aws

Panduan Developerr

# Amazon Elastic Compute Cloud

# Amazon Elastic Compute Cloud: Panduan Developerr

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# Akses terprogram ke Amazon EC2

Anda dapat membuat dan mengelola sumber daya Amazon EC2 menggunakan AWS Management Console atau antarmuka terprogram. Untuk informasi tentang menggunakan konsol Amazon EC2, lihat Panduan Pengguna Amazon EC2.

Cara kerjanya

- Titik akhir Amazon EC2
- Konsistensi akhirnya
- Idempotensi
- Minta pelambatan

Antarmuka terprogram

- AWS Command Line Interface (AWS CLI)
- AWS CloudFormation
- AWS SDK
- API tingkat rendah

Memulai

- Contoh kode
- Konsol-ke-Kode

Pemantauan

- AWS CloudTrail
- Memantau permintaan

# Titik akhir EC2 layanan Amazon

Endpoint adalah titik URL yang berfungsi sebagai titik masuk untuk layanan AWS web. Amazon EC2 mendukung jenis titik akhir berikut:

- IPv4titik akhir
- Titik akhir tumpukan ganda (mendukung keduanya dan) IPv4 IPv6
- FIPStitik akhir

Saat Anda membuat permintaan, Anda dapat menentukan titik akhir yang akan digunakan. Jika Anda tidak menentukan titik akhir, IPv4 titik akhir digunakan secara default. Untuk menggunakan tipe titik akhir yang berbeda, Anda harus menentukannya dalam permintaan Anda. Untuk contoh cara melakukannya, lihat Menentukan titik akhir. Untuk tabel titik akhir yang tersedia, lihatTitik akhir layanan menurut Wilayah.

## IPv4titik akhir

IPv4endpoint hanya mendukung IPv4 lalu lintas. IPv4titik akhir tersedia untuk semua Wilayah.

Jika Anda menentukan titik akhir umum, `ec2.amazonaws.com`, kami menggunakan titik akhir untuk `us-east-1`. Untuk menggunakan Wilayah yang berbeda, tentukan titik akhir yang terkait. Misalnya, jika Anda menentukan `ec2.us-east-2.amazonaws.com` sebagai titik akhir, kami mengarahkan permintaan Anda ke titik `us-east-2` akhir.

IPv4nama endpoint menggunakan konvensi penamaan berikut:

- *`service`*`.`*`region`*`.amazonaws.com`

Misalnya, nama IPv4 endpoint untuk `eu-west-1` Region adalah`ec2.eu-west-1.amazonaws.com`.

## Titik akhir tumpukan ganda (IPv4danIPv6)

Titik akhir dual-stack mendukung keduanya IPv4 dan lalu lintas. IPv6 Saat Anda membuat permintaan ke titik akhir dual-stack, titik akhir URL menyelesaikan ke alamat IPv6 atau IPv4 alamat, tergantung pada protokol yang digunakan oleh jaringan dan klien Anda.

Amazon hanya EC2 mendukung titik akhir dual-stack regional, yang berarti Anda harus menentukan Wilayah sebagai bagian dari nama titik akhir. Nama titik akhir tumpukan ganda menggunakan konvensi penamaan berikut:

- `ec2.`*`region`*`.api.aws`

Misalnya, nama titik akhir tumpukan ganda untuk Wilayah `eu-west-1` adalah `ec2.eu-west-1.api.aws`.

## Titik akhir layanan menurut Wilayah

Berikut ini adalah titik akhir layanan untuk AmazonEC2. Untuk informasi selengkapnya tentang Wilayah, lihat Wilayah dan Zona Ketersediaan di Panduan EC2 Pengguna Amazon.

| Nama Wilayah | Wilayah | Titik Akhir | Protokol | |
|---|---|---|---|---|
| AS Timur (Ohio) | us-east-2 | ec2.us-east-2.amazonaws.com<br>ec2-fips.us-east-2.amazonaws.com<br>ec2.us-east-2.api.aws | HTTPdan HTTPS<br>HTTPS<br>HTTPS | |
| AS Timur (Virginia Utara) | us-east-1 | ec2.us-east-1.amazonaws.com<br>ec2-fips.us-east-1.amazonaws.com<br>ec2.us-east-1.api.aws | HTTPdan HTTPS<br>HTTPS<br>HTTPS | |
| AS Barat (Californ ia Utara) | us-west-1 | ec2.us-west-1.amazonaws.com<br>ec2-fips.us-west-1.amazonaws.com<br>ec2.us-west-1.api.aws | HTTPdan HTTPS<br>HTTPS<br>HTTPS | |
| AS Barat (Oregon) | us-west-2 | ec2.us-west-2.amazonaws.com<br>ec2-fips.us-west-2.amazonaws.com<br>ec2.us-west-2.api.aws | HTTPdan HTTPS<br>HTTPS<br>HTTPS | |

| Nama Wilayah | Wilayah | Titik Akhir | Protokol |
|---|---|---|---|
| Afrika (Cape Town) | af-south-1 | ec2.af-south-1.amazonaws.com<br>ec2.af-south-1.api.aws | HTTPdan HTTPS<br>HTTPS |
| Asia Pasifik (Hong Kong) | ap-east-1 | ec2.ap-east-1.amazonaws.com<br>ec2.ap-east-1.api.aws | HTTPdan HTTPS<br>HTTPS |
| Asia Pasifik (Hyderabad) | ap-south-2 | ec2.ap-south-2.amazonaws.com | HTTPS |
| Asia Pasifik (Jakarta) | ap-southeast-3 | ec2.ap-southeast-3.amazonaws.com | HTTPS |
| Asia Pasifik (Malaysia) | ap-southeast-5 | ec2.ap-southeast-5.amazonaws.com | HTTPS |
| Asia Pasifik (Melbourne) | ap-southeast-4 | ec2.ap-southeast-4.amazonaws.com | HTTPS |
| Asia Pasifik (Mumbai) | ap-south-1 | ec2.ap-south-1.amazonaws.com<br>ec2.ap-south-1.api.aws | HTTPdan HTTPS<br>HTTPS |

| Nama Wilayah | Wilayah | Titik Akhir | Protokol |
|---|---|---|---|
| Asia Pasifik (Osaka) | ap-northeast-3 | ec2.ap-northeast-3.amazonaws.com | HTTPdan HTTPS |
| Asia Pasifik (Seoul) | ap-northeast-2 | ec2.ap-northeast-2.amazonaws.com<br>ec2.ap-northeast-2.api.aws | HTTPdan HTTPS<br>HTTPS |
| Asia Pasifik (Singapura) | ap-southeast-1 | ec2.ap-southeast-1.amazonaws.com<br>ec2.ap-southeast-1.api.aws | HTTPdan HTTPS<br>HTTPS |
| Asia Pasifik (Sydney) | ap-southeast-2 | ec2.ap-southeast-2.amazonaws.com<br>ec2.ap-southeast-2.api.aws | HTTPdan HTTPS<br>HTTPS |
| Asia Pacific (Tokyo) | ap-northeast-1 | ec2.ap-northeast-1.amazonaws.com<br>ec2.ap-northeast-1.api.aws | HTTPdan HTTPS<br>HTTPS |
| Kanada (Pusat) | ca-central-1 | ec2.ca-central-1.amazonaws.com<br>ec2-fips.ca-central-1.amazonaws.com<br>ec2.ca-central-1.api.aws | HTTPdan HTTPS<br>HTTPS<br>HTTPS |
| Kanada Barat (Calgary) | ca-west-1 | ec2.ca-west-1.amazonaws.com<br>ec2-fips.ca-west-1.amazonaws.com | HTTPS<br>HTTPS |

| Nama Wilayah | Wilayah | Titik Akhir | Protokol |
|---|---|---|---|
| Eropa (Frankfurt) | eu-central-1 | ec2.eu-central-1.amazonaws.com<br>ec2.eu-central-1.api.aws | HTTPdan HTTPS<br>HTTPS |
| Eropa (Irlandia) | eu-west-1 | ec2.eu-west-1.amazonaws.com<br>ec2.eu-west-1.api.aws | HTTPdan HTTPS<br>HTTPS |
| Eropa (London) | eu-west-2 | ec2.eu-west-2.amazonaws.com<br>ec2.eu-west-2.api.aws | HTTPdan HTTPS<br>HTTPS |
| Eropa (Milan) | eu-south-1 | ec2.eu-south-1.amazonaws.com<br>ec2.eu-south-1.api.aws | HTTPdan HTTPS<br>HTTPS |
| Eropa (Paris) | eu-west-3 | ec2.eu-west-3.amazonaws.com<br>ec2.eu-west-3.api.aws | HTTPdan HTTPS<br>HTTPS |
| Eropa (Spanyol) | eu-south-2 | ec2.eu-south-2.amazonaws.com | HTTPS |
| Eropa (Stockholm) | eu-north-1 | ec2.eu-north-1.amazonaws.com<br>ec2.eu-north-1.api.aws | HTTPdan HTTPS<br>HTTPS |
| Eropa (Zürich) | eu-central-2 | ec2.eu-central-2.amazonaws.com | HTTPS |
| Israel (Tel Aviv) | il-central-1 | ec2.il-central-1.amazonaws.com | HTTPS |

| Nama Wilayah | Wilayah | Titik Akhir | Protokol |
|---|---|---|---|
| Timur Tengah (Bahrain) | me-south-1 | ec2.me-south-1.amazonaws.com<br>ec2.me-south-1.api.aws | HTTPdan HTTPS<br>HTTPS |
| Timur Tengah (UAE) | me-central-1 | ec2.me-central-1.amazonaws.com | HTTPS |
| Amerika Selatan (Sao Paulo) | sa-east-1 | ec2.sa-east-1.amazonaws.com<br>ec2.sa-east-1.api.aws | HTTPdan HTTPS<br>HTTPS |
| AWS GovCloud (AS-Timur) | us-gov-east-1 | ec2.us-gov-east-1.amazonaws.com<br>ec2.us-gov-east-1.api.aws | HTTPS<br>HTTPS |
| AWS GovCloud (AS-Barat) | us-gov-west-1 | ec2.us-gov-west-1.amazonaws.com<br>ec2.us-gov-west-1.api.aws | HTTPS<br>HTTPS |

## Menentukan titik akhir

Bagian ini memberikan beberapa contoh cara menentukan titik akhir saat membuat permintaan.

AWS CLI

Contoh berikut menunjukkan cara menentukan titik akhir untuk `us-east-2` Wilayah menggunakan. AWS CLI

- Tumpukan ganda

```
aws ec2 describe-regions --region us-east-2 --endpoint-url https://ec2.us-
east-2.api.aws
```

- IPv4

```
aws ec2 describe-regions --region us-east-2 --endpoint-url https://ec2.us-
east-2.amazonaws.com
```

AWS SDK for Java 2.x

Contoh berikut menunjukkan cara menentukan titik akhir untuk `us-east-2` Wilayah menggunakan. AWS SDK for Java 2.x

- Tumpukan ganda

```
Ec2Client client = Ec2Client.builder()
    .region(Region.US_EAST_2)
    .endpointOverride(URI.create("https://ec2.us-east-2.api.aws"))
    .build();
```

- IPv4

```
Ec2Client client = Ec2Client.builder()
    .region(Region.US_EAST_2)
    .endpointOverride(URI.create("https://ec2.us-east-2.amazonaws.com"))
    .build();
```

AWS SDK for Java 1.x

Contoh berikut menunjukkan cara menentukan titik akhir untuk `eu-west-1` Wilayah menggunakan AWS SDK for Java 1.x.

- Tumpukan ganda

```
AmazonEC2 s3 = AmazonEC2ClientBuilder.standard()
     .withEndpointConfiguration(new EndpointConfiguration(
          "https://ec2.eu-west-1.api.aws",
          "eu-west-1"))
```

```
     .build();
```

- IPv4

```
AmazonEC2 s3 = AmazonEC2ClientBuilder.standard()
     .withEndpointConfiguration(new EndpointConfiguration(
          "https://ec2.eu-west-1.amazonaws.com",
          "eu-west-1"))
     .build();
```

AWS SDK for Go

Contoh berikut menunjukkan cara menentukan titik akhir untuk `us-east-1` Wilayah menggunakan. AWS SDK for Go

- Tumpukan ganda

```
sess := session.Must(session.NewSession())
svc := ec2.New(sess, &aws.Config{
    Region: aws.String(endpoints.UsEast1RegionID),
    Endpoint: aws.String("https://ec2.us-east-1.api.aws")
})
```

- IPv4

```
sess := session.Must(session.NewSession())
svc := ec2.New(sess, &aws.Config{
    Region: aws.String(endpoints.UsEast1RegionID),
    Endpoint: aws.String("https://ec2.us-east-1.amazonaws.com")
})
```

# Konsistensi akhirnya di Amazon EC2 API

Amazon EC2 API mengikuti model konsistensi akhirnya, karena sifat terdistribusi dari sistem yang mendukung. API Ini berarti bahwa hasil API perintah yang Anda jalankan yang memengaruhi EC2 sumber daya Amazon Anda mungkin tidak langsung terlihat oleh semua perintah berikutnya yang Anda jalankan. Anda harus mengingat hal ini ketika Anda menjalankan API perintah yang segera mengikuti API perintah sebelumnya.

Konsistensi akhirnya dapat memengaruhi cara Anda mengelola sumber daya Anda. Misalnya, jika Anda menjalankan perintah untuk membuat sumber daya, pada akhirnya akan terlihat oleh perintah lain. Ini berarti bahwa jika Anda menjalankan perintah untuk memodifikasi atau mendeskripsikan sumber daya yang baru saja Anda buat, ID-nya mungkin tidak disebarkan ke seluruh sistem, dan Anda akan mendapatkan kesalahan yang merespons bahwa sumber daya tidak ada.

Untuk mengelola konsistensi akhirnya, Anda dapat melakukan hal berikut:

- Konfirmasikan status sumber daya sebelum Anda menjalankan perintah untuk memodifikasinya. Jalankan `Describe` perintah yang sesuai menggunakan algoritma backoff eksponensial untuk memastikan bahwa Anda memberikan cukup waktu untuk perintah sebelumnya untuk menyebar melalui sistem. Untuk melakukan ini, jalankan `Describe` perintah berulang kali, dimulai dengan beberapa detik waktu tunggu, dan meningkat secara bertahap hingga lima menit waktu tunggu.
- Tambahkan waktu tunggu antara perintah berikutnya, bahkan jika `Describe` perintah mengembalikan respons yang akurat. Terapkan algoritma backoff eksponensial dimulai dengan beberapa detik waktu tunggu, dan tingkatkan secara bertahap hingga sekitar lima menit waktu tunggu.

### Contoh kesalahan konsistensi akhirnya

Berikut ini adalah contoh kode kesalahan yang mungkin Anda temui sebagai akibat dari konsistensi akhirnya.

- `InvalidInstanceID.NotFound`

  Jika Anda berhasil menjalankan `RunInstances` perintah, dan kemudian segera menjalankan perintah lain menggunakan ID instance yang disediakan dalam respons`RunInstances`, itu mungkin mengembalikan `InvalidInstanceID.NotFound` kesalahan. Ini tidak berarti instance tidak ada.

  Beberapa perintah spesifik yang mungkin terpengaruh adalah:

  - `DescribeInstances`: Untuk mengonfirmasi keadaan sebenarnya dari instance, jalankan perintah ini menggunakan algoritma backoff eksponensial.
  - `TerminateInstances`: Untuk mengonfirmasi status instance, pertama jalankan `DescribeInstances` perintah menggunakan algoritma backoff eksponensial.

> **Important**
>
> Jika Anda mendapatkan `InvalidInstanceID.NotFound` kesalahan setelah menjalankan`TerminateInstances`, ini tidak berarti bahwa instance tersebut akan atau akan dihentikan. Instance Anda masih bisa berjalan. Inilah sebabnya mengapa penting untuk terlebih dahulu mengkonfirmasi status instance menggunakan`DescribeInstances`.

- `InvalidGroup.NotFound`

  Jika Anda berhasil menjalankan `CreateSecurityGroup` perintah, dan kemudian segera menjalankan perintah lain menggunakan ID grup keamanan yang disediakan dalam respons`CreateSecurityGroup`, itu mungkin mengembalikan `InvalidGroup.NotFound` kesalahan. Untuk mengonfirmasi status grup keamanan, jalankan `DescribeSecurityGroups` perintah menggunakan algoritma backoff eksponensial.

- `InstanceLimitExceeded`

  Anda telah meminta lebih banyak instance daripada yang diizinkan batas instans saat ini untuk jenis instans yang ditentukan. Anda dapat mencapai batas ini secara tidak terduga jika Anda meluncurkan dan menghentikan instance dengan cepat, karena instance yang dihentikan dihitung terhadap batas instans Anda untuk sementara waktu setelah dihentikan.

## Memastikan idempotensi dalam permintaan Amazon EC2 API

Saat Anda membuat API permintaan mutasi, permintaan biasanya mengembalikan hasil sebelum alur kerja asinkron operasi selesai. Operasi mungkin juga habis waktu atau mengalami masalah server lain sebelum selesai, meskipun permintaan telah mengembalikan hasilnya. Hal ini dapat membuat sulit untuk menentukan apakah permintaan berhasil atau tidak, dan dapat menyebabkan beberapa percobaan ulang untuk memastikan bahwa operasi selesai dengan sukses. Namun, jika permintaan asli dan percobaan ulang berikutnya berhasil, operasi selesai beberapa kali. Ini berarti Anda dapat membuat lebih banyak sumber daya daripada yang Anda inginkan.

Idempotency memastikan bahwa API permintaan selesai tidak lebih dari satu kali. Dengan permintaan idempoten, jika permintaan asli berhasil diselesaikan, percobaan ulang berikutnya berhasil diselesaikan tanpa melakukan tindakan lebih lanjut. Namun, hasilnya mungkin berisi informasi yang diperbarui, seperti status pembuatan saat ini.

Daftar Isi


- Idempotensi di Amazon EC2
- RunInstances idempotensi
- Contoh
- Coba lagi rekomendasi untuk permintaan idempoten


## Idempotensi di Amazon EC2

APITindakan berikut ini idempoten secara default, dan tidak memerlukan konfigurasi tambahan. AWS CLI Perintah yang sesuai juga mendukung idempotensi secara default.

Idempoten secara default

- AssociateAddress
- CreateVpnConnection
- DisassociateAddress
- ReplaceNetworkAclAssociation
- TerminateInstances

APITindakan berikut secara opsional mendukung idempotensi menggunakan token klien. AWS CLI Perintah yang sesuai juga mendukung idempotensi menggunakan token klien. Token klien adalah string unik dan peka huruf besar/kecil hingga 64 ASCII karakter. Untuk membuat API permintaan idempoten menggunakan salah satu tindakan ini, tentukan token klien dalam permintaan. Anda tidak boleh menggunakan kembali token klien yang sama untuk API permintaan lainnya. Jika Anda mencoba lagi permintaan yang berhasil diselesaikan menggunakan token klien yang sama dan parameter yang sama, percobaan ulang berhasil tanpa melakukan tindakan lebih lanjut. Jika Anda mencoba kembali permintaan yang berhasil menggunakan token klien yang sama, tetapi satu atau beberapa parameter berbeda, selain Wilayah atau Zona Ketersediaan, percobaan ulang gagal dengan kesalahan`IdempotentParameterMismatch`.

Idempoten menggunakan token klien

- AllocateHosts
- AllocateIpamPoolCidr
- AssociateClientVpnTargetNetwork

- AssociateIpamResourceDiscovery
- AttachVerifiedAccessTrustProvider
- AuthorizeClientVpnIngress
- CopyFpgaImage
- CopyImage
- CreateCapacityReservation
- CreateCapacityReservationFleet
- CreateClientVpnEndpoint
- CreateClientVpnRoute
- CreateEgressOnlyInternetGateway
- CreateFleet
- CreateFlowLogs
- CreateFpgaImage
- CreateInstanceConnectEndpoint
- CreateIpam
- CreateIpamPool
- CreateIpamResourceDiscovery
- CreateIpamScope
- CreateLaunchTemplate
- CreateLaunchTemplateVersion
- CreateManagedPrefixList
- CreateNatGateway
- CreateNetworkAcl
- CreateNetworkInsightsAccessScope
- CreateNetworkInsightsPath
- CreateNetworkInterface
- CreateReplaceRootVolumeTask
- CreateReservedInstancesListing
- CreateRouteTable

- CreateTrafficMirrorFilter
- CreateTrafficMirrorFilterRule
- CreateTrafficMirrorSession
- CreateTrafficMirrorTarget
- CreateVerifiedAccessEndpoint
- CreateVerifiedAccessGroup
- CreateVerifiedAccessInstance
- CreateVerifiedAccessTrustProvider
- CreateVolume
- CreateVpcEndpoint
- CreateVpcEndpointConnectionNotification
- CreateVpcEndpointServiceConfiguration
- DeleteVerifiedAccessEndpoint
- DeleteVerifiedAccessGroup
- DeleteVerifiedAccessInstance
- DeleteVerifiedAccessTrustProvider
- DetachVerifiedAccessTrustProvider
- ExportImage
- ImportImage
- ImportSnapshot
- ModifyInstanceCreditSpecification
- ModifyLaunchTemplate
- ModifyReservedInstances
- ModifyVerifiedAccessEndpoint
- ModifyVerifiedAccessEndpointPolicy
- ModifyVerifiedAccessGroup
- ModifyVerifiedAccessGroupPolicy
- ModifyVerifiedAccessInstance
- ModifyVerifiedAccessInstanceLoggingConfiguration
- ModifyVerifiedAccessTrustProvider

- ProvisionIpamPoolCidr
- PurchaseHostReservation
- RequestSpotFleet
- RequestSpotInstances
- RunInstances
- StartNetworkInsightsAccessScopeAnalysis
- StartNetworkInsightsAnalysis

Jenis idempotensi

- Regional — Permintaan bersifat idempoten di setiap Wilayah. Namun, Anda dapat menggunakan permintaan yang sama, termasuk token klien yang sama, di Wilayah yang berbeda.
- Zonal — Permintaan bersifat idempoten di setiap Availability Zone di suatu Wilayah. Misalnya, jika Anda menentukan token klien yang sama dalam dua panggilan ke AllocateHosts Region yang sama, panggilan berhasil jika mereka menentukan nilai yang berbeda untuk AvailabilityZone parameter.

## RunInstances idempotensi

RunInstancesAPITindakan ini menggunakan idempotensi Regional dan zonal.

Jenis idempotensi yang digunakan bergantung pada bagaimana Anda menentukan Availability Zone dalam permintaan Anda RunInstances API. Permintaan menggunakan idempotensi zonal dalam kasus berikut:

- Jika Anda secara eksplisit menentukan Availability Zone menggunakan AvailabilityZoneparameter dalam tipe data Penempatan
- Jika Anda secara implisit menentukan Availability Zone menggunakan parameter SubnetId

Jika Anda tidak secara eksplisit atau implisit menentukan Availability Zone, permintaan menggunakan idempotensi Regional.

### Idempotensi zona

Idempotensi zona memastikan bahwa RunInstances API permintaan idempoten di setiap Availability Zone di Region. Ini memastikan bahwa permintaan dengan token klien yang sama hanya dapat

diselesaikan sekali dalam setiap Availability Zone di Region. Namun, token klien yang sama dapat digunakan untuk meluncurkan instance di Availability Zone lainnya di Region.

Misalnya, jika Anda mengirim permintaan idempoten untuk meluncurkan instance di `us-east-1a` Availability Zone, dan kemudian menggunakan token klien yang sama dalam permintaan di `us-east-1b` Availability Zone, kami meluncurkan instance di masing-masing Availability Zone tersebut. Jika satu atau beberapa parameter berbeda, percobaan ulang berikutnya dengan token klien yang sama di Availability Zones tersebut berhasil kembali tanpa melakukan tindakan lebih lanjut atau gagal dengan `IdempotentParameterMismatch` kesalahan.

### Idempotensi regional

Idempotensi regional memastikan bahwa RunInstances API permintaan idempoten di suatu Wilayah. Ini memastikan bahwa permintaan dengan token klien yang sama hanya dapat diselesaikan sekali dalam Wilayah. Namun, permintaan yang sama persis, dengan token klien yang sama, dapat digunakan untuk meluncurkan instance di Wilayah yang berbeda.

Misalnya, jika Anda mengirim permintaan idempoten untuk meluncurkan instance di `us-east-1` Wilayah, dan kemudian menggunakan token klien yang sama dalam permintaan di `eu-west-1` Wilayah, kami meluncurkan instance di masing-masing Wilayah tersebut. Jika satu atau lebih parameter berbeda, percobaan ulang berikutnya dengan token klien yang sama di Wilayah tersebut berhasil kembali tanpa melakukan tindakan lebih lanjut atau gagal dengan `IdempotentParameterMismatch` kesalahan.

> **Tip**
>
> Jika salah satu Availability Zone di Region yang diminta tidak tersedia, RunInstances permintaan yang menggunakan idempotensi regional bisa gagal. Untuk memanfaatkan fitur Availability Zone yang ditawarkan oleh AWS infrastruktur, sebaiknya gunakan idempotensi zona saat meluncurkan instans. RunInstances permintaan yang menggunakan idempotensi zona dan menargetkan Availability Zone yang tersedia berhasil meskipun Availability Zone lain di Wilayah yang diminta tidak tersedia.

## Contoh

### AWS CLI contoh perintah

Untuk membuat AWS CLI perintah idempoten, tambahkan opsi. `--client-token`

Contoh 1: Idempotensi

Perintah allocate-hosts berikut menggunakan idempotency karena menyertakan token klien.

```
aws ec2 allocate-hosts  --instance-type m5.large  --availability-zone eu-west-1a  --
auto-placement on  --quantity 1 --client-token 550e8400-e29b-41d4-a716-446655440000
```

Contoh 2: run-instance idempotensi regional

Perintah run-instance berikut menggunakan idempotensi regional karena menyertakan token klien tetapi tidak secara eksplisit atau implisit menentukan Availability Zone.

```
aws ec2 run-instances --image-id ami-b232d0db --count 1 --key-name my-key-pair --
client-token 550e8400-e29b-41d4-a716-446655440000
```

Contoh 3: run-instance idempotensi zona

Perintah run-instance berikut menggunakan idempotensi zonal karena menyertakan token klien dan Availability Zone yang ditentukan secara eksplisit.

```
aws ec2 run-instances  --placement "AvailabilityZone=us-east-1a" --image-id ami-
b232d0db --count 1 --key-name my-key-pair --client-token 550e8400-e29b-41d4-
a716-446655440000
```

## APIcontoh permintaan

Untuk membuat API permintaan idempoten, tambahkan parameter. `ClientToken`

Contoh 1: Idempotensi

AllocateHostsAPIPermintaan berikut menggunakan idempotensi karena menyertakan token klien.

```
https://ec2.amazonaws.com/?Action=AllocateHosts
&AvailabilityZone=us-east-1b
&InstanceType=m5.large
&Quantity=1
&AutoPlacement=off
&ClientToken=550e8400-e29b-41d4-a716-446655440000
&AUTHPARAMS
```

Contoh 2: RunInstances idempotensi regional

RunInstancesAPIPermintaan berikut menggunakan idempotensi regional karena menyertakan token klien tetapi tidak secara eksplisit atau implisit menentukan Availability Zone.

```
https://ec2.amazonaws.com/?Action=RunInstances
&ImageId=ami-3ac33653
&MaxCount=1
&MinCount=1
&KeyName=my-key-pair
&ClientToken=550e8400-e29b-41d4-a716-446655440000
&AUTHPARAMS
```

Contoh 3: RunInstances idempotensi zonal

RunInstancesAPIPermintaan berikut menggunakan idempotensi zonal karena menyertakan token klien dan Availability Zone yang ditentukan secara eksplisit.

```
https://ec2.amazonaws.com/?Action=RunInstances
&Placement.AvailabilityZone=us-east-1d
&ImageId=ami-3ac33653
&MaxCount=1
&MinCount=1
&KeyName=my-key-pair
&ClientToken=550e8400-e29b-41d4-a716-446655440000
&AUTHPARAMS
```

## Coba lagi rekomendasi untuk permintaan idempoten

Tabel berikut menunjukkan beberapa tanggapan umum yang mungkin Anda dapatkan untuk API permintaan idempoten, dan memberikan rekomendasi coba lagi.

| Respons | Rekomendasi | Komentar |
| --- | --- | --- |
| 200 (OK) | Jangan coba lagi | Permintaan asli berhasil diselesaikan. Setiap percobaan ulang berikutnya berhasil kembali. |
| | Jangan coba lagi | |

| Respons | Rekomendasi | Komentar |
| --- | --- | --- |
| Kode respons 400 seri (kesalahan klien) | | Ada masalah dengan permintaan, dari antara yang berikut:<br>• Ini termasuk parameter atau kombinasi parameter yang tidak valid.<br>• Ini menggunakan tindakan atau sumber daya yang Anda tidak memiliki izin.<br>• Ini menggunakan sumber daya yang sedang dalam proses mengubah keadaan.<br><br>Jika permintaan melibatkan sumber daya yang sedang dalam proses mengubah status, mencoba kembali permintaan mungkin berhasil. |
| Kode respons 500 seri (kesalahan server) | Coba lagi | Kesalahan ini disebabkan oleh masalah AWS sisi server dan umumnya bersifat sementara . Ulangi permintaan dengan strategi backoff yang sesuai. |

# Minta pembatasan untuk Amazon EC2 API

Amazon EC2 membatasi EC2 API permintaan untuk setiap AWS akun berdasarkan per wilayah. Kami melakukan ini untuk membantu kinerja layanan, dan untuk memastikan penggunaan yang adil untuk semua EC2 pelanggan Amazon. Throttling memastikan bahwa permintaan ke Amazon EC2 API tidak melebihi batas maksimum API permintaan yang diizinkan. APIPermintaan tunduk pada batas permintaan apakah mereka berasal dari:

- Aplikasi pihak ketiga
- Alat baris perintah
- EC2Konsol Amazon

Jika Anda melebihi batas API pelambatan, Anda mendapatkan kode `RequestLimitExceeded` kesalahan.

Daftar Isi


- Bagaimana throttling diterapkan
- Batas pelambatan
- Pantau API pelambatan
- Mencoba lagi dan backoff eksponensial
- Minta kenaikan batas


## Bagaimana throttling diterapkan

Amazon EC2 menggunakan algoritma token bucket untuk mengimplementasikan API throttling. Dengan algoritme ini, akun Anda memiliki bucket yang memegang sejumlah tertentu token. Jumlah token dalam bucket mewakili batas throttling Anda pada detik tertentu.

Amazon EC2 mengimplementasikan dua jenis API pelambatan:

APIjenis pelambatan

- Pembatasan laju permintaan
- Pembatasan tingkat sumber daya

### Pembatasan laju permintaan

Dengan pembatasan tarif permintaan, masing-masing API dievaluasi secara individual, dan Anda dibatasi pada jumlah permintaan yang Anda buat per- basis. API Setiap permintaan yang Anda buat menghapus satu token dari API bucket. Misalnya, ukuran ember token untuk`DescribeHosts`, API tindakan non-mutasi, adalah 100 token. Anda dapat membuat hingga 100 `DescribeHosts` permintaan dalam satu detik. Jika Anda melebihi 100 permintaan dalam satu detik, Anda akan dibatasi API dan permintaan yang tersisa dalam detik itu gagal, namun permintaan untuk permintaan lainnya tidak API terpengaruh.

Bucket secara otomatis diisi ulang pada tingkat yang ditetapkan. Jika bucket berada di bawah kapasitas maksimumnya, sejumlah token ditambahkan kembali setiap detik hingga mencapai kapasitas maksimumnya. Jika ember penuh saat token isi ulang tiba, mereka dibuang. Bucket tidak dapat menampung lebih dari jumlah token maksimumnya. Misalnya, ukuran bucket

untuk`DescribeHosts`, API tindakan non-mutasi, adalah 100 token dan tingkat isi ulang adalah 20 token per detik. Jika Anda membuat 100 `DescribeHosts` permintaan dalam satu detik, bucket dikurangi menjadi nol (0) token. Bucket kemudian diisi ulang dengan 20 token setiap detik, hingga mencapai kapasitas maksimum 100 token. Ini berarti bahwa ember kosong mencapai kapasitas maksimumnya setelah 5 detik jika tidak ada permintaan yang dibuat selama waktu itu.

Anda tidak perlu menunggu ember benar-benar penuh sebelum Anda dapat mengajukan API permintaan. Anda dapat menggunakan token isi ulang saat ditambahkan ke ember. Jika Anda segera menggunakan token isi ulang, ember tidak mencapai kapasitas maksimumnya. Misalnya, ukuran bucket untuk`DescribeHosts`, API tindakan non-mutasi, adalah 100 token dan tingkat isi ulang adalah 20 token per detik. Jika Anda menghabiskan bucket dengan membuat 100 API permintaan dalam satu detik, Anda dapat terus membuat 20 API permintaan per detik dengan menggunakan token isi ulang saat ditambahkan ke ember. Bucket dapat diisi ulang hingga kapasitas maksimum hanya jika Anda membuat kurang dari 20 API permintaan per detik.

## Pembatasan tingkat sumber daya

Beberapa API tindakan, seperti `RunInstances` dan`TerminateInstances`, seperti yang dijelaskan dalam tabel berikut, menggunakan pembatasan tingkat sumber daya selain pembatasan tingkat permintaan. APITindakan ini memiliki bucket token sumber daya terpisah yang habis berdasarkan jumlah sumber daya yang dipengaruhi oleh permintaan. Seperti bucket token permintaan, bucket token sumber daya memiliki bucket maksimum yang memungkinkan Anda melakukan burst, dan tingkat isi ulang yang memungkinkan Anda mempertahankan tingkat permintaan yang stabil selama diperlukan. Jika Anda melebihi batas bucket tertentu untuk sebuah bucketAPI, termasuk ketika bucket belum diisi ulang untuk mendukung API permintaan berikutnya, tindakan tersebut API terbatas meskipun Anda belum mencapai batas API throttle total.

Misalnya, ukuran bucket token sumber daya untuk `RunInstances` adalah 1000 token, dan tingkat isi ulang adalah dua token per detik. Oleh karena itu, Anda dapat segera meluncurkan 1000 instance, menggunakan sejumlah API permintaan, seperti satu permintaan untuk 1000 instans atau empat permintaan untuk 250 instance. Setelah bucket token sumber daya kosong, Anda dapat meluncurkan hingga dua instance setiap detik, menggunakan salah satu permintaan untuk dua instance atau dua permintaan untuk satu instance.

Untuk informasi selengkapnya, lihat Ukuran bucket token sumber daya dan tarif isi ulang.

# Batas pelambatan

Bagian berikut menjelaskan ukuran bucket token permintaan dan bucket token sumber daya serta tarif isi ulang.

Batas

- Minta ukuran bucket token dan tarif isi ulang
- Ukuran bucket token sumber daya dan tarif isi ulang

## Minta ukuran bucket token dan tarif isi ulang

Untuk tujuan pembatasan tarif permintaan, API tindakan dikelompokkan ke dalam kategori berikut:

- Tindakan non-mutasi — API tindakan yang mengambil data tentang sumber daya. Kategori ini umumnya mencakup semua`Describe*`,`List*`,`Search*`, dan `Get*` API tindakan, seperti`DescribeRouteTables`,`SearchTransitGatewayRoutes`, dan`GetIpamPoolCidrs`. APITindakan ini biasanya memiliki batas API pelambatan tertinggi.
- Tindakan non-mutasi tanpa filter dan tanpa paginasi — Subset spesifik dari tindakan non-mutasi API yang, ketika diminta tanpa menentukan pagination atau filter, menggunakan token dari bucket token yang lebih kecil. Disarankan agar Anda menggunakan pagination dan filtering sehingga token dikurangkan dari bucket token standar (lebih besar).
- Tindakan mutasi — API tindakan yang membuat, memodifikasi, atau menghapus sumber daya. Kategori ini umumnya mencakup semua API tindakan yang tidak dikategorikan sebagai tindakan non-mutasi, seperti`AllocateHosts`,, dan. `ModifyHosts` `CreateCapacityReservation` Tindakan ini memiliki batas pelambatan yang lebih rendah daripada tindakan API non-mutasi.
- Tindakan intensif sumber daya — Mutasi API tindakan yang membutuhkan waktu paling banyak dan menghabiskan sumber daya paling banyak untuk diselesaikan. Tindakan ini memiliki batas pelambatan yang lebih rendah daripada tindakan mutasi. Mereka dibatasi secara terpisah dari tindakan mutasi lainnya.
- Tindakan non-mutasi konsol — Tindakan non-mutasi yang API diminta dari konsol Amazon. EC2 APITindakan ini dibatasi secara terpisah dari tindakan API non-mutasi lainnya.
- Tindakan yang tidak dikategorikan — Ini adalah API tindakan yang menerima ukuran bucket token dan tarif isi ulang mereka sendiri, meskipun menurut definisi mereka cocok dalam salah satu kategori lainnya.

Tabel berikut menunjukkan ukuran bucket token permintaan dan tarif isi ulang untuk semua AWS Wilayah.

| APIkategori aksi | Tindakan | Kapasitas maksimum bucket | Tingkat isi ulang ember |
|---|---|---|---|
| Tindakan yang tidak bermutasi | Semua*Describe** ,, *List*Search**, dan *Get** API tindakan yang bukan Tindakan non-mutasi tanpa filter dan tanpa paginasi atau tindakan yang tidak dikategorikan. | 100 | 20 |
| Tindakan non-mutasi tanpa filter dan tanpa paginasi | • DescribeInstances<br>• DescribeInstanceStatus<br>• DescribeNetworkInterfaces<br>• DescribeSecurityGroups<br>• DescribeSnapshots<br>• | 50 | 10 |

| APIkategori aksi | Tindakan | Kapasitas maksimum bucket | Tingkat isi ulang ember |
|---|---|---|---|
| | `DescribeSpotInstanceRequests`<br>• `DescribeVolumes` | | |
| Tindakan bermutasi | Semua API tindakan bermutasi yang bukan tindakan intensif sumber daya atau tindakan yang tidak dikategorikan. | 50 | 5 |

| APIkategori aksi | Tindakan | Kapasitas maksimum bucket | Tingkat isi ulang ember |
| --- | --- | --- | --- |
| Tindakan intensif sumber daya | • AcceptVpcPeeringConnection<br>• AuthorizeSecurityGroupIngress<br>• CancelSpotInstanceRequests<br>• CreateKeyPair<br>• CreateVpcPeeringConnection<br>• DeleteVpcPeeringConnection<br>• RejectVpcPeeringConnection<br>• RevokeSecurityGroupIngress<br>• RequestSpotInstances | 50 | 5 |

| APIkategori aksi | Tindakan | Kapasitas maksimum bucket | Tingkat isi ulang ember |
|---|---|---|---|
| Tindakan konsol yang tidak bermutasi | • `Describe*`<br>• `Get*` | 100 | 10 |
| Tindakan yang tidak dikategorikan | `AcceptVpcEndpointConnections` | 10 | 1 |
| | `AdvertiseByoipCidr` | 1 | 0.1 |
| | `AssignIpv6Addresses` | 100 | 5 |
| | `AssignPrivateIpAddresses` | 100 | 5 |
| | `AssignPrivateNatGatewayAddress` | 10 | 1 |
| | `AssociateEnclaveCertificateIamRole` | 10 | 1 |
| | `AssociateIamInstanceProfile` | 100 | 5 |
| | `AssociateNatGatewayAddress` | 10 | 1 |

| APIkategori aksi | Tindakan | Kapasitas maksimum bucket | Tingkat isi ulang ember |
|---|---|---|---|
| | AttachVerifiedAccessTrustProvider | 10 | 2 |
| | CreateDefaultSubnet | 1 | 1 |
| | CreateDefaultVpc | 1 | 1 |
| | CopyImage | 100 | 1 |
| | CreateLaunchTemplateVersion | 100 | 5 |
| | CreateNatGateway | 10 | 1 |
| | CreateNetworkInterface | 100 | 5 |
| | CreateRestoreImageTask | 50 | 0.1 |
| | CreateSnapshot | 100 | 5 |
| | CreateSnapshots | 100 | 5 |
| | CreateStoreImageTask | 50 | 0.1 |
| | CreateTags | 100 | 10 |

| APIkategori aksi | Tindakan | Kapasitas maksimum bucket | Tingkat isi ulang ember |
|---|---|---|---|
| | CreateVerifiedAccessEndpoint | 20 | 4 |
| | CreateVerifiedAccessGroup | 10 | 2 |
| | CreateVerifiedAccessInstance | 10 | 2 |
| | CreateVerifiedAccessTrustProvider | 10 | 2 |
| | CreateVolume | 100 | 5 |
| | CreateVpcEndpoint | 4 | 0,3 |
| | CreateVpcEndpointServiceConfiguration | 10 | 1 |
| | DeleteNatGateway | 10 | 1 |
| | DeleteNetworkInterface | 100 | 5 |
| | DeleteSnapshot | 100 | 5 |
| | DeleteTags | 100 | 10 |

| APIkategori aksi | Tindakan | Kapasitas maksimum bucket | Tingkat isi ulang ember |
|---|---|---|---|
| | DeleteQueuedReservedInstances | 5 | 5 |
| | DeleteVerifiedAccessEndpoint | 20 | 4 |
| | DeleteVerifiedAccessGroup | 10 | 2 |
| | DeleteVerifiedAccessInstance | 10 | 2 |
| | DeleteVerifiedAccessTrustProvider | 10 | 2 |
| | DeleteVolume | 100 | 5 |
| | DeleteVpcEndpoints | 4 | 0,3 |
| | DeleteVpcEndpointServiceConfigurations | 10 | 1 |
| | DeprovisionByoipCidr | 1 | 0.1 |
| | DeregisterImage | 100 | 5 |

| APIkategori aksi | Tindakan | Kapasitas maksimum bucket | Tingkat isi ulang ember |
|---|---|---|---|
| | DetachVerifiedAccessTrustProvider | 10 | 2 |
| | DescribeByoipCidrs | 1 | 0,5 |
| | DescribeCapacityBlockOfferings | 10 | 0,15 |
| | DescribeInstanceTopology | 1 | 1 |
| | DescribeMovingAddresses | 1 | 1 |
| | DescribeReservedInstancesOfferings | 10 | 10 |
| | DescribeSpotFleetRequestHistory | 100 | 5 |
| | DescribeSpotFleetInstances | 100 | 5 |
| | DescribeSpotFleetRequests | 50 | 3 |

| APIkategori aksi | Tindakan | Kapasitas maksimum bucket | Tingkat isi ulang ember |
|---|---|---|---|
| | DescribeStoreImageTasks | 50 | 0,5 |
| | DescribeVerifiedAccessInstanceLoggingConfigurations | 10 | 2 |
| | DisableFastLaunch | 5 | 2 |
| | DisableImageBlockPublicAccess | 1 | 0.1 |
| | DisableSnapshotBlockPublicAccess | 1 | 0.1 |
| | DisassociateEnclaveCertificateIamRole | 10 | 1 |
| | DisassociateIamInstanceProfile | 100 | 5 |
| | DisassociateNatGatewayAddress | 10 | 1 |

| APIkategori aksi | Tindakan | Kapasitas maksimum bucket | Tingkat isi ulang ember |
|---|---|---|---|
| | EnableFastLaunch | 5 | 2 |
| | EnableImageBlockPublicAccess | 1 | 0.1 |
| | EnableSnapshotBlockPublicAccess | 1 | 0.1 |
| | GetAssociatedEnclaveCertificateIamRoles | 10 | 1 |
| | ModifyImageAttribute | 100 | 5 |
| | ModifyInstanceMetadataOptions | 100 | 5 |
| | ModifyLaunchTemplate | 100 | 5 |
| | ModifyNetworkInterfaceAttribute | 100 | 5 |
| | ModifySnapshotAttribute | 100 | 5 |
| | ModifyVerifiedAccessEndpoint | 20 | 4 |

| APIkategori aksi | Tindakan | Kapasitas maksimum bucket | Tingkat isi ulang ember |
|---|---|---|---|
| | ModifyVerifiedAccessEndpointPolicy | 20 | 4 |
| | ModifyVerifiedAccessGroup | 10 | 2 |
| | ModifyVerifiedAccessGroupPolicy | 20 | 4 |
| | ModifyVerifiedAccessInstance | 10 | 2 |
| | ModifyVerifiedAccessInstanceLoggingConfiguration | 10 | 2 |
| | ModifyVerifiedAccessTrustProvider | 10 | 2 |
| | ModifyVpcEndpoint | 4 | 0,3 |
| | ModifyVpcEndpointServiceConfiguration | 10 | 1 |

| APIkategori aksi | Tindakan | Kapasitas maksimum bucket | Tingkat isi ulang ember |
|---|---|---|---|
| | MoveAddressToVpc | 1 | 1 |
| | ProvisionByoipCidr | 1 | 0.1 |
| | PurchaseCapacityBlock | 10 | 0,15 |
| | PurchaseReservedInstancesOffering | 5 | 5 |
| | RejectVpcEndpointConnections | 10 | 1 |
| | RestoreAddressToClassic | 1 | 1 |
| | RunInstances | 5 | 2 |
| | StartInstances | 5 | 2 |
| | TerminateInstances | 100 | 5 |
| | UnassignPrivateIpAddresses | 100 | 5 |
| | UnassignPrivateNatGatewayAddress | 10 | 1 |

| APIkategori aksi | Tindakan | Kapasitas maksimum bucket | Tingkat isi ulang ember |
|---|---|---|---|
| | `WithdrawByoipCidr` | 1 | 0.1 |

### Ukuran bucket token sumber daya dan tarif isi ulang

Tabel berikut mencantumkan ukuran bucket token sumber daya dan tarif isi ulang untuk API tindakan yang menggunakan pembatasan laju sumber daya.

| APIaksi | Kapasitas maksimum bucket | Tingkat isi ulang ember |
|---|---|---|
| `RunInstances` | 1000 | 2 |
| `TerminateInstances` | 1000 | 20 |
| `StartInstances` | 1000 | 2 |
| `StopInstances` | 1000 | 20 |

## Pantau API pelambatan

Anda dapat menggunakan Amazon CloudWatch untuk memantau EC2 API permintaan Amazon Anda dan untuk mengumpulkan dan melacak metrik seputar API pembatasan. Anda juga dapat membuat alarm untuk memperingatkan Anda ketika Anda hampir mencapai batas API pelambatan. Untuk informasi selengkapnya, lihat Pantau EC2 API permintaan Amazon menggunakan Amazon CloudWatch.

## Mencoba lagi dan backoff eksponensial

Aplikasi Anda mungkin perlu mencoba ulang API permintaan. Sebagai contoh:

- Untuk memeriksa pembaruan dalam status sumber daya
- Untuk menghitung sejumlah besar sumber daya (misalnya, semua volume Anda)
- Untuk mencoba lagi permintaan setelah gagal dengan kesalahan server (5xx) atau kesalahan pelambatan

Namun, untuk kesalahan klien (4xx), Anda harus merevisi permintaan untuk memperbaiki masalah sebelum mencoba permintaan lagi.

Perubahan status sumber daya

Sebelum Anda memulai polling untuk memeriksa pembaruan status, berikan waktu permintaan untuk berpotensi selesai. Misalnya, tunggu beberapa menit sebelum memeriksa apakah instans Anda aktif. Saat Anda memulai polling, gunakan interval tidur yang sesuai antara permintaan berturut-turut untuk menurunkan tingkat permintaan. API Untuk hasil terbaik, gunakan interval tidur yang meningkat atau variabel.

Atau, Anda dapat menggunakan Amazon EventBridge untuk memberi tahu Anda tentang status beberapa sumber daya. Misalnya, Anda dapat menggunakan acara Pemberitahuan Perubahan Status EC2 Instans untuk memberi tahu Anda tentang perubahan status untuk sebuah instance. Untuk informasi selengkapnya, lihat Mengotomatiskan Amazon EC2 menggunakan EventBridge.

Percobaan ulang

Saat Anda perlu melakukan polling atau mencoba ulang API permintaan, sebaiknya gunakan algoritma backoff eksponensial untuk menghitung interval tidur antar permintaan. API Ide di balik backoff eksponensial adalah menggunakan waktu tunggu yang semakin lama antara percobaan ulang untuk respons kesalahan yang berurutan. Anda harus menerapkan interval penundaan maksimum, serta jumlah percobaan ulang maksimum. Anda juga dapat menggunakan jitter (penundaan acak) untuk mencegah tabrakan berturut-turut. Untuk informasi selengkapnya, lihat Timeout, percobaan ulang, dan backoff dengan jitter.

Masing-masing AWS SDK menerapkan logika coba ulang otomatis. Untuk informasi selengkapnya, lihat Coba lagi perilaku di Panduan Referensi Alat AWS SDKs dan Alat.

## Minta kenaikan batas

Anda dapat meminta peningkatan batas API pelambatan untuk Anda. Akun AWS

Untuk meminta akses ke fitur ini

1. AWS Support Pusat Terbuka.
2. Pilih Buat kasus.
3. Pilih Akun dan penagihan.
4. Untuk Layanan, pilih Info Umum dan Memulai.

5. Untuk Kategori, pilih Menggunakan AWS & Layanan.
6. Pilih Langkah selanjutnya: Informasi tambahan.
7. Untuk Subjek, masukkan**`Request an increase in my Amazon EC2 API throttling limits`**.
8. Untuk Deskripsi, masukkan **`Please increase the API throttling limits for my account. Related page: https://docs.aws.amazon.com/AWSEC2/latest/APIReference/throttling.html`**. Juga mencakup informasi berikut:
   - Deskripsi kasus penggunaan Anda.
   - Wilayah di mana Anda membutuhkan peningkatan.
   - Jendela satu jam, diUTC, saat pelambatan puncak atau penggunaan terjadi (untuk menghitung batas pelambatan baru).
9. Pilih Langkah selanjutnya: Selesaikan sekarang atau hubungi kami.
10. Pada tab Hubungi kami, pilih bahasa kontak pilihan Anda dan metode kontak.
11. Pilih Kirim.

# Buat sumber daya Amazon EC2 menggunakan AWS CLI

Anda dapat membuat dan mengelola resource Amazon EC2 menggunakan AWS Command Line Interface (AWS CLI) di shell baris perintah. AWS CLI Ini menyediakan akses langsung ke API untuk Layanan AWS, seperti Amazon EC2.

Untuk sintaks dan contoh perintah untuk Amazon EC2, lihat ec2 di AWS CLI Referensi Perintah. Anda juga dapat menemukan contoh-contoh ini di aws-cli/awscli/examples/ec2 di github.

## Pelajari lebih lanjut tentang AWS CLI

Untuk mempelajari selengkapnya AWS CLI, lihat sumber daya berikut:

- AWS Command Line Interface
- AWS Command Line Interface Panduan Pengguna untuk Versi 2
- AWS Command Line Interface Panduan Pengguna untuk Versi 1

# Buat sumber daya Amazon EC2 menggunakan AWS CloudFormation

Amazon EC2 terintegrasi dengan AWS CloudFormation, layanan yang membantu Anda memodelkan dan menyiapkan AWS sumber daya sehingga Anda dapat menghabiskan lebih sedikit waktu untuk membuat dan mengelola sumber daya dan infrastruktur Anda. Anda membuat templat yang menjelaskan AWS sumber daya yang Anda butuhkan (seperti instance dan subnet), serta menyediakan serta AWS CloudFormation mengonfigurasi sumber daya tersebut untuk Anda.

Bila Anda menggunakan AWS CloudFormation, Anda dapat menggunakan kembali template Anda untuk mengatur sumber daya Amazon EC2 Anda secara konsisten dan berulang kali. Jelaskan sumber daya Anda sekali, lalu sediakan sumber daya yang sama berulang-ulang di beberapa Akun AWS dan Wilayah.

## Amazon EC2 dan template AWS CloudFormation

Untuk menyediakan dan mengonfigurasi sumber daya untuk Amazon EC2 dan layanan terkait, Anda harus memahami AWS CloudFormation templat. Templat adalah file teks dengan format JSON atau YAML. Template ini menjelaskan sumber daya yang akan Anda sediakan di AWS CloudFormation tumpukan Anda. Jika Anda tidak terbiasa dengan JSON atau YAMM, Anda dapat menggunakan AWS CloudFormation Designer untuk membantu Anda memulai dengan template. AWS CloudFormation Untuk informasi lebih lanjut, lihat Apa itu AWS CloudFormation Desainer? dalam AWS CloudFormation User Guide.

## Sumber daya untuk Amazon EC2

### Sumber daya komputasi

- AWS::EC2::CapacityReservation
- AWS::EC2::CapacityReservationArmada
- AWS:: EC2:: EC2Fleet
- AWS:: EC2:: EC2Fleet
- AWS::EC2::Host
- AWS::EC2::Instance
- AWS::EC2::InstanceConnectTitik akhir

- AWS::EC2::LaunchTemplate
- AWS::EC2::PlacementGroup
- AWS::EC2::SpotFleet

## Sumber daya jaringan

- AWS::EC2::CarrierGateway
- AWS::EC2::ClientVpnAuthorizationRule
- AWS::EC2::ClientVpnTitik akhir
- AWS::EC2::ClientVpnRute
- AWS::EC2::ClientVpnTargetNetworkAssociation
- AWS::EC2::CustomerGateway
- AWS: :EC2: :DHCPOptions
- AWS::EC2::EgressOnlyInternetGateway
- AWS: :EC2: :EIP
- AWS: :EC2: :EIPASSociation
- AWS::EC2::FlowLog
- AWS::EC2::GatewayRouteTableAssociation
- AWS::EC2::InternetGateway
- AWS: :EC2: :IPAM
- AWS: :EC2: :IPamalLocation
- AWS: :EC2: :IPampool
- AWS: :EC2: :IPAM PoolCidr
- AWS: :EC2: :IPAM ResourceDiscovery
- AWS: :EC2: :IPAM ResourceDiscoveryAssociation
- AWS: :EC2: :iPamScope
- AWS::EC2::LocalGatewayRute
- AWS::EC2::LocalGatewayRouteTable
- AWS::EC2::LocalGatewayRouteTableVirtualInterfaceGroupAssociation
- AWS::EC2::LocalGatewayRouteTableVPCASosiasi
- AWS::EC2::NatGateway

- AWS::EC2::NetworkInterface
- AWS::EC2::NetworkInsightsAccessScope
- AWS::EC2::NetworkInsightsAccessScopeAnalysis
- AWS::EC2::NetworkInsightsAnalisa
- AWS::EC2::NetworkInsightsJalan
- AWS::EC2::NetworkInterfaceLampiran
- AWS::EC2::NetworkInterfaceIzin
- AWS::EC2::NetworkPerformanceMetricSubscription
- AWS::EC2::PrefixList
- AWS::EC2::Route
- AWS::EC2::RouteTable
- AWS::EC2::Subnet
- AWS::EC2::SubnetCidrBlok
- AWS::EC2::SubnetNetworkAclAssociation
- AWS::EC2::SubnetRouteTableAssociation
- AWS::EC2::TrafficMirrorFilter
- AWS::EC2::TrafficMirrorFilterRule
- AWS::EC2::TrafficMirrorSesi
- AWS::EC2::TrafficMirrorTarget
- AWS::EC2::TransitGateway
- AWS::EC2::TransitGatewayLampiran
- AWS::EC2::TransitGatewayConnect
- AWS::EC2::TransitGatewayMulticastDomain
- AWS::EC2::TransitGatewayMulticastDomainAssociation
- AWS::EC2::TransitGatewayMulticastGroupMember
- AWS::EC2::TransitGatewayMulticastGroupSource
- AWS::EC2::TransitGatewayPeeringAttachment
- AWS::EC2::TransitGatewayRute
- AWS::EC2::TransitGatewayRouteTable
- AWS::EC2::TransitGatewayRouteTableAssociation

- AWS::EC2::TransitGatewayRouteTablePropagation
- AWS::EC2::TransitGatewayVpcAttachment
- AWS: :EC2: :VPC
- AWS: :EC2: :VPC CidrBlock
- AWS: :EC2: :VPCDHCP OptionsAssociation
- AWS: :EC2: :VPCendPoint
- AWS: :EC2: :VPC EndpointConnectionNotification
- AWS: :EC2: :VPC EndpointService
- AWS: :EC2: :VPC EndpointServicePermissions
- AWS: :EC2: :VPC GatewayAttachment
- AWS: :EC2: :VPC PeeringConnection
- AWS: :EC2: :VPNKoneksi
- AWS: :EC2: :VPN ConnectionRoute
- AWS: :EC2: :VPNGateway
- AWS: :EC2: :VPN GatewayRoutePropagation

## Sumber daya keamanan

- AWS::EC2::KeyPair
- AWS::EC2::NetworkAcl
- AWS::EC2::NetworkAclEntri
- AWS::EC2::SecurityGroup
- AWS::EC2::SecurityGroupJalan keluar
- AWS::EC2::SecurityGroupMasuknya
- AWS::EC2::VerifiedAccessTitik akhir
- AWS::EC2::VerifiedAccessKelompok
- AWS::EC2::VerifiedAccessContoh
- AWS::EC2::VerifiedAccessTrustProvider

## Sumber daya penyimpanan

- AWS::EC2::SnapshotBlockPublicAccess

- AWS::EC2::Volume
- AWS::EC2::VolumeAttachment

## Pelajari lebih lanjut tentang AWS CloudFormation

Untuk mempelajari selengkapnya AWS CloudFormation, lihat sumber daya berikut:

- AWS CloudFormation
- AWS CloudFormation Panduan Pengguna

# Membuat EC2 sumber daya Amazon menggunakan AWS SDK

AWS menyediakan kit pengembangan perangkat lunak (SDK) untuk banyak bahasa pemrograman populer. An SDK membuat pengembangan lebih efisien dengan memberikan yang berikut:

- Komponen dan pustaka pra-bangun yang dapat Anda masukkan ke dalam aplikasi Anda
- Alat khusus bahasa, seperti kompiler dan debugger
- Penandatanganan kriptografi permintaan layanan
- Minta percobaan ulang
- Penanganan respons kesalahan

## Contoh kode untuk Amazon EC2 API

Contoh kode yang disediakan oleh AWS menunjukkan kepada Anda bagaimana menggunakan API dan menyelesaikan tugas-tugas tertentu. Untuk contoh untuk Amazon EC2API, lihat Contoh kode untuk Amazon EC2. Untuk contoh tambahan, lihat Temukan contoh kode untuk AWS SDKs atau aws-doc-sdk-exampleshttps://github.com/awsdocs/aws-doc-sdk-examples/ di github.

## Pelajari lebih lanjut tentang AWS SDKs

Untuk mempelajari selengkapnya AWS SDKs, lihat sumber daya berikut:

- AWS SDKsdan Panduan Referensi Alat
- Alat untuk Dibangun AWS
- Apa itu sebuahSDK?

# API tingkat rendah untuk Amazon EC2

API tingkat rendah untuk Amazon EC2 adalah antarmuka tingkat protokol untuk Amazon EC2. Saat menggunakan API tingkat rendah, Anda harus memformat setiap permintaan HTTPS dengan benar dan menambahkan tanda tangan digital yang valid ke setiap permintaan. Untuk informasi selengkapnya, lihat Membuat permintaan ke Amazon EC2 API di Referensi API Amazon EC2. Atau, Anda dapat menggunakan AWS SDK, yang membuat dan menandatangani permintaan atas nama Anda. Untuk informasi selengkapnya, lihat Menggunakan sebuah AWS SDK.

Amazon EC2 API terdiri dari tindakan dan tipe data untuk beberapa layanan. Untuk melihat tindakan untuk setiap layanan, lihat halaman berikut di Referensi API Amazon EC2.

- AWS Client VPN tindakan
- Tindakan Amazon EBS
- Tindakan Amazon EC2
- AWS Network Manager tindakan
- AWS Tindakan Nitro Enclave
- AWS Outposts tindakan
- AWS PrivateLink tindakan
- Tindakan Recycle Bin
- AWS Site-to-Site VPN tindakan
- AWS Transit Gateway tindakan
- Akses Terverifikasi AWS tindakan
- Tindakan Impor/Ekspor VM
- Tindakan Amazon VPC
- Tindakan Amazon VPC IPAM
- AWS Wavelength tindakan

# Gunakan Console-to-Code untuk menghasilkan kode untuk tindakan EC2 konsol Anda

Konsol tersebut menyediakan jalur dengan panduan untuk membuat sumber daya dan menguji prototipe. Jika Anda ingin membuat sumber daya yang sama dalam skala besar, Anda memerlukan kode otomatisasi. Console-to-Codeadalah fitur Amazon Q Developer yang dapat membantu Anda memulai dengan kode otomatisasi Anda. Console-to-Codemerekam tindakan konsol Anda, termasuk pengaturan default dan parameter yang kompatibel. Kemudian menggunakan AI generatif untuk menyarankan kode dalam format pilihan Anda infrastructure-as-code (IAc) untuk tindakan yang Anda inginkan. Karena alur kerja konsol memastikan nilai parameter yang Anda tentukan valid bersama-sama, kode yang Anda hasilkan dengan menggunakan Console-to-Code memiliki nilai parameter yang kompatibel. Anda dapat menggunakan kode sebagai titik awal, dan kemudian menyesuaikannya untuk membuatnya siap produksi untuk kasus penggunaan spesifik Anda.

Misalnya, dengan Console-to-Code, Anda dapat merekam peluncuran EC2 instans Amazon dan memilih untuk menghasilkan kode dalam AWS CloudFormation JSON format. Kemudian, Anda dapat menyalin kode itu dan menyesuaikannya untuk digunakan dalam AWS CloudFormation template Anda.

Console-to-Code saat ini dapat menghasilkan infrastructure-as-code (IAc) dalam bahasa dan format berikut:

- CDKJawa
- CDKPython
- CDK TypeScript
- CloudFormation JSON
- CloudFormation YAML

Untuk informasi dan petunjuk selengkapnya tentang cara menggunakan Console-to-Code, lihat Mengotomatisasi AWS layanan dengan Pengembang Amazon Q Console-to-Code di Panduan Pengguna Pengembang Amazon Q.

# Contoh kode untuk Amazon EC2 menggunakan AWS SDKs

Contoh kode berikut menunjukkan cara menggunakan Amazon EC2 dengan kit pengembangan AWS perangkat lunak (SDK).

Dasar-dasar adalah contoh kode yang menunjukkan kepada Anda bagaimana melakukan operasi penting dalam suatu layanan.

Tindakan adalah kutipan kode dari program yang lebih besar dan harus dijalankan dalam konteks. Sementara tindakan menunjukkan cara memanggil fungsi layanan individual, Anda dapat melihat tindakan dalam konteks dalam skenario terkait.

Skenario adalah contoh kode yang menunjukkan kepada Anda bagaimana menyelesaikan tugas tertentu dengan memanggil beberapa fungsi dalam layanan atau dikombinasikan dengan yang lain Layanan AWS.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

Memulai

## Halo Amazon EC2

Contoh kode berikut menunjukkan cara memulai menggunakan AmazonEC2.

.NET

AWS SDK for .NET

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
namespace EC2Actions;

public class HelloEc2
{
```

```
    /// <summary>
    /// HelloEc2 lists the existing security groups for the default users.
    /// </summary>
    /// <param name="args">Command line arguments</param>
    /// <returns>Async task.</returns>
    static async Task Main(string[] args)
    {
        // Set up dependency injection for Amazon Elastic Compute Cloud (Amazon
EC2).
        using var host =
Microsoft.Extensions.Hosting.Host.CreateDefaultBuilder(args)
            .ConfigureServices((_, services) =>
                services.AddAWSService<IAmazonEC2>()
                .AddTransient<EC2Wrapper>()
            )
            .Build();

        // Now the client is available for injection.
        var ec2Client = host.Services.GetRequiredService<IAmazonEC2>();

        try
        {
            // Retrieve information for up to 10 Amazon EC2 security groups.
            var request = new DescribeSecurityGroupsRequest { MaxResults = 10, };
            var securityGroups = new List<SecurityGroup>();

            var paginatorForSecurityGroups =
                ec2Client.Paginators.DescribeSecurityGroups(request);

            await foreach (var securityGroup in
paginatorForSecurityGroups.SecurityGroups)
            {
                securityGroups.Add(securityGroup);
            }

            // Now print the security groups returned by the call to
            // DescribeSecurityGroupsAsync.
            Console.WriteLine("Welcome to the EC2 Hello Service example. " +
                              "\nLet's list your Security Groups:");
            securityGroups.ForEach(group =>
            {
                Console.WriteLine(
                    $"Security group: {group.GroupName} ID: {group.GroupId}");
            });
```

```
        }
        catch (AmazonEC2Exception ex)
        {
            Console.WriteLine($"An Amazon EC2 service error occurred while
 listing security groups. {ex.Message}");
        }
        catch (Exception ex)
        {
            Console.WriteLine($"An error occurred while listing security groups.
 {ex.Message}");
        }
    }
}
```

- Untuk API detailnya, lihat DescribeSecurityGroupsdi AWS SDK for .NET APIReferensi.

C++

SDKuntuk C ++

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

Kode untuk CMakeLists file.txtCMake.

```
# Set the minimum required version of CMake for this project.
cmake_minimum_required(VERSION 3.13)

# Set the AWS service components used by this project.
set(SERVICE_COMPONENTS ec2)

# Set this project's name.
project("hello_ec2")

# Set the C++ standard to use to build this target.
# At least C++ 11 is required for the AWS SDK for C++.
set(CMAKE_CXX_STANDARD 11)
```

```
# Use the MSVC variable to determine if this is a Windows build.
set(WINDOWS_BUILD ${MSVC})

if (WINDOWS_BUILD) # Set the location where CMake can find the installed
 libraries for the AWS SDK.
    string(REPLACE ";" "/aws-cpp-sdk-all;" SYSTEM_MODULE_PATH
 "${CMAKE_SYSTEM_PREFIX_PATH}/aws-cpp-sdk-all")
    list(APPEND CMAKE_PREFIX_PATH ${SYSTEM_MODULE_PATH})
endif ()

# Find the AWS SDK for C++ package.
find_package(AWSSDK REQUIRED COMPONENTS ${SERVICE_COMPONENTS})

if (WINDOWS_BUILD AND AWSSDK_INSTALL_AS_SHARED_LIBS)
     # Copy relevant AWS SDK for C++ libraries into the current binary directory
 for running and debugging.

     # set(BIN_SUB_DIR "/Debug") # If you are building from the command line, you
 may need to uncomment this
                                    # and set the proper subdirectory to the
 executables' location.

     AWSSDK_CPY_DYN_LIBS(SERVICE_COMPONENTS ""
 ${CMAKE_CURRENT_BINARY_DIR}${BIN_SUB_DIR})
endif ()

add_executable(${PROJECT_NAME}
        hello_ec2.cpp)

target_link_libraries(${PROJECT_NAME}
        ${AWSSDK_LINK_LIBRARIES})
```

Kode untuk file sumber hello_ec2.cpp.

```
#include <aws/core/Aws.h>
#include <aws/ec2/EC2Client.h>
#include <aws/ec2/model/DescribeInstancesRequest.h>
#include <iomanip>
#include <iostream>

/*
```

```
 *  A "Hello EC2" starter application which initializes an Amazon Elastic Compute
 Cloud (Amazon EC2) client and describes
 *  the Amazon EC2 instances.
 *
 *  main function
 *
 *  Usage: 'hello_ec2'
 *
 */

int main(int argc, char **argv) {
    (void)argc;
    (void)argv;

    Aws::SDKOptions options;
    // Optionally change the log level for debugging.
//   options.loggingOptions.logLevel = Utils::Logging::LogLevel::Debug;
    Aws::InitAPI(options); // Should only be called once.
    int result = 0;
    {
        Aws::Client::ClientConfiguration clientConfig;
        // Optional: Set to the AWS Region (overrides config file).
        // clientConfig.region = "us-east-1";

        Aws::EC2::EC2Client ec2Client(clientConfig);
        Aws::EC2::Model::DescribeInstancesRequest request;
        bool header = false;
        bool done = false;
        while (!done) {
            Aws::EC2::Model::DescribeInstancesOutcome outcome =
 ec2Client.DescribeInstances(request);
            if (outcome.IsSuccess()) {
                if (!header) {
                    std::cout << std::left <<
                              std::setw(48) << "Name" <<
                              std::setw(20) << "ID" <<
                              std::setw(25) << "Ami" <<
                              std::setw(15) << "Type" <<
                              std::setw(15) << "State" <<
                              std::setw(15) << "Monitoring" << std::endl;
                    header = true;
                }

                const std::vector<Aws::EC2::Model::Reservation> &reservations =
```

```
                        outcome.GetResult().GetReservations();

                for (const auto &reservation: reservations) {
                    const std::vector<Aws::EC2::Model::Instance> &instances =
                            reservation.GetInstances();
                    for (const auto &instance: instances) {
                        Aws::String instanceStateString =

Aws::EC2::Model::InstanceStateNameMapper::GetNameForInstanceStateName(
                                        instance.GetState().GetName());

                        Aws::String typeString =

Aws::EC2::Model::InstanceTypeMapper::GetNameForInstanceType(
                                        instance.GetInstanceType());

                        Aws::String monitorString =

Aws::EC2::Model::MonitoringStateMapper::GetNameForMonitoringState(
                                        instance.GetMonitoring().GetState());
                        Aws::String name = "Unknown";

                        const std::vector<Aws::EC2::Model::Tag> &tags =
instance.GetTags();
                        auto nameIter = std::find_if(tags.cbegin(), tags.cend(),
                                                     [](const
Aws::EC2::Model::Tag &tag) {
                                                         return tag.GetKey() ==
"Name";
                                                     });
                        if (nameIter != tags.cend()) {
                            name = nameIter->GetValue();
                        }
                        std::cout <<
                                  std::setw(48) << name <<
                                  std::setw(20) << instance.GetInstanceId() <<
                                  std::setw(25) << instance.GetImageId() <<
                                  std::setw(15) << typeString <<
                                  std::setw(15) << instanceStateString <<
                                  std::setw(15) << monitorString << std::endl;
                    }
                }

                if (!outcome.GetResult().GetNextToken().empty()) {
```

```
                    request.SetNextToken(outcome.GetResult().GetNextToken());
                } else {
                    done = true;
                }
            } else {
                std::cerr << "Failed to describe EC2 instances:" <<
                          outcome.GetError().GetMessage() << std::endl;
                result = 1;
                break;
            }
        }
    }


    Aws::ShutdownAPI(options); // Should only be called once.
    return result;
}
```

- Untuk API detailnya, lihat DescribeSecurityGroupsdi AWS SDK for C++ APIReferensi.

Java

SDKuntuk Java 2.x

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    /**
     * Asynchronously describes the security groups for the specified group ID.
     *
     * @param groupName the name of the security group to describe
     * @return a {@link CompletableFuture} that represents the asynchronous
 operation
     *         of describing the security groups. The future will complete with a
     *         {@link DescribeSecurityGroupsResponse} object that contains the
     *         security group information.
     */
```

```
   public CompletableFuture<String> describeSecurityGroupArnByNameAsync(String
groupName) {
       DescribeSecurityGroupsRequest request =
DescribeSecurityGroupsRequest.builder()
           .groupNames(groupName)
           .build();

       DescribeSecurityGroupsPublisher paginator =
getAsyncClient().describeSecurityGroupsPaginator(request);
       AtomicReference<String> groupIdRef = new AtomicReference<>();
       return paginator.subscribe(response -> {
           response.securityGroups().stream()
               .filter(securityGroup ->
securityGroup.groupName().equals(groupName))
               .findFirst()
               .ifPresent(securityGroup ->
groupIdRef.set(securityGroup.groupId()));
       }).thenApply(v -> {
           String groupId = groupIdRef.get();
           if (groupId == null) {
               throw new RuntimeException("No security group found with the
name: " + groupName);
           }
           return groupId;
       }).exceptionally(ex -> {
           logger.info("Failed to describe security group: " + ex.getMessage());
           throw new RuntimeException("Failed to describe security group", ex);
       });
   }
```

- Untuk API detailnya, lihat DescribeSecurityGroupsdi AWS SDK for Java 2.x APIReferensi.

JavaScript

SDKuntuk JavaScript (v3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
import { DescribeSecurityGroupsCommand, EC2Client } from "@aws-sdk/client-ec2";

// Call DescribeSecurityGroups and display the result.
export const main = async () => {
  const client = new EC2Client();
  try {
    const { SecurityGroups } = await client.send(
      new DescribeSecurityGroupsCommand({}),
    );

    const securityGroupList = SecurityGroups.slice(0, 9)
      .map((sg) => ` • ${sg.GroupId}: ${sg.GroupName}`)
      .join("\n");

    console.log(
      "Hello, Amazon EC2! Let's list up to 10 of your security groups:",
    );
    console.log(securityGroupList);
  } catch (err) {
    console.error(err);
  }
};

// Call function if run directly.
import { fileURLToPath } from "node:url";
if (process.argv[1] === fileURLToPath(import.meta.url)) {
  main();
}
```

- Untuk API detailnya, lihat DescribeSecurityGroupsdi AWS SDK for JavaScript APIReferensi.

Kotlin

SDKuntuk Kotlin

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
suspend fun describeEC2SecurityGroups(groupId: String) {
    val request =
        DescribeSecurityGroupsRequest {
            groupIds = listOf(groupId)
        }

    Ec2Client { region = "us-west-2" }.use { ec2 ->

        val response = ec2.describeSecurityGroups(request)
        response.securityGroups?.forEach { group ->
            println("Found Security Group with id ${group.groupId}, vpc id
 ${group.vpcId} and description ${group.description}")
        }
    }
}
```

- Untuk API detailnya, lihat DescribeSecurityGroups AWSSDKAPIreferensi Kotlin.

Python

SDKuntuk Python (Boto3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
def hello_ec2(ec2_client):
    """
    Use the AWS SDK for Python (Boto3) to list the security groups in your
 account.
    This example uses the default settings specified in your shared credentials
    and config files.

    :param ec2_client: A Boto3 EC2 client. This client provides low-level
                       access to AWS EC2 services.
    """
    print("Hello, Amazon EC2! Let's list up to 10 of your security groups:")
    try:
```

```
        paginator = ec2_client.get_paginator("describe_security_groups")
        response_iterator = paginator.paginate(MaxResults=10)
        for page in response_iterator:
            for sg in page["SecurityGroups"]:
                logger.info(f"\t{sg['GroupId']}: {sg['GroupName']}")
    except ClientError as err:
        logger.error("Failed to list security groups.")
        if err.response["Error"]["Code"] == "AccessDeniedException":
            logger.error("You do not have permission to list security groups.")
        raise


if __name__ == "__main__":
    hello_ec2(boto3.client("ec2"))
```

- Untuk API detailnya, lihat DescribeSecurityGroups AWSSDKReferensi Python (Boto3). API

Ruby

SDKuntuk Ruby

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
require 'aws-sdk-ec2'
require 'logger'

# EC2Manager is a class responsible for managing EC2 operations
# such as listing all EC2 instances in the current AWS account.
class EC2Manager
  def initialize(client)
    @client = client
    @logger = Logger.new($stdout)
  end

  # Lists and prints all EC2 instances in the current AWS account.
  def list_instances
```

```
    @logger.info('Listing instances')

    instances = fetch_instances

    if instances.empty?
      @logger.info('You have no instances')
    else
      print_instances(instances)
    end
  end

  private

  # Fetches all EC2 instances using pagination.
  #
  # @return [Array<Aws::EC2::Types::Instance>] List of EC2 instances.
  def fetch_instances
    paginator = @client.describe_instances
    instances = []

    paginator.each_page do |page|
      page.reservations.each do |reservation|
        reservation.instances.each do |instance|
          instances << instance
        end
      end
    end

    instances
  end

  # Prints details of the given EC2 instances.
  #
  # @param instances [Array<Aws::EC2::Types::Instance>] List of EC2 instances to
print.
  def print_instances(instances)
    instances.each do |instance|
      @logger.info("Instance ID: #{instance.instance_id}")
      @logger.info("Instance Type: #{instance.instance_type}")
      @logger.info("Public IP: #{instance.public_ip_address}")
      @logger.info("Public DNS Name: #{instance.public_dns_name}")
      @logger.info("\n")
    end
  end
```

```
end

if $PROGRAM_NAME == __FILE__
  ec2_client = Aws::EC2::Client.new(region: 'us-west-2')
  manager = EC2Manager.new(ec2_client)
  manager.list_instances
end
```

- Untuk API detailnya, lihat DescribeSecurityGroupsdi AWS SDK for Ruby APIReferensi.

## Rust

### SDKuntuk Rust

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
async fn show_security_groups(client: &aws_sdk_ec2::Client, group_ids:
 Vec<String>) {
    let response = client
        .describe_security_groups()
        .set_group_ids(Some(group_ids))
        .send()
        .await;

    match response {
        Ok(output) => {
            for group in output.security_groups() {
                println!(
                    "Found Security Group {} ({}), vpc id {} and description {}",
                    group.group_name().unwrap_or("unknown"),
                    group.group_id().unwrap_or("id-unknown"),
                    group.vpc_id().unwrap_or("vpcid-unknown"),
                    group.description().unwrap_or("(none)")
                );
            }
        }
```

```
        Err(err) => {
            let err = err.into_service_error();
            let meta = err.meta();
            let message = meta.message().unwrap_or("unknown");
            let code = meta.code().unwrap_or("unknown");
            eprintln!("Error listing EC2 Security Groups: ({code}) {message}");
        }
    }
}
```

- Untuk API detailnya, lihat DescribeSecurityGroups AWSSDKAPIreferensi Rust.

Contoh kode

- Contoh dasar untuk Amazon EC2 menggunakan AWS SDKs
  - Halo Amazon EC2
  - Pelajari dasar-dasar Amazon EC2 dengan AWS SDK
  - Tindakan untuk Amazon EC2 menggunakan AWS SDKs
    - Gunakan AcceptVpcPeeringConnection dengan CLI
    - Gunakan AllocateAddress dengan AWS SDK atau CLI
    - Gunakan AllocateHosts dengan CLI
    - Gunakan AssignPrivateIpAddresses dengan CLI
    - Gunakan AssociateAddress dengan AWS SDK atau CLI
    - Gunakan AssociateDhcpOptions dengan CLI
    - Gunakan AssociateRouteTable dengan CLI
    - Gunakan AttachInternetGateway dengan CLI
    - Gunakan AttachNetworkInterface dengan CLI
    - Gunakan AttachVolume dengan CLI
    - Gunakan AttachVpnGateway dengan CLI
    - Gunakan AuthorizeSecurityGroupEgress dengan CLI
    - Gunakan AuthorizeSecurityGroupIngress dengan AWS SDK atau CLI
    - Gunakan CancelCapacityReservation dengan CLI
    - Gunakan CancelImportTask dengan CLI
    - Gunakan CancelSpotFleetRequests dengan CLI

- Gunakan CancelSpotInstanceRequests dengan CLI
- Gunakan ConfirmProductInstance dengan CLI
- Gunakan CopyImage dengan CLI
- Gunakan CopySnapshot dengan CLI
- Gunakan CreateCapacityReservation dengan CLI
- Gunakan CreateCustomerGateway dengan CLI
- Gunakan CreateDhcpOptions dengan CLI
- Gunakan CreateFlowLogs dengan CLI
- Gunakan CreateImage dengan CLI
- Gunakan CreateInstanceExportTask dengan CLI
- Gunakan CreateInternetGateway dengan CLI
- Gunakan CreateKeyPair dengan AWS SDK atau CLI
- Gunakan CreateLaunchTemplate dengan AWS SDK atau CLI
- Gunakan CreateNetworkAcl dengan CLI
- Gunakan CreateNetworkAclEntry dengan CLI
- Gunakan CreateNetworkInterface dengan CLI
- Gunakan CreatePlacementGroup dengan CLI
- Gunakan CreateRoute dengan CLI
- Gunakan CreateRouteTable dengan AWS SDK atau CLI
- Gunakan CreateSecurityGroup dengan AWS SDK atau CLI
- Gunakan CreateSnapshot dengan CLI
- Gunakan CreateSpotDatafeedSubscription dengan CLI
- Gunakan CreateSubnet dengan AWS SDK atau CLI
- Gunakan CreateTags dengan AWS SDK atau CLI
- Gunakan CreateVolume dengan CLI
- Gunakan CreateVpc dengan AWS SDK atau CLI
- Gunakan CreateVpcEndpoint dengan AWS SDK atau CLI
- Gunakan CreateVpnConnection dengan CLI
- Gunakan CreateVpnConnectionRoute dengan CLI
- Gunakan CreateVpnGateway dengan CLI

- Gunakan DeleteCustomerGateway dengan CLI
- Gunakan DeleteDhcpOptions dengan CLI
- Gunakan DeleteFlowLogs dengan CLI
- Gunakan DeleteInternetGateway dengan CLI
- Gunakan DeleteKeyPair dengan AWS SDK atau CLI
- Gunakan DeleteLaunchTemplate dengan AWS SDK atau CLI
- Gunakan DeleteNetworkAcl dengan CLI
- Gunakan DeleteNetworkAclEntry dengan CLI
- Gunakan DeleteNetworkInterface dengan CLI
- Gunakan DeletePlacementGroup dengan CLI
- Gunakan DeleteRoute dengan CLI
- Gunakan DeleteRouteTable dengan CLI
- Gunakan DeleteSecurityGroup dengan AWS SDK atau CLI
- Gunakan DeleteSnapshot dengan AWS SDK atau CLI
- Gunakan DeleteSpotDatafeedSubscription dengan CLI
- Gunakan DeleteSubnet dengan CLI
- Gunakan DeleteTags dengan CLI
- Gunakan DeleteVolume dengan CLI
- Gunakan DeleteVpc dengan AWS SDK atau CLI
- Gunakan DeleteVpcEndpoint dengan AWS SDK
- Gunakan DeleteVpnConnection dengan CLI
- Gunakan DeleteVpnConnectionRoute dengan CLI
- Gunakan DeleteVpnGateway dengan CLI
- Gunakan DeregisterImage dengan CLI
- Gunakan DescribeAccountAttributes dengan CLI
- Gunakan DescribeAddresses dengan AWS SDK atau CLI
- Gunakan DescribeAvailabilityZones dengan AWS SDK atau CLI
- Gunakan DescribeBundleTasks dengan CLI
- Gunakan DescribeCapacityReservations dengan CLI
- Gunakan DescribeCustomerGateways dengan CLI

- Gunakan DescribeDhcpOptions dengan CLI
- Gunakan DescribeFlowLogs dengan CLI
- Gunakan DescribeHostReservationOfferings dengan CLI
- Gunakan DescribeHosts dengan CLI
- Gunakan DescribeIamInstanceProfileAssociations dengan AWS SDK atau CLI
- Gunakan DescribeIdFormat dengan CLI
- Gunakan DescribeIdentityIdFormat dengan CLI
- Gunakan DescribeImageAttribute dengan CLI
- Gunakan DescribeImages dengan AWS SDK atau CLI
- Gunakan DescribeImportImageTasks dengan CLI
- Gunakan DescribeImportSnapshotTasks dengan CLI
- Gunakan DescribeInstanceAttribute dengan CLI
- Gunakan DescribeInstanceStatus dengan AWS SDK atau CLI
- Gunakan DescribeInstanceTypes dengan AWS SDK atau CLI
- Gunakan DescribeInstances dengan AWS SDK atau CLI
- Gunakan DescribeInternetGateways dengan CLI
- Gunakan DescribeKeyPairs dengan AWS SDK atau CLI
- Gunakan DescribeNetworkAcls dengan CLI
- Gunakan DescribeNetworkInterfaceAttribute dengan CLI
- Gunakan DescribeNetworkInterfaces dengan CLI
- Gunakan DescribePlacementGroups dengan CLI
- Gunakan DescribePrefixLists dengan CLI
- Gunakan DescribeRegions dengan AWS SDK atau CLI
- Gunakan DescribeRouteTables dengan AWS SDK atau CLI
- Gunakan DescribeScheduledInstanceAvailability dengan CLI
- Gunakan DescribeScheduledInstances dengan CLI
- Gunakan DescribeSecurityGroups dengan AWS SDK atau CLI
- Gunakan DescribeSnapshotAttribute dengan CLI
- Gunakan DescribeSnapshots dengan AWS SDK atau CLI
- Gunakan DescribeSpotDatafeedSubscription dengan CLI

- Gunakan DescribeSpotFleetInstances dengan CLI
- Gunakan DescribeSpotFleetRequestHistory dengan CLI
- Gunakan DescribeSpotFleetRequests dengan CLI
- Gunakan DescribeSpotInstanceRequests dengan CLI
- Gunakan DescribeSpotPriceHistory dengan CLI
- Gunakan DescribeSubnets dengan AWS SDK atau CLI
- Gunakan DescribeTags dengan CLI
- Gunakan DescribeVolumeAttribute dengan CLI
- Gunakan DescribeVolumeStatus dengan CLI
- Gunakan DescribeVolumes dengan CLI
- Gunakan DescribeVpcAttribute dengan CLI
- Gunakan DescribeVpcClassicLink dengan CLI
- Gunakan DescribeVpcClassicLinkDnsSupport dengan CLI
- Gunakan DescribeVpcEndpointServices dengan CLI
- Gunakan DescribeVpcEndpoints dengan CLI
- Gunakan DescribeVpcs dengan AWS SDK atau CLI
- Gunakan DescribeVpnConnections dengan CLI
- Gunakan DescribeVpnGateways dengan CLI
- Gunakan DetachInternetGateway dengan CLI
- Gunakan DetachNetworkInterface dengan CLI
- Gunakan DetachVolume dengan CLI
- Gunakan DetachVpnGateway dengan CLI
- Gunakan DisableVgwRoutePropagation dengan CLI
- Gunakan DisableVpcClassicLink dengan CLI
- Gunakan DisableVpcClassicLinkDnsSupport dengan CLI
- Gunakan DisassociateAddress dengan AWS SDK atau CLI
- Gunakan DisassociateRouteTable dengan CLI
- Gunakan EnableVgwRoutePropagation dengan CLI
- Gunakan EnableVolumeIo dengan CLI
- Gunakan EnableVpcClassicLink dengan CLI

- Gunakan EnableVpcClassicLinkDnsSupport dengan CLI
- Gunakan GetConsoleOutput dengan CLI
- Gunakan GetHostReservationPurchasePreview dengan CLI
- Gunakan GetPasswordData dengan AWS SDK atau CLI
- Gunakan ImportImage dengan CLI
- Gunakan ImportKeyPair dengan CLI
- Gunakan ImportSnapshot dengan CLI
- Gunakan ModifyCapacityReservation dengan CLI
- Gunakan ModifyHosts dengan CLI
- Gunakan ModifyIdFormat dengan CLI
- Gunakan ModifyImageAttribute dengan CLI
- Gunakan ModifyInstanceAttribute dengan CLI
- Gunakan ModifyInstanceCreditSpecification dengan CLI
- Gunakan ModifyNetworkInterfaceAttribute dengan CLI
- Gunakan ModifyReservedInstances dengan CLI
- Gunakan ModifySnapshotAttribute dengan CLI
- Gunakan ModifySpotFleetRequest dengan CLI
- Gunakan ModifySubnetAttribute dengan CLI
- Gunakan ModifyVolumeAttribute dengan CLI
- Gunakan ModifyVpcAttribute dengan CLI
- Gunakan MonitorInstances dengan AWS SDK atau CLI
- Gunakan MoveAddressToVpc dengan CLI
- Gunakan PurchaseHostReservation dengan CLI
- Gunakan PurchaseScheduledInstances dengan CLI
- Gunakan RebootInstances dengan AWS SDK atau CLI
- Gunakan RegisterImage dengan CLI
- Gunakan RejectVpcPeeringConnection dengan CLI
- Gunakan ReleaseAddress dengan AWS SDK atau CLI
- Gunakan ReleaseHosts dengan CLI
- Gunakan ReplaceIamInstanceProfileAssociation dengan AWS SDK atau CLI

    - Gunakan ReplaceNetworkAclAssociation dengan CLI
    - Gunakan ReplaceNetworkAclEntry dengan CLI
    - Gunakan ReplaceRoute dengan CLI
    - Gunakan ReplaceRouteTableAssociation dengan CLI
    - Gunakan ReportInstanceStatus dengan CLI
    - Gunakan RequestSpotFleet dengan CLI
    - Gunakan RequestSpotInstances dengan CLI
    - Gunakan ResetImageAttribute dengan CLI
    - Gunakan ResetInstanceAttribute dengan CLI
    - Gunakan ResetNetworkInterfaceAttribute dengan CLI
    - Gunakan ResetSnapshotAttribute dengan CLI
    - Gunakan RevokeSecurityGroupEgress dengan CLI
    - Gunakan RevokeSecurityGroupIngress dengan CLI
    - Gunakan RunInstances dengan AWS SDK atau CLI
    - Gunakan RunScheduledInstances dengan CLI
    - Gunakan StartInstances dengan AWS SDK atau CLI
    - Gunakan StopInstances dengan AWS SDK atau CLI
    - Gunakan TerminateInstances dengan AWS SDK atau CLI
    - Gunakan UnassignPrivateIpAddresses dengan CLI
    - Gunakan UnmonitorInstances dengan AWS SDK atau CLI
    - Gunakan UpdateSecurityGroupRuleDescriptionsIngress dengan CLI
- Skenario untuk Amazon EC2 menggunakan AWS SDKs
    - Membangun dan mengelola layanan tangguh menggunakan AWS SDK


# Contoh dasar untuk Amazon EC2 menggunakan AWS SDKs

Contoh kode berikut menunjukkan cara menggunakan dasar-dasar Amazon Elastic Compute Cloud dengan AWS SDKs.

Contoh


- Halo Amazon EC2

- Pelajari dasar-dasar Amazon EC2 dengan AWS SDK
- Tindakan untuk Amazon EC2 menggunakan AWS SDKs
  - Gunakan AcceptVpcPeeringConnection dengan CLI
  - Gunakan AllocateAddress dengan AWS SDK atau CLI
  - Gunakan AllocateHosts dengan CLI
  - Gunakan AssignPrivateIpAddresses dengan CLI
  - Gunakan AssociateAddress dengan AWS SDK atau CLI
  - Gunakan AssociateDhcpOptions dengan CLI
  - Gunakan AssociateRouteTable dengan CLI
  - Gunakan AttachInternetGateway dengan CLI
  - Gunakan AttachNetworkInterface dengan CLI
  - Gunakan AttachVolume dengan CLI
  - Gunakan AttachVpnGateway dengan CLI
  - Gunakan AuthorizeSecurityGroupEgress dengan CLI
  - Gunakan AuthorizeSecurityGroupIngress dengan AWS SDK atau CLI
  - Gunakan CancelCapacityReservation dengan CLI
  - Gunakan CancelImportTask dengan CLI
  - Gunakan CancelSpotFleetRequests dengan CLI
  - Gunakan CancelSpotInstanceRequests dengan CLI
  - Gunakan ConfirmProductInstance dengan CLI
  - Gunakan CopyImage dengan CLI
  - Gunakan CopySnapshot dengan CLI
  - Gunakan CreateCapacityReservation dengan CLI
  - Gunakan CreateCustomerGateway dengan CLI
  - Gunakan CreateDhcpOptions dengan CLI
  - Gunakan CreateFlowLogs dengan CLI
  - Gunakan CreateImage dengan CLI
  - Gunakan CreateInstanceExportTask dengan CLI
  - Gunakan CreateInternetGateway dengan CLI
  - Gunakan CreateKeyPair dengan AWS SDK atau CLI

- Gunakan CreateLaunchTemplate dengan AWS SDK atau CLI
- Gunakan CreateNetworkAcl dengan CLI
- Gunakan CreateNetworkAclEntry dengan CLI
- Gunakan CreateNetworkInterface dengan CLI
- Gunakan CreatePlacementGroup dengan CLI
- Gunakan CreateRoute dengan CLI
- Gunakan CreateRouteTable dengan AWS SDK atau CLI
- Gunakan CreateSecurityGroup dengan AWS SDK atau CLI
- Gunakan CreateSnapshot dengan CLI
- Gunakan CreateSpotDatafeedSubscription dengan CLI
- Gunakan CreateSubnet dengan AWS SDK atau CLI
- Gunakan CreateTags dengan AWS SDK atau CLI
- Gunakan CreateVolume dengan CLI
- Gunakan CreateVpc dengan AWS SDK atau CLI
- Gunakan CreateVpcEndpoint dengan AWS SDK atau CLI
- Gunakan CreateVpnConnection dengan CLI
- Gunakan CreateVpnConnectionRoute dengan CLI
- Gunakan CreateVpnGateway dengan CLI
- Gunakan DeleteCustomerGateway dengan CLI
- Gunakan DeleteDhcpOptions dengan CLI
- Gunakan DeleteFlowLogs dengan CLI
- Gunakan DeleteInternetGateway dengan CLI
- Gunakan DeleteKeyPair dengan AWS SDK atau CLI
- Gunakan DeleteLaunchTemplate dengan AWS SDK atau CLI
- Gunakan DeleteNetworkAcl dengan CLI
- Gunakan DeleteNetworkAclEntry dengan CLI
- Gunakan DeleteNetworkInterface dengan CLI
- Gunakan DeletePlacementGroup dengan CLI
- Gunakan DeleteRoute dengan CLI
- Gunakan DeleteRouteTable dengan CLI

- Gunakan DeleteSecurityGroup dengan AWS SDK atau CLI
- Gunakan DeleteSnapshot dengan AWS SDK atau CLI
- Gunakan DeleteSpotDatafeedSubscription dengan CLI
- Gunakan DeleteSubnet dengan CLI
- Gunakan DeleteTags dengan CLI
- Gunakan DeleteVolume dengan CLI
- Gunakan DeleteVpc dengan AWS SDK atau CLI
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- Gunakan DeleteVpnConnectionRoute dengan CLI
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- Gunakan DescribeAvailabilityZones dengan AWS SDK atau CLI
- Gunakan DescribeBundleTasks dengan CLI
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- Gunakan DescribeCustomerGateways dengan CLI
- Gunakan DescribeDhcpOptions dengan CLI
- Gunakan DescribeFlowLogs dengan CLI
- Gunakan DescribeHostReservationOfferings dengan CLI
- Gunakan DescribeHosts dengan CLI
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- Gunakan DescribeImportSnapshotTasks dengan CLI
- Gunakan DescribeInstanceAttribute dengan CLI

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- Gunakan DescribeInstanceTypes dengan AWS SDK atau CLI
- Gunakan DescribeInstances dengan AWS SDK atau CLI
- Gunakan DescribeInternetGateways dengan CLI
- Gunakan DescribeKeyPairs dengan AWS SDK atau CLI
- Gunakan DescribeNetworkAcls dengan CLI
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- Gunakan DescribePlacementGroups dengan CLI
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- Gunakan DescribeScheduledInstanceAvailability dengan CLI
- Gunakan DescribeScheduledInstances dengan CLI
- Gunakan DescribeSecurityGroups dengan AWS SDK atau CLI
- Gunakan DescribeSnapshotAttribute dengan CLI
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- Gunakan DescribeSpotDatafeedSubscription dengan CLI
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- Gunakan DescribeSpotFleetRequestHistory dengan CLI
- Gunakan DescribeSpotFleetRequests dengan CLI
- Gunakan DescribeSpotInstanceRequests dengan CLI
- Gunakan DescribeSpotPriceHistory dengan CLI
- Gunakan DescribeSubnets dengan AWS SDK atau CLI
- Gunakan DescribeTags dengan CLI
- Gunakan DescribeVolumeAttribute dengan CLI
- Gunakan DescribeVolumeStatus dengan CLI
- Gunakan DescribeVolumes dengan CLI
- Gunakan DescribeVpcAttribute dengan CLI



- Gunakan DescribeVpcClassicLink dengan CLI

- Gunakan DescribeVpcClassicLinkDnsSupport dengan CLI
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- Gunakan ImportSnapshot dengan CLI
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- Gunakan ModifyHosts dengan CLI
- Gunakan ModifyIdFormat dengan CLI
- Gunakan ModifyImageAttribute dengan CLI



- Gunakan ModifyInstanceAttribute dengan CLI

- Gunakan ModifyInstanceCreditSpecification dengan CLI
- Gunakan ModifyNetworkInterfaceAttribute dengan CLI
- Gunakan ModifyReservedInstances dengan CLI
- Gunakan ModifySnapshotAttribute dengan CLI
- Gunakan ModifySpotFleetRequest dengan CLI
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- Gunakan ReplaceIamInstanceProfileAssociation dengan AWS SDK atau CLI
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- Gunakan ReplaceNetworkAclEntry dengan CLI
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- Gunakan ReportInstanceStatus dengan CLI
- Gunakan RequestSpotFleet dengan CLI
- Gunakan RequestSpotInstances dengan CLI
- Gunakan ResetImageAttribute dengan CLI
- Gunakan ResetInstanceAttribute dengan CLI
- Gunakan ResetNetworkInterfaceAttribute dengan CLI
- Gunakan ResetSnapshotAttribute dengan CLI



- Gunakan RevokeSecurityGroupEgress dengan CLI

- Gunakan RevokeSecurityGroupIngress dengan CLI
- Gunakan RunInstances dengan AWS SDK atau CLI
- Gunakan RunScheduledInstances dengan CLI
- Gunakan StartInstances dengan AWS SDK atau CLI
- Gunakan StopInstances dengan AWS SDK atau CLI
- Gunakan TerminateInstances dengan AWS SDK atau CLI
- Gunakan UnassignPrivateIpAddresses dengan CLI
- Gunakan UnmonitorInstances dengan AWS SDK atau CLI
- Gunakan UpdateSecurityGroupRuleDescriptionsIngress dengan CLI

## Halo Amazon EC2

Contoh kode berikut menunjukkan cara memulai menggunakan AmazonEC2.

.NET

AWS SDK for .NET

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
namespace EC2Actions;

public class HelloEc2
{
    /// <summary>
    /// HelloEc2 lists the existing security groups for the default users.
    /// </summary>
    /// <param name="args">Command line arguments</param>
    /// <returns>Async task.</returns>
    static async Task Main(string[] args)
    {
        // Set up dependency injection for Amazon Elastic Compute Cloud (Amazon
 EC2).
```

```
        using var host =
Microsoft.Extensions.Hosting.Host.CreateDefaultBuilder(args)
            .ConfigureServices((_, services) =>
                services.AddAWSService<IAmazonEC2>()
                .AddTransient<EC2Wrapper>()
            )
            .Build();

        // Now the client is available for injection.
        var ec2Client = host.Services.GetRequiredService<IAmazonEC2>();

        try
        {
            // Retrieve information for up to 10 Amazon EC2 security groups.
            var request = new DescribeSecurityGroupsRequest { MaxResults = 10, };
            var securityGroups = new List<SecurityGroup>();

            var paginatorForSecurityGroups =
                ec2Client.Paginators.DescribeSecurityGroups(request);

            await foreach (var securityGroup in
paginatorForSecurityGroups.SecurityGroups)
            {
                securityGroups.Add(securityGroup);
            }

            // Now print the security groups returned by the call to
            // DescribeSecurityGroupsAsync.
            Console.WriteLine("Welcome to the EC2 Hello Service example. " +
                              "\nLet's list your Security Groups:");
            securityGroups.ForEach(group =>
            {
                Console.WriteLine(
                    $"Security group: {group.GroupName} ID: {group.GroupId}");
            });
        }
        catch (AmazonEC2Exception ex)
        {
            Console.WriteLine($"An Amazon EC2 service error occurred while
listing security groups. {ex.Message}");
        }
        catch (Exception ex)
        {
```

```
            Console.WriteLine($"An error occurred while listing security groups.
 {ex.Message}");
        }
    }
}
```

- Untuk API detailnya, lihat DescribeSecurityGroupsdi AWS SDK for .NET APIReferensi.

C++

SDKuntuk C ++

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

Kode untuk CMakeLists file.txtCMake.

```
# Set the minimum required version of CMake for this project.
cmake_minimum_required(VERSION 3.13)

# Set the AWS service components used by this project.
set(SERVICE_COMPONENTS ec2)

# Set this project's name.
project("hello_ec2")

# Set the C++ standard to use to build this target.
# At least C++ 11 is required for the AWS SDK for C++.
set(CMAKE_CXX_STANDARD 11)

# Use the MSVC variable to determine if this is a Windows build.
set(WINDOWS_BUILD ${MSVC})

if (WINDOWS_BUILD) # Set the location where CMake can find the installed
 libraries for the AWS SDK.
    string(REPLACE ";" "/aws-cpp-sdk-all;" SYSTEM_MODULE_PATH
 "${CMAKE_SYSTEM_PREFIX_PATH}/aws-cpp-sdk-all")
    list(APPEND CMAKE_PREFIX_PATH ${SYSTEM_MODULE_PATH})
```

```
endif ()

# Find the AWS SDK for C++ package.
find_package(AWSSDK REQUIRED COMPONENTS ${SERVICE_COMPONENTS})

if (WINDOWS_BUILD AND AWSSDK_INSTALL_AS_SHARED_LIBS)
     # Copy relevant AWS SDK for C++ libraries into the current binary directory
 for running and debugging.

     # set(BIN_SUB_DIR "/Debug") # If you are building from the command line, you
 may need to uncomment this
                                     # and set the proper subdirectory to the
 executables' location.

     AWSSDK_CPY_DYN_LIBS(SERVICE_COMPONENTS ""
 ${CMAKE_CURRENT_BINARY_DIR}${BIN_SUB_DIR})
endif ()

add_executable(${PROJECT_NAME}
        hello_ec2.cpp)

target_link_libraries(${PROJECT_NAME}
        ${AWSSDK_LINK_LIBRARIES})
```

Kode untuk file sumber hello_ec2.cpp.

```
#include <aws/core/Aws.h>
#include <aws/ec2/EC2Client.h>
#include <aws/ec2/model/DescribeInstancesRequest.h>
#include <iomanip>
#include <iostream>

/*
 *  A "Hello EC2" starter application which initializes an Amazon Elastic Compute
 Cloud (Amazon EC2) client and describes
 *  the Amazon EC2 instances.
 *
 *  main function
 *
 *  Usage: 'hello_ec2'
 *
 */
```

```
int main(int argc, char **argv) {
    (void)argc;
    (void)argv;

    Aws::SDKOptions options;
    // Optionally change the log level for debugging.
//   options.loggingOptions.logLevel = Utils::Logging::LogLevel::Debug;
    Aws::InitAPI(options); // Should only be called once.
    int result = 0;
    {
        Aws::Client::ClientConfiguration clientConfig;
        // Optional: Set to the AWS Region (overrides config file).
        // clientConfig.region = "us-east-1";

        Aws::EC2::EC2Client ec2Client(clientConfig);
        Aws::EC2::Model::DescribeInstancesRequest request;
        bool header = false;
        bool done = false;
        while (!done) {
            Aws::EC2::Model::DescribeInstancesOutcome outcome =
 ec2Client.DescribeInstances(request);
            if (outcome.IsSuccess()) {
                if (!header) {
                    std::cout << std::left <<
                              std::setw(48) << "Name" <<
                              std::setw(20) << "ID" <<
                              std::setw(25) << "Ami" <<
                              std::setw(15) << "Type" <<
                              std::setw(15) << "State" <<
                              std::setw(15) << "Monitoring" << std::endl;
                    header = true;
                }

                const std::vector<Aws::EC2::Model::Reservation> &reservations =
                        outcome.GetResult().GetReservations();

                for (const auto &reservation: reservations) {
                    const std::vector<Aws::EC2::Model::Instance> &instances =
                            reservation.GetInstances();
                    for (const auto &instance: instances) {
                        Aws::String instanceStateString =

 Aws::EC2::Model::InstanceStateNameMapper::GetNameForInstanceStateName(
```

```
                                        instance.GetState().GetName());

                        Aws::String typeString =

Aws::EC2::Model::InstanceTypeMapper::GetNameForInstanceType(
                                        instance.GetInstanceType());

                        Aws::String monitorString =

Aws::EC2::Model::MonitoringStateMapper::GetNameForMonitoringState(
                                        instance.GetMonitoring().GetState());
                        Aws::String name = "Unknown";

                        const std::vector<Aws::EC2::Model::Tag> &tags =
instance.GetTags();
                        auto nameIter = std::find_if(tags.cbegin(), tags.cend(),
                                                     [](const
Aws::EC2::Model::Tag &tag) {
                                                         return tag.GetKey() ==
"Name";
                                                     });
                        if (nameIter != tags.cend()) {
                            name = nameIter->GetValue();
                        }
                        std::cout <<
                                  std::setw(48) << name <<
                                  std::setw(20) << instance.GetInstanceId() <<
                                  std::setw(25) << instance.GetImageId() <<
                                  std::setw(15) << typeString <<
                                  std::setw(15) << instanceStateString <<
                                  std::setw(15) << monitorString << std::endl;
                    }
                }

                if (!outcome.GetResult().GetNextToken().empty()) {
                    request.SetNextToken(outcome.GetResult().GetNextToken());
                } else {
                    done = true;
                }
            } else {
                std::cerr << "Failed to describe EC2 instances:" <<
                          outcome.GetError().GetMessage() << std::endl;
                result = 1;
                break;
```

```
            }
        }
    }


    Aws::ShutdownAPI(options); // Should only be called once.
    return result;
}
```

- Untuk API detailnya, lihat DescribeSecurityGroupsdi AWS SDK for C++ APIReferensi.

Java

SDKuntuk Java 2.x

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
   /**
    * Asynchronously describes the security groups for the specified group ID.
    *
    * @param groupName the name of the security group to describe
    * @return a {@link CompletableFuture} that represents the asynchronous
operation
    *         of describing the security groups. The future will complete with a
    *         {@link DescribeSecurityGroupsResponse} object that contains the
    *         security group information.
    */
   public CompletableFuture<String> describeSecurityGroupArnByNameAsync(String
groupName) {
       DescribeSecurityGroupsRequest request =
DescribeSecurityGroupsRequest.builder()
           .groupNames(groupName)
           .build();

       DescribeSecurityGroupsPublisher paginator =
getAsyncClient().describeSecurityGroupsPaginator(request);
```

```
        AtomicReference<String> groupIdRef = new AtomicReference<>();
        return paginator.subscribe(response -> {
            response.securityGroups().stream()
                .filter(securityGroup ->
securityGroup.groupName().equals(groupName))
                .findFirst()
                .ifPresent(securityGroup ->
groupIdRef.set(securityGroup.groupId()));
        }).thenApply(v -> {
            String groupId = groupIdRef.get();
            if (groupId == null) {
                throw new RuntimeException("No security group found with the
name: " + groupName);
            }
            return groupId;
        }).exceptionally(ex -> {
            logger.info("Failed to describe security group: " + ex.getMessage());
            throw new RuntimeException("Failed to describe security group", ex);
        });
    }
```

- Untuk API detailnya, lihat DescribeSecurityGroupsdi AWS SDK for Java 2.x APIReferensi.

JavaScript

SDKuntuk JavaScript (v3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
import { DescribeSecurityGroupsCommand, EC2Client } from "@aws-sdk/client-ec2";

// Call DescribeSecurityGroups and display the result.
export const main = async () => {
  const client = new EC2Client();
  try {
    const { SecurityGroups } = await client.send(
```

```
      new DescribeSecurityGroupsCommand({}),
    );

    const securityGroupList = SecurityGroups.slice(0, 9)
      .map((sg) => ` • ${sg.GroupId}: ${sg.GroupName}`)
      .join("\n");

    console.log(
      "Hello, Amazon EC2! Let's list up to 10 of your security groups:",
    );
    console.log(securityGroupList);
  } catch (err) {
    console.error(err);
  }
};

// Call function if run directly.
import { fileURLToPath } from "node:url";
if (process.argv[1] === fileURLToPath(import.meta.url)) {
  main();
}
```

- Untuk API detailnya, lihat DescribeSecurityGroupsdi AWS SDK for JavaScript APIReferensi.

Kotlin

SDKuntuk Kotlin

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
suspend fun describeEC2SecurityGroups(groupId: String) {
    val request =
        DescribeSecurityGroupsRequest {
            groupIds = listOf(groupId)
        }

    Ec2Client { region = "us-west-2" }.use { ec2 ->
```

```
        val response = ec2.describeSecurityGroups(request)
        response.securityGroups?.forEach { group ->
            println("Found Security Group with id ${group.groupId}, vpc id
 ${group.vpcId} and description ${group.description}")
        }
    }
}
```

- Untuk API detailnya, lihat DescribeSecurityGroups AWSSDKAPIreferensi Kotlin.

Python

SDKuntuk Python (Boto3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
def hello_ec2(ec2_client):
    """
    Use the AWS SDK for Python (Boto3) to list the security groups in your
 account.
    This example uses the default settings specified in your shared credentials
    and config files.

    :param ec2_client: A Boto3 EC2 client. This client provides low-level
                       access to AWS EC2 services.
    """
    print("Hello, Amazon EC2! Let's list up to 10 of your security groups:")
    try:
        paginator = ec2_client.get_paginator("describe_security_groups")
        response_iterator = paginator.paginate(MaxResults=10)
        for page in response_iterator:
            for sg in page["SecurityGroups"]:
                logger.info(f"\t{sg['GroupId']}: {sg['GroupName']}")
    except ClientError as err:
        logger.error("Failed to list security groups.")
        if err.response["Error"]["Code"] == "AccessDeniedException":
```

```
            logger.error("You do not have permission to list security groups.")
        raise


if __name__ == "__main__":
    hello_ec2(boto3.client("ec2"))
```

- Untuk API detailnya, lihat DescribeSecurityGroups AWSSDKReferensi Python (Boto3). API

Ruby

SDKuntuk Ruby

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
require 'aws-sdk-ec2'
require 'logger'

# EC2Manager is a class responsible for managing EC2 operations
# such as listing all EC2 instances in the current AWS account.
class EC2Manager
  def initialize(client)
    @client = client
    @logger = Logger.new($stdout)
  end

  # Lists and prints all EC2 instances in the current AWS account.
  def list_instances
    @logger.info('Listing instances')

    instances = fetch_instances

    if instances.empty?
      @logger.info('You have no instances')
    else
      print_instances(instances)
```

```
    end
  end

  private

  # Fetches all EC2 instances using pagination.
  #
  # @return [Array<Aws::EC2::Types::Instance>] List of EC2 instances.
  def fetch_instances
    paginator = @client.describe_instances
    instances = []

    paginator.each_page do |page|
      page.reservations.each do |reservation|
        reservation.instances.each do |instance|
          instances << instance
        end
      end
    end

    instances
  end

  # Prints details of the given EC2 instances.
  #
  # @param instances [Array<Aws::EC2::Types::Instance>] List of EC2 instances to
 print.
  def print_instances(instances)
    instances.each do |instance|
      @logger.info("Instance ID: #{instance.instance_id}")
      @logger.info("Instance Type: #{instance.instance_type}")
      @logger.info("Public IP: #{instance.public_ip_address}")
      @logger.info("Public DNS Name: #{instance.public_dns_name}")
      @logger.info("\n")
    end
  end
end

if $PROGRAM_NAME == __FILE__
  ec2_client = Aws::EC2::Client.new(region: 'us-west-2')
  manager = EC2Manager.new(ec2_client)
  manager.list_instances
end
```

- Untuk API detailnya, lihat DescribeSecurityGroupsdi AWS SDK for Ruby APIReferensi.

Rust

SDKuntuk Rust

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
async fn show_security_groups(client: &aws_sdk_ec2::Client, group_ids:
 Vec<String>) {
    let response = client
        .describe_security_groups()
        .set_group_ids(Some(group_ids))
        .send()
        .await;

    match response {
        Ok(output) => {
            for group in output.security_groups() {
                println!(
                    "Found Security Group {} ({}), vpc id {} and description {}",
                    group.group_name().unwrap_or("unknown"),
                    group.group_id().unwrap_or("id-unknown"),
                    group.vpc_id().unwrap_or("vpcid-unknown"),
                    group.description().unwrap_or("(none)")
                );
            }
        }
        Err(err) => {
            let err = err.into_service_error();
            let meta = err.meta();
            let message = meta.message().unwrap_or("unknown");
            let code = meta.code().unwrap_or("unknown");
            eprintln!("Error listing EC2 Security Groups: ({code}) {message}");
        }
    }
```

```
}
```

- Untuk API detailnya, lihat DescribeSecurityGroups AWSSDKAPIreferensi Rust.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Pelajari dasar-dasar Amazon EC2 dengan AWS SDK

Contoh-contoh kode berikut ini menunjukkan cara untuk melakukan:

- Membuat pasangan kunci dan grup keamanan.
- Pilih Amazon Machine Image (AMI) dan jenis instans yang kompatibel, lalu buat instance.
- Menghentikan dan memulai ulang instans.
- Kaitkan alamat IP Elastis dengan instans Anda.
- Connect ke instans Anda denganSSH, lalu bersihkan sumber daya.

.NET

AWS SDK for .NET

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

Menjalankan skenario di prompt perintah.

```
/// <summary>
/// Show Amazon Elastic Compute Cloud (Amazon EC2) Basics actions.
/// </summary>
public class EC2Basics
{
    public static ILogger<EC2Basics> _logger = null!;
    public static EC2Wrapper _ec2Wrapper = null!;
    public static SsmWrapper _ssmWrapper = null!;
```

```
    public static UiMethods _uiMethods = null!;

    public static string associationId = null!;
    public static string allocationId = null!;
    public static string instanceId = null!;
    public static string keyPairName = null!;
    public static string groupName = null!;
    public static string tempFileName = null!;
    public static string secGroupId = null!;
    public static bool isInteractive = true;

    /// <summary>
    /// Perform the actions defined for the Amazon EC2 Basics scenario.
    /// </summary>
    /// <param name="args">Command line arguments.</param>
    /// <returns>A Task object.</returns>
    public static async Task Main(string[] args)
    {
        // Set up dependency injection for Amazon EC2 and Amazon Simple Systems
        // Management (Amazon SSM) Service.
        using var host =
Microsoft.Extensions.Hosting.Host.CreateDefaultBuilder(args)
            .ConfigureServices((_, services) =>
                services.AddAWSService<IAmazonEC2>()
                    .AddAWSService<IAmazonSimpleSystemsManagement>()
                    .AddTransient<EC2Wrapper>()
                    .AddTransient<SsmWrapper>()
            )
            .Build();

        SetUpServices(host);

        var uniqueName = Guid.NewGuid().ToString();
        keyPairName = "mvp-example-key-pair" + uniqueName;
        groupName = "ec2-scenario-group" + uniqueName;
        var groupDescription = "A security group created for the EC2 Basics
scenario.";

        try
        {
            // Start the scenario.
            _uiMethods.DisplayOverview();
            _uiMethods.PressEnter(isInteractive);
```

```
            // Create the key pair.
            _uiMethods.DisplayTitle("Create RSA key pair");
            Console.Write("Let's create an RSA key pair that you can be use to
");
            Console.WriteLine("securely connect to your EC2 instance.");
            var keyPair = await _ec2Wrapper.CreateKeyPair(keyPairName);

            // Save key pair information to a temporary file.
            tempFileName = _ec2Wrapper.SaveKeyPair(keyPair);

            Console.WriteLine(
                $"Created the key pair: {keyPair.KeyName} and saved it to:
{tempFileName}");
            string? answer = "";
            if (isInteractive)
            {
                do
                {
                    Console.Write("Would you like to list your existing key
pairs? ");
                    answer = Console.ReadLine();
                } while (answer!.ToLower() != "y" && answer.ToLower() != "n");
            }

            if (!isInteractive || answer == "y")
            {
                // List existing key pairs.
                _uiMethods.DisplayTitle("Existing key pairs");

                // Passing an empty string to the DescribeKeyPairs method will
return
                // a list of all existing key pairs.
                var keyPairs = await _ec2Wrapper.DescribeKeyPairs("");
                keyPairs.ForEach(kp =>
                {
                    Console.WriteLine(
                        $"{kp.KeyName} created at: {kp.CreateTime} Fingerprint:
{kp.KeyFingerprint}");
                });
            }

            _uiMethods.PressEnter(isInteractive);

            // Create the security group.
```

```
            Console.WriteLine(
                "Let's create a security group to manage access to your
instance.");
            secGroupId = await _ec2Wrapper.CreateSecurityGroup(groupName,
groupDescription);
            Console.WriteLine(
                "Let's add rules to allow all HTTP and HTTPS inbound traffic and
to allow SSH only from your current IP address.");

            _uiMethods.DisplayTitle("Security group information");
            var secGroups = await _ec2Wrapper.DescribeSecurityGroups(secGroupId);

            Console.WriteLine($"Created security group {groupName} in your
default VPC.");
            secGroups.ForEach(group =>
            {
                _ec2Wrapper.DisplaySecurityGroupInfoAsync(group);
            });
            _uiMethods.PressEnter(isInteractive);

            Console.WriteLine(
                "Now we'll authorize the security group we just created so that
it can");
            Console.WriteLine("access the EC2 instances you create.");
            await _ec2Wrapper.AuthorizeSecurityGroupIngress(groupName);

            secGroups = await _ec2Wrapper.DescribeSecurityGroups(secGroupId);
            Console.WriteLine($"Now let's look at the permissions again.");
            secGroups.ForEach(group =>
            {
                _ec2Wrapper.DisplaySecurityGroupInfoAsync(group);
            });
            _uiMethods.PressEnter(isInteractive);

            // Get list of available Amazon Linux 2 Amazon Machine Images (AMIs).
            var parameters =
                await _ssmWrapper.GetParametersByPath(
                    "/aws/service/ami-amazon-linux-latest");

            List<string> imageIds = parameters.Select(param =>
param.Value).ToList();

            var images = await _ec2Wrapper.DescribeImages(imageIds);
```

```
            var i = 1;
            images.ForEach(image =>
            {
                Console.WriteLine($"\t{i++}\t{image.Description}");
            });

            int choice = 1;
            bool validNumber = false;
            if (isInteractive)
            {
                do
                {
                    Console.Write("Please select an image: ");
                    var selImage = Console.ReadLine();
                    validNumber = int.TryParse(selImage, out choice);
                } while (!validNumber);
            }

            var selectedImage = images[choice - 1];

            // Display available instance types.
            _uiMethods.DisplayTitle("Instance Types");
            var instanceTypes =
                await
_ec2Wrapper.DescribeInstanceTypes(selectedImage.Architecture);

            i = 1;
            instanceTypes.ForEach(instanceType =>
            {
                Console.WriteLine($"\t{i++}\t{instanceType.InstanceType}");
            });
            if (isInteractive)
            {
                do
                {
                    Console.Write("Please select an instance type: ");
                    var selImage = Console.ReadLine();
                    validNumber = int.TryParse(selImage, out choice);
                } while (!validNumber);
            }

            var selectedInstanceType = instanceTypes[choice - 1].InstanceType;

            // Create an EC2 instance.
```

```
            _uiMethods.DisplayTitle("Creating an EC2 Instance");
            instanceId = await _ec2Wrapper.RunInstances(selectedImage.ImageId,
                selectedInstanceType, keyPairName, secGroupId);

            _uiMethods.PressEnter(isInteractive);

            var instance = await _ec2Wrapper.DescribeInstance(instanceId);
            _uiMethods.DisplayTitle("New Instance Information");
            _ec2Wrapper.DisplayInstanceInformation(instance);

            Console.WriteLine(
                "\nYou can use SSH to connect to your instance. For example:");
            Console.WriteLine(
                $"\tssh -i {tempFileName} ec2-user@{instance.PublicIpAddress}");

            _uiMethods.PressEnter(isInteractive);

            Console.WriteLine(
                "Now we'll stop the instance and then start it again to see
what's changed.");

            await _ec2Wrapper.StopInstances(instanceId);

            Console.WriteLine("Now let's start it up again.");
            await _ec2Wrapper.StartInstances(instanceId);

            Console.WriteLine("\nLet's see what changed.");

            instance = await _ec2Wrapper.DescribeInstance(instanceId);
            _uiMethods.DisplayTitle("New Instance Information");
            _ec2Wrapper.DisplayInstanceInformation(instance);

            Console.WriteLine("\nNotice the change in the SSH information:");
            Console.WriteLine(
                $"\tssh -i {tempFileName} ec2-user@{instance.PublicIpAddress}");

            _uiMethods.PressEnter(isInteractive);

            Console.WriteLine(
                "Now we will stop the instance again. Then we will create and
associate an");
            Console.WriteLine("Elastic IP address to use with our instance.");

            await _ec2Wrapper.StopInstances(instanceId);
```

```
            _uiMethods.PressEnter(isInteractive);

            _uiMethods.DisplayTitle("Allocate Elastic IP address");
            Console.WriteLine(
                "You can allocate an Elastic IP address and associate it
with your instance\nto keep a consistent IP address even when your instance
restarts.");
            var allocationResponse = await _ec2Wrapper.AllocateAddress();
            allocationId = allocationResponse.AllocationId;
            Console.WriteLine(
                "Now we will associate the Elastic IP address with our
instance.");
            associationId = await _ec2Wrapper.AssociateAddress(allocationId,
instanceId);

            // Start the instance again.
            Console.WriteLine("Now let's start the instance again.");
            await _ec2Wrapper.StartInstances(instanceId);

            Console.WriteLine("\nLet's see what changed.");

            instance = await _ec2Wrapper.DescribeInstance(instanceId);
            _uiMethods.DisplayTitle("Instance information");
            _ec2Wrapper.DisplayInstanceInformation(instance);

            Console.WriteLine("\nHere is the SSH information:");
            Console.WriteLine(
                $"\tssh -i {tempFileName} ec2-user@{instance.PublicIpAddress}");

            Console.WriteLine("Let's stop and start the instance again.");
            _uiMethods.PressEnter(isInteractive);

            await _ec2Wrapper.StopInstances(instanceId);

            Console.WriteLine("\nThe instance has stopped.");

            Console.WriteLine("Now let's start it up again.");
            await _ec2Wrapper.StartInstances(instanceId);

            instance = await _ec2Wrapper.DescribeInstance(instanceId);
            _uiMethods.DisplayTitle("New Instance Information");
            _ec2Wrapper.DisplayInstanceInformation(instance);
            Console.WriteLine("Note that the IP address did not change this
time.");
```

```
            _uiMethods.PressEnter(isInteractive);

            await Cleanup();
        }
        catch (Exception ex)
        {
            _logger.LogError(ex, "There was a problem with the scenario, starting
cleanup.");
            await Cleanup();
        }

        _uiMethods.DisplayTitle("EC2 Basics Scenario completed.");
        _uiMethods.PressEnter(isInteractive);
    }

    /// <summary>
    /// Set up the services and logging.
    /// </summary>
    /// <param name="host"></param>
    public static void SetUpServices(IHost host)
    {
        var loggerFactory = LoggerFactory.Create(builder =>
        {
            builder.AddConsole();
        });
        _logger = new Logger<EC2Basics>(loggerFactory);

        // Now the client is available for injection.
        _ec2Wrapper = host.Services.GetRequiredService<EC2Wrapper>();
        _ssmWrapper = host.Services.GetRequiredService<SsmWrapper>();
        _uiMethods = new UiMethods();
    }

    /// <summary>
    /// Clean up any resources from the scenario.
    /// </summary>
    /// <returns></returns>
    public static async Task Cleanup()
    {
        _uiMethods.DisplayTitle("Clean up resources");
        Console.WriteLine("Now let's clean up the resources we created.");

        Console.WriteLine("Disassociate the Elastic IP address and release it.");
        // Disassociate the Elastic IP address.
```

```
        await _ec2Wrapper.DisassociateIp(associationId);

        // Delete the Elastic IP address.
        await _ec2Wrapper.ReleaseAddress(allocationId);

        // Terminate the instance.
        Console.WriteLine("Terminating the instance we created.");
        await _ec2Wrapper.TerminateInstances(instanceId);

        // Delete the security group.
        Console.WriteLine($"Deleting the Security Group: {groupName}.");
        await _ec2Wrapper.DeleteSecurityGroup(secGroupId);

        // Delete the RSA key pair.
        Console.WriteLine($"Deleting the key pair: {keyPairName}");
        await _ec2Wrapper.DeleteKeyPair(keyPairName);
        Console.WriteLine("Deleting the temporary file with the key
 information.");
        _ec2Wrapper.DeleteTempFile(tempFileName);
        _uiMethods.PressEnter(isInteractive);
    }
}
```

Tentukan kelas yang membungkus EC2 tindakan.

```
/// <summary>
/// Methods of this class perform Amazon Elastic Compute Cloud (Amazon EC2).
/// </summary>
public class EC2Wrapper
{
    private readonly IAmazonEC2 _amazonEC2;
    private readonly ILogger<EC2Wrapper> _logger;

    /// <summary>
    /// Constructor for the EC2Wrapper class.
    /// </summary>
    /// <param name="amazonScheduler">The injected EC2 client.</param>
    /// <param name="logger">The injected logger.</param>
    public EC2Wrapper(IAmazonEC2 amazonService, ILogger<EC2Wrapper> logger)
    {
        _amazonEC2 = amazonService;
        _logger = logger;
```

```
    }

    /// <summary>
    /// Allocates an Elastic IP address that can be associated with an Amazon EC2
    // instance. By using an Elastic IP address, you can keep the public IP
 address
    // constant even when you restart the associated instance.
    /// </summary>
    /// <returns>The response object for the allocated address.</returns>
    public async Task<AllocateAddressResponse> AllocateAddress()
    {
        var request = new AllocateAddressRequest();

        try
        {
            var response = await _amazonEC2.AllocateAddressAsync(request);
            Console.WriteLine($"Allocated IP: {response.PublicIp} with allocation
 ID {response.AllocationId}.");
            return response;
        }
        catch (AmazonEC2Exception ec2Exception)
        {
            if (ec2Exception.ErrorCode == "AddressLimitExceeded")
            {
                // For more information on Elastic IP address quotas, see:
                // https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/elastic-
ip-addresses-eip.html#using-instance-addressing-limit
                _logger.LogError($"Unable to allocate Elastic IP, address limit
 exceeded. {ec2Exception.Message}");
            }

            throw;
        }
        catch (Exception ex)
        {
            _logger.LogError($"An error occurred while allocating Elastic IP.:
 {ex.Message}");
            throw;
        }
    }

    /// <summary>
    /// Associates an Elastic IP address with an instance. When this association
 is
```

```
    /// created, the Elastic IP's public IP address is immediately used as the
 public
    /// IP address of the associated instance.
    /// </summary>
    /// <param name="allocationId">The allocation Id of an Elastic IP address.</
param>
    /// <param name="instanceId">The instance Id of the EC2 instance to
    /// associate the address with.</param>
    /// <returns>The association Id that represents
    /// the association of the Elastic IP address with an instance.</returns>
    public async Task<string> AssociateAddress(string allocationId, string
 instanceId)
    {
        try
        {
            var request = new AssociateAddressRequest
            {
                AllocationId = allocationId,
                InstanceId = instanceId
            };

            var response = await _amazonEC2.AssociateAddressAsync(request);
            return response.AssociationId;
        }
        catch (AmazonEC2Exception ec2Exception)
        {
            if (ec2Exception.ErrorCode == "InvalidInstanceId")
            {
                _logger.LogError(
                    $"InstanceId is invalid, unable to associate address.
 {ec2Exception.Message}");
            }

            throw;
        }
        catch (Exception ex)
        {
            _logger.LogError(
                $"An error occurred while associating the Elastic IP.:
 {ex.Message}");
            throw;
        }
    }
```

```
    /// <summary>
    /// Authorize the local computer ingress to EC2 instances associated
    /// with the virtual private cloud (VPC) security group.
    /// </summary>
    /// <param name="groupName">The name of the security group.</param>
    /// <returns>A Boolean value indicating the success of the action.</returns>
    public async Task<bool> AuthorizeSecurityGroupIngress(string groupName)
    {
        try
        {
            // Get the IP address for the local computer.
            var ipAddress = await GetIpAddress();
            Console.WriteLine($"Your IP address is: {ipAddress}");
            var ipRanges =
                new List<IpRange> { new IpRange { CidrIp = $"{ipAddress}/32" } };
            var permission = new IpPermission
            {
                Ipv4Ranges = ipRanges,
                IpProtocol = "tcp",
                FromPort = 22,
                ToPort = 22
            };
            var permissions = new List<IpPermission> { permission };
            var response = await _amazonEC2.AuthorizeSecurityGroupIngressAsync(
                new AuthorizeSecurityGroupIngressRequest(groupName,
permissions));
            return response.HttpStatusCode == HttpStatusCode.OK;
        }
        catch (AmazonEC2Exception ec2Exception)
        {
            if (ec2Exception.ErrorCode == "InvalidPermission.Duplicate")
            {
                _logger.LogError(
                    $"The ingress rule already exists. {ec2Exception.Message}");
            }

            throw;
        }
        catch (Exception ex)
        {
            _logger.LogError(
                $"An error occurred while authorizing ingress.: {ex.Message}");
            throw;
        }
```

```
    }

    /// <summary>
    /// Authorize the local computer for ingress to
    /// the Amazon EC2 SecurityGroup.
    /// </summary>
    /// <returns>The IPv4 address of the computer running the scenario.</returns>
    private static async Task<string> GetIpAddress()
    {
        var httpClient = new HttpClient();
        var ipString = await httpClient.GetStringAsync("https://
checkip.amazonaws.com");

        // The IP address is returned with a new line
        // character on the end. Trim off the whitespace and
        // return the value to the caller.
        return ipString.Trim();
    }

    /// <summary>
    /// Create an Amazon EC2 key pair with a specified name.
    /// </summary>
    /// <param name="keyPairName">The name for the new key pair.</param>
    /// <returns>The Amazon EC2 key pair created.</returns>
    public async Task<KeyPair?> CreateKeyPair(string keyPairName)
    {
        try
        {
            var request = new CreateKeyPairRequest { KeyName = keyPairName, };

            var response = await _amazonEC2.CreateKeyPairAsync(request);

            var kp = response.KeyPair;
            // Return the key pair so it can be saved if needed.

            // Wait until the key pair exists.
            int retries = 5;
            while (retries-- > 0)
            {
                Console.WriteLine($"Checking for new KeyPair {keyPairName}...");
                var keyPairs = await DescribeKeyPairs(keyPairName);
                if (keyPairs.Any())
                {
                    return kp;
```

```
                }

                Thread.Sleep(5000);
                retries--;
            }
            _logger.LogError($"Unable to find newly created KeyPair
{keyPairName}.");
            throw new DoesNotExistException("KeyPair not found");
        }
        catch (AmazonEC2Exception ec2Exception)
        {
            if (ec2Exception.ErrorCode == "InvalidKeyPair.Duplicate")
            {
                _logger.LogError(
                    $"A key pair called {keyPairName} already exists.");
            }

            throw;
        }
        catch (Exception ex)
        {
            _logger.LogError(
                $"An error occurred while creating the key pair.: {ex.Message}");
            throw;
        }
    }

    /// <summary>
    /// Save KeyPair information to a temporary file.
    /// </summary>
    /// <param name="keyPair">The name of the key pair.</param>
    /// <returns>The full path to the temporary file.</returns>
    public string SaveKeyPair(KeyPair keyPair)
    {
        var tempPath = Path.GetTempPath();
        var tempFileName = $"{tempPath}\\{Path.GetRandomFileName()}";
        var pemFileName = Path.ChangeExtension(tempFileName, "pem");

        // Save the key pair to a file in a temporary folder.
        using var stream = new FileStream(pemFileName, FileMode.Create);
        using var writer = new StreamWriter(stream);
        writer.WriteLine(keyPair.KeyMaterial);

        return pemFileName;
```

```
    }

    /// <summary>
    /// Create an Amazon EC2 security group with a specified name and
 description.
    /// </summary>
    /// <param name="groupName">The name for the new security group.</param>
    /// <param name="groupDescription">A description of the new security group.</
param>
    /// <returns>The group Id of the new security group.</returns>
    public async Task<string> CreateSecurityGroup(string groupName, string
 groupDescription)
    {
        try
        {
            var response = await _amazonEC2.CreateSecurityGroupAsync(
                new CreateSecurityGroupRequest(groupName, groupDescription));

            // Wait until the security group exists.
            int retries = 5;
            while (retries-- > 0)
            {
                var groups = await DescribeSecurityGroups(response.GroupId);
                if (groups.Any())
                {
                    return response.GroupId;
                }

                Thread.Sleep(5000);
                retries--;
            }
            _logger.LogError($"Unable to find newly created group {groupName}.");
            throw new DoesNotExistException("security group not found");
        }
        catch (AmazonEC2Exception ec2Exception)
        {
            if (ec2Exception.ErrorCode == "ResourceAlreadyExists")
            {
                _logger.LogError(
                    $"A security group with the name {groupName} already exists.
 {ec2Exception.Message}");
            }
            throw;
        }
```

```
        catch (Exception ex)
        {
            _logger.LogError(
                $"An error occurred while creating the security group.:
 {ex.Message}");
            throw;
        }
    }


    /// <summary>
    /// Create a new Amazon EC2 VPC.
    /// </summary>
    /// <param name="cidrBlock">The CIDR block for the new security group.</
param>
    /// <returns>The VPC Id of the new VPC.</returns>
    public async Task<string?> CreateVPC(string cidrBlock)
    {

        try
        {
            var response = await _amazonEC2.CreateVpcAsync(new CreateVpcRequest
            {
                CidrBlock = cidrBlock,
            });

            Vpc vpc = response.Vpc;
            Console.WriteLine($"Created VPC with ID: {vpc.VpcId}.");
            return vpc.VpcId;
        }
        catch (AmazonEC2Exception ex)
        {
            Console.WriteLine($"Couldn't create VPC because: {ex.Message}");
            return null;
        }
    }

    /// <summary>
    /// Delete an Amazon EC2 key pair.
    /// </summary>
    /// <param name="keyPairName">The name of the key pair to delete.</param>
    /// <returns>A Boolean value indicating the success of the action.</returns>
    public async Task<bool> DeleteKeyPair(string keyPairName)
    {
```

```
        try
        {
            await _amazonEC2.DeleteKeyPairAsync(new
DeleteKeyPairRequest(keyPairName)).ConfigureAwait(false);
            return true;
        }
        catch (AmazonEC2Exception ec2Exception)
        {
            if (ec2Exception.ErrorCode == "InvalidKeyPair.NotFound")
            {
                _logger.LogError($"KeyPair {keyPairName} does not exist and
cannot be deleted. Please verify the key pair name and try again.");
            }

            return false;
        }
        catch (Exception ex)
        {
            Console.WriteLine($"Couldn't delete the key pair because:
{ex.Message}");
            return false;
        }
    }

    /// <summary>
    /// Delete the temporary file where the key pair information was saved.
    /// </summary>
    /// <param name="tempFileName">The path to the temporary file.</param>
    public void DeleteTempFile(string tempFileName)
    {
        if (File.Exists(tempFileName))
        {
            File.Delete(tempFileName);
        }
    }

    /// <summary>
    /// Delete an Amazon EC2 security group.
    /// </summary>
    /// <param name="groupName">The name of the group to delete.</param>
    /// <returns>A Boolean value indicating the success of the action.</returns>
    public async Task<bool> DeleteSecurityGroup(string groupId)
    {
        try
```

```
        {
            var response =
                await _amazonEC2.DeleteSecurityGroupAsync(
                    new DeleteSecurityGroupRequest { GroupId = groupId });
            return response.HttpStatusCode == HttpStatusCode.OK;
        }
        catch (AmazonEC2Exception ec2Exception)
        {
            if (ec2Exception.ErrorCode == "InvalidGroup.NotFound")
            {
                _logger.LogError(
                    $"Security Group {groupId} does not exist and cannot be
deleted. Please verify the ID and try again.");
            }

            return false;
        }
        catch (Exception ex)
        {
            Console.WriteLine($"Couldn't delete the security group because:
{ex.Message}");
            return false;
        }
    }

    /// <summary>
    /// Delete an Amazon EC2 VPC.
    /// </summary>
    /// <returns>A Boolean value indicating the success of the action.</returns>
    public async Task<bool> DeleteVpc(string vpcId)
    {
        var request = new DeleteVpcRequest
        {
            VpcId = vpcId,
        };

        var response = await _amazonEC2.DeleteVpcAsync(request);

        return response.HttpStatusCode == System.Net.HttpStatusCode.OK;
    }

    /// <summary>
    /// Get information about existing Amazon EC2 images.
    /// </summary>
```

```
    /// <returns>A list of image information.</returns>
    public async Task<List<Image>> DescribeImages(List<string>? imageIds)
    {
        var request = new DescribeImagesRequest();
        if (imageIds is not null)
        {
            // If the imageIds list is not null, add the list
            // to the request object.
            request.ImageIds = imageIds;
        }

        var response = await _amazonEC2.DescribeImagesAsync(request);
        return response.Images;
    }

    /// <summary>
    /// Display the information returned by DescribeImages.
    /// </summary>
    /// <param name="images">The list of image information to display.</param>
    public void DisplayImageInfo(List<Image> images)
    {
        images.ForEach(image =>
        {
            Console.WriteLine($"{image.Name} Created on: {image.CreationDate}");
        });

    }

    /// <summary>
    /// Get information about an Amazon EC2 instance.
    /// </summary>
    /// <param name="instanceId">The instance Id of the EC2 instance.</param>
    /// <returns>An EC2 instance.</returns>
    public async Task<Instance> DescribeInstance(string instanceId)
    {
        var response = await _amazonEC2.DescribeInstancesAsync(
            new DescribeInstancesRequest { InstanceIds = new List<string>
{ instanceId } });
        return response.Reservations[0].Instances[0];
    }

    /// <summary>
    /// Display EC2 instance information.
    /// </summary>
```

```
    /// <param name="instance">The instance Id of the EC2 instance.</param>
    public void DisplayInstanceInformation(Instance instance)
    {
        Console.WriteLine($"ID: {instance.InstanceId}");
        Console.WriteLine($"Image ID: {instance.ImageId}");
        Console.WriteLine($"{instance.InstanceType}");
        Console.WriteLine($"Key Name: {instance.KeyName}");
        Console.WriteLine($"VPC ID: {instance.VpcId}");
        Console.WriteLine($"Public IP: {instance.PublicIpAddress}");
        Console.WriteLine($"State: {instance.State.Name}");
    }

    /// <summary>
    /// Get information about EC2 instances with a particular state.
    /// </summary>
    /// <param name="tagName">The name of the tag to filter on.</param>
    /// <param name="tagValue">The value of the tag to look for.</param>
    /// <returns>True if successful.</returns>
    public async Task<bool> GetInstancesWithState(string state)
    {
        try
        {
            // Filters the results of the instance list.
            var filters = new List<Filter>
            {
                new Filter
                {
                    Name = $"instance-state-name",
                    Values = new List<string> { state, },
                },
            };
            var request = new DescribeInstancesRequest { Filters = filters, };

            Console.WriteLine($"\nShowing instances with state {state}");
            var paginator = _amazonEC2.Paginators.DescribeInstances(request);

            await foreach (var response in paginator.Responses)
            {
                foreach (var reservation in response.Reservations)
                {
                    foreach (var instance in reservation.Instances)
                    {
                        Console.Write($"Instance ID: {instance.InstanceId} ");
```

```
                        Console.WriteLine($"\tCurrent State:
{instance.State.Name}");
                    }
                }
            }

            return true;
        }
        catch (AmazonEC2Exception ec2Exception)
        {
            if (ec2Exception.ErrorCode == "InvalidParameterValue")
            {
                _logger.LogError(
                    $"Invalid parameter value for filtering instances.");
            }

            return false;
        }
        catch (Exception ex)
        {
            Console.WriteLine($"Couldn't list instances because: {ex.Message}");
            return false;
        }
    }

    /// <summary>
    /// Describe the instance types available.
    /// </summary>
    /// <returns>A list of instance type information.</returns>
    public async Task<List<InstanceTypeInfo>>
DescribeInstanceTypes(ArchitectureValues architecture)
    {
        try
        {
            var request = new DescribeInstanceTypesRequest();

            var filters = new List<Filter>
            {
                new Filter("processor-info.supported-architecture",
                    new List<string> { architecture.ToString() })
            };
            filters.Add(new Filter("instance-type", new() { "*.micro",
"*.small" }));
```

```
            request.Filters = filters;
            var instanceTypes = new List<InstanceTypeInfo>();

            var paginator = _amazonEC2.Paginators.DescribeInstanceTypes(request);
            await foreach (var instanceType in paginator.InstanceTypes)
            {
                instanceTypes.Add(instanceType);
            }

            return instanceTypes;
        }
        catch (AmazonEC2Exception ec2Exception)
        {
            if (ec2Exception.ErrorCode == "InvalidParameterValue")
            {
                _logger.LogError(
                    $"Parameters are invalid. Ensure architecture and size
strings conform to DescribeInstanceTypes API reference.");
            }

            throw;
        }
        catch (Exception ex)
        {
            Console.WriteLine($"Couldn't delete the security group because:
{ex.Message}");
            throw;
        }
    }

    /// <summary>
    /// Get information about an Amazon EC2 key pair.
    /// </summary>
    /// <param name="keyPairName">The name of the key pair.</param>
    /// <returns>A list of key pair information.</returns>
    public async Task<List<KeyPairInfo>> DescribeKeyPairs(string keyPairName)
    {
        try
        {
            var request = new DescribeKeyPairsRequest();
            if (!string.IsNullOrEmpty(keyPairName))
            {
                request = new DescribeKeyPairsRequest
                {
```

```
                    KeyNames = new List<string> { keyPairName }
                };
            }

            var response = await _amazonEC2.DescribeKeyPairsAsync(request);
            return response.KeyPairs.ToList();
        }
        catch (AmazonEC2Exception ec2Exception)
        {
            if (ec2Exception.ErrorCode == "InvalidKeyPair.NotFound")
            {
                _logger.LogError(
                    $"A key pair called {keyPairName} does not exist.");
            }

            throw;
        }
        catch (Exception ex)
        {
            _logger.LogError(
                $"An error occurred while describing the key pair.:
{ex.Message}");
            throw;
        }
    }


    /// <summary>
    /// Retrieve information for one or all Amazon EC2 security group.
    /// </summary>
    /// <param name="groupId">The optional Id of a specific Amazon EC2 security
group.</param>
    /// <returns>A list of security group information.</returns>
    public async Task<List<SecurityGroup>> DescribeSecurityGroups(string groupId)
    {
        try
        {
            var securityGroups = new List<SecurityGroup>();
            var request = new DescribeSecurityGroupsRequest();

            if (!string.IsNullOrEmpty(groupId))
            {
                var groupIds = new List<string> { groupId };
                request.GroupIds = groupIds;
```

```
            }

            var paginatorForSecurityGroups =
                _amazonEC2.Paginators.DescribeSecurityGroups(request);

            await foreach (var securityGroup in
paginatorForSecurityGroups.SecurityGroups)
            {
                securityGroups.Add(securityGroup);
            }

            return securityGroups;

        }
        catch (AmazonEC2Exception ec2Exception)
        {
            if (ec2Exception.ErrorCode == "InvalidGroup.NotFound")
            {
                _logger.LogError(
                    $"A security group {groupId} does not exist.");
            }

            throw;
        }
        catch (Exception ex)
        {
            _logger.LogError(
                $"An error occurred while listing security groups.
{ex.Message}");
            throw;
        }
    }

    /// <summary>
    /// Display the information returned by the call to
    /// DescribeSecurityGroupsAsync.
    /// </summary>
    /// <param name="securityGroup">A list of security group information.</param>
    public void DisplaySecurityGroupInfoAsync(SecurityGroup securityGroup)
    {
        Console.WriteLine($"{securityGroup.GroupName}");
        Console.WriteLine("Ingress permissions:");
        securityGroup.IpPermissions.ForEach(permission =>
        {
```

```
            Console.WriteLine($"\tFromPort: {permission.FromPort}");
            Console.WriteLine($"\tIpProtocol: {permission.IpProtocol}");

            Console.Write($"\tIpv4Ranges: ");
            permission.Ipv4Ranges.ForEach(range =>
{ Console.Write($"{range.CidrIp} "); });

            Console.WriteLine($"\n\tIpv6Ranges:");
            permission.Ipv6Ranges.ForEach(range =>
{ Console.Write($"{range.CidrIpv6} "); });

            Console.Write($"\n\tPrefixListIds: ");
            permission.PrefixListIds.ForEach(id => Console.Write($"{id.Id} "));

            Console.WriteLine($"\n\tTo Port: {permission.ToPort}");
        });
        Console.WriteLine("Egress permissions:");
        securityGroup.IpPermissionsEgress.ForEach(permission =>
        {
            Console.WriteLine($"\tFromPort: {permission.FromPort}");
            Console.WriteLine($"\tIpProtocol: {permission.IpProtocol}");

            Console.Write($"\tIpv4Ranges: ");
            permission.Ipv4Ranges.ForEach(range =>
{ Console.Write($"{range.CidrIp} "); });

            Console.WriteLine($"\n\tIpv6Ranges:");
            permission.Ipv6Ranges.ForEach(range =>
{ Console.Write($"{range.CidrIpv6} "); });

            Console.Write($"\n\tPrefixListIds: ");
            permission.PrefixListIds.ForEach(id => Console.Write($"{id.Id} "));

            Console.WriteLine($"\n\tTo Port: {permission.ToPort}");
        });
    }


    /// <summary>
    /// Disassociate an Elastic IP address from an EC2 instance.
    /// </summary>
    /// <param name="associationId">The association Id.</param>
    /// <returns>A Boolean value indicating the success of the action.</returns>
    public async Task<bool> DisassociateIp(string associationId)
```

```
    {
        try
        {
            var response = await _amazonEC2.DisassociateAddressAsync(
                new DisassociateAddressRequest { AssociationId =
associationId });
            return response.HttpStatusCode == HttpStatusCode.OK;
        }
        catch (AmazonEC2Exception ec2Exception)
        {
            if (ec2Exception.ErrorCode == "InvalidAssociationID.NotFound")
            {
                _logger.LogError(
                    $"AssociationId is invalid, unable to disassociate address.
{ec2Exception.Message}");
            }

            return false;
        }
        catch (Exception ex)
        {
            _logger.LogError(
                $"An error occurred while disassociating the Elastic IP.:
{ex.Message}");
            return false;
        }
    }

    /// <summary>
    /// Retrieve a list of available Amazon Linux images.
    /// </summary>
    /// <returns>A list of image information.</returns>
    public async Task<List<Image>> GetEC2AmiList()
    {
        var filter = new Filter { Name = "architecture", Values = new
List<string> { "x86_64" } };
        var filters = new List<Filter> { filter };
        var response = await _amazonEC2.DescribeImagesAsync(new
DescribeImagesRequest { Filters = filters });
        return response.Images;
    }

    /// <summary>
    /// Reboot a specific EC2 instance.
```

```
    /// </summary>
    /// <param name="ec2InstanceId">The instance Id of the instance that will be
rebooted.</param>
    /// <returns>Async Task.</returns>
    public async Task<bool> RebootInstances(string ec2InstanceId)
    {
        try
        {
            var request = new RebootInstancesRequest
            {
                InstanceIds = new List<string> { ec2InstanceId },
            };

            await _amazonEC2.RebootInstancesAsync(request);

            // Wait for the instance to be running.
            Console.Write("Waiting for the instance to start.");
            await WaitForInstanceState(ec2InstanceId, InstanceStateName.Running);

            return true;
        }
        catch (AmazonEC2Exception ec2Exception)
        {
            if (ec2Exception.ErrorCode == "InvalidInstanceId")
            {
                _logger.LogError(
                    $"InstanceId {ec2InstanceId} is invalid, unable to reboot.
{ec2Exception.Message}");
            }
            return false;
        }
        catch (Exception ex)
        {
            _logger.LogError(
                $"An error occurred while rebooting the instance
{ec2InstanceId}.: {ex.Message}");
            return false;
        }
    }

    /// <summary>
    /// Release an Elastic IP address. After the Elastic IP address is released,
    /// it can no longer be used.
    /// </summary>
```

```
    /// <param name="allocationId">The allocation Id of the Elastic IP address.</
param>
    /// <returns>True if successful.</returns>
    public async Task<bool> ReleaseAddress(string allocationId)
    {
        try
        {
            var request = new ReleaseAddressRequest { AllocationId =
 allocationId };

            var response = await _amazonEC2.ReleaseAddressAsync(request);
            return response.HttpStatusCode == HttpStatusCode.OK;
        }
        catch (AmazonEC2Exception ec2Exception)
        {
            if (ec2Exception.ErrorCode == "InvalidAllocationID.NotFound")
            {
                _logger.LogError(
                    $"AllocationId {allocationId} was not found.
 {ec2Exception.Message}");
            }

            return false;
        }
        catch (Exception ex)
        {
            _logger.LogError(
                $"An error occurred while releasing the AllocationId
 {allocationId}.: {ex.Message}");
            return false;
        }
    }

    /// <summary>
    /// Create and run an EC2 instance.
    /// </summary>
    /// <param name="ImageId">The image Id of the image used as a basis for the
    /// EC2 instance.</param>
    /// <param name="instanceType">The instance type of the EC2 instance to
 create.</param>
    /// <param name="keyName">The name of the key pair to associate with the
    /// instance.</param>
    /// <param name="groupId">The Id of the Amazon EC2 security group that will
 be
```

```
    /// allowed to interact with the new EC2 instance.</param>
    /// <returns>The instance Id of the new EC2 instance.</returns>
    public async Task<string> RunInstances(string imageId, string instanceType,
string keyName, string groupId)
    {
        try
        {
            var request = new RunInstancesRequest
            {
                ImageId = imageId,
                InstanceType = instanceType,
                KeyName = keyName,
                MinCount = 1,
                MaxCount = 1,
                SecurityGroupIds = new List<string> { groupId }
            };
            var response = await _amazonEC2.RunInstancesAsync(request);
            var instanceId = response.Reservation.Instances[0].InstanceId;

            Console.Write("Waiting for the instance to start.");
            await WaitForInstanceState(instanceId, InstanceStateName.Running);

            return instanceId;
        }
        catch (AmazonEC2Exception ec2Exception)
        {
            if (ec2Exception.ErrorCode == "InvalidGroupId.NotFound")
            {
                _logger.LogError(
                    $"GroupId {groupId} was not found. {ec2Exception.Message}");
            }

            throw;
        }
        catch (Exception ex)
        {
            _logger.LogError(
                $"An error occurred while running the instance.: {ex.Message}");
            throw;
        }
    }


    /// <summary>
```

```
    /// Start an EC2 instance.
    /// </summary>
    /// <param name="ec2InstanceId">The instance Id of the Amazon EC2 instance
    /// to start.</param>
    /// <returns>Async task.</returns>
    public async Task StartInstances(string ec2InstanceId)
    {
        try
        {
            var request = new StartInstancesRequest
            {
                InstanceIds = new List<string> { ec2InstanceId },
            };

            await _amazonEC2.StartInstancesAsync(request);

            Console.Write("Waiting for instance to start. ");
            await WaitForInstanceState(ec2InstanceId, InstanceStateName.Running);
        }
        catch (AmazonEC2Exception ec2Exception)
        {
            if (ec2Exception.ErrorCode == "InvalidInstanceId")
            {
                _logger.LogError(
                    $"InstanceId is invalid, unable to start.
{ec2Exception.Message}");
            }

            throw;
        }
        catch (Exception ex)
        {
            _logger.LogError(
                $"An error occurred while starting the instance.: {ex.Message}");
            throw;
        }
    }

    /// <summary>
    /// Stop an EC2 instance.
    /// </summary>
    /// <param name="ec2InstanceId">The instance Id of the EC2 instance to
    /// stop.</param>
    /// <returns>Async task.</returns>
```

```
    public async Task StopInstances(string ec2InstanceId)
    {
        try
        {
            var request = new StopInstancesRequest
            {
                InstanceIds = new List<string> { ec2InstanceId },
            };

            await _amazonEC2.StopInstancesAsync(request);
            Console.Write("Waiting for the instance to stop.");
            await WaitForInstanceState(ec2InstanceId, InstanceStateName.Stopped);

            Console.WriteLine("\nThe instance has stopped.");
        }
        catch (AmazonEC2Exception ec2Exception)
        {
            if (ec2Exception.ErrorCode == "InvalidInstanceId")
            {
                _logger.LogError(
                    $"InstanceId is invalid, unable to stop.
{ec2Exception.Message}");
            }

            throw;
        }
        catch (Exception ex)
        {
            _logger.LogError(
                $"An error occurred while stopping the instance.: {ex.Message}");
            throw;
        }
    }

    /// <summary>
    /// Terminate an EC2 instance.
    /// </summary>
    /// <param name="ec2InstanceId">The instance Id of the EC2 instance
    /// to terminate.</param>
    /// <returns>Async task.</returns>
    public async Task<List<InstanceStateChange>> TerminateInstances(string
ec2InstanceId)
    {
        try
```

```
        {
            var request = new TerminateInstancesRequest
            {
                InstanceIds = new List<string> { ec2InstanceId }
            };

            var response = await _amazonEC2.TerminateInstancesAsync(request);
            Console.Write("Waiting for the instance to terminate.");
            await WaitForInstanceState(ec2InstanceId,
InstanceStateName.Terminated);

            Console.WriteLine($"\nThe instance {ec2InstanceId} has been
terminated.");
            return response.TerminatingInstances;
        }
        catch (AmazonEC2Exception ec2Exception)
        {
            if (ec2Exception.ErrorCode == "InvalidInstanceId")
            {
                _logger.LogError(
                    $"InstanceId is invalid, unable to terminate.
{ec2Exception.Message}");
            }

            throw;
        }
        catch (Exception ex)
        {
            _logger.LogError(
                $"An error occurred while terminating the instance.:
{ex.Message}");
            throw;
        }
    }

    /// <summary>
    /// Wait until an EC2 instance is in a specified state.
    /// </summary>
    /// <param name="instanceId">The instance Id.</param>
    /// <param name="stateName">The state to wait for.</param>
    /// <returns>A Boolean value indicating the success of the action.</returns>
    public async Task<bool> WaitForInstanceState(string instanceId,
InstanceStateName stateName)
    {
```

```
        var request = new DescribeInstancesRequest
        {
            InstanceIds = new List<string> { instanceId }
        };

        // Wait until the instance is in the specified state.
        var hasState = false;
        do
        {
            // Wait 5 seconds.
            Thread.Sleep(5000);

            // Check for the desired state.
            var response = await _amazonEC2.DescribeInstancesAsync(request);
            var instance = response.Reservations[0].Instances[0];
            hasState = instance.State.Name == stateName;
            Console.Write(". ");
        } while (!hasState);

        return hasState;
    }

}
```

- Untuk API detailnya, lihat topik berikut di AWS SDK for .NET APIReferensi.
  - AllocateAddress
  - AssociateAddress
  - AuthorizeSecurityGroupIngress
  - CreateKeyPair
  - CreateSecurityGroup
  - DeleteKeyPair
  - DeleteSecurityGroup
  - DescribeImages
  - DescribeInstanceTypes
  - DescribeInstances
  - DescribeKeyPairs
  - DescribeSecurityGroups

- DisassociateAddress
- ReleaseAddress
- RunInstances
- StartInstances
- StopInstances
- TerminateInstances
- UnmonitorInstances

Bash

AWS CLI dengan skrip Bash

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

Jalankan skenario interaktif di penggugah/prompt perintah.

```
###############################################################################
# function get_started_with_ec2_instances
#
# Runs an interactive scenario that shows how to get started using EC2 instances.
#
#     "EC2 access" permissions are needed to run this code.
#
# Returns:
#       0 - If successful.
#       1 - If an error occurred.
###############################################################################
function get_started_with_ec2_instances() {
  # Requires version 4 for mapfile.
  local required_version=4.0

  # Get the current Bash version
  # Check if BASH_VERSION is set
  local current_version
  if [[ -n "$BASH_VERSION" ]]; then
```

```
    # Convert BASH_VERSION to a number for comparison
    current_version=$BASH_VERSION
  else
    # Get the current Bash version using the bash command
    current_version=$(bash --version | head -n 1 | awk '{ print $4 }')
  fi

  # Convert version strings to numbers for comparison
  local required_version_num current_version_num
  required_version_num=$(echo "$required_version" | awk -F. '{ print ($1 * 10000)
+ ($2 * 100) + $3 }')
  current_version_num=$(echo "$current_version" | awk -F. '{ print ($1 * 10000) +
($2 * 100) + $3 }')

  # Compare versions
  if ((current_version_num < required_version_num)); then
    echo "Error: This script requires Bash version $required_version or higher."
    echo "Your current Bash version is number is $current_version."
    exit 1
  fi

  {
    if [ "$EC2_OPERATIONS_SOURCED" != "True" ]; then

      source ./ec2_operations.sh
    fi
  }

  echo_repeat "*" 88
  echo "Welcome to the Amazon Elastic Compute Cloud (Amazon EC2) get started with
instances demo."
  echo_repeat "*" 88
  echo

  echo "Let's create an RSA key pair that you can be use to securely connect to "
  echo "your EC2 instance."

  echo -n "Enter a unique name for your key: "
  get_input
  local key_name
  key_name=$get_input_result

  local temp_dir
  temp_dir=$(mktemp -d)
```

```
  local key_file_name="$temp_dir/${key_name}.pem"

  if ec2_create_keypair -n "${key_name}" -f "${key_file_name}"; then
    echo "Created a key pair $key_name and saved the private key to
$key_file_name"
    echo
  else
    errecho "The key pair failed to create. This demo will exit."
    return 1
  fi

  chmod 400 "${key_file_name}"

  if yes_no_input "Do you want to list some of your key pairs? (y/n) "; then
    local keys_and_fingerprints
    keys_and_fingerprints="$(ec2_describe_key_pairs)" && {
      local image_name_and_id
      while IFS=$'\n' read -r image_name_and_id; do
        local entries
        IFS=$'\t' read -ra entries <<<"$image_name_and_id"
        echo "Found rsa key ${entries[0]} with fingerprint:"
        echo "     ${entries[1]}"
      done <<<"$keys_and_fingerprints"

    }
  fi

  echo_repeat "*" 88
  echo_repeat "*" 88

  echo "Let's create a security group to manage access to your instance."
  echo -n "Enter a unique name for your security group: "
  get_input
  local security_group_name
  security_group_name=$get_input_result
  local security_group_id
  security_group_id=$(ec2_create_security_group -n "$security_group_name" \
    -d "Security group for EC2 instance") || {
    errecho "The security failed to create. This demo will exit."
    clean_up "$key_name" "$key_file_name"
    return 1
  }

  echo "Security group created with ID $security_group_id"
```

```
  echo

  local public_ip
  public_ip=$(curl -s http://checkip.amazonaws.com)

  echo "Let's add a rule to allow SSH only from your current IP address."
  echo "Your public IP address is $public_ip"
  echo -n "press return to add this rule to your security group."
  get_input

  if ! ec2_authorize_security_group_ingress -g "$security_group_id" -i
 "$public_ip" -p tcp -f 22 -t 22; then
    errecho "The security group rules failed to update. This demo will exit."
    clean_up "$key_name" "$key_file_name" "$security_group_id"
    return 1
  fi

  echo "Security group rules updated"

  local security_group_description
  security_group_description="$(ec2_describe_security_groups -g
 "${security_group_id}")" || {
    errecho "Failed to describe security groups. This demo will exit."
    clean_up "$key_name" "$key_file_name" "$security_group_id"
    return 1
  }

  mapfile -t parameters <<<"$security_group_description"
  IFS=$'\t' read -ra entries <<<"${parameters[0]}"
  echo "Security group: ${entries[0]}"
  echo "    ID: ${entries[1]}"
  echo "    VPC: ${entries[2]}"
  echo "Inbound permissions:"
  IFS=$'\t' read -ra entries <<<"${parameters[1]}"
  echo "    IpProtocol: ${entries[0]}"
  echo "    FromPort: ${entries[1]}"
  echo "    ToPort: ${entries[2]}"
  echo "    CidrIp: ${parameters[2]}"

  local parameters
  parameters="$(ssm_get_parameters_by_path -p "/aws/service/ami-amazon-linux-
latest")" || {
    errecho "Failed to get parameters. This demo will exit."
    clean_up "$key_name" "$key_file_name" "$security_group_id"
```

```
    return 1

  }

  local image_ids=""
  mapfile -t parameters <<<"$parameters"
  for image_name_and_id in "${parameters[@]}"; do
    IFS=$'\t' read -ra values <<<"$image_name_and_id"
    if [[ "${values[0]}" == *"amzn2"* ]]; then
      image_ids+="${values[1]} "
    fi
  done

  local images
  images="$(ec2_describe_images -i "$image_ids")" || {
    errecho "Failed to describe images. This demo will exit."
    clean_up "$key_name" "$key_file_name" "$security_group_id"
    return 1

  }

  new_line_and_tab_to_list "$images"
  local images=("${list_result[@]}")

  # Get the size of the array
  local images_count=${#images[@]}

  if ((images_count == 0)); then
    errecho "No images found. This demo will exit."
    clean_up "$key_name" "$key_file_name" "$security_group_id"
    return 1
  fi

  echo_repeat "*" 88
  echo_repeat "*" 88

  echo "Let's create an instance from an Amazon Linux 2 AMI. Here are some
options:"
  for ((i = 0; i < images_count; i += 3)); do
    echo "$(((i / 3) + 1)) - ${images[$i]}"
  done

  integer_input "Please enter the number of the AMI you want to use: " 1
"$((images_count / 3))"
```

```
  local choice=$get_input_result
  choice=$(((choice - 1) * 3))

  echo "Great choice."
  echo

  local architecture=${images[$((choice + 1))]}
  local image_id=${images[$((choice + 2))]}
  echo "Here are some instance types that support the ${architecture}
 architecture of the image:"
  response="$(ec2_describe_instance_types -a "${architecture}" -t
"*.micro,*.small")" || {
    errecho "Failed to describe instance types. This demo will exit."
    clean_up "$key_name" "$key_file_name" "$security_group_id"
    return 1
  }

  local instance_types
  mapfile -t instance_types <<<"$response"

  # Get the size of the array
  local instance_types_count=${#instance_types[@]}

  echo "Here are some options:"
  for ((i = 0; i < instance_types_count; i++)); do
    echo "$((i + 1)) - ${instance_types[$i]}"
  done

  integer_input "Which one do you want to use? " 1 "${#instance_types[@]}
"
  choice=$get_input_result
  local instance_type=${instance_types[$((choice - 1))]}
  echo "Another great choice."
  echo

  echo "Creating your instance and waiting for it to start..."
  local instance_id
  instance_id=$(ec2_run_instances -i "$image_id" -t "$instance_type" -k
 "$key_name" -s "$security_group_id") || {
    errecho "Failed to run instance. This demo will exit."
    clean_up "$key_name" "$key_file_name" "$security_group_id"
    return 1
  }
```

```
  ec2_wait_for_instance_running -i "$instance_id"
  echo "Your instance is ready:"
  echo

  local instance_details
  instance_details="$(ec2_describe_instances -i "${instance_id}")"

  echo
  print_instance_details "${instance_details}"

  local public_ip
  public_ip=$(echo "${instance_details}" | awk '{print $6}')
  echo
  echo "You can use SSH to connect to your instance"
  echo "If the connection attempt times out, you might have to manually update
the SSH ingress rule"
  echo "for your IP address in the AWS Management Console."
  connect_to_instance "$key_file_name" "$public_ip"

  echo -n "Press Enter when you're ready to continue the demo: "
  get_input

  echo_repeat "*" 88
  echo_repeat "*" 88

  echo "Let's stop and start your instance to see what changes."
  echo "Stopping your instance and waiting until it's stopped..."
  ec2_stop_instances -i "$instance_id"
  ec2_wait_for_instance_stopped -i "$instance_id"

  echo "Your instance is stopped. Restarting..."

  ec2_start_instances -i "$instance_id"
  ec2_wait_for_instance_running -i "$instance_id"

  echo "Your instance is running again."
  local instance_details
  instance_details="$(ec2_describe_instances -i "${instance_id}")"

  print_instance_details "${instance_details}"

  public_ip=$(echo "${instance_details}" | awk '{print $6}')

  echo "Every time your instance is restarted, its public IP address changes"
```

```
 connect_to_instance "$key_file_name" "$public_ip"

 echo -n "Press Enter when you're ready to continue the demo: "
 get_input

 echo_repeat "*" 88
 echo_repeat "*" 88

 echo "You can allocate an Elastic IP address and associate it with your
instance"
 echo "to keep a consistent IP address even when your instance restarts."

 local result
 result=$(ec2_allocate_address -d vpc) || {
   errecho "Failed to allocate an address. This demo will exit."
   clean_up "$key_name" "$key_file_name" "$security_group_id" "$instance_id"
   return 1
 }

 local elastic_ip allocation_id
 elastic_ip=$(echo "$result" | awk '{print $1}')
 allocation_id=$(echo "$result" | awk '{print $2}')

 echo "Allocated static Elastic IP address: $elastic_ip"

 local association_id
 association_id=$(ec2_associate_address -i "$instance_id" -a "$allocation_id")
|| {
   errecho "Failed to associate an address. This demo will exit."
   clean_up "$key_name" "$key_file_name" "$security_group_id" "$instance_id"
"$allocation_id"
   return 1
 }

 echo "Associated your Elastic IP with your instance."
 echo "You can now use SSH to connect to your instance by using the Elastic IP."
 connect_to_instance "$key_file_name" "$elastic_ip"

 echo -n "Press Enter when you're ready to continue the demo: "
 get_input

 echo_repeat "*" 88
 echo_repeat "*" 88
```

```
  echo "Let's stop and start your instance to see what changes."
  echo "Stopping your instance and waiting until it's stopped..."
  ec2_stop_instances -i "$instance_id"
  ec2_wait_for_instance_stopped -i "$instance_id"

  echo "Your instance is stopped. Restarting..."

  ec2_start_instances -i "$instance_id"
  ec2_wait_for_instance_running -i "$instance_id"

  echo "Your instance is running again."
  local instance_details
  instance_details="$(ec2_describe_instances -i "${instance_id}")"

  print_instance_details "${instance_details}"

  echo "Because you have associated an Elastic IP with your instance, you can"
  echo "connect by using a consistent IP address after the instance restarts."
  connect_to_instance "$key_file_name" "$elastic_ip"

  echo -n "Press Enter when you're ready to continue the demo: "
  get_input

  echo_repeat "*" 88
  echo_repeat "*" 88

  if yes_no_input "Do you want to delete the resources created in this demo: (y/
n) "; then
    clean_up "$key_name" "$key_file_name" "$security_group_id" "$instance_id" \
      "$allocation_id" "$association_id"
  else
    echo "The following resources were not deleted."
    echo "Key pair: $key_name"
    echo "Key file: $key_file_name"
    echo "Security group: $security_group_id"
    echo "Instance: $instance_id"
    echo "Elastic IP address: $elastic_ip"
  fi
}

###############################################################################
# function clean_up
#
# This function cleans up the created resources.
```

```
#     $1 - The name of the ec2 key pair to delete.
#     $2 - The name of the key file to delete.
#     $3 - The ID of the security group to delete.
#     $4 - The ID of the instance to terminate.
#     $5 - The ID of the elastic IP address to release.
#     $6 - The ID of the elastic IP address to disassociate.
#
# Returns:
#       0 - If successful.
#       1 - If an error occurred.
###############################################################################
function clean_up() {
  local result=0
  local key_pair_name=$1
  local key_file_name=$2
  local security_group_id=$3
  local instance_id=$4
  local allocation_id=$5
  local association_id=$6

  if [ -n "$association_id" ]; then
    # bashsupport disable=BP2002
    if (ec2_disassociate_address -a "$association_id"); then
      echo "Disassociated elastic IP address with ID $association_id"
    else
      errecho "The elastic IP address disassociation failed."
      result=1
    fi
  fi

  if [ -n "$allocation_id" ]; then
    # bashsupport disable=BP2002
    if (ec2_release_address -a "$allocation_id"); then
      echo "Released elastic IP address with ID $allocation_id"
    else
      errecho "The elastic IP address release failed."
      result=1
    fi
  fi

  if [ -n "$instance_id" ]; then
    # bashsupport disable=BP2002
    if (ec2_terminate_instances -i "$instance_id"); then
      echo "Started terminating instance with ID $instance_id"
```

```
      ec2_wait_for_instance_terminated -i "$instance_id"
    else
      errecho "The instance terminate failed."
      result=1
    fi
  fi

  if [ -n "$security_group_id" ]; then
    # bashsupport disable=BP2002
    if (ec2_delete_security_group -i "$security_group_id"); then
      echo "Deleted security group with ID $security_group_id"
    else
      errecho "The security group delete failed."
      result=1
    fi
  fi

  if [ -n "$key_pair_name" ]; then
    # bashsupport disable=BP2002
    if (ec2_delete_keypair -n "$key_pair_name"); then
      echo "Deleted key pair named $key_pair_name"
    else
      errecho "The key pair delete failed."
      result=1
    fi
  fi

  if [ -n "$key_file_name" ]; then
    rm -f "$key_file_name"
  fi

  return $result
}

###############################################################################
# function ssm_get_parameters_by_path
#
# This function retrieves one or more parameters from the AWS Systems Manager
 Parameter Store
# by specifying a parameter path.
#
# Parameters:
#       -p parameter_path - The path of the parameter(s) to retrieve.
```

```
#
# And:
#       0 - If successful.
#       1 - If it fails.
###############################################################################
function ssm_get_parameters_by_path() {
  local parameter_path response
  local option OPTARG # Required to use getopts command in a function.

  # bashsupport disable=BP5008
  function usage() {
    echo "function ssm_get_parameters_by_path"
    echo "Retrieves one or more parameters from the AWS Systems Manager Parameter
 Store by specifying a parameter path."
    echo "  -p parameter_path - The path of the parameter(s) to retrieve."
    echo ""
  }

  # Retrieve the calling parameters.
  while getopts "p:h" option; do
    case "${option}" in
      p) parameter_path="${OPTARG}" ;;
      h)
        usage
        return 0
        ;;
      \?)
        echo "Invalid parameter"
        usage
        return 1
        ;;
    esac
  done
  export OPTIND=1

  if [[ -z "$parameter_path" ]]; then
    errecho "ERROR: You must provide a parameter path with the -p parameter."
    usage
    return 1
  fi

  response=$(aws ssm get-parameters-by-path \
    --path "$parameter_path" \
    --query "Parameters[*].[Name, Value]" \
```

```
    --output text) || {
    aws_cli_error_log $?
    errecho "ERROR: AWS reports get-parameters-by-path operation failed.
$response"
    return 1
  }

  echo "$response"

  return 0
}

################################################################################
# function print_instance_details
#
# This function prints the details of an Amazon Elastic Compute Cloud (Amazon
 EC2) instance.
#
# Parameters:
#       instance_details - The instance details in the format "InstanceId ImageId
 InstanceType KeyName VpcId PublicIpAddress State.Name".
#
# Returns:
#       0 - If successful.
#       1 - If it fails.
################################################################################
function print_instance_details() {
  local instance_details="$1"

  if [[ -z "${instance_details}" ]]; then
    echo "Error: Missing required instance details argument."
    return 1
  fi

  local instance_id image_id instance_type key_name vpc_id public_ip state
  instance_id=$(echo "${instance_details}" | awk '{print $1}')
  image_id=$(echo "${instance_details}" | awk '{print $2}')
  instance_type=$(echo "${instance_details}" | awk '{print $3}')
  key_name=$(echo "${instance_details}" | awk '{print $4}')
  vpc_id=$(echo "${instance_details}" | awk '{print $5}')
  public_ip=$(echo "${instance_details}" | awk '{print $6}')
  state=$(echo "${instance_details}" | awk '{print $7}')

  echo "    ID: ${instance_id}"
```

```
  echo "    Image ID: ${image_id}"
  echo "    Instance type: ${instance_type}"
  echo "    Key name: ${key_name}"
  echo "    VPC ID: ${vpc_id}"
  echo "    Public IP: ${public_ip}"
  echo "    State: ${state}"

  return 0
}

################################################################################
# function connect_to_instance
#
# This function displays the public IP address of an Amazon Elastic Compute Cloud
 (Amazon EC2) instance and prompts the user to connect to the instance via SSH.
#
# Parameters:
#       $1 - The name of the key file used to connect to the instance.
#       $2 - The public IP address of the instance.
#
# Returns:
#       None
################################################################################
function connect_to_instance() {
  local key_file_name="$1"
  local public_ip="$2"

  # Validate the input parameters
  if [[ -z "$key_file_name" ]]; then
    echo "ERROR: You must provide a key file name as the first argument." >&2
    return 1
  fi

  if [[ -z "$public_ip" ]]; then
    echo "ERROR: You must provide a public IP address as the second argument."
 >&2
    return 1
  fi

  # Display the public IP address and connection command
  echo "To connect, run the following command:"
  echo "    ssh -i ${key_file_name} ec2-user@${public_ip}"

  # Prompt the user to connect to the instance
```

```
  if yes_no_input "Do you want to connect now? (y/n) "; then
    echo "After you have connected, you can return to this example by typing
 'exit'"
    ssh -i "${key_file_name}" ec2-user@"${public_ip}"
  fi
}

###############################################################################
# function get_input
#
# This function gets user input from the command line.
#
# Outputs:
#   User input to stdout.
#
# Returns:
#       0
###############################################################################
function get_input() {

  if [ -z "${mock_input+x}" ]; then
    read -r get_input_result
  else

    if [ "$mock_input_array_index" -lt ${#mock_input_array[@]} ]; then
      get_input_result="${mock_input_array[$mock_input_array_index]}"
      # bashsupport disable=BP2001
      # shellcheck disable=SC2206
      ((mock_input_array_index++))
      echo -n "$get_input_result"
    else
      echo "MOCK_INPUT_ARRAY has no more elements" 1>&2
      return 1
    fi
  fi

  return 0
}

###############################################################################
# function yes_no_input
#
# This function requests a yes/no answer from the user, following to a prompt.
#
```

```
# Parameters:
#       $1 - The prompt.
#
# Returns:
#       0 - If yes.
#       1 - If no.
###############################################################################
function yes_no_input() {
  if [ -z "$1" ]; then
    echo "Internal error yes_no_input"
    return 1
  fi

  local index=0
  local response="N"
  while [[ $index -lt 10 ]]; do
    index=$((index + 1))
    echo -n "$1"
    if ! get_input; then
      return 1
    fi
    response=$(echo "$get_input_result" | tr '[:upper:]' '[:lower:]')
    if [ "$response" = "y" ] || [ "$response" = "n" ]; then
      break
    else
      echo -e "\nPlease enter or 'y' or 'n'."
    fi
  done

  echo

  if [ "$response" = "y" ]; then
    return 0
  else
    return 1
  fi
}

###############################################################################
# function integer_input
#
# This function prompts the user to enter an integer within a specified range
# and validates the input.
#
```

```
# Parameters:
#       $1 - The prompt message to display to the user.
#       $2 - The minimum value of the accepted range.
#       $3 - The maximum value of the accepted range.
#
# Returns:
#       The valid integer input from the user.
#       If the input is invalid or out of range, the function will continue
#       prompting the user until a valid input is provided.
################################################################################
function integer_input() {
  local prompt="$1"
  local min_value="$2"
  local max_value="$3"
  local input=""

  while true; do
    # Display the prompt message and wait for user input
    echo -n "$prompt"

    if ! get_input; then
      return 1
    fi

    input="$get_input_result"

    # Check if the input is a valid integer
    if [[ "$input" =~ ^-?[0-9]+$ ]]; then
      # Check if the input is within the specified range
      if ((input >= min_value && input <= max_value)); then
        return 0
      else
        echo "Error: Input, $input, must be between $min_value and $max_value."
      fi
    else
      echo "Error: Invalid input- $input. Please enter an integer."
    fi
  done
}
################################################################################
# function new_line_and_tab_to_list
#
# This function takes a string input containing newlines and tabs, and
# converts it into a list (array) of elements.
```

```
#
# Parameters:
#       $1 - The input string containing newlines and tabs.
#
# Returns:
#       The resulting list (array) is stored in the global variable
#       'list_result'.
##############################################################################
function new_line_and_tab_to_list() {
  local input=$1
  export list_result

  list_result=()
  mapfile -t lines <<<"$input"
  local line
  for line in "${lines[@]}"; do
    IFS=$'\t' read -ra parameters <<<"$line"
    list_result+=("${parameters[@]}")
  done
}

##############################################################################
# function echo_repeat
#
# This function prints a string 'n' times to stdout.
#
# Parameters:
#       $1 - The string.
#       $2 - Number of times to print the string.
#
# Outputs:
#   String 'n' times to stdout.
#
# Returns:
#       0
##############################################################################
function echo_repeat() {
  local end=$2
  for ((i = 0; i < end; i++)); do
    echo -n "$1"
  done
  echo
}
```

Fungsi DynamoDB yang digunakan dalam skenario ini.

```
###############################################################################
# function ec2_create_keypair
#
# This function creates an Amazon Elastic Compute Cloud (Amazon EC2) ED25519 or
 2048-bit RSA key pair
# and writes it to a file.
#
# Parameters:
#       -n key_pair_name - A key pair name.
#       -f file_path - File to store the key pair.
#
# And:
#       0 - If successful.
#       1 - If it fails.
###############################################################################
function ec2_create_keypair() {
  local key_pair_name file_path response
  local option OPTARG # Required to use getopts command in a function.

  # bashsupport disable=BP5008
  function usage() {
    echo "function ec2_create_keypair"
    echo "Creates an Amazon Elastic Compute Cloud (Amazon EC2) ED25519 or 2048-
bit RSA key pair"
    echo " and writes it to a file."
    echo "  -n key_pair_name - A key pair name."
    echo "  -f file_path - File to store the key pair."
    echo ""
  }

  # Retrieve the calling parameters.
  while getopts "n:f:h" option; do
    case "${option}" in
      n) key_pair_name="${OPTARG}" ;;
      f) file_path="${OPTARG}" ;;
      h)
        usage
        return 0
        ;;
```

```
      \?)
        echo "Invalid parameter"
        usage
        return 1
        ;;
    esac
  done
  export OPTIND=1

  if [[ -z "$key_pair_name" ]]; then
    errecho "ERROR: You must provide a key name with the -n parameter."
    usage
    return 1
  fi

  if [[ -z "$file_path" ]]; then
    errecho "ERROR: You must provide a file path with the -f parameter."
    usage
    return 1
  fi

  response=$(aws ec2 create-key-pair \
    --key-name "$key_pair_name" \
    --query 'KeyMaterial' \
    --output text) || {
    aws_cli_error_log ${?}
    errecho "ERROR: AWS reports create-access-key operation failed.$response"
    return 1
  }

  if [[ -n "$file_path" ]]; then
    echo "$response" >"$file_path"
  fi

  return 0
}

################################################################################
# function ec2_describe_key_pairs
#
# This function describes one or more Amazon Elastic Compute Cloud (Amazon EC2)
 key pairs.
#
# Parameters:
```

```
#       -h - Display help.
#
# And:
#       0 - If successful.
#       1 - If it fails.
###############################################################################
function ec2_describe_key_pairs() {
  local option OPTARG # Required to use getopts command in a function.

  # bashsupport disable=BP5008
  function usage() {
    echo "function ec2_describe_key_pairs"
    echo "Describes one or more Amazon Elastic Compute Cloud (Amazon EC2) key
 pairs."
    echo "  -h - Display help."
    echo ""
  }

  # Retrieve the calling parameters.
  while getopts "h" option; do
    case "${option}" in
      h)
        usage
        return 0
        ;;
      \?)
        echo "Invalid parameter"
        usage
        return 1
        ;;
    esac
  done
  export OPTIND=1

  local response

  response=$(aws ec2 describe-key-pairs \
    --query 'KeyPairs[*].[KeyName, KeyFingerprint]' \
    --output text) || {
    aws_cli_error_log ${?}
    errecho "ERROR: AWS reports describe-key-pairs operation failed.$response"
    return 1
  }
```

```
  echo "$response"

  return 0
}

###############################################################################
# function ec2_create_security_group
#
# This function creates an Amazon Elastic Compute Cloud (Amazon EC2) security
 group.
#
# Parameters:
#       -n security_group_name - The name of the security group.
#       -d security_group_description - The description of the security group.
#
# Returns:
#       The ID of the created security group, or an error message if the
 operation fails.
# And:
#       0 - If successful.
#       1 - If it fails.
#
###############################################################################
function ec2_create_security_group() {
  local security_group_name security_group_description response

  # Function to display usage information
  function usage() {
    echo "function ec2_create_security_group"
    echo "Creates an Amazon Elastic Compute Cloud (Amazon EC2) security group."
    echo "  -n security_group_name - The name of the security group."
    echo "  -d security_group_description - The description of the security
 group."
    echo ""
  }

  # Parse the command-line arguments
  while getopts "n:d:h" option; do
    case "${option}" in
      n) security_group_name="${OPTARG}" ;;
      d) security_group_description="${OPTARG}" ;;
      h)
        usage
        return 0
```

```
        ;;
      \?)
        echo "Invalid parameter"
        usage
        return 1
        ;;
    esac
  done
  export OPTIND=1

  # Validate the input parameters
  if [[ -z "$security_group_name" ]]; then
    errecho "ERROR: You must provide a security group name with the -n
 parameter."
    return 1
  fi

  if [[ -z "$security_group_description" ]]; then
    errecho "ERROR: You must provide a security group description with the -d
 parameter."
    return 1
  fi

  # Create the security group
  response=$(aws ec2 create-security-group \
    --group-name "$security_group_name" \
    --description "$security_group_description" \
    --query "GroupId" \
    --output text) || {
    aws_cli_error_log ${?}
    errecho "ERROR: AWS reports create-security-group operation failed."
    errecho "$response"
    return 1
  }

  echo "$response"
  return 0
}

###############################################################################
# function ec2_describe_security_groups
#
# This function describes one or more Amazon Elastic Compute Cloud (Amazon EC2)
 security groups.
```

```
#
# Parameters:
#       -g security_group_id - The ID of the security group to describe
 (optional).
#
# And:
#       0 - If successful.
#       1 - If it fails.
###############################################################################
function ec2_describe_security_groups() {
  local security_group_id response
  local option OPTARG # Required to use getopts command in a function.

  # bashsupport disable=BP5008
  function usage() {
    echo "function ec2_describe_security_groups"
    echo "Describes one or more Amazon Elastic Compute Cloud (Amazon EC2)
 security groups."
    echo "  -g security_group_id - The ID of the security group to describe
 (optional)."
    echo ""
  }

  # Retrieve the calling parameters.
  while getopts "g:h" option; do
    case "${option}" in
      g) security_group_id="${OPTARG}" ;;
      h)
        usage
        return 0
        ;;
      \?)
        echo "Invalid parameter"
        usage
        return 1
        ;;
    esac
  done
  export OPTIND=1

  local query="SecurityGroups[*].[GroupName, GroupId, VpcId, IpPermissions[*].
[IpProtocol, FromPort, ToPort, IpRanges[*].CidrIp]]"

  if [[ -n "$security_group_id" ]]; then
```

```
    response=$(aws ec2 describe-security-groups --group-ids "$security_group_id"
 --query "${query}" --output text)
  else
    response=$(aws ec2 describe-security-groups --query "${query}" --output text)
  fi

  local error_code=${?}

  if [[ $error_code -ne 0 ]]; then
    aws_cli_error_log $error_code
    errecho "ERROR: AWS reports describe-security-groups operation failed.
$response"
    return 1
  fi

  echo "$response"

  return 0
}

###############################################################################
# function ec2_authorize_security_group_ingress
#
# This function authorizes an ingress rule for an Amazon Elastic Compute Cloud
 (Amazon EC2) security group.
#
# Parameters:
#       -g security_group_id - The ID of the security group.
#       -i ip_address - The IP address or CIDR block to authorize.
#       -p protocol - The protocol to authorize (e.g., tcp, udp, icmp).
#       -f from_port - The start of the port range to authorize.
#       -t to_port - The end of the port range to authorize.
#
# And:
#       0 - If successful.
#       1 - If it fails.
###############################################################################
function ec2_authorize_security_group_ingress() {
  local security_group_id ip_address protocol from_port to_port response
  local option OPTARG # Required to use getopts command in a function.

  # bashsupport disable=BP5008
  function usage() {
    echo "function ec2_authorize_security_group_ingress"
```

```
   echo "Authorizes an ingress rule for an Amazon Elastic Compute Cloud (Amazon
EC2) security group."
   echo "  -g security_group_id - The ID of the security group."
   echo "  -i ip_address - The IP address or CIDR block to authorize."
   echo "  -p protocol - The protocol to authorize (e.g., tcp, udp, icmp)."
   echo "  -f from_port - The start of the port range to authorize."
   echo "  -t to_port - The end of the port range to authorize."
   echo ""
 }

 # Retrieve the calling parameters.
 while getopts "g:i:p:f:t:h" option; do
   case "${option}" in
     g) security_group_id="${OPTARG}" ;;
     i) ip_address="${OPTARG}" ;;
     p) protocol="${OPTARG}" ;;
     f) from_port="${OPTARG}" ;;
     t) to_port="${OPTARG}" ;;
     h)
       usage
       return 0
       ;;
     \?)
       echo "Invalid parameter"
       usage
       return 1
       ;;
   esac
 done
 export OPTIND=1

 if [[ -z "$security_group_id" ]]; then
   errecho "ERROR: You must provide a security group ID with the -g parameter."
   usage
   return 1
 fi

 if [[ -z "$ip_address" ]]; then
   errecho "ERROR: You must provide an IP address or CIDR block with the -i
parameter."
   usage
   return 1
 fi
```

```
  if [[ -z "$protocol" ]]; then
    errecho "ERROR: You must provide a protocol with the -p parameter."
    usage
    return 1
  fi

  if [[ -z "$from_port" ]]; then
    errecho "ERROR: You must provide a start port with the -f parameter."
    usage
    return 1
  fi

  if [[ -z "$to_port" ]]; then
    errecho "ERROR: You must provide an end port with the -t parameter."
    usage
    return 1
  fi

  response=$(aws ec2 authorize-security-group-ingress \
    --group-id "$security_group_id" \
    --cidr "${ip_address}/32" \
    --protocol "$protocol" \
    --port "$from_port-$to_port" \
    --output text) || {
    aws_cli_error_log ${?}
    errecho "ERROR: AWS reports authorize-security-group-ingress operation
 failed.$response"
    return 1
  }

  return 0
}

###############################################################################
# function ec2_describe_images
#
# This function describes one or more Amazon Elastic Compute Cloud (Amazon EC2)
 images.
#
# Parameters:
#       -i image_ids - A space-separated  list of image IDs (optional).
#       -h - Display help.
#
# And:
```

```
#       0 - If successful.
#       1 - If it fails.
###############################################################################
function ec2_describe_images() {
  local image_ids response
  local option OPTARG # Required to use getopts command in a function.

  # bashsupport disable=BP5008
  function usage() {
    echo "function ec2_describe_images"
    echo "Describes one or more Amazon Elastic Compute Cloud (Amazon EC2)
 images."
    echo "  -i image_ids - A space-separated list of image IDs (optional)."
    echo "  -h - Display help."
    echo ""
  }

  # Retrieve the calling parameters.
  while getopts "i:h" option; do
    case "${option}" in
      i) image_ids="${OPTARG}" ;;
      h)
        usage
        return 0
        ;;
      \?)
        echo "Invalid parameter"
        usage
        return 1
        ;;
    esac
  done
  export OPTIND=1

  local aws_cli_args=()

  if [[ -n "$image_ids" ]]; then
    # shellcheck disable=SC2206
    aws_cli_args+=("--image-ids" $image_ids)
  fi

  response=$(aws ec2 describe-images \
    "${aws_cli_args[@]}" \
    --query 'Images[*].[Description,Architecture,ImageId]' \
```

```
    --output text) || {
    aws_cli_error_log ${?}
    errecho "ERROR: AWS reports describe-images operation failed.$response"
    return 1
  }

  echo "$response"

  return 0
}

################################################################################
# ec2_describe_instance_types
#
# This function describes EC2 instance types filtered by processor architecture
# and optionally by instance type. It takes the following arguments:
#
# -a, --architecture ARCHITECTURE  Specify the processor architecture (e.g.,
 x86_64)
# -t, --type INSTANCE_TYPE         Comma-separated list of instance types (e.g.,
 t2.micro)
# -h, --help                       Show the usage help
#
# The function prints the instance type and supported architecture for each
# matching instance type.
################################################################################
function ec2_describe_instance_types() {
  local architecture=""
  local instance_types=""

  # bashsupport disable=BP5008
  function usage() {
    echo "Usage: ec2_describe_instance_types [-a|--architecture ARCHITECTURE] [-
t|--type INSTANCE_TYPE] [-h|--help]"
    echo "  -a, --architecture ARCHITECTURE  Specify the processor architecture
 (e.g., x86_64)"
    echo "  -t, --type INSTANCE_TYPE         Comma-separated list of instance
 types (e.g., t2.micro)"
    echo "  -h, --help                       Show this help message"
  }

  while [[ $# -gt 0 ]]; do
    case "$1" in
      -a | --architecture)
```

```
      architecture="$2"
      shift 2
      ;;
    -t | --type)
      instance_types="$2"
      shift 2
      ;;
    -h | --help)
      usage
      return 0
      ;;
    *)
      echo "Unknown argument: $1"
      return 1
      ;;
  esac
done

if [[ -z "$architecture" ]]; then
  errecho "Error: Architecture not specified."
  usage
  return 1
fi

if [[ -z "$instance_types" ]]; then
  errecho "Error: Instance type not specified."
  usage
  return 1
fi

local tmp_json_file="temp_ec2.json"
echo -n '[
  {
    "Name": "processor-info.supported-architecture",
    "Values": [' >"$tmp_json_file"

local items
IFS=',' read -ra items <<<"$architecture"
local array_size
array_size=${#items[@]}
for i in $(seq 0 $((array_size - 1))); do
  echo -n '"'"${items[$i]}"'"' >>"$tmp_json_file"
  if [[ $i -lt $((array_size - 1)) ]]; then
    echo -n ',' >>"$tmp_json_file"
```

```
    fi
  done
  echo -n ']},
    {
    "Name": "instance-type",
      "Values": [' >>"$tmp_json_file"
  IFS=',' read -ra items <<<"$instance_types"
  local array_size
  array_size=${#items[@]}
  for i in $(seq 0 $((array_size - 1))); do
    echo -n '"'"${items[$i]}"'"' >>"$tmp_json_file"
    if [[ $i -lt $((array_size - 1)) ]]; then
      echo -n ',' >>"$tmp_json_file"
    fi
  done

  echo -n ']}]' >>"$tmp_json_file"

  local response
  response=$(aws ec2 describe-instance-types --filters file://"$tmp_json_file" \
    --query 'InstanceTypes[*].[InstanceType]' --output text)

  local error_code=$?

  rm "$tmp_json_file"

  if [[ $error_code -ne 0 ]]; then
    aws_cli_error_log $error_code
    echo "ERROR: AWS reports describe-instance-types operation failed."
    return 1
  fi

  echo "$response"
  return 0
}

###############################################################################
# function ec2_run_instances
#
# This function launches one or more Amazon Elastic Compute Cloud (Amazon EC2)
 instances.
#
# Parameters:
#       -i image_id - The ID of the Amazon Machine Image (AMI) to use.
```

```
#       -t instance_type - The instance type to use (e.g., t2.micro).
#       -k key_pair_name - The name of the key pair to use.
#       -s security_group_id - The ID of the security group to use.
#       -c count - The number of instances to launch (default: 1).
#       -h - Display help.
#
# Returns:
#       0 - If successful.
#       1 - If it fails.
###############################################################################
function ec2_run_instances() {
  local image_id instance_type key_pair_name security_group_id count response
  local option OPTARG # Required to use getopts command in a function.

  # bashsupport disable=BP5008
  function usage() {
    echo "function ec2_run_instances"
    echo "Launches one or more Amazon Elastic Compute Cloud (Amazon EC2)
 instances."
    echo "  -i image_id - The ID of the Amazon Machine Image (AMI) to use."
    echo "  -t instance_type - The instance type to use (e.g., t2.micro)."
    echo "  -k key_pair_name - The name of the key pair to use."
    echo "  -s security_group_id - The ID of the security group to use."
    echo "  -c count - The number of instances to launch (default: 1)."
    echo "  -h - Display help."
    echo ""
  }

  # Retrieve the calling parameters.
  while getopts "i:t:k:s:c:h" option; do
    case "${option}" in
      i) image_id="${OPTARG}" ;;
      t) instance_type="${OPTARG}" ;;
      k) key_pair_name="${OPTARG}" ;;
      s) security_group_id="${OPTARG}" ;;
      c) count="${OPTARG}" ;;
      h)
        usage
        return 0
        ;;
      \?)
        echo "Invalid parameter"
        usage
        return 1
```

```
        ;;
    esac
  done
  export OPTIND=1

  if [[ -z "$image_id" ]]; then
    errecho "ERROR: You must provide an Amazon Machine Image (AMI) ID with the -i
parameter."
    usage
    return 1
  fi

  if [[ -z "$instance_type" ]]; then
    errecho "ERROR: You must provide an instance type with the -t parameter."
    usage
    return 1
  fi

  if [[ -z "$key_pair_name" ]]; then
    errecho "ERROR: You must provide a key pair name with the -k parameter."
    usage
    return 1
  fi

  if [[ -z "$security_group_id" ]]; then
    errecho "ERROR: You must provide a security group ID with the -s parameter."
    usage
    return 1
  fi

  if [[ -z "$count" ]]; then
    count=1
  fi

  response=$(aws ec2 run-instances \
    --image-id "$image_id" \
    --instance-type "$instance_type" \
    --key-name "$key_pair_name" \
    --security-group-ids "$security_group_id" \
    --count "$count" \
    --query 'Instances[*].[InstanceId]' \
    --output text) || {
    aws_cli_error_log ${?}
    errecho "ERROR: AWS reports run-instances operation failed.$response"
```

```
    return 1
  }

  echo "$response"

  return 0
}

################################################################################
# function ec2_describe_instances
#
# This function describes one or more Amazon Elastic Compute Cloud (Amazon EC2)
 instances.
#
# Parameters:
#       -i instance_id - The ID of the instance to describe (optional).
#       -q query - The query to filter the response (optional).
#       -h - Display help.
#
# Returns:
#       0 - If successful.
#       1 - If it fails.
################################################################################
function ec2_describe_instances() {
  local instance_id query response
  local option OPTARG # Required to use getopts command in a function.

  # bashsupport disable=BP5008
  function usage() {
    echo "function ec2_describe_instances"
    echo "Describes one or more Amazon Elastic Compute Cloud (Amazon EC2)
 instances."
    echo "  -i instance_id - The ID of the instance to describe (optional)."
    echo "  -q query - The query to filter the response (optional)."
    echo "  -h - Display help."
    echo ""
  }

  # Retrieve the calling parameters.
  while getopts "i:q:h" option; do
    case "${option}" in
      i) instance_id="${OPTARG}" ;;
      q) query="${OPTARG}" ;;
      h)
```

```
        usage
        return 0
        ;;
      \?)
        echo "Invalid parameter"
        usage
        return 1
        ;;
    esac
  done
  export OPTIND=1

  local aws_cli_args=()

  if [[ -n "$instance_id" ]]; then
    # shellcheck disable=SC2206
    aws_cli_args+=("--instance-ids" $instance_id)
  fi

  local query_arg=""
  if [[ -n "$query" ]]; then
    query_arg="--query '$query'"
  else
    query_arg="--query Reservations[*].Instances[*].
[InstanceId,ImageId,InstanceType,KeyName,VpcId,PublicIpAddress,State.Name]"
  fi

  # shellcheck disable=SC2086
  response=$(aws ec2 describe-instances \
    "${aws_cli_args[@]}" \
    $query_arg \
    --output text) || {
    aws_cli_error_log ${?}
    errecho "ERROR: AWS reports describe-instances operation failed.$response"
    return 1
  }

  echo "$response"

  return 0
}

###############################################################################
# function ec2_stop_instances
```

```
#
# This function stops one or more Amazon Elastic Compute Cloud (Amazon EC2)
 instances.
#
# Parameters:
#       -i instance_id - The ID(s) of the instance(s) to stop (comma-separated).
#       -h - Display help.
#
# Returns:
#       0 - If successful.
#       1 - If it fails.
###############################################################################
function ec2_stop_instances() {
  local instance_ids
  local option OPTARG # Required to use getopts command in a function.

  # bashsupport disable=BP5008
  function usage() {
    echo "function ec2_stop_instances"
    echo "Stops one or more Amazon Elastic Compute Cloud (Amazon EC2) instances."
    echo "  -i instance_id - The ID(s) of the instance(s) to stop (comma-
separated)."
    echo "  -h - Display help."
    echo ""
  }

  # Retrieve the calling parameters.
  while getopts "i:h" option; do
    case "${option}" in
      i) instance_ids="${OPTARG}" ;;
      h)
        usage
        return 0
        ;;
      \?)
        echo "Invalid parameter"
        usage
        return 1
        ;;
    esac
  done
  export OPTIND=1

  if [[ -z "$instance_ids" ]]; then
```

```
    errecho "ERROR: You must provide one or more instance IDs with the -i
 parameter."
    usage
    return 1
  fi

  response=$(aws ec2 stop-instances \
    --instance-ids "${instance_ids}") || {
    aws_cli_error_log ${?}
    errecho "ERROR: AWS reports stop-instances operation failed with $response."
    return 1
  }

  return 0
}

###############################################################################
# function ec2_start_instances
#
# This function starts one or more Amazon Elastic Compute Cloud (Amazon EC2)
 instances.
#
# Parameters:
#       -i instance_id - The ID(s) of the instance(s) to start (comma-separated).
#       -h - Display help.
#
# Returns:
#       0 - If successful.
#       1 - If it fails.
###############################################################################
function ec2_start_instances() {
  local instance_ids
  local option OPTARG # Required to use getopts command in a function.

  # bashsupport disable=BP5008
  function usage() {
    echo "function ec2_start_instances"
    echo "Starts one or more Amazon Elastic Compute Cloud (Amazon EC2)
 instances."
    echo "  -i instance_id - The ID(s) of the instance(s) to start (comma-
separated)."
    echo "  -h - Display help."
    echo ""
  }
```

```
  # Retrieve the calling parameters.
  while getopts "i:h" option; do
    case "${option}" in
      i) instance_ids="${OPTARG}" ;;
      h)
        usage
        return 0
        ;;
      \?)
        echo "Invalid parameter"
        usage
        return 1
        ;;
    esac
  done
  export OPTIND=1

  if [[ -z "$instance_ids" ]]; then
    errecho "ERROR: You must provide one or more instance IDs with the -i
 parameter."
    usage
    return 1
  fi

  response=$(aws ec2 start-instances \
    --instance-ids "${instance_ids}") || {
    aws_cli_error_log ${?}
    errecho "ERROR: AWS reports start-instances operation failed with $response."
    return 1
  }

  return 0
}

################################################################################
# function ec2_allocate_address
#
# This function allocates an Elastic IP address for use with Amazon Elastic
 Compute Cloud (Amazon EC2) instances in a specific AWS Region.
#
# Parameters:
#       -d domain - The domain for the Elastic IP address (either 'vpc' or
 'standard').
```

```
#
# Returns:
#       The allocated Elastic IP address, or an error message if the operation
 fails.
# And:
#       0 - If successful.
#       1 - If it fails.
#
###############################################################################
function ec2_allocate_address() {
  local domain response

  # Function to display usage information
  function usage() {
    echo "function ec2_allocate_address"
    echo "Allocates an Elastic IP address for use with Amazon Elastic Compute
 Cloud (Amazon EC2) instances in a specific AWS Region."
    echo "  -d domain - The domain for the Elastic IP address (either 'vpc' or
 'standard')."
    echo ""
  }

  # Parse the command-line arguments
  while getopts "d:h" option; do
    case "${option}" in
      d) domain="${OPTARG}" ;;
      h)
        usage
        return 0
        ;;
      \?)
        echo "Invalid parameter"
        usage
        return 1
        ;;
    esac
  done
  export OPTIND=1

  # Validate the input parameters
  if [[ -z "$domain" ]]; then
    errecho "ERROR: You must provide a domain with the -d parameter (either 'vpc'
 or 'standard')."
    return 1
```

```
  fi

  if [[ "$domain" != "vpc" && "$domain" != "standard" ]]; then
    errecho "ERROR: Invalid domain value. Must be either 'vpc' or 'standard'."
    return 1
  fi

  # Allocate the Elastic IP address
  response=$(aws ec2 allocate-address \
    --domain "$domain" \
    --query "[PublicIp,AllocationId]" \
    --output text) || {
    aws_cli_error_log ${?}
    errecho "ERROR: AWS reports allocate-address operation failed."
    errecho "$response"
    return 1
  }

  echo "$response"
  return 0
}

################################################################################
# function ec2_associate_address
#
# This function associates an Elastic IP address with an Amazon Elastic Compute
 Cloud (Amazon EC2) instance.
#
# Parameters:
#       -a allocation_id - The allocation ID of the Elastic IP address to
 associate.
#       -i instance_id - The ID of the EC2 instance to associate the Elastic IP
 address with.
#
# Returns:
#       0 - If successful.
#       1 - If it fails.
#
################################################################################
function ec2_associate_address() {
  local allocation_id instance_id response

  # Function to display usage information
  function usage() {
```

```
   echo "function ec2_associate_address"
   echo "Associates an Elastic IP address with an Amazon Elastic Compute Cloud
(Amazon EC2) instance."
   echo "  -a allocation_id - The allocation ID of the Elastic IP address to
associate."
   echo "  -i instance_id - The ID of the EC2 instance to associate the Elastic
IP address with."
   echo ""
 }

 # Parse the command-line arguments
 while getopts "a:i:h" option; do
   case "${option}" in
     a) allocation_id="${OPTARG}" ;;
     i) instance_id="${OPTARG}" ;;
     h)
       usage
       return 0
       ;;
     \?)
       echo "Invalid parameter"
       usage
       return 1
       ;;
   esac
 done
 export OPTIND=1

 # Validate the input parameters
 if [[ -z "$allocation_id" ]]; then
   errecho "ERROR: You must provide an allocation ID with the -a parameter."
   return 1
 fi

 if [[ -z "$instance_id" ]]; then
   errecho "ERROR: You must provide an instance ID with the -i parameter."
   return 1
 fi

 # Associate the Elastic IP address
 response=$(aws ec2 associate-address \
   --allocation-id "$allocation_id" \
   --instance-id "$instance_id" \
   --query "AssociationId" \
```

```
    --output text) || {
    aws_cli_error_log ${?}
    errecho "ERROR: AWS reports associate-address operation failed."
    errecho "$response"
    return 1
  }

  echo "$response"
  return 0
}

###############################################################################
# function ec2_disassociate_address
#
# This function disassociates an Elastic IP address from an Amazon Elastic
 Compute Cloud (Amazon EC2) instance.
#
# Parameters:
#       -a association_id - The association ID that represents the association of
 the Elastic IP address with an instance.
#
# And:
#       0 - If successful.
#       1 - If it fails.
#
###############################################################################
function ec2_disassociate_address() {
  local association_id response

  # Function to display usage information
  function usage() {
    echo "function ec2_disassociate_address"
    echo "Disassociates an Elastic IP address from an Amazon Elastic Compute
 Cloud (Amazon EC2) instance."
    echo "  -a association_id - The association ID that represents the
 association of the Elastic IP address with an instance."
    echo ""
  }

  # Parse the command-line arguments
  while getopts "a:h" option; do
    case "${option}" in
      a) association_id="${OPTARG}" ;;
      h)
```

```
        usage
        return 0
        ;;
      \?)
        echo "Invalid parameter"
        usage
        return 1
        ;;
    esac
  done
  export OPTIND=1

  # Validate the input parameters
  if [[ -z "$association_id" ]]; then
    errecho "ERROR: You must provide an association ID with the -a parameter."
    return 1
  fi

  response=$(aws ec2 disassociate-address \
    --association-id "$association_id") || {
    aws_cli_error_log ${?}
    errecho "ERROR: AWS reports disassociate-address operation failed."
    errecho "$response"
    return 1
  }

  return 0
}

###############################################################################
# function ec2_release_address
#
# This function releases an Elastic IP address from an Amazon Elastic Compute
 Cloud (Amazon EC2) instance.
#
# Parameters:
#       -a allocation_id - The allocation ID of the Elastic IP address to
 release.
#
# Returns:
#       0 - If successful.
#       1 - If it fails.
#
###############################################################################
```

```
function ec2_release_address() {
  local allocation_id response

  # Function to display usage information
  function usage() {
    echo "function ec2_release_address"
    echo "Releases an Elastic IP address from an Amazon Elastic Compute Cloud
 (Amazon EC2) instance."
    echo "  -a allocation_id - The allocation ID of the Elastic IP address to
 release."
    echo ""
  }

  # Parse the command-line arguments
  while getopts "a:h" option; do
    case "${option}" in
      a) allocation_id="${OPTARG}" ;;
      h)
        usage
        return 0
        ;;
      \?)
        echo "Invalid parameter"
        usage
        return 1
        ;;
    esac
  done
  export OPTIND=1

  # Validate the input parameters
  if [[ -z "$allocation_id" ]]; then
    errecho "ERROR: You must provide an allocation ID with the -a parameter."
    return 1
  fi

  response=$(aws ec2 release-address \
    --allocation-id "$allocation_id") || {
    aws_cli_error_log ${?}
    errecho "ERROR: AWS reports release-address operation failed."
    errecho "$response"
    return 1
  }
```

```
  return 0
}

################################################################################
# function ec2_terminate_instances
#
# This function terminates one or more Amazon Elastic Compute Cloud (Amazon EC2)
# instances using the AWS CLI.
#
# Parameters:
#       -i instance_ids - A space-separated list of instance IDs.
#       -h - Display help.
#
# Returns:
#       0 - If successful.
#       1 - If it fails.
################################################################################
function ec2_terminate_instances() {
  local instance_ids response
  local option OPTARG # Required to use getopts command in a function.

  # bashsupport disable=BP5008
  function usage() {
    echo "function ec2_terminate_instances"
    echo "Terminates one or more Amazon Elastic Compute Cloud (Amazon EC2)
 instances."
    echo "  -i instance_ids - A space-separated list of instance IDs."
    echo "  -h - Display help."
    echo ""
  }

  # Retrieve the calling parameters.
  while getopts "i:h" option; do
    case "${option}" in
      i) instance_ids="${OPTARG}" ;;
      h)
        usage
        return 0
        ;;
      \?)
        echo "Invalid parameter"
        usage
        return 1
        ;;
```

```
    esac
  done
  export OPTIND=1

  # Check if instance ID is provided
  if [[ -z "${instance_ids}" ]]; then
    echo "Error: Missing required instance IDs parameter."
    usage
    return 1
  fi

  # shellcheck disable=SC2086
  response=$(aws ec2 terminate-instances \
    "--instance-ids" $instance_ids \
    --query 'TerminatingInstances[*].[InstanceId,CurrentState.Name]' \
    --output text) || {
    aws_cli_error_log ${?}
    errecho "ERROR: AWS reports terminate-instances operation failed.$response"
    return 1
  }

  return 0
}

################################################################################
# function ec2_delete_security_group
#
# This function deletes an Amazon Elastic Compute Cloud (Amazon EC2) security
 group.
#
# Parameters:
#       -i security_group_id - The ID of the security group to delete.
#
# And:
#       0 - If successful.
#       1 - If it fails.
################################################################################
function ec2_delete_security_group() {
  local security_group_id response
  local option OPTARG # Required to use getopts command in a function.

  # bashsupport disable=BP5008
  function usage() {
    echo "function ec2_delete_security_group"
```

```
    echo "Deletes an Amazon Elastic Compute Cloud (Amazon EC2) security group."
    echo "  -i security_group_id - The ID of the security group to delete."
    echo ""
  }

  # Retrieve the calling parameters.
  while getopts "i:h" option; do
    case "${option}" in
      i) security_group_id="${OPTARG}" ;;
      h)
        usage
        return 0
        ;;
      \?)
        echo "Invalid parameter"
        usage
        return 1
        ;;
    esac
  done
  export OPTIND=1

  if [[ -z "$security_group_id" ]]; then
    errecho "ERROR: You must provide a security group ID with the -i parameter."
    usage
    return 1
  fi

  response=$(aws ec2 delete-security-group --group-id "$security_group_id" --
output text) || {
    aws_cli_error_log ${?}
    errecho "ERROR: AWS reports delete-security-group operation failed.$response"
    return 1
  }

  return 0
}

################################################################################
# function ec2_delete_keypair
#
# This function deletes an Amazon EC2 ED25519 or 2048-bit RSA key pair.
#
# Parameters:
```

```
#       -n key_pair_name - A key pair name.
#
# And:
#       0 - If successful.
#       1 - If it fails.
###############################################################################
function ec2_delete_keypair() {
  local key_pair_name response

  local option OPTARG # Required to use getopts command in a function.
  # bashsupport disable=BP5008
  function usage() {
    echo "function ec2_delete_keypair"
    echo "Deletes an Amazon EC2 ED25519 or 2048-bit RSA key pair."
    echo "  -n key_pair_name - A key pair name."
    echo ""
  }

  # Retrieve the calling parameters.
  while getopts "n:h" option; do
    case "${option}" in
      n) key_pair_name="${OPTARG}" ;;
      h)
        usage
        return 0
        ;;
      \?)
        echo "Invalid parameter"
        usage
        return 1
        ;;
    esac
  done
  export OPTIND=1

  if [[ -z "$key_pair_name" ]]; then
    errecho "ERROR: You must provide a key pair name with the -n parameter."
    usage
    return 1
  fi

  response=$(aws ec2 delete-key-pair \
    --key-name "$key_pair_name") || {
    aws_cli_error_log ${?}
```

```
    errecho "ERROR: AWS reports delete-key-pair operation failed.$response"
    return 1
  }

  return 0
}
```

Fungsi utilitas yang digunakan dalam skenario ini.

```
################################################################################
# function errecho
#
# This function outputs everything sent to it to STDERR (standard error output).
################################################################################
function errecho() {
  printf "%s\n" "$*" 1>&2
}

################################################################################
# function aws_cli_error_log()
#
# This function is used to log the error messages from the AWS CLI.
#
# The function expects the following argument:
#         $1 - The error code returned by the AWS CLI.
#
#  Returns:
#          0: - Success.
#
################################################################################
function aws_cli_error_log() {
  local err_code=$1
  errecho "Error code : $err_code"
  if [ "$err_code" == 1 ]; then
    errecho "  One or more S3 transfers failed."
  elif [ "$err_code" == 2 ]; then
    errecho "  Command line failed to parse."
  elif [ "$err_code" == 130 ]; then
    errecho "  Process received SIGINT."
  elif [ "$err_code" == 252 ]; then
    errecho "  Command syntax invalid."
  elif [ "$err_code" == 253 ]; then
```

```
    errecho "  The system environment or configuration was invalid."
  elif [ "$err_code" == 254 ]; then
    errecho "  The service returned an error."
  elif [ "$err_code" == 255 ]; then
    errecho "  255 is a catch-all error."
  fi

  return 0
}
```

- Untuk API detailnya, lihat topik berikut di Referensi AWS CLI Perintah.
  - AllocateAddress
  - AssociateAddress
  - AuthorizeSecurityGroupIngress
  - CreateKeyPair
  - CreateSecurityGroup
  - DeleteKeyPair
  - DeleteSecurityGroup
  - DescribeImages
  - DescribeInstanceTypes
  - DescribeInstances
  - DescribeKeyPairs
  - DescribeSecurityGroups
  - DisassociateAddress
  - ReleaseAddress
  - RunInstances
  - StartInstances
  - StopInstances
  - TerminateInstances
  - UnmonitorInstances

Java

SDKuntuk Java 2.x

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

Menjalankan skenario di prompt perintah.

```
import org.slf4j.Logger;
import org.slf4j.LoggerFactory;
import software.amazon.awssdk.services.ec2.model.CreateKeyPairResponse;
import software.amazon.awssdk.services.ec2.model.DeleteKeyPairResponse;
import software.amazon.awssdk.services.ec2.model.DescribeKeyPairsResponse;
import software.amazon.awssdk.services.ec2.model.DisassociateAddressResponse;
import software.amazon.awssdk.services.ec2.model.Ec2Exception;
import software.amazon.awssdk.services.ec2.model.ReleaseAddressResponse;
import software.amazon.awssdk.services.ssm.model.GetParametersByPathResponse;
import software.amazon.awssdk.services.ssm.model.Parameter;

import java.net.InetAddress;
import java.net.UnknownHostException;
import java.util.List;
import java.util.Scanner;
import java.util.concurrent.CompletableFuture;
import java.util.concurrent.CompletionException;

/**
 * Before running this Java (v2) code example, set up your development
 * environment, including your credentials.
 *
 * For more information, see the following documentation topic:
 *
 * https://docs.aws.amazon.com/sdk-for-java/latest/developer-guide/get-
started.html
 *
 * This Java example performs the following tasks:
 *
 * 1. Creates an RSA key pair and saves the private key data as a .pem file.
 * 2. Lists key pairs.
```

```
 * 3. Creates a security group for the default VPC.
 * 4. Displays security group information.
 * 5. Gets a list of Amazon Linux 2 AMIs and selects one.
 * 6. Gets additional information about the image.
 * 7. Gets a list of instance types that are compatible with the selected AMI's
 * architecture.
 * 8. Creates an instance with the key pair, security group, AMI, and an
 * instance type.
 * 9. Displays information about the instance.
 * 10. Stops the instance and waits for it to stop.
 * 11. Starts the instance and waits for it to start.
 * 12. Allocates an Elastic IP address and associates it with the instance.
 * 13. Displays SSH connection info for the instance.
 * 14. Disassociates and deletes the Elastic IP address.
 * 15. Terminates the instance and waits for it to terminate.
 * 16. Deletes the security group.
 * 17. Deletes the key pair.
 */
public class EC2Scenario {

    public static final String DASHES = new String(new char[80]).replace("\0",
 "-");
    private static final Logger logger =
 LoggerFactory.getLogger(EC2Scenario.class);
    public static void main(String[] args) throws InterruptedException,
 UnknownHostException {

        logger.info("""
            Usage:
               <keyName> <fileName> <groupName> <groupDesc>

            Where:
               keyName -  A key pair name (for example, TestKeyPair).\s
               fileName -  A file name where the key information is written to.\s
               groupName - The name of the security group.\s
               groupDesc - The description of the security group.\s
            """);

        Scanner scanner = new Scanner(System.in);
        EC2Actions ec2Actions = new EC2Actions();

        String keyName = "TestKeyPair7" ;
        String fileName = "ec2Key.pem";
        String groupName = "TestSecGroup7" ;
```

```
        String groupDesc = "Test Group" ;
        String vpcId = ec2Actions.describeFirstEC2VpcAsync().join().vpcId();
        InetAddress localAddress = InetAddress.getLocalHost();
        String myIpAddress = localAddress.getHostAddress();

        logger.info("""
            Amazon Elastic Compute Cloud (EC2) is a web service that provides
 secure, resizable compute
            capacity in the cloud. It allows developers and organizations to
 easily launch and manage
            virtual server instances, known as EC2 instances, to run their
 applications.

            EC2 provides a wide range of instance types, each with different
 compute, memory,
            and storage capabilities, to meet the diverse needs of various
 workloads. Developers
            can choose the appropriate instance type based on their application's
 requirements,
            such as high-performance computing, memory-intensive tasks, or GPU-
accelerated workloads.

            The `Ec2AsyncClient` interface in the AWS SDK for Java 2.x provides a
 set of methods to
            programmatically interact with the Amazon EC2 service. This allows
 developers to
            automate the provisioning, management, and monitoring of EC2
 instances as part of their
            application deployment pipelines. With EC2, teams can focus on
 building and deploying
            their applications without having to worry about the underlying
 infrastructure
            required to host and manage physical servers.

            This scenario walks you through how to perform key operations for
 this service.
            Let's get started...
            """);

        waitForInputToContinue(scanner);
        logger.info(DASHES);

        logger.info(DASHES);
```

```
        logger.info("1. Create an RSA key pair and save the private key material
as a .pem file.");
        logger.info("""
            An RSA key pair for Amazon EC2 is a security mechanism used to
authenticate and secure
            access to your EC2 instances. It consists of a public key and a
private key,
            which are generated as a pair.
            """);
        waitForInputToContinue(scanner);
        try {
            CompletableFuture<CreateKeyPairResponse> future =
ec2Actions.createKeyPairAsync(keyName, fileName);
            CreateKeyPairResponse response = future.join();
            logger.info("Key Pair successfully created. Key Fingerprint: " +
response.keyFingerprint());

        } catch (RuntimeException rt) {
            Throwable cause = rt.getCause();
            if (cause instanceof Ec2Exception ec2Ex) {
                if (ec2Ex.getMessage().contains("already exists")) {
                    // Key pair already exists.
                    logger.info("The key pair '" + keyName + "' already exists.
Moving on...");
                } else {
                    logger.info("EC2 error occurred: Error message: {}, Error
code {}", ec2Ex.getMessage(), ec2Ex.awsErrorDetails().errorCode());
                    return;
                }
            } else {
                logger.info("An unexpected error occurred: " +
(rt.getMessage()));
                return;
            }
        }
        waitForInputToContinue(scanner);
        logger.info(DASHES);

        logger.info(DASHES);
        logger.info("2. List key pairs.");
        waitForInputToContinue(scanner);
        try {
            CompletableFuture<DescribeKeyPairsResponse> future =
ec2Actions.describeKeysAsync();
```

```
            DescribeKeyPairsResponse keyPairsResponse = future.join();
            keyPairsResponse.keyPairs().forEach(keyPair -> logger.info(
                "Found key pair with name {} and fingerprint {}",
                keyPair.keyName(),
                keyPair.keyFingerprint()));

        } catch (RuntimeException rt) {
            Throwable cause = rt.getCause();
            if (cause instanceof Ec2Exception ec2Ex) {
                logger.info("EC2 error occurred: Error message: {}, Error code
{}", ec2Ex.getMessage(), ec2Ex.awsErrorDetails().errorCode());
                return;
            } else {
                logger.info("An unexpected error occurred: {}", (cause != null ?
cause.getMessage() : rt.getMessage()));
                return;
            }
        }
        waitForInputToContinue(scanner);
        logger.info(DASHES);

        logger.info(DASHES);
        logger.info("3. Create a security group.");
        logger.info("""
            An AWS EC2 Security Group is a virtual firewall that controls the
            inbound and outbound traffic to an EC2 instance. It acts as a first
line
            of defense for your EC2 instances, allowing you to specify the rules
that
            govern the network traffic entering and leaving your instances.
           """);
        waitForInputToContinue(scanner);
        String groupId = "";
        try {
            CompletableFuture<String> future =
ec2Actions.createSecurityGroupAsync(groupName, groupDesc, vpcId, myIpAddress);
            future.join();
            logger.info("Created security group") ;

        } catch (RuntimeException rt) {
            Throwable cause = rt.getCause();
            if (cause instanceof Ec2Exception ec2Ex) {
                if (ec2Ex.awsErrorDetails().errorMessage().contains("already
exists")) {
```

```
                    logger.info("The Security Group already exists. Moving
on...");
                } else {
                    logger.error("An unexpected error occurred: {}",
ec2Ex.awsErrorDetails().errorMessage());
                    return;
                }
            } else {
                logger.error("An unexpected error occurred: {}",
cause.getMessage());
                return;
            }
        }
        waitForInputToContinue(scanner);
        logger.info(DASHES);

        logger.info(DASHES);
        logger.info("4. Display security group information for the new security
group.");
        waitForInputToContinue(scanner);
        try {
            CompletableFuture<String> future =
ec2Actions.describeSecurityGroupArnByNameAsync(groupName);
            groupId = future.join();
            logger.info("The security group Id is "+groupId);

        } catch (RuntimeException rt) {
            Throwable cause = rt.getCause();
            if (cause instanceof Ec2Exception ec2Ex) {
                String errorCode = ec2Ex.awsErrorDetails().errorCode();
                if ("InvalidGroup.NotFound".equals(errorCode)) {
                    logger.info("Security group '{}' does not exist. Error Code:
{}", groupName, errorCode);
                } else {
                    logger.info("EC2 error occurred: Message {}, Error Code: {}",
ec2Ex.getMessage(), errorCode);
                }
            } else {
                logger.info("An unexpected error occurred: {}",
cause.getMessage());
            }
        }
        waitForInputToContinue(scanner);
        logger.info(DASHES);
```

```
        logger.info(DASHES);
        logger.info("5. Get a list of Amazon Linux 2 AMIs and select one with
amzn2 in the name.");
        logger.info("""
            An Amazon EC2 AMI (Amazon Machine Image) is a pre-configured virtual
machine image that
            serves as a template for launching EC2 instances. It contains all the
necessary software and
            configurations required to run an application or operating system on
an EC2 instance.
            """);
        waitForInputToContinue(scanner);
        String instanceAMI="";
        try {
            CompletableFuture<GetParametersByPathResponse> future =
ec2Actions.getParaValuesAsync();
            GetParametersByPathResponse pathResponse = future.join();
            List<Parameter> parameterList = pathResponse.parameters();
            for (Parameter para : parameterList) {
                if (filterName(para.name())) {
                    instanceAMI = para.value();
                    break;
                }
            }
        } catch (RuntimeException rt) {
            Throwable cause = rt.getCause();
            if (cause instanceof Ec2Exception ec2Ex) {
                logger.info("EC2 error occurred: Message {}, Error Code:{}",
ec2Ex.getMessage(), ec2Ex.awsErrorDetails().errorCode());
                return;
            } else {
                logger.info("An unexpected error occurred: {}",
cause.getMessage());
                return;
            }
        }
        logger.info("The AMI value with amzn2 is: {}", instanceAMI);
        waitForInputToContinue(scanner);
        logger.info(DASHES);

        logger.info(DASHES);
        logger.info("6. Get the (Amazon Machine Image) AMI value from the amzn2
image.");
```

```
        logger.info("""
           An AMI value represents a specific version of a virtual machine (VM)
or server image.
           It uniquely identifies a particular version of an EC2 instance,
including its operating system,
           pre-installed software, and any custom configurations. This allows you
to consistently deploy the same
           VM image across your infrastructure.

            """);
        waitForInputToContinue(scanner);
        String amiValue;
        try {
            CompletableFuture<String> future =
ec2Actions.describeImageAsync(instanceAMI);
            amiValue = future.join();

        } catch (CompletionException ce) {
            Throwable cause = ce.getCause();
            if (cause instanceof Ec2Exception) {
                Ec2Exception ec2Ex = (Ec2Exception) cause;
                logger.info("EC2 error occurred: Message {}, Error Code:{}",
ec2Ex.getMessage(), ec2Ex.awsErrorDetails().errorCode());
                return;
            } else {
                logger.info("An unexpected error occurred: {}",
cause.getMessage());
                return;
            }
        }
        waitForInputToContinue(scanner);
        logger.info(DASHES);

        logger.info(DASHES);
        logger.info("7. Retrieves an instance type available in the current AWS
region.");
        waitForInputToContinue(scanner);
        String instanceType;
        try {
            CompletableFuture<String> future =
ec2Actions.getInstanceTypesAsync();
            instanceType = future.join();
            if (!instanceType.isEmpty()) {
                logger.info("Found instance type: " + instanceType);
```

```
            } else {
                logger.info("Desired instance type not found.");
            }
        } catch (RuntimeException rt) {
            Throwable cause = rt.getCause();
            if (cause instanceof Ec2Exception ec2Ex) {
                logger.info("EC2 error occurred: Message {}, Error Code:{}",
 ec2Ex.getMessage(), ec2Ex.awsErrorDetails().errorCode());
                return;
            } else {
                logger.info("An unexpected error occurred: {}",
 cause.getMessage());
                return;
            }
        }
        waitForInputToContinue(scanner);
        logger.info(DASHES);

        logger.info(DASHES);
        logger.info("8. Create an Amazon EC2 instance using the key pair, the
 instance type, the security group, and the EC2 AMI value.");
        logger.info("Once the EC2 instance is created, it is placed into a
 running state.");
        waitForInputToContinue(scanner);
        String newInstanceId;
        try {
            CompletableFuture<String> future =
 ec2Actions.runInstanceAsync(instanceType, keyName, groupName, amiValue);
            newInstanceId = future.join();
        } catch (RuntimeException rt) {
            Throwable cause = rt.getCause();
            if (cause instanceof Ec2Exception) {
                Ec2Exception ec2Ex = (Ec2Exception) cause;
                switch (ec2Ex.awsErrorDetails().errorCode()) {
                    case "InvalidParameterValue":
                        logger.info("EC2 error occurred: Message {}, Error Code:
{}", ec2Ex.getMessage(), ec2Ex.awsErrorDetails().errorCode());
                        break;
                    case "InsufficientInstanceCapacity":
                        // Handle insufficient instance capacity.
                        logger.info("Insufficient instance capacity: {}, {}",
 ec2Ex.getMessage(), ec2Ex.awsErrorDetails().errorCode());
                        break;
                    case "InvalidGroup.NotFound":
```

```
                        // Handle security group not found.
                        logger.info("Security group not found: {},{}",
ec2Ex.getMessage(), ec2Ex.awsErrorDetails().errorCode());
                        break;
                    default:
                        logger.info("EC2 error occurred: {} (Code: {}",
ec2Ex.getMessage(), ec2Ex.awsErrorDetails().errorCode());
                        break;
                }
                return;
            } else {
                logger.info("An unexpected error occurred: {}", (cause != null ?
cause.getMessage() : rt.getMessage()));
                return;
            }
        }
        logger.info("The instance Id is " + newInstanceId);
        waitForInputToContinue(scanner);
        logger.info(DASHES);

        logger.info(DASHES);
        logger.info("9. Display information about the running instance. ");

        waitForInputToContinue(scanner);
        String publicIp;
        try {
            CompletableFuture<String> future =
ec2Actions.describeEC2InstancesAsync(newInstanceId);
            publicIp = future.join();
            logger.info("EC2 instance public IP {}", publicIp);
        } catch (RuntimeException rt) {
            Throwable cause = rt.getCause();
            if (cause instanceof Ec2Exception ec2Ex) {
                logger.info("EC2 error occurred: Message {}, Error Code:{}",
ec2Ex.getMessage(), ec2Ex.awsErrorDetails().errorCode());
                return;
            } else {
                logger.info("An unexpected error occurred: {}",
cause.getMessage());
                return;
            }

        }
        logger.info("You can SSH to the instance using this command:");
```

```
        logger.info("ssh -i " + fileName + " ec2-user@" + publicIp);
        waitForInputToContinue(scanner);
        logger.info(DASHES);

        logger.info(DASHES);
        logger.info("10. Stop the instance using a waiter (this may take a few
mins).");
        // Remove the 2nd one
        waitForInputToContinue(scanner);
        try {
            CompletableFuture<Void> future =
ec2Actions.stopInstanceAsync(newInstanceId);
            future.join();

        } catch (RuntimeException rt) {
            Throwable cause = rt.getCause();
            if (cause instanceof Ec2Exception ec2Ex) {
                logger.info("EC2 error occurred: Message {}, Error Code:{}",
ec2Ex.getMessage(), ec2Ex.awsErrorDetails().errorCode());
                return;
            } else {
                logger.info("An unexpected error occurred: {}",
cause.getMessage());
                return;
            }
        }
        waitForInputToContinue(scanner);
        logger.info(DASHES);

        logger.info(DASHES);
        logger.info("11. Start the instance using a waiter (this may take a few
mins).");
        try {
            CompletableFuture<Void> future =
ec2Actions.startInstanceAsync(newInstanceId);
            future.join();

        } catch (RuntimeException rt) {
            Throwable cause = rt.getCause();
            if (cause instanceof Ec2Exception ec2Ex) {
                // Handle EC2 exceptions.
                logger.info("EC2 error occurred: Message {}, Error Code:{}",
ec2Ex.getMessage(), ec2Ex.awsErrorDetails().errorCode());
                return;
```

```
            } else {
                logger.info("An unexpected error occurred: {}",
cause.getMessage());
                return;
            }
        }
        waitForInputToContinue(scanner);
        logger.info(DASHES);

        logger.info(DASHES);
        logger.info("12. Allocate an Elastic IP address and associate it with the
instance.");
        logger.info("""
            An Elastic IP address is a static public IP address that you can
associate with your EC2 instance.
            This allows you to have a fixed, predictable IP address that remains
the same even if your instance
            is stopped, terminated, or replaced.
            This is particularly useful for applications or services that need to
be accessed consistently from a
            known IP address.

            An EC2 Allocation ID (also known as a Reserved Instance Allocation
ID) is a unique identifier associated with a Reserved Instance (RI) that you
have purchased in AWS.

            When you purchase a Reserved Instance, AWS assigns a unique
Allocation ID to it.
            This Allocation ID is used to track and identify the specific RI you
have purchased,
            and it is important for managing and monitoring your Reserved
Instances.

            """);

        waitForInputToContinue(scanner);
        String allocationId;
        try {
            CompletableFuture<String> future = ec2Actions.allocateAddressAsync();
            allocationId = future.join();
            logger.info("Successfully allocated address with ID: "
+allocationId);
        } catch (RuntimeException rt) {
            Throwable cause = rt.getCause();
```

```
            if (cause instanceof Ec2Exception ec2Ex) {
                logger.info("EC2 error occurred: Message {}, Error Code:{}",
ec2Ex.getMessage(), ec2Ex.awsErrorDetails().errorCode());
                return;
            } else {
                logger.info("An unexpected error occurred: {}",
cause.getMessage());
                return;
            }
        }
        logger.info("The allocation Id value is " + allocationId);
        waitForInputToContinue(scanner);
        String associationId;
        try {
            CompletableFuture<String> future =
ec2Actions.associateAddressAsync(newInstanceId, allocationId);
            associationId = future.join();
            logger.info("Successfully associated address with ID: "
+associationId);
        } catch (RuntimeException rt) {
            Throwable cause = rt.getCause();
            if (cause instanceof Ec2Exception ec2Ex) {
                logger.info("EC2 error occurred: Message {}, Error Code:{}",
ec2Ex.getMessage(), ec2Ex.awsErrorDetails().errorCode());
                return;
            } else {
                logger.info("An unexpected error occurred: {}",
cause.getMessage());
                return;
            }
        }
        waitForInputToContinue(scanner);
        logger.info(DASHES);

        logger.info(DASHES);
        logger.info("13. Describe the instance again. Note that the public IP
address has changed");
        waitForInputToContinue(scanner);
        try {
            CompletableFuture<String> future =
ec2Actions.describeEC2InstancesAsync(newInstanceId);
            publicIp = future.join();
            logger.info("EC2 instance public IP: " + publicIp);
            logger.info("You can SSH to the instance using this command:");
```

```
            logger.info("ssh -i " + fileName + " ec2-user@" + publicIp);
        } catch (RuntimeException rt) {
            Throwable cause = rt.getCause();
            if (cause instanceof Ec2Exception ec2Ex) {
                logger.info("EC2 error occurred: Message {}, Error Code:{}",
ec2Ex.getMessage(), ec2Ex.awsErrorDetails().errorCode());
                return;
            } else {
                logger.info("An unexpected error occurred: {}",
cause.getMessage());
                return;
            }
        }
        waitForInputToContinue(scanner);
        logger.info(DASHES);

        logger.info(DASHES);
        logger.info("14. Disassociate and release the Elastic IP address.");
        waitForInputToContinue(scanner);
        try {
            CompletableFuture<DisassociateAddressResponse> future =
ec2Actions.disassociateAddressAsync(associationId);
            future.join();
            logger.info("Address successfully disassociated.");
        } catch (RuntimeException rt) {
            Throwable cause = rt.getCause();
            if (cause instanceof Ec2Exception ec2Ex) {
                // Handle EC2 exceptions.
                logger.info("EC2 error occurred: Message {}, Error Code:{}",
ec2Ex.getMessage(), ec2Ex.awsErrorDetails().errorCode());
                return;
            } else {
                logger.info("An unexpected error occurred: {}",
cause.getMessage());
                return;
            }
        }
        waitForInputToContinue(scanner);
        try {
            CompletableFuture<ReleaseAddressResponse> future =
ec2Actions.releaseEC2AddressAsync(allocationId);
            future.join(); // Wait for the operation to complete
            logger.info("Elastic IP address successfully released.");
        } catch (RuntimeException rte) {
```

```
            logger.info("An unexpected error occurred: {}", rte.getMessage());
            return;
        }
        waitForInputToContinue(scanner);
        logger.info(DASHES);

        logger.info(DASHES);
        logger.info("15. Terminate the instance and use a waiter (this may take a
few mins).");
        waitForInputToContinue(scanner);
        try {
            CompletableFuture<Object> future =
ec2Actions.terminateEC2Async(newInstanceId);
            future.join();
            logger.info("EC2 instance successfully terminated.");
        } catch (RuntimeException rt) {
            Throwable cause = rt.getCause();
            if (cause instanceof Ec2Exception ec2Ex) {
                // Handle EC2 exceptions.
                logger.info("EC2 error occurred: Message {}, Error Code:{}",
ec2Ex.getMessage(), ec2Ex.awsErrorDetails().errorCode());
                return;
            } else {
                logger.info("An unexpected error occurred: {}",
cause.getMessage());
                return;
            }
        }
        logger.info(DASHES);

        logger.info(DASHES);
        logger.info("16. Delete the security group.");
        waitForInputToContinue(scanner);
        try {
            CompletableFuture<Void> future =
ec2Actions.deleteEC2SecGroupAsync(groupId);
            future.join();
            logger.info("Security group successfully deleted.");
        } catch (RuntimeException rt) {
            Throwable cause = rt.getCause();
            if (cause instanceof Ec2Exception ec2Ex) {
                logger.info("EC2 error occurred: Message {}, Error Code:{}",
ec2Ex.getMessage(), ec2Ex.awsErrorDetails().errorCode());
                return;
```

```
            } else {
                logger.info("An unexpected error occurred: {}",
cause.getMessage());
                return;
            }
        }
        waitForInputToContinue(scanner);
        logger.info(DASHES);

        logger.info(DASHES);
        logger.info("17. Delete the key.");
        waitForInputToContinue(scanner);
        try {
            CompletableFuture<DeleteKeyPairResponse> future =
ec2Actions.deleteKeysAsync(keyName);
            future.join();
            logger.info("Successfully deleted key pair named " + keyName);
        } catch (RuntimeException rt) {
            Throwable cause = rt.getCause();
            if (cause instanceof Ec2Exception ec2Ex) {
                logger.info("EC2 error occurred: Message {}, Error Code:{}",
ec2Ex.getMessage(), ec2Ex.awsErrorDetails().errorCode());
                return;
            } else {
                logger.info("An unexpected error occurred: {}",
cause.getMessage());
                return;
            }
        }
        waitForInputToContinue(scanner);
        logger.info(DASHES);

        logger.info(DASHES);
        logger.info("You successfully completed the Amazon EC2 scenario.");
        logger.info(DASHES);
    }
    public static boolean filterName(String name) {
        String[] parts = name.split("/");
        String myValue = parts[4];
        return myValue.contains("amzn2");
    }

    private static void waitForInputToContinue(Scanner scanner) {
        while (true) {
```

```
            logger.info("");
            logger.info("Enter 'c' followed by <ENTER> to continue:");
            String input = scanner.nextLine();

            if (input.trim().equalsIgnoreCase("c")) {
                logger.info("Continuing with the program...");
                logger.info("");
                break;
            } else {
                // Handle invalid input.
                logger.info("Invalid input. Please try again.");
            }
        }
    }
}
```

Tentukan kelas yang membungkus EC2 tindakan.

```
import org.slf4j.Logger;
import org.slf4j.LoggerFactory;
import software.amazon.awssdk.core.client.config.ClientOverrideConfiguration;
import software.amazon.awssdk.http.async.SdkAsyncHttpClient;
import software.amazon.awssdk.http.nio.netty.NettyNioAsyncHttpClient;
import software.amazon.awssdk.regions.Region;
import software.amazon.awssdk.services.ec2.Ec2AsyncClient;
import software.amazon.awssdk.services.ec2.model.AllocateAddressRequest;
import software.amazon.awssdk.services.ec2.model.AllocateAddressResponse;
import software.amazon.awssdk.services.ec2.model.AssociateAddressRequest;
import software.amazon.awssdk.services.ec2.model.AssociateAddressResponse;
import
 software.amazon.awssdk.services.ec2.model.AuthorizeSecurityGroupIngressRequest;
import software.amazon.awssdk.services.ec2.model.CreateKeyPairRequest;
import software.amazon.awssdk.services.ec2.model.CreateKeyPairResponse;
import software.amazon.awssdk.services.ec2.model.CreateSecurityGroupRequest;
import software.amazon.awssdk.services.ec2.model.DeleteKeyPairRequest;
import software.amazon.awssdk.services.ec2.model.DeleteKeyPairResponse;
import software.amazon.awssdk.services.ec2.model.DeleteSecurityGroupRequest;
import software.amazon.awssdk.services.ec2.model.DeleteSecurityGroupResponse;
import software.amazon.awssdk.services.ec2.model.DescribeImagesRequest;
import software.amazon.awssdk.services.ec2.model.DescribeInstanceTypesRequest;
import software.amazon.awssdk.services.ec2.model.DescribeInstanceTypesResponse;
import software.amazon.awssdk.services.ec2.model.DescribeInstancesRequest;
```

```
import software.amazon.awssdk.services.ec2.model.DescribeKeyPairsResponse;
import software.amazon.awssdk.services.ec2.model.DescribeSecurityGroupsRequest;
import software.amazon.awssdk.services.ec2.model.DescribeSecurityGroupsResponse;
import software.amazon.awssdk.services.ec2.model.DescribeVpcsRequest;
import software.amazon.awssdk.services.ec2.model.DisassociateAddressRequest;
import software.amazon.awssdk.services.ec2.model.DisassociateAddressResponse;
import software.amazon.awssdk.services.ec2.model.DomainType;
import software.amazon.awssdk.services.ec2.model.Ec2Exception;
import software.amazon.awssdk.services.ec2.model.Filter;
import software.amazon.awssdk.services.ec2.model.InstanceTypeInfo;
import software.amazon.awssdk.services.ec2.model.IpPermission;
import software.amazon.awssdk.services.ec2.model.IpRange;
import software.amazon.awssdk.services.ec2.model.ReleaseAddressRequest;
import software.amazon.awssdk.services.ec2.model.ReleaseAddressResponse;
import software.amazon.awssdk.services.ec2.model.RunInstancesRequest;
import software.amazon.awssdk.services.ec2.model.RunInstancesResponse;
import software.amazon.awssdk.services.ec2.model.StopInstancesRequest;
import software.amazon.awssdk.services.ec2.model.StartInstancesRequest;
import software.amazon.awssdk.services.ec2.model.TerminateInstancesRequest;
import software.amazon.awssdk.services.ec2.model.Vpc;
import software.amazon.awssdk.services.ec2.paginators.DescribeImagesPublisher;
import software.amazon.awssdk.services.ec2.paginators.DescribeInstancesPublisher;
import
 software.amazon.awssdk.services.ec2.paginators.DescribeSecurityGroupsPublisher;
import software.amazon.awssdk.services.ec2.paginators.DescribeVpcsPublisher;
import software.amazon.awssdk.services.ec2.waiters.Ec2AsyncWaiter;
import software.amazon.awssdk.services.ssm.SsmAsyncClient;
import software.amazon.awssdk.services.ssm.model.GetParametersByPathRequest;
import software.amazon.awssdk.services.ssm.model.GetParametersByPathResponse;
import software.amazon.awssdk.services.ec2.model.TerminateInstancesResponse;
import java.io.BufferedWriter;
import java.io.FileWriter;
import java.io.IOException;
import java.time.Duration;
import java.util.List;
import java.util.concurrent.CompletableFuture;
import java.util.concurrent.CompletionException;
import java.util.concurrent.atomic.AtomicReference;

public class EC2Actions {
    private static final Logger logger =
 LoggerFactory.getLogger(EC2Actions.class);
    private static Ec2AsyncClient ec2AsyncClient;
```

```
   /**
    * Retrieves an asynchronous Amazon Elastic Container Registry (ECR) client.
    *
    * @return the configured ECR asynchronous client.
    */
   private static Ec2AsyncClient getAsyncClient() {
       if (ec2AsyncClient == null) {
           /*
           The `NettyNioAsyncHttpClient` class is part of the AWS SDK for Java,
version 2,
           and it is designed to provide a high-performance, asynchronous HTTP
client for interacting with AWS services.
            It uses the Netty framework to handle the underlying network
communication and the Java NIO API to
            provide a non-blocking, event-driven approach to HTTP requests and
responses.
            */
           SdkAsyncHttpClient httpClient = NettyNioAsyncHttpClient.builder()
               .maxConcurrency(50)  // Adjust as needed.
               .connectionTimeout(Duration.ofSeconds(60))  // Set the connection
timeout.
               .readTimeout(Duration.ofSeconds(60))  // Set the read timeout.
               .writeTimeout(Duration.ofSeconds(60))  // Set the write timeout.
               .build();

           ClientOverrideConfiguration overrideConfig =
ClientOverrideConfiguration.builder()
              .apiCallTimeout(Duration.ofMinutes(2))  // Set the overall API
call timeout.
               .apiCallAttemptTimeout(Duration.ofSeconds(90))  // Set the
individual call attempt timeout.
               .build();

           ec2AsyncClient = Ec2AsyncClient.builder()
               .region(Region.US_EAST_1)
               .httpClient(httpClient)
               .overrideConfiguration(overrideConfig)
               .build();
       }
       return ec2AsyncClient;
   }

   /**
    * Deletes a key pair asynchronously.
```

```
    *
    * @param keyPair the name of the key pair to delete
    * @return a {@link CompletableFuture} that represents the result of the
asynchronous operation.
    *         The {@link CompletableFuture} will complete with a {@link
DeleteKeyPairResponse} object
    *         that provides the result of the key pair deletion operation.
    */
   public CompletableFuture<DeleteKeyPairResponse> deleteKeysAsync(String
keyPair) {
       DeleteKeyPairRequest request = DeleteKeyPairRequest.builder()
           .keyName(keyPair)
           .build();

       // Initiate the asynchronous request to delete the key pair.
       CompletableFuture<DeleteKeyPairResponse> response =
getAsyncClient().deleteKeyPair(request);
       return response.whenComplete((resp, ex) -> {
           if (ex != null) {
               throw new RuntimeException("Failed to delete key pair: " +
keyPair, ex);
           } else if (resp == null) {
               throw new RuntimeException("No response received for deleting key
pair: " + keyPair);
           }
       });
   }

   /**
    * Deletes an EC2 security group asynchronously.
    *
    * @param groupId the ID of the security group to delete
    * @return a CompletableFuture that completes when the security group is
deleted
    */
   public CompletableFuture<Void> deleteEC2SecGroupAsync(String groupId) {
       DeleteSecurityGroupRequest request = DeleteSecurityGroupRequest.builder()
           .groupId(groupId)
           .build();

       CompletableFuture<DeleteSecurityGroupResponse> response =
getAsyncClient().deleteSecurityGroup(request);
       return response.whenComplete((resp, ex) -> {
           if (ex != null) {
```

```
                throw new RuntimeException("Failed to delete security group with
Id " + groupId, ex);
            } else if (resp == null) {
                throw new RuntimeException("No response received for deleting
security group with Id " + groupId);
            }
        }).thenApply(resp -> null);
    }

    /**
     * Terminates an EC2 instance asynchronously and waits for it to reach the
terminated state.
     *
     * @param instanceId the ID of the EC2 instance to terminate
     * @return a {@link CompletableFuture} that completes when the instance has
been terminated
     * @throws RuntimeException if there is no response from the AWS SDK or if
there is a failure during the termination process
     */
    public CompletableFuture<Object> terminateEC2Async(String instanceId) {
        TerminateInstancesRequest terminateRequest =
TerminateInstancesRequest.builder()
            .instanceIds(instanceId)
            .build();

        CompletableFuture<TerminateInstancesResponse> responseFuture =
getAsyncClient().terminateInstances(terminateRequest);
        return responseFuture.thenCompose(terminateResponse -> {
            if (terminateResponse == null) {
                throw new RuntimeException("No response received for terminating
instance " + instanceId);
            }
            System.out.println("Going to terminate an EC2 instance and use a
waiter to wait for it to be in terminated state");
            return getAsyncClient().waiter()
                .waitUntilInstanceTerminated(r -> r.instanceIds(instanceId))
                .thenApply(waiterResponse -> null);
        }).exceptionally(throwable -> {
            // Handle any exceptions that occurred during the async call
            throw new RuntimeException("Failed to terminate EC2 instance: " +
throwable.getMessage(), throwable);
        });
    }
```

```
   /**
    * Releases an Elastic IP address asynchronously.
    *
    * @param allocId the allocation ID of the Elastic IP address to be released
    * @return a {@link CompletableFuture} representing the asynchronous
operation of releasing the Elastic IP address
    */
   public CompletableFuture<ReleaseAddressResponse>
releaseEC2AddressAsync(String allocId) {
       ReleaseAddressRequest request = ReleaseAddressRequest.builder()
           .allocationId(allocId)
           .build();

       CompletableFuture<ReleaseAddressResponse> response =
getAsyncClient().releaseAddress(request);
       response.whenComplete((resp, ex) -> {
           if (ex != null) {
               throw new RuntimeException("Failed to release Elastic IP
address", ex);
           }
       });

       return response;
   }

   /**
    * Disassociates an Elastic IP address from an instance asynchronously.
    *
    * @param associationId The ID of the association you want to disassociate.
    * @return a {@link CompletableFuture} representing the asynchronous
operation of disassociating the address. The
    *         {@link CompletableFuture} will complete with a {@link
DisassociateAddressResponse} when the operation is
    *         finished.
    * @throws RuntimeException if the disassociation of the address fails.
    */
   public CompletableFuture<DisassociateAddressResponse>
disassociateAddressAsync(String associationId) {
       Ec2AsyncClient ec2 = getAsyncClient();
       DisassociateAddressRequest addressRequest =
DisassociateAddressRequest.builder()
           .associationId(associationId)
           .build();
```

```
        // Disassociate the address asynchronously.
        CompletableFuture<DisassociateAddressResponse> response =
ec2.disassociateAddress(addressRequest);
        response.whenComplete((resp, ex) -> {
            if (ex != null) {
               throw new RuntimeException("Failed to disassociate address", ex);
            }
        });

        return response;
    }

    /**
     * Associates an Elastic IP address with an EC2 instance asynchronously.
     *
     * @param instanceId    the ID of the EC2 instance to associate the Elastic
IP address with
     * @param allocationId  the allocation ID of the Elastic IP address to
associate
     * @return a {@link CompletableFuture} that completes with the association ID
when the operation is successful,
     *         or throws a {@link RuntimeException} if the operation fails
     */
    public CompletableFuture<String> associateAddressAsync(String instanceId,
String allocationId) {
        AssociateAddressRequest associateRequest =
AssociateAddressRequest.builder()
            .instanceId(instanceId)
            .allocationId(allocationId)
            .build();

        CompletableFuture<AssociateAddressResponse> responseFuture =
getAsyncClient().associateAddress(associateRequest);
        return responseFuture.thenApply(response -> {
            if (response.associationId() != null) {
                return response.associationId();
            } else {
                throw new RuntimeException("Association ID is null after
associating address.");
            }
        }).whenComplete((result, ex) -> {
            if (ex != null) {
                throw new RuntimeException("Failed to associate address", ex);
            }
```

```
        });
    }

    /**
     * Allocates an Elastic IP address asynchronously in the VPC domain.
     *
     * @return a {@link CompletableFuture} containing the allocation ID of the
allocated Elastic IP address
     */
    public CompletableFuture<String> allocateAddressAsync() {
        AllocateAddressRequest allocateRequest = AllocateAddressRequest.builder()
            .domain(DomainType.VPC)
            .build();

        CompletableFuture<AllocateAddressResponse> responseFuture =
getAsyncClient().allocateAddress(allocateRequest);
        return
responseFuture.thenApply(AllocateAddressResponse::allocationId).whenComplete((result,
ex) -> {
            if (ex != null) {
                throw new RuntimeException("Failed to allocate address", ex);
            }
        });
    }

    /**
     * Asynchronously describes the state of an EC2 instance.
     * The paginator helps you iterate over multiple pages of results.
     *
     * @param newInstanceId the ID of the EC2 instance to describe
     * @return a {@link CompletableFuture} that, when completed, contains a
string describing the state of the EC2 instance
     */
    public CompletableFuture<String> describeEC2InstancesAsync(String
newInstanceId) {
        DescribeInstancesRequest request = DescribeInstancesRequest.builder()
            .instanceIds(newInstanceId)
            .build();

        DescribeInstancesPublisher paginator =
getAsyncClient().describeInstancesPaginator(request);
        AtomicReference<String> publicIpAddressRef = new AtomicReference<>();
        return paginator.subscribe(response -> {
            response.reservations().stream()
```

```
                .flatMap(reservation -> reservation.instances().stream())
                .filter(instance -> instance.instanceId().equals(newInstanceId))
                .findFirst()
                .ifPresent(instance ->
publicIpAddressRef.set(instance.publicIpAddress()));
        }).thenApply(v -> {
            String publicIpAddress = publicIpAddressRef.get();
            if (publicIpAddress == null) {
                throw new RuntimeException("Instance with ID " + newInstanceId +
" not found.");
            }
            return publicIpAddress;
        }).exceptionally(ex -> {
            logger.info("Failed to describe instances: " + ex.getMessage());
            throw new RuntimeException("Failed to describe instances", ex);
        });
    }

    /**
     * Runs an EC2 instance asynchronously.
     *
     * @param instanceType The instance type to use for the EC2 instance.
     * @param keyName The name of the key pair to associate with the EC2
instance.
     * @param groupName The name of the security group to associate with the EC2
instance.
     * @param amiId The ID of the Amazon Machine Image (AMI) to use for the EC2
instance.
     * @return A {@link CompletableFuture} that completes with the ID of the
started EC2 instance.
     * @throws RuntimeException If there is an error running the EC2 instance.
     */
    public CompletableFuture<String> runInstanceAsync(String instanceType, String
keyName, String groupName, String amiId) {
        RunInstancesRequest runRequest = RunInstancesRequest.builder()
            .instanceType(instanceType)
            .keyName(keyName)
            .securityGroups(groupName)
            .maxCount(1)
            .minCount(1)
            .imageId(amiId)
            .build();
```

```
        CompletableFuture<RunInstancesResponse> responseFuture =
getAsyncClient().runInstances(runRequest);
        return responseFuture.thenCompose(response -> {
            String instanceIdVal = response.instances().get(0).instanceId();
            System.out.println("Going to start an EC2 instance and use a waiter
to wait for it to be in running state");
            return getAsyncClient().waiter()
                .waitUntilInstanceExists(r -> r.instanceIds(instanceIdVal))
                .thenCompose(waitResponse -> getAsyncClient().waiter()
                    .waitUntilInstanceRunning(r -> r.instanceIds(instanceIdVal))
                    .thenApply(runningResponse -> instanceIdVal));
        }).exceptionally(throwable -> {
            // Handle any exceptions that occurred during the async call
            throw new RuntimeException("Failed to run EC2 instance: " +
throwable.getMessage(), throwable);
        });
    }

    /**
     * Asynchronously retrieves the instance types available in the current AWS
region.
     * <p>
     * This method uses the AWS SDK's asynchronous API to fetch the available
instance types
     * and then processes the response. It logs the memory information, network
information,
     * and instance type for each instance type returned. Additionally, it
returns a
     * {@link CompletableFuture} that resolves to the instance type string for
the "t2.2xlarge"
     * instance type, if it is found in the response. If the "t2.2xlarge"
instance type is not
     * found, an empty string is returned.
     * </p>
     *
     * @return a {@link CompletableFuture} that resolves to the instance type
string for the
     * "t2.2xlarge" instance type, or an empty string if the instance type is not
found
     */
    public CompletableFuture<String> getInstanceTypesAsync() {
        DescribeInstanceTypesRequest typesRequest =
DescribeInstanceTypesRequest.builder()
            .maxResults(10)
```

```
            .build();

        CompletableFuture<DescribeInstanceTypesResponse> response =
getAsyncClient().describeInstanceTypes(typesRequest);
        response.whenComplete((resp, ex) -> {
            if (resp != null) {
                List<InstanceTypeInfo> instanceTypes = resp.instanceTypes();
                for (InstanceTypeInfo type : instanceTypes) {
                    logger.info("The memory information of this type is " +
type.memoryInfo().sizeInMiB());
                    logger.info("Network information is " +
type.networkInfo().toString());
                    logger.info("Instance type is " +
type.instanceType().toString());
                }
            } else {
                throw (RuntimeException) ex;
            }
        });

        return response.thenApply(resp -> {
            for (InstanceTypeInfo type : resp.instanceTypes()) {
                String instanceType = type.instanceType().toString();
                if (instanceType.equals("t2.2xlarge")) {
                    return instanceType;
                }
            }
            return "";
        });
    }

    /**
     * Asynchronously describes an AWS EC2 image with the specified image ID.
     *
     * @param imageId the ID of the image to be described
     * @return a {@link CompletableFuture} that, when completed, contains the ID
of the described image
     * @throws RuntimeException if no images are found with the provided image
ID, or if an error occurs during the AWS API call
     */
    public CompletableFuture<String> describeImageAsync(String imageId) {
        DescribeImagesRequest imagesRequest = DescribeImagesRequest.builder()
            .imageIds(imageId)
            .build();
```

```
        AtomicReference<String> imageIdRef = new AtomicReference<>();
        DescribeImagesPublisher paginator =
getAsyncClient().describeImagesPaginator(imagesRequest);
        return paginator.subscribe(response -> {
            response.images().stream()
                .filter(image -> image.imageId().equals(imageId))
                .findFirst()
                .ifPresent(image -> {
                    logger.info("The description of the image is " +
image.description());
                    logger.info("The name of the image is " + image.name());
                    imageIdRef.set(image.imageId());
                });
        }).thenApply(v -> {
            String id = imageIdRef.get();
            if (id == null) {
                throw new RuntimeException("No images found with the provided
image ID.");
            }
            return id;
        }).exceptionally(ex -> {
            logger.info("Failed to describe image: " + ex.getMessage());
            throw new RuntimeException("Failed to describe image", ex);
        });
    }

    /**
     * Retrieves the parameter values asynchronously using the AWS Systems
Manager (SSM) API.
     *
     * @return a {@link CompletableFuture} that holds the response from the SSM
API call to get parameters by path
     */
    public CompletableFuture<GetParametersByPathResponse> getParaValuesAsync() {
        SsmAsyncClient ssmClient = SsmAsyncClient.builder()
            .region(Region.US_EAST_1)
            .build();

        GetParametersByPathRequest parameterRequest =
GetParametersByPathRequest.builder()
            .path("/aws/service/ami-amazon-linux-latest")
            .build();
```

```
        // Create a CompletableFuture to hold the final result.
        CompletableFuture<GetParametersByPathResponse> responseFuture = new
CompletableFuture<>();
        ssmClient.getParametersByPath(parameterRequest)
            .whenComplete((response, exception) -> {
                if (exception != null) {
                    responseFuture.completeExceptionally(new
RuntimeException("Failed to get parameters by path", exception));
                } else {
                    responseFuture.complete(response);
                }
            });

        return responseFuture;
    }


    /**
     * Asynchronously describes the security groups for the specified group ID.
     *
     * @param groupName the name of the security group to describe
     * @return a {@link CompletableFuture} that represents the asynchronous
operation
     *         of describing the security groups. The future will complete with a
     *         {@link DescribeSecurityGroupsResponse} object that contains the
     *         security group information.
     */
    public CompletableFuture<String> describeSecurityGroupArnByNameAsync(String
groupName) {
        DescribeSecurityGroupsRequest request =
DescribeSecurityGroupsRequest.builder()
            .groupNames(groupName)
            .build();

        DescribeSecurityGroupsPublisher paginator =
getAsyncClient().describeSecurityGroupsPaginator(request);
        AtomicReference<String> groupIdRef = new AtomicReference<>();
        return paginator.subscribe(response -> {
            response.securityGroups().stream()
                .filter(securityGroup ->
securityGroup.groupName().equals(groupName))
                .findFirst()
                .ifPresent(securityGroup ->
groupIdRef.set(securityGroup.groupId()));
```

```
        }).thenApply(v -> {
            String groupId = groupIdRef.get();
            if (groupId == null) {
                throw new RuntimeException("No security group found with the
name: " + groupName);
            }
            return groupId;
        }).exceptionally(ex -> {
            logger.info("Failed to describe security group: " + ex.getMessage());
            throw new RuntimeException("Failed to describe security group", ex);
        });
    }

    /**
     * Creates a new security group asynchronously with the specified group name,
description, and VPC ID. It also
     * authorizes inbound traffic on ports 80 and 22 from the specified IP
address.
     *
     * @param groupName    the name of the security group to create
     * @param groupDesc    the description of the security group
     * @param vpcId        the ID of the VPC in which to create the security
group
     * @param myIpAddress  the IP address from which to allow inbound traffic
(e.g., "192.168.1.1/0" to allow traffic from
     *                     any IP address in the 192.168.1.0/24 subnet)
     * @return a CompletableFuture that, when completed, returns the ID of the
created security group
     * @throws RuntimeException if there was a failure creating the security
group or authorizing the inbound traffic
     */
    public CompletableFuture<String> createSecurityGroupAsync(String groupName,
String groupDesc, String vpcId, String myIpAddress) {
        CreateSecurityGroupRequest createRequest =
CreateSecurityGroupRequest.builder()
            .groupName(groupName)
            .description(groupDesc)
            .vpcId(vpcId)
            .build();

        return getAsyncClient().createSecurityGroup(createRequest)
            .thenCompose(createResponse -> {
                String groupId = createResponse.groupId();
                IpRange ipRange = IpRange.builder()
```

```
                    .cidrIp(myIpAddress + "/32")
                    .build();

                IpPermission ipPerm = IpPermission.builder()
                    .ipProtocol("tcp")
                    .toPort(80)
                    .fromPort(80)
                    .ipRanges(ipRange)
                    .build();

                IpPermission ipPerm2 = IpPermission.builder()
                    .ipProtocol("tcp")
                    .toPort(22)
                    .fromPort(22)
                    .ipRanges(ipRange)
                    .build();

                AuthorizeSecurityGroupIngressRequest authRequest =
AuthorizeSecurityGroupIngressRequest.builder()
                    .groupName(groupName)
                    .ipPermissions(ipPerm, ipPerm2)
                    .build();

                return
getAsyncClient().authorizeSecurityGroupIngress(authRequest)
                    .thenApply(authResponse -> groupId);
            })
            .whenComplete((result, exception) -> {
                if (exception != null) {
                    if (exception instanceof CompletionException &&
exception.getCause() instanceof Ec2Exception) {
                        throw (Ec2Exception) exception.getCause();
                    } else {
                        throw new RuntimeException("Failed to create security
group: " + exception.getMessage(), exception);
                    }
                }
            });
    }

    /**
     * Asynchronously describes the key pairs associated with the current AWS
account.
     *
```

```
    * @return a {@link CompletableFuture} containing the {@link
DescribeKeyPairsResponse} object, which provides
    * information about the key pairs.
    */
   public CompletableFuture<DescribeKeyPairsResponse> describeKeysAsync() {
       CompletableFuture<DescribeKeyPairsResponse> responseFuture =
getAsyncClient().describeKeyPairs();
       responseFuture.whenComplete((response, exception) -> {
           if (exception != null) {
             throw new RuntimeException("Failed to describe key pairs: " +
exception.getMessage(), exception);
           }
       });

       return responseFuture;
   }

   /**
    * Creates a new key pair asynchronously.
    *
    * @param keyName the name of the key pair to create
    * @param fileName the name of the file to write the key material to
    * @return a {@link CompletableFuture} that represents the asynchronous
operation
    *         of creating the key pair and writing the key material to a file
    */
   public CompletableFuture<CreateKeyPairResponse> createKeyPairAsync(String
keyName, String fileName) {
       CreateKeyPairRequest request = CreateKeyPairRequest.builder()
           .keyName(keyName)
           .build();

       CompletableFuture<CreateKeyPairResponse> responseFuture =
getAsyncClient().createKeyPair(request);
       responseFuture.whenComplete((response, exception) -> {
           if (response != null) {
               try {
                   BufferedWriter writer = new BufferedWriter(new
FileWriter(fileName));
                   writer.write(response.keyMaterial());
                   writer.close();
               } catch (IOException e) {
                   throw new RuntimeException("Failed to write key material to
file: " + e.getMessage(), e);
```

```
                }
            } else {
                throw new RuntimeException("Failed to create key pair: " +
exception.getMessage(), exception);
            }
        });

        return responseFuture;
    }

    /**
     * Describes the first default VPC asynchronously and using a paginator.
     *
     * @return a {@link CompletableFuture} that, when completed, contains the
first default VPC found.\
     */
    public CompletableFuture<Vpc> describeFirstEC2VpcAsync() {
        Filter myFilter = Filter.builder()
            .name("is-default")
            .values("true")
            .build();

        DescribeVpcsRequest request = DescribeVpcsRequest.builder()
            .filters(myFilter)
            .build();

        DescribeVpcsPublisher paginator =
getAsyncClient().describeVpcsPaginator(request);
        AtomicReference<Vpc> vpcRef = new AtomicReference<>();
        return paginator.subscribe(response -> {
            response.vpcs().stream()
                .findFirst()
                .ifPresent(vpcRef::set);
        }).thenApply(v -> {
            Vpc vpc = vpcRef.get();
            if (vpc == null) {
                throw new RuntimeException("Default VPC not found");
            }
            return vpc;
        }).exceptionally(ex -> {
            logger.info("Failed to describe VPCs: " + ex.getMessage());
            throw new RuntimeException("Failed to describe VPCs", ex);
        });
    }
```

```
   /**
    * Stops the EC2 instance with the specified ID asynchronously and waits for
the instance to stop.
    *
    * @param instanceId the ID of the EC2 instance to stop
    * @return a {@link CompletableFuture} that completes when the instance has
been stopped, or exceptionally if an error occurs
    */
   public CompletableFuture<Void> stopInstanceAsync(String instanceId) {
       StopInstancesRequest stopRequest = StopInstancesRequest.builder()
           .instanceIds(instanceId)
           .build();

       DescribeInstancesRequest describeRequest =
DescribeInstancesRequest.builder()
           .instanceIds(instanceId)
           .build();

       Ec2AsyncWaiter ec2Waiter = Ec2AsyncWaiter.builder()
           .client(getAsyncClient())
           .build();

       CompletableFuture<Void> resultFuture = new CompletableFuture<>();
       logger.info("Stopping instance " + instanceId + " and waiting for it to
stop.");
       getAsyncClient().stopInstances(stopRequest)
           .thenCompose(response -> {
               if (response.stoppingInstances().isEmpty()) {
                   return CompletableFuture.failedFuture(new
RuntimeException("No instances were stopped. Please check the instance ID: " +
instanceId));
               }
               return ec2Waiter.waitUntilInstanceStopped(describeRequest);
           })
           .thenAccept(waiterResponse -> {
               logger.info("Successfully stopped instance " + instanceId);
               resultFuture.complete(null);
           })
           .exceptionally(throwable -> {
               logger.error("Failed to stop instance " + instanceId + ": " +
throwable.getMessage(), throwable);
               resultFuture.completeExceptionally(new RuntimeException("Failed
to stop instance: " + throwable.getMessage(), throwable));
```

```
                return null;
            });

        return resultFuture;
    }

    /**
     * Starts an Amazon EC2 instance asynchronously and waits until it is in the
"running" state.
     *
     * @param instanceId the ID of the instance to start
     * @return a {@link CompletableFuture} that completes when the instance has
been started and is in the "running" state, or exceptionally if an error occurs
     */
    public CompletableFuture<Void> startInstanceAsync(String instanceId) {
        StartInstancesRequest startRequest = StartInstancesRequest.builder()
            .instanceIds(instanceId)
            .build();

        Ec2AsyncWaiter ec2Waiter = Ec2AsyncWaiter.builder()
            .client(getAsyncClient())
            .build();

        DescribeInstancesRequest describeRequest =
DescribeInstancesRequest.builder()
            .instanceIds(instanceId)
            .build();

        logger.info("Starting instance " + instanceId + " and waiting for it to
run.");
        CompletableFuture<Void> resultFuture = new CompletableFuture<>();
        return getAsyncClient().startInstances(startRequest)
            .thenCompose(response ->
                ec2Waiter.waitUntilInstanceRunning(describeRequest)
            )
            .thenAccept(waiterResponse -> {
                logger.info("Successfully started instance " + instanceId);
                resultFuture.complete(null);
            })
            .exceptionally(throwable -> {
                resultFuture.completeExceptionally(new RuntimeException("Failed
to start instance: " + throwable.getMessage(), throwable));
                return null;
            });
```

```
    }

}
```

- Untuk API detailnya, lihat topik berikut di AWS SDK for Java 2.x APIReferensi.
  - AllocateAddress
  - AssociateAddress
  - AuthorizeSecurityGroupIngress
  - CreateKeyPair
  - CreateSecurityGroup
  - DeleteKeyPair
  - DeleteSecurityGroup
  - DescribeImages
  - DescribeInstanceTypes
  - DescribeInstances
  - DescribeKeyPairs
  - DescribeSecurityGroups
  - DisassociateAddress
  - ReleaseAddress
  - RunInstances
  - StartInstances
  - StopInstances
  - TerminateInstances
  - UnmonitorInstances

JavaScript

SDKuntuk JavaScript (v3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

File ini berisi daftar tindakan umum yang digunakanEC2. Langkah-langkah dibangun dengan kerangka Skenario yang menyederhanakan menjalankan contoh interaktif. Untuk konteks lengkap, kunjungi GitHub repositori.

```
import { tmpdir } from "node:os";
import { writeFile, mkdtemp, rm } from "node:fs/promises";
import { join } from "node:path";
import { get } from "node:http";

import {
  AllocateAddressCommand,
  AssociateAddressCommand,
  AuthorizeSecurityGroupIngressCommand,
  CreateKeyPairCommand,
  CreateSecurityGroupCommand,
  DeleteKeyPairCommand,
  DeleteSecurityGroupCommand,
  DisassociateAddressCommand,
  paginateDescribeImages,
  paginateDescribeInstances,
  paginateDescribeInstanceTypes,
  ReleaseAddressCommand,
  RunInstancesCommand,
  StartInstancesCommand,
  StopInstancesCommand,
  TerminateInstancesCommand,
  waitUntilInstanceStatusOk,
  waitUntilInstanceStopped,
  waitUntilInstanceTerminated,
} from "@aws-sdk/client-ec2";

import {
```

```
  ScenarioAction,
  ScenarioInput,
  ScenarioOutput,
} from "@aws-doc-sdk-examples/lib/scenario/index.js";

import { paginateGetParametersByPath, SSMClient } from "@aws-sdk/client-ssm";

/**
 * @typedef {{
 *   ec2Client: import('@aws-sdk/client-ec2').EC2Client,
 *   errors: Error[],
 *   keyPairId?: string,
 *   tmpDirectory?: string,
 *   securityGroupId?: string,
 *   ipAddress?: string,
 *   images?: import('@aws-sdk/client-ec2').Image[],
 *   image?: import('@aws-sdk/client-ec2').Image,
 *   instanceTypes?: import('@aws-sdk/client-ec2').InstanceTypeInfo[],
 *   instanceId?: string,
 *   instanceIpAddress?: string,
 *   allocationId?: string,
 *   allocatedIpAddress?: string,
 *   associationId?: string,
 * }} State
 */

/**
 * A skip function provided to the `skipWhen` of a Step when you want
 * to ignore that step if any errors have occurred.
 * @param {State} state
 */
const skipWhenErrors = (state) => state.errors.length > 0;

const MAX_WAITER_TIME_IN_SECONDS = 60 * 8;

export const confirm = new ScenarioInput("confirmContinue", "Continue?", {
  type: "confirm",
  skipWhen: skipWhenErrors,
});

export const exitOnNoConfirm = new ScenarioAction(
  "exitOnConfirmContinueFalse",
  (/** @type { { earlyExit: boolean } & Record<string, any>} */ state) => {
    if (!state[confirm.name]) {
```

```
      state.earlyExit = true;
    }
  },
  {
    skipWhen: skipWhenErrors,
  },
);

export const greeting = new ScenarioOutput(
  "greeting",
  `

Welcome to the Amazon EC2 basic usage scenario.

Before you launch an instances, you'll need to provide a few things:
 - A key pair - This is for SSH access to your EC2 instance. You only need to
 provide the name.
 - A security group - This is used for configuring access to your instance.
 Again, only the name is needed.
 - An IP address - Your public IP address will be fetched.
 - An Amazon Machine Image (AMI)
 - A compatible instance type`,
  { header: true, preformatted: true, skipWhen: skipWhenErrors },
);

export const provideKeyPairName = new ScenarioInput(
  "keyPairName",
  "Provide a name for a new key pair.",
  { type: "input", default: "ec2-example-key-pair", skipWhen: skipWhenErrors },
);

export const createKeyPair = new ScenarioAction(
  "createKeyPair",
  async (/** @type {State} */ state) => {
    try {
      // Create a key pair in Amazon EC2.
      const { KeyMaterial, KeyPairId } = await state.ec2Client.send(
        // A unique name for the key pair. Up to 255 ASCII characters.
        new CreateKeyPairCommand({ KeyName: state[provideKeyPairName.name] }),
      );

      state.keyPairId = KeyPairId;

      // Save the private key in a temporary location.
```

```
      state.tmpDirectory = await mkdtemp(join(tmpdir(), "ec2-scenario-tmp"));
      await writeFile(
        `${state.tmpDirectory}/${state[provideKeyPairName.name]}.pem`,
        KeyMaterial,
        {
          mode: 0o400,
        },
      );
    } catch (caught) {
      if (
        caught instanceof Error &&
        caught.name === "InvalidKeyPair.Duplicate"
      ) {
        caught.message = `${caught.message}. Try another key name.`;
      }

      state.errors.push(caught);
    }
  },
  { skipWhen: skipWhenErrors },
);

export const logKeyPair = new ScenarioOutput(
  "logKeyPair",
  (/** @type {State} */ state) =>
    `Created the key pair ${state[provideKeyPairName.name]}.`,
  { skipWhen: skipWhenErrors },
);

export const confirmDeleteKeyPair = new ScenarioInput(
  "confirmDeleteKeyPair",
  "Do you want to delete the key pair?",
  {
    type: "confirm",
    // Don't do anything when a key pair was never created.
    skipWhen: (/** @type {State} */ state) => !state.keyPairId,
  },
);

export const maybeDeleteKeyPair = new ScenarioAction(
  "deleteKeyPair",
  async (/** @type {State} */ state) => {
    try {
      // Delete a key pair by name from EC2
```

```
      await state.ec2Client.send(
        new DeleteKeyPairCommand({ KeyName: state[provideKeyPairName.name] }),
      );
    } catch (caught) {
      if (
        caught instanceof Error &&
        // Occurs when a required parameter (e.g. KeyName) is undefined.
        caught.name === "MissingParameter"
      ) {
        caught.message = `${caught.message}. Did you provide the required value?
`;
      }
      state.errors.push(caught);
    }
  },
  {
    // Don't do anything when there's no key pair to delete or the user chooses
    // to keep it.
    skipWhen: (/** @type {State} */ state) =>
      !state.keyPairId || !state[confirmDeleteKeyPair.name],
  },
);

export const provideSecurityGroupName = new ScenarioInput(
  "securityGroupName",
  "Provide a name for a new security group.",
  { type: "input", default: "ec2-scenario-sg", skipWhen: skipWhenErrors },
);

export const createSecurityGroup = new ScenarioAction(
  "createSecurityGroup",
  async (/** @type {State} */ state) => {
    try {
      // Create a new security group that will be used to configure ingress/
egress for
      // an EC2 instance.
      const { GroupId } = await state.ec2Client.send(
        new CreateSecurityGroupCommand({
          GroupName: state[provideSecurityGroupName.name],
          Description: "A security group for the Amazon EC2 example.",
        }),
      );
      state.securityGroupId = GroupId;
    } catch (caught) {
```

```
      if (caught instanceof Error && caught.name === "InvalidGroup.Duplicate") {
        caught.message = `${caught.message}. Please provide a different name for
 your security group.`;
      }

      state.errors.push(caught);
    }
  },
  { skipWhen: skipWhenErrors },
);

export const logSecurityGroup = new ScenarioOutput(
  "logSecurityGroup",
  (/** @type {State} */ state) =>
    `Created the security group ${state.securityGroupId}.`,
  { skipWhen: skipWhenErrors },
);

export const confirmDeleteSecurityGroup = new ScenarioInput(
  "confirmDeleteSecurityGroup",
  "Do you want to delete the security group?",
  {
    type: "confirm",
    // Don't do anything when a security group was never created.
    skipWhen: (/** @type {State} */ state) => !state.securityGroupId,
  },
);

export const maybeDeleteSecurityGroup = new ScenarioAction(
  "deleteSecurityGroup",
  async (/** @type {State} */ state) => {
    try {
      // Delete the security group if the 'skipWhen' condition below is not met.
      await state.ec2Client.send(
        new DeleteSecurityGroupCommand({
          GroupId: state.securityGroupId,
        }),
      );
    } catch (caught) {
      if (
        caught instanceof Error &&
        caught.name === "InvalidGroupId.Malformed"
      ) {
        caught.message = `${caught.message}. Please provide a valid GroupId.`;
```

```
      }
      state.errors.push(caught);
    }
  },
  {
    // Don't do anything when there's no security group to delete
    // or the user chooses to keep it.
    skipWhen: (/** @type {State} */ state) =>
      !state.securityGroupId || !state[confirmDeleteSecurityGroup.name],
  },
);

export const authorizeSecurityGroupIngress = new ScenarioAction(
  "authorizeSecurity",
  async (/** @type {State} */ state) => {
    try {
      // Get the public IP address of the machine running this example.
      const ipAddress = await new Promise((res, rej) => {
        get("http://checkip.amazonaws.com", (response) => {
          let data = "";
          response.on("data", (chunk) => {
            data += chunk;
          });
          response.on("end", () => res(data.trim()));
        }).on("error", (err) => {
          rej(err);
        });
      });
      state.ipAddress = ipAddress;
      // Allow ingress from the IP address above to the security group.
      // This will allow you to SSH into the EC2 instance.
      const command = new AuthorizeSecurityGroupIngressCommand({
        GroupId: state.securityGroupId,
        IpPermissions: [
          {
            IpProtocol: "tcp",
            FromPort: 22,
            ToPort: 22,
            IpRanges: [{ CidrIp: `${ipAddress}/32` }],
          },
        ],
      });

      await state.ec2Client.send(command);
```

```
    } catch (caught) {
      if (
        caught instanceof Error &&
        caught.name === "InvalidGroupId.Malformed"
      ) {
        caught.message = `${caught.message}. Please provide a valid GroupId.`;
      }

      state.errors.push(caught);
    }
  },
  { skipWhen: skipWhenErrors },
);

export const logSecurityGroupIngress = new ScenarioOutput(
  "logSecurityGroupIngress",
  (/** @type {State} */ state) =>
    `Allowed SSH access from your public IP: ${state.ipAddress}.`,
  { skipWhen: skipWhenErrors },
);

export const getImages = new ScenarioAction(
  "images",
  async (/** @type {State} */ state) => {
    const AMIs = [];
    // Some AWS services publish information about common artifacts as AWS
 Systems Manager (SSM)
    // public parameters. For example, the Amazon Elastic Compute Cloud (Amazon
 EC2)
    // service publishes information about Amazon Machine Images (AMIs) as public
 parameters.

    // Create the paginator for getting images. Actions that return multiple
 pages of
    // results have paginators to simplify those calls.
    const getParametersByPathPaginator = paginateGetParametersByPath(
      {
        // Not storing this client in state since it's only used once.
        client: new SSMClient({}),
      },
      {
        // The path to the public list of the latest amazon-linux instances.
        Path: "/aws/service/ami-amazon-linux-latest",
      },
```

```
    );

    try {
      for await (const page of getParametersByPathPaginator) {
        for (const param of page.Parameters) {
          // Filter by Amazon Linux 2
          if (param.Name.includes("amzn2")) {
            AMIs.push(param.Value);
          }
        }
      }
    } catch (caught) {
      if (caught instanceof Error && caught.name === "InvalidFilterValue") {
        caught.message = `${caught.message} Please provide a valid filter value
for paginateGetParametersByPath.`;
      }
      state.errors.push(caught);
      return;
    }

    const imageDetails = [];
    const describeImagesPaginator = paginateDescribeImages(
      { client: state.ec2Client },
      // The images found from the call to SSM.
      { ImageIds: AMIs },
    );

    try {
      // Get more details for the images found above.
      for await (const page of describeImagesPaginator) {
        imageDetails.push(...(page.Images || []));
      }

      // Store the image details for later use.
      state.images = imageDetails;
    } catch (caught) {
      if (caught instanceof Error && caught.name === "InvalidAMIID.NotFound") {
        caught.message = `${caught.message}. Please provide a valid image id.`;
      }

      state.errors.push(caught);
    }
  },
  { skipWhen: skipWhenErrors },
```

```
);

export const provideImage = new ScenarioInput(
  "image",
  "Select one of the following images.",
  {
    type: "select",
    choices: (/** @type { State } */ state) =>
      state.images.map((image) => ({
        name: `${image.Description}`,
        value: image,
      })),
    default: (/** @type { State } */ state) => state.images[0],
    skipWhen: skipWhenErrors,
  },
);

export const getCompatibleInstanceTypes = new ScenarioAction(
  "getCompatibleInstanceTypes",
  async (/** @type {State} */ state) => {
    // Get more details about instance types that match the architecture of
    // the provided image.
    const paginator = paginateDescribeInstanceTypes(
      { client: state.ec2Client, pageSize: 25 },
      {
        Filters: [
          {
            Name: "processor-info.supported-architecture",
            // The value selected from provideImage()
            Values: [state.image.Architecture],
          },
          // Filter for smaller, less expensive, types.
          { Name: "instance-type", Values: ["*.micro", "*.small"] },
        ],
      },
    );

    const instanceTypes = [];

    try {
      for await (const page of paginator) {
        if (page.InstanceTypes.length) {
          instanceTypes.push(...(page.InstanceTypes || []));
        }
```

```
      }

      if (!instanceTypes.length) {
        state.errors.push(
          "No instance types matched the instance type filters.",
        );
      }
    } catch (caught) {
      if (caught instanceof Error && caught.name === "InvalidParameterValue") {
        caught.message = `${caught.message}. Please check the provided values and
 try again.`;
      }

      state.errors.push(caught);
    }

    state.instanceTypes = instanceTypes;
  },
  { skipWhen: skipWhenErrors },
);

export const provideInstanceType = new ScenarioInput(
  "instanceType",
  "Select an instance type.",
  {
    choices: (/** @type {State} */ state) =>
      state.instanceTypes.map((instanceType) => ({
        name: `${instanceType.InstanceType} - Memory:
${instanceType.MemoryInfo.SizeInMiB}`,
        value: instanceType.InstanceType,
      })),
    type: "select",
    default: (/** @type {State} */ state) =>
      state.instanceTypes[0].InstanceType,
    skipWhen: skipWhenErrors,
  },
);

export const runInstance = new ScenarioAction(
  "runInstance",
  async (/** @type { State } */ state) => {
    const { Instances } = await state.ec2Client.send(
      new RunInstancesCommand({
        KeyName: state[provideKeyPairName.name],
```

```
        SecurityGroupIds: [state.securityGroupId],
        ImageId: state.image.ImageId,
        InstanceType: state[provideInstanceType.name],
        // Availability Zones have capacity limitations that may impact your
 ability to launch instances.
        // The `RunInstances` operation will only succeed if it can allocate at
 least the `MinCount` of instances.
        // However, EC2 will attempt to launch up to the `MaxCount` of instances,
 even if the full request cannot be satisfied.
        // If you need a specific number of instances, use `MinCount` and
 `MaxCount` set to the same value.
        // If you want to launch up to a certain number of instances, use
 `MaxCount` and let EC2 provision as many as possible.
        // If you require a minimum number of instances, but do not want to
 exceed a maximum, use both `MinCount` and `MaxCount`.
        MinCount: 1,
        MaxCount: 1,
      }),
    );

    state.instanceId = Instances[0].InstanceId;

    try {
      // Poll `DescribeInstanceStatus` until status is "ok".
      await waitUntilInstanceStatusOk(
        {
          client: state.ec2Client,
          maxWaitTime: MAX_WAITER_TIME_IN_SECONDS,
        },
        { InstanceIds: [Instances[0].InstanceId] },
      );
    } catch (caught) {
      if (caught instanceof Error && caught.name === "TimeoutError") {
        caught.message = `${caught.message}. Try increasing the maxWaitTime in
 the waiter.`;
      }

      state.errors.push(caught);
    }
  },
  { skipWhen: skipWhenErrors },
);

export const logRunInstance = new ScenarioOutput(
```

```
  "logRunInstance",
  "The next step is to run your EC2 instance for the first time. This can take a
 few minutes.",
  { header: true, skipWhen: skipWhenErrors },
);

export const describeInstance = new ScenarioAction(
  "describeInstance",
  async (/** @type { State } */ state) => {
    /** @type { import("@aws-sdk/client-ec2").Instance[] } */
    const instances = [];

    try {
      const paginator = paginateDescribeInstances(
        {
          client: state.ec2Client,
        },
        {
          // Only get our created instance.
          InstanceIds: [state.instanceId],
        },
      );

      for await (const page of paginator) {
        for (const reservation of page.Reservations) {
          instances.push(...reservation.Instances);
        }
      }
      if (instances.length !== 1) {
        throw new Error(`Instance ${state.instanceId} not found.`);
      }

      // The only info we need is the IP address for SSH purposes.
      state.instanceIpAddress = instances[0].PublicIpAddress;
    } catch (caught) {
      if (caught instanceof Error && caught.name === "InvalidParameterValue") {
        caught.message = `${caught.message}. Please check provided values and try
 again.`;
      }

      state.errors.push(caught);
    }
  },
  { skipWhen: skipWhenErrors },
```

```
);

export const logSSHConnectionInfo = new ScenarioOutput(
  "logSSHConnectionInfo",
  (/** @type { State } */ state) =>
    `You can now SSH into your instance using the following command:
ssh -i ${state.tmpDirectory}/${state[provideKeyPairName.name]}.pem ec2-user@
${state.instanceIpAddress}`,
  { preformatted: true, skipWhen: skipWhenErrors },
);

export const logStopInstance = new ScenarioOutput(
  "logStopInstance",
  "Stopping your EC2 instance.",
  { skipWhen: skipWhenErrors },
);

export const stopInstance = new ScenarioAction(
  "stopInstance",
  async (/** @type { State } */ state) => {
    try {
      await state.ec2Client.send(
        new StopInstancesCommand({
          InstanceIds: [state.instanceId],
        }),
      );

      await waitUntilInstanceStopped(
        {
          client: state.ec2Client,
          maxWaitTime: MAX_WAITER_TIME_IN_SECONDS,
        },
        { InstanceIds: [state.instanceId] },
      );
    } catch (caught) {
      if (caught instanceof Error && caught.name === "TimeoutError") {
        caught.message = `${caught.message}. Try increasing the maxWaitTime in
 the waiter.`;
      }

      state.errors.push(caught);
    }
  },
  // Don't try to stop an instance that doesn't exist.
```

```
  { skipWhen: (/** @type { State } */ state) => !state.instanceId },
);

export const logIpAddressBehavior = new ScenarioOutput(
  "logIpAddressBehavior",
  [
    "When you run an instance, by default it's assigned an IP address.",
    "That IP address is not static. It will change every time the instance is
 restarted.",
    "The next step is to stop and restart your instance to demonstrate this
 behavior.",
  ].join(" "),
  { header: true, skipWhen: skipWhenErrors },
);

export const logStartInstance = new ScenarioOutput(
  "logStartInstance",
  (/** @type { State } */ state) => `Starting instance ${state.instanceId}`,
  { skipWhen: skipWhenErrors },
);

export const startInstance = new ScenarioAction(
  "startInstance",
  async (/** @type { State } */ state) => {
    try {
      await state.ec2Client.send(
        new StartInstancesCommand({
          InstanceIds: [state.instanceId],
        }),
      );

      await waitUntilInstanceStatusOk(
        {
          client: state.ec2Client,
          maxWaitTime: MAX_WAITER_TIME_IN_SECONDS,
        },
        { InstanceIds: [state.instanceId] },
      );
    } catch (caught) {
      if (caught instanceof Error && caught.name === "TimeoutError") {
        caught.message = `${caught.message}. Try increasing the maxWaitTime in
 the waiter.`;
      }
```

```
      state.errors.push(caught);
    }
  },
  { skipWhen: skipWhenErrors },
);

export const logIpAllocation = new ScenarioOutput(
  "logIpAllocation",
  [
    "It is possible to have a static IP address.",
    "To demonstrate this, an IP will be allocated and associated to your EC2
 instance.",
  ].join(" "),
  { header: true, skipWhen: skipWhenErrors },
);

export const allocateIp = new ScenarioAction(
  "allocateIp",
  async (/** @type { State } */ state) => {
    try {
      // An Elastic IP address is allocated to your AWS account, and is yours
 until you release it.
      const { AllocationId, PublicIp } = await state.ec2Client.send(
        new AllocateAddressCommand({}),
      );
      state.allocationId = AllocationId;
      state.allocatedIpAddress = PublicIp;
    } catch (caught) {
      if (caught instanceof Error && caught.name === "MissingParameter") {
        caught.message = `${caught.message}. Did you provide these values?`;
      }
      state.errors.push(caught);
    }
  },
  { skipWhen: skipWhenErrors },
);

export const associateIp = new ScenarioAction(
  "associateIp",
  async (/** @type { State } */ state) => {
    try {
      // Associate an allocated IP address to an EC2 instance. An IP address can
 be allocated
      // with the AllocateAddress action.
```

```
      const { AssociationId } = await state.ec2Client.send(
        new AssociateAddressCommand({
          AllocationId: state.allocationId,
          InstanceId: state.instanceId,
        }),
      );
      state.associationId = AssociationId;
      // Update the IP address that is being tracked to match
      // the one just associated.
      state.instanceIpAddress = state.allocatedIpAddress;
    } catch (caught) {
      if (
        caught instanceof Error &&
        caught.name === "InvalidAllocationID.NotFound"
      ) {
        caught.message = `${caught.message}. Did you provide the ID of a valid
 Elastic IP address AllocationId?`;
      }
      state.errors.push(caught);
    }
  },
  { skipWhen: skipWhenErrors },
);

export const logStaticIpProof = new ScenarioOutput(
  "logStaticIpProof",
  "The IP address should remain the same even after stopping and starting the
 instance.",
  { header: true, skipWhen: skipWhenErrors },
);

export const logCleanUp = new ScenarioOutput(
  "logCleanUp",
  "That's it! You can choose to clean up the resources now, or clean them up on
 your own later.",
  { header: true, skipWhen: skipWhenErrors },
);

export const confirmDisassociateAddress = new ScenarioInput(
  "confirmDisassociateAddress",
  "Do you want to disassociate and release the static IP address created
 earlier?",
  {
    type: "confirm",
```

```
    skipWhen: (/** @type { State } */ state) => !state.associationId,
  },
);

export const maybeDisassociateAddress = new ScenarioAction(
  "maybeDisassociateAddress",
  async (/** @type { State } */ state) => {
    try {
      await state.ec2Client.send(
        new DisassociateAddressCommand({
          AssociationId: state.associationId,
        }),
      );
    } catch (caught) {
      if (
        caught instanceof Error &&
        caught.name === "InvalidAssociationID.NotFound"
      ) {
        caught.message = `${caught.message}. Please provide a valid association
 ID.`;
      }
      state.errors.push(caught);
    }
  },
  {
    skipWhen: (/** @type { State } */ state) =>
      !state[confirmDisassociateAddress.name] || !state.associationId,
  },
);

export const maybeReleaseAddress = new ScenarioAction(
  "maybeReleaseAddress",
  async (/** @type { State } */ state) => {
    try {
      await state.ec2Client.send(
        new ReleaseAddressCommand({
          AllocationId: state.allocationId,
        }),
      );
    } catch (caught) {
      if (
        caught instanceof Error &&
        caught.name === "InvalidAllocationID.NotFound"
      ) {
```

```
        caught.message = `${caught.message}. Please provide a valid
 AllocationID.`;
      }
      state.errors.push(caught);
    }
  },
  {
    skipWhen: (/** @type { State } */ state) =>
      !state[confirmDisassociateAddress.name] || !state.allocationId,
  },
);

export const confirmTerminateInstance = new ScenarioInput(
  "confirmTerminateInstance",
  "Do you want to terminate the instance?",
  // Don't do anything when an instance was never run.
  {
    skipWhen: (/** @type { State } */ state) => !state.instanceId,
    type: "confirm",
  },
);

export const maybeTerminateInstance = new ScenarioAction(
  "terminateInstance",
  async (/** @type { State } */ state) => {
    try {
      await state.ec2Client.send(
        new TerminateInstancesCommand({
          InstanceIds: [state.instanceId],
        }),
      );
      await waitUntilInstanceTerminated(
        { client: state.ec2Client },
        { InstanceIds: [state.instanceId] },
      );
    } catch (caught) {
      if (caught instanceof Error && caught.name === "TimeoutError") {
        caught.message = `${caught.message}. Try increasing the maxWaitTime in
 the waiter.`;
      }

      state.errors.push(caught);
    }
  },
```

```
  {
    // Don't do anything when there's no instance to terminate or the
    // use chooses not to terminate.
    skipWhen: (/** @type { State } */ state) =>
      !state.instanceId || !state[confirmTerminateInstance.name],
  },
);

export const deleteTemporaryDirectory = new ScenarioAction(
  "deleteTemporaryDirectory",
  async (/** @type { State } */ state) => {
    try {
      await rm(state.tmpDirectory, { recursive: true });
    } catch (caught) {
      state.errors.push(caught);
    }
  },
);

export const logErrors = new ScenarioOutput(
  "logErrors",
  (/** @type {State}*/ state) => {
    const errorList = state.errors
      .map((err) => ` - ${err.name}: ${err.message}`)
      .join("\n");
    return `Scenario errors found:\n${errorList}`;
  },
  {
    preformatted: true,
    header: true,
    // Don't log errors when there aren't any!
    skipWhen: (/** @type {State} */ state) => state.errors.length === 0,
  },
);
```

- Untuk API detailnya, lihat topik berikut di AWS SDK for JavaScript APIReferensi.
  - AllocateAddress
  - AssociateAddress
  - AuthorizeSecurityGroupIngress
  - CreateKeyPair

- CreateSecurityGroup
- DeleteKeyPair
- DeleteSecurityGroup
- DescribeImages
- DescribeInstanceTypes
- DescribeInstances
- DescribeKeyPairs
- DescribeSecurityGroups
- DisassociateAddress
- ReleaseAddress
- RunInstances
- StartInstances
- StopInstances
- TerminateInstances
- UnmonitorInstances

Kotlin

SDKuntuk Kotlin

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
/**
 Before running this Kotlin code example, set up your development environment,
 including your credentials.

 For more information, see the following documentation topic:
 https://docs.aws.amazon.com/sdk-for-kotlin/latest/developer-guide/setup.html

 This Kotlin example performs the following tasks:
```

```
 1. Creates an RSA key pair and saves the private key data as a .pem file.
 2. Lists key pairs.
 3. Creates a security group for the default VPC.
 4. Displays security group information.
 5. Gets a list of Amazon Linux 2 AMIs and selects one.
 6. Gets more information about the image.
 7. Gets a list of instance types that are compatible with the selected AMI's
 architecture.
 8. Creates an instance with the key pair, security group, AMI, and an instance
 type.
 9. Displays information about the instance.
 10. Stops the instance and waits for it to stop.
 11. Starts the instance and waits for it to start.
 12. Allocates an Elastic IP address and associates it with the instance.
 13. Displays SSH connection info for the instance.
 14. Disassociates and deletes the Elastic IP address.
 15. Terminates the instance.
 16. Deletes the security group.
 17. Deletes the key pair.
 */

val DASHES = String(CharArray(80)).replace("\u0000", "-")

suspend fun main(args: Array<String>) {
    val usage = """
        Usage:
            <keyName> <fileName> <groupName> <groupDesc> <vpcId> <myIpAddress>

        Where:
            keyName - A key pair name (for example, TestKeyPair).
            fileName - A file name where the key information is written to.
            groupName - The name of the security group.
            groupDesc - The description of the security group.
            vpcId - A VPC ID. You can get this value from the AWS Management
 Console.
            myIpAddress - The IP address of your development machine.

"""

    if (args.size != 6) {
        println(usage)
        exitProcess(0)
    }
```

```
    val keyName = args[0]
    val fileName = args[1]
    val groupName = args[2]
    val groupDesc = args[3]
    val vpcId = args[4]
    val myIpAddress = args[5]
    var newInstanceId: String? = ""

    println(DASHES)
    println("Welcome to the Amazon EC2 example scenario.")
    println(DASHES)

    println(DASHES)
    println("1. Create an RSA key pair and save the private key material as
a .pem file.")
    createKeyPairSc(keyName, fileName)
    println(DASHES)

    println(DASHES)
    println("2. List key pairs.")
    describeEC2KeysSc()
    println(DASHES)

    println(DASHES)
    println("3. Create a security group.")
    val groupId = createEC2SecurityGroupSc(groupName, groupDesc, vpcId,
myIpAddress)
    println(DASHES)

    println(DASHES)
    println("4. Display security group info for the newly created security
group.")
    describeSecurityGroupsSc(groupId.toString())
    println(DASHES)

    println(DASHES)
    println("5. Get a list of Amazon Linux 2 AMIs and select one with amzn2 in
the name.")
    val instanceId = getParaValuesSc()
    if (instanceId == "") {
        println("The instance Id value isn't valid.")
        exitProcess(0)
    }
```

```
    println("The instance Id is $instanceId.")
    println(DASHES)

    println(DASHES)
    println("6. Get more information about an amzn2 image and return the AMI
value.")
    val amiValue = instanceId?.let { describeImageSc(it) }
    if (instanceId == "") {
        println("The instance Id value is invalid.")
        exitProcess(0)
    }
    println("The AMI value is $amiValue.")
    println(DASHES)

    println(DASHES)
    println("7. Get a list of instance types.")
    val instanceType = getInstanceTypesSc()
    println(DASHES)

    println(DASHES)
    println("8. Create an instance.")
    if (amiValue != null) {
        newInstanceId = runInstanceSc(instanceType, keyName, groupName, amiValue)
        println("The instance Id is $newInstanceId")
    }
    println(DASHES)

    println(DASHES)
    println("9. Display information about the running instance. ")
    var ipAddress = describeEC2InstancesSc(newInstanceId)
    println("You can SSH to the instance using this command:")
    println("ssh -i " + fileName + "ec2-user@" + ipAddress)
    println(DASHES)

    println(DASHES)
    println("10.  Stop the instance.")
    if (newInstanceId != null) {
        stopInstanceSc(newInstanceId)
    }
    println(DASHES)

    println(DASHES)
    println("11.  Start the instance.")
    if (newInstanceId != null) {
```

```
        startInstanceSc(newInstanceId)
    }
    ipAddress = describeEC2InstancesSc(newInstanceId)
    println("You can SSH to the instance using this command:")
    println("ssh -i " + fileName + "ec2-user@" + ipAddress)
    println(DASHES)

    println(DASHES)
    println("12. Allocate an Elastic IP address and associate it with the
instance.")
    val allocationId = allocateAddressSc()
    println("The allocation Id value is $allocationId")
    val associationId = associateAddressSc(newInstanceId, allocationId)
    println("The associate Id value is $associationId")
    println(DASHES)

    println(DASHES)
    println("13. Describe the instance again.")
    ipAddress = describeEC2InstancesSc(newInstanceId)
    println("You can SSH to the instance using this command:")
    println("ssh -i " + fileName + "ec2-user@" + ipAddress)
    println(DASHES)

    println(DASHES)
    println("14. Disassociate and release the Elastic IP address.")
    disassociateAddressSc(associationId)
    releaseEC2AddressSc(allocationId)
    println(DASHES)

    println(DASHES)
    println("15. Terminate the instance and use a waiter.")
    if (newInstanceId != null) {
        terminateEC2Sc(newInstanceId)
    }
    println(DASHES)

    println(DASHES)
    println("16. Delete the security group.")
    if (groupId != null) {
        deleteEC2SecGroupSc(groupId)
    }
    println(DASHES)

    println(DASHES)
```

```
    println("17. Delete the key pair.")
    deleteKeysSc(keyName)
    println(DASHES)

    println(DASHES)
    println("You successfully completed the Amazon EC2 scenario.")
    println(DASHES)
}

suspend fun deleteKeysSc(keyPair: String) {
    val request =
        DeleteKeyPairRequest {
            keyName = keyPair
        }
    Ec2Client { region = "us-west-2" }.use { ec2 ->
        ec2.deleteKeyPair(request)
        println("Successfully deleted key pair named $keyPair")
    }
}

suspend fun deleteEC2SecGroupSc(groupIdVal: String) {
    val request =
        DeleteSecurityGroupRequest {
            groupId = groupIdVal
        }
    Ec2Client { region = "us-west-2" }.use { ec2 ->
        ec2.deleteSecurityGroup(request)
        println("Successfully deleted security group with Id $groupIdVal")
    }
}

suspend fun terminateEC2Sc(instanceIdVal: String) {
    val ti =
        TerminateInstancesRequest {
            instanceIds = listOf(instanceIdVal)
        }
    println("Wait for the instance to terminate. This will take a few minutes.")
    Ec2Client { region = "us-west-2" }.use { ec2 ->
        ec2.terminateInstances(ti)
        ec2.waitUntilInstanceTerminated {
            // suspend call
            instanceIds = listOf(instanceIdVal)
        }
        println("$instanceIdVal is terminated!")
```

```
    }
}

suspend fun releaseEC2AddressSc(allocId: String?) {
    val request =
        ReleaseAddressRequest {
            allocationId = allocId
        }

    Ec2Client { region = "us-west-2" }.use { ec2 ->
        ec2.releaseAddress(request)
        println("Successfully released Elastic IP address $allocId")
    }
}

suspend fun disassociateAddressSc(associationIdVal: String?) {
    val addressRequest =
        DisassociateAddressRequest {
            associationId = associationIdVal
        }
    Ec2Client { region = "us-west-2" }.use { ec2 ->
        ec2.disassociateAddress(addressRequest)
        println("You successfully disassociated the address!")
    }
}

suspend fun associateAddressSc(
    instanceIdVal: String?,
    allocationIdVal: String?,
): String? {
    val associateRequest =
        AssociateAddressRequest {
            instanceId = instanceIdVal
            allocationId = allocationIdVal
        }

    Ec2Client { region = "us-west-2" }.use { ec2 ->
        val associateResponse = ec2.associateAddress(associateRequest)
        return associateResponse.associationId
    }
}

suspend fun allocateAddressSc(): String? {
    val allocateRequest =
```

```
        AllocateAddressRequest {
            domain = DomainType.Vpc
        }
    Ec2Client { region = "us-west-2" }.use { ec2 ->
        val allocateResponse = ec2.allocateAddress(allocateRequest)
        return allocateResponse.allocationId
    }
}

suspend fun startInstanceSc(instanceId: String) {
    val request =
        StartInstancesRequest {
            instanceIds = listOf(instanceId)
        }

    Ec2Client { region = "us-west-2" }.use { ec2 ->
        ec2.startInstances(request)
        println("Waiting until instance $instanceId starts. This will take a few
 minutes.")
        ec2.waitUntilInstanceRunning {
            // suspend call
            instanceIds = listOf(instanceId)
        }
        println("Successfully started instance $instanceId")
    }
}

suspend fun stopInstanceSc(instanceId: String) {
    val request =
        StopInstancesRequest {
            instanceIds = listOf(instanceId)
        }

    Ec2Client { region = "us-west-2" }.use { ec2 ->
        ec2.stopInstances(request)
        println("Waiting until instance $instanceId stops. This will take a few
 minutes.")
        ec2.waitUntilInstanceStopped {
            // suspend call
            instanceIds = listOf(instanceId)
        }
        println("Successfully stopped instance $instanceId")
    }
}
```

```
suspend fun describeEC2InstancesSc(newInstanceId: String?): String {
    var pubAddress = ""
    var isRunning = false
    val request =
        DescribeInstancesRequest {
            instanceIds = listOf(newInstanceId.toString())
        }

    while (!isRunning) {
        Ec2Client { region = "us-west-2" }.use { ec2 ->
            val response = ec2.describeInstances(request)
            val state =
                response.reservations
                    ?.get(0)
                    ?.instances
                    ?.get(0)
                    ?.state
                    ?.name
                    ?. value
            if (state != null) {
                if (state.compareTo("running") == 0) {
                    println("Image id is
 ${response.reservations!!.get(0).instances?.get(0)?.imageId}")
                    println("Instance type is
 ${response.reservations!!.get(0).instances?.get(0)?.instanceType}")
                    println("Instance state is
 ${response.reservations!!.get(0).instances?.get(0)?.state}")
                    pubAddress =
                        response.reservations!!
                            .get(0)
                            .instances
                            ?.get(0)
                            ?.publicIpAddress
                            .toString()
                    println("Instance address is $pubAddress")
                    isRunning = true
                }
            }
        }
    }
    return pubAddress
}
```

```
suspend fun runInstanceSc(
    instanceTypeVal: String,
    keyNameVal: String,
    groupNameVal: String,
    amiIdVal: String,
): String {
    val runRequest =
        RunInstancesRequest {
            instanceType = InstanceType.fromValue(instanceTypeVal)
            keyName = keyNameVal
            securityGroups = listOf(groupNameVal)
            maxCount = 1
            minCount = 1
            imageId = amiIdVal
        }

    Ec2Client { region = "us-west-2" }.use { ec2 ->
        val response = ec2.runInstances(runRequest)
        val instanceId = response.instances?.get(0)?.instanceId
        println("Successfully started EC2 Instance $instanceId based on AMI
 $amiIdVal")
        return instanceId.toString()
    }
}

// Get a list of instance types.
suspend fun getInstanceTypesSc(): String {
    var instanceType = ""
    val filterObs = ArrayList<Filter>()
    val filter =
        Filter {
            name = "processor-info.supported-architecture"
            values = listOf("arm64")
        }

    filterObs.add(filter)
    val typesRequest =
        DescribeInstanceTypesRequest {
            filters = filterObs
            maxResults = 10
        }
    Ec2Client { region = "us-west-2" }.use { ec2 ->
        val response = ec2.describeInstanceTypes(typesRequest)
        response.instanceTypes?.forEach { type ->
```

```
            println("The memory information of this type is
 ${type.memoryInfo?.sizeInMib}")
            println("Maximum number of network cards is
 ${type.networkInfo?.maximumNetworkCards}")
            instanceType = type.instanceType.toString()
        }
        return instanceType
    }
}

// Display the Description field that corresponds to the instance Id value.
suspend fun describeImageSc(instanceId: String): String? {
    val imagesRequest =
        DescribeImagesRequest {
            imageIds = listOf(instanceId)
        }

    Ec2Client { region = "us-west-2" }.use { ec2 ->
        val response = ec2.describeImages(imagesRequest)
        println("The description of the first image is
 ${response.images?.get(0)?.description}")
        println("The name of the first image is
 ${response.images?.get(0)?.name}")

        // Return the image Id value.
        return response.images?.get(0)?.imageId
    }
}

// Get the Id value of an instance with amzn2 in the name.
suspend fun getParaValuesSc(): String? {
    val parameterRequest =
        GetParametersByPathRequest {
            path = "/aws/service/ami-amazon-linux-latest"
        }

    SsmClient { region = "us-west-2" }.use { ssmClient ->
        val response = ssmClient.getParametersByPath(parameterRequest)
        response.parameters?.forEach { para ->
            println("The name of the para is: ${para.name}")
            println("The type of the para is: ${para.type}")
            println("")
            if (para.name?.let { filterName(it) } == true) {
                return para.value
```

```
            }
        }
    }
    return ""
}

fun filterName(name: String): Boolean {
    val parts = name.split("/").toTypedArray()
    val myValue = parts[4]
    return myValue.contains("amzn2")
}

suspend fun describeSecurityGroupsSc(groupId: String) {
    val request =
        DescribeSecurityGroupsRequest {
            groupIds = listOf(groupId)
        }

    Ec2Client { region = "us-west-2" }.use { ec2 ->
        val response = ec2.describeSecurityGroups(request)
        for (group in response.securityGroups!!) {
            println("Found Security Group with id " + group.groupId.toString() +
 " and group VPC " + group.vpcId)
        }
    }
}

suspend fun createEC2SecurityGroupSc(
    groupNameVal: String?,
    groupDescVal: String?,
    vpcIdVal: String?,
    myIpAddress: String?,
): String? {
    val request =
        CreateSecurityGroupRequest {
            groupName = groupNameVal
            description = groupDescVal
            vpcId = vpcIdVal
        }

    Ec2Client { region = "us-west-2" }.use { ec2 ->
        val resp = ec2.createSecurityGroup(request)
        val ipRange =
            IpRange {
```

```
                cidrIp = "$myIpAddress/0"
            }

        val ipPerm =
            IpPermission {
                ipProtocol = "tcp"
                toPort = 80
                fromPort = 80
                ipRanges = listOf(ipRange)
            }

        val ipPerm2 =
            IpPermission {
                ipProtocol = "tcp"
                toPort = 22
                fromPort = 22
                ipRanges = listOf(ipRange)
            }

        val authRequest =
            AuthorizeSecurityGroupIngressRequest {
                groupName = groupNameVal
                ipPermissions = listOf(ipPerm, ipPerm2)
            }
        ec2.authorizeSecurityGroupIngress(authRequest)
        println("Successfully added ingress policy to Security Group
 $groupNameVal")
        return resp.groupId
    }
}

suspend fun describeEC2KeysSc() {
    Ec2Client { region = "us-west-2" }.use { ec2 ->
        val response = ec2.describeKeyPairs(DescribeKeyPairsRequest {})
        response.keyPairs?.forEach { keyPair ->
            println("Found key pair with name ${keyPair.keyName} and fingerprint
 ${ keyPair.keyFingerprint}")
        }
    }
}

suspend fun createKeyPairSc(
    keyNameVal: String,
    fileNameVal: String,
```

```
) {
    val request =
        CreateKeyPairRequest {
            keyName = keyNameVal
        }

    Ec2Client { region = "us-west-2" }.use { ec2 ->
        val response = ec2.createKeyPair(request)
        val content = response.keyMaterial
        if (content != null) {
            File(fileNameVal).writeText(content)
        }
        println("Successfully created key pair named $keyNameVal")
    }
}
```

- Untuk API detailnya, lihat topik berikut AWS SDKuntuk API referensi Kotlin.
  - AllocateAddress
  - AssociateAddress
  - AuthorizeSecurityGroupIngress
  - CreateKeyPair
  - CreateSecurityGroup
  - DeleteKeyPair
  - DeleteSecurityGroup
  - DescribeImages
  - DescribeInstanceTypes
  - DescribeInstances
  - DescribeKeyPairs
  - DescribeSecurityGroups
  - DisassociateAddress
  - ReleaseAddress
  - RunInstances
  - StartInstances
  - StopInstances
  - TerminateInstances

- UnmonitorInstances

Python

SDKuntuk Python (Boto3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

Jalankan skenario interaktif di prompt perintah.

```
class EC2InstanceScenario:
    """
    A scenario that demonstrates how to use Boto3 to manage Amazon EC2 resources.
    Covers creating a key pair, security group, launching an instance,
 associating
    an Elastic IP, and cleaning up resources.
    """

    def __init__(
        self,
        inst_wrapper: EC2InstanceWrapper,
        key_wrapper: KeyPairWrapper,
        sg_wrapper: SecurityGroupWrapper,
        eip_wrapper: ElasticIpWrapper,
        ssm_client: boto3.client,
        remote_exec: bool = False,
    ):
        """
        Initializes the EC2InstanceScenario with the necessary AWS service
 wrappers.

        :param inst_wrapper: Wrapper for EC2 instance operations.
        :param key_wrapper: Wrapper for key pair operations.
        :param sg_wrapper: Wrapper for security group operations.
        :param eip_wrapper: Wrapper for Elastic IP operations.
        :param ssm_client: Boto3 client for accessing SSM to retrieve AMIs.
        :param remote_exec: Flag to indicate if the scenario is running in a
 remote execution
```

```
                            environment. Defaults to False. If True, the script
won't prompt
                            for user interaction.
        """
        self.inst_wrapper = inst_wrapper
        self.key_wrapper = key_wrapper
        self.sg_wrapper = sg_wrapper
        self.eip_wrapper = eip_wrapper
        self.ssm_client = ssm_client
        self.remote_exec = remote_exec

    def create_and_list_key_pairs(self) -> None:
        """
        Creates an RSA key pair for SSH access to the EC2 instance and lists
available key pairs.
        """
        console.print("**Step 1: Create a Secure Key Pair**", style="bold cyan")
        console.print(
            "Let's create a secure RSA key pair for connecting to your EC2
instance."
        )
        key_name = f"MyUniqueKeyPair-{uuid.uuid4().hex[:8]}"
        console.print(f"- **Key Pair Name**: {key_name}")

        # Create the key pair and simulate the process with a progress bar.
        with alive_bar(1, title="Creating Key Pair") as bar:
            self.key_wrapper.create(key_name)
            time.sleep(0.4)  # Simulate the delay in key creation
            bar()

        console.print(f"- **Private Key Saved to**:
{self.key_wrapper.key_file_path}\n")

        # List key pairs (simulated) and show a progress bar.
        list_keys = True
        if list_keys:
            console.print("- Listing your key pairs...")
            start_time = time.time()
            with alive_bar(100, title="Listing Key Pairs") as bar:
                while time.time() - start_time < 2:
                    time.sleep(0.2)
                    bar(10)
                self.key_wrapper.list(5)
                if time.time() - start_time > 2:
```

```
                    console.print(
                        "Taking longer than expected! Please wait...",
                        style="bold yellow",
                    )

    def create_security_group(self) -> None:
        """
        Creates a security group that controls access to the EC2 instance and
adds a rule
        to allow SSH access from the user's current public IP address.
        """
        console.print("**Step 2: Create a Security Group**", style="bold cyan")
        console.print(
            "Security groups manage access to your instance. Let's create one."
        )
        sg_name = f"MySecurityGroup-{uuid.uuid4().hex[:8]}"
        console.print(f"- **Security Group Name**: {sg_name}")

        # Create the security group and simulate the process with a progress bar.
        with alive_bar(1, title="Creating Security Group") as bar:
            self.sg_wrapper.create(
                sg_name, "Security group for example: get started with
instances."
            )
            time.sleep(0.5)
            bar()

        console.print(f"- **Security Group ID**:
{self.sg_wrapper.security_group}\n")

        # Get the current public IP to set up SSH access.
        ip_response = urllib.request.urlopen("http://checkip.amazonaws.com")
        current_ip_address = ip_response.read().decode("utf-8").strip()
        console.print(
            "Let's add a rule to allow SSH only from your current IP address."
        )
        console.print(f"- **Your Public IP Address**: {current_ip_address}")
        console.print("- Automatically adding SSH rule...")

        # Update security group rules to allow SSH and simulate with a progress
bar.
        with alive_bar(1, title="Updating Security Group Rules") as bar:
            response = self.sg_wrapper.authorize_ingress(current_ip_address)
            time.sleep(0.4)
```

```
            if response and response.get("Return"):
                console.print("- **Security Group Rules Updated**.")
            else:
                console.print(
                    "- **Error**: Couldn't update security group rules.",
                    style="bold red",
                )
            bar()

        self.sg_wrapper.describe(self.sg_wrapper.security_group)

    def create_instance(self) -> None:
        """
        Launches an EC2 instance using an Amazon Linux 2 AMI and the created key
 pair
        and security group. Displays instance details and SSH connection
 information.
        """
        # Retrieve Amazon Linux 2 AMIs from SSM.
        ami_paginator = self.ssm_client.get_paginator("get_parameters_by_path")
        ami_options = []
        for page in ami_paginator.paginate(Path="/aws/service/ami-amazon-linux-
latest"):
            ami_options += page["Parameters"]
        amzn2_images = self.inst_wrapper.get_images(
            [opt["Value"] for opt in ami_options if "amzn2" in opt["Name"]]
        )
        console.print("\n**Step 3: Launch Your Instance**", style="bold cyan")
        console.print(
            "Let's create an instance from an Amazon Linux 2 AMI. Here are some
 options:"
        )
        image_choice = 0
        console.print(f"- Selected AMI: {amzn2_images[image_choice]
['ImageId']}\n")

        # Display instance types compatible with the selected AMI
        inst_types = self.inst_wrapper.get_instance_types(
            amzn2_images[image_choice]["Architecture"]
        )
        inst_type_choice = 0
        console.print(
            f"- Selected instance type: {inst_types[inst_type_choice]
['InstanceType']}\n"
```

```
        )

        console.print("Creating your instance and waiting for it to start...")
        with alive_bar(1, title="Creating Instance") as bar:
            self.inst_wrapper.create(
                amzn2_images[image_choice]["ImageId"],
                inst_types[inst_type_choice]["InstanceType"],
                self.key_wrapper.key_pair["KeyName"],
                [self.sg_wrapper.security_group],
            )
            time.sleep(21)
            bar()

        console.print(f"**Success! Your instance is ready:**\n", style="bold
green")
        self.inst_wrapper.display()

        console.print(
            "You can use SSH to connect to your instance. "
            "If the connection attempt times out, you might have to manually
update "
            "the SSH ingress rule for your IP address in the AWS Management
Console."
        )
        self._display_ssh_info()

    def _display_ssh_info(self) -> None:
        """
        Displays SSH connection information for the user to connect to the EC2
instance.
        Handles the case where the instance does or does not have an associated
public IP address.
        """
        if (
            not self.eip_wrapper.elastic_ips
            or not self.eip_wrapper.elastic_ips[0].allocation_id
        ):
            if self.inst_wrapper.instances:
                instance = self.inst_wrapper.instances[0]
                instance_id = instance["InstanceId"]

                waiter =
self.inst_wrapper.ec2_client.get_waiter("instance_running")
                console.print(
```

```
                    "Waiting for the instance to be in a running state with a
 public IP...",
                    style="bold cyan",
                )

                with alive_bar(1, title="Waiting for Instance to Start") as bar:
                    waiter.wait(InstanceIds=[instance_id])
                    time.sleep(20)
                    bar()

                instance = self.inst_wrapper.ec2_client.describe_instances(
                    InstanceIds=[instance_id]
                )["Reservations"][0]["Instances"][0]

                public_ip = instance.get("PublicIpAddress")
                if public_ip:
                    console.print(
                        "\nTo connect via SSH, open another command prompt and
 run the following command:",
                        style="bold cyan",
                    )
                    console.print(
                        f"\tssh -i {self.key_wrapper.key_file_path} ec2-
user@{public_ip}"
                    )
                else:
                    console.print(
                        "Instance does not have a public IP address assigned.",
                        style="bold red",
                    )
            else:
                console.print(
                    "No instance available to retrieve public IP address.",
                    style="bold red",
                )
        else:
            elastic_ip = self.eip_wrapper.elastic_ips[0]
            elastic_ip_address = elastic_ip.public_ip
            console.print(
                f"\tssh -i {self.key_wrapper.key_file_path} ec2-
user@{elastic_ip_address}"
            )

        if not self.remote_exec:
```

```
            console.print("\nOpen a new terminal tab to try the above SSH
 command.")
            input("Press Enter to continue...")

    def associate_elastic_ip(self) -> None:
        """
        Allocates an Elastic IP address and associates it with the EC2 instance.
        Displays the Elastic IP address and SSH connection information.
        """
        console.print("\n**Step 4: Allocate an Elastic IP Address**", style="bold
 cyan")
        console.print(
            "You can allocate an Elastic IP address and associate it with your
 instance\n"
            "to keep a consistent IP address even when your instance restarts."
        )

        with alive_bar(1, title="Allocating Elastic IP") as bar:
            elastic_ip = self.eip_wrapper.allocate()
            time.sleep(0.5)
            bar()

        console.print(
            f"- **Allocated Static Elastic IP Address**: {elastic_ip.public_ip}."
        )

        with alive_bar(1, title="Associating Elastic IP") as bar:
            self.eip_wrapper.associate(
                elastic_ip.allocation_id, self.inst_wrapper.instances[0]
["InstanceId"]
            )
            time.sleep(2)
            bar()

        console.print(f"- **Associated Elastic IP with Your Instance**.")
        console.print(
            "You can now use SSH to connect to your instance by using the Elastic
 IP."
        )
        self._display_ssh_info()

    def stop_and_start_instance(self) -> None:
        """
        Stops and restarts the EC2 instance. Displays instance state and explains
```

```
        changes that occur when the instance is restarted, such as the potential
change
        in the public IP address unless an Elastic IP is associated.
        """
        console.print("\n**Step 5: Stop and Start Your Instance**", style="bold
cyan")
        console.print("Let's stop and start your instance to see what changes.")
        console.print("- **Stopping your instance and waiting until it's
stopped...**")

        with alive_bar(1, title="Stopping Instance") as bar:
            self.inst_wrapper.stop()
            time.sleep(360)
            bar()

        console.print("- **Your instance is stopped. Restarting...**")

        with alive_bar(1, title="Starting Instance") as bar:
            self.inst_wrapper.start()
            time.sleep(20)
            bar()

        console.print("**Your instance is running.**", style="bold green")
        self.inst_wrapper.display()

        elastic_ip = (
            self.eip_wrapper.elastic_ips[0] if self.eip_wrapper.elastic_ips else
None
        )

        if elastic_ip is None or elastic_ip.allocation_id is None:
            console.print(
                "- **Note**: Every time your instance is restarted, its public IP
address changes."
            )
        else:
            console.print(
                f"Because you have associated an Elastic IP with your instance,
you can \n"
                f"connect by using a consistent IP address after the instance
restarts: {elastic_ip.public_ip}"
            )

        self._display_ssh_info()
```

```
    def cleanup(self) -> None:
        """
        Cleans up all the resources created during the scenario, including
 disassociating
        and releasing the Elastic IP, terminating the instance, deleting the
 security
        group, and deleting the key pair.
        """
        console.print("\n**Step 6: Clean Up Resources**", style="bold cyan")
        console.print("Cleaning up resources:")

        for elastic_ip in self.eip_wrapper.elastic_ips:
            console.print(f"- **Elastic IP**: {elastic_ip.public_ip}")

            with alive_bar(1, title="Disassociating Elastic IP") as bar:
                self.eip_wrapper.disassociate(elastic_ip.allocation_id)
                time.sleep(2)
                bar()

            console.print("\t- **Disassociated Elastic IP from the Instance**")

            with alive_bar(1, title="Releasing Elastic IP") as bar:
                self.eip_wrapper.release(elastic_ip.allocation_id)
                time.sleep(1)
                bar()

            console.print("\t- **Released Elastic IP**")

        console.print(f"- **Instance**: {self.inst_wrapper.instances[0]
['InstanceId']}")

        with alive_bar(1, title="Terminating Instance") as bar:
            self.inst_wrapper.terminate()
            time.sleep(380)
            bar()

        console.print("\t- **Terminated Instance**")

        console.print(f"- **Security Group**: {self.sg_wrapper.security_group}")

        with alive_bar(1, title="Deleting Security Group") as bar:
            self.sg_wrapper.delete(self.sg_wrapper.security_group)
            time.sleep(1)
```

```
            bar()

        console.print("\t- **Deleted Security Group**")

        console.print(f"- **Key Pair**: {self.key_wrapper.key_pair['KeyName']}")

        with alive_bar(1, title="Deleting Key Pair") as bar:
            self.key_wrapper.delete(self.key_wrapper.key_pair["KeyName"])
            time.sleep(0.4)
            bar()

        console.print("\t- **Deleted Key Pair**")

    def run_scenario(self) -> None:
        """
        Executes the entire EC2 instance scenario: creates key pairs, security
groups,
        launches an instance, associates an Elastic IP, and cleans up all
resources.
        """
        logging.basicConfig(level=logging.INFO, format="%(levelname)s:
%(message)s")

        console.print("-" * 88)
        console.print(
            "Welcome to the Amazon Elastic Compute Cloud (Amazon EC2) get started
with instances demo.",
            style="bold magenta",
        )
        console.print("-" * 88)

        self.create_and_list_key_pairs()
        self.create_security_group()
        self.create_instance()
        self.stop_and_start_instance()
        self.associate_elastic_ip()
        self.stop_and_start_instance()
        self.cleanup()

        console.print("\nThanks for watching!", style="bold green")
        console.print("-" * 88)


if __name__ == "__main__":
```

```
    try:
        scenario = EC2InstanceScenario(
            EC2InstanceWrapper.from_client(),
            KeyPairWrapper.from_client(),
            SecurityGroupWrapper.from_client(),
            ElasticIpWrapper.from_client(),
            boto3.client("ssm"),
        )
        scenario.run_scenario()
    except Exception:
        logging.exception("Something went wrong with the demo.")
```

Tentukan kelas yang membungkus aksi pasangan kunci.

```
class KeyPairWrapper:
    """
    Encapsulates Amazon Elastic Compute Cloud (Amazon EC2) key pair actions.
    This class provides methods to create, list, and delete EC2 key pairs.
    """

    def __init__(
        self,
        ec2_client: boto3.client,
        key_file_dir: Union[tempfile.TemporaryDirectory, str],
        key_pair: Optional[dict] = None,
    ):
        """
        Initializes the KeyPairWrapper with the specified EC2 client, key file
 directory,
        and an optional key pair.

        :param ec2_client: A Boto3 Amazon EC2 client. This client provides low-
level
                           access to AWS EC2 services.
        :param key_file_dir: The folder where the private key information is
 stored.
                             This should be a secure folder.
        :param key_pair: A dictionary representing the Boto3 KeyPair object.
                         This is a high-level object that wraps key pair actions.
 Optional.
        """
        self.ec2_client = ec2_client
```

```
        self.key_pair = key_pair
        self.key_file_path: Optional[str] = None
        self.key_file_dir = key_file_dir

    @classmethod
    def from_client(cls) -> "KeyPairWrapper":
        """
        Class method to create an instance of KeyPairWrapper using a new EC2
client
        and a temporary directory for storing key files.

        :return: An instance of KeyPairWrapper.
        """
        ec2_client = boto3.client("ec2")
        return cls(ec2_client, tempfile.TemporaryDirectory())


    def create(self, key_name: str) -> dict:
        """
        Creates a key pair that can be used to securely connect to an EC2
instance.
        The returned key pair contains private key information that cannot be
retrieved
        again. The private key data is stored as a .pem file.

        :param key_name: The name of the key pair to create.
        :return: A dictionary representing the Boto3 KeyPair object that
represents the newly created key pair.
        :raises ClientError: If there is an error in creating the key pair, for
example, if a key pair with the same name already exists.
        """
        try:
            response = self.ec2_client.create_key_pair(KeyName=key_name)
            self.key_pair = response
            self.key_file_path = os.path.join(
                self.key_file_dir.name, f"{self.key_pair['KeyName']}.pem"
            )
            with open(self.key_file_path, "w") as key_file:
                key_file.write(self.key_pair["KeyMaterial"])
        except ClientError as err:
            if err.response["Error"]["Code"] == "InvalidKeyPair.Duplicate":
                logger.error(
                    f"A key pair called {key_name} already exists. "
                    "Please choose a different name for your key pair "
```

```
                    "or delete the existing key pair before creating."
                )
            raise
        else:
            return self.key_pair


    def list(self, limit: Optional[int] = None) -> None:
        """
        Displays a list of key pairs for the current account.

        WARNING: Results are not paginated.

        :param limit: The maximum number of key pairs to list. If not specified,
                      all key pairs will be listed.
        :raises ClientError: If there is an error in listing the key pairs.
        """
        try:
            response = self.ec2_client.describe_key_pairs()
            key_pairs = response.get("KeyPairs", [])

            if limit:
                key_pairs = key_pairs[:limit]

            for key_pair in key_pairs:
                logger.info(
                    f"Found {key_pair['KeyType']} key '{key_pair['KeyName']}'
with fingerprint:"
                )
                logger.info(f"\t{key_pair['KeyFingerprint']}")
        except ClientError as err:
            logger.error(f"Failed to list key pairs: {str(err)}")
            raise


    def delete(self, key_name: str) -> bool:
        """
        Deletes a key pair by its name.

        :param key_name: The name of the key pair to delete.
        :return: A boolean indicating whether the deletion was successful.
        :raises ClientError: If there is an error in deleting the key pair, for
example,
                             if the key pair does not exist.
```

```
        """
        try:
            self.ec2_client.delete_key_pair(KeyName=key_name)
            logger.info(f"Successfully deleted key pair: {key_name}")
            self.key_pair = None
            return True
        except self.ec2_client.exceptions.ClientError as err:
            logger.error(f"Deletion failed for key pair: {key_name}")
            error_code = err.response["Error"]["Code"]
            if error_code == "InvalidKeyPair.NotFound":
                logger.error(
                    f"The key pair '{key_name}' does not exist and cannot be
 deleted. "
                    "Please verify the key pair name and try again."
                )
            raise
```

Menentukan kelas yang menggabungkan tindakan grup keamanan.

```
class SecurityGroupWrapper:
    """Encapsulates Amazon Elastic Compute Cloud (Amazon EC2) security group
 actions."""

    def __init__(self, ec2_client: boto3.client, security_group: Optional[str] =
 None):
        """
        Initializes the SecurityGroupWrapper with an EC2 client and an optional
 security group ID.

        :param ec2_client: A Boto3 Amazon EC2 client. This client provides low-
level
                           access to AWS EC2 services.
        :param security_group: The ID of a security group to manage. This is a
 high-level identifier
                               that represents the security group.
        """
        self.ec2_client = ec2_client
        self.security_group = security_group
```

```
    @classmethod
    def from_client(cls) -> "SecurityGroupWrapper":
        """
        Creates a SecurityGroupWrapper instance with a default EC2 client.

        :return: An instance of SecurityGroupWrapper initialized with the default
EC2 client.
        """
        ec2_client = boto3.client("ec2")
        return cls(ec2_client)


    def create(self, group_name: str, group_description: str) -> str:
        """
        Creates a security group in the default virtual private cloud (VPC) of
the current account.

        :param group_name: The name of the security group to create.
        :param group_description: The description of the security group to
create.
        :return: The ID of the newly created security group.
        :raise Handles AWS SDK service-level ClientError, with special handling
for ResourceAlreadyExists
        """
        try:
            response = self.ec2_client.create_security_group(
                GroupName=group_name, Description=group_description
            )
            self.security_group = response["GroupId"]
        except ClientError as err:
            if err.response["Error"]["Code"] == "ResourceAlreadyExists":
                logger.error(
                    f"Security group '{group_name}' already exists. Please choose
a different name."
                )
            raise
        else:
            return self.security_group


    def authorize_ingress(self, ssh_ingress_ip: str) -> Optional[Dict[str, Any]]:
        """
        Adds a rule to the security group to allow access to SSH.
```

```
        :param ssh_ingress_ip: The IP address that is granted inbound access to
connect
                               to port 22 over TCP, used for SSH.
        :return: The response to the authorization request. The 'Return' field of
the
                 response indicates whether the request succeeded or failed, or
None if no security group is set.
        :raise Handles AWS SDK service-level ClientError, with special handling
for ResourceAlreadyExists
        """
        if self.security_group is None:
            logger.info("No security group to update.")
            return None

        try:
            ip_permissions = [
                {
                    # SSH ingress open to only the specified IP address.
                    "IpProtocol": "tcp",
                    "FromPort": 22,
                    "ToPort": 22,
                    "IpRanges": [{"CidrIp": f"{ssh_ingress_ip}/32"}],
                }
            ]
            response = self.ec2_client.authorize_security_group_ingress(
                GroupId=self.security_group, IpPermissions=ip_permissions
            )
        except ClientError as err:
            if err.response["Error"]["Code"] == "InvalidPermission.Duplicate":
                logger.error(
                    f"The SSH ingress rule for IP {ssh_ingress_ip} already
exists"
                    f"in security group '{self.security_group}'."
                )
            raise
        else:
            return response


    def describe(self, security_group_id: Optional[str] = None) -> bool:
        """
        Displays information about the specified security group or all security
groups if no ID is provided.
```

```
        :param security_group_id: The ID of the security group to describe.
                                  If None, an open search is performed to
describe all security groups.
        :returns: True if the description is successful.
        :raises ClientError: If there is an error describing the security
group(s), such as an invalid security group ID.
        """
        try:
            paginator = self.ec2_client.get_paginator("describe_security_groups")

            if security_group_id is None:
                # If no ID is provided, return all security groups.
                page_iterator = paginator.paginate()
            else:
                page_iterator = paginator.paginate(GroupIds=[security_group_id])

            for page in page_iterator:
                for security_group in page["SecurityGroups"]:
                    print(f"Security group: {security_group['GroupName']}")
                    print(f"\tID: {security_group['GroupId']}")
                    print(f"\tVPC: {security_group['VpcId']}")
                    if security_group["IpPermissions"]:
                        print("Inbound permissions:")
                        pp(security_group["IpPermissions"])

            return True
        except ClientError as err:
            logger.error("Failed to describe security group(s).")
            if err.response["Error"]["Code"] == "InvalidGroup.NotFound":
                logger.error(
                    f"Security group {security_group_id} does not exist "
                    f"because the specified security group ID was not found."
                )
            raise


    def delete(self, security_group_id: str) -> bool:
        """
        Deletes the specified security group.

        :param security_group_id: The ID of the security group to delete.
Required.

        :returns: True if the deletion is successful.
```

```
        :raises ClientError: If the security group cannot be deleted due to an
 AWS service error.
        """
        try:
            self.ec2_client.delete_security_group(GroupId=security_group_id)
            logger.info(f"Successfully deleted security group
 '{security_group_id}'")
            return True
        except ClientError as err:
            logger.error(f"Deletion failed for security group
 '{security_group_id}'")
            error_code = err.response["Error"]["Code"]

            if error_code == "InvalidGroup.NotFound":
                logger.error(
                    f"Security group '{security_group_id}' cannot be deleted
 because it does not exist."
                )
            elif error_code == "DependencyViolation":
                logger.error(
                    f"Security group '{security_group_id}' cannot be deleted
 because it is still in use."
                    " Verify that it is:"
                    "\n\t- Detached from resources"
                    "\n\t- Removed from references in other groups"
                    "\n\t- Removed from VPC's as a default group"
                )
            raise
```

Menentukan kelas yang menggabungkan tindakan instans.

```
class EC2InstanceWrapper:
    """Encapsulates Amazon Elastic Compute Cloud (Amazon EC2) instance actions
 using the client interface."""

    def __init__(
        self, ec2_client: Any, instances: Optional[List[Dict[str, Any]]] = None
    ) -> None:
        """
```

```
        Initializes the EC2InstanceWrapper with an EC2 client and optional
 instances.

        :param ec2_client: A Boto3 Amazon EC2 client. This client provides low-
level
                           access to AWS EC2 services.
        :param instances: A list of dictionaries representing Boto3 Instance
 objects. These are high-level objects that
                          wrap instance actions.
        """
        self.ec2_client = ec2_client
        self.instances = instances or []

    @classmethod
    def from_client(cls) -> "EC2InstanceWrapper":
        """
        Creates an EC2InstanceWrapper instance with a default EC2 client.

        :return: An instance of EC2InstanceWrapper initialized with the default
 EC2 client.
        """
        ec2_client = boto3.client("ec2")
        return cls(ec2_client)


    def create(
        self,
        image_id: str,
        instance_type: str,
        key_pair_name: str,
        security_group_ids: Optional[List[str]] = None,
    ) -> List[Dict[str, Any]]:
        """
        Creates a new EC2 instance in the default VPC of the current account.

        The instance starts immediately after it is created.

        :param image_id: The ID of the Amazon Machine Image (AMI) to use for the
 instance.
        :param instance_type: The type of instance to create, such as 't2.micro'.
        :param key_pair_name: The name of the key pair to use for SSH access.
        :param security_group_ids: A list of security group IDs to associate with
 the instance.
```

```
                                    If not specified, the default security group
 of the VPC is used.
        :return: A list of dictionaries representing Boto3 Instance objects
 representing the newly created instances.
        """
        try:
            instance_params = {
                "ImageId": image_id,
                "InstanceType": instance_type,
                "KeyName": key_pair_name,
            }
            if security_group_ids is not None:
                instance_params["SecurityGroupIds"] = security_group_ids

            response = self.ec2_client.run_instances(
                **instance_params, MinCount=1, MaxCount=1
            )
            instance = response["Instances"][0]
            self.instances.append(instance)
            waiter = self.ec2_client.get_waiter("instance_running")
            waiter.wait(InstanceIds=[instance["InstanceId"]])
        except ClientError as err:
            params_str = "\n\t".join(
                f"{key}: {value}" for key, value in instance_params.items()
            )
            logger.error(
                f"Failed to complete instance creation request.\nRequest details:
{params_str}"
            )
            error_code = err.response["Error"]["Code"]
            if error_code == "InstanceLimitExceeded":
                logger.error(
                    (
                        f"Insufficient capacity for instance type
 '{instance_type}'. "
                        "Terminate unused instances or contact AWS Support for a
 limit increase."
                    )
                )
            if error_code == "InsufficientInstanceCapacity":
                logger.error(
                    (
                        f"Insufficient capacity for instance type
 '{instance_type}'. "
```

```
                        "Select a different instance type or launch in a
different availability zone."
                    )
                )
            raise
        return self.instances


    def display(self, state_filter: Optional[str] = "running") -> None:
        """
        Displays information about instances, filtering by the specified state.

        :param state_filter: The instance state to include in the output. Only
instances in this state
                             will be displayed. Default is 'running'. Example
states: 'running', 'stopped'.
        """
        if not self.instances:
            logger.info("No instances to display.")
            return

        instance_ids = [instance["InstanceId"] for instance in self.instances]
        paginator = self.ec2_client.get_paginator("describe_instances")
        page_iterator = paginator.paginate(InstanceIds=instance_ids)

        try:
            for page in page_iterator:
                for reservation in page["Reservations"]:
                    for instance in reservation["Instances"]:
                        instance_state = instance["State"]["Name"]

                        # Apply the state filter (default is 'running')
                        if state_filter and instance_state != state_filter:
                            continue  # Skip this instance if it doesn't match
the filter

                        # Create a formatted string with instance details
                        instance_info = (
                            f"• ID: {instance['InstanceId']}\n"
                            f"• Image ID: {instance['ImageId']}\n"
                            f"• Instance type: {instance['InstanceType']}\n"
                            f"• Key name: {instance['KeyName']}\n"
                            f"• VPC ID: {instance['VpcId']}\n"
```

```
                            f"• Public IP: {instance.get('PublicIpAddress', 'N/
A')}\n"
                            f"• State: {instance_state}"
                        )
                        print(instance_info)

        except ClientError as err:
            logger.error(
                f"Failed to display instance(s). : {' '.join(map(str,
 instance_ids))}"
            )
            error_code = err.response["Error"]["Code"]
            if error_code == "InvalidInstanceID.NotFound":
                logger.error(
                    "One or more instance IDs do not exist. "
                    "Please verify the instance IDs and try again."
                )
                raise


    def terminate(self) -> None:
        """
        Terminates instances and waits for them to reach the terminated state.
        """
        if not self.instances:
            logger.info("No instances to terminate.")
            return

        instance_ids = [instance["InstanceId"] for instance in self.instances]
        try:
            self.ec2_client.terminate_instances(InstanceIds=instance_ids)
            waiter = self.ec2_client.get_waiter("instance_terminated")
            waiter.wait(InstanceIds=instance_ids)
            self.instances.clear()
            for instance_id in instance_ids:
                print(f"• Instance ID: {instance_id}\n" f"• Action: Terminated")

        except ClientError as err:
            logger.error(
                f"Failed instance termination details:\n\t{str(self.instances)}"
            )
            error_code = err.response["Error"]["Code"]
            if error_code == "InvalidInstanceID.NotFound":
                logger.error(
```

```
                    "One or more instance IDs do not exist. "
                    "Please verify the instance IDs and try again."
                )
            raise


    def start(self) -> Optional[Dict[str, Any]]:
        """
        Starts instances and waits for them to be in a running state.

        :return: The response to the start request.
        """
        if not self.instances:
            logger.info("No instances to start.")
            return None

        instance_ids = [instance["InstanceId"] for instance in self.instances]
        try:
            start_response =
self.ec2_client.start_instances(InstanceIds=instance_ids)
            waiter = self.ec2_client.get_waiter("instance_running")
            waiter.wait(InstanceIds=instance_ids)
            return start_response
        except ClientError as err:
            logger.error(
                f"Failed to start instance(s): {','.join(map(str,
instance_ids))}"
            )
            error_code = err.response["Error"]["Code"]
            if error_code == "IncorrectInstanceState":
                logger.error(
                    "Couldn't start instance(s) because they are in an incorrect
state. "
                    "Ensure the instances are in a stopped state before starting
them."
                )
            raise


    def stop(self) -> Optional[Dict[str, Any]]:
        """
        Stops instances and waits for them to be in a stopped state.
```

```
        :return: The response to the stop request, or None if there are no
instances to stop.
        """
        if not self.instances:
            logger.info("No instances to stop.")
            return None

        instance_ids = [instance["InstanceId"] for instance in self.instances]
        try:
            # Attempt to stop the instances
            stop_response =
self.ec2_client.stop_instances(InstanceIds=instance_ids)
            waiter = self.ec2_client.get_waiter("instance_stopped")
            waiter.wait(InstanceIds=instance_ids)
        except ClientError as err:
            logger.error(
                f"Failed to stop instance(s): {','.join(map(str, instance_ids))}"
            )
            error_code = err.response["Error"]["Code"]
            if error_code == "IncorrectInstanceState":
                logger.error(
                    "Couldn't stop instance(s) because they are in an incorrect
state. "
                    "Ensure the instances are in a running state before stopping
them."
                )
            raise
        return stop_response


    def get_images(self, image_ids: List[str]) -> List[Dict[str, Any]]:
        """
        Gets information about Amazon Machine Images (AMIs) from a list of AMI
IDs.

        :param image_ids: The list of AMI IDs to look up.
        :return: A list of dictionaries representing the requested AMIs.
        """
        try:
            response = self.ec2_client.describe_images(ImageIds=image_ids)
            images = response["Images"]
        except ClientError as err:
            logger.error(f"Failed to stop AMI(s): {','.join(map(str,
image_ids))}")
```

```
            error_code = err.response["Error"]["Code"]
            if error_code == "InvalidAMIID.NotFound":
                logger.error("One or more of the AMI IDs does not exist.")
            raise
        return images


    def get_instance_types(
        self, architecture: str = "x86_64", sizes: List[str] = ["*.micro",
 "*.small"]
    ) -> List[Dict[str, Any]]:
        """
        Gets instance types that support the specified architecture and size.
        See https://docs.aws.amazon.com/AWSEC2/latest/APIReference/
API_DescribeInstanceTypes.html
        for a list of allowable parameters.

        :param architecture: The architecture supported by instance types.
 Default: 'x86_64'.
        :param sizes: The size of instance types. Default: '*.micro', '*.small',
        :return: A list of dictionaries representing instance types that support
 the specified architecture and size.
        """
        try:
            inst_types = []
            paginator = self.ec2_client.get_paginator("describe_instance_types")
            for page in paginator.paginate(
                Filters=[
                    {
                        "Name": "processor-info.supported-architecture",
                        "Values": [architecture],
                    },
                    {"Name": "instance-type", "Values": sizes},
                ]
            ):
                inst_types += page["InstanceTypes"]
        except ClientError as err:
            logger.error(
                f"Failed to get instance types: {architecture},
 {','.join(map(str, sizes))}"
            )
            error_code = err.response["Error"]["Code"]
            if error_code == "InvalidParameterValue":
                logger.error(
```

```
                    "Parameters are invalid. "
                    "Ensure architecture and size strings conform to
 DescribeInstanceTypes API reference."
                )
            raise
        else:
            return inst_types
```

Menentukan kelas yang menggabungkan tindakan IP Elastis.

```
class ElasticIpWrapper:
    """Encapsulates Amazon Elastic Compute Cloud (Amazon EC2) Elastic IP address
 actions using the client interface."""

    class ElasticIp:
        """Represents an Elastic IP and its associated instance."""

        def __init__(
            self, allocation_id: str, public_ip: str, instance_id: Optional[str]
 = None
        ) -> None:
            """
            Initializes the ElasticIp object.

            :param allocation_id: The allocation ID of the Elastic IP.
            :param public_ip: The public IP address of the Elastic IP.
            :param instance_id: The ID of the associated EC2 instance, if any.
            """
            self.allocation_id = allocation_id
            self.public_ip = public_ip
            self.instance_id = instance_id

    def __init__(self, ec2_client: Any) -> None:
        """
        Initializes the ElasticIpWrapper with an EC2 client.

        :param ec2_client: A Boto3 Amazon EC2 client. This client provides low-
level
                           access to AWS EC2 services.
```

```
        """
        self.ec2_client = ec2_client
        self.elastic_ips: List[ElasticIpWrapper.ElasticIp] = []

    @classmethod
    def from_client(cls) -> "ElasticIpWrapper":
        """
        Creates an ElasticIpWrapper instance with a default EC2 client.

        :return: An instance of ElasticIpWrapper initialized with the default EC2
client.
        """
        ec2_client = boto3.client("ec2")
        return cls(ec2_client)


    def allocate(self) -> "ElasticIpWrapper.ElasticIp":
        """
        Allocates an Elastic IP address that can be associated with an Amazon EC2
        instance. By using an Elastic IP address, you can keep the public IP
address
        constant even when you restart the associated instance.

        :return: The ElasticIp object for the newly created Elastic IP address.
        :raises ClientError: If the allocation fails, such as reaching the
maximum limit of Elastic IPs.
        """
        try:
            response = self.ec2_client.allocate_address(Domain="vpc")
            elastic_ip = self.ElasticIp(
                allocation_id=response["AllocationId"],
public_ip=response["PublicIp"]
            )
            self.elastic_ips.append(elastic_ip)
        except ClientError as err:
            if err.response["Error"]["Code"] == "AddressLimitExceeded":
                logger.error(
                    "Max IP's reached. Release unused addresses or contact AWS
Support for an increase."
                )
            raise err
        return elastic_ip
```

```
   def associate(
       self, allocation_id: str, instance_id: str
   ) -> Union[Dict[str, Any], None]:
       """
       Associates an Elastic IP address with an instance. When this association
is
       created, the Elastic IP's public IP address is immediately used as the
public
       IP address of the associated instance.

       :param allocation_id: The allocation ID of the Elastic IP.
       :param instance_id: The ID of the Amazon EC2 instance.
       :return: A response that contains the ID of the association, or None if
no Elastic IP is found.
       :raises ClientError: If the association fails, such as when the instance
ID is not found.
       """
       elastic_ip = self.get_elastic_ip_by_allocation(self.elastic_ips,
allocation_id)
       if elastic_ip is None:
           logger.info(f"No Elastic IP found with allocation ID
{allocation_id}.")
           return None

       try:
           response = self.ec2_client.associate_address(
               AllocationId=allocation_id, InstanceId=instance_id
           )
           elastic_ip.instance_id = (
               instance_id  # Track the instance associated with this Elastic
IP.
           )
       except ClientError as err:
           if err.response["Error"]["Code"] == "InvalidInstanceID.NotFound":
               logger.error(
                   f"Failed to associate Elastic IP {allocation_id} with
{instance_id} "
                   "because the specified instance ID does not exist or has not
propagated fully. "
                   "Verify the instance ID and try again, or wait a few moments
before attempting to "
                   "associate the Elastic IP address."
               )
           raise
```

```
        return response


    def disassociate(self, allocation_id: str) -> None:
        """
        Removes an association between an Elastic IP address and an instance.
When the
        association is removed, the instance is assigned a new public IP address.

        :param allocation_id: The allocation ID of the Elastic IP to
disassociate.
        :raises ClientError: If the disassociation fails, such as when the
association ID is not found.
        """
        elastic_ip = self.get_elastic_ip_by_allocation(self.elastic_ips,
allocation_id)
        if elastic_ip is None or elastic_ip.instance_id is None:
            logger.info(
                f"No association found for Elastic IP with allocation ID
{allocation_id}."
            )
            return

        try:
            # Retrieve the association ID before disassociating
            response =
self.ec2_client.describe_addresses(AllocationIds=[allocation_id])
            association_id = response["Addresses"][0].get("AssociationId")

            if association_id:

self.ec2_client.disassociate_address(AssociationId=association_id)
                elastic_ip.instance_id = None  # Remove the instance association
            else:
                logger.info(
                    f"No Association ID found for Elastic IP with allocation ID
{allocation_id}."
                )

        except ClientError as err:
            if err.response["Error"]["Code"] == "InvalidAssociationID.NotFound":
                logger.error(
                    f"Failed to disassociate Elastic IP {allocation_id} "
```

```
                    "because the specified association ID for the Elastic IP
address was not found. "
                    "Verify the association ID and ensure the Elastic IP is
currently associated with a "
                    "resource before attempting to disassociate it."
                )
            raise


    def release(self, allocation_id: str) -> None:
        """
        Releases an Elastic IP address. After the Elastic IP address is released,
        it can no longer be used.

        :param allocation_id: The allocation ID of the Elastic IP to release.
        :raises ClientError: If the release fails, such as when the Elastic IP
address is not found.
        """
        elastic_ip = self.get_elastic_ip_by_allocation(self.elastic_ips,
allocation_id)
        if elastic_ip is None:
            logger.info(f"No Elastic IP found with allocation ID
{allocation_id}.")
            return

        try:
            self.ec2_client.release_address(AllocationId=allocation_id)
            self.elastic_ips.remove(elastic_ip)  # Remove the Elastic IP from the
list
        except ClientError as err:
            if err.response["Error"]["Code"] == "InvalidAddress.NotFound":
                logger.error(
                    f"Failed to release Elastic IP address {allocation_id} "
                    "because it could not be found. Verify the Elastic IP address
"
                    "and ensure it is allocated to your account in the correct
region "
                    "before attempting to release it."
                )
            raise


    @staticmethod
    def get_elastic_ip_by_allocation(
```

```
        elastic_ips: List["ElasticIpWrapper.ElasticIp"], allocation_id: str
    ) -> Optional["ElasticIpWrapper.ElasticIp"]:
        """
        Retrieves an Elastic IP object by its allocation ID from a given list of
Elastic IPs.

        :param elastic_ips: A list of ElasticIp objects.
        :param allocation_id: The allocation ID of the Elastic IP to retrieve.
        :return: The ElasticIp object associated with the allocation ID, or None
if not found.
        """
        return next(
            (ip for ip in elastic_ips if ip.allocation_id == allocation_id), None
        )
```

- Untuk API detailnya, lihat topik berikut AWS SDKuntuk Referensi Python (Boto3). API
  - AllocateAddress
  - AssociateAddress
  - AuthorizeSecurityGroupIngress
  - CreateKeyPair
  - CreateSecurityGroup
  - DeleteKeyPair
  - DeleteSecurityGroup
  - DescribeImages
  - DescribeInstanceTypes
  - DescribeInstances
  - DescribeKeyPairs
  - DescribeSecurityGroups
  - DisassociateAddress
  - ReleaseAddress
  - RunInstances
  - StartInstances
  - StopInstances

- TerminateInstances
- UnmonitorInstances

Rust

SDKuntuk Rust

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

EC2InstanceScenarioImplementasinya berisi logika untuk menjalankan contoh secara keseluruhan.

```
//! Scenario that uses the AWS SDK for Rust (the SDK) with Amazon Elastic Compute
 Cloud
//! (Amazon EC2) to do the following:
//!
//! * Create a key pair that is used to secure SSH communication between your
 computer and
//!   an EC2 instance.
//! * Create a security group that acts as a virtual firewall for your EC2
 instances to
//!   control incoming and outgoing traffic.
//! * Find an Amazon Machine Image (AMI) and a compatible instance type.
//! * Create an instance that is created from the instance type and AMI you
 select, and
//!   is configured to use the security group and key pair created in this
 example.
//! * Stop and restart the instance.
//! * Create an Elastic IP address and associate it as a consistent IP address
 for your instance.
//! * Connect to your instance with SSH, using both its public IP address and
 your Elastic IP
//!   address.
//! * Clean up all of the resources created by this example.

use std::net::Ipv4Addr;
```

```
use crate::{
    ec2::{EC2Error, EC2},
    getting_started::{key_pair::KeyPairManager, util::Util},
    ssm::SSM,
};
use aws_sdk_ssm::types::Parameter;

use super::{
    elastic_ip::ElasticIpManager, instance::InstanceManager,
 security_group::SecurityGroupManager,
    util::ScenarioImage,
};

pub struct Ec2InstanceScenario {
    ec2: EC2,
    ssm: SSM,
    util: Util,
    key_pair_manager: KeyPairManager,
    security_group_manager: SecurityGroupManager,
    instance_manager: InstanceManager,
    elastic_ip_manager: ElasticIpManager,
}

impl Ec2InstanceScenario {
    pub fn new(ec2: EC2, ssm: SSM, util: Util) -> Self {
        Ec2InstanceScenario {
            ec2,
            ssm,
            util,
            key_pair_manager: Default::default(),
            security_group_manager: Default::default(),
            instance_manager: Default::default(),
            elastic_ip_manager: Default::default(),
        }
    }

    pub async fn run(&mut self) -> Result<(), EC2Error> {
        self.create_and_list_key_pairs().await?;
        self.create_security_group().await?;
        self.create_instance().await?;
        self.stop_and_start_instance().await?;
        self.associate_elastic_ip().await?;
        self.stop_and_start_instance().await?;
```

```
        Ok(())
    }

    /// 1. Creates an RSA key pair and saves its private key data as a .pem file
in secure
    ///    temporary storage. The private key data is deleted after the example
completes.
    /// 2. Optionally, lists the first five key pairs for the current account.
    pub async fn create_and_list_key_pairs(&mut self) -> Result<(), EC2Error> {
        println!( "Let's create an RSA key pair that you can be use to securely
connect to your EC2 instance.");

        let key_name = self.util.prompt_key_name()?;

        self.key_pair_manager
            .create(&self.ec2, &self.util, key_name)
            .await?;

        println!(
            "Created a key pair {} and saved the private key to {:?}.",
            self.key_pair_manager
                .key_pair()
                .key_name()
                .ok_or_else(|| EC2Error::new("No key name after creating key"))?,
            self.key_pair_manager
                .key_file_path()
                .ok_or_else(|| EC2Error::new("No key file after creating key"))?
        );

        if self.util.should_list_key_pairs()? {
            for pair in self.key_pair_manager.list(&self.ec2).await? {
                println!(
                    "Found {:?} key {} with fingerprint:\t{:?}",
                    pair.key_type(),
                    pair.key_name().unwrap_or("Unknown"),
                    pair.key_fingerprint()
                );
            }
        }

        Ok(())
    }

    /// 1. Creates a security group for the default VPC.
```

```
    /// 2. Adds an inbound rule to allow SSH. The SSH rule allows only
    ///    inbound traffic from the current computer's public IPv4 address.
    /// 3. Displays information about the security group.
    ///
    /// This function uses <http://checkip.amazonaws.com> to get the current
public IP
    /// address of the computer that is running the example. This method works in
most
    /// cases. However, depending on how your computer connects to the internet,
you
    /// might have to manually add your public IP address to the security group
by using
    /// the AWS Management Console.
    pub async fn create_security_group(&mut self) -> Result<(), EC2Error> {
        println!("Let's create a security group to manage access to your
instance.");
        let group_name = self.util.prompt_security_group_name()?;

        self.security_group_manager
            .create(
                &self.ec2,
                &group_name,
                "Security group for example: get started with instances.",
            )
            .await?;

        println!(
            "Created security group {} in your default VPC {}.",
            self.security_group_manager.group_name(),
            self.security_group_manager
                .vpc_id()
                .unwrap_or("(unknown vpc)")
        );

        let check_ip = self.util.do_get("https://checkip.amazonaws.com").await?;
        let current_ip_address: Ipv4Addr = check_ip.trim().parse().map_err(|e| {
            EC2Error::new(format!(
                "Failed to convert response {} to IP Address: {e:?}",
                check_ip
            ))
        })?;

        println!("Your public IP address seems to be {current_ip_address}");
        if self.util.should_add_to_security_group() {
```

```
            match self
                .security_group_manager
                .authorize_ingress(&self.ec2, current_ip_address)
                .await
            {
                Ok(_) => println!("Security group rules updated"),
                Err(err) => eprintln!("Couldn't update security group rules:
{err:?}"),
            }
        }
        println!("{}", self.security_group_manager);

        Ok(())
    }

    /// 1. Gets a list of Amazon Linux 2 AMIs from AWS Systems Manager.
Specifying the
    ///    '/aws/service/ami-amazon-linux-latest' path returns only the latest
AMIs.
    /// 2. Gets and displays information about the available AMIs and lets you
select one.
    /// 3. Gets a list of instance types that are compatible with the selected
AMI and
    ///    lets you select one.
    /// 4. Creates an instance with the previously created key pair and security
group,
    ///    and the selected AMI and instance type.
    /// 5. Waits for the instance to be running and then displays its
information.
    pub async fn create_instance(&mut self) -> Result<(), EC2Error> {
        let ami = self.find_image().await?;

        let instance_types = self
            .ec2
            .list_instance_types(&ami.0)
            .await
            .map_err(|e| e.add_message("Could not find instance types"))?;
        println!(
            "There are several instance types that support the {} architecture of
the image.",
            ami.0
                .architecture
                .as_ref()
```

```
                .ok_or_else(|| EC2Error::new(format!("Missing architecture in
{:?}", ami.0)))?
        );
        let instance_type = self.util.select_instance_type(instance_types)?;

        println!("Creating your instance and waiting for it to start...");
        self.instance_manager
            .create(
                &self.ec2,
                ami.0
                    .image_id()
                    .ok_or_else(|| EC2Error::new("Could not find image ID"))?,
                instance_type,
                self.key_pair_manager.key_pair(),
                self.security_group_manager
                    .security_group()
                    .map(|sg| vec![sg])
                    .ok_or_else(|| EC2Error::new("Could not find security
group"))?,
            )
            .await
            .map_err(|e| e.add_message("Scenario failed to create instance"))?;

        while let Err(err) = self
            .ec2
            .wait_for_instance_ready(self.instance_manager.instance_id(), None)
            .await
        {
            println!("{err}");
            if !self.util.should_continue_waiting() {
                return Err(err);
            }
        }

        println!("Your instance is ready:\n{}", self.instance_manager);

        self.display_ssh_info();

        Ok(())
    }

    async fn find_image(&mut self) -> Result<ScenarioImage, EC2Error> {
        let params: Vec<Parameter> = self
            .ssm
```

```
            .list_path("/aws/service/ami-amazon-linux-latest")
            .await
            .map_err(|e| e.add_message("Could not find parameters for available
images"))?
            .into_iter()
            .filter(|param| param.name().is_some_and(|name|
name.contains("amzn2")))
            .collect();
        let amzn2_images: Vec<ScenarioImage> = self
            .ec2
            .list_images(params)
            .await
            .map_err(|e| e.add_message("Could not find images"))?
            .into_iter()
            .map(ScenarioImage::from)
            .collect();
        println!("We will now create an instance from an Amazon Linux 2 AMI");
        let ami = self.util.select_scenario_image(amzn2_images)?;
        Ok(ami)
    }

    // 1. Stops the instance and waits for it to stop.
    // 2. Starts the instance and waits for it to start.
    // 3. Displays information about the instance.
    // 4. Displays an SSH connection string. When an Elastic IP address is
associated
    //    with the instance, the IP address stays consistent when the instance
stops
    //    and starts.
    pub async fn stop_and_start_instance(&self) -> Result<(), EC2Error> {
        println!("Let's stop and start your instance to see what changes.");
        println!("Stopping your instance and waiting until it's stopped...");
        self.instance_manager.stop(&self.ec2).await?;
        println!("Your instance is stopped. Restarting...");
        self.instance_manager.start(&self.ec2).await?;
        println!("Your instance is running.");
        println!("{}", self.instance_manager);
        if self.elastic_ip_manager.public_ip() == "0.0.0.0" {
            println!("Every time your instance is restarted, its public IP
address changes.");
        } else {
            println!(
                "Because you have associated an Elastic IP with your instance,
you can connect by using a consistent IP address after the instance restarts."
```

```
            );
        }
        self.display_ssh_info();
        Ok(())
    }

    /// 1. Allocates an Elastic IP address and associates it with the instance.
    /// 2. Displays an SSH connection string that uses the Elastic IP address.
    async fn associate_elastic_ip(&mut self) -> Result<(), EC2Error> {
        self.elastic_ip_manager.allocate(&self.ec2).await?;
        println!(
            "Allocated static Elastic IP address: {}",
            self.elastic_ip_manager.public_ip()
        );

        self.elastic_ip_manager
            .associate(&self.ec2, self.instance_manager.instance_id())
            .await?;
        println!("Associated your Elastic IP with your instance.");
        println!("You can now use SSH to connect to your instance by using the
Elastic IP.");
        self.display_ssh_info();
        Ok(())
    }

    /// Displays an SSH connection string that can be used to connect to a
running
    /// instance.
    fn display_ssh_info(&self) {
        let ip_addr = if self.elastic_ip_manager.has_allocation() {
            self.elastic_ip_manager.public_ip()
        } else {
            self.instance_manager.instance_ip()
        };
        let key_file_path = self.key_pair_manager.key_file_path().unwrap();
        println!("To connect, open another command prompt and run the following
command:");
        println!("\nssh -i {} ec2-user@{ip_addr}\n", key_file_path.display());
        let _ = self.util.enter_to_continue();
    }

    /// 1. Disassociate and delete the previously created Elastic IP.
    /// 2. Terminate the previously created instance.
    /// 3. Delete the previously created security group.
```

```
    /// 4. Delete the previously created key pair.
    pub async fn clean_up(self) {
        println!("Let's clean everything up. This example created these
 resources:");
        println!(
            "\tKey pair: {}",
            self.key_pair_manager
                .key_pair()
                .key_name()
                .unwrap_or("(unknown key pair)")
        );
        println!(
            "\tSecurity group: {}",
            self.security_group_manager.group_name()
        );
        println!(
            "\tInstance: {}",
            self.instance_manager.instance_display_name()
        );
        if self.util.should_clean_resources() {
            if let Err(err) = self.elastic_ip_manager.remove(&self.ec2).await {
                eprintln!("{err}")
            }
            if let Err(err) = self.instance_manager.delete(&self.ec2).await {
                eprintln!("{err}")
            }
            if let Err(err) = self.security_group_manager.delete(&self.ec2).await
 {
                eprintln!("{err}");
            }
            if let Err(err) = self.key_pair_manager.delete(&self.ec2,
 &self.util).await {
                eprintln!("{err}");
            }
        } else {
            println!("Ok, not cleaning up any resources!");
        }
    }
}

pub async fn run(mut scenario: Ec2InstanceScenario) {
    println!
("--------------------------------------------------------------------------------");
    println!(
```

```
        "Welcome to the Amazon Elastic Compute Cloud (Amazon EC2) get started
 with instances demo."
    );
    println!
("--------------------------------------------------------------------------------");

    if let Err(err) = scenario.run().await {
        eprintln!("There was an error running the scenario: {err}")
    }

    println!
("--------------------------------------------------------------------------------");

    scenario.clean_up().await;

    println!("Thanks for running!");
    println!
("--------------------------------------------------------------------------------");
}
```

EC2ImplStruct berfungsi sebagai titik automock untuk pengujian, dan fungsinya membungkus panggilan. EC2 SDK

```
use std::{net::Ipv4Addr, time::Duration};

use aws_sdk_ec2::{
    client::Waiters,
    error::ProvideErrorMetadata,
    operation::{
        allocate_address::AllocateAddressOutput,
 associate_address::AssociateAddressOutput,
    },
    types::{
        DomainType, Filter, Image, Instance, InstanceType, IpPermission, IpRange,
 KeyPairInfo,
        SecurityGroup, Tag,
    },
    Client as EC2Client,
};
use aws_sdk_ssm::types::Parameter;
use aws_smithy_runtime_api::client::waiters::error::WaiterError;
```

```
#[cfg(test)]
use mockall::automock;

#[cfg(not(test))]
pub use EC2Impl as EC2;

#[cfg(test)]
pub use MockEC2Impl as EC2;

#[derive(Clone)]
pub struct EC2Impl {
    pub client: EC2Client,
}

#[cfg_attr(test, automock)]
impl EC2Impl {
    pub fn new(client: EC2Client) -> Self {
        EC2Impl { client }
    }

    pub async fn create_key_pair(&self, name: String) -> Result<(KeyPairInfo,
 String), EC2Error> {
        tracing::info!("Creating key pair {name}");
        let output = self.client.create_key_pair().key_name(name).send().await?;
        let info = KeyPairInfo::builder()
            .set_key_name(output.key_name)
            .set_key_fingerprint(output.key_fingerprint)
            .set_key_pair_id(output.key_pair_id)
            .build();
        let material = output
            .key_material
            .ok_or_else(|| EC2Error::new("Create Key Pair has no key
 material"))?;
        Ok((info, material))
    }

    pub async fn list_key_pair(&self) -> Result<Vec<KeyPairInfo>, EC2Error> {
        let output = self.client.describe_key_pairs().send().await?;
        Ok(output.key_pairs.unwrap_or_default())
    }

    pub async fn delete_key_pair(&self, key_pair_id: &str) -> Result<(),
 EC2Error> {
```

```
        let key_pair_id: String = key_pair_id.into();
        tracing::info!("Deleting key pair {key_pair_id}");
        self.client
            .delete_key_pair()
            .key_pair_id(key_pair_id)
            .send()
            .await?;
        Ok(())
    }

    pub async fn create_security_group(
        &self,
        name: &str,
        description: &str,
    ) -> Result<SecurityGroup, EC2Error> {
        tracing::info!("Creating security group {name}");
        let create_output = self
            .client
            .create_security_group()
            .group_name(name)
            .description(description)
            .send()
            .await
            .map_err(EC2Error::from)?;

        let group_id = create_output
            .group_id
            .ok_or_else(|| EC2Error::new("Missing security group id after
creation"))?;

        let group = self
            .describe_security_group(&group_id)
            .await?
            .ok_or_else(|| {
                EC2Error::new(format!("Could not find security group with id
{group_id}"))
            })?;

        tracing::info!("Created security group {name} as {group_id}");

        Ok(group)
    }
```

```
    /// Find a single security group, by ID. Returns Err if multiple groups are
found.
    pub async fn describe_security_group(
        &self,
        group_id: &str,
    ) -> Result<Option<SecurityGroup>, EC2Error> {
        let group_id: String = group_id.into();
        let describe_output = self
            .client
            .describe_security_groups()
            .group_ids(&group_id)
            .send()
            .await?;

        let mut groups = describe_output.security_groups.unwrap_or_default();

        match groups.len() {
            0 => Ok(None),
            1 => Ok(Some(groups.remove(0))),
            _ => Err(EC2Error::new(format!(
                "Expected single group for {group_id}"
            ))),
        }
    }

    /// Add an ingress rule to a security group explicitly allowing IPv4 address
    /// as {ip}/32 over TCP port 22.
    pub async fn authorize_security_group_ssh_ingress(
        &self,
        group_id: &str,
        ingress_ips: Vec<Ipv4Addr>,
    ) -> Result<(), EC2Error> {
        tracing::info!("Authorizing ingress for security group {group_id}");
        self.client
            .authorize_security_group_ingress()
            .group_id(group_id)
            .set_ip_permissions(Some(
                ingress_ips
                    .into_iter()
                    .map(|ip| {
                        IpPermission::builder()
                            .ip_protocol("tcp")
                            .from_port(22)
                            .to_port(22)
```

```
                            .ip_ranges(IpRange::builder().cidr_ip(format!
("{ip}/32")).build())
                            .build()
                    })
                    .collect(),
            ))
            .send()
            .await?;
        Ok(())
    }

    pub async fn delete_security_group(&self, group_id: &str) -> Result<(),
 EC2Error> {
        tracing::info!("Deleting security group {group_id}");
        self.client
            .delete_security_group()
            .group_id(group_id)
            .send()
            .await?;
        Ok(())
    }

    pub async fn list_images(&self, ids: Vec<Parameter>) -> Result<Vec<Image>,
 EC2Error> {
        let image_ids = ids.into_iter().filter_map(|p| p.value).collect();
        let output = self
            .client
            .describe_images()
            .set_image_ids(Some(image_ids))
            .send()
            .await?;

        let images = output.images.unwrap_or_default();
        if images.is_empty() {
            Err(EC2Error::new("No images for selected AMIs"))
        } else {
            Ok(images)
        }
    }

    /// List instance types that match an image's architecture and are free tier
 eligible.
    pub async fn list_instance_types(&self, image: &Image) ->
 Result<Vec<InstanceType>, EC2Error> {
```

```
        let architecture = format!(
            "{}",
            image.architecture().ok_or_else(|| EC2Error::new(format!(
                "Image {:?} does not have a listed architecture",
                image.image_id()
            )))?
        );
        let free_tier_eligible_filter = Filter::builder()
            .name("free-tier-eligible")
            .values("false")
            .build();
        let supported_architecture_filter = Filter::builder()
            .name("processor-info.supported-architecture")
            .values(architecture)
            .build();
        let response = self
            .client
            .describe_instance_types()
            .filters(free_tier_eligible_filter)
            .filters(supported_architecture_filter)
            .send()
            .await?;

        Ok(response
            .instance_types
            .unwrap_or_default()
            .into_iter()
            .filter_map(|iti| iti.instance_type)
            .collect())
    }

    pub async fn create_instance<'a>(
        &self,
        image_id: &'a str,
        instance_type: InstanceType,
        key_pair: &'a KeyPairInfo,
        security_groups: Vec<&'a SecurityGroup>,
    ) -> Result<String, EC2Error> {
        let run_instances = self
            .client
            .run_instances()
            .image_id(image_id)
            .instance_type(instance_type)
            .key_name(
```

```
                key_pair
                    .key_name()
                    .ok_or_else(|| EC2Error::new("Missing key name when launching
instance"))?,
            )
            .set_security_group_ids(Some(
                security_groups
                    .iter()
                    .filter_map(|sg| sg.group_id.clone())
                    .collect(),
            ))
            .min_count(1)
            .max_count(1)
            .send()
            .await?;

        if run_instances.instances().is_empty() {
            return Err(EC2Error::new("Failed to create instance"));
        }

        let instance_id = run_instances.instances()[0].instance_id().unwrap();
        let response = self
            .client
            .create_tags()
            .resources(instance_id)
            .tags(
                Tag::builder()
                    .key("Name")
                    .value("From SDK Examples")
                    .build(),
            )
            .send()
            .await;

        match response {
            Ok(_) => tracing::info!("Created {instance_id} and applied tags."),
            Err(err) => {
                tracing::info!("Error applying tags to {instance_id}: {err:?}");
                return Err(err.into());
            }
        }

        tracing::info!("Instance is created.");
```

```
        Ok(instance_id.to_string())
    }

    /// Wait for an instance to be ready and status ok (default wait 60 seconds)
    pub async fn wait_for_instance_ready(
        &self,
        instance_id: &str,
        duration: Option<Duration>,
    ) -> Result<(), EC2Error> {
        self.client
            .wait_until_instance_status_ok()
            .instance_ids(instance_id)
            .wait(duration.unwrap_or(Duration::from_secs(60)))
            .await
            .map_err(|err| match err {
                WaiterError::ExceededMaxWait(exceeded) => EC2Error(format!(
                    "Exceeded max time ({}s) waiting for instance to start.",
                    exceeded.max_wait().as_secs()
                )),
                _ => EC2Error::from(err),
            })?;
        Ok(())
    }

    pub async fn describe_instance(&self, instance_id: &str) -> Result<Instance,
EC2Error> {
        let response = self
            .client
            .describe_instances()
            .instance_ids(instance_id)
            .send()
            .await?;

        let instance = response
            .reservations()
            .first()
            .ok_or_else(|| EC2Error::new(format!("No instance reservations for
{instance_id}")))?
            .instances()
            .first()
            .ok_or_else(|| {
                EC2Error::new(format!("No instances in reservation for
{instance_id}"))
            })?;
```

```
        Ok(instance.clone())
    }

    pub async fn start_instance(&self, instance_id: &str) -> Result<(), EC2Error>
{
        tracing::info!("Starting instance {instance_id}");

        self.client
            .start_instances()
            .instance_ids(instance_id)
            .send()
            .await?;

        tracing::info!("Started instance.");

        Ok(())
    }

    pub async fn stop_instance(&self, instance_id: &str) -> Result<(), EC2Error>
{
        tracing::info!("Stopping instance {instance_id}");

        self.client
            .stop_instances()
            .instance_ids(instance_id)
            .send()
            .await?;

        self.wait_for_instance_stopped(instance_id, None).await?;

        tracing::info!("Stopped instance.");

        Ok(())
    }

    pub async fn reboot_instance(&self, instance_id: &str) -> Result<(),
EC2Error> {
        tracing::info!("Rebooting instance {instance_id}");

        self.client
            .reboot_instances()
            .instance_ids(instance_id)
            .send()
```

```
            .await?;

        Ok(())
    }

    pub async fn wait_for_instance_stopped(
        &self,
        instance_id: &str,
        duration: Option<Duration>,
    ) -> Result<(), EC2Error> {
        self.client
            .wait_until_instance_stopped()
            .instance_ids(instance_id)
            .wait(duration.unwrap_or(Duration::from_secs(60)))
            .await
            .map_err(|err| match err {
                WaiterError::ExceededMaxWait(exceeded) => EC2Error(format!(
                    "Exceeded max time ({}s) waiting for instance to stop.",
                    exceeded.max_wait().as_secs(),
                )),
                _ => EC2Error::from(err),
            })?;
        Ok(())
    }

    pub async fn delete_instance(&self, instance_id: &str) -> Result<(),
EC2Error> {
        tracing::info!("Deleting instance with id {instance_id}");
        self.stop_instance(instance_id).await?;
        self.client
            .terminate_instances()
            .instance_ids(instance_id)
            .send()
            .await?;
        self.wait_for_instance_terminated(instance_id).await?;
        tracing::info!("Terminated instance with id {instance_id}");
        Ok(())
    }

    async fn wait_for_instance_terminated(&self, instance_id: &str) -> Result<(),
EC2Error> {
        self.client
            .wait_until_instance_terminated()
            .instance_ids(instance_id)
```

```
            .wait(Duration::from_secs(60))
            .await
            .map_err(|err| match err {
                WaiterError::ExceededMaxWait(exceeded) => EC2Error(format!(
                    "Exceeded max time ({}s) waiting for instance to terminate.",
                    exceeded.max_wait().as_secs(),
                )),
                _ => EC2Error::from(err),
            })?;
        Ok(())
    }

    pub async fn allocate_ip_address(&self) -> Result<AllocateAddressOutput,
EC2Error> {
        self.client
            .allocate_address()
            .domain(DomainType::Vpc)
            .send()
            .await
            .map_err(EC2Error::from)
    }

    pub async fn deallocate_ip_address(&self, allocation_id: &str) -> Result<(),
EC2Error> {
        self.client
            .release_address()
            .allocation_id(allocation_id)
            .send()
            .await?;
        Ok(())
    }

    pub async fn associate_ip_address(
        &self,
        allocation_id: &str,
        instance_id: &str,
    ) -> Result<AssociateAddressOutput, EC2Error> {
        let response = self
            .client
            .associate_address()
            .allocation_id(allocation_id)
            .instance_id(instance_id)
            .send()
            .await?;
```

```
        Ok(response)
    }

    pub async fn disassociate_ip_address(&self, association_id: &str) ->
 Result<(), EC2Error> {
        self.client
            .disassociate_address()
            .association_id(association_id)
            .send()
            .await?;
        Ok(())
    }
}

#[derive(Debug)]
pub struct EC2Error(String);
impl EC2Error {
    pub fn new(value: impl Into<String>) -> Self {
        EC2Error(value.into())
    }

    pub fn add_message(self, message: impl Into<String>) -> Self {
        EC2Error(format!("{}: {}", message.into(), self.0))
    }
}

impl<T: ProvideErrorMetadata> From<T> for EC2Error {
    fn from(value: T) -> Self {
        EC2Error(format!(
            "{}: {}",
            value
                .code()
                .map(String::from)
                .unwrap_or("unknown code".into()),
            value
                .message()
                .map(String::from)
                .unwrap_or("missing reason".into()),
        ))
    }
}

impl std::error::Error for EC2Error {}
```

```
impl std::fmt::Display for EC2Error {
    fn fmt(&self, f: &mut std::fmt::Formatter<'_>) -> std::fmt::Result {
        write!(f, "{}", self.0)
    }
}
```

SSMStruct berfungsi sebagai titik automock untuk pengujian, dan fungsinya membungkus SSM SDK panggilan.

```
use aws_sdk_ssm::{types::Parameter, Client};
use aws_smithy_async::future::pagination_stream::TryFlatMap;

use crate::ec2::EC2Error;

#[cfg(test)]
use mockall::automock;

#[cfg(not(test))]
pub use SSMImpl as SSM;

#[cfg(test)]
pub use MockSSMImpl as SSM;

pub struct SSMImpl {
    inner: Client,
}

#[cfg_attr(test, automock)]
impl SSMImpl {
    pub fn new(inner: Client) -> Self {
        SSMImpl { inner }
    }

    pub async fn list_path(&self, path: &str) -> Result<Vec<Parameter>, EC2Error>
 {
        let maybe_params: Vec<Result<Parameter, _>> = TryFlatMap::new(
            self.inner
                .get_parameters_by_path()
                .path(path)
                .into_paginator()
                .send(),
```

```
        )
        .flat_map(|item| item.parameters.unwrap_or_default())
        .collect()
        .await;
        // Fail on the first error
        let params = maybe_params
            .into_iter()
            .collect::<Result<Vec<Parameter>, _>>()?;
        Ok(params)
    }
}
```

Skenario ini menggunakan beberapa struct gaya “Manajer” untuk menangani akses ke sumber daya yang dibuat dan dihapus di seluruh skenario.

```
use aws_sdk_ec2::operation::{
    allocate_address::AllocateAddressOutput,
 associate_address::AssociateAddressOutput,
};

use crate::ec2::{EC2Error, EC2};

/// ElasticIpManager tracks the lifecycle of a public IP address, including its
/// allocation from the global pool and association with a specific instance.
#[derive(Debug, Default)]
pub struct ElasticIpManager {
    elastic_ip: Option<AllocateAddressOutput>,
    association: Option<AssociateAddressOutput>,
}

impl ElasticIpManager {
    pub fn has_allocation(&self) -> bool {
        self.elastic_ip.is_some()
    }

    pub fn public_ip(&self) -> &str {
        if let Some(allocation) = &self.elastic_ip {
            if let Some(addr) = allocation.public_ip() {
                return addr;
            }
        }
```

```
        "0.0.0.0"
    }

    pub async fn allocate(&mut self, ec2: &EC2) -> Result<(), EC2Error> {
        let allocation = ec2.allocate_ip_address().await?;
        self.elastic_ip = Some(allocation);
        Ok(())
    }

    pub async fn associate(&mut self, ec2: &EC2, instance_id: &str) -> Result<(),
 EC2Error> {
        if let Some(allocation) = &self.elastic_ip {
            if let Some(allocation_id) = allocation.allocation_id() {
                let association = ec2.associate_ip_address(allocation_id,
 instance_id).await?;
                self.association = Some(association);
                return Ok(());
            }
        }
        Err(EC2Error::new("No ip address allocation to associate"))
    }

    pub async fn remove(mut self, ec2: &EC2) -> Result<(), EC2Error> {
        if let Some(association) = &self.association {
            if let Some(association_id) = association.association_id() {
                ec2.disassociate_ip_address(association_id).await?;
            }
        }
        self.association = None;
        if let Some(allocation) = &self.elastic_ip {
            if let Some(allocation_id) = allocation.allocation_id() {
                ec2.deallocate_ip_address(allocation_id).await?;
            }
        }
        self.elastic_ip = None;
        Ok(())
    }
}


use std::fmt::Display;

use aws_sdk_ec2::types::{Instance, InstanceType, KeyPairInfo, SecurityGroup};
```

```
use crate::ec2::{EC2Error, EC2};

/// InstanceManager wraps the lifecycle of an EC2 Instance.
#[derive(Debug, Default)]
pub struct InstanceManager {
    instance: Option<Instance>,
}

impl InstanceManager {
    pub fn instance_id(&self) -> &str {
        if let Some(instance) = &self.instance {
            if let Some(id) = instance.instance_id() {
                return id;
            }
        }
        "Unknown"
    }

    pub fn instance_name(&self) -> &str {
        if let Some(instance) = &self.instance {
            if let Some(tag) = instance.tags().iter().find(|e| e.key() ==
 Some("Name")) {
                if let Some(value) = tag.value() {
                    return value;
                }
            }
        }
        "Unknown"
    }

    pub fn instance_ip(&self) -> &str {
        if let Some(instance) = &self.instance {
            if let Some(public_ip_address) = instance.public_ip_address() {
                return public_ip_address;
            }
        }
        "0.0.0.0"
    }

    pub fn instance_display_name(&self) -> String {
        format!("{} ({})", self.instance_name(), self.instance_id())
    }

    /// Create an EC2 instance with the given ID on a given type, using a
```

```
    /// generated KeyPair and applying a list of security groups.
    pub async fn create(
        &mut self,
        ec2: &EC2,
        image_id: &str,
        instance_type: InstanceType,
        key_pair: &KeyPairInfo,
        security_groups: Vec<&SecurityGroup>,
    ) -> Result<(), EC2Error> {
        let instance_id = ec2
            .create_instance(image_id, instance_type, key_pair, security_groups)
            .await?;
        let instance = ec2.describe_instance(&instance_id).await?;
        self.instance = Some(instance);
        Ok(())
    }

    /// Start the managed EC2 instance, if present.
    pub async fn start(&self, ec2: &EC2) -> Result<(), EC2Error> {
        if self.instance.is_some() {
            ec2.start_instance(self.instance_id()).await?;
        }
        Ok(())
    }

    /// Stop the managed EC2 instance, if present.
    pub async fn stop(&self, ec2: &EC2) -> Result<(), EC2Error> {
        if self.instance.is_some() {
            ec2.stop_instance(self.instance_id()).await?;
        }
        Ok(())
    }

    pub async fn reboot(&self, ec2: &EC2) -> Result<(), EC2Error> {
        if self.instance.is_some() {
            ec2.reboot_instance(self.instance_id()).await?;
            ec2.wait_for_instance_stopped(self.instance_id(), None)
                .await?;
            ec2.wait_for_instance_ready(self.instance_id(), None)
                .await?;
        }
        Ok(())
    }
```

```
    /// Terminate and delete the managed EC2 instance, if present.
    pub async fn delete(self, ec2: &EC2) -> Result<(), EC2Error> {
        if self.instance.is_some() {
            ec2.delete_instance(self.instance_id()).await?;
        }
        Ok(())
    }
}

impl Display for InstanceManager {
    fn fmt(&self, f: &mut std::fmt::Formatter<'_>) -> std::fmt::Result {
        if let Some(instance) = &self.instance {
            writeln!(f, "\tID: {}",
 instance.instance_id().unwrap_or("(Unknown)"))?;
            writeln!(
                f,
                "\tImage ID: {}",
                instance.image_id().unwrap_or("(Unknown)")
            )?;
            writeln!(
                f,
                "\tInstance type: {}",
                instance
                    .instance_type()
                    .map(|it| format!("{it}"))
                    .unwrap_or("(Unknown)".to_string())
            )?;
            writeln!(
                f,
                "\tKey name: {}",
                instance.key_name().unwrap_or("(Unknown)")
            )?;
            writeln!(f, "\tVPC ID: {}",
 instance.vpc_id().unwrap_or("(Unknown)"))?;
            writeln!(
                f,
                "\tPublic IP: {}",
                instance.public_ip_address().unwrap_or("(Unknown)")
            )?;
            let instance_state = instance
                .state
                .as_ref()
                .map(|is| {
                    is.name()
```

```
                        .map(|isn| format!("{isn}"))
                        .unwrap_or("(Unknown)".to_string())
                })
                .unwrap_or("(Unknown)".to_string());
            writeln!(f, "\tState: {instance_state}")?;
        } else {
            writeln!(f, "\tNo loaded instance")?;
        }
        Ok(())
    }
}


use std::{env, path::PathBuf};

use aws_sdk_ec2::types::KeyPairInfo;

use crate::ec2::{EC2Error, EC2};

use super::util::Util;

/// KeyPairManager tracks a KeyPairInfo and the path the private key has been
/// written to, if it's been created.
#[derive(Debug)]
pub struct KeyPairManager {
    key_pair: KeyPairInfo,
    key_file_path: Option<PathBuf>,
    key_file_dir: PathBuf,
}

impl KeyPairManager {
    pub fn new() -> Self {
        Self::default()
    }

    pub fn key_pair(&self) -> &KeyPairInfo {
        &self.key_pair
    }

    pub fn key_file_path(&self) -> Option<&PathBuf> {
        self.key_file_path.as_ref()
    }

    pub fn key_file_dir(&self) -> &PathBuf {
```

```
        &self.key_file_dir
    }

    /// Creates a key pair that can be used to securely connect to an EC2
instance.
    /// The returned key pair contains private key information that cannot be
retrieved
    /// again. The private key data is stored as a .pem file.
    ///
    /// :param key_name: The name of the key pair to create.
    pub async fn create(
        &mut self,
        ec2: &EC2,
        util: &Util,
        key_name: String,
    ) -> Result<KeyPairInfo, EC2Error> {
        let (key_pair, material) = ec2
            .create_key_pair(key_name.clone())
            .await
            .map_err(|e| e.add_message(format!("Couldn't create key
{key_name}")))?;

        let path = self.key_file_dir.join(format!("{key_name}.pem"));

        util.write_secure(&key_name, &path, material)?;

        self.key_file_path = Some(path);
        self.key_pair = key_pair.clone();

        Ok(key_pair)
    }

    pub async fn delete(self, ec2: &EC2, util: &Util) -> Result<(), EC2Error> {
        if let Some(key_pair_id) = self.key_pair.key_pair_id() {
            ec2.delete_key_pair(key_pair_id).await?;
            if let Some(key_path) = self.key_file_path() {
                if let Err(err) = util.remove(key_path) {
                    eprintln!("Failed to remove {key_path:?} ({err:?})");
                }
            }
        }
        Ok(())
    }
```

```
    pub async fn list(&self, ec2: &EC2) -> Result<Vec<KeyPairInfo>, EC2Error> {
        ec2.list_key_pair().await
    }
}

impl Default for KeyPairManager {
    fn default() -> Self {
        KeyPairManager {
            key_pair: KeyPairInfo::builder().build(),
            key_file_path: Default::default(),
            key_file_dir: env::temp_dir(),
        }
    }
}


use std::net::Ipv4Addr;

use aws_sdk_ec2::types::SecurityGroup;

use crate::ec2::{EC2Error, EC2};

/// SecurityGroupManager tracks the lifecycle of a SecurityGroup for an instance,
/// including adding a rule to allow SSH from a public IP address.
#[derive(Debug, Default)]
pub struct SecurityGroupManager {
    group_name: String,
    group_description: String,
    security_group: Option<SecurityGroup>,
}

impl SecurityGroupManager {
    pub async fn create(
        &mut self,
        ec2: &EC2,
        group_name: &str,
        group_description: &str,
    ) -> Result<(), EC2Error> {
        self.group_name = group_name.into();
        self.group_description = group_description.into();

        self.security_group = Some(
            ec2.create_security_group(group_name, group_description)
                .await
```

```
                .map_err(|e| e.add_message("Couldn't create security group"))?,
        );

        Ok(())
    }

    pub async fn authorize_ingress(&self, ec2: &EC2, ip_address: Ipv4Addr) ->
 Result<(), EC2Error> {
        if let Some(sg) = &self.security_group {
            ec2.authorize_security_group_ssh_ingress(
                sg.group_id()
                    .ok_or_else(|| EC2Error::new("Missing security group ID"))?,
                vec![ip_address],
            )
            .await?;
        };

        Ok(())
    }

    pub async fn delete(self, ec2: &EC2) -> Result<(), EC2Error> {
        if let Some(sg) = &self.security_group {
            ec2.delete_security_group(
                sg.group_id()
                    .ok_or_else(|| EC2Error::new("Missing security group ID"))?,
            )
            .await?;
        };

        Ok(())
    }

    pub fn group_name(&self) -> &str {
        &self.group_name
    }

    pub fn vpc_id(&self) -> Option<&str> {
        self.security_group.as_ref().and_then(|sg| sg.vpc_id())
    }

    pub fn security_group(&self) -> Option<&SecurityGroup> {
        self.security_group.as_ref()
    }
}
```

```
impl std::fmt::Display for SecurityGroupManager {
    fn fmt(&self, f: &mut std::fmt::Formatter<'_>) -> std::fmt::Result {
        match &self.security_group {
            Some(sg) => {
                writeln!(
                    f,
                    "Security group: {}",
                    sg.group_name().unwrap_or("(unknown group)")
                )?;
                writeln!(f, "\tID: {}", sg.group_id().unwrap_or("(unknown group
 id)"))?;
                writeln!(f, "\tVPC: {}", sg.vpc_id().unwrap_or("(unknown group
 vpc)"))?;
                if !sg.ip_permissions().is_empty() {
                    writeln!(f, "\tInbound Permissions:")?;
                    for permission in sg.ip_permissions() {
                        writeln!(f, "\t\t{permission:?}")?;
                    }
                }
                Ok(())
            }
            None => writeln!(f, "No security group loaded."),
        }
    }
}
```

Titik masuk utama untuk skenario.

```
use ec2_code_examples::{
    ec2::EC2,
    getting_started::{
        scenario::{run, Ec2InstanceScenario},
        util::UtilImpl,
    },
    ssm::SSM,
};

#[tokio::main]
async fn main() {
    tracing_subscriber::fmt::init();
```

```
    let sdk_config = aws_config::load_from_env().await;
    let ec2 = EC2::new(aws_sdk_ec2::Client::new(&sdk_config));
    let ssm = SSM::new(aws_sdk_ssm::Client::new(&sdk_config));
    let util = UtilImpl {};
    let scenario = Ec2InstanceScenario::new(ec2, ssm, util);
    run(scenario).await;
}
```

- Untuk API detailnya, lihat topik berikut AWS SDKuntuk API referensi Rust.
  - AllocateAddress
  - AssociateAddress
  - AuthorizeSecurityGroupIngress
  - CreateKeyPair
  - CreateSecurityGroup
  - DeleteKeyPair
  - DeleteSecurityGroup
  - DescribeImages
  - DescribeInstanceTypes
  - DescribeInstances
  - DescribeKeyPairs
  - DescribeSecurityGroups
  - DisassociateAddress
  - ReleaseAddress
  - RunInstances
  - StartInstances
  - StopInstances
  - TerminateInstances
  - UnmonitorInstances

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

# Tindakan untuk Amazon EC2 menggunakan AWS SDKs

Contoh kode berikut menunjukkan cara melakukan EC2 tindakan Amazon individual dengan AWS SDKs. Setiap contoh menyertakan tautan ke GitHub, di mana Anda dapat menemukan instruksi untuk mengatur dan menjalankan kode.

Kutipan ini menyebut Amazon EC2 API dan merupakan kutipan kode dari program yang lebih besar yang harus dijalankan dalam konteks. Anda dapat melihat tindakan dalam konteks diSkenario untuk Amazon EC2 menggunakan AWS SDKs .

Contoh berikut hanya mencakup tindakan yang paling umum digunakan. Untuk daftar lengkapnya, lihat APIReferensi Cloud Amazon Elastic Compute.

Contoh

- Gunakan AcceptVpcPeeringConnection dengan CLI
- Gunakan AllocateAddress dengan AWS SDK atau CLI
- Gunakan AllocateHosts dengan CLI
- Gunakan AssignPrivateIpAddresses dengan CLI
- Gunakan AssociateAddress dengan AWS SDK atau CLI
- Gunakan AssociateDhcpOptions dengan CLI
- Gunakan AssociateRouteTable dengan CLI
- Gunakan AttachInternetGateway dengan CLI
- Gunakan AttachNetworkInterface dengan CLI
- Gunakan AttachVolume dengan CLI
- Gunakan AttachVpnGateway dengan CLI
- Gunakan AuthorizeSecurityGroupEgress dengan CLI
- Gunakan AuthorizeSecurityGroupIngress dengan AWS SDK atau CLI
- Gunakan CancelCapacityReservation dengan CLI
- Gunakan CancelImportTask dengan CLI
- Gunakan CancelSpotFleetRequests dengan CLI
- Gunakan CancelSpotInstanceRequests dengan CLI
- Gunakan ConfirmProductInstance dengan CLI
- Gunakan CopyImage dengan CLI

- Gunakan CopySnapshot dengan CLI
- Gunakan CreateCapacityReservation dengan CLI
- Gunakan CreateCustomerGateway dengan CLI
- Gunakan CreateDhcpOptions dengan CLI
- Gunakan CreateFlowLogs dengan CLI
- Gunakan CreateImage dengan CLI
- Gunakan CreateInstanceExportTask dengan CLI
- Gunakan CreateInternetGateway dengan CLI
- Gunakan CreateKeyPair dengan AWS SDK atau CLI
- Gunakan CreateLaunchTemplate dengan AWS SDK atau CLI
- Gunakan CreateNetworkAcl dengan CLI
- Gunakan CreateNetworkAclEntry dengan CLI
- Gunakan CreateNetworkInterface dengan CLI
- Gunakan CreatePlacementGroup dengan CLI
- Gunakan CreateRoute dengan CLI
- Gunakan CreateRouteTable dengan AWS SDK atau CLI
- Gunakan CreateSecurityGroup dengan AWS SDK atau CLI
- Gunakan CreateSnapshot dengan CLI
- Gunakan CreateSpotDatafeedSubscription dengan CLI
- Gunakan CreateSubnet dengan AWS SDK atau CLI
- Gunakan CreateTags dengan AWS SDK atau CLI
- Gunakan CreateVolume dengan CLI
- Gunakan CreateVpc dengan AWS SDK atau CLI
- Gunakan CreateVpcEndpoint dengan AWS SDK atau CLI
- Gunakan CreateVpnConnection dengan CLI
- Gunakan CreateVpnConnectionRoute dengan CLI
- Gunakan CreateVpnGateway dengan CLI
- Gunakan DeleteCustomerGateway dengan CLI
- Gunakan DeleteDhcpOptions dengan CLI
- Gunakan DeleteFlowLogs dengan CLI

- Gunakan DeleteInternetGateway dengan CLI
- Gunakan DeleteKeyPair dengan AWS SDK atau CLI
- Gunakan DeleteLaunchTemplate dengan AWS SDK atau CLI
- Gunakan DeleteNetworkAcl dengan CLI
- Gunakan DeleteNetworkAclEntry dengan CLI
- Gunakan DeleteNetworkInterface dengan CLI
- Gunakan DeletePlacementGroup dengan CLI
- Gunakan DeleteRoute dengan CLI
- Gunakan DeleteRouteTable dengan CLI
- Gunakan DeleteSecurityGroup dengan AWS SDK atau CLI
- Gunakan DeleteSnapshot dengan AWS SDK atau CLI
- Gunakan DeleteSpotDatafeedSubscription dengan CLI
- Gunakan DeleteSubnet dengan CLI
- Gunakan DeleteTags dengan CLI
- Gunakan DeleteVolume dengan CLI
- Gunakan DeleteVpc dengan AWS SDK atau CLI
- Gunakan DeleteVpcEndpoint dengan AWS SDK
- Gunakan DeleteVpnConnection dengan CLI
- Gunakan DeleteVpnConnectionRoute dengan CLI
- Gunakan DeleteVpnGateway dengan CLI
- Gunakan DeregisterImage dengan CLI
- Gunakan DescribeAccountAttributes dengan CLI
- Gunakan DescribeAddresses dengan AWS SDK atau CLI
- Gunakan DescribeAvailabilityZones dengan AWS SDK atau CLI
- Gunakan DescribeBundleTasks dengan CLI
- Gunakan DescribeCapacityReservations dengan CLI
- Gunakan DescribeCustomerGateways dengan CLI
- Gunakan DescribeDhcpOptions dengan CLI
- Gunakan DescribeFlowLogs dengan CLI
- Gunakan DescribeHostReservationOfferings dengan CLI

- Gunakan DescribeHosts dengan CLI
- Gunakan DescribeIamInstanceProfileAssociations dengan AWS SDK atau CLI
- Gunakan DescribeIdFormat dengan CLI
- Gunakan DescribeIdentityIdFormat dengan CLI
- Gunakan DescribeImageAttribute dengan CLI
- Gunakan DescribeImages dengan AWS SDK atau CLI
- Gunakan DescribeImportImageTasks dengan CLI
- Gunakan DescribeImportSnapshotTasks dengan CLI
- Gunakan DescribeInstanceAttribute dengan CLI
- Gunakan DescribeInstanceStatus dengan AWS SDK atau CLI
- Gunakan DescribeInstanceTypes dengan AWS SDK atau CLI
- Gunakan DescribeInstances dengan AWS SDK atau CLI
- Gunakan DescribeInternetGateways dengan CLI
- Gunakan DescribeKeyPairs dengan AWS SDK atau CLI
- Gunakan DescribeNetworkAcls dengan CLI
- Gunakan DescribeNetworkInterfaceAttribute dengan CLI
- Gunakan DescribeNetworkInterfaces dengan CLI
- Gunakan DescribePlacementGroups dengan CLI
- Gunakan DescribePrefixLists dengan CLI
- Gunakan DescribeRegions dengan AWS SDK atau CLI
- Gunakan DescribeRouteTables dengan AWS SDK atau CLI
- Gunakan DescribeScheduledInstanceAvailability dengan CLI
- Gunakan DescribeScheduledInstances dengan CLI
- Gunakan DescribeSecurityGroups dengan AWS SDK atau CLI
- Gunakan DescribeSnapshotAttribute dengan CLI
- Gunakan DescribeSnapshots dengan AWS SDK atau CLI
- Gunakan DescribeSpotDatafeedSubscription dengan CLI
- Gunakan DescribeSpotFleetInstances dengan CLI
- Gunakan DescribeSpotFleetRequestHistory dengan CLI
- Gunakan DescribeSpotFleetRequests dengan CLI

- Gunakan DescribeSpotInstanceRequests dengan CLI
- Gunakan DescribeSpotPriceHistory dengan CLI
- Gunakan DescribeSubnets dengan AWS SDK atau CLI
- Gunakan DescribeTags dengan CLI
- Gunakan DescribeVolumeAttribute dengan CLI
- Gunakan DescribeVolumeStatus dengan CLI
- Gunakan DescribeVolumes dengan CLI
- Gunakan DescribeVpcAttribute dengan CLI
- Gunakan DescribeVpcClassicLink dengan CLI
- Gunakan DescribeVpcClassicLinkDnsSupport dengan CLI
- Gunakan DescribeVpcEndpointServices dengan CLI
- Gunakan DescribeVpcEndpoints dengan CLI
- Gunakan DescribeVpcs dengan AWS SDK atau CLI
- Gunakan DescribeVpnConnections dengan CLI
- Gunakan DescribeVpnGateways dengan CLI
- Gunakan DetachInternetGateway dengan CLI
- Gunakan DetachNetworkInterface dengan CLI
- Gunakan DetachVolume dengan CLI
- Gunakan DetachVpnGateway dengan CLI
- Gunakan DisableVgwRoutePropagation dengan CLI
- Gunakan DisableVpcClassicLink dengan CLI
- Gunakan DisableVpcClassicLinkDnsSupport dengan CLI
- Gunakan DisassociateAddress dengan AWS SDK atau CLI
- Gunakan DisassociateRouteTable dengan CLI
- Gunakan EnableVgwRoutePropagation dengan CLI
- Gunakan EnableVolumeIo dengan CLI
- Gunakan EnableVpcClassicLink dengan CLI
- Gunakan EnableVpcClassicLinkDnsSupport dengan CLI
- Gunakan GetConsoleOutput dengan CLI
- Gunakan GetHostReservationPurchasePreview dengan CLI

- Gunakan GetPasswordData dengan AWS SDK atau CLI
- Gunakan ImportImage dengan CLI
- Gunakan ImportKeyPair dengan CLI
- Gunakan ImportSnapshot dengan CLI
- Gunakan ModifyCapacityReservation dengan CLI
- Gunakan ModifyHosts dengan CLI
- Gunakan ModifyIdFormat dengan CLI
- Gunakan ModifyImageAttribute dengan CLI
- Gunakan ModifyInstanceAttribute dengan CLI
- Gunakan ModifyInstanceCreditSpecification dengan CLI
- Gunakan ModifyNetworkInterfaceAttribute dengan CLI
- Gunakan ModifyReservedInstances dengan CLI
- Gunakan ModifySnapshotAttribute dengan CLI
- Gunakan ModifySpotFleetRequest dengan CLI
- Gunakan ModifySubnetAttribute dengan CLI
- Gunakan ModifyVolumeAttribute dengan CLI
- Gunakan ModifyVpcAttribute dengan CLI
- Gunakan MonitorInstances dengan AWS SDK atau CLI
- Gunakan MoveAddressToVpc dengan CLI
- Gunakan PurchaseHostReservation dengan CLI
- Gunakan PurchaseScheduledInstances dengan CLI
- Gunakan RebootInstances dengan AWS SDK atau CLI
- Gunakan RegisterImage dengan CLI
- Gunakan RejectVpcPeeringConnection dengan CLI
- Gunakan ReleaseAddress dengan AWS SDK atau CLI
- Gunakan ReleaseHosts dengan CLI
- Gunakan ReplaceIamInstanceProfileAssociation dengan AWS SDK atau CLI
- Gunakan ReplaceNetworkAclAssociation dengan CLI
- Gunakan ReplaceNetworkAclEntry dengan CLI
- Gunakan ReplaceRoute dengan CLI

- Gunakan ReplaceRouteTableAssociation dengan CLI
- Gunakan ReportInstanceStatus dengan CLI
- Gunakan RequestSpotFleet dengan CLI
- Gunakan RequestSpotInstances dengan CLI
- Gunakan ResetImageAttribute dengan CLI
- Gunakan ResetInstanceAttribute dengan CLI
- Gunakan ResetNetworkInterfaceAttribute dengan CLI
- Gunakan ResetSnapshotAttribute dengan CLI
- Gunakan RevokeSecurityGroupEgress dengan CLI
- Gunakan RevokeSecurityGroupIngress dengan CLI
- Gunakan RunInstances dengan AWS SDK atau CLI
- Gunakan RunScheduledInstances dengan CLI
- Gunakan StartInstances dengan AWS SDK atau CLI
- Gunakan StopInstances dengan AWS SDK atau CLI
- Gunakan TerminateInstances dengan AWS SDK atau CLI
- Gunakan UnassignPrivateIpAddresses dengan CLI
- Gunakan UnmonitorInstances dengan AWS SDK atau CLI
- Gunakan UpdateSecurityGroupRuleDescriptionsIngress dengan CLI

## Gunakan **`AcceptVpcPeeringConnection`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`AcceptVpcPeeringConnection`.

CLI

AWS CLI

Untuk menerima koneksi VPC peering

Contoh ini menerima permintaan koneksi VPC peering yang ditentukan.

Perintah:

```
aws ec2 accept-vpc-peering-connection --vpc-peering-connection-id pcx-1a2b3c4d
```

Output:

```
{
  "VpcPeeringConnection": {
    "Status": {
      "Message": "Provisioning",
      "Code": "provisioning"
    },
    "Tags": [],
    "AccepterVpcInfo": {
      "OwnerId": "444455556666",
      "VpcId": "vpc-44455566",
      "CidrBlock": "10.0.1.0/28"
    },
    "VpcPeeringConnectionId": "pcx-1a2b3c4d",
    "RequesterVpcInfo": {
      "OwnerId": "444455556666",
      "VpcId": "vpc-111abc45",
      "CidrBlock": "10.0.0.0/28"
    }
  }
}
```

- Untuk API detailnya, lihat AcceptVpcPeeringConnectiondi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menyetujui pcx-1dfad234b56ff78be yang diminta VpcPeeringConnectionId

```
Approve-EC2VpcPeeringConnection -VpcPeeringConnectionId pcx-1dfad234b56ff78be
```

Output:

```
AccepterVpcInfo        : Amazon.EC2.Model.VpcPeeringConnectionVpcInfo
ExpirationTime         : 1/1/0001 12:00:00 AM
RequesterVpcInfo       : Amazon.EC2.Model.VpcPeeringConnectionVpcInfo
Status                 : Amazon.EC2.Model.VpcPeeringConnectionStateReason
Tags                   : {}
```

```
VpcPeeringConnectionId : pcx-1dfad234b56ff78be
```

- Untuk API detailnya, lihat AcceptVpcPeeringConnectiondi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`AllocateAddress`** dengan AWS SDK atau CLI

Contoh kode berikut menunjukkan cara menggunakan`AllocateAddress`.

Contoh tindakan adalah kutipan kode dari program yang lebih besar dan harus dijalankan dalam konteks. Anda dapat melihat tindakan ini dalam konteks dalam contoh kode berikut:

- Pelajari dasar-dasarnya

.NET

AWS SDK for .NET

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    /// <summary>
    /// Allocates an Elastic IP address that can be associated with an Amazon EC2
    // instance. By using an Elastic IP address, you can keep the public IP
address
    // constant even when you restart the associated instance.
    /// </summary>
    /// <returns>The response object for the allocated address.</returns>
    public async Task<AllocateAddressResponse> AllocateAddress()
    {
        var request = new AllocateAddressRequest();

        try
```

```
        {
            var response = await _amazonEC2.AllocateAddressAsync(request);
            Console.WriteLine($"Allocated IP: {response.PublicIp} with allocation
 ID {response.AllocationId}.");
            return response;
        }
        catch (AmazonEC2Exception ec2Exception)
        {
            if (ec2Exception.ErrorCode == "AddressLimitExceeded")
            {
                // For more information on Elastic IP address quotas, see:
                // https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/elastic-
ip-addresses-eip.html#using-instance-addressing-limit
                _logger.LogError($"Unable to allocate Elastic IP, address limit
 exceeded. {ec2Exception.Message}");
            }

            throw;
        }
        catch (Exception ex)
        {
            _logger.LogError($"An error occurred while allocating Elastic IP.:
 {ex.Message}");
            throw;
        }
    }
```

- Untuk API detailnya, lihat AllocateAddressdi AWS SDK for .NET APIReferensi.

## Bash

### AWS CLI dengan skrip Bash

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
#############################################################################
# function ec2_allocate_address
```

```
#
# This function allocates an Elastic IP address for use with Amazon Elastic
 Compute Cloud (Amazon EC2) instances in a specific AWS Region.
#
# Parameters:
#       -d domain - The domain for the Elastic IP address (either 'vpc' or
 'standard').
#
# Returns:
#       The allocated Elastic IP address, or an error message if the operation
 fails.
# And:
#       0 - If successful.
#       1 - If it fails.
#
###############################################################################
function ec2_allocate_address() {
  local domain response

  # Function to display usage information
  function usage() {
    echo "function ec2_allocate_address"
    echo "Allocates an Elastic IP address for use with Amazon Elastic Compute
 Cloud (Amazon EC2) instances in a specific AWS Region."
    echo "  -d domain - The domain for the Elastic IP address (either 'vpc' or
 'standard')."
    echo ""
  }

  # Parse the command-line arguments
  while getopts "d:h" option; do
    case "${option}" in
      d) domain="${OPTARG}" ;;
      h)
        usage
        return 0
        ;;
      \?)
        echo "Invalid parameter"
        usage
        return 1
        ;;
    esac
  done
```

```
  export OPTIND=1

  # Validate the input parameters
  if [[ -z "$domain" ]]; then
    errecho "ERROR: You must provide a domain with the -d parameter (either 'vpc'
 or 'standard')."
    return 1
  fi

  if [[ "$domain" != "vpc" && "$domain" != "standard" ]]; then
    errecho "ERROR: Invalid domain value. Must be either 'vpc' or 'standard'."
    return 1
  fi

  # Allocate the Elastic IP address
  response=$(aws ec2 allocate-address \
    --domain "$domain" \
    --query "[PublicIp,AllocationId]" \
    --output text) || {
    aws_cli_error_log ${?}
    errecho "ERROR: AWS reports allocate-address operation failed."
    errecho "$response"
    return 1
  }

  echo "$response"
  return 0
}
```

Fungsi utilitas yang digunakan dalam contoh ini.

```
###############################################################################
# function errecho
#
# This function outputs everything sent to it to STDERR (standard error output).
###############################################################################
function errecho() {
  printf "%s\n" "$*" 1>&2
}

###############################################################################
# function aws_cli_error_log()
```

```
#
# This function is used to log the error messages from the AWS CLI.
#
# The function expects the following argument:
#         $1 - The error code returned by the AWS CLI.
#
#  Returns:
#          0: - Success.
#
########################################################################
function aws_cli_error_log() {
  local err_code=$1
  errecho "Error code : $err_code"
  if [ "$err_code" == 1 ]; then
    errecho "  One or more S3 transfers failed."
  elif [ "$err_code" == 2 ]; then
    errecho "  Command line failed to parse."
  elif [ "$err_code" == 130 ]; then
    errecho "  Process received SIGINT."
  elif [ "$err_code" == 252 ]; then
    errecho "  Command syntax invalid."
  elif [ "$err_code" == 253 ]; then
    errecho "  The system environment or configuration was invalid."
  elif [ "$err_code" == 254 ]; then
    errecho "  The service returned an error."
  elif [ "$err_code" == 255 ]; then
    errecho "  255 is a catch-all error."
  fi

  return 0
}
```

- Untuk API detailnya, lihat AllocateAddressdi Referensi AWS CLI Perintah.

C++

SDKuntuk C ++

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
//! Allocate an Elastic IP address and associate it with an Amazon Elastic
 Compute Cloud
//! (Amazon EC2) instance.
/*!
  \param instanceID: An EC2 instance ID.
  \param[out] publicIPAddress: String to return the public IP address.
  \param[out] allocationID: String to return the allocation ID.
  \param clientConfiguration: AWS client configuration.
  \return bool: Function succeeded.
 */
bool AwsDoc::EC2::allocateAndAssociateAddress(const Aws::String &instanceId,
 Aws::String &publicIPAddress,
                                               Aws::String &allocationID,
                                               const
 Aws::Client::ClientConfiguration &clientConfiguration) {
    Aws::EC2::EC2Client ec2Client(clientConfiguration);

    Aws::EC2::Model::AllocateAddressRequest request;
    request.SetDomain(Aws::EC2::Model::DomainType::vpc);

    const Aws::EC2::Model::AllocateAddressOutcome outcome =
            ec2Client.AllocateAddress(request);
    if (!outcome.IsSuccess()) {
        std::cerr << "Failed to allocate Elastic IP address:" <<
                  outcome.GetError().GetMessage() << std::endl;
        return false;
    }
    const Aws::EC2::Model::AllocateAddressResponse &response =
 outcome.GetResult();
    allocationID = response.GetAllocationId();
    publicIPAddress = response.GetPublicIp();
```

```
    return true;
}
```

- Untuk API detailnya, lihat AllocateAddressdi AWS SDK for C++ APIReferensi.

CLI

AWS CLI

Contoh 1: Untuk mengalokasikan alamat IP Elastis dari kolam alamat Amazon

Contoh `allocate-address` berikut mengalokasikan alamat IP Elastis. Amazon EC2 memilih alamat dari kumpulan alamat Amazon.

```
aws ec2 allocate-address
```

Output:

```
{
    "PublicIp": "70.224.234.241",
    "AllocationId": "eipalloc-01435ba59eEXAMPLE",
    "PublicIpv4Pool": "amazon",
    "NetworkBorderGroup": "us-west-2",
    "Domain": "vpc"
}
```

Untuk informasi selengkapnya, lihat Alamat IP Elastis di Panduan EC2 Pengguna Amazon.

Contoh 2: Untuk mengalokasikan alamat IP Elastis dan mengaitkannya dengan grup batas jaringan

Contoh `allocate-address` berikut mengalokasikan alamat IP Elastis dan mengaitkannya dengan grup batas jaringan tertentu.

```
aws ec2 allocate-address \
    --network-border-group us-west-2-lax-1
```

Output:

```
{
    "PublicIp": "70.224.234.241",
    "AllocationId": "eipalloc-e03dd489ceEXAMPLE",
    "PublicIpv4Pool": "amazon",
    "NetworkBorderGroup": "us-west-2-lax-1",
    "Domain": "vpc"
}
```

Untuk informasi selengkapnya, lihat Alamat IP Elastis di Panduan EC2 Pengguna Amazon.

Contoh 3: Untuk mengalokasikan alamat IP Elastis dari kolam alamat milik Anda

Contoh `allocate-address` berikut mengalokasikan alamat IP Elastis dari kolam alamat yang Anda bawa ke akun Amazon Web Services. Amazon EC2 memilih alamat dari kumpulan alamat.

```
aws ec2 allocate-address \
    --public-ipv4-pool ipv4pool-ec2-1234567890abcdef0
```

Output:

```
{
    "AllocationId": "eipalloc-02463d08ceEXAMPLE",
    "NetworkBorderGroup": "us-west-2",
    "CustomerOwnedIp": "18.218.95.81",
    "CustomerOwnedIpv4Pool": "ipv4pool-ec2-1234567890abcdef0",
    "Domain": "vpc"
    "NetworkBorderGroup": "us-west-2",
}
```

Untuk informasi selengkapnya, lihat Alamat IP Elastis di Panduan EC2 Pengguna Amazon.

- Untuk API detailnya, lihat AllocateAddressdi Referensi AWS CLI Perintah.

Java

SDKuntuk Java 2.x

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    /**
     * Allocates an Elastic IP address asynchronously in the VPC domain.
     *
     * @return a {@link CompletableFuture} containing the allocation ID of the
allocated Elastic IP address
     */
    public CompletableFuture<String> allocateAddressAsync() {
        AllocateAddressRequest allocateRequest = AllocateAddressRequest.builder()
            .domain(DomainType.VPC)
            .build();

        CompletableFuture<AllocateAddressResponse> responseFuture =
getAsyncClient().allocateAddress(allocateRequest);
        return
responseFuture.thenApply(AllocateAddressResponse::allocationId).whenComplete((result,
ex) -> {
            if (ex != null) {
                throw new RuntimeException("Failed to allocate address", ex);
            }
        });
    }
```

- Untuk API detailnya, lihat AllocateAddressdi AWS SDK for Java 2.x APIReferensi.

JavaScript

SDKuntuk JavaScript (v3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
import { AllocateAddressCommand, EC2Client } from "@aws-sdk/client-ec2";

/**
 * Allocates an Elastic IP address to your AWS account.
 */
export const main = async () => {
  const client = new EC2Client({});
  const command = new AllocateAddressCommand({});

  try {
    const { AllocationId, PublicIp } = await client.send(command);
    console.log("A new IP address has been allocated to your account:");
    console.log(`ID: ${AllocationId} Public IP: ${PublicIp}`);
    console.log(
      "You can view your IP addresses in the AWS Management Console for Amazon
 EC2. Look under Network & Security > Elastic IPs",
    );
  } catch (caught) {
    if (caught instanceof Error && caught.name === "MissingParameter") {
      console.warn(`${caught.message}. Did you provide these values?`);
    } else {
      throw caught;
    }
  }
};
import { fileURLToPath } from "node:url";
// Call function if run directly.
if (process.argv[1] === fileURLToPath(import.meta.url)) {
  main();
}
```

- Untuk API detailnya, lihat AllocateAddressdi AWS SDK for JavaScript APIReferensi.

Kotlin

SDKuntuk Kotlin

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
suspend fun getAllocateAddress(instanceIdVal: String?): String? {
    val allocateRequest =
        AllocateAddressRequest {
            domain = DomainType.Vpc
        }

    Ec2Client { region = "us-west-2" }.use { ec2 ->
        val allocateResponse = ec2.allocateAddress(allocateRequest)
        val allocationIdVal = allocateResponse.allocationId

        val request =
            AssociateAddressRequest {
                instanceId = instanceIdVal
                allocationId = allocationIdVal
            }

        val associateResponse = ec2.associateAddress(request)
        return associateResponse.associationId
    }
}
```

- Untuk API detailnya, lihat AllocateAddress AWSSDKAPIreferensi Kotlin.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini mengalokasikan alamat IP Elastis untuk digunakan dengan sebuah instance dalam file. VPC

```
New-EC2Address -Domain Vpc
```

Output:

```
AllocationId         Domain      PublicIp
------------         ------      --------
eipalloc-12345678    vpc         198.51.100.2
```

Contoh 2: Contoh ini mengalokasikan alamat IP Elastis untuk digunakan dengan instance di EC2 -Classic.

```
New-EC2Address
```

Output:

```
AllocationId         Domain      PublicIp
------------         ------      --------
                     standard    203.0.113.17
```

- Untuk API detailnya, lihat AllocateAddressdi AWS Tools for PowerShell Referensi Cmdlet.

Python

SDKuntuk Python (Boto3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
class ElasticIpWrapper:
```

```
    """Encapsulates Amazon Elastic Compute Cloud (Amazon EC2) Elastic IP address
 actions using the client interface."""

    class ElasticIp:
        """Represents an Elastic IP and its associated instance."""

        def __init__(
            self, allocation_id: str, public_ip: str, instance_id: Optional[str]
 = None
        ) -> None:
            """
            Initializes the ElasticIp object.

            :param allocation_id: The allocation ID of the Elastic IP.
            :param public_ip: The public IP address of the Elastic IP.
            :param instance_id: The ID of the associated EC2 instance, if any.
            """
            self.allocation_id = allocation_id
            self.public_ip = public_ip
            self.instance_id = instance_id

    def __init__(self, ec2_client: Any) -> None:
        """
        Initializes the ElasticIpWrapper with an EC2 client.

        :param ec2_client: A Boto3 Amazon EC2 client. This client provides low-
level
                           access to AWS EC2 services.
        """
        self.ec2_client = ec2_client
        self.elastic_ips: List[ElasticIpWrapper.ElasticIp] = []

    @classmethod
    def from_client(cls) -> "ElasticIpWrapper":
        """
        Creates an ElasticIpWrapper instance with a default EC2 client.

        :return: An instance of ElasticIpWrapper initialized with the default EC2
 client.
        """
        ec2_client = boto3.client("ec2")
        return cls(ec2_client)
```

```
    def allocate(self) -> "ElasticIpWrapper.ElasticIp":
        """
        Allocates an Elastic IP address that can be associated with an Amazon EC2
        instance. By using an Elastic IP address, you can keep the public IP
address
        constant even when you restart the associated instance.

        :return: The ElasticIp object for the newly created Elastic IP address.
        :raises ClientError: If the allocation fails, such as reaching the
maximum limit of Elastic IPs.
        """
        try:
            response = self.ec2_client.allocate_address(Domain="vpc")
            elastic_ip = self.ElasticIp(
                allocation_id=response["AllocationId"],
public_ip=response["PublicIp"]
            )
            self.elastic_ips.append(elastic_ip)
        except ClientError as err:
            if err.response["Error"]["Code"] == "AddressLimitExceeded":
                logger.error(
                    "Max IP's reached. Release unused addresses or contact AWS
Support for an increase."
                )
            raise err
        return elastic_ip
```

- Untuk API detailnya, lihat AllocateAddress AWSSDKReferensi Python (Boto3). API

Ruby

SDKuntuk Ruby

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
# Creates an Elastic IP address in Amazon Virtual Private Cloud (Amazon VPC).
```

```
#
# @param ec2_client [Aws::EC2::Client] An initialized EC2 client.
# @return [String] The allocation ID corresponding to the Elastic IP address.
# @example
#   puts allocate_elastic_ip_address(Aws::EC2::Client.new(region: 'us-west-2'))
def allocate_elastic_ip_address(ec2_client)
  response = ec2_client.allocate_address(domain: 'vpc')
  response.allocation_id
rescue StandardError => e
  puts "Error allocating Elastic IP address: #{e.message}"
  'Error'
end
```

- Untuk API detailnya, lihat AllocateAddressdi AWS SDK for Ruby APIReferensi.

Rust

SDKuntuk Rust

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    pub async fn allocate_ip_address(&self) -> Result<AllocateAddressOutput,
 EC2Error> {
        self.client
            .allocate_address()
            .domain(DomainType::Vpc)
            .send()
            .await
            .map_err(EC2Error::from)
    }
```

- Untuk API detailnya, lihat AllocateAddress AWSSDKAPIreferensi Rust.

SAP ABAP

SDKuntuk SAP ABAP

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    TRY.
        oo_result = lo_ec2->allocateaddress( iv_domain = 'vpc' ).   " oo_result
 is returned for testing purposes. "
        MESSAGE 'Allocated an Elastic IP address.' TYPE 'I'.
      CATCH /aws1/cx_rt_service_generic INTO DATA(lo_exception).
        DATA(lv_error) = |"{ lo_exception->av_err_code }" - { lo_exception-
>av_err_msg }|.
        MESSAGE lv_error TYPE 'E'.
    ENDTRY.
```

- Untuk API detailnya, lihat AllocateAddress AWSSDKuntuk SAP ABAP API referensi.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`AllocateHosts`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`AllocateHosts`.

CLI

AWS CLI

Contoh 1: Untuk mengalokasikan Host Khusus

`allocate-hosts`Contoh berikut mengalokasikan satu Host Khusus di `eu-west-1a` Availability Zone, tempat Anda dapat meluncurkan `m5.large` instance. Secara default, Host Khusus hanya menerima peluncuran instans target, dan tidak mendukung pemulihan host.

```
aws ec2 allocate-hosts \
    --instance-type m5.large \
    --availability-zone eu-west-1a \
    --quantity 1
```

Output:

```
{
    "HostIds": [
        "h-07879acf49EXAMPLE"
    ]
}
```

Contoh 2: Untuk mengalokasikan Host Khusus dengan penempatan otomatis dan pemulihan host diaktifkan

`allocate-hosts`Contoh berikut mengalokasikan satu Host Khusus di `eu-west-1a` Availability Zone dengan penempatan otomatis dan pemulihan host diaktifkan.

```
aws ec2 allocate-hosts \
    --instance-type m5.large \
    --availability-zone eu-west-1a \
    --auto-placement on \
    --host-recovery on \
    --quantity 1
```

Output:

```
{
     "HostIds": [
         "h-07879acf49EXAMPLE"
     ]
}
```

Contoh 3: Untuk mengalokasikan Host Khusus dengan tag

`allocate-hosts`Contoh berikut mengalokasikan satu Host Khusus dan menerapkan tag dengan kunci bernama `purpose` dan nilai. `production`

```
aws ec2 allocate-hosts \
    --instance-type m5.large \
```

```
    --availability-zone eu-west-1a \
    --quantity 1 \
    --tag-specifications 'ResourceType=dedicated-
host,Tags={Key=purpose,Value=production}'
```

Output:

```
{
    "HostIds": [
        "h-07879acf49EXAMPLE"
    ]
}
```

Untuk informasi selengkapnya, lihat Mengalokasikan Host Khusus di Panduan Pengguna Amazon Elastic Compute Cloud untuk Instans Linux.

- Untuk API detailnya, lihat AllocateHostsdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini mengalokasikan Host Khusus ke akun Anda untuk jenis instans dan zona ketersediaan yang diberikan

```
New-EC2Host -AutoPlacement on -AvailabilityZone eu-west-1b -InstanceType
 m4.xlarge -Quantity 1
```

Output:

```
h-01e23f4cd567890f3
```

- Untuk API detailnya, lihat AllocateHostsdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`AssignPrivateIpAddresses`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`AssignPrivateIpAddresses`.

CLI

AWS CLI

Untuk menetapkan alamat IP pribadi sekunder tertentu antarmuka jaringan

Contoh ini memberikan alamat IP pribadi sekunder yang ditentukan ke antarmuka jaringan yang ditentukan. Jika perintah berhasil, tidak ada output yang akan ditampilkan.

Perintah:

```
aws ec2 assign-private-ip-addresses --network-interface-id eni-e5aa89a3 --
private-ip-addresses 10.0.0.82
```

Untuk menetapkan alamat IP pribadi sekunder yang EC2 dipilih Amazon ke antarmuka jaringan

Contoh ini memberikan dua alamat IP pribadi sekunder ke antarmuka jaringan yang ditentukan. Amazon EC2 secara otomatis menetapkan alamat IP ini dari alamat IP yang tersedia dalam rentang CIDR blok subnet yang terkait dengan antarmuka jaringan. Jika perintah berhasil, tidak ada output yang akan ditampilkan.

Perintah:

```
aws ec2 assign-private-ip-addresses --network-interface-id eni-e5aa89a3 --
secondary-private-ip-address-count 2
```

- Untuk API detailnya, lihat AssignPrivateIpAddressesdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini memberikan alamat IP pribadi sekunder yang ditentukan ke antarmuka jaringan yang ditentukan.

```
Register-EC2PrivateIpAddress -NetworkInterfaceId eni-1a2b3c4d -PrivateIpAddress
 10.0.0.82
```

Contoh 2: Contoh ini membuat dua alamat IP pribadi sekunder dan menetapkannya ke antarmuka jaringan yang ditentukan.

```
Register-EC2PrivateIpAddress -NetworkInterfaceId eni-1a2b3c4d -
SecondaryPrivateIpAddressCount 2
```

- Untuk API detailnya, lihat AssignPrivateIpAddressesdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`AssociateAddress`** dengan AWS SDK atau CLI

Contoh kode berikut menunjukkan cara menggunakan`AssociateAddress`.

Contoh tindakan adalah kutipan kode dari program yang lebih besar dan harus dijalankan dalam konteks. Anda dapat melihat tindakan ini dalam konteks dalam contoh kode berikut:

- Pelajari dasar-dasarnya

.NET

AWS SDK for .NET

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    /// <summary>
    /// Associates an Elastic IP address with an instance. When this association
 is
    /// created, the Elastic IP's public IP address is immediately used as the
 public
    /// IP address of the associated instance.
    /// </summary>
    /// <param name="allocationId">The allocation Id of an Elastic IP address.</
param>
    /// <param name="instanceId">The instance Id of the EC2 instance to
```

```
    /// associate the address with.</param>
    /// <returns>The association Id that represents
    /// the association of the Elastic IP address with an instance.</returns>
    public async Task<string> AssociateAddress(string allocationId, string
instanceId)
    {
        try
        {
            var request = new AssociateAddressRequest
            {
                AllocationId = allocationId,
                InstanceId = instanceId
            };

            var response = await _amazonEC2.AssociateAddressAsync(request);
            return response.AssociationId;
        }
        catch (AmazonEC2Exception ec2Exception)
        {
            if (ec2Exception.ErrorCode == "InvalidInstanceId")
            {
                _logger.LogError(
                    $"InstanceId is invalid, unable to associate address.
{ec2Exception.Message}");
            }

            throw;
        }
        catch (Exception ex)
        {
            _logger.LogError(
                $"An error occurred while associating the Elastic IP.:
{ex.Message}");
            throw;
        }
    }
```

- Untuk API detailnya, lihat AssociateAddressdi AWS SDK for .NET APIReferensi.

## Bash

### AWS CLI dengan skrip Bash

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
#############################################################################
# function ec2_associate_address
#
# This function associates an Elastic IP address with an Amazon Elastic Compute
 Cloud (Amazon EC2) instance.
#
# Parameters:
#       -a allocation_id - The allocation ID of the Elastic IP address to
 associate.
#       -i instance_id - The ID of the EC2 instance to associate the Elastic IP
 address with.
#
# Returns:
#       0 - If successful.
#       1 - If it fails.
#
#############################################################################
function ec2_associate_address() {
  local allocation_id instance_id response

  # Function to display usage information
  function usage() {
    echo "function ec2_associate_address"
    echo "Associates an Elastic IP address with an Amazon Elastic Compute Cloud
 (Amazon EC2) instance."
    echo "  -a allocation_id - The allocation ID of the Elastic IP address to
 associate."
    echo "  -i instance_id - The ID of the EC2 instance to associate the Elastic
 IP address with."
    echo ""
  }
```

```
  # Parse the command-line arguments
  while getopts "a:i:h" option; do
    case "${option}" in
      a) allocation_id="${OPTARG}" ;;
      i) instance_id="${OPTARG}" ;;
      h)
        usage
        return 0
        ;;
      \?)
        echo "Invalid parameter"
        usage
        return 1
        ;;
    esac
  done
  export OPTIND=1

  # Validate the input parameters
  if [[ -z "$allocation_id" ]]; then
    errecho "ERROR: You must provide an allocation ID with the -a parameter."
    return 1
  fi

  if [[ -z "$instance_id" ]]; then
    errecho "ERROR: You must provide an instance ID with the -i parameter."
    return 1
  fi

  # Associate the Elastic IP address
  response=$(aws ec2 associate-address \
    --allocation-id "$allocation_id" \
    --instance-id "$instance_id" \
    --query "AssociationId" \
    --output text) || {
    aws_cli_error_log ${?}
    errecho "ERROR: AWS reports associate-address operation failed."
    errecho "$response"
    return 1
  }

  echo "$response"
  return 0
}
```

Fungsi utilitas yang digunakan dalam contoh ini.

```
###############################################################################
# function errecho
#
# This function outputs everything sent to it to STDERR (standard error output).
###############################################################################
function errecho() {
  printf "%s\n" "$*" 1>&2
}

###############################################################################
# function aws_cli_error_log()
#
# This function is used to log the error messages from the AWS CLI.
#
# The function expects the following argument:
#         $1 - The error code returned by the AWS CLI.
#
#  Returns:
#          0: - Success.
#
###############################################################################
function aws_cli_error_log() {
  local err_code=$1
  errecho "Error code : $err_code"
  if [ "$err_code" == 1 ]; then
    errecho "  One or more S3 transfers failed."
  elif [ "$err_code" == 2 ]; then
    errecho "  Command line failed to parse."
  elif [ "$err_code" == 130 ]; then
    errecho "  Process received SIGINT."
  elif [ "$err_code" == 252 ]; then
    errecho "  Command syntax invalid."
  elif [ "$err_code" == 253 ]; then
    errecho "  The system environment or configuration was invalid."
  elif [ "$err_code" == 254 ]; then
    errecho "  The service returned an error."
  elif [ "$err_code" == 255 ]; then
    errecho "  255 is a catch-all error."
  fi
```

```
  return 0
}
```

- Untuk API detailnya, lihat AssociateAddressdi Referensi AWS CLI Perintah.

C++

SDKuntuk C ++

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    Aws::EC2::EC2Client ec2Client(clientConfiguration);

//! Associate an Elastic IP address with an EC2 instance.
/*!
  \param instanceId: An EC2 instance ID.
  \param allocationId: An Elastic IP allocation ID.
  \param[out] associationID: String to receive the association ID.
  \param clientConfiguration: AWS client configuration.
  \return bool: True if the address was associated with the instance; otherwise,
 false.
 */
bool AwsDoc::EC2::associateAddress(const Aws::String &instanceId, const
 Aws::String &allocationId,
                                   Aws::String &associationID,
                                   const Aws::Client::ClientConfiguration
 &clientConfiguration) {
    Aws::EC2::EC2Client ec2Client(clientConfiguration);

    Aws::EC2::Model::AssociateAddressRequest request;
    request.SetInstanceId(instanceId);
    request.SetAllocationId(allocationId);

    Aws::EC2::Model::AssociateAddressOutcome outcome =
 ec2Client.AssociateAddress(request);
```

```
    if (!outcome.IsSuccess()) {
        std::cerr << "Failed to associate address " << allocationId <<
                  " with instance " << instanceId << ": " <<
                  outcome.GetError().GetMessage() << std::endl;
    } else {
        std::cout << "Successfully associated address " << allocationId <<
                  " with instance " << instanceId << std::endl;
        associationID = outcome.GetResult().GetAssociationId();
    }

    return outcome.IsSuccess();
}
```

- Untuk API detailnya, lihat AssociateAddressdi AWS SDK for C++ APIReferensi.

CLI

AWS CLI

Untuk mengaitkan alamat IP Elastis di EC2 -Classic

Contoh ini mengaitkan alamat IP Elastis dengan instance di EC2 -Classic. Jika perintah berhasil, tidak ada output yang akan ditampilkan.

Perintah:

```
aws ec2 associate-address --instance-id i-07ffe74c7330ebf53 --public-
ip 198.51.100.0
```

Untuk mengaitkan alamat IP Elastis di EC2 - VPC

Contoh ini mengaitkan alamat IP Elastis dengan instance di file. VPC

Perintah:

```
aws ec2 associate-address --instance-id i-0b263919b6498b123 --allocation-
id eipalloc-64d5890a
```

Output:

```
{
    "AssociationId": "eipassoc-2bebb745"
}
```

Contoh ini mengaitkan alamat IP Elastis dengan antarmuka jaringan.

Perintah:

```
aws ec2 associate-address --allocation-id eipalloc-64d5890a --network-interface-
id eni-1a2b3c4d
```

Contoh ini mengaitkan IP Elastis dengan alamat IP privat yang terkait dengan antarmuka jaringan.

Perintah:

```
aws ec2 associate-address --allocation-id eipalloc-64d5890a --network-interface-
id eni-1a2b3c4d --private-ip-address 10.0.0.85
```

- Untuk API detailnya, lihat AssociateAddressdi Referensi AWS CLI Perintah.

Java

SDKuntuk Java 2.x

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    /**
     * Associates an Elastic IP address with an EC2 instance asynchronously.
     *
     * @param instanceId    the ID of the EC2 instance to associate the Elastic
IP address with
     * @param allocationId  the allocation ID of the Elastic IP address to
associate
```

```
     * @return a {@link CompletableFuture} that completes with the association ID
when the operation is successful,
     *         or throws a {@link RuntimeException} if the operation fails
     */
    public CompletableFuture<String> associateAddressAsync(String instanceId,
String allocationId) {
        AssociateAddressRequest associateRequest =
AssociateAddressRequest.builder()
            .instanceId(instanceId)
            .allocationId(allocationId)
            .build();

        CompletableFuture<AssociateAddressResponse> responseFuture =
getAsyncClient().associateAddress(associateRequest);
        return responseFuture.thenApply(response -> {
            if (response.associationId() != null) {
                return response.associationId();
            } else {
                throw new RuntimeException("Association ID is null after
associating address.");
            }
        }).whenComplete((result, ex) -> {
            if (ex != null) {
                throw new RuntimeException("Failed to associate address", ex);
            }
        });
    }
```

- Untuk API detailnya, lihat AssociateAddressdi AWS SDK for Java 2.x APIReferensi.

## JavaScript

### SDKuntuk JavaScript (v3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
import { AssociateAddressCommand, EC2Client } from "@aws-sdk/client-ec2";
```

```
/**
 * Associates an Elastic IP address, or carrier IP address (for instances that
 are in subnets in Wavelength Zones)
 * with an instance or a network interface.
 * @param {{ instanceId: string, allocationId: string }} options
 */
export const main = async ({ instanceId, allocationId }) => {
  const client = new EC2Client({});
  const command = new AssociateAddressCommand({
    // You need to allocate an Elastic IP address before associating it with an
 instance.
    // You can do that with the AllocateAddressCommand.
    AllocationId: allocationId,
    // You need to create an EC2 instance before an IP address can be associated
 with it.
    // You can do that with the RunInstancesCommand.
    InstanceId: instanceId,
  });

  try {
    const { AssociationId } = await client.send(command);
    console.log(
      `Address with allocation ID ${allocationId} is now associated with instance
 ${instanceId}.`,
      `The association ID is ${AssociationId}.`,
    );
  } catch (caught) {
    if (
      caught instanceof Error &&
      caught.name === "InvalidAllocationID.NotFound"
    ) {
      console.warn(
        `${caught.message}. Did you provide the ID of a valid Elastic IP address
 AllocationId?`,
      );
    } else {
      throw caught;
    }
  }
};
```

- Untuk API detailnya, lihat AssociateAddressdi AWS SDK for JavaScript APIReferensi.

Kotlin

SDKuntuk Kotlin

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
suspend fun associateAddressSc(
    instanceIdVal: String?,
    allocationIdVal: String?,
): String? {
    val associateRequest =
        AssociateAddressRequest {
            instanceId = instanceIdVal
            allocationId = allocationIdVal
        }

    Ec2Client { region = "us-west-2" }.use { ec2 ->
        val associateResponse = ec2.associateAddress(associateRequest)
        return associateResponse.associationId
    }
}
```

- Untuk API detailnya, lihat AssociateAddress AWSSDKAPIreferensi Kotlin.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini mengaitkan alamat IP Elastis yang ditentukan dengan instance yang ditentukan dalam file. VPC

```
C:\> Register-EC2Address -InstanceId i-12345678 -AllocationId eipalloc-12345678
```

Output:

```
eipassoc-12345678
```

Contoh 2: Contoh ini mengaitkan alamat IP Elastis yang ditentukan dengan instance yang ditentukan di EC2 -Classic.

```
C:\> Register-EC2Address -InstanceId i-12345678 -PublicIp 203.0.113.17
```

- Untuk API detailnya, lihat AssociateAddressdi AWS Tools for PowerShell Referensi Cmdlet.

Python

SDKuntuk Python (Boto3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
class ElasticIpWrapper:
    """Encapsulates Amazon Elastic Compute Cloud (Amazon EC2) Elastic IP address
 actions using the client interface."""

    class ElasticIp:
        """Represents an Elastic IP and its associated instance."""

        def __init__(
            self, allocation_id: str, public_ip: str, instance_id: Optional[str]
 = None
        ) -> None:
            """
            Initializes the ElasticIp object.

            :param allocation_id: The allocation ID of the Elastic IP.
            :param public_ip: The public IP address of the Elastic IP.
            :param instance_id: The ID of the associated EC2 instance, if any.
            """
            self.allocation_id = allocation_id
            self.public_ip = public_ip
            self.instance_id = instance_id
```

```
    def __init__(self, ec2_client: Any) -> None:
        """
        Initializes the ElasticIpWrapper with an EC2 client.

        :param ec2_client: A Boto3 Amazon EC2 client. This client provides low-
level
                           access to AWS EC2 services.
        """
        self.ec2_client = ec2_client
        self.elastic_ips: List[ElasticIpWrapper.ElasticIp] = []

    @classmethod
    def from_client(cls) -> "ElasticIpWrapper":
        """
        Creates an ElasticIpWrapper instance with a default EC2 client.

        :return: An instance of ElasticIpWrapper initialized with the default EC2
 client.
        """
        ec2_client = boto3.client("ec2")
        return cls(ec2_client)


    def associate(
        self, allocation_id: str, instance_id: str
    ) -> Union[Dict[str, Any], None]:
        """
        Associates an Elastic IP address with an instance. When this association
 is
        created, the Elastic IP's public IP address is immediately used as the
 public
        IP address of the associated instance.

        :param allocation_id: The allocation ID of the Elastic IP.
        :param instance_id: The ID of the Amazon EC2 instance.
        :return: A response that contains the ID of the association, or None if
 no Elastic IP is found.
        :raises ClientError: If the association fails, such as when the instance
 ID is not found.
        """
        elastic_ip = self.get_elastic_ip_by_allocation(self.elastic_ips,
 allocation_id)
        if elastic_ip is None:
```

```
            logger.info(f"No Elastic IP found with allocation ID
{allocation_id}.")
            return None

        try:
            response = self.ec2_client.associate_address(
                AllocationId=allocation_id, InstanceId=instance_id
            )
            elastic_ip.instance_id = (
                instance_id  # Track the instance associated with this Elastic
IP.
            )
        except ClientError as err:
            if err.response["Error"]["Code"] == "InvalidInstanceID.NotFound":
                logger.error(
                    f"Failed to associate Elastic IP {allocation_id} with
{instance_id} "
                    "because the specified instance ID does not exist or has not
propagated fully. "
                    "Verify the instance ID and try again, or wait a few moments
before attempting to "
                    "associate the Elastic IP address."
                )
            raise
        return response
```

- Untuk API detailnya, lihat [AssociateAddress AWS](#)SDKReferensi Python (Boto3). API

Ruby

SDKuntuk Ruby

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di [Repositori Contoh Kode AWS](#).

```
# Associates an Elastic IP address with an Amazon Elastic Compute Cloud
# (Amazon EC2) instance.
```

```
#
# Prerequisites:
#
# - The allocation ID corresponding to the Elastic IP address.
# - The Amazon EC2 instance.
#
# @param ec2_client [Aws::EC2::Client] An initialized EC2 client.
# @param allocation_id [String] The ID of the allocation corresponding to
#   the Elastic IP address.
# @param instance_id [String] The ID of the instance.
# @return [String] The assocation ID corresponding to the association of the
#   Elastic IP address to the instance.
# @example
#   puts allocate_elastic_ip_address(
#     Aws::EC2::Client.new(region: 'us-west-2'),
#     'eipalloc-04452e528a66279EX',
#     'i-033c48ef067af3dEX')
def associate_elastic_ip_address_with_instance(
  ec2_client,
  allocation_id,
  instance_id
)
  response = ec2_client.associate_address(
    allocation_id: allocation_id,
    instance_id: instance_id
  )
  response.association_id
rescue StandardError => e
  puts "Error associating Elastic IP address with instance: #{e.message}"
  'Error'
end
```

- Untuk API detailnya, lihat AssociateAddressdi AWS SDK for Ruby APIReferensi.

Rust

SDKuntuk Rust

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
pub async fn associate_ip_address(
    &self,
    allocation_id: &str,
    instance_id: &str,
) -> Result<AssociateAddressOutput, EC2Error> {
    let response = self
        .client
        .associate_address()
        .allocation_id(allocation_id)
        .instance_id(instance_id)
        .send()
        .await?;
    Ok(response)
}
```

- Untuk API detailnya, lihat AssociateAddress AWSSDKAPIreferensi Rust.

SAP ABAP

SDKuntuk SAP ABAP

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
TRY.
```

```
        oo_result = lo_ec2->associateaddress(                          " oo_result
 is returned for testing purposes. "
            iv_allocationid = iv_allocation_id
            iv_instanceid = iv_instance_id
        ).
        MESSAGE 'Associated an Elastic IP address with an EC2 instance.' TYPE
 'I'.
      CATCH /aws1/cx_rt_service_generic INTO DATA(lo_exception).
        DATA(lv_error) = |"{ lo_exception->av_err_code }" - { lo_exception-
>av_err_msg }|.
        MESSAGE lv_error TYPE 'E'.
    ENDTRY.
```

- Untuk API detailnya, lihat AssociateAddress AWSSDKuntuk SAP ABAP API referensi.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`AssociateDhcpOptions`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`AssociateDhcpOptions`.

CLI

AWS CLI

Untuk mengaitkan DHCP opsi yang ditetapkan dengan VPC

Contoh ini mengaitkan DHCP opsi yang ditentukan yang ditetapkan dengan yang ditentukanVPC. Jika perintah berhasil, tidak ada output yang akan ditampilkan.

Perintah:

```
aws ec2 associate-dhcp-options --dhcp-options-id dopt-d9070ebb --vpc-id vpc-
a01106c2
```

Untuk mengaitkan DHCP opsi default yang ditetapkan dengan VPC

Contoh ini mengaitkan DHCP opsi default yang ditetapkan dengan yang ditentukanVPC. Jika perintah berhasil, tidak ada output yang akan ditampilkan.

Perintah:

```
aws ec2 associate-dhcp-options --dhcp-options-id default --vpc-id vpc-a01106c2
```

- Untuk API detailnya, lihat AssociateDhcpOptionsdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini mengaitkan DHCP opsi yang ditentukan yang ditetapkan dengan yang ditentukanVPC.

```
Register-EC2DhcpOption -DhcpOptionsId dopt-1a2b3c4d -VpcId vpc-12345678
```

Contoh 2: Contoh ini mengaitkan DHCP opsi default yang ditetapkan dengan yang ditentukanVPC.

```
Register-EC2DhcpOption -DhcpOptionsId default -VpcId vpc-12345678
```

- Untuk API detailnya, lihat AssociateDhcpOptionsdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`AssociateRouteTable`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`AssociateRouteTable`.

CLI

AWS CLI

Untuk mengaitkan tabel rute dengan subnet

Contoh ini mengaitkan tabel rute yang ditentukan dengan subnet yang ditentukan.

Perintah:

```
aws ec2 associate-route-table --route-table-id rtb-22574640 --subnet-
id subnet-9d4a7b6c
```

Output:

```
{
    "AssociationId": "rtbassoc-781d0d1a"
}
```

- Untuk API detailnya, lihat AssociateRouteTabledi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini mengaitkan tabel rute yang ditentukan dengan subnet yang ditentukan.

```
Register-EC2RouteTable -RouteTableId rtb-1a2b3c4d -SubnetId subnet-1a2b3c4d
```

Output:

```
rtbassoc-12345678
```

- Untuk API detailnya, lihat AssociateRouteTabledi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`AttachInternetGateway`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`AttachInternetGateway`.

CLI

AWS CLI

Untuk melampirkan gateway internet ke Anda VPC

`attach-internet-gateway`Contoh berikut melampirkan gateway internet yang ditentukan ke spesifikVPC.

```
aws ec2 attach-internet-gateway \
    --internet-gateway-id igw-0d0fb496b3EXAMPLE \
    --vpc-id vpc-0a60eb65b4EXAMPLE
```

Perintah ini tidak menghasilkan output.

Untuk informasi selengkapnya, lihat gateway Internet di VPCPanduan Pengguna Amazon.

- Untuk API detailnya, lihat AttachInternetGatewaydi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini melampirkan gateway Internet yang ditentukan ke yang ditentukanVPC.

```
Add-EC2InternetGateway -InternetGatewayId igw-1a2b3c4d -VpcId vpc-12345678
```

Contoh 2: Contoh ini membuat VPC dan gateway Internet, dan kemudian melampirkan gateway Internet keVPC.

```
$vpc = New-EC2Vpc -CidrBlock 10.0.0.0/16
New-EC2InternetGateway | Add-EC2InternetGateway -VpcId $vpc.VpcId
```

- Untuk API detailnya, lihat AttachInternetGatewaydi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`AttachNetworkInterface`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`AttachNetworkInterface`.

CLI

AWS CLI

Contoh 1: Untuk melampirkan antarmuka jaringan ke sebuah instance

`attach-network-interface`Contoh berikut melampirkan antarmuka jaringan yang ditentukan untuk contoh yang ditentukan.

```
aws ec2 attach-network-interface \
    --network-interface-id eni-0dc56a8d4640ad10a \
    --instance-id i-1234567890abcdef0 \
    --device-index 1
```

Output:

```
{
    "AttachmentId": "eni-attach-01a8fc87363f07cf9"
}
```

Untuk informasi selengkapnya, lihat Antarmuka jaringan elastis di Panduan EC2 Pengguna Amazon.

Contoh 2: Untuk melampirkan antarmuka jaringan ke instance dengan beberapa kartu jaringan

`attach-network-interface`Contoh berikut melampirkan antarmuka jaringan yang ditentukan untuk contoh yang ditentukan dan kartu jaringan.

```
aws ec2 attach-network-interface \
    --network-interface-id eni-07483b1897541ad83 \
    --instance-id i-01234567890abcdef \
    --network-card-index 1 \
    --device-index 1
```

Output:

```
{
    "AttachmentId": "eni-attach-0fbd7ee87a88cd06c"
}
```

Untuk informasi selengkapnya, lihat Antarmuka jaringan elastis di Panduan EC2 Pengguna Amazon.

- Untuk API detailnya, lihat AttachNetworkInterfacedi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini melampirkan antarmuka jaringan yang ditentukan ke instance tertentu.

```
Add-EC2NetworkInterface -NetworkInterfaceId eni-12345678 -InstanceId i-1a2b3c4d -
DeviceIndex 1
```

Output:

```
eni-attach-1a2b3c4d
```

- Untuk API detailnya, lihat AttachNetworkInterfacedi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`AttachVolume`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`AttachVolume`.

CLI

AWS CLI

Untuk melampirkan volume ke sebuah instance

Perintah contoh ini melampirkan volume (`vol-1234567890abcdef0`) ke instance (`i-01474ef662b89480`) sebagai`/dev/sdf`.

Perintah:

```
aws ec2 attach-volume --volume-id vol-1234567890abcdef0 --instance-
id i-01474ef662b89480 --device /dev/sdf
```

Output:

```
{
    "AttachTime": "YYYY-MM-DDTHH:MM:SS.000Z",
    "InstanceId": "i-01474ef662b89480",
    "VolumeId": "vol-1234567890abcdef0",
    "State": "attaching",
    "Device": "/dev/sdf"
}
```

- Untuk API detailnya, lihat AttachVolumedi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini melampirkan volume yang ditentukan ke instance yang ditentukan dan memaparkannya dengan nama perangkat yang ditentukan.

```
Add-EC2Volume -VolumeId vol-12345678 -InstanceId i-1a2b3c4d -Device /dev/sdh
```

Output:

```
AttachTime          : 12/22/2015 1:53:58 AM
DeleteOnTermination : False
Device              : /dev/sdh
InstanceId          : i-1a2b3c4d
State               : attaching
VolumeId            : vol-12345678
```

- Untuk API detailnya, lihat AttachVolumedi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`AttachVpnGateway`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`AttachVpnGateway`.

CLI

AWS CLI

Untuk melampirkan gateway pribadi virtual ke VPC

`attach-vpn-gateway`Contoh berikut melampirkan gateway pribadi virtual yang ditentukan ke yang ditentukanVPC.

```
aws ec2 attach-vpn-gateway \
    --vpn-gateway-id vgw-9a4cacf3 \
    --vpc-id vpc-a01106c2
```

Output:

```
{
    "VpcAttachment": {
        "State": "attaching",
        "VpcId": "vpc-a01106c2"
    }
}
```

- Untuk API detailnya, lihat AttachVpnGatewaydi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini melampirkan gateway pribadi virtual yang ditentukan ke yang ditentukanVPC.

```
Add-EC2VpnGateway -VpnGatewayId vgw-1a2b3c4d -VpcId vpc-12345678
```

Output:

```
State       VpcId
-----       -----
```

```
attaching    vpc-12345678
```

- Untuk API detailnya, lihat AttachVpnGatewaydi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`AuthorizeSecurityGroupEgress`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`AuthorizeSecurityGroupEgress`.

CLI

AWS CLI

Untuk menambahkan aturan yang memungkinkan lalu lintas keluar ke rentang alamat tertentu

Perintah contoh ini menambahkan aturan yang memberikan akses ke rentang alamat yang ditentukan pada TCP port 80.

Perintah (Linux):

```
aws ec2 authorize-security-group-egress --group-id sg-1a2b3c4d --ip-permissions
 IpProtocol=tcp,FromPort=80,ToPort=80,IpRanges='[{CidrIp=10.0.0.0/16}]'
```

Perintah (Windows):

```
aws ec2 authorize-security-group-egress --group-id sg-1a2b3c4d --ip-
permissions IpProtocol=tcp,FromPort=80,ToPort=80,IpRanges=[{CidrIp=10.0.0.0/16}]
```

Untuk menambahkan aturan yang memungkinkan lalu lintas keluar ke grup keamanan tertentu

Perintah contoh ini menambahkan aturan yang memberikan akses ke grup keamanan yang ditentukan pada TCP port 80.

Perintah (Linux):

```
aws ec2 authorize-security-group-egress --group-id sg-1a2b3c4d --ip-permissions
 IpProtocol=tcp,FromPort=80,ToPort=80,UserIdGroupPairs='[{GroupId=sg-4b51a32f}]'
```

Perintah (Windows):

```
aws ec2 authorize-security-group-egress --group-id sg-1a2b3c4d --ip-
permissions IpProtocol=tcp,FromPort=80,ToPort=80,UserIdGroupPairs=[{GroupId=sg-4b51a32f}]
```

- Untuk API detailnya, lihat AuthorizeSecurityGroupEgressdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini mendefinisikan aturan jalan keluar untuk grup keamanan yang ditentukan untuk -. EC2 VPC Aturan memberikan akses ke rentang alamat IP yang ditentukan pada TCP port 80. Sintaks yang digunakan oleh contoh ini membutuhkan PowerShell versi 3 atau lebih tinggi.

```
$ip = @{ IpProtocol="tcp"; FromPort="80"; ToPort="80";
 IpRanges="203.0.113.0/24" }
Grant-EC2SecurityGroupEgress -GroupId sg-12345678 -IpPermission $ip
```

Contoh 2: Dengan PowerShell versi 2, Anda harus menggunakan New-Object untuk membuat objek. IpPermission

```
$ip = New-Object Amazon.EC2.Model.IpPermission
$ip.IpProtocol = "tcp"
$ip.FromPort = 80
$ip.ToPort = 80
$ip.IpRanges.Add("203.0.113.0/24")

Grant-EC2SecurityGroupEgress -GroupId sg-12345678 -IpPermission $ip
```

Contoh 3: Contoh ini memberikan akses ke grup keamanan sumber yang ditentukan pada TCP port 80.

```
$ug = New-Object Amazon.EC2.Model.UserIdGroupPair
$ug.GroupId = "sg-1a2b3c4d"
$ug.UserId = "123456789012"

Grant-EC2SecurityGroupEgress -GroupId sg-12345678 -IpPermission
 @( @{ IpProtocol="tcp"; FromPort="80"; ToPort="80"; UserIdGroupPairs=$ug } )
```

- Untuk API detailnya, lihat AuthorizeSecurityGroupEgressdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`AuthorizeSecurityGroupIngress`** dengan AWS SDK atau CLI

Contoh kode berikut menunjukkan cara menggunakan`AuthorizeSecurityGroupIngress`.

Contoh tindakan adalah kutipan kode dari program yang lebih besar dan harus dijalankan dalam konteks. Anda dapat melihat tindakan ini dalam konteks dalam contoh kode berikut:

- Pelajari dasar-dasarnya

.NET

AWS SDK for .NET

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
/// <summary>
/// Authorize the local computer ingress to EC2 instances associated
/// with the virtual private cloud (VPC) security group.
/// </summary>
/// <param name="groupName">The name of the security group.</param>
/// <returns>A Boolean value indicating the success of the action.</returns>
public async Task<bool> AuthorizeSecurityGroupIngress(string groupName)
{
    try
    {
        // Get the IP address for the local computer.
        var ipAddress = await GetIpAddress();
        Console.WriteLine($"Your IP address is: {ipAddress}");
        var ipRanges =
```

```
                new List<IpRange> { new IpRange { CidrIp = $"{ipAddress}/32" } };
            var permission = new IpPermission
            {
                Ipv4Ranges = ipRanges,
                IpProtocol = "tcp",
                FromPort = 22,
                ToPort = 22
            };
            var permissions = new List<IpPermission> { permission };
            var response = await _amazonEC2.AuthorizeSecurityGroupIngressAsync(
                new AuthorizeSecurityGroupIngressRequest(groupName,
 permissions));
            return response.HttpStatusCode == HttpStatusCode.OK;
        }
        catch (AmazonEC2Exception ec2Exception)
        {
            if (ec2Exception.ErrorCode == "InvalidPermission.Duplicate")
            {
                _logger.LogError(
                    $"The ingress rule already exists. {ec2Exception.Message}");
            }

            throw;
        }
        catch (Exception ex)
        {
            _logger.LogError(
                $"An error occurred while authorizing ingress.: {ex.Message}");
            throw;
        }
    }

    /// <summary>
    /// Authorize the local computer for ingress to
    /// the Amazon EC2 SecurityGroup.
    /// </summary>
    /// <returns>The IPv4 address of the computer running the scenario.</returns>
    private static async Task<string> GetIpAddress()
    {
        var httpClient = new HttpClient();
        var ipString = await httpClient.GetStringAsync("https://
checkip.amazonaws.com");

        // The IP address is returned with a new line
```

```
        // character on the end. Trim off the whitespace and
        // return the value to the caller.
        return ipString.Trim();
    }
```

- Untuk API detailnya, lihat AuthorizeSecurityGroupIngressdi AWS SDK for .NET APIReferensi.

## Bash

### AWS CLI dengan skrip Bash

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
###############################################################################
# function ec2_authorize_security_group_ingress
#
# This function authorizes an ingress rule for an Amazon Elastic Compute Cloud
 (Amazon EC2) security group.
#
# Parameters:
#       -g security_group_id - The ID of the security group.
#       -i ip_address - The IP address or CIDR block to authorize.
#       -p protocol - The protocol to authorize (e.g., tcp, udp, icmp).
#       -f from_port - The start of the port range to authorize.
#       -t to_port - The end of the port range to authorize.
#
# And:
#       0 - If successful.
#       1 - If it fails.
###############################################################################
function ec2_authorize_security_group_ingress() {
  local security_group_id ip_address protocol from_port to_port response
  local option OPTARG # Required to use getopts command in a function.

  # bashsupport disable=BP5008
```

```
 function usage() {
   echo "function ec2_authorize_security_group_ingress"
   echo "Authorizes an ingress rule for an Amazon Elastic Compute Cloud (Amazon
EC2) security group."
   echo "  -g security_group_id - The ID of the security group."
   echo "  -i ip_address - The IP address or CIDR block to authorize."
   echo "  -p protocol - The protocol to authorize (e.g., tcp, udp, icmp)."
   echo "  -f from_port - The start of the port range to authorize."
   echo "  -t to_port - The end of the port range to authorize."
   echo ""
 }

 # Retrieve the calling parameters.
 while getopts "g:i:p:f:t:h" option; do
   case "${option}" in
     g) security_group_id="${OPTARG}" ;;
     i) ip_address="${OPTARG}" ;;
     p) protocol="${OPTARG}" ;;
     f) from_port="${OPTARG}" ;;
     t) to_port="${OPTARG}" ;;
     h)
       usage
       return 0
       ;;
     \?)
       echo "Invalid parameter"
       usage
       return 1
       ;;
   esac
 done
 export OPTIND=1

 if [[ -z "$security_group_id" ]]; then
   errecho "ERROR: You must provide a security group ID with the -g parameter."
   usage
   return 1
 fi

 if [[ -z "$ip_address" ]]; then
   errecho "ERROR: You must provide an IP address or CIDR block with the -i
parameter."
   usage
   return 1
```

```
  fi

  if [[ -z "$protocol" ]]; then
    errecho "ERROR: You must provide a protocol with the -p parameter."
    usage
    return 1
  fi

  if [[ -z "$from_port" ]]; then
    errecho "ERROR: You must provide a start port with the -f parameter."
    usage
    return 1
  fi

  if [[ -z "$to_port" ]]; then
    errecho "ERROR: You must provide an end port with the -t parameter."
    usage
    return 1
  fi

  response=$(aws ec2 authorize-security-group-ingress \
    --group-id "$security_group_id" \
    --cidr "${ip_address}/32" \
    --protocol "$protocol" \
    --port "$from_port-$to_port" \
    --output text) || {
    aws_cli_error_log ${?}
    errecho "ERROR: AWS reports authorize-security-group-ingress operation
 failed.$response"
    return 1
  }

  return 0
}
```

Fungsi utilitas yang digunakan dalam contoh ini.

```
###############################################################################
# function errecho
#
# This function outputs everything sent to it to STDERR (standard error output).
###############################################################################
```

```
function errecho() {
  printf "%s\n" "$*" 1>&2
}

###############################################################################
# function aws_cli_error_log()
#
# This function is used to log the error messages from the AWS CLI.
#
# The function expects the following argument:
#         $1 - The error code returned by the AWS CLI.
#
#  Returns:
#          0: - Success.
#
###############################################################################
function aws_cli_error_log() {
  local err_code=$1
  errecho "Error code : $err_code"
  if [ "$err_code" == 1 ]; then
    errecho "  One or more S3 transfers failed."
  elif [ "$err_code" == 2 ]; then
    errecho "  Command line failed to parse."
  elif [ "$err_code" == 130 ]; then
    errecho "  Process received SIGINT."
  elif [ "$err_code" == 252 ]; then
    errecho "  Command syntax invalid."
  elif [ "$err_code" == 253 ]; then
    errecho "  The system environment or configuration was invalid."
  elif [ "$err_code" == 254 ]; then
    errecho "  The service returned an error."
  elif [ "$err_code" == 255 ]; then
    errecho "  255 is a catch-all error."
  fi

  return 0
}
```

- Untuk API detailnya, lihat AuthorizeSecurityGroupIngressdi Referensi AWS CLI Perintah.

C++

SDKuntuk C ++

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
//! Authorize ingress to an Amazon Elastic Compute Cloud (Amazon EC2) group.
/*!
  \param groupID: The EC2 group ID.
  \param clientConfiguration: The ClientConfiguration object.
  \return bool: True if the operation was successful, false otherwise.
 */
bool
AwsDoc::EC2::authorizeSecurityGroupIngress(const Aws::String &groupID,
                                           const Aws::Client::ClientConfiguration
 &clientConfiguration) {
    Aws::EC2::EC2Client ec2Client(clientConfiguration);
    Aws::EC2::Model::AuthorizeSecurityGroupIngressRequest
 authorizeSecurityGroupIngressRequest;
    authorizeSecurityGroupIngressRequest.SetGroupId(groupID);
    buildSampleIngressRule(authorizeSecurityGroupIngressRequest);

    Aws::EC2::Model::AuthorizeSecurityGroupIngressOutcome
 authorizeSecurityGroupIngressOutcome =

 ec2Client.AuthorizeSecurityGroupIngress(authorizeSecurityGroupIngressRequest);

    if (authorizeSecurityGroupIngressOutcome.IsSuccess()) {
        std::cout << "Successfully authorized security group ingress." <<
 std::endl;
    } else {
        std::cerr << "Error authorizing security group ingress: "
                  << authorizeSecurityGroupIngressOutcome.GetError().GetMessage()
 << std::endl;
    }

    return authorizeSecurityGroupIngressOutcome.IsSuccess();
}
```

Fungsi utilitas untuk membangun aturan masuk.

```
//! Build a sample ingress rule.
/*!
  \param authorize_request: An 'AuthorizeSecurityGroupIngressRequest' instance.
  \return void:
 */
void buildSampleIngressRule(
        Aws::EC2::Model::AuthorizeSecurityGroupIngressRequest &authorize_request)
 {
    Aws::String ingressIPRange = "203.0.113.0/24";  // Configure this for your
 allowed IP range.
    Aws::EC2::Model::IpRange ip_range;
    ip_range.SetCidrIp(ingressIPRange);

    Aws::EC2::Model::IpPermission permission1;
    permission1.SetIpProtocol("tcp");
    permission1.SetToPort(80);
    permission1.SetFromPort(80);
    permission1.AddIpRanges(ip_range);

    authorize_request.AddIpPermissions(permission1);

    Aws::EC2::Model::IpPermission permission2;
    permission2.SetIpProtocol("tcp");
    permission2.SetToPort(22);
    permission2.SetFromPort(22);
    permission2.AddIpRanges(ip_range);

    authorize_request.AddIpPermissions(permission2);
}
```

- Untuk API detailnya, lihat AuthorizeSecurityGroupIngressdi AWS SDK for C++ APIReferensi.

CLI

AWS CLI

Contoh 1: Untuk menambahkan aturan yang memungkinkan lalu lintas masuk SSH

`authorize-security-group-ingress`Contoh berikut menambahkan aturan yang memungkinkan lalu lintas masuk pada TCP port 22 (SSH).

```
aws ec2 authorize-security-group-ingress \
    --group-id sg-1234567890abcdef0 \
    --protocol tcp \
    --port 22 \
    --cidr 203.0.113.0/24
```

Output:

```
{
    "Return": true,
    "SecurityGroupRules": [
        {
            "SecurityGroupRuleId": "sgr-01afa97ef3e1bedfc",
            "GroupId": "sg-1234567890abcdef0",
            "GroupOwnerId": "123456789012",
            "IsEgress": false,
            "IpProtocol": "tcp",
            "FromPort": 22,
            "ToPort": 22,
            "CidrIpv4": "203.0.113.0/24"
        }
    ]
}
```

Contoh 2: Untuk menambahkan aturan yang memungkinkan HTTP lalu lintas masuk dari grup keamanan lain

`authorize-security-group-ingress`Contoh berikut menambahkan aturan yang memungkinkan akses masuk pada TCP port 80 dari grup `sg-1a2b3c4d` keamanan sumber. Kelompok sumber harus sama VPC atau sejawat VPC (membutuhkan koneksi VPC peering). Lalu lintas masuk diizinkan berdasarkan alamat IP privat dari instans yang dikaitkan dengan grup keamanan sumber (bukan alamat IP publik atau alamat IP Elastis).

```
aws ec2 authorize-security-group-ingress \
    --group-id sg-1234567890abcdef0 \
    --protocol tcp \
    --port 80 \
    --source-group sg-1a2b3c4d
```

Output:

```
{
    "Return": true,
    "SecurityGroupRules": [
        {
            "SecurityGroupRuleId": "sgr-01f4be99110f638a7",
            "GroupId": "sg-1234567890abcdef0",
            "GroupOwnerId": "123456789012",
            "IsEgress": false,
            "IpProtocol": "tcp",
            "FromPort": 80,
            "ToPort": 80,
            "ReferencedGroupInfo": {
                "GroupId": "sg-1a2b3c4d",
                "UserId": "123456789012"
            }
        }
    ]
}
```

Contoh 3: Untuk menambahkan banyak aturan dalam panggilan yang sama

`authorize-security-group-ingress`Contoh berikut menggunakan `ip-permissions` parameter untuk menambahkan dua aturan masuk, satu yang memungkinkan akses masuk pada TCP port 3389 (RDP) dan yang lainnya yang memungkinkan ping/. ICMP

aws ec2 authorize-security-group-ingress --group-id sg-1234567890abcdef0 --ip-permissions IpProtocol =tcp, =3389, FromPort =3389, = "[{=172.31.0.0/16}]” =icmp, =-1, =-1, = "[{=172.31.0.0/16}ToPort]” IpRanges CidrIp IpProtocol FromPort ToPort IpRanges CidrIp

Output:

```
{
    "Return": true,
```

```
    "SecurityGroupRules": [
        {
            "SecurityGroupRuleId": "sgr-00e06e5d3690f29f3",
            "GroupId": "sg-1234567890abcdef0",
            "GroupOwnerId": "123456789012",
            "IsEgress": false,
            "IpProtocol": "tcp",
            "FromPort": 3389,
            "ToPort": 3389,
            "CidrIpv4": "172.31.0.0/16"
        },
        {
            "SecurityGroupRuleId": "sgr-0a133dd4493944b87",
            "GroupId": "sg-1234567890abcdef0",
            "GroupOwnerId": "123456789012",
            "IsEgress": false,
            "IpProtocol": "tcp",
            "FromPort": -1,
            "ToPort": -1,
            "CidrIpv4": "172.31.0.0/16"
        }
    ]
}
```

Contoh 4: Untuk menambahkan aturan untuk ICMP lalu lintas

`authorize-security-group-ingress`Contoh berikut menggunakan `ip-permissions` parameter untuk menambahkan aturan masuk yang memungkinkan ICMP pesan `Destination Unreachable: Fragmentation Needed and Don't Fragment was Set` (Tipe 3, Kode 4) dari mana saja.

aws ec2 authorize-security-group-ingress --group-id sg-1234567890abcdef0 --ip-permissions =icmp, =3, =4, = "[{=0.0.0.0/0}]" IpProtocol FromPort ToPort IpRanges CidrIp

Output:

```
{
    "Return": true,
    "SecurityGroupRules": [
        {
            "SecurityGroupRuleId": "sgr-0de3811019069b787",
            "GroupId": "sg-1234567890abcdef0",
            "GroupOwnerId": "123456789012",
```

```
            "IsEgress": false,
            "IpProtocol": "icmp",
            "FromPort": 3,
            "ToPort": 4,
            "CidrIpv4": "0.0.0.0/0"
        }
    ]
}
```

Contoh 5: Untuk menambahkan aturan untuk IPv6 lalu lintas

`authorize-security-group-ingress`Contoh berikut menggunakan `ip-permissions` parameter untuk menambahkan aturan masuk yang memungkinkan SSH akses (port 22) dari IPv6 rentang`2001:db8:1234:1a00::/64`.

aws ec2 authorize-security-group-ingress --group-id sg-1234567890abcdef0 --ip-permissions =tcp, =22, =22, Ipv6Ranges= "[{6=2001:db 8:1234:1 a00: IpProtocol :/64}]" FromPort ToPort CidrIpv

Output:

```
{
    "Return": true,
    "SecurityGroupRules": [
        {
            "SecurityGroupRuleId": "sgr-0455bc68b60805563",
            "GroupId": "sg-1234567890abcdef0",
            "GroupOwnerId": "123456789012",
            "IsEgress": false,
            "IpProtocol": "tcp",
            "FromPort": 22,
            "ToPort": 22,
            "CidrIpv6": "2001:db8:1234:1a00::/64"
        }
    ]
}
```

Contoh 6: Untuk menambahkan aturan untuk ICMPv6 lalu lintas

`authorize-security-group-ingress`Contoh berikut menggunakan `ip-permissions` parameter untuk menambahkan aturan masuk yang memungkinkan ICMPv6 lalu lintas dari mana saja.

aws ec2 authorize-security-group-ingress --group-id sg-1234567890abcdef0 --ip-permissions =icmpv6, Ipv6Ranges= "[{6=: :/0}]" IpProtocol CidrIpv

Output:

```
{
    "Return": true,
    "SecurityGroupRules": [
        {
            "SecurityGroupRuleId": "sgr-04b612d9363ab6327",
            "GroupId": "sg-1234567890abcdef0",
            "GroupOwnerId": "123456789012",
            "IsEgress": false,
            "IpProtocol": "icmpv6",
            "FromPort": -1,
            "ToPort": -1,
            "CidrIpv6": "::/0"
        }
    ]
}
```

Contoh 7: Tambahkan aturan dengan deskripsi

`authorize-security-group-ingress`Contoh berikut menggunakan `ip-permissions` parameter untuk menambahkan aturan masuk yang memungkinkan RDP lalu lintas dari rentang IPv4 alamat yang ditentukan. Aturan mencakup deskripsi untuk membantu Anda mengidentifikasinya nanti.

aws ec2 authorize-security-group-ingress --group-id sg-1234567890abcdef0 --ip-permissions IpProtocol =tcp, =3389, =3389, = "[{=203.0.113.0/24, Description='akses dari kantor NY'}]" FromPort ToPort IpRanges CidrIp RDP

Output:

```
{
    "Return": true,
    "SecurityGroupRules": [
        {
            "SecurityGroupRuleId": "sgr-0397bbcc01e974db3",
            "GroupId": "sg-1234567890abcdef0",
            "GroupOwnerId": "123456789012",
```

```
            "IsEgress": false,
            "IpProtocol": "tcp",
            "FromPort": 3389,
            "ToPort": 3389,
            "CidrIpv4": "203.0.113.0/24",
            "Description": "RDP access from NY office"
        }
    ]
}
```

Contoh 8: Untuk menambahkan aturan masuk yang menggunakan daftar prefiks

`authorize-security-group-ingress`Contoh berikut menggunakan `ip-permissions` parameter untuk menambahkan aturan masuk yang memungkinkan semua lalu lintas untuk CIDR rentang dalam daftar awalan yang ditentukan.

aws ec2 authorize-security-group-ingress --group-id sg-04a351bfe432d4e71 --ip-permissions =all, = "[{=pl-002dc3ec097de1514}]" IpProtocol PrefixListIds PrefixListId

Output:

```
{
    "Return": true,
    "SecurityGroupRules": [
        {
            "SecurityGroupRuleId": "sgr-09c74b32f677c6c7c",
            "GroupId": "sg-1234567890abcdef0",
            "GroupOwnerId": "123456789012",
            "IsEgress": false,
            "IpProtocol": "-1",
            "FromPort": -1,
            "ToPort": -1,
            "PrefixListId": "pl-0721453c7ac4ec009"
        }
    ]
}
```

Untuk informasi selengkapnya, lihat Grup keamanan di Panduan VPC Pengguna Amazon.

- Untuk API detailnya, lihat AuthorizeSecurityGroupIngressdi Referensi AWS CLI Perintah.

Java

SDKuntuk Java 2.x

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
   /**
    * Creates a new security group asynchronously with the specified group name,
description, and VPC ID. It also
    * authorizes inbound traffic on ports 80 and 22 from the specified IP
address.
    *
    * @param groupName    the name of the security group to create
    * @param groupDesc    the description of the security group
    * @param vpcId        the ID of the VPC in which to create the security
group
    * @param myIpAddress  the IP address from which to allow inbound traffic
(e.g., "192.168.1.1/0" to allow traffic from
    *                     any IP address in the 192.168.1.0/24 subnet)
    * @return a CompletableFuture that, when completed, returns the ID of the
created security group
    * @throws RuntimeException if there was a failure creating the security
group or authorizing the inbound traffic
    */
   public CompletableFuture<String> createSecurityGroupAsync(String groupName,
String groupDesc, String vpcId, String myIpAddress) {
       CreateSecurityGroupRequest createRequest =
CreateSecurityGroupRequest.builder()
           .groupName(groupName)
           .description(groupDesc)
           .vpcId(vpcId)
           .build();

       return getAsyncClient().createSecurityGroup(createRequest)
           .thenCompose(createResponse -> {
               String groupId = createResponse.groupId();
               IpRange ipRange = IpRange.builder()
                   .cidrIp(myIpAddress + "/32")
```

```
                    .build();

                IpPermission ipPerm = IpPermission.builder()
                    .ipProtocol("tcp")
                    .toPort(80)
                    .fromPort(80)
                    .ipRanges(ipRange)
                    .build();

                IpPermission ipPerm2 = IpPermission.builder()
                    .ipProtocol("tcp")
                    .toPort(22)
                    .fromPort(22)
                    .ipRanges(ipRange)
                    .build();

                AuthorizeSecurityGroupIngressRequest authRequest =
AuthorizeSecurityGroupIngressRequest.builder()
                    .groupName(groupName)
                    .ipPermissions(ipPerm, ipPerm2)
                    .build();

                return
getAsyncClient().authorizeSecurityGroupIngress(authRequest)
                    .thenApply(authResponse -> groupId);
            })
            .whenComplete((result, exception) -> {
                if (exception != null) {
                    if (exception instanceof CompletionException &&
exception.getCause() instanceof Ec2Exception) {
                        throw (Ec2Exception) exception.getCause();
                    } else {
                        throw new RuntimeException("Failed to create security
group: " + exception.getMessage(), exception);
                    }
                }
            });
    }
```

- Untuk API detailnya, lihat AuthorizeSecurityGroupIngressdi AWS SDK for Java 2.x APIReferensi.

JavaScript

SDKuntuk JavaScript (v3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
import {
  AuthorizeSecurityGroupIngressCommand,
  EC2Client,
} from "@aws-sdk/client-ec2";

/**
 * Adds the specified inbound (ingress) rules to a security group.
 * @param {{ groupId: string, ipAddress: string }} options
 */
export const main = async ({ groupId, ipAddress }) => {
  const client = new EC2Client({});
  const command = new AuthorizeSecurityGroupIngressCommand({
    // Use a group ID from the AWS console or
    // the DescribeSecurityGroupsCommand.
    GroupId: groupId,
    IpPermissions: [
      {
        IpProtocol: "tcp",
        FromPort: 22,
        ToPort: 22,
        // The IP address to authorize.
        // For more information on this notation, see
        // https://en.wikipedia.org/wiki/Classless_Inter-
Domain_Routing#CIDR_notation
        IpRanges: [{ CidrIp: `${ipAddress}/32` }],
      },
    ],
  });

  try {
    const { SecurityGroupRules } = await client.send(command);
    console.log(JSON.stringify(SecurityGroupRules, null, 2));
```

```
  } catch (caught) {
    if (caught instanceof Error && caught.name === "InvalidGroupId.Malformed") {
      console.warn(`${caught.message}. Please provide a valid GroupId.`);
    } else {
      throw caught;
    }
  }
};
```

- Untuk API detailnya, lihat AuthorizeSecurityGroupIngressdi AWS SDK for JavaScript APIReferensi.

Kotlin

SDKuntuk Kotlin

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
suspend fun createEC2SecurityGroupSc(
    groupNameVal: String?,
    groupDescVal: String?,
    vpcIdVal: String?,
    myIpAddress: String?,
): String? {
    val request =
        CreateSecurityGroupRequest {
            groupName = groupNameVal
            description = groupDescVal
            vpcId = vpcIdVal
        }

    Ec2Client { region = "us-west-2" }.use { ec2 ->
        val resp = ec2.createSecurityGroup(request)
        val ipRange =
            IpRange {
                cidrIp = "$myIpAddress/0"
```

```
            }

        val ipPerm =
            IpPermission {
                ipProtocol = "tcp"
                toPort = 80
                fromPort = 80
                ipRanges = listOf(ipRange)
            }

        val ipPerm2 =
            IpPermission {
                ipProtocol = "tcp"
                toPort = 22
                fromPort = 22
                ipRanges = listOf(ipRange)
            }

        val authRequest =
            AuthorizeSecurityGroupIngressRequest {
                groupName = groupNameVal
                ipPermissions = listOf(ipPerm, ipPerm2)
            }
        ec2.authorizeSecurityGroupIngress(authRequest)
        println("Successfully added ingress policy to Security Group
 $groupNameVal")
        return resp.groupId
    }
}
```

- Untuk API detailnya, lihat AuthorizeSecurityGroupIngress AWSSDKAPIreferensi Kotlin.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini mendefinisikan aturan ingress untuk grup keamanan untuk EC2 -. VPC Aturan-aturan ini memberikan akses ke alamat IP tertentu untuk SSH (port 22) dan RDC (port 3389). Perhatikan bahwa Anda harus mengidentifikasi grup keamanan untuk EC2 - VPC menggunakan ID grup keamanan bukan nama grup keamanan. Sintaks yang digunakan oleh contoh ini membutuhkan PowerShell versi 3 atau lebih tinggi.

```
$ip1 = @{ IpProtocol="tcp"; FromPort="22"; ToPort="22";
 IpRanges="203.0.113.25/32" }
$ip2 = @{ IpProtocol="tcp"; FromPort="3389"; ToPort="3389";
 IpRanges="203.0.113.25/32" }

Grant-EC2SecurityGroupIngress -GroupId sg-12345678 -IpPermission @( $ip1, $ip2 )
```

Contoh 2: Dengan PowerShell versi 2, Anda harus menggunakan New-Object untuk membuat objek. IpPermission

```
$ip1 = New-Object Amazon.EC2.Model.IpPermission
$ip1.IpProtocol = "tcp"
$ip1.FromPort = 22
$ip1.ToPort = 22
$ip1.IpRanges.Add("203.0.113.25/32")

$ip2 = new-object Amazon.EC2.Model.IpPermission
$ip2.IpProtocol = "tcp"
$ip2.FromPort = 3389
$ip2.ToPort = 3389
$ip2.IpRanges.Add("203.0.113.25/32")

Grant-EC2SecurityGroupIngress -GroupId sg-12345678 -IpPermission @( $ip1, $ip2 )
```

Contoh 3: Contoh ini mendefinisikan aturan ingress untuk grup keamanan untuk -Classic. EC2 Aturan-aturan ini memberikan akses ke alamat IP tertentu untuk SSH (port 22) dan RDC (port 3389). Sintaks yang digunakan oleh contoh ini membutuhkan PowerShell versi 3 atau lebih tinggi.

```
$ip1 = @{ IpProtocol="tcp"; FromPort="22"; ToPort="22";
 IpRanges="203.0.113.25/32" }
$ip2 = @{ IpProtocol="tcp"; FromPort="3389"; ToPort="3389";
 IpRanges="203.0.113.25/32" }

Grant-EC2SecurityGroupIngress -GroupName "my-security-group" -IpPermission
 @( $ip1, $ip2 )
```

Contoh 4: Dengan PowerShell versi 2, Anda harus menggunakan New-Object untuk membuat objek. IpPermission

```
$ip1 = New-Object Amazon.EC2.Model.IpPermission
```

```
$ip1.IpProtocol = "tcp"
$ip1.FromPort = 22
$ip1.ToPort = 22
$ip1.IpRanges.Add("203.0.113.25/32")

$ip2 = new-object Amazon.EC2.Model.IpPermission
$ip2.IpProtocol = "tcp"
$ip2.FromPort = 3389
$ip2.ToPort = 3389
$ip2.IpRanges.Add("203.0.113.25/32")

Grant-EC2SecurityGroupIngress -GroupName "my-security-group" -IpPermission
 @( $ip1, $ip2 )
```

Contoh 5: Contoh ini memberikan akses TCP port 8081 dari grup keamanan sumber tertentu (sg-1a2b3c4d) ke grup keamanan tertentu (sg-12345678).

```
$ug = New-Object Amazon.EC2.Model.UserIdGroupPair
$ug.GroupId = "sg-1a2b3c4d"
$ug.UserId = "123456789012"

Grant-EC2SecurityGroupIngress -GroupId sg-12345678 -IpPermission
 @( @{ IpProtocol="tcp"; FromPort="8081"; ToPort="8081"; UserIdGroupPairs=$ug } )
```

Contoh 6: Contoh ini menambahkan CIDR 5.5.5.5/32 ke aturan Ingress dari Security Group sg-1234abcd untuk lalu lintas port 22 dengan deskripsi. TCP

```
$IpRange = New-Object -TypeName Amazon.EC2.Model.IpRange
$IpRange.CidrIp = "5.5.5.5/32"
$IpRange.Description = "SSH from Office"
$IpPermission = New-Object Amazon.EC2.Model.IpPermission
$IpPermission.IpProtocol = "tcp"
$IpPermission.ToPort = 22
$IpPermission.FromPort = 22
$IpPermission.Ipv4Ranges = $IpRange
Grant-EC2SecurityGroupIngress -GroupId sg-1234abcd -IpPermission $IpPermission
```

- Untuk API detailnya, lihat AuthorizeSecurityGroupIngressdi AWS Tools for PowerShell Referensi Cmdlet.

Python

SDKuntuk Python (Boto3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
class SecurityGroupWrapper:
    """Encapsulates Amazon Elastic Compute Cloud (Amazon EC2) security group
 actions."""

    def __init__(self, ec2_client: boto3.client, security_group: Optional[str] =
 None):
        """
        Initializes the SecurityGroupWrapper with an EC2 client and an optional
 security group ID.

        :param ec2_client: A Boto3 Amazon EC2 client. This client provides low-
level
                           access to AWS EC2 services.
        :param security_group: The ID of a security group to manage. This is a
 high-level identifier
                               that represents the security group.
        """
        self.ec2_client = ec2_client
        self.security_group = security_group

    @classmethod
    def from_client(cls) -> "SecurityGroupWrapper":
        """
        Creates a SecurityGroupWrapper instance with a default EC2 client.

        :return: An instance of SecurityGroupWrapper initialized with the default
 EC2 client.
        """
        ec2_client = boto3.client("ec2")
        return cls(ec2_client)
```

```
    def authorize_ingress(self, ssh_ingress_ip: str) -> Optional[Dict[str, Any]]:
        """
        Adds a rule to the security group to allow access to SSH.

        :param ssh_ingress_ip: The IP address that is granted inbound access to
connect
                               to port 22 over TCP, used for SSH.
        :return: The response to the authorization request. The 'Return' field of
the
                 response indicates whether the request succeeded or failed, or
None if no security group is set.
        :raise Handles AWS SDK service-level ClientError, with special handling
for ResourceAlreadyExists
        """
        if self.security_group is None:
            logger.info("No security group to update.")
            return None

        try:
            ip_permissions = [
                {
                    # SSH ingress open to only the specified IP address.
                    "IpProtocol": "tcp",
                    "FromPort": 22,
                    "ToPort": 22,
                    "IpRanges": [{"CidrIp": f"{ssh_ingress_ip}/32"}],
                }
            ]
            response = self.ec2_client.authorize_security_group_ingress(
                GroupId=self.security_group, IpPermissions=ip_permissions
            )
        except ClientError as err:
            if err.response["Error"]["Code"] == "InvalidPermission.Duplicate":
                logger.error(
                    f"The SSH ingress rule for IP {ssh_ingress_ip} already
exists"
                    f"in security group '{self.security_group}'."
                )
            raise
        else:
            return response
```

- Untuk API detailnya, lihat AuthorizeSecurityGroupIngress AWSSDKReferensi Python (Boto3). API

Rust

SDKuntuk Rust

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    /// Add an ingress rule to a security group explicitly allowing IPv4 address
    /// as {ip}/32 over TCP port 22.
    pub async fn authorize_security_group_ssh_ingress(
        &self,
        group_id: &str,
        ingress_ips: Vec<Ipv4Addr>,
    ) -> Result<(), EC2Error> {
        tracing::info!("Authorizing ingress for security group {group_id}");
        self.client
            .authorize_security_group_ingress()
            .group_id(group_id)
            .set_ip_permissions(Some(
                ingress_ips
                    .into_iter()
                    .map(|ip| {
                        IpPermission::builder()
                            .ip_protocol("tcp")
                            .from_port(22)
                            .to_port(22)
                            .ip_ranges(IpRange::builder().cidr_ip(format!
("{ip}/32")).build())
                            .build()
                    })
                    .collect(),
            ))
            .send()
            .await?;
        Ok(())
```

```
    }
```

- Untuk API detailnya, lihat AuthorizeSecurityGroupIngress AWSSDKAPIreferensi Rust.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`CancelCapacityReservation`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`CancelCapacityReservation`.

CLI

AWS CLI

Untuk membatalkan reservasi kapasitas

`cancel-capacity-reservation`Contoh berikut membatalkan reservasi kapasitas yang ditentukan.

```
aws ec2 cancel-capacity-reservation \
    --capacity-reservation-id cr-1234abcd56EXAMPLE
```

Output:

```
{
    "Return": true
}
```

Untuk informasi selengkapnya, lihat Membatalkan Reservasi Kapasitas di Panduan Pengguna Amazon Elastic Compute Cloud untuk Instans Linux.

- Untuk API detailnya, lihat CancelCapacityReservationdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini membatalkan reservasi kapasitas cr-0c1f2345db6f7cdba

```
Remove-EC2CapacityReservation -CapacityReservationId cr-0c1f2345db6f7cdba
```

Output:

```
Confirm
Are you sure you want to perform this action?
Performing the operation "Remove-EC2CapacityReservation
 (CancelCapacityReservation)" on target "cr-0c1f2345db6f7cdba".
[Y] Yes  [A] Yes to All  [N] No  [L] No to All  [S] Suspend  [?] Help (default is
 "Y"): y
True
```

- Untuk API detailnya, lihat CancelCapacityReservationdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`CancelImportTask`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`CancelImportTask`.

CLI

AWS CLI

Untuk membatalkan tugas impor

`cancel-import-task`Contoh berikut membatalkan tugas gambar impor yang ditentukan.

```
aws ec2 cancel-import-task \
    --import-task-id import-ami-1234567890abcdef0
```

Output:

```
{
    "ImportTaskId": "import-ami-1234567890abcdef0",
    "PreviousState": "active",
```

```
    "State": "deleting"
}
```

- Untuk API detailnya, lihat CancelImportTaskdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini membatalkan tugas impor yang ditentukan (baik snapshot atau impor gambar). Jika diperlukan, alasan dapat menyediakan menggunakan **`-CancelReason`** parameter.

```
Stop-EC2ImportTask -ImportTaskId import-ami-abcdefgh
```

- Untuk API detailnya, lihat CancelImportTaskdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`CancelSpotFleetRequests`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`CancelSpotFleetRequests`.

CLI

AWS CLI

Contoh 1: Untuk membatalkan permintaan armada Spot dan menghentikan instans terkait

`cancel-spot-fleet-requests`Contoh berikut membatalkan permintaan Armada Spot dan mengakhiri Instans Sesuai Permintaan dan Instans Spot terkait.

```
aws ec2 cancel-spot-fleet-requests \
    --spot-fleet-request-ids sfr-73fbd2ce-aa30-494c-8788-1cee4EXAMPLE \
    --terminate-instances
```

Output:

```
{
    "SuccessfulFleetRequests": [
        {
            "SpotFleetRequestId": "sfr-73fbd2ce-aa30-494c-8788-1cee4EXAMPLE",
            "CurrentSpotFleetRequestState": "cancelled_terminating",
            "PreviousSpotFleetRequestState": "active"
        }
    ],
    "UnsuccessfulFleetRequests": []
}
```

Untuk informasi selengkapnya, lihat Membatalkan permintaan Armada Spot di Panduan Pengguna Amazon Elastic Compute Cloud untuk Instans Linux.

Contoh 2: Untuk membatalkan permintaan armada Spot tanpa menghentikan instans terkait

`cancel-spot-fleet-requests`Contoh berikut membatalkan permintaan Armada Spot tanpa menghentikan Instans Sesuai Permintaan dan Instans Spot terkait.

```
aws ec2 cancel-spot-fleet-requests \
    --spot-fleet-request-ids sfr-73fbd2ce-aa30-494c-8788-1cee4EXAMPLE \
    --no-terminate-instances
```

Output:

```
{
    "SuccessfulFleetRequests": [
        {
            "SpotFleetRequestId": "sfr-73fbd2ce-aa30-494c-8788-1cee4EXAMPLE",
            "CurrentSpotFleetRequestState": "cancelled_running",
            "PreviousSpotFleetRequestState": "active"
        }
    ],
    "UnsuccessfulFleetRequests": []
}
```

Untuk informasi selengkapnya, lihat Membatalkan permintaan Armada Spot di Panduan Pengguna Amazon Elastic Compute Cloud untuk Instans Linux.

- Untuk API detailnya, lihat CancelSpotFleetRequestsdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini membatalkan permintaan armada Spot yang ditentukan dan mengakhiri instance Spot terkait.

```
Stop-EC2SpotFleetRequest -SpotFleetRequestId sfr-73fbd2ce-
aa30-494c-8788-1cee4EXAMPLE -TerminateInstance $true
```

Contoh 2: Contoh ini membatalkan permintaan armada Spot yang ditentukan tanpa menghentikan instance Spot terkait.

```
Stop-EC2SpotFleetRequest -SpotFleetRequestId sfr-73fbd2ce-
aa30-494c-8788-1cee4EXAMPLE -TerminateInstance $false
```

- Untuk API detailnya, lihat CancelSpotFleetRequestsdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`CancelSpotInstanceRequests`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`CancelSpotInstanceRequests`.

CLI

AWS CLI

Untuk membatalkan permintaan Instans Spot

Perintah contoh ini membatalkan permintaan Instans Spot.

Perintah:

```
aws ec2 cancel-spot-instance-requests --spot-instance-request-ids sir-08b93456
```

Output:

```
{
    "CancelledSpotInstanceRequests": [
        {
            "State": "cancelled",
            "SpotInstanceRequestId": "sir-08b93456"
        }
    ]
}
```

- Untuk API detailnya, lihat CancelSpotInstanceRequestsdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini membatalkan permintaan instance Spot yang ditentukan.

```
Stop-EC2SpotInstanceRequest -SpotInstanceRequestId sir-12345678
```

Output:

```
SpotInstanceRequestId    State
---------------------    -----
sir-12345678             cancelled
```

- Untuk API detailnya, lihat CancelSpotInstanceRequestsdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`ConfirmProductInstance`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`ConfirmProductInstance`.

CLI

AWS CLI

Untuk mengonfirmasi contoh produk

Contoh ini menentukan apakah kode produk yang ditentukan dikaitkan dengan contoh yang ditentukan.

Perintah:

```
aws ec2 confirm-product-instance --product-code 774F4FF8 --instance-
id i-1234567890abcdef0
```

Output:

```
{
  "OwnerId": "123456789012"
}
```

- Untuk API detailnya, lihat ConfirmProductInstancedi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menentukan apakah kode produk yang ditentukan dikaitkan dengan instance yang ditentukan.

```
Confirm-EC2ProductInstance -ProductCode 774F4FF8 -InstanceId i-12345678
```

- Untuk API detailnya, lihat ConfirmProductInstancedi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`CopyImage`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`CopyImage`.

CLI

AWS CLI

Contoh 1: Untuk menyalin AMI ke Wilayah lain

`copy-image`Contoh perintah berikut menyalin yang ditentukan AMI dari `us-west-2` Region ke `us-east-1` Region dan menambahkan deskripsi singkat.

```
aws ec2 copy-image \
    --region us-east-1 \
    --name ami-name \
    --source-region us-west-2 \
    --source-image-id ami-066877671789bd71b \
    --description "This is my copied image."
```

Output:

```
{
    "ImageId": "ami-0123456789abcdefg"
}
```

Untuk informasi selengkapnya, lihat Menyalin AMI di Panduan EC2 Pengguna Amazon.

Contoh 2: Untuk menyalin AMI ke Wilayah lain dan mengenkripsi snapshot dukungan

`copy-image`Perintah berikut menyalin yang ditentukan AMI dari `us-west-2` Wilayah ke Wilayah saat ini dan mengenkripsi snapshot dukungan menggunakan kunci yang ditentukan. KMS

```
aws ec2 copy-image \
    --source-region us-west-2 \
    --name ami-name \
    --source-image-id ami-066877671789bd71b \
    --encrypted \
    --kms-key-id alias/my-kms-key
```

Output:

```
{
```

```
    "ImageId": "ami-0123456789abcdefg"
}
```

Untuk informasi selengkapnya, lihat Menyalin AMI di Panduan EC2 Pengguna Amazon.

Contoh 3: Untuk menyertakan AMI tag yang ditentukan pengguna saat menyalin AMI

`copy-image`Perintah berikut menggunakan `--copy-image-tags` parameter untuk menyalin tag yang ditentukan pengguna saat menyalin AMI tag. AMI

```
aws ec2 copy-image \
    --region us-east-1 \
    --name ami-name \
    --source-region us-west-2 \
    --source-image-id ami-066877671789bd71b \
    --description "This is my copied image." 
    --copy-image-tags
```

Output:

```
{
    "ImageId": "ami-0123456789abcdefg"
}
```

Untuk informasi selengkapnya, lihat Menyalin AMI di Panduan EC2 Pengguna Amazon.

- Untuk API detailnya, lihat CopyImagedi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menyalin yang ditentukan AMI di wilayah 'UE (Irlandia) 'ke wilayah 'AS Barat (Oregon)'. Jika -Region tidak ditentukan, wilayah default saat ini digunakan sebagai wilayah tujuan.

```
Copy-EC2Image -SourceRegion eu-west-1 -SourceImageId ami-12345678 -Region us-
west-2 -Name "Copy of ami-12345678"
```

Output:

```
ami-87654321
```

- Untuk API detailnya, lihat CopyImagedi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`CopySnapshot`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`CopySnapshot`.

CLI

AWS CLI

Contoh 1: Untuk menyalin snapshot ke Wilayah lain

`copy-snapshot`Contoh perintah berikut menyalin snapshot yang ditentukan dari `us-west-2` Region ke `us-east-1` Region dan menambahkan deskripsi singkat.

```
aws ec2 copy-snapshot \
    --region us-east-1 \
    --source-region us-west-2 \
    --source-snapshot-id snap-066877671789bd71b \
    --description "This is my copied snapshot."
```

Output:

```
{
    "SnapshotId": "snap-066877671789bd71b"
}
```

Untuk informasi selengkapnya, lihat Menyalin EBS snapshot Amazon di Panduan EC2 Pengguna Amazon.

Contoh 2: Untuk menyalin snapshot yang tidak terenkripsi dan mengenkripsi snapshot baru

`copy-snapshot`Perintah berikut menyalin snapshot tak terenkripsi yang ditentukan dari `us-west-2` Wilayah ke Wilayah saat ini dan mengenkripsi snapshot baru menggunakan kunci yang ditentukan. KMS

```
aws ec2 copy-snapshot \
    --source-region us-west-2 \
    --source-snapshot-id snap-066877671789bd71b \
    --encrypted \
    --kms-key-id alias/my-kms-key
```

Output:

```
{
    "SnapshotId": "snap-066877671789bd71b"
}
```

Untuk informasi selengkapnya, lihat Menyalin EBS snapshot Amazon di Panduan EC2 Pengguna Amazon.

- Untuk API detailnya, lihat CopySnapshotdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menyalin snapshot yang ditentukan dari wilayah UE (Irlandia) ke wilayah AS Barat (Oregon).

```
Copy-EC2Snapshot -SourceRegion eu-west-1 -SourceSnapshotId snap-12345678 -Region
 us-west-2
```

Contoh 2: Jika Anda menetapkan wilayah default dan menghilangkan parameter Region, wilayah tujuan default adalah wilayah default.

```
Set-DefaultAWSRegion us-west-2
Copy-EC2Snapshot -SourceRegion eu-west-1 -SourceSnapshotId snap-12345678
```

- Untuk API detailnya, lihat CopySnapshotdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`CreateCapacityReservation`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`CreateCapacityReservation`.

CLI

AWS CLI

Contoh 1: Untuk membuat reservasi kapasitas

`create-capacity-reservation`Contoh berikut membuat reservasi kapasitas di `eu-west-1a` Availability Zone, di mana Anda dapat meluncurkan tiga `t2.medium` instance yang menjalankan sistem operasi Linux/Unix. Secara default, reservasi kapasitas dibuat dengan kriteria pencocokan instans terbuka dan tidak ada dukungan untuk penyimpanan sementara, dan tetap aktif hingga Anda membatalkannya secara manual.

```
aws ec2 create-capacity-reservation \
    --availability-zone eu-west-1a \
    --instance-type t2.medium \
    --instance-platform Linux/UNIX \
    --instance-count 3
```

Output:

```
{
    "CapacityReservation": {
        "CapacityReservationId": "cr-1234abcd56EXAMPLE ",
        "EndDateType": "unlimited",
        "AvailabilityZone": "eu-west-1a",
        "InstanceMatchCriteria": "open",
        "EphemeralStorage": false,
        "CreateDate": "2019-08-16T09:27:35.000Z",
        "AvailableInstanceCount": 3,
        "InstancePlatform": "Linux/UNIX",
        "TotalInstanceCount": 3,
        "State": "active",
        "Tenancy": "default",
        "EbsOptimized": false,
        "InstanceType": "t2.medium"
    }
}
```

Contoh 2: Untuk membuat Reservasi Kapasitas yang secara otomatis berakhir pada tanggal/waktu tertentu

`create-capacity-reservation`Contoh berikut membuat reservasi kapasitas di `eu-west-1a` Availability Zone, di mana Anda dapat meluncurkan tiga `m5.large` instance yang menjalankan sistem operasi Linux/Unix. Reservasi kapasitas ini secara otomatis berakhir pada 31/08/2019 pukul 23:59:59.

```
aws ec2 create-capacity-reservation \
    --availability-zone eu-west-1a \
    --instance-type m5.large \
    --instance-platform Linux/UNIX \
    --instance-count 3 \
    --end-date-type limited \
    --end-date 2019-08-31T23:59:59Z
```

Output:

```
{
    "CapacityReservation": {
        "CapacityReservationId": "cr-1234abcd56EXAMPLE ",
        "EndDateType": "limited",
        "AvailabilityZone": "eu-west-1a",
        "EndDate": "2019-08-31T23:59:59.000Z",
        "InstanceMatchCriteria": "open",
        "EphemeralStorage": false,
        "CreateDate": "2019-08-16T10:15:53.000Z",
        "AvailableInstanceCount": 3,
        "InstancePlatform": "Linux/UNIX",
        "TotalInstanceCount": 3,
        "State": "active",
        "Tenancy": "default",
        "EbsOptimized": false,
        "InstanceType": "m5.large"
    }
}
```

Contoh 3: Untuk membuat Reservasi Kapasitas yang hanya menerima peluncuran instans yang ditargetkan

`create-capacity-reservation`Contoh berikut membuat reservasi kapasitas yang hanya menerima peluncuran instans yang ditargetkan.

```
aws ec2 create-capacity-reservation \
    --availability-zone eu-west-1a \
    --instance-type m5.large \
    --instance-platform Linux/UNIX \
    --instance-count 3 \
    --instance-match-criteria targeted
```

Output:

```
{
    "CapacityReservation": {
        "CapacityReservationId": "cr-1234abcd56EXAMPLE ",
        "EndDateType": "unlimited",
        "AvailabilityZone": "eu-west-1a",
        "InstanceMatchCriteria": "targeted",
        "EphemeralStorage": false,
        "CreateDate": "2019-08-16T10:21:57.000Z",
        "AvailableInstanceCount": 3,
        "InstancePlatform": "Linux/UNIX",
        "TotalInstanceCount": 3,
        "State": "active",
        "Tenancy": "default",
        "EbsOptimized": false,
        "InstanceType": "m5.large"
    }
}
```

Untuk informasi selengkapnya, lihat Membuat Reservasi Kapasitas di Panduan Pengguna Amazon Elastic Compute Cloud untuk Instans Linux.

- Untuk API detailnya, lihat CreateCapacityReservationdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini membuat Reservasi Kapasitas baru dengan atribut yang ditentukan

```
Add-EC2CapacityReservation -InstanceType m4.xlarge -InstanceCount 2 -
AvailabilityZone eu-west-1b -EbsOptimized True -InstancePlatform Windows
```

Output:

```
AvailabilityZone       : eu-west-1b
AvailableInstanceCount : 2
CapacityReservationId  : cr-0c1f2345db6f7cdba
CreateDate             : 3/28/2019 9:29:41 AM
EbsOptimized           : True
EndDate                : 1/1/0001 12:00:00 AM
EndDateType            : unlimited
EphemeralStorage       : False
InstanceMatchCriteria  : open
InstancePlatform       : Windows
InstanceType           : m4.xlarge
State                  : active
Tags                   : {}
Tenancy                : default
TotalInstanceCount     : 2
```

- Untuk API detailnya, lihat CreateCapacityReservationdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`CreateCustomerGateway`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`CreateCustomerGateway`.

CLI

AWS CLI

Untuk membuat gateway pelanggan

Contoh ini membuat gateway pelanggan dengan alamat IP yang ditentukan untuk antarmuka luarnya.

Perintah:

```
aws ec2 create-customer-gateway --type ipsec.1 --public-ip 12.1.2.3 --bgp-
asn 65534
```

Output:

```
{
    "CustomerGateway": {
        "CustomerGatewayId": "cgw-0e11f167",
        "IpAddress": "12.1.2.3",
        "State": "available",
        "Type": "ipsec.1",
        "BgpAsn": "65534"
    }
}
```

- Untuk API detailnya, lihat CreateCustomerGatewaydi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini membuat gateway pelanggan yang ditentukan.

```
New-EC2CustomerGateway -Type ipsec.1 -PublicIp 203.0.113.12 -BgpAsn 65534
```

Output:

```
BgpAsn            : 65534
CustomerGatewayId : cgw-1a2b3c4d
IpAddress         : 203.0.113.12
State             : available
Tags              : {}
Type              : ipsec.1
```

- Untuk API detailnya, lihat CreateCustomerGatewaydi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`CreateDhcpOptions`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`CreateDhcpOptions`.

CLI

AWS CLI

Untuk membuat satu set DHCP pilihan

`create-dhcp-options`Contoh berikut membuat satu set DHCP opsi yang menentukan nama domain, server nama domain, dan jenis BIOS node Net.

```
aws ec2 create-dhcp-options \
    --dhcp-configuration \
        "Key=domain-name-servers,Values=10.2.5.1,10.2.5.2" \
        "Key=domain-name,Values=example.com" \
        "Key=netbios-node-type,Values=2"
```

Output:

```
{
    "DhcpOptions": {
        "DhcpConfigurations": [
            {
                "Key": "domain-name",
                "Values": [
                    {
                        "Value": "example.com"
                    }
                ]
            },
            {
                "Key": "domain-name-servers",
                "Values": [
                    {
                        "Value": "10.2.5.1"
                    },
                    {
                        "Value": "10.2.5.2"
                    }
                ]
            },
            {
                "Key": "netbios-node-type",
                "Values": [
                    {
```

```
                        "Value": "2"
                    }
                ]
            }
        ],
        "DhcpOptionsId": "dopt-06d52773eff4c55f3"
    }
}
```

- Untuk API detailnya, lihat CreateDhcpOptionsdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menciptakan kumpulan DHCP opsi yang ditentukan. Sintaks yang digunakan oleh contoh ini memerlukan PowerShell versi 3 atau yang lebih baru.

```
$options = @( @{Key="domain-name";Values=@("abc.local")}, @{Key="domain-name-
servers";Values=@("10.0.0.101","10.0.0.102")})
New-EC2DhcpOption -DhcpConfiguration $options
```

Output:

```
DhcpConfigurations                  DhcpOptionsId    Tags
------------------                  -------------    ----
{domain-name, domain-name-servers}    dopt-1a2b3c4d    {}
```

Contoh 2: Dengan PowerShell versi 2, Anda harus menggunakan New-Object untuk membuat setiap DHCP opsi.

```
$option1 = New-Object Amazon.EC2.Model.DhcpConfiguration
$option1.Key = "domain-name"
$option1.Values = "abc.local"

$option2 = New-Object Amazon.EC2.Model.DhcpConfiguration
$option2.Key = "domain-name-servers"
$option2.Values = @("10.0.0.101","10.0.0.102")

New-EC2DhcpOption -DhcpConfiguration @($option1, $option2)
```

Output:

```
DhcpConfigurations                    DhcpOptionsId    Tags
------------------                    -------------    ----
{domain-name, domain-name-servers}    dopt-2a3b4c5d    {}
```

- Untuk API detailnya, lihat CreateDhcpOptionsdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`CreateFlowLogs`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`CreateFlowLogs`.

CLI

AWS CLI

Contoh 1: Untuk membuat log aliran

`create-flow-logs`Contoh berikut membuat log aliran yang menangkap semua lalu lintas ditolak untuk antarmuka jaringan yang ditentukan. Log aliran dikirim ke grup log di CloudWatch Log menggunakan izin dalam IAM peran yang ditentukan.

```
aws ec2 create-flow-logs \
    --resource-type NetworkInterface \
    --resource-ids eni-11223344556677889 \
    --traffic-type REJECT \
    --log-group-name my-flow-logs \
    --deliver-logs-permission-arn arn:aws:iam::123456789101:role/publishFlowLogs
```

Output:

```
{
    "ClientToken": "so0eNA2uSHUNlHI0S2cJ305GuIX1CezaRdGtexample",
    "FlowLogIds": [
        "fl-12345678901234567"
    ],
```

```
    "Unsuccessful": []
}
```

Untuk informasi selengkapnya, lihat Log VPC Aliran di Panduan VPC Pengguna Amazon.

Contoh 2: Untuk membuat log alur dengan format kustom

`create-flow-logs`Contoh berikut membuat log alur yang menangkap semua lalu lintas untuk yang ditentukan VPC dan mengirimkan log aliran ke bucket Amazon S3. Parameter `--log-format` menentukan format kustom untuk catatan log alur. Untuk menjalankan perintah ini di Windows, ubah tanda kutip tunggal (') menjadi tanda kutip ganda (“).

```
aws ec2 create-flow-logs \
    --resource-type VPC \
    --resource-ids vpc-00112233344556677 \
    --traffic-type ALL \
    --log-destination-type s3 \
    --log-destination arn:aws:s3:::flow-log-bucket/my-custom-flow-logs/ \
    --log-format '${version} ${vpc-id} ${subnet-id} ${instance-id} ${srcaddr}
 ${dstaddr} ${srcport} ${dstport} ${protocol} ${tcp-flags} ${type} ${pkt-srcaddr}
 ${pkt-dstaddr}'
```

Untuk informasi selengkapnya, lihat Log VPC Aliran di Panduan VPC Pengguna Amazon.

Contoh 3: Untuk membuat log aliran dengan interval agregasi maksimum satu menit

`create-flow-logs`Contoh berikut membuat log alur yang menangkap semua lalu lintas untuk yang ditentukan VPC dan mengirimkan log aliran ke bucket Amazon S3. `--max-aggregation-interval`Parameter menentukan interval agregasi maksimum 60 detik (1 menit).

```
aws ec2 create-flow-logs \
    --resource-type VPC \
    --resource-ids vpc-00112233344556677 \
    --traffic-type ALL \
    --log-destination-type s3 \
    --log-destination arn:aws:s3:::flow-log-bucket/my-custom-flow-logs/ \
    --max-aggregation-interval 60
```

Untuk informasi selengkapnya, lihat Log VPC Aliran di Panduan VPC Pengguna Amazon.

- Untuk API detailnya, lihat CreateFlowLogsdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini membuat EC2 flowlog untuk subnet subnet-1d234567 ke 'subnet1-log' cloud-watch-log bernama untuk semua lalu lintas " menggunakan batas peran 'Admin' REJECT

```
New-EC2FlowLog -ResourceId "subnet-1d234567" -LogDestinationType cloud-watch-logs -LogGroupName subnet1-log -TrafficType "REJECT" -ResourceType Subnet -DeliverLogsPermissionArn "arn:aws:iam::98765432109:role/Admin"
```

Output:

```
ClientToken                                    FlowLogIds             Unsuccessful
-----------                                    ----------             ------------
m1VN2cxP3iB4qo//VUKl5EU6cF7gQLOxcqNefvjeTGw= {fl-012fc34eed5678c9d} {}
```

- Untuk API detailnya, lihat CreateFlowLogsdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`CreateImage`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`CreateImage`.

CLI

AWS CLI

Contoh 1: Untuk membuat AMI dari instans yang EBS didukung Amazon

`create-image`Contoh berikut menciptakan AMI dari contoh yang ditentukan.

```
aws ec2 create-image \
    --instance-id i-1234567890abcdef0 \
    --name "My server" \
    --description "An AMI for my server"
```

Output:

```
{
    "ImageId": "ami-abcdef01234567890"
}
```

Untuk informasi selengkapnya tentang menentukan pemetaan perangkat blokir untuk AndaAMI, lihat Menentukan pemetaan perangkat blokir untuk Panduan Pengguna AMI Amazon. EC2

Contoh 2: Untuk membuat instance AMI dari Amazon yang EBS didukung tanpa reboot

`create-image`Contoh berikut membuat AMI dan menetapkan parameter --no-reboot, sehingga instance tidak reboot sebelum gambar dibuat.

```
aws ec2 create-image \
    --instance-id i-1234567890abcdef0 \
    --name "My server" \
    --no-reboot
```

Output:

```
{
    "ImageId": "ami-abcdef01234567890"
}
```

Untuk informasi selengkapnya tentang menentukan pemetaan perangkat blokir untuk AndaAMI, lihat Menentukan pemetaan perangkat blokir untuk Panduan Pengguna AMI Amazon. EC2

Contoh 3: Untuk menandai AMI dan snapshot pada pembuatan

`create-image`Contoh berikut membuatAMI, dan tag AMI dan snapshot dengan tag yang sama `cost-center=cc123`

```
aws ec2 create-image \
    --instance-id i-1234567890abcdef0 \
    --name "My server" \
    --tag-specifications "ResourceType=image,Tags=[{Key=cost-
center,Value=cc123}]" "ResourceType=snapshot,Tags=[{Key=cost-
center,Value=cc123}]"
```

Output:

```
{
    "ImageId": "ami-abcdef01234567890"
}
```

Untuk informasi selengkapnya tentang menandai sumber daya Anda saat pembuatan, lihat Menambahkan tag pada pembuatan sumber daya di Panduan EC2 Pengguna Amazon.

- Untuk API detailnya, lihat CreateImagedi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini membuat AMI dengan nama dan deskripsi yang ditentukan, dari contoh yang ditentukan. Amazon EC2 mencoba mematikan instance dengan bersih sebelum membuat gambar, dan memulai ulang instance setelah selesai.

```
New-EC2Image -InstanceId i-12345678 -Name "my-web-server" -Description "My web
 server AMI"
```

Contoh 2: Contoh ini membuat AMI dengan nama dan deskripsi yang ditentukan, dari contoh yang ditentukan. Amazon EC2 membuat gambar tanpa mematikan dan memulai ulang instance; oleh karena itu, integritas sistem file pada gambar yang dibuat tidak dapat dijamin.

```
New-EC2Image -InstanceId i-12345678 -Name "my-web-server" -Description "My web
 server AMI" -NoReboot $true
```

Contoh 3: Contoh ini membuat AMI dengan tiga volume. Volume pertama didasarkan pada EBS snapshot Amazon. Volume kedua adalah volume Amazon EBS 100 GiB kosong. Volume ketiga adalah volume penyimpanan instance. Sintaks yang digunakan oleh contoh ini membutuhkan PowerShell versi 3 atau lebih tinggi.

```
$ebsBlock1 = @{SnapshotId="snap-1a2b3c4d"}
$ebsBlock2 = @{VolumeSize=100}

New-EC2Image -InstanceId i-12345678 -Name "my-web-server" -Description
 "My web server AMI" -BlockDeviceMapping @( @{DeviceName="/dev/sdf";Ebs=
```

```
$ebsBlock1}, @{DeviceName="/dev/sdg";Ebs=$ebsBlock2}, @{DeviceName="/dev/
sdc";VirtualName="ephemeral0"})
```

- Untuk API detailnya, lihat CreateImagedi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`CreateInstanceExportTask`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`CreateInstanceExportTask`.

CLI

AWS CLI

Untuk mengekspor sebuah instance

Perintah contoh ini membuat tugas untuk mengekspor instance i-1234567890abcdef0 ke bucket Amazon S3 myexportbucket.

Perintah:

```
aws ec2 create-instance-export-task --description "RHEL5 instance" --
instance-id i-1234567890abcdef0 --target-environment vmware --export-to-s3-
task DiskImageFormat=vmdk,ContainerFormat=ova,S3Bucket=myexportbucket,S3Prefix=RHEL5
```

Output:

```
{
    "ExportTask": {
        "State": "active",
        "InstanceExportDetails": {
            "InstanceId": "i-1234567890abcdef0",
            "TargetEnvironment": "vmware"
        },
        "ExportToS3Task": {
            "S3Bucket": "myexportbucket",
            "S3Key": "RHEL5export-i-fh8sjjsq.ova",
            "DiskImageFormat": "vmdk",
```

```
            "ContainerFormat": "ova"
        },
        "Description": "RHEL5 instance",
        "ExportTaskId": "export-i-fh8sjjsq"
    }
}
```

- Untuk API detailnya, lihat CreateInstanceExportTaskdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini mengekspor instance yang dihentikan,**i-0800b00a00EXAMPLE**, sebagai hard disk virtual (VHD) ke bucket S3. **testbucket-export-instances-2019** Lingkungan target adalah**Microsoft**, dan parameter wilayah ditambahkan karena instance ada di **us-east-1** wilayah, sedangkan AWS Wilayah default pengguna bukan us-east-1. Untuk mendapatkan status tugas ekspor, salin **ExportTaskId** nilai dari hasil perintah ini, lalu jalankan **Get-EC2ExportTask -ExportTaskId export_task_ID_from_results.**

```
New-EC2InstanceExportTask -InstanceId i-0800b00a00EXAMPLE -
ExportToS3Task_DiskImageFormat VHD -ExportToS3Task_S3Bucket "amzn-s3-demo-bucket"
 -TargetEnvironment Microsoft -Region us-east-1
```

Output:

```
Description           :
ExportTaskId          : export-i-077c73108aEXAMPLE
ExportToS3Task        : Amazon.EC2.Model.ExportToS3Task
InstanceExportDetails : Amazon.EC2.Model.InstanceExportDetails
State                 : active
StatusMessage         :
```

- Untuk API detailnya, lihat CreateInstanceExportTaskdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`CreateInternetGateway`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`CreateInternetGateway`.

CLI

AWS CLI

Untuk membuat gateway internet

`create-internet-gateway`Contoh berikut membuat gateway internet dengan tag`Name=my-igw`.

```
aws ec2 create-internet-gateway \
    --tag-specifications ResourceType=internet-gateway,Tags=[{Key=Name,Value=my-igw}]
```

Output:

```
{
    "InternetGateway": {
        "Attachments": [],
        "InternetGatewayId": "igw-0d0fb496b3994d755",
        "OwnerId": "123456789012",
        "Tags": [
            {
                "Key": "Name",
                "Value": "my-igw"
            }
        ]
    }
}
```

Untuk informasi selengkapnya, lihat gateway Internet di VPCPanduan Pengguna Amazon.

- Untuk API detailnya, lihat CreateInternetGatewaydi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini membuat gateway Internet.

```
New-EC2InternetGateway
```

Output:

```
Attachments    InternetGatewayId    Tags
-----------    -----------------    ----
{}             igw-1a2b3c4d         {}
```

- Untuk API detailnya, lihat CreateInternetGatewaydi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`CreateKeyPair`** dengan AWS SDK atau CLI

Contoh kode berikut menunjukkan cara menggunakan`CreateKeyPair`.

Contoh tindakan adalah kutipan kode dari program yang lebih besar dan harus dijalankan dalam konteks. Anda dapat melihat tindakan ini dalam konteks dalam contoh kode berikut:

- Pelajari dasar-dasarnya

.NET

AWS SDK for .NET

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    /// <summary>
    /// Create an Amazon EC2 key pair with a specified name.
    /// </summary>
    /// <param name="keyPairName">The name for the new key pair.</param>
    /// <returns>The Amazon EC2 key pair created.</returns>
```

```
    public async Task<KeyPair?> CreateKeyPair(string keyPairName)
    {
        try
        {
            var request = new CreateKeyPairRequest { KeyName = keyPairName, };

            var response = await _amazonEC2.CreateKeyPairAsync(request);

            var kp = response.KeyPair;
            // Return the key pair so it can be saved if needed.

            // Wait until the key pair exists.
            int retries = 5;
            while (retries-- > 0)
            {
                Console.WriteLine($"Checking for new KeyPair {keyPairName}...");
                var keyPairs = await DescribeKeyPairs(keyPairName);
                if (keyPairs.Any())
                {
                    return kp;
                }

                Thread.Sleep(5000);
                retries--;
            }
            _logger.LogError($"Unable to find newly created KeyPair
{keyPairName}.");
            throw new DoesNotExistException("KeyPair not found");
        }
        catch (AmazonEC2Exception ec2Exception)
        {
            if (ec2Exception.ErrorCode == "InvalidKeyPair.Duplicate")
            {
                _logger.LogError(
                    $"A key pair called {keyPairName} already exists.");
            }

            throw;
        }
        catch (Exception ex)
        {
            _logger.LogError(
                $"An error occurred while creating the key pair.: {ex.Message}");
            throw;
```

```
        }
    }

    /// <summary>
    /// Save KeyPair information to a temporary file.
    /// </summary>
    /// <param name="keyPair">The name of the key pair.</param>
    /// <returns>The full path to the temporary file.</returns>
    public string SaveKeyPair(KeyPair keyPair)
    {
        var tempPath = Path.GetTempPath();
        var tempFileName = $"{tempPath}\\{Path.GetRandomFileName()}";
        var pemFileName = Path.ChangeExtension(tempFileName, "pem");

        // Save the key pair to a file in a temporary folder.
        using var stream = new FileStream(pemFileName, FileMode.Create);
        using var writer = new StreamWriter(stream);
        writer.WriteLine(keyPair.KeyMaterial);

        return pemFileName;
    }
```

- Untuk API detailnya, lihat CreateKeyPairdi AWS SDK for .NET APIReferensi.

## Bash

### AWS CLI dengan skrip Bash

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
#!/bin/bash
# function ec2_create_keypair
#
# This function creates an Amazon Elastic Compute Cloud (Amazon EC2) ED25519 or
 2048-bit RSA key pair
# and writes it to a file.
#
```

```
# Parameters:
#       -n key_pair_name - A key pair name.
#       -f file_path - File to store the key pair.
#
# And:
#       0 - If successful.
#       1 - If it fails.
###############################################################################
function ec2_create_keypair() {
  local key_pair_name file_path response
  local option OPTARG # Required to use getopts command in a function.

  # bashsupport disable=BP5008
  function usage() {
    echo "function ec2_create_keypair"
    echo "Creates an Amazon Elastic Compute Cloud (Amazon EC2) ED25519 or 2048-
bit RSA key pair"
    echo " and writes it to a file."
    echo "  -n key_pair_name - A key pair name."
    echo "  -f file_path - File to store the key pair."
    echo ""
  }

  # Retrieve the calling parameters.
  while getopts "n:f:h" option; do
    case "${option}" in
      n) key_pair_name="${OPTARG}" ;;
      f) file_path="${OPTARG}" ;;
      h)
        usage
        return 0
        ;;
      \?)
        echo "Invalid parameter"
        usage
        return 1
        ;;
    esac
  done
  export OPTIND=1

  if [[ -z "$key_pair_name" ]]; then
    errecho "ERROR: You must provide a key name with the -n parameter."
    usage
```

```
    return 1
  fi

  if [[ -z "$file_path" ]]; then
    errecho "ERROR: You must provide a file path with the -f parameter."
    usage
    return 1
  fi

  response=$(aws ec2 create-key-pair \
    --key-name "$key_pair_name" \
    --query 'KeyMaterial' \
    --output text) || {
    aws_cli_error_log ${?}
    errecho "ERROR: AWS reports create-access-key operation failed.$response"
    return 1
  }

  if [[ -n "$file_path" ]]; then
    echo "$response" >"$file_path"
  fi

  return 0
}
```

Fungsi utilitas yang digunakan dalam contoh ini.

```
###############################################################################
# function errecho
#
# This function outputs everything sent to it to STDERR (standard error output).
###############################################################################
function errecho() {
  printf "%s\n" "$*" 1>&2
}

###############################################################################
# function aws_cli_error_log()
#
# This function is used to log the error messages from the AWS CLI.
#
# The function expects the following argument:
```

```
#         $1 - The error code returned by the AWS CLI.
#
#  Returns:
#          0: - Success.
#
###############################################################################
function aws_cli_error_log() {
  local err_code=$1
  errecho "Error code : $err_code"
  if [ "$err_code" == 1 ]; then
    errecho "  One or more S3 transfers failed."
  elif [ "$err_code" == 2 ]; then
    errecho "  Command line failed to parse."
  elif [ "$err_code" == 130 ]; then
    errecho "  Process received SIGINT."
  elif [ "$err_code" == 252 ]; then
    errecho "  Command syntax invalid."
  elif [ "$err_code" == 253 ]; then
    errecho "  The system environment or configuration was invalid."
  elif [ "$err_code" == 254 ]; then
    errecho "  The service returned an error."
  elif [ "$err_code" == 255 ]; then
    errecho "  255 is a catch-all error."
  fi

  return 0
}
```

- Untuk API detailnya, lihat CreateKeyPairdi Referensi AWS CLI Perintah.

## C++

### SDKuntuk C ++

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
//! Create an Amazon Elastic Compute Cloud (Amazon EC2) instance key pair.
```

```
/*!
  \param keyPairName: A name for a key pair.
  \param keyFilePath: File path where the credentials are stored. Ignored if it
 is an empty string;
  \param clientConfiguration: AWS client configuration.
  \return bool: Function succeeded.
 */
bool AwsDoc::EC2::createKeyPair(const Aws::String &keyPairName, const Aws::String
 &keyFilePath,
                                const Aws::Client::ClientConfiguration
 &clientConfiguration) {
    Aws::EC2::EC2Client ec2Client(clientConfiguration);
    Aws::EC2::Model::CreateKeyPairRequest request;
    request.SetKeyName(keyPairName);

    Aws::EC2::Model::CreateKeyPairOutcome outcome =
 ec2Client.CreateKeyPair(request);
    if (!outcome.IsSuccess()) {
        std::cerr << "Failed to create key pair - "  << keyPairName << ". " <<
                  outcome.GetError().GetMessage() << std::endl;
    } else {
        std::cout << "Successfully created key pair named " <<
                  keyPairName << std::endl;
        if (!keyFilePath.empty()) {
            std::ofstream keyFile(keyFilePath.c_str());
            keyFile << outcome.GetResult().GetKeyMaterial();
            keyFile.close();
            std::cout << "Keys written to the file " <<
                      keyFilePath << std::endl;
        }

    }

    return outcome.IsSuccess();

}
```

- Untuk API detailnya, lihat CreateKeyPairdi AWS SDK for C++ APIReferensi.

CLI

AWS CLI

Untuk membuat pasangan kunci

Contoh ini membuat pasangan kunci bernama `MyKeyPair`.

Perintah:

```
aws ec2 create-key-pair --key-name MyKeyPair
```

Outputnya adalah ASCII versi dari kunci pribadi dan sidik jari kunci. Anda perlu menyimpan kunci ke file.

Untuk informasi selengkapnya, lihat Menggunakan Pasangan Kunci di Panduan Pengguna Antarmuka Baris Perintah AWS .

- Untuk API detailnya, lihat CreateKeyPairdi Referensi AWS CLI Perintah.

Java

SDKuntuk Java 2.x

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    /**
     * Creates a new key pair asynchronously.
     *
     * @param keyName the name of the key pair to create
     * @param fileName the name of the file to write the key material to
     * @return a {@link CompletableFuture} that represents the asynchronous
operation
     *         of creating the key pair and writing the key material to a file
     */
    public CompletableFuture<CreateKeyPairResponse> createKeyPairAsync(String
keyName, String fileName) {
```

```
        CreateKeyPairRequest request = CreateKeyPairRequest.builder()
            .keyName(keyName)
            .build();

        CompletableFuture<CreateKeyPairResponse> responseFuture =
getAsyncClient().createKeyPair(request);
        responseFuture.whenComplete((response, exception) -> {
            if (response != null) {
                try {
                    BufferedWriter writer = new BufferedWriter(new
FileWriter(fileName));
                    writer.write(response.keyMaterial());
                    writer.close();
                } catch (IOException e) {
                    throw new RuntimeException("Failed to write key material to
file: " + e.getMessage(), e);
                }
            } else {
                throw new RuntimeException("Failed to create key pair: " +
exception.getMessage(), exception);
            }
        });

        return responseFuture;
    }
```

- Untuk API detailnya, lihat CreateKeyPairdi AWS SDK for Java 2.x APIReferensi.

## JavaScript

### SDKuntuk JavaScript (v3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
import { CreateKeyPairCommand, EC2Client } from "@aws-sdk/client-ec2";

/**
```

```
 * Creates an ED25519 or 2048-bit RSA key pair with the specified name and in the
 specified PEM or PPK format.
 * Amazon EC2 stores the public key and displays the private key for you to save
 to a file.
 * @param {{ keyName: string }} options
 */
export const main = async ({ keyName }) => {
  const client = new EC2Client({});
  const command = new CreateKeyPairCommand({
    KeyName: keyName,
  });

  try {
    const { KeyMaterial, KeyName } = await client.send(command);
    console.log(KeyName);
    console.log(KeyMaterial);
  } catch (caught) {
    if (caught instanceof Error && caught.name === "InvalidKeyPair.Duplicate") {
      console.warn(`${caught.message}. Try another key name.`);
    } else {
      throw caught;
    }
  }
};
```

- Untuk API detailnya, lihat CreateKeyPairdi AWS SDK for JavaScript APIReferensi.

Kotlin

SDKuntuk Kotlin

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
suspend fun createEC2KeyPair(keyNameVal: String) {
    val request =
        CreateKeyPairRequest {
            keyName = keyNameVal
```

```
        }

    Ec2Client { region = "us-west-2" }.use { ec2 ->
        val response = ec2.createKeyPair(request)
        println("The key ID is ${response.keyPairId}")
    }
}
```

- Untuk API detailnya, lihat CreateKeyPair AWSSDKAPIreferensi Kotlin.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini membuat key pair dan menangkap kunci RSA pribadi PEM -encoded dalam file dengan nama yang ditentukan. Saat Anda menggunakan PowerShell, pengkodean harus diatur ke ascii untuk menghasilkan kunci yang valid. Untuk informasi selengkapnya, lihat Membuat, Menampilkan, dan Menghapus Pasangan EC2 Kunci Amazon (https://docs.aws.amazon.com/cli/latest/userguide/cli-services-ec2-keypairs.html) di Panduan Pengguna Antarmuka Baris AWS Perintah.

```
(New-EC2KeyPair -KeyName "my-key-pair").KeyMaterial | Out-File -Encoding ascii -
FilePath C:\path\my-key-pair.pem
```

- Untuk API detailnya, lihat CreateKeyPairdi AWS Tools for PowerShell Referensi Cmdlet.

Python

SDKuntuk Python (Boto3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
class KeyPairWrapper:
    """
    Encapsulates Amazon Elastic Compute Cloud (Amazon EC2) key pair actions.
```

```
    This class provides methods to create, list, and delete EC2 key pairs.
    """

    def __init__(
        self,
        ec2_client: boto3.client,
        key_file_dir: Union[tempfile.TemporaryDirectory, str],
        key_pair: Optional[dict] = None,
    ):
        """
        Initializes the KeyPairWrapper with the specified EC2 client, key file
 directory,
        and an optional key pair.

        :param ec2_client: A Boto3 Amazon EC2 client. This client provides low-
level
                           access to AWS EC2 services.
        :param key_file_dir: The folder where the private key information is
 stored.
                             This should be a secure folder.
        :param key_pair: A dictionary representing the Boto3 KeyPair object.
                         This is a high-level object that wraps key pair actions.
 Optional.
        """
        self.ec2_client = ec2_client
        self.key_pair = key_pair
        self.key_file_path: Optional[str] = None
        self.key_file_dir = key_file_dir

    @classmethod
    def from_client(cls) -> "KeyPairWrapper":
        """
        Class method to create an instance of KeyPairWrapper using a new EC2
 client
        and a temporary directory for storing key files.

        :return: An instance of KeyPairWrapper.
        """
        ec2_client = boto3.client("ec2")
        return cls(ec2_client, tempfile.TemporaryDirectory())


    def create(self, key_name: str) -> dict:
        """
```

```
        Creates a key pair that can be used to securely connect to an EC2
instance.
        The returned key pair contains private key information that cannot be
retrieved
        again. The private key data is stored as a .pem file.

        :param key_name: The name of the key pair to create.
        :return: A dictionary representing the Boto3 KeyPair object that
represents the newly created key pair.
        :raises ClientError: If there is an error in creating the key pair, for
example, if a key pair with the same name already exists.
        """
        try:
            response = self.ec2_client.create_key_pair(KeyName=key_name)
            self.key_pair = response
            self.key_file_path = os.path.join(
                self.key_file_dir.name, f"{self.key_pair['KeyName']}.pem"
            )
            with open(self.key_file_path, "w") as key_file:
                key_file.write(self.key_pair["KeyMaterial"])
        except ClientError as err:
            if err.response["Error"]["Code"] == "InvalidKeyPair.Duplicate":
                logger.error(
                    f"A key pair called {key_name} already exists. "
                    "Please choose a different name for your key pair "
                    "or delete the existing key pair before creating."
                )
            raise
        else:
            return self.key_pair
```

- Untuk API detailnya, lihat CreateKeyPair AWSSDKReferensi Python (Boto3). API

Ruby

SDKuntuk Ruby

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
# This code example does the following:
# 1. Creates a key pair in Amazon Elastic Compute Cloud (Amazon EC2).
# 2. Displays information about available key pairs.
# 3. Deletes the key pair.

require 'aws-sdk-ec2'

# @param ec2_client [Aws::EC2::Client] An initialized EC2 client.
# @param key_pair_name [String] The name for the key pair and private
#   key file.
# @return [Boolean] true if the key pair and private key file were
#   created; otherwise, false.
# @example
#   exit 1 unless key_pair_created?(
#     Aws::EC2::Client.new(region: 'us-west-2'),
#     'my-key-pair'
#   )
def key_pair_created?(ec2_client, key_pair_name)
  key_pair = ec2_client.create_key_pair(key_name: key_pair_name)
  puts "Created key pair '#{key_pair.key_name}' with fingerprint " \
    "'#{key_pair.key_fingerprint}' and ID '#{key_pair.key_pair_id}'."
  filename = File.join(Dir.home, "#{key_pair_name}.pem")
  File.open(filename, 'w') { |file| file.write(key_pair.key_material) }
  puts "Private key file saved locally as '#{filename}'."
  true
rescue Aws::EC2::Errors::InvalidKeyPairDuplicate
  puts "Error creating key pair: a key pair named '#{key_pair_name}' " \
    'already exists.'
  false
rescue StandardError => e
  puts "Error creating key pair or saving private key file: #{e.message}"
```

```
  false
end

# Displays information about available key pairs in
# Amazon Elastic Compute Cloud (Amazon EC2).
#
# @param ec2_client [Aws::EC2::Client] An initialized EC2 client.
# @example
#   describe_key_pairs(Aws::EC2::Client.new(region: 'us-west-2'))
def describe_key_pairs(ec2_client)
  result = ec2_client.describe_key_pairs
  if result.key_pairs.count.zero?
    puts 'No key pairs found.'
  else
    puts 'Key pair names:'
    result.key_pairs.each do |key_pair|
      puts key_pair.key_name
    end
  end
rescue StandardError => e
  puts "Error getting information about key pairs: #{e.message}"
end

# Deletes a key pair in Amazon Elastic Compute Cloud (Amazon EC2).
#
# Prerequisites:
#
# - The key pair to delete.
#
# @param ec2_client [Aws::EC2::Client] An initialized EC2 client.
# @param key_pair_name [String] The name of the key pair to delete.
# @return [Boolean] true if the key pair was deleted; otherwise, false.
# @example
#   exit 1 unless key_pair_deleted?(
#     Aws::EC2::Client.new(region: 'us-west-2'),
#     'my-key-pair'
#   )
def key_pair_deleted?(ec2_client, key_pair_name)
  ec2_client.delete_key_pair(key_name: key_pair_name)
  true
rescue StandardError => e
  puts "Error deleting key pair: #{e.message}"
  false
end
```

```
# Example usage:
def run_me
  key_pair_name = ''
  region = ''
  # Print usage information and then stop.
  if ARGV[0] == '--help' || ARGV[0] == '-h'
    puts 'Usage:   ruby ec2-ruby-example-key-pairs.rb KEY_PAIR_NAME REGION'
    puts 'Example: ruby ec2-ruby-example-key-pairs.rb my-key-pair us-west-2'
    exit 1
  # If no values are specified at the command prompt, use these default values.
  # Replace us-west-2 with the AWS Region you're using for Amazon EC2.
  elsif ARGV.count.zero?
    key_pair_name = 'my-key-pair'
    region = 'us-west-2'
  # Otherwise, use the values as specified at the command prompt.
  else
    key_pair_name = ARGV[0]
    region = ARGV[1]
  end

  ec2_client = Aws::EC2::Client.new(region: region)

  puts 'Displaying existing key pair names before creating this key pair...'
  describe_key_pairs(ec2_client)

  puts '-' * 10
  puts 'Creating key pair...'
  unless key_pair_created?(ec2_client, key_pair_name)
    puts 'Stopping program.'
    exit 1
  end

  puts '-' * 10
  puts 'Displaying existing key pair names after creating this key pair...'
  describe_key_pairs(ec2_client)

  puts '-' * 10
  puts 'Deleting key pair...'
  unless key_pair_deleted?(ec2_client, key_pair_name)
    puts 'Stopping program. You must delete the key pair yourself.'
    exit 1
  end
  puts 'Key pair deleted.'
```

```
  puts '-' * 10
  puts 'Now that the key pair is deleted, ' \
    'also deleting the related private key pair file...'
  filename = File.join(Dir.home, "#{key_pair_name}.pem")
  File.delete(filename)
  if File.exist?(filename)
    puts "Could not delete file at '#{filename}'. You must delete it yourself."
  else
    puts 'File deleted.'
  end

  puts '-' * 10
  puts 'Displaying existing key pair names after deleting this key pair...'
  describe_key_pairs(ec2_client)
end

run_me if $PROGRAM_NAME == __FILE__
```

- Untuk API detailnya, lihat CreateKeyPairdi AWS SDK for Ruby APIReferensi.

## Rust

### SDKuntuk Rust

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

Implementasi Rust yang memanggil create_key_pair EC2 Klien dan mengekstrak materi yang dikembalikan.

```
    pub async fn create_key_pair(&self, name: String) -> Result<(KeyPairInfo,
 String), EC2Error> {
        tracing::info!("Creating key pair {name}");
        let output = self.client.create_key_pair().key_name(name).send().await?;
        let info = KeyPairInfo::builder()
            .set_key_name(output.key_name)
            .set_key_fingerprint(output.key_fingerprint)
```

```
            .set_key_pair_id(output.key_pair_id)
            .build();
        let material = output
            .key_material
            .ok_or_else(|| EC2Error::new("Create Key Pair has no key
material"))?;
        Ok((info, material))
    }
```

Fungsi yang memanggil create_key impl dan menyimpan kunci pribadi dengan aman. PEM

```
    /// Creates a key pair that can be used to securely connect to an EC2
instance.
    /// The returned key pair contains private key information that cannot be
retrieved
    /// again. The private key data is stored as a .pem file.
    ///
    /// :param key_name: The name of the key pair to create.
    pub async fn create(
        &mut self,
        ec2: &EC2,
        util: &Util,
        key_name: String,
    ) -> Result<KeyPairInfo, EC2Error> {
        let (key_pair, material) = ec2
            .create_key_pair(key_name.clone())
            .await
            .map_err(|e| e.add_message(format!("Couldn't create key
{key_name}")))?;

        let path = self.key_file_dir.join(format!("{key_name}.pem"));

        util.write_secure(&key_name, &path, material)?;

        self.key_file_path = Some(path);
        self.key_pair = key_pair.clone();

        Ok(key_pair)
    }
```

- Untuk API detailnya, lihat CreateKeyPair AWSSDKAPIreferensi Rust.

SAP ABAP

SDKuntuk SAP ABAP

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    TRY.
        oo_result = lo_ec2->createkeypair( iv_keyname = iv_key_name ).
                 " oo_result is returned for testing purposes. "
        MESSAGE 'Amazon EC2 key pair created.' TYPE 'I'.
      CATCH /aws1/cx_rt_service_generic INTO DATA(lo_exception).
        DATA(lv_error) = |"{ lo_exception->av_err_code }" - { lo_exception-
>av_err_msg }|.
        MESSAGE lv_error TYPE 'E'.
    ENDTRY.
```

- Untuk API detailnya, lihat CreateKeyPair AWSSDKuntuk SAP ABAP API referensi.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`CreateLaunchTemplate`** dengan AWS SDK atau CLI

Contoh kode berikut menunjukkan cara menggunakan`CreateLaunchTemplate`.

Contoh tindakan adalah kutipan kode dari program yang lebih besar dan harus dijalankan dalam konteks. Anda dapat melihat tindakan ini dalam konteks dalam contoh kode berikut:

- Membangun dan mengelola layanan yang tangguh

.NET

AWS SDK for .NET

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
   /// <summary>
   /// Creates an Amazon EC2 launch template to use with Amazon EC2 Auto
Scaling.
   /// The launch template specifies a Bash script in its user data field that
runs after
   /// the instance is started. This script installs the Python packages and
starts a Python
   /// web server on the instance.
   /// </summary>
   /// <param name="startupScriptPath">The path to a Bash script file that is
run.</param>
   /// <param name="instancePolicyPath">The path to a permissions policy to
create and attach to the profile.</param>
   /// <returns>The template object.</returns>
   public async Task<Amazon.EC2.Model.LaunchTemplate> CreateTemplate(string
startupScriptPath, string instancePolicyPath)
   {
       try
       {
           await CreateKeyPair(_keyPairName);
           await CreateInstanceProfileWithName(_instancePolicyName,
_instanceRoleName,
               _instanceProfileName, instancePolicyPath);

           var startServerText = await File.ReadAllTextAsync(startupScriptPath);
           var plainTextBytes =
System.Text.Encoding.UTF8.GetBytes(startServerText);

           var amiLatest = await _amazonSsm.GetParameterAsync(
               new GetParameterRequest() { Name = _amiParam });
           var amiId = amiLatest.Parameter.Value;
```

```
            var launchTemplateResponse = await
_amazonEc2.CreateLaunchTemplateAsync(
                new CreateLaunchTemplateRequest()
                {
                    LaunchTemplateName = _launchTemplateName,
                    LaunchTemplateData = new RequestLaunchTemplateData()
                    {
                        InstanceType = _instanceType,
                        ImageId = amiId,
                        IamInstanceProfile =
                            new

LaunchTemplateIamInstanceProfileSpecificationRequest()
                            {
                                Name = _instanceProfileName
                            },
                        KeyName = _keyPairName,
                        UserData = System.Convert.ToBase64String(plainTextBytes)
                    }
                });
            return launchTemplateResponse.LaunchTemplate;
        }
        catch (AmazonEC2Exception ec2Exception)
        {
            if (ec2Exception.ErrorCode ==
"InvalidLaunchTemplateName.AlreadyExistsException")
            {
                _logger.LogError($"Could not create the template, the name
{_launchTemplateName} already exists. " +
                                 $"Please try again with a unique name.");
            }

            throw;
        }
        catch (Exception ex)
        {
            _logger.LogError($"An error occurred while creating the template.:
{ex.Message}");
            throw;
        }
    }
```

- Untuk API detailnya, lihat CreateLaunchTemplatedi AWS SDK for .NET APIReferensi.

CLI

AWS CLI

Contoh 1: Untuk membuat templat peluncuran

`create-launch-template`Contoh berikut membuat template peluncuran yang menentukan subnet untuk meluncurkan instance, menetapkan alamat IP publik dan IPv6 alamat ke instance, dan membuat tag untuk instance tersebut.

```
aws ec2 create-launch-template \
    --launch-template-name TemplateForWebServer \
    --version-description WebVersion1 \
    --launch-template-data '{"NetworkInterfaces":
[{"AssociatePublicIpAddress":true,"DeviceIndex":0,"Ipv6AddressCount":1,"SubnetId":"subnet
[{"ResourceType":"instance","Tags":[{"Key":"purpose","Value":"webserver"}]}]}'
```

Output:

```
{
    "LaunchTemplate": {
        "LatestVersionNumber": 1,
        "LaunchTemplateId": "lt-01238c059e3466abc",
        "LaunchTemplateName": "TemplateForWebServer",
        "DefaultVersionNumber": 1,
        "CreatedBy": "arn:aws:iam::123456789012:user/Bob",
        "CreateTime": "2019-01-27T09:13:24.000Z"
    }
}
```

Untuk informasi selengkapnya, lihat Meluncurkan Instans dari Templat Peluncuran di Panduan Pengguna Amazon Elastic Compute Cloud. Untuk informasi tentang mengutip parameter yang JSON diformat, lihat Mengutip String di Panduan Pengguna Antarmuka Baris AWS Perintah.

Contoh 2: Untuk membuat template peluncuran untuk Amazon EC2 Auto Scaling

`create-launch-template`Contoh berikut membuat template peluncuran dengan beberapa tag dan pemetaan perangkat blok untuk menentukan EBS volume tambahan saat instance diluncurkan. Tentukan nilai untuk `Groups` yang sesuai dengan grup keamanan untuk grup Auto Scaling Anda akan meluncurkan instance. VPC Tentukan subnet VPC dan sebagai properti dari grup Auto Scaling.

```
aws ec2 create-launch-template \
    --launch-template-name TemplateForAutoScaling \
    --version-description AutoScalingVersion1 \
    --launch-template-data '{"NetworkInterfaces":
[{"DeviceIndex":0,"AssociatePublicIpAddress":true,"Groups":
["sg-7c227019,sg-903004f8"],"DeleteOnTermination":true}],"ImageId":"ami-
b42209de","InstanceType":"m4.large","TagSpecifications":
[{"ResourceType":"instance","Tags":[{"Key":"environment","Value":"production"},
{"Key":"purpose","Value":"webserver"}]},{"ResourceType":"volume","Tags":
[{"Key":"environment","Value":"production"},{"Key":"cost-
center","Value":"cc123"}]}],"BlockDeviceMappings":[{"DeviceName":"/dev/
sda1","Ebs":{"VolumeSize":100}}]}' --region us-east-1
```

Output:

```
{
    "LaunchTemplate": {
        "LatestVersionNumber": 1,
        "LaunchTemplateId": "lt-0123c79c33a54e0abc",
        "LaunchTemplateName": "TemplateForAutoScaling",
        "DefaultVersionNumber": 1,
        "CreatedBy": "arn:aws:iam::123456789012:user/Bob",
        "CreateTime": "2019-04-30T18:16:06.000Z"
    }
}
```

Untuk informasi selengkapnya, lihat Membuat Template Peluncuran untuk Grup Auto Scaling di Panduan Pengguna Amazon Auto EC2 Scaling. Untuk informasi tentang mengutip parameter yang JSON diformat, lihat Mengutip String di Panduan Pengguna Antarmuka Baris AWS Perintah.

Contoh 3: Untuk membuat template peluncuran yang menentukan enkripsi volume EBS

`create-launch-template`Contoh berikut membuat template peluncuran yang menyertakan EBS volume terenkripsi yang dibuat dari snapshot yang tidak terenkripsi. Contoh tersebut juga menandai volume selama pembuatan. Jika enkripsi secara default dinonaktifkan, Anda harus menentukan opsi `"Encrypted"` seperti yang ditunjukkan pada contoh berikut. Jika Anda menggunakan `"KmsKeyId"` opsi untuk menentukan pelanggan yang dikelolaCMK, Anda juga harus menentukan `"Encrypted"` opsi meskipun enkripsi secara default diaktifkan.

```
aws ec2 create-launch-template \
```

```
  --launch-template-name TemplateForEncryption \
  --launch-template-data file://config.json
```

Isi dari `config.json`:

```
{
    "BlockDeviceMappings":[
        {
            "DeviceName":"/dev/sda1",
            "Ebs":{
                "VolumeType":"gp2",
                "DeleteOnTermination":true,
                "SnapshotId":"snap-066877671789bd71b",
                "Encrypted":true,
                "KmsKeyId":"arn:aws:kms:us-east-1:012345678910:key/abcd1234-
a123-456a-a12b-a123b4cd56ef"
            }
        }
    ],
    "ImageId":"ami-00068cd7555f543d5",
    "InstanceType":"c5.large",
    "TagSpecifications":[
        {
            "ResourceType":"volume",
            "Tags":[
                {
                    "Key":"encrypted",
                    "Value":"yes"
                }
            ]
        }
    ]
}
```

Output:

```
{
    "LaunchTemplate": {
        "LatestVersionNumber": 1,
        "LaunchTemplateId": "lt-0d5bd51bcf8530abc",
        "LaunchTemplateName": "TemplateForEncryption",
        "DefaultVersionNumber": 1,
        "CreatedBy": "arn:aws:iam::123456789012:user/Bob",
```

```
        "CreateTime": "2020-01-07T19:08:36.000Z"
    }
}
```

Untuk informasi selengkapnya, lihat Memulihkan EBS Volume Amazon dari Snapshot dan Enkripsi secara Default di Panduan Pengguna Amazon Elastic Compute Cloud.

- Untuk API detailnya, lihat CreateLaunchTemplatedi Referensi AWS CLI Perintah.

JavaScript

SDKuntuk JavaScript (v3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
const ssmClient = new SSMClient({});
const { Parameter } = await ssmClient.send(
  new GetParameterCommand({
    Name: "/aws/service/ami-amazon-linux-latest/amzn2-ami-hvm-x86_64-gp2",
  }),
);
const ec2Client = new EC2Client({});
await ec2Client.send(
  new CreateLaunchTemplateCommand({
    LaunchTemplateName: NAMES.launchTemplateName,
    LaunchTemplateData: {
      InstanceType: "t3.micro",
      ImageId: Parameter.Value,
      IamInstanceProfile: { Name: NAMES.instanceProfileName },
      UserData: readFileSync(
        join(RESOURCES_PATH, "server_startup_script.sh"),
      ).toString("base64"),
      KeyName: NAMES.keyPairName,
    },
  }),
```

- Untuk API detailnya, lihat CreateLaunchTemplatedi AWS SDK for JavaScript APIReferensi.

Python

SDKuntuk Python (Boto3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

Contoh ini membuat templat peluncuran yang menyertakan profil instans yang memberikan izin khusus ke instans, dan skrip Bash data pengguna yang berjalan pada instans tersebut setelah dimulai.

```
class AutoScalingWrapper:
    """
    Encapsulates Amazon EC2 Auto Scaling and EC2 management actions.
    """

    def __init__(
        self,
        resource_prefix: str,
        inst_type: str,
        ami_param: str,
        autoscaling_client: boto3.client,
        ec2_client: boto3.client,
        ssm_client: boto3.client,
        iam_client: boto3.client,
    ):
        """
        Initializes the AutoScaler class with the necessary parameters.

        :param resource_prefix: The prefix for naming AWS resources that are
 created by this class.
        :param inst_type: The type of EC2 instance to create, such as t3.micro.
        :param ami_param: The Systems Manager parameter used to look up the AMI
 that is created.
        :param autoscaling_client: A Boto3 EC2 Auto Scaling client.
        :param ec2_client: A Boto3 EC2 client.
        :param ssm_client: A Boto3 Systems Manager client.
        :param iam_client: A Boto3 IAM client.
        """
```

```
        self.inst_type = inst_type
        self.ami_param = ami_param
        self.autoscaling_client = autoscaling_client
        self.ec2_client = ec2_client
        self.ssm_client = ssm_client
        self.iam_client = iam_client
        sts_client = boto3.client("sts")
        self.account_id = sts_client.get_caller_identity()["Account"]

        self.key_pair_name = f"{resource_prefix}-key-pair"
        self.launch_template_name = f"{resource_prefix}-template-"
        self.group_name = f"{resource_prefix}-group"

        # Happy path
        self.instance_policy_name = f"{resource_prefix}-pol"
        self.instance_role_name = f"{resource_prefix}-role"
        self.instance_profile_name = f"{resource_prefix}-prof"

        # Failure mode
        self.bad_creds_policy_name = f"{resource_prefix}-bc-pol"
        self.bad_creds_role_name = f"{resource_prefix}-bc-role"
        self.bad_creds_profile_name = f"{resource_prefix}-bc-prof"


    def create_template(
        self, server_startup_script_file: str, instance_policy_file: str
    ) -> Dict[str, Any]:
        """
        Creates an Amazon EC2 launch template to use with Amazon EC2 Auto
Scaling. The
        launch template specifies a Bash script in its user data field that runs
after
        the instance is started. This script installs Python packages and starts
a
        Python web server on the instance.

        :param server_startup_script_file: The path to a Bash script file that is
run
                                           when an instance starts.
        :param instance_policy_file: The path to a file that defines a
permissions policy
                                     to create and attach to the instance
profile.
        :return: Information about the newly created template.
```

```
        """
        template = {}
        try:
            # Create key pair and instance profile
            self.create_key_pair(self.key_pair_name)
            self.create_instance_profile(
                instance_policy_file,
                self.instance_policy_name,
                self.instance_role_name,
                self.instance_profile_name,
            )

            # Read the startup script
            with open(server_startup_script_file) as file:
                start_server_script = file.read()

            # Get the latest AMI ID
            ami_latest = self.ssm_client.get_parameter(Name=self.ami_param)
            ami_id = ami_latest["Parameter"]["Value"]

            # Create the launch template
            lt_response = self.ec2_client.create_launch_template(
                LaunchTemplateName=self.launch_template_name,
                LaunchTemplateData={
                    "InstanceType": self.inst_type,
                    "ImageId": ami_id,
                    "IamInstanceProfile": {"Name": self.instance_profile_name},
                    "UserData": base64.b64encode(
                        start_server_script.encode(encoding="utf-8")
                    ).decode(encoding="utf-8"),
                    "KeyName": self.key_pair_name,
                },
            )
            template = lt_response["LaunchTemplate"]
            log.info(
                f"Created launch template {self.launch_template_name} for AMI
{ami_id} on {self.inst_type}."
            )
        except ClientError as err:
            log.error(f"Failed to create launch template
{self.launch_template_name}.")
            error_code = err.response["Error"]["Code"]
            if error_code == "InvalidLaunchTemplateName.AlreadyExistsException":
                log.info(
```

```
                    f"Launch template {self.launch_template_name} already exists,
 nothing to do."
                )
            log.error(f"Full error:\n\t{err}")
        return template
```

- Untuk API detailnya, lihat CreateLaunchTemplate AWSSDKReferensi Python (Boto3). API

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`CreateNetworkAcl`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`CreateNetworkAcl`.

CLI

AWS CLI

Untuk membuat jaringan ACL

Contoh ini menciptakan jaringan ACL untuk yang ditentukanVPC.

Perintah:

```
aws ec2 create-network-acl --vpc-id vpc-a01106c2
```

Output:

```
{
    "NetworkAcl": {
        "Associations": [],
        "NetworkAclId": "acl-5fb85d36",
        "VpcId": "vpc-a01106c2",
        "Tags": [],
        "Entries": [
            {
                "CidrBlock": "0.0.0.0/0",
                "RuleNumber": 32767,
```

```
                "Protocol": "-1",
                "Egress": true,
                "RuleAction": "deny"
            },
            {
                "CidrBlock": "0.0.0.0/0",
                "RuleNumber": 32767,
                "Protocol": "-1",
                "Egress": false,
                "RuleAction": "deny"
            }
        ],
        "IsDefault": false
    }
}
```

- Untuk API detailnya, lihat CreateNetworkAcldi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini membuat jaringan ACL untuk yang ditentukanVPC.

```
New-EC2NetworkAcl -VpcId vpc-12345678
```

Output:

```
Associations : {}
Entries      : {Amazon.EC2.Model.NetworkAclEntry,
 Amazon.EC2.Model.NetworkAclEntry}
IsDefault    : False
NetworkAclId : acl-12345678
Tags         : {}
VpcId        : vpc-12345678
```

- Untuk API detailnya, lihat CreateNetworkAcldi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan `CreateNetworkAclEntry` dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`CreateNetworkAclEntry`.

CLI

AWS CLI

Untuk membuat ACL entri jaringan

Contoh ini membuat entri untuk jaringan yang ditentukanACL. Aturan ini memungkinkan lalu lintas masuk dari IPv4 alamat apa pun (0.0.0.0/0) pada UDP port 53 (DNS) ke subnet terkait. Jika perintah berhasil, tidak ada output yang akan ditampilkan.

Perintah:

```
aws ec2 create-network-acl-entry --network-acl-id acl-5fb85d36 --ingress --rule-number 100 --protocol udp --port-range From=53,To=53 --cidr-block 0.0.0.0/0 --rule-action allow
```

Contoh ini membuat aturan untuk jaringan tertentu ACL yang memungkinkan lalu lintas masuk dari IPv6 alamat apa pun (:: /0) pada TCP port 80 (HTTP).

Perintah:

```
aws ec2 create-network-acl-entry --network-acl-id acl-5fb85d36 --ingress --rule-number 120 --protocol tcp --port-range From=80,To=80 --ipv6-cidr-block ::/0 --rule-action allow
```

- Untuk API detailnya, lihat CreateNetworkAclEntrydi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini membuat entri untuk jaringan yang ditentukanACL. Aturan ini memungkinkan lalu lintas masuk dari mana saja (0.0.0.0/0) pada UDP port 53 (DNS) ke subnet terkait.

```
New-EC2NetworkAclEntry -NetworkAclId acl-12345678 -Egress $false -RuleNumber
 100 -Protocol 17 -PortRange_From 53 -PortRange_To 53 -CidrBlock 0.0.0.0/0 -
RuleAction allow
```

- Untuk API detailnya, lihat CreateNetworkAclEntrydi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`CreateNetworkInterface`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`CreateNetworkInterface`.

CLI

AWS CLI

Contoh 1: Untuk menentukan IPv4 alamat untuk antarmuka jaringan

`create-network-interface`Contoh berikut membuat antarmuka jaringan untuk subnet tertentu dengan IPv4 alamat utama yang ditentukan.

```
aws ec2 create-network-interface \
    --subnet-id subnet-00a24d0d67acf6333 \
    --description "my network interface" \
    --groups sg-09dfba7ed20cda78b \
    --private-ip-address 10.0.8.17
```

Output:

```
{
    "NetworkInterface": {
        "AvailabilityZone": "us-west-2a",
        "Description": "my network interface",
        "Groups": [
            {
                "GroupName": "my-security-group",
                "GroupId": "sg-09dfba7ed20cda78b"
            }
```

```
        ],
        "InterfaceType": "interface",
        "Ipv6Addresses": [],
        "MacAddress": "06:6a:0f:9a:49:37",
        "NetworkInterfaceId": "eni-0492b355f0cf3b3f8",
        "OwnerId": "123456789012",
        "PrivateDnsName": "ip-10-0-8-18.us-west-2.compute.internal",
        "PrivateIpAddress": "10.0.8.17",
        "PrivateIpAddresses": [
            {
                "Primary": true,
                "PrivateDnsName": "ip-10-0-8-17.us-west-2.compute.internal",
                "PrivateIpAddress": "10.0.8.17"
            }
        ],
        "RequesterId": "AIDA4Z3Y7GSXTMEXAMPLE",
        "RequesterManaged": false,
        "SourceDestCheck": true,
        "Status": "pending",
        "SubnetId": "subnet-00a24d0d67acf6333",
        "TagSet": [],
        "VpcId": "vpc-02723a0feeeb9d57b"
    }
}
```

Contoh 2: Untuk membuat antarmuka jaringan dengan IPv4 alamat dan IPv6 alamat

`create-network-interface`Contoh berikut membuat antarmuka jaringan untuk subnet yang ditentukan dengan IPv4 alamat dan IPv6 alamat yang dipilih oleh AmazonEC2.

```
aws ec2 create-network-interface \
    --subnet-id subnet-00a24d0d67acf6333 \
    --description "my dual stack network interface" \
    --ipv6-address-count 1 \
    --groups sg-09dfba7ed20cda78b
```

Output:

```
{
    "NetworkInterface": {
        "AvailabilityZone": "us-west-2a",
        "Description": "my dual stack network interface",
        "Groups": [
```

```
            {
                "GroupName": "my-security-group",
                "GroupId": "sg-09dfba7ed20cda78b"
            }
        ],
        "InterfaceType": "interface",
        "Ipv6Addresses": [
            {
                "Ipv6Address": "2600:1f13:cfe:3650:a1dc:237c:393a:4ba7",
                "IsPrimaryIpv6": false
            }
        ],
        "MacAddress": "06:b8:68:d2:b2:2d",
        "NetworkInterfaceId": "eni-05da417453f9a84bf",
        "OwnerId": "123456789012",
        "PrivateDnsName": "ip-10-0-8-18.us-west-2.compute.internal",
        "PrivateIpAddress": "10.0.8.18",
        "PrivateIpAddresses": [
            {
                "Primary": true,
                "PrivateDnsName": "ip-10-0-8-18.us-west-2.compute.internal",
                "PrivateIpAddress": "10.0.8.18"
            }
        ],
        "RequesterId": "AIDA4Z3Y7GSXTMEXAMPLE",
        "RequesterManaged": false,
        "SourceDestCheck": true,
        "Status": "pending",
        "SubnetId": "subnet-00a24d0d67acf6333",
        "TagSet": [],
        "VpcId": "vpc-02723a0feeeb9d57b",
        "Ipv6Address": "2600:1f13:cfe:3650:a1dc:237c:393a:4ba7"
    }
}
```

Contoh 3: Untuk membuat antarmuka jaringan dengan opsi konfigurasi pelacakan koneksi

`create-network-interface`Contoh berikut membuat antarmuka jaringan dan mengkonfigurasi batas waktu pelacakan koneksi idle.

```
aws ec2 create-network-interface \
    --subnet-id subnet-00a24d0d67acf6333 \
    --groups sg-02e57dbcfe0331c1b \
```

```
    --connection-tracking-specification TcpEstablishedTimeout=86400,UdpTimeout=60
```

Output:

```
{
    "NetworkInterface": {
        "AvailabilityZone": "us-west-2a",
        "ConnectionTrackingConfiguration": {
            "TcpEstablishedTimeout": 86400,
            "UdpTimeout": 60
        },
        "Description": "",
        "Groups": [
            {
                "GroupName": "my-security-group",
                "GroupId": "sg-02e57dbcfe0331c1b"
            }
        ],
        "InterfaceType": "interface",
        "Ipv6Addresses": [],
        "MacAddress": "06:4c:53:de:6d:91",
        "NetworkInterfaceId": "eni-0c133586e08903d0b",
        "OwnerId": "123456789012",
        "PrivateDnsName": "ip-10-0-8-94.us-west-2.compute.internal",
        "PrivateIpAddress": "10.0.8.94",
        "PrivateIpAddresses": [
            {
                "Primary": true,
                "PrivateDnsName": "ip-10-0-8-94.us-west-2.compute.internal",
                "PrivateIpAddress": "10.0.8.94"
            }
        ],
        "RequesterId": "AIDA4Z3Y7GSXTMEXAMPLE",
        "RequesterManaged": false,
        "SourceDestCheck": true,
        "Status": "pending",
        "SubnetId": "subnet-00a24d0d67acf6333",
        "TagSet": [],
        "VpcId": "vpc-02723a0feeeb9d57b"
    }
}
```

Contoh 4: Untuk membuat Adaptor Kain Elastis

`create-network-interface`Contoh berikut menciptakan sebuahEFA.

```
aws ec2 create-network-interface \
    --interface-type efa \
    --subnet-id subnet-00a24d0d67acf6333 \
    --description "my efa" \
    --groups sg-02e57dbcfe0331c1b
```

Output:

```
{
    "NetworkInterface": {
        "AvailabilityZone": "us-west-2a",
        "Description": "my efa",
        "Groups": [
            {
                "GroupName": "my-efa-sg",
                "GroupId": "sg-02e57dbcfe0331c1b"
            }
        ],
        "InterfaceType": "efa",
        "Ipv6Addresses": [],
        "MacAddress": "06:d7:a4:f7:4d:57",
        "NetworkInterfaceId": "eni-034acc2885e862b65",
        "OwnerId": "123456789012",
        "PrivateDnsName": "ip-10-0-8-180.us-west-2.compute.internal",
        "PrivateIpAddress": "10.0.8.180",
        "PrivateIpAddresses": [
            {
                "Primary": true,
                "PrivateDnsName": "ip-10-0-8-180.us-west-2.compute.internal",
                "PrivateIpAddress": "10.0.8.180"
            }
        ],
        "RequesterId": "AIDA4Z3Y7GSXTMEXAMPLE",
        "RequesterManaged": false,
        "SourceDestCheck": true,
        "Status": "pending",
        "SubnetId": "subnet-00a24d0d67acf6333",
        "TagSet": [],
        "VpcId": "vpc-02723a0feeeb9d57b"
    }
}
```

Untuk informasi selengkapnya, lihat Antarmuka jaringan elastis di Panduan EC2 Pengguna Amazon.

- Untuk API detailnya, lihat CreateNetworkInterfacedi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menciptakan antarmuka jaringan yang ditentukan.

```
New-EC2NetworkInterface -SubnetId subnet-1a2b3c4d -Description "my network
 interface" -Group sg-12345678 -PrivateIpAddress 10.0.0.17
```

Output:

```
Association        :
Attachment         :
AvailabilityZone   : us-west-2c
Description        : my network interface
Groups             : {my-security-group}
MacAddress         : 0a:72:bc:1a:cd:7f
NetworkInterfaceId : eni-12345678
OwnerId            : 123456789012
PrivateDnsName     : ip-10-0-0-17.us-west-2.compute.internal
PrivateIpAddress   : 10.0.0.17
PrivateIpAddresses : {}
RequesterId        :
RequesterManaged   : False
SourceDestCheck    : True
Status             : pending
SubnetId           : subnet-1a2b3c4d
TagSet             : {}
VpcId              : vpc-12345678
```

- Untuk API detailnya, lihat CreateNetworkInterfacedi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`CreatePlacementGroup`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`CreatePlacementGroup`.

CLI

AWS CLI

Untuk membuat grup penempatan

Perintah contoh ini membuat grup penempatan dengan nama yang ditentukan.

Perintah:

```
aws ec2 create-placement-group --group-name my-cluster --strategy cluster
```

Untuk membuat grup penempatan partisi

Perintah contoh ini membuat grup penempatan partisi bernama `HDFS-Group-A` dengan lima partisi.

Perintah:

```
aws ec2 create-placement-group --group-name HDFS-Group-A --strategy partition --
partition-count 5
```

- Untuk API detailnya, lihat CreatePlacementGroupdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini membuat grup penempatan dengan nama yang ditentukan.

```
New-EC2PlacementGroup -GroupName my-placement-group -Strategy cluster
```

- Untuk API detailnya, lihat CreatePlacementGroupdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`CreateRoute`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`CreateRoute`.

CLI

AWS CLI

Untuk membuat rute

Contoh ini membuat rute untuk tabel rute yang ditentukan. Rute cocok dengan semua IPv4 lalu lintas (`0.0.0.0/0`) dan merutekkannya ke gateway Internet yang ditentukan. Jika perintah berhasil, tidak ada output yang akan ditampilkan.

Perintah:

```
aws ec2 create-route --route-table-id rtb-22574640 --destination-cidr-
block 0.0.0.0/0 --gateway-id igw-c0a643a9
```

Perintah contoh ini membuat rute dalam tabel rute rtb-g8ff4ea2. Rute ini cocok dengan lalu lintas untuk IPv4 CIDR blok 10.0.0.0/16 dan mengarahkannya ke koneksi VPC peering, pcx-111aaa22. Rute ini memungkinkan lalu lintas diarahkan ke peer VPC dalam koneksi VPC peering. Jika perintah berhasil, tidak ada output yang akan ditampilkan.

Perintah:

```
aws ec2 create-route --route-table-id rtb-g8ff4ea2 --destination-cidr-
block 10.0.0.0/16 --vpc-peering-connection-id pcx-1a2b3c4d
```

Contoh ini membuat rute dalam tabel rute yang ditentukan yang cocok dengan semua IPv6 traffic (`::/0`) dan merutekkannya ke gateway Internet khusus egres yang ditentukan.

Perintah:

```
aws ec2 create-route --route-table-id rtb-dce620b8 --destination-ipv6-cidr-
block ::/0 --egress-only-internet-gateway-id eigw-01eadbd45ecd7943f
```

- Untuk API detailnya, lihat CreateRoutedi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menciptakan rute yang ditentukan untuk tabel rute yang ditentukan. Rute cocok dengan semua lalu lintas dan mengirimkannya ke gateway Internet yang ditentukan.

```
New-EC2Route -RouteTableId rtb-1a2b3c4d -DestinationCidrBlock 0.0.0.0/0 -
GatewayId igw-1a2b3c4d
```

Output:

```
True
```

- Untuk API detailnya, lihat CreateRoutedi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`CreateRouteTable`** dengan AWS SDK atau CLI

Contoh kode berikut menunjukkan cara menggunakan`CreateRouteTable`.

CLI

AWS CLI

Untuk membuat tabel rute

Contoh ini membuat tabel rute untuk yang ditentukanVPC.

Perintah:

```
aws ec2 create-route-table --vpc-id vpc-a01106c2
```

Output:

```
{
    "RouteTable": {
        "Associations": [],
        "RouteTableId": "rtb-22574640",
        "VpcId": "vpc-a01106c2",
        "PropagatingVgws": [],
        "Tags": [],
        "Routes": [
            {
                "GatewayId": "local",
                "DestinationCidrBlock": "10.0.0.0/16",
                "State": "active"
            }
        ]
    }
}
```

- Untuk API detailnya, lihat CreateRouteTabledi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini membuat tabel rute untuk yang ditentukanVPC.

```
New-EC2RouteTable -VpcId vpc-12345678
```

Output:

```
Associations    : {}
PropagatingVgws : {}
Routes          : {}
RouteTableId    : rtb-1a2b3c4d
Tags            : {}
VpcId           : vpc-12345678
```

- Untuk API detailnya, lihat CreateRouteTabledi AWS Tools for PowerShell Referensi Cmdlet.

Ruby

SDKuntuk Ruby

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
require 'aws-sdk-ec2'

# Prerequisites:
#
# - A VPC in Amazon VPC.
# - A subnet in that VPC.
# - A gateway attached to that subnet.
#
# @param ec2_resource [Aws::EC2::Resource] An initialized
#   Amazon Elastic Compute Cloud (Amazon EC2) resource object.
# @param vpc_id [String] The ID of the VPC for the route table.
# @param subnet_id [String] The ID of the subnet for the route table.
# @param gateway_id [String] The ID of the gateway for the route.
# @param destination_cidr_block [String] The destination CIDR block
#   for the route.
# @param tag_key [String] The key portion of the tag for the route table.
# @param tag_value [String] The value portion of the tag for the route table.
# @return [Boolean] true if the route table was created and associated;
#   otherwise, false.
# @example
#   exit 1 unless route_table_created_and_associated?(
#     Aws::EC2::Resource.new(region: 'us-west-2'),
#     'vpc-0b6f769731EXAMPLE',
#     'subnet-03d9303b57EXAMPLE',
#     'igw-06ca90c011EXAMPLE',
#     '0.0.0.0/0',
#     'my-key',
#     'my-value'
#   )
def route_table_created_and_associated?(
  ec2_resource,
  vpc_id,
```

```
  subnet_id,
  gateway_id,
  destination_cidr_block,
  tag_key,
  tag_value
)
  route_table = ec2_resource.create_route_table(vpc_id: vpc_id)
  puts "Created route table with ID '#{route_table.id}'."
  route_table.create_tags(
    tags: [
      {
        key: tag_key,
        value: tag_value
      }
    ]
  )
  puts 'Added tags to route table.'
  route_table.create_route(
    destination_cidr_block: destination_cidr_block,
    gateway_id: gateway_id
  )
  puts 'Created route with destination CIDR block ' \
    "'#{destination_cidr_block}' and associated with gateway " \
    "with ID '#{gateway_id}'."
  route_table.associate_with_subnet(subnet_id: subnet_id)
  puts "Associated route table with subnet with ID '#{subnet_id}'."
  true
rescue StandardError => e
  puts "Error creating or associating route table: #{e.message}"
  puts 'If the route table was created but not associated, you should ' \
    'clean up by deleting the route table.'
  false
end

# Example usage:
def run_me
  vpc_id = ''
  subnet_id = ''
  gateway_id = ''
  destination_cidr_block = ''
  tag_key = ''
  tag_value = ''
  region = ''
  # Print usage information and then stop.
```

```
if ARGV[0] == '--help' || ARGV[0] == '-h'
  puts 'Usage: ruby ec2-ruby-example-create-route-table.rb ' \
    'VPC_ID SUBNET_ID GATEWAY_ID DESTINATION_CIDR_BLOCK ' \
    'TAG_KEY TAG_VALUE REGION'
  # Replace us-west-2 with the AWS Region you're using for Amazon EC2.
  puts 'Example: ruby ec2-ruby-example-create-route-table.rb ' \
    'vpc-0b6f769731EXAMPLE subnet-03d9303b57EXAMPLE igw-06ca90c011EXAMPLE ' \
    "'0.0.0.0/0' my-key my-value us-west-2"
  exit 1
# If no values are specified at the command prompt, use these default values.
elsif ARGV.count.zero?
  vpc_id = 'vpc-0b6f769731EXAMPLE'
  subnet_id = 'subnet-03d9303b57EXAMPLE'
  gateway_id = 'igw-06ca90c011EXAMPLE'
  destination_cidr_block = '0.0.0.0/0'
  tag_key = 'my-key'
  tag_value = 'my-value'
  # Replace us-west-2 with the AWS Region you're using for Amazon EC2.
  region = 'us-west-2'
# Otherwise, use the values as specified at the command prompt.
else
  vpc_id = ARGV[0]
  subnet_id = ARGV[1]
  gateway_id = ARGV[2]
  destination_cidr_block = ARGV[3]
  tag_key = ARGV[4]
  tag_value = ARGV[5]
  region = ARGV[6]
end

ec2_resource = Aws::EC2::Resource.new(region: region)

if route_table_created_and_associated?(
  ec2_resource,
  vpc_id,
  subnet_id,
  gateway_id,
  destination_cidr_block,
  tag_key,
  tag_value
)
  puts 'Route table created and associated.'
else
  puts 'Route table not created or not associated.'
```

```
  end
end

run_me if $PROGRAM_NAME == __FILE__
```

- Untuk API detailnya, lihat CreateRouteTabledi AWS SDK for Ruby APIReferensi.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`CreateSecurityGroup`** dengan AWS SDK atau CLI

Contoh kode berikut menunjukkan cara menggunakan`CreateSecurityGroup`.

Contoh tindakan adalah kutipan kode dari program yang lebih besar dan harus dijalankan dalam konteks. Anda dapat melihat tindakan ini dalam konteks dalam contoh kode berikut:

- Pelajari dasar-dasarnya

.NET

AWS SDK for .NET

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    /// <summary>
    /// Create an Amazon EC2 security group with a specified name and
 description.
    /// </summary>
    /// <param name="groupName">The name for the new security group.</param>
    /// <param name="groupDescription">A description of the new security group.</
param>
    /// <returns>The group Id of the new security group.</returns>
```

```
   public async Task<string> CreateSecurityGroup(string groupName, string
groupDescription)
   {
       try
       {
           var response = await _amazonEC2.CreateSecurityGroupAsync(
               new CreateSecurityGroupRequest(groupName, groupDescription));

           // Wait until the security group exists.
           int retries = 5;
           while (retries-- > 0)
           {
               var groups = await DescribeSecurityGroups(response.GroupId);
               if (groups.Any())
               {
                   return response.GroupId;
               }

               Thread.Sleep(5000);
               retries--;
           }
           _logger.LogError($"Unable to find newly created group {groupName}.");
           throw new DoesNotExistException("security group not found");
       }
       catch (AmazonEC2Exception ec2Exception)
       {
           if (ec2Exception.ErrorCode == "ResourceAlreadyExists")
           {
               _logger.LogError(
                   $"A security group with the name {groupName} already exists.
{ec2Exception.Message}");
           }
           throw;
       }
       catch (Exception ex)
       {
           _logger.LogError(
               $"An error occurred while creating the security group.:
{ex.Message}");
           throw;
       }
   }
```

- Untuk API detailnya, lihat CreateSecurityGroupdi AWS SDK for .NET APIReferensi.

Bash

AWS CLI dengan skrip Bash

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
###############################################################################
# function ec2_create_security_group
#
# This function creates an Amazon Elastic Compute Cloud (Amazon EC2) security
 group.
#
# Parameters:
#       -n security_group_name - The name of the security group.
#       -d security_group_description - The description of the security group.
#
# Returns:
#       The ID of the created security group, or an error message if the
 operation fails.
# And:
#       0 - If successful.
#       1 - If it fails.
#
###############################################################################
function ec2_create_security_group() {
  local security_group_name security_group_description response

  # Function to display usage information
  function usage() {
    echo "function ec2_create_security_group"
    echo "Creates an Amazon Elastic Compute Cloud (Amazon EC2) security group."
    echo "  -n security_group_name - The name of the security group."
    echo "  -d security_group_description - The description of the security
 group."
```

```
  echo ""
}

# Parse the command-line arguments
while getopts "n:d:h" option; do
  case "${option}" in
    n) security_group_name="${OPTARG}" ;;
    d) security_group_description="${OPTARG}" ;;
    h)
      usage
      return 0
      ;;
    \?)
      echo "Invalid parameter"
      usage
      return 1
      ;;
  esac
done
export OPTIND=1

# Validate the input parameters
if [[ -z "$security_group_name" ]]; then
  errecho "ERROR: You must provide a security group name with the -n
parameter."
  return 1
fi

if [[ -z "$security_group_description" ]]; then
  errecho "ERROR: You must provide a security group description with the -d
parameter."
  return 1
fi

# Create the security group
response=$(aws ec2 create-security-group \
  --group-name "$security_group_name" \
  --description "$security_group_description" \
  --query "GroupId" \
  --output text) || {
  aws_cli_error_log ${?}
  errecho "ERROR: AWS reports create-security-group operation failed."
  errecho "$response"
  return 1
```

```
  }

  echo "$response"
  return 0
}
```

Fungsi utilitas yang digunakan dalam contoh ini.

```
###############################################################################
# function errecho
#
# This function outputs everything sent to it to STDERR (standard error output).
###############################################################################
function errecho() {
  printf "%s\n" "$*" 1>&2
}

###############################################################################
# function aws_cli_error_log()
#
# This function is used to log the error messages from the AWS CLI.
#
# The function expects the following argument:
#         $1 - The error code returned by the AWS CLI.
#
#  Returns:
#          0: - Success.
#
###############################################################################
function aws_cli_error_log() {
  local err_code=$1
  errecho "Error code : $err_code"
  if [ "$err_code" == 1 ]; then
    errecho "  One or more S3 transfers failed."
  elif [ "$err_code" == 2 ]; then
    errecho "  Command line failed to parse."
  elif [ "$err_code" == 130 ]; then
    errecho "  Process received SIGINT."
  elif [ "$err_code" == 252 ]; then
    errecho "  Command syntax invalid."
  elif [ "$err_code" == 253 ]; then
    errecho "  The system environment or configuration was invalid."
```

```
  elif [ "$err_code" == 254 ]; then
    errecho "  The service returned an error."
  elif [ "$err_code" == 255 ]; then
    errecho "  255 is a catch-all error."
  fi

  return 0
}
```

- Untuk API detailnya, lihat CreateSecurityGroupdi Referensi AWS CLI Perintah.

C++

SDKuntuk C ++

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
//! Create a security group.
/*!
  \param groupName: A security group name.
  \param description: A description.
  \param vpcID: A virtual private cloud (VPC) ID.
  \param[out] groupIDResult: A string to receive the group ID.
  \param clientConfiguration: AWS client configuration.
  \return bool: Function succeeded.
 */
bool AwsDoc::EC2::createSecurityGroup(const Aws::String &groupName,
                                      const Aws::String &description,
                                      const Aws::String &vpcID,
                                      Aws::String &groupIDResult,
                                      const Aws::Client::ClientConfiguration
 &clientConfiguration) {
    Aws::EC2::EC2Client ec2Client(clientConfiguration);

    Aws::EC2::Model::CreateSecurityGroupRequest request;

    request.SetGroupName(groupName);
```

```
    request.SetDescription(description);
    request.SetVpcId(vpcID);

    const Aws::EC2::Model::CreateSecurityGroupOutcome outcome =
            ec2Client.CreateSecurityGroup(request);

    if (!outcome.IsSuccess()) {
        std::cerr << "Failed to create security group:" <<
                  outcome.GetError().GetMessage() << std::endl;
        return false;
    }

    std::cout << "Successfully created security group named " << groupName <<
              std::endl;


    groupIDResult = outcome.GetResult().GetGroupId();

    return true;
}
```

- Untuk API detailnya, lihat CreateSecurityGroupdi AWS SDK for C++ APIReferensi.

## CLI

### AWS CLI

#### Untuk membuat grup keamanan untuk EC2 -Classic

Contoh ini membuat grup keamanan bernama `MySecurityGroup`.

Perintah:

```
aws ec2 create-security-group --group-name MySecurityGroup --description "My
 security group"
```

Output:

```
{
    "GroupId": "sg-903004f8"
}
```

Untuk membuat grup keamanan untuk EC2 - VPC

Contoh ini membuat grup keamanan bernama `MySecurityGroup` untuk yang ditentukanVPC.

Perintah:

```
aws ec2 create-security-group --group-name MySecurityGroup --description "My
 security group" --vpc-id vpc-1a2b3c4d
```

Output:

```
{
    "GroupId": "sg-903004f8"
}
```

Untuk informasi selengkapnya, lihat Menggunakan Grup Keamanan di Panduan Pengguna Antarmuka Baris Perintah AWS .

- Untuk API detailnya, lihat CreateSecurityGroupdi Referensi AWS CLI Perintah.

Java

SDKuntuk Java 2.x

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    /**
     * Creates a new security group asynchronously with the specified group name,
description, and VPC ID. It also
     * authorizes inbound traffic on ports 80 and 22 from the specified IP
address.
     *
     * @param groupName    the name of the security group to create
     * @param groupDesc    the description of the security group
     * @param vpcId        the ID of the VPC in which to create the security
group
```

```
    * @param myIpAddress  the IP address from which to allow inbound traffic
(e.g., "192.168.1.1/0" to allow traffic from
    *                     any IP address in the 192.168.1.0/24 subnet)
    * @return a CompletableFuture that, when completed, returns the ID of the
created security group
    * @throws RuntimeException if there was a failure creating the security
group or authorizing the inbound traffic
    */
   public CompletableFuture<String> createSecurityGroupAsync(String groupName,
String groupDesc, String vpcId, String myIpAddress) {
       CreateSecurityGroupRequest createRequest =
CreateSecurityGroupRequest.builder()
           .groupName(groupName)
           .description(groupDesc)
           .vpcId(vpcId)
           .build();

       return getAsyncClient().createSecurityGroup(createRequest)
           .thenCompose(createResponse -> {
               String groupId = createResponse.groupId();
               IpRange ipRange = IpRange.builder()
                   .cidrIp(myIpAddress + "/32")
                   .build();

               IpPermission ipPerm = IpPermission.builder()
                   .ipProtocol("tcp")
                   .toPort(80)
                   .fromPort(80)
                   .ipRanges(ipRange)
                   .build();

               IpPermission ipPerm2 = IpPermission.builder()
                   .ipProtocol("tcp")
                   .toPort(22)
                   .fromPort(22)
                   .ipRanges(ipRange)
                   .build();

               AuthorizeSecurityGroupIngressRequest authRequest =
AuthorizeSecurityGroupIngressRequest.builder()
                   .groupName(groupName)
                   .ipPermissions(ipPerm, ipPerm2)
                   .build();
```

```
                return
 getAsyncClient().authorizeSecurityGroupIngress(authRequest)
                    .thenApply(authResponse -> groupId);
            })
            .whenComplete((result, exception) -> {
                if (exception != null) {
                    if (exception instanceof CompletionException &&
 exception.getCause() instanceof Ec2Exception) {
                        throw (Ec2Exception) exception.getCause();
                    } else {
                        throw new RuntimeException("Failed to create security
 group: " + exception.getMessage(), exception);
                    }
                }
            });
    }
```

- Untuk API detailnya, lihat CreateSecurityGroupdi AWS SDK for Java 2.x APIReferensi.

## JavaScript

### SDKuntuk JavaScript (v3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
import { CreateSecurityGroupCommand, EC2Client } from "@aws-sdk/client-ec2";

/**
 * Creates a security group.
 * @param {{ groupName: string, description: string }} options
 */
export const main = async ({ groupName, description }) => {
  const client = new EC2Client({});
  const command = new CreateSecurityGroupCommand({
    // Up to 255 characters in length. Cannot start with sg-.
    GroupName: groupName,
    // Up to 255 characters in length.
```

```
    Description: description,
  });

  try {
    const { GroupId } = await client.send(command);
    console.log(GroupId);
  } catch (caught) {
    if (caught instanceof Error && caught.name === "InvalidParameterValue") {
      console.warn(`${caught.message}.`);
    } else {
      throw caught;
    }
  }
};
```

- Untuk API detailnya, lihat CreateSecurityGroupdi AWS SDK for JavaScript APIReferensi.

Kotlin

SDKuntuk Kotlin

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
suspend fun createEC2SecurityGroup(
    groupNameVal: String?,
    groupDescVal: String?,
    vpcIdVal: String?,
): String? {
    val request =
        CreateSecurityGroupRequest {
            groupName = groupNameVal
            description = groupDescVal
            vpcId = vpcIdVal
        }

    Ec2Client { region = "us-west-2" }.use { ec2 ->
        val resp = ec2.createSecurityGroup(request)
```

```
        val ipRange =
            IpRange {
                cidrIp = "0.0.0.0/0"
            }

        val ipPerm =
            IpPermission {
                ipProtocol = "tcp"
                toPort = 80
                fromPort = 80
                ipRanges = listOf(ipRange)
            }

        val ipPerm2 =
            IpPermission {
                ipProtocol = "tcp"
                toPort = 22
                fromPort = 22
                ipRanges = listOf(ipRange)
            }

        val authRequest =
            AuthorizeSecurityGroupIngressRequest {
                groupName = groupNameVal
                ipPermissions = listOf(ipPerm, ipPerm2)
            }
        ec2.authorizeSecurityGroupIngress(authRequest)
        println("Successfully added ingress policy to Security Group
 $groupNameVal")
        return resp.groupId
    }
}
```

- Untuk API detailnya, lihat [CreateSecurityGroup AWS](#)SDKAPIreferensi Kotlin.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini membuat grup keamanan untuk yang ditentukanVPC.

```
New-EC2SecurityGroup -GroupName my-security-group -Description "my security
 group" -VpcId vpc-12345678
```

Output:

```
sg-12345678
```

Contoh 2: Contoh ini membuat grup keamanan untuk EC2 -Classic.

```
New-EC2SecurityGroup -GroupName my-security-group -Description "my security
 group"
```

Output:

```
sg-45678901
```

- Untuk API detailnya, lihat CreateSecurityGroupdi AWS Tools for PowerShell Referensi Cmdlet.

Python

SDKuntuk Python (Boto3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
class SecurityGroupWrapper:
    """Encapsulates Amazon Elastic Compute Cloud (Amazon EC2) security group
 actions."""

    def __init__(self, ec2_client: boto3.client, security_group: Optional[str] =
 None):
        """
        Initializes the SecurityGroupWrapper with an EC2 client and an optional
 security group ID.
```

```
        :param ec2_client: A Boto3 Amazon EC2 client. This client provides low-
level
                           access to AWS EC2 services.
        :param security_group: The ID of a security group to manage. This is a
 high-level identifier
                               that represents the security group.
        """
        self.ec2_client = ec2_client
        self.security_group = security_group

    @classmethod
    def from_client(cls) -> "SecurityGroupWrapper":
        """
        Creates a SecurityGroupWrapper instance with a default EC2 client.

        :return: An instance of SecurityGroupWrapper initialized with the default
 EC2 client.
        """
        ec2_client = boto3.client("ec2")
        return cls(ec2_client)


    def create(self, group_name: str, group_description: str) -> str:
        """
        Creates a security group in the default virtual private cloud (VPC) of
 the current account.

        :param group_name: The name of the security group to create.
        :param group_description: The description of the security group to
create.
        :return: The ID of the newly created security group.
        :raise Handles AWS SDK service-level ClientError, with special handling
 for ResourceAlreadyExists
        """
        try:
            response = self.ec2_client.create_security_group(
                GroupName=group_name, Description=group_description
            )
            self.security_group = response["GroupId"]
        except ClientError as err:
            if err.response["Error"]["Code"] == "ResourceAlreadyExists":
                logger.error(
                    f"Security group '{group_name}' already exists. Please choose
 a different name."
```

```
                )
            raise
        else:
            return self.security_group
```

- Untuk API detailnya, lihat CreateSecurityGroup AWSSDKReferensi Python (Boto3). API

Ruby

SDKuntuk Ruby

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
# This code example does the following:
# 1. Creates an Amazon Elastic Compute Cloud (Amazon EC2) security group.
# 2. Adds inbound rules to the security group.
# 3. Displays information about available security groups.
# 4. Deletes the security group.

require 'aws-sdk-ec2'

# Creates an Amazon Elastic Compute Cloud (Amazon EC2) security group.
#
# Prerequisites:
#
# - A VPC in Amazon Virtual Private Cloud (Amazon VPC).
#
# @param ec2_client [Aws::EC2::Client] An initialized
#   Amazon EC2 client.
# @param group_name [String] A name for the security group.
# @param description [String] A description for the security group.
# @param vpc_id [String] The ID of the VPC for the security group.
# @return [String] The ID of security group that was created.
# @example
#   puts create_security_group(
```

```
#     Aws::EC2::Client.new(region: 'us-west-2'),
#     'my-security-group',
#     'This is my security group.',
#     'vpc-6713dfEX'
#   )
def create_security_group(ec2_client, group_name, description, vpc_id)
  security_group = ec2_client.create_security_group(
    group_name: group_name,
    description: description,
    vpc_id: vpc_id
  )
  puts "Created security group '#{group_name}' with ID " \
    "'#{security_group.group_id}' in VPC with ID '#{vpc_id}'."
  security_group.group_id
rescue StandardError => e
  puts "Error creating security group: #{e.message}"
  'Error'
end

# Adds an inbound rule to an Amazon Elastic Compute Cloud (Amazon EC2)
# security group.
#
# Prerequisites:
#
# - The security group.
#
# @param ec2_client [Aws::EC2::Client] An initialized Amazon EC2 client.
# @param security_group_id [String] The ID of the security group.
# @param ip_protocol [String] The network protocol for the inbound rule.
# @param from_port [String] The originating port for the inbound rule.
# @param to_port [String] The destination port for the inbound rule.
# @param cidr_ip_range [String] The CIDR IP range for the inbound rule.
# @return
# @example
#   exit 1 unless security_group_ingress_authorized?(
#     Aws::EC2::Client.new(region: 'us-west-2'),
#     'sg-030a858e078f1b9EX',
#     'tcp',
#     '80',
#     '80',
#     '0.0.0.0/0'
#   )
def security_group_ingress_authorized?(
  ec2_client, security_group_id, ip_protocol, from_port, to_port, cidr_ip_range
```

```
)
  ec2_client.authorize_security_group_ingress(
    group_id: security_group_id,
    ip_permissions: [
      {
        ip_protocol: ip_protocol,
        from_port: from_port,
        to_port: to_port,
        ip_ranges: [
          {
            cidr_ip: cidr_ip_range
          }
        ]
      }
    ]
  )
  puts "Added inbound rule to security group '#{security_group_id}' for protocol
 " \
    "'#{ip_protocol}' from port '#{from_port}' to port '#{to_port}' " \
    "with CIDR IP range '#{cidr_ip_range}'."
  true
rescue StandardError => e
  puts "Error adding inbound rule to security group: #{e.message}"
  false
end

# Refactored method to simplify complexity for describing security group
 permissions
def format_port_information(perm)
  from_port_str = perm.from_port == '-1' || perm.from_port == -1 ? 'All' :
 perm.from_port.to_s
  to_port_str = perm.to_port == '-1' || perm.to_port == -1 ? 'All' :
 perm.to_port.to_s
  { from_port: from_port_str, to_port: to_port_str }
end

# Displays information about a security group's IP permissions set in
# Amazon Elastic Compute Cloud (Amazon EC2).
def describe_security_group_permissions(perm)
  ports = format_port_information(perm)

  print "  Protocol: #{perm.ip_protocol == '-1' ? 'All' : perm.ip_protocol}"
  print ", From: #{ports[:from_port]}, To: #{ports[:to_port]}"
```

```
  print ", CIDR IPv6: #{perm.ipv_6_ranges[0].cidr_ipv_6}" if perm.key?
(:ipv_6_ranges) && perm.ipv_6_ranges.count.positive?

  print ", CIDR IPv4: #{perm.ip_ranges[0].cidr_ip}" if perm.key?(:ip_ranges) &&
 perm.ip_ranges.count.positive?
  print "\n"
end

# Displays information about available security groups in
# Amazon Elastic Compute Cloud (Amazon EC2).
def describe_security_groups(ec2_client)
  response = ec2_client.describe_security_groups

  if response.security_groups.count.positive?
    response.security_groups.each do |sg|
      display_group_details(sg)
    end
  else
    puts 'No security groups found.'
  end
rescue StandardError => e
  puts "Error getting information about security groups: #{e.message}"
end

# Helper method to display the details of security groups
def display_group_details(sg)
  puts '-' * (sg.group_name.length + 13)
  puts "Name:        #{sg.group_name}"
  puts "Description: #{sg.description}"
  puts "Group ID:    #{sg.group_id}"
  puts "Owner ID:    #{sg.owner_id}"
  puts "VPC ID:      #{sg.vpc_id}"

  display_group_tags(sg.tags) if sg.tags.count.positive?
  display_group_permissions(sg)
end

def display_group_tags(tags)
  puts 'Tags:'
  tags.each do |tag|
    puts "  Key: #{tag.key}, Value: #{tag.value}"
  end
end
```

```
def display_group_permissions(sg)
  if sg.ip_permissions.count.positive?
    puts 'Inbound rules:'
    sg.ip_permissions.each do |p|
      describe_security_group_permissions(p)
    end
  end

  return if sg.ip_permissions_egress.empty?

  puts 'Outbound rules:'
  sg.ip_permissions_egress.each do |p|
    describe_security_group_permissions(p)
  end
end

# Deletes an Amazon Elastic Compute Cloud (Amazon EC2)
# security group.
def security_group_deleted?(ec2_client, security_group_id)
  ec2_client.delete_security_group(group_id: security_group_id)
  puts "Deleted security group '#{security_group_id}'."
  true
rescue StandardError => e
  puts "Error deleting security group: #{e.message}"
  false
end

# Example usage with refactored run_me to reduce complexity
def run_me
  group_name, description, vpc_id, ip_protocol_http, from_port_http,
 to_port_http, \
  cidr_ip_range_http, ip_protocol_ssh, from_port_ssh, to_port_ssh, \
  cidr_ip_range_ssh, region = process_arguments
  ec2_client = Aws::EC2::Client.new(region: region)

  security_group_id = attempt_create_security_group(ec2_client, group_name,
 description, vpc_id)
  security_group_exists = security_group_id != 'Error'

  if security_group_exists
    add_inbound_rules(ec2_client, security_group_id, ip_protocol_http,
 from_port_http, to_port_http, cidr_ip_range_http)
    add_inbound_rules(ec2_client, security_group_id, ip_protocol_ssh,
 from_port_ssh, to_port_ssh, cidr_ip_range_ssh)
```

```
  end

  describe_security_groups(ec2_client)
  attempt_delete_security_group(ec2_client, security_group_id) if
 security_group_exists
end

def process_arguments
  if ARGV[0] == '--help' || ARGV[0] == '-h'
    display_help
    exit 1
  elsif ARGV.count.zero?
    default_values
  else
    ARGV
  end
end

def attempt_create_security_group(ec2_client, group_name, description, vpc_id)
  puts 'Attempting to create security group...'
  security_group_id = create_security_group(ec2_client, group_name, description,
 vpc_id)
  puts 'Could not create security group. Skipping this step.' if
 security_group_id == 'Error'
  security_group_id
end

def add_inbound_rules(ec2_client, security_group_id, ip_protocol, from_port,
 to_port, cidr_ip_range)
  puts 'Attempting to add inbound rules to security group...'
  return if security_group_ingress_authorized?(ec2_client, security_group_id,
 ip_protocol, from_port, to_port,
                                               cidr_ip_range)

  puts 'Could not add inbound rule to security group. Skipping this step.'
end

def attempt_delete_security_group(ec2_client, security_group_id)
  puts "\nAttempting to delete security group..."
  return if security_group_deleted?(ec2_client, security_group_id)

  puts 'Could not delete security group. You must delete it yourself.'
end
```

```
def display_help
  puts 'Usage:   ruby ec2-ruby-example-security-group.rb ' \
    'GROUP_NAME DESCRIPTION VPC_ID IP_PROTOCOL_1 FROM_PORT_1 TO_PORT_1 ' \
    'CIDR_IP_RANGE_1 IP_PROTOCOL_2 FROM_PORT_2 TO_PORT_2 ' \
    'CIDR_IP_RANGE_2 REGION'
  puts 'Example: ruby ec2-ruby-example-security-group.rb ' \
    "my-security-group 'This is my security group.' vpc-6713dfEX " \
    "tcp 80 80 '0.0.0.0/0' tcp 22 22 '0.0.0.0/0' us-west-2"
end

def default_values
  [
    'my-security-group', 'This is my security group.', 'vpc-6713dfEX', 'tcp',
 '80', '80',
    '0.0.0.0/0', 'tcp', '22', '22', '0.0.0.0/0', 'us-west-2'
  ]
end

run_me if $PROGRAM_NAME == __FILE__
```

- Untuk API detailnya, lihat CreateSecurityGroupdi AWS SDK for Ruby APIReferensi.

## Rust

### SDKuntuk Rust

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    pub async fn create_security_group(
        &self,
        name: &str,
        description: &str,
    ) -> Result<SecurityGroup, EC2Error> {
        tracing::info!("Creating security group {name}");
        let create_output = self
            .client
            .create_security_group()
```

```
            .group_name(name)
            .description(description)
            .send()
            .await
            .map_err(EC2Error::from)?;

        let group_id = create_output
            .group_id
            .ok_or_else(|| EC2Error::new("Missing security group id after
creation"))?;

        let group = self
            .describe_security_group(&group_id)
            .await?
            .ok_or_else(|| {
                EC2Error::new(format!("Could not find security group with id
{group_id}"))
            })?;

        tracing::info!("Created security group {name} as {group_id}");

        Ok(group)
    }
```

- Untuk API detailnya, lihat [CreateSecurityGroup AWS](SDKAPIreferensi Rust.

## SAP ABAP

### SDKuntuk SAP ABAP

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di [Repositori Contoh Kode AWS].

```
    TRY.
        oo_result = lo_ec2->createsecuritygroup(                " oo_result is
returned for testing purposes. "
          iv_description = 'Security group example'
          iv_groupname = iv_security_group_name
```

```
          iv_vpcid = iv_vpc_id
        ).
        MESSAGE 'Security group created.' TYPE 'I'.
      CATCH /aws1/cx_rt_service_generic INTO DATA(lo_exception).
        DATA(lv_error) = |"{ lo_exception->av_err_code }" - { lo_exception-
>av_err_msg }|.
        MESSAGE lv_error TYPE 'E'.
    ENDTRY.
```

- Untuk API detailnya, lihat CreateSecurityGroup AWSSDKuntuk SAP ABAP API referensi.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`CreateSnapshot`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`CreateSnapshot`.

CLI

AWS CLI

Untuk membuat snapshot

Perintah contoh ini membuat snapshot volume dengan ID volume `vol-1234567890abcdef0` dan deskripsi singkat untuk mengidentifikasi snapshot.

Perintah:

```
aws ec2 create-snapshot --volume-id vol-1234567890abcdef0 --description "This is
 my root volume snapshot"
```

Output:

```
{
    "Description": "This is my root volume snapshot",
    "Tags": [],
    "Encrypted": false,
    "VolumeId": "vol-1234567890abcdef0",
    "State": "pending",
```

```
    "VolumeSize": 8,
    "StartTime": "2018-02-28T21:06:01.000Z",
    "Progress": "",
    "OwnerId": "012345678910",
    "SnapshotId": "snap-066877671789bd71b"
}
```

Untuk membuat snapshot dengan tag

Perintah contoh ini membuat snapshot dan menerapkan dua tag: purpose=prod dan costcenter=123.

Perintah:

```
aws ec2 create-snapshot --volume-id vol-1234567890abcdef0
 --description 'Prod backup' --tag-specifications
 'ResourceType=snapshot,Tags=[{Key=purpose,Value=prod},
{Key=costcenter,Value=123}]'
```

Output:

```
{
    "Description": "Prod backup",
    "Tags": [
        {
            "Value": "prod",
            "Key": "purpose"
        },
        {
            "Value": "123",
            "Key": "costcenter"
        }
     ],
     "Encrypted": false,
     "VolumeId": "vol-1234567890abcdef0",
     "State": "pending",
     "VolumeSize": 8,
     "StartTime": "2018-02-28T21:06:06.000Z",
     "Progress": "",
     "OwnerId": "012345678910",
     "SnapshotId": "snap-09ed24a70bc19bbe4"
 }
```

- Untuk API detailnya, lihat CreateSnapshotdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini membuat snapshot dari volume yang ditentukan.

```
New-EC2Snapshot -VolumeId vol-12345678 -Description "This is a test"
```

Output:

```
DataEncryptionKeyId :
Description         : This is a test
Encrypted           : False
KmsKeyId            :
OwnerAlias          :
OwnerId             : 123456789012
Progress            :
SnapshotId          : snap-12345678
StartTime           : 12/22/2015 1:28:42 AM
State               : pending
StateMessage        :
Tags                : {}
VolumeId            : vol-12345678
VolumeSize          : 20
```

- Untuk API detailnya, lihat CreateSnapshotdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`CreateSpotDatafeedSubscription`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`CreateSpotDatafeedSubscription`.

CLI

AWS CLI

Untuk membuat umpan data Instance Spot

`create-spot-datafeed-subscription`Contoh berikut membuat umpan data Spot Instance.

```
aws ec2 create-spot-datafeed-subscription \
    --bucket my-bucket \
    --prefix spot-data-feed
```

Output:

```
{
    "SpotDatafeedSubscription": {
        "Bucket": "my-bucket",
        "OwnerId": "123456789012",
        "Prefix": "spot-data-feed",
        "State": "Active"
    }
}
```

Umpan data disimpan di bucket Amazon S3 yang Anda tentukan. Nama file untuk umpan data ini memiliki format berikut.

```
my-bucket.s3.amazonaws.com/spot-data-feed/123456789012.YYYY-MM-DD-
HH.n.abcd1234.gz
```

Untuk informasi selengkapnya, lihat umpan data Instans Spot di Panduan Pengguna Amazon Elastic Compute Cloud untuk Instans Linux.

- Untuk API detailnya, lihat CreateSpotDatafeedSubscriptiondi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini membuat umpan data instance Spot.

```
New-EC2SpotDatafeedSubscription -Bucket amzn-s3-demo-bucket -Prefix spotdata
```

Output:

```
Bucket  : my-s3-bucket
Fault   :
OwnerId : 123456789012
Prefix  : spotdata
State   : Active
```

- Untuk API detailnya, lihat CreateSpotDatafeedSubscriptiondi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`CreateSubnet`** dengan AWS SDK atau CLI

Contoh kode berikut menunjukkan cara menggunakan`CreateSubnet`.

CLI

AWS CLI

Contoh 1: Untuk membuat subnet dengan IPv4 CIDR blok saja

`create-subnet`Contoh berikut membuat subnet di ditentukan VPC dengan IPv4 CIDR blok yang ditentukan.

```
aws ec2 create-subnet \
    --vpc-id vpc-081ec835f3EXAMPLE \
    --cidr-block 10.0.0.0/24 \
    --tag-specifications ResourceType=subnet,Tags=[{Key=Name,Value=my-ipv4-only-
subnet}]
```

Output:

```
{
    "Subnet": {
```

```
        "AvailabilityZone": "us-west-2a",
        "AvailabilityZoneId": "usw2-az2",
        "AvailableIpAddressCount": 251,
        "CidrBlock": "10.0.0.0/24",
        "DefaultForAz": false,
        "MapPublicIpOnLaunch": false,
        "State": "available",
        "SubnetId": "subnet-0e99b93155EXAMPLE",
        "VpcId": "vpc-081ec835f3EXAMPLE",
        "OwnerId": "123456789012",
        "AssignIpv6AddressOnCreation": false,
        "Ipv6CidrBlockAssociationSet": [],
        "Tags": [
            {
                "Key": "Name",
                "Value": "my-ipv4-only-subnet"
            }
        ],
        "SubnetArn": "arn:aws:ec2:us-west-2:123456789012:subnet/
subnet-0e99b93155EXAMPLE"
    }
}
```

Contoh 2: Untuk membuat subnet dengan keduanya IPv4 dan blok IPv6 CIDR

`create-subnet`Contoh berikut menciptakan subnet dalam ditentukan VPC dengan yang ditentukan IPv4 dan IPv6 CIDR blok.

```
aws ec2 create-subnet \
    --vpc-id vpc-081ec835f3EXAMPLE \
    --cidr-block 10.0.0.0/24 \
    --ipv6-cidr-block 2600:1f16:cfe:3660::/64 \
    --tag-specifications ResourceType=subnet,Tags=[{Key=Name,Value=my-ipv4-ipv6-
subnet}]
```

Output:

```
{
    "Subnet": {
        "AvailabilityZone": "us-west-2a",
        "AvailabilityZoneId": "usw2-az2",
        "AvailableIpAddressCount": 251,
        "CidrBlock": "10.0.0.0/24",
```

```
        "DefaultForAz": false,
        "MapPublicIpOnLaunch": false,
        "State": "available",
        "SubnetId": "subnet-0736441d38EXAMPLE",
        "VpcId": "vpc-081ec835f3EXAMPLE",
        "OwnerId": "123456789012",
        "AssignIpv6AddressOnCreation": false,
        "Ipv6CidrBlockAssociationSet": [
            {
                "AssociationId": "subnet-cidr-assoc-06c5f904499fcc623",
                "Ipv6CidrBlock": "2600:1f13:cfe:3660::/64",
                "Ipv6CidrBlockState": {
                    "State": "associating"
                }
            }
        ],
        "Tags": [
            {
                "Key": "Name",
                "Value": "my-ipv4-ipv6-subnet"
            }
        ],
        "SubnetArn": "arn:aws:ec2:us-west-2:123456789012:subnet/
subnet-0736441d38EXAMPLE"
    }
}
```

Contoh 3: Untuk membuat subnet dengan IPv6 CIDR blok saja

`create-subnet`Contoh berikut membuat subnet di ditentukan VPC dengan IPv6 CIDR blok yang ditentukan.

```
aws ec2 create-subnet \
    --vpc-id vpc-081ec835f3EXAMPLE \
    --ipv6-native \
    --ipv6-cidr-block 2600:1f16:115:200::/64 \
    --tag-specifications ResourceType=subnet,Tags=[{Key=Name,Value=my-ipv6-only-
subnet}]
```

Output:

```
{
    "Subnet": {
```

```
        "AvailabilityZone": "us-west-2a",
        "AvailabilityZoneId": "usw2-az2",
        "AvailableIpAddressCount": 0,
        "DefaultForAz": false,
        "MapPublicIpOnLaunch": false,
        "State": "available",
        "SubnetId": "subnet-03f720e7deEXAMPLE",
        "VpcId": "vpc-081ec835f3EXAMPLE",
        "OwnerId": "123456789012",
        "AssignIpv6AddressOnCreation": true,
        "Ipv6CidrBlockAssociationSet": [
            {
                "AssociationId": "subnet-cidr-assoc-01ef639edde556709",
                "Ipv6CidrBlock": "2600:1f13:cfe:3660::/64",
                "Ipv6CidrBlockState": {
                    "State": "associating"
                }
            }
        ],
        "Tags": [
            {
                "Key": "Name",
                "Value": "my-ipv6-only-subnet"
            }
        ],
        "SubnetArn": "arn:aws:ec2:us-west-2:123456789012:subnet/
subnet-03f720e7deEXAMPLE"
    }
}
```

Untuk informasi selengkapnya, lihat VPCsdan subnet di Panduan VPC Pengguna Amazon.

- Untuk API detailnya, lihat CreateSubnetdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini membuat subnet dengan yang ditentukanCIDR.

```
New-EC2Subnet -VpcId vpc-12345678 -CidrBlock 10.0.0.0/24
```

Output:

```
AvailabilityZone        : us-west-2c
AvailableIpAddressCount : 251
CidrBlock               : 10.0.0.0/24
DefaultForAz            : False
MapPublicIpOnLaunch     : False
State                   : pending
SubnetId                : subnet-1a2b3c4d
Tag                     : {}
VpcId                   : vpc-12345678
```

- Untuk API detailnya, lihat CreateSubnetdi AWS Tools for PowerShell Referensi Cmdlet.

Ruby

SDKuntuk Ruby

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
require 'aws-sdk-ec2'

# Creates a subnet within a virtual private cloud (VPC) in
# Amazon Virtual Private Cloud (Amazon VPC) and then tags
# the subnet.
#
# Prerequisites:
#
# - A VPC in Amazon VPC.
#
# @param ec2_resource [Aws::EC2::Resource] An initialized
#   Amazon Elastic Compute Cloud (Amazon EC2) resource object.
# @param vpc_id [String] The ID of the VPC for the subnet.
# @param cidr_block [String] The IPv4 CIDR block for the subnet.
# @param availability_zone [String] The ID of the Availability Zone
#   for the subnet.
# @param tag_key [String] The key portion of the tag for the subnet.
# @param tag_vlue [String] The value portion of the tag for the subnet.
```

```
# @return [Boolean] true if the subnet was created and tagged;
#   otherwise, false.
# @example
#   exit 1 unless subnet_created_and_tagged?(
#     Aws::EC2::Resource.new(region: 'us-west-2'),
#     'vpc-6713dfEX',
#     '10.0.0.0/24',
#     'us-west-2a',
#     'my-key',
#     'my-value'
#   )
def subnet_created_and_tagged?(
  ec2_resource,
  vpc_id,
  cidr_block,
  availability_zone,
  tag_key,
  tag_value
)
  subnet = ec2_resource.create_subnet(
    vpc_id: vpc_id,
    cidr_block: cidr_block,
    availability_zone: availability_zone
  )
  subnet.create_tags(
    tags: [
      {
        key: tag_key,
        value: tag_value
      }
    ]
  )
  puts "Subnet created with ID '#{subnet.id}' in VPC with ID '#{vpc_id}' " \
    "and CIDR block '#{cidr_block}' in availability zone " \
    "'#{availability_zone}' and tagged with key '#{tag_key}' and " \
    "value '#{tag_value}'."
  true
rescue StandardError => e
  puts "Error creating or tagging subnet: #{e.message}"
  false
end

# Example usage:
def run_me
```

```
vpc_id = ''
cidr_block = ''
availability_zone = ''
tag_key = ''
tag_value = ''
region = ''
# Print usage information and then stop.
if ARGV[0] == '--help' || ARGV[0] == '-h'
  puts 'Usage:   ruby ec2-ruby-example-create-subnet.rb ' \
    'VPC_ID CIDR_BLOCK AVAILABILITY_ZONE TAG_KEY TAG_VALUE REGION'
  # Replace us-west-2 with the AWS Region you're using for Amazon EC2.
  puts 'Example: ruby ec2-ruby-example-create-subnet.rb ' \
    'vpc-6713dfEX 10.0.0.0/24 us-west-2a my-key my-value us-west-2'
  exit 1
# If no values are specified at the command prompt, use these default values.
elsif ARGV.count.zero?
  vpc_id = 'vpc-6713dfEX'
  cidr_block = '10.0.0.0/24'
  availability_zone = 'us-west-2a'
  tag_key = 'my-key'
  tag_value = 'my-value'
  # Replace us-west-2 with the AWS Region you're using for Amazon EC2.
  region = 'us-west-2'
# Otherwise, use the values as specified at the command prompt.
else
  vpc_id = ARGV[0]
  cidr_block = ARGV[1]
  availability_zone = ARGV[2]
  tag_key = ARGV[3]
  tag_value = ARGV[4]
  region = ARGV[5]
end

ec2_resource = Aws::EC2::Resource.new(region: region)

if subnet_created_and_tagged?(
  ec2_resource,
  vpc_id,
  cidr_block,
  availability_zone,
  tag_key,
  tag_value
)
  puts 'Subnet created and tagged.'
```

```
  else
    puts 'Subnet not created or not tagged.'
  end
end

run_me if $PROGRAM_NAME == __FILE__
```

- Untuk API detailnya, lihat CreateSubnetdi AWS SDK for Ruby APIReferensi.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`CreateTags`** dengan AWS SDK atau CLI

Contoh kode berikut menunjukkan cara menggunakan`CreateTags`.

C++

SDKuntuk C ++

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
//! Add or overwrite only the specified tags for the specified Amazon Elastic
 Compute Cloud (Amazon EC2) resource or resources.
/*!
  \param resources: The resources for the tags.
  \param tags: Vector of tags.
  \param clientConfiguration: AWS client configuration.
  \return bool: Function succeeded.
 */
bool AwsDoc::EC2::createTags(const Aws::Vector<Aws::String> &resources,
                             const Aws::Vector<Aws::EC2::Model::Tag> &tags,
                             const Aws::Client::ClientConfiguration
 &clientConfiguration) {
    Aws::EC2::EC2Client ec2Client(clientConfiguration);
```

```
    Aws::EC2::Model::CreateTagsRequest createTagsRequest;
    createTagsRequest.SetResources(resources);
    createTagsRequest.SetTags(tags);

    Aws::EC2::Model::CreateTagsOutcome outcome =
 ec2Client.CreateTags(createTagsRequest);

    if (outcome.IsSuccess()) {
        std::cout << "Successfully created tags for resources" << std::endl;
    } else {
        std::cerr << "Failed to create tags for resources, " <<
 outcome.GetError().GetMessage() << std::endl;
    }

    return outcome.IsSuccess();
}
```

- Untuk API detailnya, lihat CreateTagsdi AWS SDK for C++ APIReferensi.

CLI

AWS CLI

Contoh 1: Untuk menambahkan tag ke sumber daya

`create-tags`Contoh berikut menambahkan tag `Stack=production` ke gambar yang ditentukan, atau menimpa tag yang ada untuk AMI tempat kunci tag berada`Stack`.

```
aws ec2 create-tags \
    --resources ami-1234567890abcdef0 \
    --tags Key=Stack,Value=production
```

Untuk informasi selengkapnya, lihat Ini adalah judul topik di Panduan Pengguna Amazon Elastic Compute Cloud untuk Instans Linux.

Contoh 2: Untuk menambahkan tag ke beberapa sumber daya

`create-tags`Contoh berikut menambahkan (atau menimpa) dua tag untuk AMI dan sebuah instance. Salah satu tanda memiliki kunci (`webserver`) tetapi tidak memiliki nilai (nilai diatur ke string kosong). Tanda lainnya memiliki kunci (`stack`) dan nilai (`Production`).

```
aws ec2 create-tags \
    --resources ami-1a2b3c4d i-1234567890abcdef0 \
    --tags Key=webserver,Value=   Key=stack,Value=Production
```

Untuk informasi selengkapnya, lihat Ini adalah judul topik di Panduan Pengguna Amazon Elastic Compute Cloud untuk Instans Linux.

Contoh 3: Untuk menambahkan tag yang berisi karakter khusus

Contoh `create-tags` berikut menambahkan tanda `[Group]=test` untuk instans. Tanda kurung siku ([ dan ]) adalah karakter khusus dan harus di-escape. Contoh berikut juga menggunakan karakter lanjutan baris yang sesuai untuk setiap lingkungan.

Jika Anda menggunakan Windows, kurung elemen yang memiliki karakter khusus dengan petik ganda ("), lalu di depan setiap karakter bertanda petik ganda, tambahkan garis miring terbalik (\) sebagai berikut:

```
aws ec2 create-tags ^
    --resources i-1234567890abcdef0 ^
    --tags Key=\"[Group]\",Value=test
```

Jika Anda menggunakan Windows PowerShell, kelilingi elemen nilai yang memiliki karakter khusus dengan tanda kutip ganda (“), mendahului setiap karakter kutipan ganda dengan garis miring terbalik (\), dan kemudian kelilingi seluruh kunci dan struktur nilai dengan tanda kutip tunggal (') sebagai berikut:

```
aws ec2 create-tags `
    --resources i-1234567890abcdef0 `
    --tags 'Key=\"[Group]\",Value=test'
```

Jika Anda menggunakan Linux atau OS X, apit elemen yang memiliki karakter khusus dengan petik ganda ("), lalu apit keseluruhan kunci dan struktur nilai dengan tanda petik tunggal (') sebagai berikut:

```
aws ec2 create-tags \
    --resources i-1234567890abcdef0 \
    --tags 'Key="[Group]",Value=test'
```

Untuk informasi selengkapnya, lihat Ini adalah judul topik di Panduan Pengguna Amazon Elastic Compute Cloud untuk Instans Linux.

- Untuk API detailnya, lihat CreateTagsdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menambahkan satu tag ke sumber daya yang ditentukan. Kunci tag adalah 'myTag' dan nilai tag adalah 'myTagValue'. Sintaks yang digunakan oleh contoh ini membutuhkan PowerShell versi 3 atau lebih tinggi.

```
New-EC2Tag -Resource i-12345678 -Tag @{ Key="myTag"; Value="myTagValue" }
```

Contoh 2: Contoh ini memperbarui atau menambahkan tag yang ditentukan ke sumber daya yang ditentukan. Sintaks yang digunakan oleh contoh ini membutuhkan PowerShell versi 3 atau lebih tinggi.

```
New-EC2Tag -Resource i-12345678 -Tag @( @{ Key="myTag"; Value="newTagValue" },
 @{ Key="test"; Value="anotherTagValue" } )
```

Contoh 3: Dengan PowerShell versi 2, Anda harus menggunakan New-Object untuk membuat tag untuk parameter Tag.

```
$tag = New-Object Amazon.EC2.Model.Tag
$tag.Key = "myTag"
$tag.Value = "myTagValue"

New-EC2Tag -Resource i-12345678 -Tag $tag
```

- Untuk API detailnya, lihat CreateTagsdi AWS Tools for PowerShell Referensi Cmdlet.

Rust

SDKuntuk Rust

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

Contoh ini menerapkan tag Nama Setelah membuat instance.

```
    pub async fn create_instance<'a>(
        &self,
        image_id: &'a str,
        instance_type: InstanceType,
        key_pair: &'a KeyPairInfo,
        security_groups: Vec<&'a SecurityGroup>,
    ) -> Result<String, EC2Error> {
        let run_instances = self
            .client
            .run_instances()
            .image_id(image_id)
            .instance_type(instance_type)
            .key_name(
                key_pair
                    .key_name()
                    .ok_or_else(|| EC2Error::new("Missing key name when launching
instance"))?,
            )
            .set_security_group_ids(Some(
                security_groups
                    .iter()
                    .filter_map(|sg| sg.group_id.clone())
                    .collect(),
            ))
            .min_count(1)
            .max_count(1)
            .send()
            .await?;

        if run_instances.instances().is_empty() {
            return Err(EC2Error::new("Failed to create instance"));
        }

        let instance_id = run_instances.instances()[0].instance_id().unwrap();
        let response = self
            .client
            .create_tags()
            .resources(instance_id)
            .tags(
                Tag::builder()
                    .key("Name")
                    .value("From SDK Examples")
```

```
                    .build(),
            )
            .send()
            .await;

        match response {
            Ok(_) => tracing::info!("Created {instance_id} and applied tags."),
            Err(err) => {
                tracing::info!("Error applying tags to {instance_id}: {err:?}");
                return Err(err.into());
            }
        }

        tracing::info!("Instance is created.");

        Ok(instance_id.to_string())
    }
```

- Untuk API detailnya, lihat CreateTags AWSSDKAPIreferensi Rust.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`CreateVolume`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`CreateVolume`.

CLI

AWS CLI

Untuk membuat volume General Purpose SSD (gp2) kosong

`create-volume`Contoh berikut membuat 80 GiB General Purpose SSD (gp2) volume di Availability Zone yang ditentukan. Perhatikan bahwa Wilayah saat ini harus`us-east-1`, atau Anda dapat menambahkan `--region` parameter untuk menentukan Wilayah untuk perintah.

```
aws ec2 create-volume \
    --volume-type gp2 \
```

```
    --size 80 \
    --availability-zone us-east-1a
```

Output:

```
{
    "AvailabilityZone": "us-east-1a",
    "Tags": [],
    "Encrypted": false,
    "VolumeType": "gp2",
    "VolumeId": "vol-1234567890abcdef0",
    "State": "creating",
    "Iops": 240,
    "SnapshotId": "",
    "CreateTime": "YYYY-MM-DDTHH:MM:SS.000Z",
    "Size": 80
}
```

Jika Anda tidak menentukan jenis volume, tipe volume default adalahgp2.

```
aws ec2 create-volume \
    --size 80 \
    --availability-zone us-east-1a
```

Contoh 2: Untuk membuat volume Provisioned IOPS SSD (io1) dari snapshot

`create-volume`Contoh berikut membuat volume Provisioned IOPS SSD (io1) dengan 1000 disediakan IOPS di Availability Zone yang ditentukan menggunakan snapshot yang ditentukan.

```
aws ec2 create-volume \
    --volume-type io1 \
    --iops 1000 \
    --snapshot-id snap-066877671789bd71b \
    --availability-zone us-east-1a
```

Output:

```
{
    "AvailabilityZone": "us-east-1a",
    "Tags": [],
```

```
    "Encrypted": false,
    "VolumeType": "io1",
    "VolumeId": "vol-1234567890abcdef0",
    "State": "creating",
    "Iops": 1000,
    "SnapshotId": "snap-066877671789bd71b",
    "CreateTime": "YYYY-MM-DDTHH:MM:SS.000Z",
    "Size": 500
}
```

Contoh 3: Untuk membuat volume terenkripsi

`create-volume`Contoh berikut membuat volume terenkripsi menggunakan default CMK untuk EBS enkripsi. Jika enkripsi secara default dinonaktifkan, Anda harus menentukan `--encrypted` parameter sebagai berikut.

```
aws ec2 create-volume \
    --size 80 \
    --encrypted \
    --availability-zone us-east-1a
```

Output:

```
{
    "AvailabilityZone": "us-east-1a",
    "Tags": [],
    "Encrypted": true,
    "VolumeType": "gp2",
    "VolumeId": "vol-1234567890abcdef0",
    "State": "creating",
    "Iops": 240,
    "SnapshotId": "",
    "CreateTime": "YYYY-MM-DDTHH:MM:SS.000Z",
    "Size": 80
}
```

Jika enkripsi secara default diaktifkan, perintah contoh berikut membuat volume terenkripsi, bahkan tanpa parameter. `--encrypted`

```
aws ec2 create-volume \
    --size 80 \
```

```
    --availability-zone us-east-1a
```

Jika Anda menggunakan `--kms-key-id` parameter untuk menentukan pelanggan yang dikelolaCMK, Anda harus menentukan `--encrypted` parameter bahkan jika enkripsi secara default diaktifkan.

```
aws ec2 create-volume \
    --volume-type gp2 \
    --size 80 \
    --encrypted \
    --kms-key-id 0ea3fef3-80a7-4778-9d8c-1c0c6EXAMPLE \
    --availability-zone us-east-1a
```

Contoh 4: Untuk membuat volume dengan tag

`create-volume`Contoh berikut menciptakan volume dan menambahkan dua tag.

```
aws ec2 create-volume \
    --availability-zone us-east-1a \
    --volume-type gp2 \
    --size 80 \
    --tag-specifications
 'ResourceType=volume,Tags=[{Key=purpose,Value=production},{Key=cost-
center,Value=cc123}]'
```

- Untuk API detailnya, lihat CreateVolumedi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menciptakan volume yang ditentukan.

```
New-EC2Volume -Size 50 -AvailabilityZone us-west-2a -VolumeType gp2
```

Output:

```
Attachments      : {}
AvailabilityZone : us-west-2a
CreateTime       : 12/22/2015 1:42:07 AM
```

```
Encrypted        : False
Iops             : 150
KmsKeyId         :
Size             : 50
SnapshotId       :
State            : creating
Tags             : {}
VolumeId         : vol-12345678
VolumeType       : gp2
```

Contoh 2: Permintaan contoh ini membuat volume dan menerapkan tag dengan kunci tumpukan dan nilai produksi.

```
$tag = @{ Key="stack"; Value="production" }

$tagspec = new-object Amazon.EC2.Model.TagSpecification
$tagspec.ResourceType = "volume"
$tagspec.Tags.Add($tag)

New-EC2Volume -Size 80 -AvailabilityZone "us-west-2a" -TagSpecification $tagspec
```

- Untuk API detailnya, lihat CreateVolumedi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`CreateVpc`** dengan AWS SDK atau CLI

Contoh kode berikut menunjukkan cara menggunakan`CreateVpc`.

CLI

AWS CLI

Contoh 1: Untuk membuat VPC

`create-vpc`Contoh berikut membuat VPC dengan IPv4 CIDR blok tertentu dan tag Nama.

```
aws ec2 create-vpc \
    --cidr-block 10.0.0.0/16 \
```

```
    --tag-specifications ResourceType=vpc,Tags=[{Key=Name,Value=MyVpc}]
```

Output:

```
{
    "Vpc": {
        "CidrBlock": "10.0.0.0/16",
        "DhcpOptionsId": "dopt-5EXAMPLE",
        "State": "pending",
        "VpcId": "vpc-0a60eb65b4EXAMPLE",
        "OwnerId": "123456789012",
        "InstanceTenancy": "default",
        "Ipv6CidrBlockAssociationSet": [],
        "CidrBlockAssociationSet": [
            {
                "AssociationId": "vpc-cidr-assoc-07501b79ecEXAMPLE",
                "CidrBlock": "10.0.0.0/16",
                "CidrBlockState": {
                    "State": "associated"
                }
            }
        ],
        "IsDefault": false,
        "Tags": [
            {
                "Key": "Name",
                "Value": MyVpc"
            }
        ]
    }
}
```

Contoh 2: Untuk membuat VPC dengan penyewaan khusus

`create-vpc`Contoh berikut membuat VPC dengan IPv4 CIDR blok tertentu dan penyewaan khusus.

```
aws ec2 create-vpc \
    --cidr-block 10.0.0.0/16 \
    --instance-tenancy dedicated
```

Output:

```
{
    "Vpc": {
        "CidrBlock": "10.0.0.0/16",
        "DhcpOptionsId": "dopt-19edf471",
        "State": "pending",
        "VpcId": "vpc-0a53287fa4EXAMPLE",
        "OwnerId": "111122223333",
        "InstanceTenancy": "dedicated",
        "Ipv6CidrBlockAssociationSet": [],
        "CidrBlockAssociationSet": [
            {
                "AssociationId": "vpc-cidr-assoc-00b24cc1c2EXAMPLE",
                "CidrBlock": "10.0.0.0/16",
                "CidrBlockState": {
                    "State": "associated"
                }
            }
        ],
        "IsDefault": false
    }
}
```

Contoh 3: Untuk membuat VPC dengan IPv6 CIDR blok

`create-vpc`Contoh berikut membuat VPC dengan blok yang disediakan Amazon IPv6CIDR.

```
aws ec2 create-vpc \
    --cidr-block 10.0.0.0/16 \
    --amazon-provided-ipv6-cidr-block
```

Output:

```
{
    "Vpc": {
        "CidrBlock": "10.0.0.0/16",
        "DhcpOptionsId": "dopt-dEXAMPLE",
        "State": "pending",
        "VpcId": "vpc-0fc5e3406bEXAMPLE",
        "OwnerId": "123456789012",
        "InstanceTenancy": "default",
        "Ipv6CidrBlockAssociationSet": [
            {
```

```
                "AssociationId": "vpc-cidr-assoc-068432c60bEXAMPLE",
                "Ipv6CidrBlock": "",
                "Ipv6CidrBlockState": {
                    "State": "associating"
                },
                "Ipv6Pool": "Amazon",
                "NetworkBorderGroup": "us-west-2"
            }
        ],
        "CidrBlockAssociationSet": [
            {
                "AssociationId": "vpc-cidr-assoc-0669f8f9f5EXAMPLE",
                "CidrBlock": "10.0.0.0/16",
                "CidrBlockState": {
                    "State": "associated"
                }
            }
        ],
        "IsDefault": false
    }
}
```

Contoh 4: Untuk membuat VPC dengan CIDR dari IPAM kolam

`create-vpc`Contoh berikut membuat kumpulan VPC with a CIDR from a Amazon VPC IP Address Manager (IPAM).

Linux dan macOS:

```
aws ec2 create-vpc \
    --ipv4-ipam-pool-id ipam-pool-0533048da7d823723 \
    --tag-specifications
 ResourceType=vpc,Tags='[{Key=Environment,Value="Preprod"},
{Key=Owner,Value="Build Team"}]'
```

Windows:

```
aws ec2 create-vpc ^
    --ipv4-ipam-pool-id ipam-pool-0533048da7d823723 ^
    --tag-specifications
 ResourceType=vpc,Tags=[{Key=Environment,Value="Preprod"},{Key=Owner,Value="Build
 Team"}]
```

Output:

```
{
    "Vpc": {
        "CidrBlock": "10.0.1.0/24",
        "DhcpOptionsId": "dopt-2afccf50",
        "State": "pending",
        "VpcId": "vpc-010e1791024eb0af9",
        "OwnerId": "123456789012",
        "InstanceTenancy": "default",
        "Ipv6CidrBlockAssociationSet": [],
        "CidrBlockAssociationSet": [
            {
                "AssociationId": "vpc-cidr-assoc-0a77de1d803226d4b",
                "CidrBlock": "10.0.1.0/24",
                "CidrBlockState": {
                    "State": "associated"
                }
            }
        ],
        "IsDefault": false,
        "Tags": [
            {
                "Key": "Environment",
                "Value": "Preprod"
            },
            {
                "Key": "Owner",
                "Value": "Build Team"
            }
        ]
    }
}
```

Untuk informasi selengkapnya, lihat Membuat VPC yang menggunakan IPAM kumpulan CIDR di Panduan VPC IPAM Pengguna Amazon.

- Untuk API detailnya, lihat CreateVpcdi Referensi AWS CLI Perintah.

PHP

SDKuntuk PHP

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    /**
     * @param string $cidr
     * @return array
     */
    public function createVpc(string $cidr): array
    {
        try {
            $result = $this->ec2Client->createVpc([
                "CidrBlock" => $cidr,
            ]);
            return $result['Vpc'];
        }catch(Ec2Exception $caught){
            echo "There was a problem creating the VPC: {$caught-
>getAwsErrorMessage()}\n";
            throw $caught;
        }
    }
```

- Untuk API detailnya, lihat CreateVpcdi AWS SDK for PHP APIReferensi.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menciptakan a VPC dengan yang ditentukanCIDR. Amazon VPC juga membuat yang berikut untukVPC: set DHCP opsi default, tabel rute utama, dan jaringan defaultACL.

```
New-EC2VPC -CidrBlock 10.0.0.0/16
```

Output:

```
CidrBlock       : 10.0.0.0/16
DhcpOptionsId   : dopt-1a2b3c4d
InstanceTenancy : default
IsDefault       : False
State           : pending
Tags            : {}
VpcId           : vpc-12345678
```

- Untuk API detailnya, lihat CreateVpcdi AWS Tools for PowerShell Referensi Cmdlet.

## Ruby

### SDKuntuk Ruby

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
require 'aws-sdk-ec2'

# Creates a virtual private cloud (VPC) in
# Amazon Virtual Private Cloud (Amazon VPC) and then tags
# the VPC.
#
# @param ec2_resource [Aws::EC2::Resource] An initialized
#   Amazon Elastic Compute Cloud (Amazon EC2) resource object.
# @param cidr_block [String] The IPv4 CIDR block for the subnet.
# @param tag_key [String] The key portion of the tag for the VPC.
# @param tag_value [String] The value portion of the tag for the VPC.
# @return [Boolean] true if the VPC was created and tagged;
#   otherwise, false.
# @example
#   exit 1 unless vpc_created_and_tagged?(
#     Aws::EC2::Resource.new(region: 'us-west-2'),
```

```
#     '10.0.0.0/24',
#     'my-key',
#     'my-value'
#   )
def vpc_created_and_tagged?(
  ec2_resource,
  cidr_block,
  tag_key,
  tag_value
)
  vpc = ec2_resource.create_vpc(cidr_block: cidr_block)

  # Create a public DNS by enabling DNS support and DNS hostnames.
  vpc.modify_attribute(enable_dns_support: { value: true })
  vpc.modify_attribute(enable_dns_hostnames: { value: true })

  vpc.create_tags(tags: [{ key: tag_key, value: tag_value }])

  puts "Created VPC with ID '#{vpc.id}' and tagged with key " \
    "'#{tag_key}' and value '#{tag_value}'."
  true
rescue StandardError => e
  puts e.message
  false
end

# Example usage:
def run_me
  cidr_block = ''
  tag_key = ''
  tag_value = ''
  region = ''
  # Print usage information and then stop.
  if ARGV[0] == '--help' || ARGV[0] == '-h'
    puts 'Usage:   ruby ec2-ruby-example-create-vpc.rb ' \
      'CIDR_BLOCK TAG_KEY TAG_VALUE REGION'
    # Replace us-west-2 with the AWS Region you're using for Amazon EC2.
    puts 'Example: ruby ec2-ruby-example-create-vpc.rb ' \
      '10.0.0.0/24 my-key my-value us-west-2'
    exit 1
  # If no values are specified at the command prompt, use these default values.
  elsif ARGV.count.zero?
    cidr_block = '10.0.0.0/24'
    tag_key = 'my-key'
```

```
    tag_value = 'my-value'
    # Replace us-west-2 with the AWS Region you're using for Amazon EC2.
    region = 'us-west-2'
  # Otherwise, use the values as specified at the command prompt.
  else
    cidr_block = ARGV[0]
    tag_key = ARGV[1]
    tag_value = ARGV[2]
    region = ARGV[3]
  end

  ec2_resource = Aws::EC2::Resource.new(region: region)

  if vpc_created_and_tagged?(
    ec2_resource,
    cidr_block,
    tag_key,
    tag_value
  )
    puts 'VPC created and tagged.'
  else
    puts 'VPC not created or not tagged.'
  end
end

run_me if $PROGRAM_NAME == __FILE__
```

- Untuk API detailnya, lihat CreateVpcdi AWS SDK for Ruby APIReferensi.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`CreateVpcEndpoint`** dengan AWS SDK atau CLI

Contoh kode berikut menunjukkan cara menggunakan`CreateVpcEndpoint`.

CLI

AWS CLI

Contoh 1: Untuk membuat titik akhir gateway

`create-vpc-endpoint`Contoh berikut membuat VPC titik akhir gateway antara VPC `vpc-1a2b3c4d` dan Amazon S3 di `us-east-1` wilayah tersebut, dan mengaitkan `rtb-11aa22bb` tabel rute dengan titik akhir.

```
aws ec2 create-vpc-endpoint \
    --vpc-id vpc-1a2b3c4d \
    --service-name com.amazonaws.us-east-1.s3 \
    --route-table-ids rtb-11aa22bb
```

Output:

```
{
    "VpcEndpoint": {
        "PolicyDocument": "{\"Version\":\"2008-10-17\",\"Statement\":[{\"Sid\":
\"\",\"Effect\":\"Allow\",\"Principal\":\"\*\",\"Action\":\"\*\",\"Resource\":
\"\*\"}]}",
        "VpcId": "vpc-1a2b3c4d",
        "State": "available",
        "ServiceName": "com.amazonaws.us-east-1.s3",
        "RouteTableIds": [
            "rtb-11aa22bb"
        ],
        "VpcEndpointId": "vpc-1a2b3c4d",
        "CreationTimestamp": "2015-05-15T09:40:50Z"
    }
}
```

Untuk informasi selengkapnya, lihat Membuat titik akhir gateway di AWS PrivateLink Panduan.

Contoh 2: Untuk membuat titik akhir antarmuka

`create-vpc-endpoint`Contoh berikut membuat VPC titik akhir antarmuka antara VPC `vpc-1a2b3c4d` dan Amazon S3 di `us-east-1` wilayah tersebut. Perintah membuat titik akhir di subnet`subnet-1a2b3c4d`, mengaitkannya dengan grup keamanan`sg-1a2b3c4d`, dan menambahkan tag dengan kunci “Layanan” dan Nilai “S3".

```
aws ec2 create-vpc-endpoint \
    --vpc-id vpc-1a2b3c4d \
    --vpc-endpoint-type Interface \
    --service-name com.amazonaws.us-east-1.s3 \
    --subnet-ids subnet-7b16de0c \
```

```
    --security-group-id sg-1a2b3c4d \
    --tag-specifications ResourceType=vpc-endpoint,Tags=[{Key=service,Value=S3}]
```

Output:

```
{
    "VpcEndpoint": {
        "VpcEndpointId": "vpce-1a2b3c4d5e6f1a2b3",
        "VpcEndpointType": "Interface",
        "VpcId": "vpc-1a2b3c4d",
        "ServiceName": "com.amazonaws.us-east-1.s3",
        "State": "pending",
        "RouteTableIds": [],
        "SubnetIds": [
            "subnet-1a2b3c4d"
        ],
        "Groups": [
            {
                "GroupId": "sg-1a2b3c4d",
                "GroupName": "default"
            }
        ],
        "PrivateDnsEnabled": false,
        "RequesterManaged": false,
        "NetworkInterfaceIds": [
            "eni-0b16f0581c8ac6877"
        ],
        "DnsEntries": [
            {
                "DnsName": "*.vpce-1a2b3c4d5e6f1a2b3-9hnenorg.s3.us-
east-1.vpce.amazonaws.com",
                "HostedZoneId": "Z7HUB22UULQXV"
            },
            {
                "DnsName": "*.vpce-1a2b3c4d5e6f1a2b3-9hnenorg-us-east-1c.s3.us-
east-1.vpce.amazonaws.com",
                "HostedZoneId": "Z7HUB22UULQXV"
            }
        ],
        "CreationTimestamp": "2021-03-05T14:46:16.030000+00:00",
        "Tags": [
            {
                "Key": "service",
```

```
                "Value": "S3"
            }
        ],
        "OwnerId": "123456789012"
    }
}
```

Untuk informasi selengkapnya, lihat Membuat titik akhir antarmuka di Panduan Pengguna untuk AWS PrivateLink.

Contoh 3: Untuk membuat titik akhir Load Balancer Gateway

`create-vpc-endpoint`Contoh berikut membuat titik akhir Load Balancer Gateway antara VPC `vpc-111122223333aabbc` dan dan layanan yang dikonfigurasi menggunakan Load Balancer Gateway.

```
aws ec2 create-vpc-endpoint \
    --service-name com.amazonaws.vpce.us-east-1.vpce-svc-123123a1c43abc123 \
    --vpc-endpoint-type GatewayLoadBalancer \
    --vpc-id vpc-111122223333aabbc \
    --subnet-ids subnet-0011aabbcc2233445
```

Output:

```
{
    "VpcEndpoint": {
        "VpcEndpointId": "vpce-aabbaabbaabbaabba",
        "VpcEndpointType": "GatewayLoadBalancer",
        "VpcId": "vpc-111122223333aabbc",
        "ServiceName": "com.amazonaws.vpce.us-east-1.vpce-svc-123123a1c43abc123",
        "State": "pending",
        "SubnetIds": [
            "subnet-0011aabbcc2233445"
        ],
        "RequesterManaged": false,
        "NetworkInterfaceIds": [
            "eni-01010120203030405"
        ],
        "CreationTimestamp": "2020-11-11T08:06:03.522Z",
        "OwnerId": "123456789012"
    }
}
```

Untuk informasi selengkapnya, lihat titik akhir Load Balancer Gateway di Panduan Pengguna untuk. AWS PrivateLink

- Untuk API detailnya, lihat CreateVpcEndpointdi Referensi AWS CLI Perintah.

PHP

SDKuntuk PHP

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    /**
     * @param string $serviceName
     * @param string $vpcId
     * @param array $routeTableIds
     * @return array
     */
    public function createVpcEndpoint(string $serviceName, string $vpcId, array
 $routeTableIds): array
    {
        try {
            $result = $this->ec2Client->createVpcEndpoint([
                'ServiceName' => $serviceName,
                'VpcId' => $vpcId,
                'RouteTableIds' => $routeTableIds,
            ]);

            return $result["VpcEndpoint"];
        } catch(Ec2Exception $caught){
            echo "There was a problem creating the VPC Endpoint: {$caught-
>getAwsErrorMessage()}\n";
            throw $caught;
        }
    }
```

- Untuk API detailnya, lihat CreateVpcEndpointdi AWS SDK for PHP APIReferensi.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini membuat VPC Endpoint baru untuk layanan com.amazonaws.eu-west-1.s3 di vpc-0fc1ff23f45b678eb VPC

```
New-EC2VpcEndpoint -ServiceName com.amazonaws.eu-west-1.s3 -VpcId
 vpc-0fc1ff23f45b678eb
```

Output:

```
ClientToken VpcEndpoint
----------- -----------
            Amazon.EC2.Model.VpcEndpoint
```

- Untuk API detailnya, lihat CreateVpcEndpointdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`CreateVpnConnection`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`CreateVpnConnection`.

CLI

AWS CLI

Contoh 1: Untuk membuat VPN koneksi dengan perutean dinamis

`create-vpn-connection`Contoh berikut membuat VPN koneksi antara gateway pribadi virtual yang ditentukan dan gateway pelanggan yang ditentukan, dan menerapkan tag ke VPN koneksi. Outputnya mencakup informasi konfigurasi untuk perangkat gateway pelanggan Anda, dalam XML format.

```
aws ec2 create-vpn-connection \
    --type ipsec.1 \
    --customer-gateway-id cgw-001122334455aabbc \
    --vpn-gateway-id vgw-1a1a1a1a1a1a2b2b2 \
    --tag-specification 'ResourceType=vpn-connection,Tags=[{Key=Name,Value=BGP-VPN}]'
```

Output:

```
{
    "VpnConnection": {
        "CustomerGatewayConfiguration": "...configuration information...",
        "CustomerGatewayId": "cgw-001122334455aabbc",
        "Category": "VPN",
        "State": "pending",
        "VpnConnectionId": "vpn-123123123123abcab",
        "VpnGatewayId": "vgw-1a1a1a1a1a1a2b2b2",
        "Options": {
            "EnableAcceleration": false,
            "StaticRoutesOnly": false,
            "LocalIpv4NetworkCidr": "0.0.0.0/0",
            "RemoteIpv4NetworkCidr": "0.0.0.0/0",
            "TunnelInsideIpVersion": "ipv4",
            "TunnelOptions": [
                {},
                {}
            ]
        },
        "Routes": [],
        "Tags": [
             {
                "Key": "Name",
                "Value": "BGP-VPN"
            }
        ]
    }
}
```

Untuk informasi selengkapnya, lihat Cara AWS Site-to-Site VPN kerja di Panduan AWS Site-to-Site VPN Pengguna.

Contoh 2: Untuk membuat VPN koneksi dengan perutean statis

`create-vpn-connection`Contoh berikut membuat VPN koneksi antara gateway pribadi virtual yang ditentukan dan gateway pelanggan yang ditentukan. Opsi menentukan perutean statis. Outputnya mencakup informasi konfigurasi untuk perangkat gateway pelanggan Anda, dalam XML format.

```
aws ec2 create-vpn-connection \
    --type ipsec.1 \
    --customer-gateway-id cgw-001122334455aabbc \
    --vpn-gateway-id vgw-1a1a1a1a1a1a2b2b2 \
    --options "{\"StaticRoutesOnly\":true}"
```

Output:

```
{
    "VpnConnection": {
        "CustomerGatewayConfiguration": "..configuration information...",
        "CustomerGatewayId": "cgw-001122334455aabbc",
        "Category": "VPN",
        "State": "pending",
        "VpnConnectionId": "vpn-123123123123abcab",
        "VpnGatewayId": "vgw-1a1a1a1a1a1a2b2b2",
        "Options": {
            "EnableAcceleration": false,
            "StaticRoutesOnly": true,
            "LocalIpv4NetworkCidr": "0.0.0.0/0",
            "RemoteIpv4NetworkCidr": "0.0.0.0/0",
            "TunnelInsideIpVersion": "ipv4",
            "TunnelOptions": [
                {},
                {}
            ]
        },
        "Routes": [],
        "Tags": []
    }
}
```

Untuk informasi selengkapnya, lihat Cara AWS Site-to-Site VPN kerja di Panduan AWS Site-to-Site VPN Pengguna.

Contoh 3: Untuk membuat VPN koneksi dan menentukan kunci internal CIDR dan pre-shared Anda sendiri

`create-vpn-connection`Contoh berikut membuat VPN koneksi dan menentukan CIDR blok alamat IP di dalam dan kunci pra-bersama khusus untuk setiap terowongan. Nilai yang ditentukan dikembalikan dalam `CustomerGatewayConfiguration` informasi.

```
aws ec2 create-vpn-connection \
    --type ipsec.1 \
    --customer-gateway-id cgw-001122334455aabbc \
    --vpn-gateway-id vgw-1a1a1a1a1a1a2b2b2 \
    --options
 TunnelOptions='[{TunnelInsideCidr=169.254.12.0/30,PreSharedKey=ExamplePreSharedKey1},
{TunnelInsideCidr=169.254.13.0/30,PreSharedKey=ExamplePreSharedKey2}]'
```

Output:

```
{
    "VpnConnection": {
        "CustomerGatewayConfiguration": "..configuration information...",
        "CustomerGatewayId": "cgw-001122334455aabbc",
        "Category": "VPN",
        "State": "pending",
        "VpnConnectionId": "vpn-123123123123abcab",
        "VpnGatewayId": "vgw-1a1a1a1a1a1a2b2b2",
        "Options": {
            "EnableAcceleration": false,
            "StaticRoutesOnly": false,
            "LocalIpv4NetworkCidr": "0.0.0.0/0",
            "RemoteIpv4NetworkCidr": "0.0.0.0/0",
            "TunnelInsideIpVersion": "ipv4",
            "TunnelOptions": [
                {
                    "OutsideIpAddress": "203.0.113.3",
                    "TunnelInsideCidr": "169.254.12.0/30",
                    "PreSharedKey": "ExamplePreSharedKey1"
                },
                {
                    "OutsideIpAddress": "203.0.113.5",
                    "TunnelInsideCidr": "169.254.13.0/30",
                    "PreSharedKey": "ExamplePreSharedKey2"
                }
            ]
        },
        "Routes": [],
        "Tags": []
```

```
    }
}
```

Untuk informasi selengkapnya, lihat Cara AWS Site-to-Site VPN kerja di Panduan AWS Site-to-Site VPN Pengguna.

Contoh 4: Untuk membuat VPN koneksi yang mendukung IPv6 lalu lintas

`create-vpn-connection`Contoh berikut membuat VPN koneksi yang mendukung IPv6 lalu lintas antara gateway transit yang ditentukan dan gateway pelanggan tertentu. Opsi terowongan untuk kedua terowongan menentukan yang AWS harus memulai negosiasi. IKE

```
aws ec2 create-vpn-connection \
    --type ipsec.1 \
    --transit-gateway-id tgw-12312312312312312 \
    --customer-gateway-id cgw-001122334455aabbc \
    --options TunnelInsideIpVersion=ipv6,TunnelOptions=[{StartupAction=start},
{StartupAction=start}]
```

Output:

```
{
    "VpnConnection": {
        "CustomerGatewayConfiguration": "..configuration information...",
        "CustomerGatewayId": "cgw-001122334455aabbc",
        "Category": "VPN",
        "State": "pending",
        "VpnConnectionId": "vpn-11111111122222222",
        "TransitGatewayId": "tgw-12312312312312312",
        "Options": {
            "EnableAcceleration": false,
            "StaticRoutesOnly": false,
            "LocalIpv6NetworkCidr": "::/0",
            "RemoteIpv6NetworkCidr": "::/0",
            "TunnelInsideIpVersion": "ipv6",
            "TunnelOptions": [
                {
                    "OutsideIpAddress": "203.0.113.3",
                    "StartupAction": "start"
                },
                {
                    "OutsideIpAddress": "203.0.113.5",
```

```
                    "StartupAction": "start"
                }
            ]
        },
        "Routes": [],
        "Tags": []
    }
}
```

Untuk informasi selengkapnya, lihat Cara AWS Site-to-Site VPN kerja di Panduan AWS Site-to-Site VPN Pengguna.

- Untuk API detailnya, lihat CreateVpnConnectiondi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini membuat VPN koneksi antara gateway pribadi virtual yang ditentukan dan gateway pelanggan yang ditentukan. Outputnya mencakup informasi konfigurasi yang dibutuhkan administrator jaringan Anda, dalam XML format.

```
New-EC2VpnConnection -Type ipsec.1 -CustomerGatewayId cgw-1a2b3c4d -VpnGatewayId
 vgw-1a2b3c4d
```

Output:

```
CustomerGatewayConfiguration : [XML document]
CustomerGatewayId            : cgw-1a2b3c4d
Options                      :
Routes                       : {}
State                        : pending
Tags                         : {}
Type                         :
VgwTelemetry                 : {}
VpnConnectionId              : vpn-12345678
VpnGatewayId                 : vgw-1a2b3c4d
```

Contoh 2: Contoh ini membuat VPN koneksi dan menangkap konfigurasi dalam file dengan nama yang ditentukan.

```
(New-EC2VpnConnection -CustomerGatewayId cgw-1a2b3c4d -VpnGatewayId
 vgw-1a2b3c4d).CustomerGatewayConfiguration | Out-File C:\path\vpn-
configuration.xml
```

Contoh 3: Contoh ini membuat VPN koneksi, dengan perutean statis, antara gateway pribadi virtual yang ditentukan dan gateway pelanggan yang ditentukan.

```
New-EC2VpnConnection -Type ipsec.1 -CustomerGatewayId cgw-1a2b3c4d -VpnGatewayId
 vgw-1a2b3c4d -Options_StaticRoutesOnly $true
```

- Untuk API detailnya, lihat CreateVpnConnectiondi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`CreateVpnConnectionRoute`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`CreateVpnConnectionRoute`.

CLI

AWS CLI

Untuk membuat rute statis untuk VPN koneksi

Contoh ini menciptakan rute statis untuk VPN koneksi yang ditentukan. Jika perintah berhasil, tidak ada output yang akan ditampilkan.

Perintah:

```
aws ec2 create-vpn-connection-route --vpn-connection-id vpn-40f41529 --
destination-cidr-block 11.12.0.0/16
```

- Untuk API detailnya, lihat CreateVpnConnectionRoutedi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menciptakan rute statis yang ditentukan untuk VPN koneksi yang ditentukan.

```
New-EC2VpnConnectionRoute -VpnConnectionId vpn-12345678 -DestinationCidrBlock
 11.12.0.0/16
```

- Untuk API detailnya, lihat CreateVpnConnectionRoutedi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`CreateVpnGateway`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`CreateVpnGateway`.

CLI

AWS CLI

Untuk membuat gateway pribadi virtual

Contoh ini membuat gateway pribadi virtual.

Perintah:

```
aws ec2 create-vpn-gateway --type ipsec.1
```

Output:

```
{
    "VpnGateway": {
        "AmazonSideAsn": 64512,
        "State": "available",
        "Type": "ipsec.1",
        "VpnGatewayId": "vgw-9a4cacf3",
        "VpcAttachments": []
```

```
    }
}
```

Untuk membuat gateway pribadi virtual dengan sisi Amazon tertentu ASN

Contoh ini membuat gateway pribadi virtual dan menentukan Autonomous System Number (ASN) untuk sisi Amazon BGP sesi.

Perintah:

```
aws ec2 create-vpn-gateway --type ipsec.1 --amazon-side-asn 65001
```

Output:

```
{
    "VpnGateway": {
        "AmazonSideAsn": 65001,
        "State": "available",
        "Type": "ipsec.1",
        "VpnGatewayId": "vgw-9a4cacf3",
        "VpcAttachments": []
    }
}
```

- Untuk API detailnya, lihat CreateVpnGatewaydi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini membuat gateway pribadi virtual yang ditentukan.

```
New-EC2VpnGateway -Type ipsec.1
```

Output:

```
AvailabilityZone :
State            : available
Tags             : {}
Type             : ipsec.1
VpcAttachments   : {}
```

```
VpnGatewayId     : vgw-1a2b3c4d
```

- Untuk API detailnya, lihat CreateVpnGatewaydi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DeleteCustomerGateway`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DeleteCustomerGateway`.

CLI

AWS CLI

Untuk menghapus gateway pelanggan

Contoh ini menghapus gateway pelanggan yang ditentukan. Jika perintah berhasil, tidak ada output yang akan ditampilkan.

Perintah:

```
aws ec2 delete-customer-gateway --customer-gateway-id cgw-0e11f167
```

- Untuk API detailnya, lihat DeleteCustomerGatewaydi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menghapus gateway pelanggan yang ditentukan. Anda diminta untuk konfirmasi sebelum operasi berlangsung, kecuali jika Anda juga menentukan parameter Force.

```
Remove-EC2CustomerGateway -CustomerGatewayId cgw-1a2b3c4d
```

Output:

```
Confirm
Are you sure you want to perform this action?
```

```
Performing operation "Remove-EC2CustomerGateway (DeleteCustomerGateway)" on
 Target "cgw-1a2b3c4d".
[Y] Yes  [A] Yes to All  [N] No  [L] No to All  [S] Suspend  [?] Help (default is
 "Y"):
```

- Untuk API detailnya, lihat DeleteCustomerGatewaydi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DeleteDhcpOptions`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DeleteDhcpOptions`.

CLI

AWS CLI

Untuk menghapus set DHCP opsi

Contoh ini menghapus set DHCP opsi yang ditentukan. Jika perintah berhasil, tidak ada output yang akan ditampilkan.

Perintah:

```
aws ec2 delete-dhcp-options --dhcp-options-id dopt-d9070ebb
```

- Untuk API detailnya, lihat DeleteDhcpOptionsdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menghapus set DHCP opsi yang ditentukan. Anda diminta untuk konfirmasi sebelum operasi berlangsung, kecuali jika Anda juga menentukan parameter Force.

```
Remove-EC2DhcpOption -DhcpOptionsId dopt-1a2b3c4d
```

Output:

```
Confirm
Are you sure you want to perform this action?
Performing operation "Remove-EC2DhcpOption (DeleteDhcpOptions)" on Target
 "dopt-1a2b3c4d".
[Y] Yes  [A] Yes to All  [N] No  [L] No to All  [S] Suspend  [?] Help (default is
 "Y"):
```

- Untuk API detailnya, lihat DeleteDhcpOptionsdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DeleteFlowLogs`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DeleteFlowLogs`.

CLI

AWS CLI

Untuk menghapus log aliran

`delete-flow-logs`Contoh berikut menghapus log aliran yang ditentukan.

```
aws ec2 delete-flow-logs --flow-log-id fl-11223344556677889
```

Output:

```
{
    "Unsuccessful": []
}
```

- Untuk API detailnya, lihat DeleteFlowLogsdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menghapus FlowLogId fl-01a2b3456a789c01 yang diberikan

```
Remove-EC2FlowLog -FlowLogId fl-01a2b3456a789c01
```

Output:

```
Confirm
Are you sure you want to perform this action?
Performing the operation "Remove-EC2FlowLog (DeleteFlowLogs)" on target
 "fl-01a2b3456a789c01".
[Y] Yes  [A] Yes to All  [N] No  [L] No to All  [S] Suspend  [?] Help (default is
 "Y"): Y
```

- Untuk API detailnya, lihat DeleteFlowLogsdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DeleteInternetGateway`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DeleteInternetGateway`.

CLI

AWS CLI

Untuk menghapus gateway internet

`delete-internet-gateway`Contoh berikut menghapus gateway internet yang ditentukan.

```
aws ec2 delete-internet-gateway \
    --internet-gateway-id igw-0d0fb496b3EXAMPLE
```

Perintah ini tidak menghasilkan output.

Untuk informasi selengkapnya, lihat gateway Internet di VPCPanduan Pengguna Amazon.

- Untuk API detailnya, lihat DeleteInternetGatewaydi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menghapus gateway Internet yang ditentukan. Anda diminta untuk konfirmasi sebelum operasi berlangsung, kecuali jika Anda juga menentukan parameter Force.

```
Remove-EC2InternetGateway -InternetGatewayId igw-1a2b3c4d
```

Output:

```
Confirm
Are you sure you want to perform this action?
Performing operation "Remove-EC2InternetGateway (DeleteInternetGateway)" on
 Target "igw-1a2b3c4d".
[Y] Yes  [A] Yes to All  [N] No  [L] No to All  [S] Suspend  [?] Help (default is
 "Y"):
```

- Untuk API detailnya, lihat DeleteInternetGatewaydi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DeleteKeyPair`** dengan AWS SDK atau CLI

Contoh kode berikut menunjukkan cara menggunakan`DeleteKeyPair`.

Contoh tindakan adalah kutipan kode dari program yang lebih besar dan harus dijalankan dalam konteks. Anda dapat melihat tindakan ini dalam konteks dalam contoh kode berikut:

- Pelajari dasar-dasarnya

.NET

AWS SDK for .NET

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    /// <summary>
    /// Delete an Amazon EC2 key pair.
    /// </summary>
    /// <param name="keyPairName">The name of the key pair to delete.</param>
    /// <returns>A Boolean value indicating the success of the action.</returns>
    public async Task<bool> DeleteKeyPair(string keyPairName)
    {
        try
        {
            await _amazonEC2.DeleteKeyPairAsync(new
DeleteKeyPairRequest(keyPairName)).ConfigureAwait(false);
            return true;
        }
        catch (AmazonEC2Exception ec2Exception)
        {
            if (ec2Exception.ErrorCode == "InvalidKeyPair.NotFound")
            {
                _logger.LogError($"KeyPair {keyPairName} does not exist and
cannot be deleted. Please verify the key pair name and try again.");
            }

            return false;
        }
        catch (Exception ex)
        {
            Console.WriteLine($"Couldn't delete the key pair because:
{ex.Message}");
            return false;
        }
    }

    /// <summary>
```

```
    /// Delete the temporary file where the key pair information was saved.
    /// </summary>
    /// <param name="tempFileName">The path to the temporary file.</param>
    public void DeleteTempFile(string tempFileName)
    {
        if (File.Exists(tempFileName))
        {
            File.Delete(tempFileName);
        }
    }
```

- Untuk API detailnya, lihat DeleteKeyPairdi AWS SDK for .NET APIReferensi.

## Bash

### AWS CLI dengan skrip Bash

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
###############################################################################
# function ec2_delete_keypair
#
# This function deletes an Amazon EC2 ED25519 or 2048-bit RSA key pair.
#
# Parameters:
#       -n key_pair_name - A key pair name.
#
# And:
#       0 - If successful.
#       1 - If it fails.
###############################################################################
function ec2_delete_keypair() {
  local key_pair_name response

  local option OPTARG # Required to use getopts command in a function.
  # bashsupport disable=BP5008
  function usage() {
```

```
    echo "function ec2_delete_keypair"
    echo "Deletes an Amazon EC2 ED25519 or 2048-bit RSA key pair."
    echo "  -n key_pair_name - A key pair name."
    echo ""
  }

  # Retrieve the calling parameters.
  while getopts "n:h" option; do
    case "${option}" in
      n) key_pair_name="${OPTARG}" ;;
      h)
        usage
        return 0
        ;;
      \?)
        echo "Invalid parameter"
        usage
        return 1
        ;;
    esac
  done
  export OPTIND=1

  if [[ -z "$key_pair_name" ]]; then
    errecho "ERROR: You must provide a key pair name with the -n parameter."
    usage
    return 1
  fi

  response=$(aws ec2 delete-key-pair \
    --key-name "$key_pair_name") || {
    aws_cli_error_log ${?}
    errecho "ERROR: AWS reports delete-key-pair operation failed.$response"
    return 1
  }

  return 0
}
```

Fungsi utilitas yang digunakan dalam contoh ini.

```
###############################################################################
```

```
# function errecho
#
# This function outputs everything sent to it to STDERR (standard error output).
#############################################################################
function errecho() {
  printf "%s\n" "$*" 1>&2
}

#############################################################################
# function aws_cli_error_log()
#
# This function is used to log the error messages from the AWS CLI.
#
# The function expects the following argument:
#         $1 - The error code returned by the AWS CLI.
#
#  Returns:
#          0: - Success.
#
#############################################################################
function aws_cli_error_log() {
  local err_code=$1
  errecho "Error code : $err_code"
  if [ "$err_code" == 1 ]; then
    errecho "  One or more S3 transfers failed."
  elif [ "$err_code" == 2 ]; then
    errecho "  Command line failed to parse."
  elif [ "$err_code" == 130 ]; then
    errecho "  Process received SIGINT."
  elif [ "$err_code" == 252 ]; then
    errecho "  Command syntax invalid."
  elif [ "$err_code" == 253 ]; then
    errecho "  The system environment or configuration was invalid."
  elif [ "$err_code" == 254 ]; then
    errecho "  The service returned an error."
  elif [ "$err_code" == 255 ]; then
    errecho "  255 is a catch-all error."
  fi

  return 0
}
```

- Untuk API detailnya, lihat DeleteKeyPairdi Referensi AWS CLI Perintah.

C++

SDKuntuk C ++

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
//! Delete an Amazon Elastic Compute Cloud (Amazon EC2) instance key pair.
/*!
  \param keyPairName: A name for a key pair.
  \param clientConfiguration: AWS client configuration.
  \return bool: Function succeeded.
 */

bool AwsDoc::EC2::deleteKeyPair(const Aws::String &keyPairName,
                                const Aws::Client::ClientConfiguration
 &clientConfiguration) {
    Aws::EC2::EC2Client ec2Client(clientConfiguration);
    Aws::EC2::Model::DeleteKeyPairRequest request;

    request.SetKeyName(keyPairName);
    const Aws::EC2::Model::DeleteKeyPairOutcome outcome =
 ec2Client.DeleteKeyPair(
            request);

    if (!outcome.IsSuccess()) {
        std::cerr << "Failed to delete key pair " << keyPairName <<
                  ":" << outcome.GetError().GetMessage() << std::endl;
    } else {
        std::cout << "Successfully deleted key pair named " << keyPairName <<
                  std::endl;
    }

    return outcome.IsSuccess();
}
```

- Untuk API detailnya, lihat DeleteKeyPairdi AWS SDK for C++ APIReferensi.

CLI

AWS CLI

Untuk menghapus pasangan kunci

`delete-key-pair`Contoh berikut menghapus key pair yang ditentukan.

```
aws ec2 delete-key-pair \
    --key-name my-key-pair
```

Output:

```
{
    "Return": true,
    "KeyPairId": "key-03c8d3aceb53b507"
}
```

Untuk informasi selengkapnya, lihat Membuat dan menghapus pasangan kunci di Panduan Pengguna Antarmuka Baris AWS Perintah.

- Untuk API detailnya, lihat DeleteKeyPairdi Referensi AWS CLI Perintah.

Java

SDKuntuk Java 2.x

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    /**
     * Deletes a key pair asynchronously.
     *
     * @param keyPair the name of the key pair to delete
     * @return a {@link CompletableFuture} that represents the result of the
asynchronous operation.
     *         The {@link CompletableFuture} will complete with a {@link
DeleteKeyPairResponse} object
```

```
     *         that provides the result of the key pair deletion operation.
     */
    public CompletableFuture<DeleteKeyPairResponse> deleteKeysAsync(String
 keyPair) {
        DeleteKeyPairRequest request = DeleteKeyPairRequest.builder()
            .keyName(keyPair)
            .build();

        // Initiate the asynchronous request to delete the key pair.
        CompletableFuture<DeleteKeyPairResponse> response =
 getAsyncClient().deleteKeyPair(request);
        return response.whenComplete((resp, ex) -> {
            if (ex != null) {
                throw new RuntimeException("Failed to delete key pair: " +
 keyPair, ex);
            } else if (resp == null) {
                throw new RuntimeException("No response received for deleting key
 pair: " + keyPair);
            }
        });
    }
```

- Untuk API detailnya, lihat DeleteKeyPairdi AWS SDK for Java 2.x APIReferensi.

### JavaScript

#### SDKuntuk JavaScript (v3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
import { DeleteKeyPairCommand, EC2Client } from "@aws-sdk/client-ec2";

/**
 * Deletes the specified key pair, by removing the public key from Amazon EC2.
 * @param {{ keyName: string }} options
 */
export const main = async ({ keyName }) => {
```

```
  const client = new EC2Client({});
  const command = new DeleteKeyPairCommand({
    KeyName: keyName,
  });

  try {
    await client.send(command);
    console.log("Successfully deleted key pair.");
  } catch (caught) {
    if (caught instanceof Error && caught.name === "MissingParameter") {
      console.warn(`${caught.message}. Did you provide the required value?`);
    } else {
      throw caught;
    }
  }
};
```

- Untuk API detailnya, lihat DeleteKeyPairdi AWS SDK for JavaScript APIReferensi.

Kotlin

SDKuntuk Kotlin

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
suspend fun deleteKeys(keyPair: String?) {
    val request =
        DeleteKeyPairRequest {
            keyName = keyPair
        }

    Ec2Client { region = "us-west-2" }.use { ec2 ->
        ec2.deleteKeyPair(request)
        println("Successfully deleted key pair named $keyPair")
    }
}
```

- Untuk API detailnya, lihat DeleteKeyPair AWSSDKAPIreferensi Kotlin.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menghapus key pair yang ditentukan. Anda diminta untuk konfirmasi sebelum operasi berlangsung, kecuali jika Anda juga menentukan parameter Force.

```
Remove-EC2KeyPair -KeyName my-key-pair
```

Output:

```
Confirm
Are you sure you want to perform this action?
Performing operation "Remove-EC2KeyPair (DeleteKeyPair)" on Target "my-key-pair".
[Y] Yes  [A] Yes to All  [N] No  [L] No to All  [S] Suspend  [?] Help (default is
 "Y"):
```

- Untuk API detailnya, lihat DeleteKeyPairdi AWS Tools for PowerShell Referensi Cmdlet.

Python

SDKuntuk Python (Boto3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
class KeyPairWrapper:
    """
    Encapsulates Amazon Elastic Compute Cloud (Amazon EC2) key pair actions.
    This class provides methods to create, list, and delete EC2 key pairs.
    """

    def __init__(
```

```
        self,
        ec2_client: boto3.client,
        key_file_dir: Union[tempfile.TemporaryDirectory, str],
        key_pair: Optional[dict] = None,
    ):
        """
        Initializes the KeyPairWrapper with the specified EC2 client, key file
 directory,
        and an optional key pair.

        :param ec2_client: A Boto3 Amazon EC2 client. This client provides low-
level
                           access to AWS EC2 services.
        :param key_file_dir: The folder where the private key information is
 stored.
                             This should be a secure folder.
        :param key_pair: A dictionary representing the Boto3 KeyPair object.
                         This is a high-level object that wraps key pair actions.
 Optional.
        """
        self.ec2_client = ec2_client
        self.key_pair = key_pair
        self.key_file_path: Optional[str] = None
        self.key_file_dir = key_file_dir

    @classmethod
    def from_client(cls) -> "KeyPairWrapper":
        """
        Class method to create an instance of KeyPairWrapper using a new EC2
 client
        and a temporary directory for storing key files.

        :return: An instance of KeyPairWrapper.
        """
        ec2_client = boto3.client("ec2")
        return cls(ec2_client, tempfile.TemporaryDirectory())


    def delete(self, key_name: str) -> bool:
        """
        Deletes a key pair by its name.

        :param key_name: The name of the key pair to delete.
        :return: A boolean indicating whether the deletion was successful.
```

```
        :raises ClientError: If there is an error in deleting the key pair, for
example,
                             if the key pair does not exist.
        """
        try:
            self.ec2_client.delete_key_pair(KeyName=key_name)
            logger.info(f"Successfully deleted key pair: {key_name}")
            self.key_pair = None
            return True
        except self.ec2_client.exceptions.ClientError as err:
            logger.error(f"Deletion failed for key pair: {key_name}")
            error_code = err.response["Error"]["Code"]
            if error_code == "InvalidKeyPair.NotFound":
                logger.error(
                    f"The key pair '{key_name}' does not exist and cannot be
deleted. "
                    "Please verify the key pair name and try again."
                )
            raise
```

- Untuk API detailnya, lihat DeleteKeyPair AWSSDKReferensi Python (Boto3). API

Rust

SDKuntuk Rust

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

Pembungkus di sekitar delete_key yang juga menghapus kunci pribadi pendukung. PEM

```
    pub async fn delete(self, ec2: &EC2, util: &Util) -> Result<(), EC2Error> {
        if let Some(key_pair_id) = self.key_pair.key_pair_id() {
            ec2.delete_key_pair(key_pair_id).await?;
            if let Some(key_path) = self.key_file_path() {
                if let Err(err) = util.remove(key_path) {
                    eprintln!("Failed to remove {key_path:?} ({err:?})");
```

```
                }
            }
        }
        Ok(())
    }
```

```
    pub async fn delete_key_pair(&self, key_pair_id: &str) -> Result<(),
EC2Error> {
        let key_pair_id: String = key_pair_id.into();
        tracing::info!("Deleting key pair {key_pair_id}");
        self.client
            .delete_key_pair()
            .key_pair_id(key_pair_id)
            .send()
            .await?;
        Ok(())
    }
```

- Untuk API detailnya, lihat DeleteKeyPair AWSSDKAPIreferensi Rust.

## SAP ABAP

### SDKuntuk SAP ABAP

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    TRY.
        lo_ec2->deletekeypair( iv_keyname = iv_key_name ).
        MESSAGE 'Amazon EC2 key pair deleted.' TYPE 'I'.
      CATCH /aws1/cx_rt_service_generic INTO DATA(lo_exception).
        DATA(lv_error) = |"{ lo_exception->av_err_code }" - { lo_exception-
>av_err_msg }|.
        MESSAGE lv_error TYPE 'E'.
    ENDTRY.
```

- Untuk API detailnya, lihat DeleteKeyPair AWSSDKuntuk SAP ABAP API referensi.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DeleteLaunchTemplate`** dengan AWS SDK atau CLI

Contoh kode berikut menunjukkan cara menggunakan`DeleteLaunchTemplate`.

Contoh tindakan adalah kutipan kode dari program yang lebih besar dan harus dijalankan dalam konteks. Anda dapat melihat tindakan ini dalam konteks dalam contoh kode berikut:

- Membangun dan mengelola layanan yang tangguh

.NET

AWS SDK for .NET

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
/// <summary>
/// Delete a launch template by name.
/// </summary>
/// <param name="templateName">The name of the template to delete.</param>
/// <returns>Async task.</returns>
public async Task DeleteTemplateByName(string templateName)
{
    try
    {
        await _amazonEc2.DeleteLaunchTemplateAsync(
            new DeleteLaunchTemplateRequest()
            {
                LaunchTemplateName = templateName
```

```
                });
        }
        catch (AmazonEC2Exception ec2Exception)
        {
            if (ec2Exception.ErrorCode ==
"InvalidLaunchTemplateName.NotFoundException")
            {
                _logger.LogError(
                    $"Could not delete the template, the name
{_launchTemplateName} was not found.");
            }

            throw;
        }
        catch (Exception ex)
        {
            _logger.LogError($"An error occurred while deleting the template.:
{ex.Message}");
            throw;
        }
    }
```

- Untuk API detailnya, lihat DeleteLaunchTemplatedi AWS SDK for .NET APIReferensi.

CLI

AWS CLI

Untuk menghapus templat peluncuran

Contoh ini menghapus templat peluncuran yang ditentukan.

Perintah:

```
aws ec2 delete-launch-template --launch-template-id lt-0abcd290751193123
```

Output:

```
{
  "LaunchTemplate": {
      "LatestVersionNumber": 2,
      "LaunchTemplateId": "lt-0abcd290751193123",
```

```
      "LaunchTemplateName": "TestTemplate",
      "DefaultVersionNumber": 2,
      "CreatedBy": "arn:aws:iam::123456789012:root",
      "CreateTime": "2017-11-23T16:46:25.000Z"
  }
}
```

- Untuk API detailnya, lihat DeleteLaunchTemplatedi Referensi AWS CLI Perintah.

JavaScript

SDKuntuk JavaScript (v3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    await client.send(
      new DeleteLaunchTemplateCommand({
        LaunchTemplateName: NAMES.launchTemplateName,
      }),
    );
```

- Untuk API detailnya, lihat DeleteLaunchTemplatedi AWS SDK for JavaScript APIReferensi.

Python

SDKuntuk Python (Boto3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
class AutoScalingWrapper:
```

```
    """
    Encapsulates Amazon EC2 Auto Scaling and EC2 management actions.
    """

    def __init__(
        self,
        resource_prefix: str,
        inst_type: str,
        ami_param: str,
        autoscaling_client: boto3.client,
        ec2_client: boto3.client,
        ssm_client: boto3.client,
        iam_client: boto3.client,
    ):
        """
        Initializes the AutoScaler class with the necessary parameters.

        :param resource_prefix: The prefix for naming AWS resources that are
created by this class.
        :param inst_type: The type of EC2 instance to create, such as t3.micro.
        :param ami_param: The Systems Manager parameter used to look up the AMI
that is created.
        :param autoscaling_client: A Boto3 EC2 Auto Scaling client.
        :param ec2_client: A Boto3 EC2 client.
        :param ssm_client: A Boto3 Systems Manager client.
        :param iam_client: A Boto3 IAM client.
        """
        self.inst_type = inst_type
        self.ami_param = ami_param
        self.autoscaling_client = autoscaling_client
        self.ec2_client = ec2_client
        self.ssm_client = ssm_client
        self.iam_client = iam_client
        sts_client = boto3.client("sts")
        self.account_id = sts_client.get_caller_identity()["Account"]

        self.key_pair_name = f"{resource_prefix}-key-pair"
        self.launch_template_name = f"{resource_prefix}-template-"
        self.group_name = f"{resource_prefix}-group"

        # Happy path
        self.instance_policy_name = f"{resource_prefix}-pol"
        self.instance_role_name = f"{resource_prefix}-role"
        self.instance_profile_name = f"{resource_prefix}-prof"
```

```
        # Failure mode
        self.bad_creds_policy_name = f"{resource_prefix}-bc-pol"
        self.bad_creds_role_name = f"{resource_prefix}-bc-role"
        self.bad_creds_profile_name = f"{resource_prefix}-bc-prof"


    def delete_template(self):
        """
        Deletes a launch template.
        """
        try:
            self.ec2_client.delete_launch_template(
                LaunchTemplateName=self.launch_template_name
            )
            self.delete_instance_profile(
                self.instance_profile_name, self.instance_role_name
            )
            log.info("Launch template %s deleted.", self.launch_template_name)
        except ClientError as err:
            if (
                err.response["Error"]["Code"]
                == "InvalidLaunchTemplateName.NotFoundException"
            ):
                log.info(
                    "Launch template %s does not exist, nothing to do.",
                    self.launch_template_name,
                )
            log.error(f"Full error:\n\t{err}")
```

- Untuk API detailnya, lihat DeleteLaunchTemplate AWSSDKReferensi Python (Boto3). API

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DeleteNetworkAcl`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DeleteNetworkAcl`.

CLI

AWS CLI

Untuk menghapus jaringan ACL

Contoh ini menghapus jaringan ACL yang ditentukan. Jika perintah berhasil, tidak ada output yang akan ditampilkan.

Perintah:

```
aws ec2 delete-network-acl --network-acl-id acl-5fb85d36
```

- Untuk API detailnya, lihat DeleteNetworkAcldi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menghapus jaringan ACL yang ditentukan. Anda diminta untuk konfirmasi sebelum operasi berlangsung, kecuali jika Anda juga menentukan parameter Force.

```
Remove-EC2NetworkAcl -NetworkAclId acl-12345678
```

Output:

```
Confirm
Are you sure you want to perform this action?
Performing operation "Remove-EC2NetworkAcl (DeleteNetworkAcl)" on Target
 "acl-12345678".
[Y] Yes  [A] Yes to All  [N] No  [L] No to All  [S] Suspend  [?] Help (default is
 "Y"):
```

- Untuk API detailnya, lihat DeleteNetworkAcldi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DeleteNetworkAclEntry`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DeleteNetworkAclEntry`.

CLI

AWS CLI

Untuk menghapus ACL entri jaringan

Contoh ini menghapus aturan ingress nomor 100 dari jaringan yang ditentukan. ACL Jika perintah berhasil, tidak ada output yang akan ditampilkan.

Perintah:

```
aws ec2 delete-network-acl-entry --network-acl-id acl-5fb85d36 --ingress --rule-
number 100
```

- Untuk API detailnya, lihat DeleteNetworkAclEntrydi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menghapus aturan yang ditentukan dari jaringan yang ditentukanACL. Anda diminta untuk konfirmasi sebelum operasi berlangsung, kecuali jika Anda juga menentukan parameter Force.

```
Remove-EC2NetworkAclEntry -NetworkAclId acl-12345678 -Egress $false -RuleNumber
 100
```

Output:

```
Confirm
Are you sure you want to perform this action?
Performing operation "Remove-EC2NetworkAclEntry (DeleteNetworkAclEntry)" on
 Target "acl-12345678".
[Y] Yes  [A] Yes to All  [N] No  [L] No to All  [S] Suspend  [?] Help (default is
 "Y"):
```

- Untuk API detailnya, lihat DeleteNetworkAclEntrydi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DeleteNetworkInterface`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DeleteNetworkInterface`.

CLI

AWS CLI

Untuk menghapus antarmuka jaringan

Contoh ini menghapus antarmuka jaringan yang ditentukan. Jika perintah berhasil, tidak ada output yang akan ditampilkan.

Perintah:

```
aws ec2 delete-network-interface --network-interface-id eni-e5aa89a3
```

- Untuk API detailnya, lihat DeleteNetworkInterfacedi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menghapus antarmuka jaringan yang ditentukan. Anda diminta untuk konfirmasi sebelum operasi berlangsung, kecuali jika Anda juga menentukan parameter Force.

```
Remove-EC2NetworkInterface -NetworkInterfaceId eni-12345678
```

Output:

```
Confirm
Are you sure you want to perform this action?
Performing operation "Remove-EC2NetworkInterface (DeleteNetworkInterface)" on
 Target "eni-12345678".
```

```
[Y] Yes  [A] Yes to All  [N] No  [L] No to All  [S] Suspend  [?] Help (default is
 "Y"):
```

- Untuk API detailnya, lihat DeleteNetworkInterfacedi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DeletePlacementGroup`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DeletePlacementGroup`.

CLI

AWS CLI

Untuk menghapus grup penempatan

Perintah contoh ini menghapus grup penempatan yang ditentukan.

Perintah:

```
aws ec2 delete-placement-group --group-name my-cluster
```

- Untuk API detailnya, lihat DeletePlacementGroupdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menghapus grup penempatan yang ditentukan. Anda diminta untuk konfirmasi sebelum operasi berlangsung, kecuali jika Anda juga menentukan parameter Force.

```
Remove-EC2PlacementGroup -GroupName my-placement-group
```

Output:

```
Confirm
Are you sure you want to perform this action?
```

```
Performing operation "Remove-EC2PlacementGroup (DeletePlacementGroup)" on Target
 "my-placement-group".
[Y] Yes  [A] Yes to All  [N] No  [L] No to All  [S] Suspend  [?] Help (default is
 "Y"):
```

- Untuk API detailnya, lihat DeletePlacementGroupdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DeleteRoute`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DeleteRoute`.

CLI

AWS CLI

Untuk menghapus rute

Contoh ini menghapus rute yang ditentukan dari tabel rute yang ditentukan. Jika perintah berhasil, tidak ada output yang akan ditampilkan.

Perintah:

```
aws ec2 delete-route --route-table-id rtb-22574640 --destination-cidr-
block 0.0.0.0/0
```

- Untuk API detailnya, lihat DeleteRoutedi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menghapus rute yang ditentukan dari tabel rute yang ditentukan. Anda diminta untuk konfirmasi sebelum operasi berlangsung, kecuali jika Anda juga menentukan parameter Force.

```
Remove-EC2Route -RouteTableId rtb-1a2b3c4d -DestinationCidrBlock 0.0.0.0/0
```

Output:

```
Confirm
Are you sure you want to perform this action?
Performing operation "Remove-EC2Route (DeleteRoute)" on Target "rtb-1a2b3c4d".
[Y] Yes  [A] Yes to All  [N] No  [L] No to All  [S] Suspend  [?] Help (default is
 "Y"):
```

- Untuk API detailnya, lihat DeleteRoutedi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DeleteRouteTable`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DeleteRouteTable`.

CLI

AWS CLI

Untuk menghapus tabel rute

Contoh ini menghapus tabel rute yang ditentukan. Jika perintah berhasil, tidak ada output yang akan ditampilkan.

Perintah:

```
aws ec2 delete-route-table --route-table-id rtb-22574640
```

- Untuk API detailnya, lihat DeleteRouteTabledi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menghapus tabel rute yang ditentukan. Anda diminta untuk konfirmasi sebelum operasi berlangsung, kecuali jika Anda juga menentukan parameter Force.

```
Remove-EC2RouteTable -RouteTableId rtb-1a2b3c4d
```

Output:

```
Confirm
Are you sure you want to perform this action?
Performing operation "Remove-EC2RouteTable (DeleteRouteTable)" on Target
 "rtb-1a2b3c4d".
[Y] Yes  [A] Yes to All  [N] No  [L] No to All  [S] Suspend  [?] Help (default is
 "Y"):
```

- Untuk API detailnya, lihat DeleteRouteTabledi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DeleteSecurityGroup`** dengan AWS SDK atau CLI

Contoh kode berikut menunjukkan cara menggunakan`DeleteSecurityGroup`.

Contoh tindakan adalah kutipan kode dari program yang lebih besar dan harus dijalankan dalam konteks. Anda dapat melihat tindakan ini dalam konteks dalam contoh kode berikut:

- Pelajari dasar-dasarnya

.NET

AWS SDK for .NET

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    /// <summary>
    /// Delete an Amazon EC2 security group.
    /// </summary>
    /// <param name="groupName">The name of the group to delete.</param>
    /// <returns>A Boolean value indicating the success of the action.</returns>
    public async Task<bool> DeleteSecurityGroup(string groupId)
```

```
    {
        try
        {
            var response =
                await _amazonEC2.DeleteSecurityGroupAsync(
                    new DeleteSecurityGroupRequest { GroupId = groupId });
            return response.HttpStatusCode == HttpStatusCode.OK;
        }
        catch (AmazonEC2Exception ec2Exception)
        {
            if (ec2Exception.ErrorCode == "InvalidGroup.NotFound")
            {
                _logger.LogError(
                    $"Security Group {groupId} does not exist and cannot be
deleted. Please verify the ID and try again.");
            }

            return false;
        }
        catch (Exception ex)
        {
            Console.WriteLine($"Couldn't delete the security group because:
{ex.Message}");
            return false;
        }
    }
```

- Untuk API detailnya, lihat DeleteSecurityGroupdi AWS SDK for .NET APIReferensi.

## Bash

### AWS CLI dengan skrip Bash

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
#############################################################################
# function ec2_delete_security_group
```

```
#
# This function deletes an Amazon Elastic Compute Cloud (Amazon EC2) security
 group.
#
# Parameters:
#       -i security_group_id - The ID of the security group to delete.
#
# And:
#       0 - If successful.
#       1 - If it fails.
###############################################################################
function ec2_delete_security_group() {
  local security_group_id response
  local option OPTARG # Required to use getopts command in a function.

  # bashsupport disable=BP5008
  function usage() {
    echo "function ec2_delete_security_group"
    echo "Deletes an Amazon Elastic Compute Cloud (Amazon EC2) security group."
    echo "  -i security_group_id - The ID of the security group to delete."
    echo ""
  }

  # Retrieve the calling parameters.
  while getopts "i:h" option; do
    case "${option}" in
      i) security_group_id="${OPTARG}" ;;
      h)
        usage
        return 0
        ;;
      \?)
        echo "Invalid parameter"
        usage
        return 1
        ;;
    esac
  done
  export OPTIND=1

  if [[ -z "$security_group_id" ]]; then
    errecho "ERROR: You must provide a security group ID with the -i parameter."
    usage
    return 1
```

```
  fi

  response=$(aws ec2 delete-security-group --group-id "$security_group_id" --
output text) || {
    aws_cli_error_log ${?}
    errecho "ERROR: AWS reports delete-security-group operation failed.$response"
    return 1
  }

  return 0
}
```

Fungsi utilitas yang digunakan dalam contoh ini.

```
###############################################################################
# function errecho
#
# This function outputs everything sent to it to STDERR (standard error output).
###############################################################################
function errecho() {
  printf "%s\n" "$*" 1>&2
}

###############################################################################
# function aws_cli_error_log()
#
# This function is used to log the error messages from the AWS CLI.
#
# The function expects the following argument:
#         $1 - The error code returned by the AWS CLI.
#
#  Returns:
#          0: - Success.
#
###############################################################################
function aws_cli_error_log() {
  local err_code=$1
  errecho "Error code : $err_code"
  if [ "$err_code" == 1 ]; then
    errecho "  One or more S3 transfers failed."
  elif [ "$err_code" == 2 ]; then
    errecho "  Command line failed to parse."
```

```
  elif [ "$err_code" == 130 ]; then
    errecho "  Process received SIGINT."
  elif [ "$err_code" == 252 ]; then
    errecho "  Command syntax invalid."
  elif [ "$err_code" == 253 ]; then
    errecho "  The system environment or configuration was invalid."
  elif [ "$err_code" == 254 ]; then
    errecho "  The service returned an error."
  elif [ "$err_code" == 255 ]; then
    errecho "  255 is a catch-all error."
  fi

  return 0
}
```

- Untuk API detailnya, lihat DeleteSecurityGroupdi Referensi AWS CLI Perintah.

C++

SDKuntuk C ++

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
//! Delete a security group.
/*!
  \param securityGroupID: A security group ID.
  \param clientConfiguration: AWS client configuration.
  \return bool: Function succeeded.
 */
bool AwsDoc::EC2::deleteSecurityGroup(const Aws::String &securityGroupID,
                                      const Aws::Client::ClientConfiguration
 &clientConfiguration) {
    Aws::EC2::EC2Client ec2Client(clientConfiguration);
    Aws::EC2::Model::DeleteSecurityGroupRequest request;

    request.SetGroupId(securityGroupID);
```

```
    Aws::EC2::Model::DeleteSecurityGroupOutcome outcome =
 ec2Client.DeleteSecurityGroup(request);

    if (!outcome.IsSuccess()) {
        std::cerr << "Failed to delete security group " << securityGroupID <<
                  ":" << outcome.GetError().GetMessage() << std::endl;
    } else {
        std::cout << "Successfully deleted security group " << securityGroupID <<
                  std::endl;
    }

    return outcome.IsSuccess();
}
```

- Untuk API detailnya, lihat DeleteSecurityGroupdi AWS SDK for C++ APIReferensi.

## CLI

### AWS CLI

#### [EC2-Classic] Untuk menghapus grup keamanan

Contoh ini menghapus grup keamanan bernama `MySecurityGroup`. Jika perintah berhasil, tidak ada output yang akan ditampilkan.

Perintah:

```
aws ec2 delete-security-group --group-name MySecurityGroup
```

#### [EC2-VPC] Untuk menghapus grup keamanan

Contoh ini menghapus grup keamanan dengan ID `sg-903004f8`. Perhatikan bahwa Anda tidak dapat mereferensikan grup keamanan untuk EC2 - VPC berdasarkan nama. Jika perintah berhasil, tidak ada output yang akan ditampilkan.

Perintah:

```
aws ec2 delete-security-group --group-id sg-903004f8
```

Untuk informasi selengkapnya, lihat Menggunakan Grup Keamanan di Panduan Pengguna Antarmuka Baris Perintah AWS .

- Untuk API detailnya, lihat DeleteSecurityGroupdi Referensi AWS CLI Perintah.

Java

SDKuntuk Java 2.x

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    /**
     * Deletes an EC2 security group asynchronously.
     *
     * @param groupId the ID of the security group to delete
     * @return a CompletableFuture that completes when the security group is
deleted
     */
    public CompletableFuture<Void> deleteEC2SecGroupAsync(String groupId) {
        DeleteSecurityGroupRequest request = DeleteSecurityGroupRequest.builder()
            .groupId(groupId)
            .build();

        CompletableFuture<DeleteSecurityGroupResponse> response =
getAsyncClient().deleteSecurityGroup(request);
        return response.whenComplete((resp, ex) -> {
            if (ex != null) {
                throw new RuntimeException("Failed to delete security group with
Id " + groupId, ex);
            } else if (resp == null) {
                throw new RuntimeException("No response received for deleting
security group with Id " + groupId);
            }
        }).thenApply(resp -> null);
    }
```

- Untuk API detailnya, lihat DeleteSecurityGroupdi AWS SDK for Java 2.x APIReferensi.

JavaScript

SDKuntuk JavaScript (v3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
import { DeleteSecurityGroupCommand, EC2Client } from "@aws-sdk/client-ec2";

/**
 * Deletes a security group.
 * @param {{ groupId: string }} options
 */
export const main = async ({ groupId }) => {
  const client = new EC2Client({});
  const command = new DeleteSecurityGroupCommand({
    GroupId: groupId,
  });

  try {
    await client.send(command);
    console.log("Security group deleted successfully.");
  } catch (caught) {
    if (caught instanceof Error && caught.name === "InvalidGroupId.Malformed") {
      console.warn(`${caught.message}. Please provide a valid GroupId.`);
    } else {
      throw caught;
    }
  }
};
```

- Untuk API detailnya, lihat DeleteSecurityGroupdi AWS SDK for JavaScript APIReferensi.

Kotlin

SDKuntuk Kotlin

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
suspend fun deleteEC2SecGroup(groupIdVal: String) {
    val request =
        DeleteSecurityGroupRequest {
            groupId = groupIdVal
        }

    Ec2Client { region = "us-west-2" }.use { ec2 ->
        ec2.deleteSecurityGroup(request)
        println("Successfully deleted Security Group with id $groupIdVal")
    }
}
```

- Untuk API detailnya, lihat DeleteSecurityGroup AWSSDKAPIreferensi Kotlin.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menghapus grup keamanan yang ditentukan untuk EC2 -VPC. Anda diminta untuk konfirmasi sebelum operasi berlangsung, kecuali jika Anda juga menentukan parameter Force.

```
Remove-EC2SecurityGroup -GroupId sg-12345678
```

Output:

```
Confirm
Are you sure you want to perform this action?
Performing operation "Remove-EC2SecurityGroup (DeleteSecurityGroup)" on Target
 "sg-12345678".
```

```
[Y] Yes  [A] Yes to All  [N] No  [L] No to All  [S] Suspend  [?] Help (default is
 "Y"):
```

Contoh 2: Contoh ini menghapus grup keamanan yang ditentukan untuk EC2 -Classic.

```
Remove-EC2SecurityGroup -GroupName my-security-group -Force
```

- Untuk API detailnya, lihat DeleteSecurityGroupdi AWS Tools for PowerShell Referensi Cmdlet.

Python

SDKuntuk Python (Boto3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
class SecurityGroupWrapper:
    """Encapsulates Amazon Elastic Compute Cloud (Amazon EC2) security group
 actions."""

    def __init__(self, ec2_client: boto3.client, security_group: Optional[str] =
 None):
        """
        Initializes the SecurityGroupWrapper with an EC2 client and an optional
 security group ID.

        :param ec2_client: A Boto3 Amazon EC2 client. This client provides low-
level
                           access to AWS EC2 services.
        :param security_group: The ID of a security group to manage. This is a
 high-level identifier
                               that represents the security group.
        """
        self.ec2_client = ec2_client
        self.security_group = security_group

    @classmethod
```

```
    def from_client(cls) -> "SecurityGroupWrapper":
        """
        Creates a SecurityGroupWrapper instance with a default EC2 client.

        :return: An instance of SecurityGroupWrapper initialized with the default
EC2 client.
        """
        ec2_client = boto3.client("ec2")
        return cls(ec2_client)


    def delete(self, security_group_id: str) -> bool:
        """
        Deletes the specified security group.

        :param security_group_id: The ID of the security group to delete.
Required.

        :returns: True if the deletion is successful.
        :raises ClientError: If the security group cannot be deleted due to an
AWS service error.
        """
        try:
            self.ec2_client.delete_security_group(GroupId=security_group_id)
            logger.info(f"Successfully deleted security group
'{security_group_id}'")
            return True
        except ClientError as err:
            logger.error(f"Deletion failed for security group
'{security_group_id}'")
            error_code = err.response["Error"]["Code"]

            if error_code == "InvalidGroup.NotFound":
                logger.error(
                    f"Security group '{security_group_id}' cannot be deleted
because it does not exist."
                )
            elif error_code == "DependencyViolation":
                logger.error(
                    f"Security group '{security_group_id}' cannot be deleted
because it is still in use."
                    " Verify that it is:"
                    "\n\t- Detached from resources"
                    "\n\t- Removed from references in other groups"
```

```
                    "\n\t- Removed from VPC's as a default group"
                )
            raise
```

- Untuk API detailnya, lihat DeleteSecurityGroup AWSSDKReferensi Python (Boto3). API

Rust

SDKuntuk Rust

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
   pub async fn delete_security_group(&self, group_id: &str) -> Result<(),
EC2Error> {
       tracing::info!("Deleting security group {group_id}");
       self.client
           .delete_security_group()
           .group_id(group_id)
           .send()
           .await?;
       Ok(())
   }
```

- Untuk API detailnya, lihat DeleteSecurityGroup AWSSDKAPIreferensi Rust.

SAP ABAP

SDKuntuk SAP ABAP

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    TRY.
        lo_ec2->deletesecuritygroup( iv_groupid = iv_security_group_id ).
        MESSAGE 'Security group deleted.' TYPE 'I'.
      CATCH /aws1/cx_rt_service_generic INTO DATA(lo_exception).
        DATA(lv_error) = |"{ lo_exception->av_err_code }" - { lo_exception-
>av_err_msg }|.
        MESSAGE lv_error TYPE 'E'.
    ENDTRY.
```

- Untuk API detailnya, lihat DeleteSecurityGroup AWSSDKuntuk SAP ABAP API referensi.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DeleteSnapshot`** dengan AWS SDK atau CLI

Contoh kode berikut menunjukkan cara menggunakan`DeleteSnapshot`.

CLI

AWS CLI

Untuk menghapus snapshot

Perintah contoh ini menghapus snapshot dengan ID snapshot `snap-1234567890abcdef0`. Jika perintah berhasil, tidak ada output yang akan ditampilkan.

Perintah:

```
aws ec2 delete-snapshot --snapshot-id snap-1234567890abcdef0
```

- Untuk API detailnya, lihat DeleteSnapshotdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menghapus snapshot yang ditentukan. Anda diminta untuk konfirmasi sebelum operasi berlangsung, kecuali jika Anda juga menentukan parameter Force.

```
Remove-EC2Snapshot -SnapshotId snap-12345678
```

Output:

```
Confirm
Are you sure you want to perform this action?
Performing the operation "Remove-EC2Snapshot (DeleteSnapshot)" on target
 "snap-12345678".
[Y] Yes  [A] Yes to All  [N] No  [L] No to All  [S] Suspend  [?] Help (default is
 "Y"):
```

- Untuk API detailnya, lihat DeleteSnapshotdi AWS Tools for PowerShell Referensi Cmdlet.

Rust

SDKuntuk Rust

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
async fn delete_snapshot(client: &Client, id: &str) -> Result<(), Error> {
    client.delete_snapshot().snapshot_id(id).send().await?;

    println!("Deleted");
```

```
    Ok(())
}
```

- Untuk API detailnya, lihat DeleteSnapshot AWSSDKAPIreferensi Rust.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DeleteSpotDatafeedSubscription`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DeleteSpotDatafeedSubscription`.

CLI

AWS CLI

Untuk membatalkan langganan umpan data Instans Spot

Perintah contoh ini menghapus langganan umpan data Spot untuk akun tersebut. Jika perintah berhasil, tidak ada output yang akan ditampilkan.

Perintah:

```
aws ec2 delete-spot-datafeed-subscription
```

- Untuk API detailnya, lihat DeleteSpotDatafeedSubscriptiondi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menghapus umpan data instans Spot Anda. Anda diminta untuk konfirmasi sebelum operasi berlangsung, kecuali jika Anda juga menentukan parameter Force.

```
Remove-EC2SpotDatafeedSubscription
```

Output:

```
Confirm
Are you sure you want to perform this action?
Performing operation "Remove-EC2SpotDatafeedSubscription
 (DeleteSpotDatafeedSubscription)" on Target "".
[Y] Yes  [A] Yes to All  [N] No  [L] No to All  [S] Suspend  [?] Help (default is
 "Y"):
```

- Untuk API detailnya, lihat DeleteSpotDatafeedSubscriptiondi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DeleteSubnet`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DeleteSubnet`.

CLI

AWS CLI

Untuk menghapus subnet

Contoh ini menghapus subnet yang ditentukan. Jika perintah berhasil, tidak ada output yang akan ditampilkan.

Perintah:

```
aws ec2 delete-subnet --subnet-id subnet-9d4a7b6c
```

- Untuk API detailnya, lihat DeleteSubnetdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menghapus subnet yang ditentukan. Anda diminta untuk konfirmasi sebelum operasi berlangsung, kecuali jika Anda juga menentukan parameter Force.

```
Remove-EC2Subnet -SubnetId subnet-1a2b3c4d
```

Output:

```
Confirm
Are you sure you want to perform this action?
Performing operation "Remove-EC2Subnet (DeleteSubnet)" on Target
 "subnet-1a2b3c4d".
[Y] Yes  [A] Yes to All  [N] No  [L] No to All  [S] Suspend  [?] Help (default is
 "Y"):
```

- Untuk API detailnya, lihat DeleteSubnetdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DeleteTags`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DeleteTags`.

CLI

AWS CLI

Contoh 1: Untuk menghapus tag dari sumber daya

`delete-tags`Contoh berikut menghapus tag `Stack=Test` dari gambar yang ditentukan. Saat Anda menentukan nilai dan nama kunci, tag akan dihapus hanya jika nilai tag cocok dengan nilai yang ditentukan.

```
aws ec2 delete-tags \
    --resources ami-1234567890abcdef0 \
    --tags Key=Stack,Value=Test
```

Ini opsional untuk menentukan nilai untuk tag. `delete-tags`Contoh berikut menghapus tag dengan nama kunci `purpose` dari contoh yang ditentukan, terlepas dari nilai tag untuk tag.

```
aws ec2 delete-tags \
    --resources i-1234567890abcdef0 \
```

```
    --tags Key=purpose
```

Jika Anda menentukan string kosong sebagai nilai tag, tag akan dihapus hanya jika nilai tag adalah string kosong. `delete-tags`Contoh berikut menentukan string kosong sebagai nilai tag untuk tag untuk menghapus.

```
aws ec2 delete-tags \
    --resources i-1234567890abcdef0 \
    --tags Key=Name,Value=
```

Contoh 2: Untuk menghapus tag dari beberapa sumber daya

`delete-tags`Contoh berikut menghapus tag``purpose=test`` dari kedua instance dan sebuah. AMI Seperti yang ditunjukkan pada contoh sebelumnya, Anda dapat menghilangkan nilai tag dari perintah.

```
aws ec2 delete-tags \
    --resources i-1234567890abcdef0 ami-1234567890abcdef0 \
    --tags Key=Purpose
```

- Untuk API detailnya, lihat DeleteTagsdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menghapus tag yang ditentukan dari sumber daya yang ditentukan, terlepas dari nilai tag. Sintaks yang digunakan oleh contoh ini memerlukan PowerShell versi 3 atau yang lebih baru.

```
Remove-EC2Tag -Resource i-12345678 -Tag @{ Key="myTag" } -Force
```

Contoh 2: Contoh ini menghapus tag yang ditentukan dari sumber daya yang ditentukan, tetapi hanya jika nilai tag cocok. Sintaks yang digunakan oleh contoh ini memerlukan PowerShell versi 3 atau yang lebih baru.

```
Remove-EC2Tag -Resource i-12345678 -Tag @{ Key="myTag";Value="myTagValue" } -
Force
```

Contoh 3: Contoh ini menghapus tag yang ditentukan dari sumber daya yang ditentukan, terlepas dari nilai tag.

```
$tag = New-Object Amazon.EC2.Model.Tag
$tag.Key = "myTag"

Remove-EC2Tag -Resource i-12345678 -Tag $tag -Force
```

Contoh 4: Contoh ini menghapus tag yang ditentukan dari sumber daya yang ditentukan, tetapi hanya jika nilai tag cocok.

```
$tag = New-Object Amazon.EC2.Model.Tag
$tag.Key = "myTag"
$tag.Value = "myTagValue"

Remove-EC2Tag -Resource i-12345678 -Tag $tag -Force
```

- Untuk API detailnya, lihat DeleteTagsdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DeleteVolume`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DeleteVolume`.

CLI

AWS CLI

Untuk menghapus volume

Perintah contoh ini menghapus volume yang tersedia dengan ID volume dari. `vol-049df61146c4d7901` Jika perintah berhasil, tidak ada output yang akan ditampilkan.

Perintah:

```
aws ec2 delete-volume --volume-id vol-049df61146c4d7901
```

- Untuk API detailnya, lihat DeleteVolumedi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini melepaskan volume yang ditentukan. Anda diminta untuk konfirmasi sebelum operasi berlangsung, kecuali jika Anda juga menentukan parameter Force.

```
Remove-EC2Volume -VolumeId vol-12345678
```

Output:

```
Confirm
Are you sure you want to perform this action?
Performing the operation "Remove-EC2Volume (DeleteVolume)" on target
 "vol-12345678".
[Y] Yes  [A] Yes to All  [N] No  [L] No to All  [S] Suspend  [?] Help (default is
 "Y"):
```

- Untuk API detailnya, lihat DeleteVolumedi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DeleteVpc`** dengan AWS SDK atau CLI

Contoh kode berikut menunjukkan cara menggunakan`DeleteVpc`.

CLI

AWS CLI

Untuk menghapus VPC

Contoh ini menghapus yang ditentukanVPC. Jika perintah berhasil, tidak ada output yang akan ditampilkan.

Perintah:

```
aws ec2 delete-vpc --vpc-id vpc-a01106c2
```

- Untuk API detailnya, lihat DeleteVpcdi Referensi AWS CLI Perintah.

PHP

SDKuntuk PHP

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    /**
     * @param string $vpcId
     * @return void
     */
    public function deleteVpc(string $vpcId)
    {
        try {
            $this->ec2Client->deleteVpc([
                "VpcId" => $vpcId,
            ]);
        }catch(Ec2Exception $caught){
            echo "There was a problem deleting the VPC: {$caught-
>getAwsErrorMessage()}\n";
            throw $caught;
        }
    }
```

- Untuk API detailnya, lihat DeleteVpcdi AWS SDK for PHP APIReferensi.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menghapus yang ditentukanVPC. Anda diminta untuk konfirmasi sebelum operasi berlangsung, kecuali jika Anda juga menentukan parameter Force.

```
Remove-EC2Vpc -VpcId vpc-12345678
```

Output:

```
Confirm
Are you sure you want to perform this action?
Performing operation "Remove-EC2Vpc (DeleteVpc)" on Target "vpc-12345678".
[Y] Yes  [A] Yes to All  [N] No  [L] No to All  [S] Suspend  [?] Help (default is
 "Y"):
```

- Untuk API detailnya, lihat DeleteVpcdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DeleteVpcEndpoint`** dengan AWS SDK

Contoh kode berikut menunjukkan cara menggunakan`DeleteVpcEndpoint`.

PHP

SDKuntuk PHP

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    /**
     * @param string $vpcEndpointId
     * @return void
     */
    public function deleteVpcEndpoint(string $vpcEndpointId)
    {
        try {
            $this->ec2Client->deleteVpcEndpoints([
                "VpcEndpointIds" => [$vpcEndpointId],
```

```
            ]);
        }catch (Ec2Exception $caught){
            echo "There was a problem deleting the VPC Endpoint: {$caught-
>getAwsErrorMessage()}\n";
            throw $caught;
        }
    }
```

- Untuk API detailnya, lihat DeleteVpcEndpointdi AWS SDK for PHP APIReferensi.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DeleteVpnConnection`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DeleteVpnConnection`.

CLI

AWS CLI

Untuk menghapus VPN koneksi

Contoh ini menghapus VPN koneksi yang ditentukan. Jika perintah berhasil, tidak ada output yang akan ditampilkan.

Perintah:

```
aws ec2 delete-vpn-connection --vpn-connection-id vpn-40f41529
```

- Untuk API detailnya, lihat DeleteVpnConnectiondi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menghapus VPN koneksi yang ditentukan. Anda diminta untuk konfirmasi sebelum operasi berlangsung, kecuali jika Anda juga menentukan parameter Force.

```
Remove-EC2VpnConnection -VpnConnectionId vpn-12345678
```

Output:

```
Confirm
Are you sure you want to perform this action?
Performing operation "Remove-EC2VpnConnection (DeleteVpnConnection)" on Target
 "vpn-12345678".
[Y] Yes  [A] Yes to All  [N] No  [L] No to All  [S] Suspend  [?] Help (default is
 "Y"):
```

- Untuk API detailnya, lihat DeleteVpnConnectiondi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DeleteVpnConnectionRoute`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DeleteVpnConnectionRoute`.

CLI

AWS CLI

Untuk menghapus rute statis dari VPN koneksi

Contoh ini menghapus rute statis yang ditentukan dari VPN koneksi yang ditentukan. Jika perintah berhasil, tidak ada output yang akan ditampilkan.

Perintah:

```
aws ec2 delete-vpn-connection-route --vpn-connection-id vpn-40f41529 --
destination-cidr-block 11.12.0.0/16
```

- Untuk API detailnya, lihat DeleteVpnConnectionRoutedi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menghapus rute statis yang ditentukan dari VPN koneksi yang ditentukan. Anda diminta untuk konfirmasi sebelum operasi berlangsung, kecuali jika Anda juga menentukan parameter Force.

```
Remove-EC2VpnConnectionRoute -VpnConnectionId vpn-12345678 -DestinationCidrBlock
 11.12.0.0/16
```

Output:

```
Confirm
Are you sure you want to perform this action?
Performing operation "Remove-EC2VpnConnectionRoute (DeleteVpnConnectionRoute)" on
 Target "vpn-12345678".
[Y] Yes  [A] Yes to All  [N] No  [L] No to All  [S] Suspend  [?] Help (default is
 "Y"):
```

- Untuk API detailnya, lihat DeleteVpnConnectionRoutedi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DeleteVpnGateway`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DeleteVpnGateway`.

CLI

AWS CLI

Untuk menghapus gateway pribadi virtual

Contoh ini menghapus gateway pribadi virtual yang ditentukan. Jika perintah berhasil, tidak ada output yang akan ditampilkan.

Perintah:

```
aws ec2 delete-vpn-gateway --vpn-gateway-id vgw-9a4cacf3
```

- Untuk API detailnya, lihat DeleteVpnGatewaydi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menghapus gateway pribadi virtual yang ditentukan. Anda diminta untuk konfirmasi sebelum operasi berlangsung, kecuali jika Anda juga menentukan parameter Force.

```
Remove-EC2VpnGateway -VpnGatewayId vgw-1a2b3c4d
```

Output:

```
Confirm
Are you sure you want to perform this action?
Performing operation "Remove-EC2VpnGateway (DeleteVpnGateway)" on Target
 "vgw-1a2b3c4d".
[Y] Yes  [A] Yes to All  [N] No  [L] No to All  [S] Suspend  [?] Help (default is
 "Y"):
```

- Untuk API detailnya, lihat DeleteVpnGatewaydi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DeregisterImage`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DeregisterImage`.

CLI

AWS CLI

Untuk membatalkan pendaftaran AMI

Contoh ini membatalkan pendaftaran yang ditentukan. AMI Jika perintah berhasil, tidak ada output yang akan ditampilkan.

Perintah:

```
aws ec2 deregister-image --image-id ami-4fa54026
```

- Untuk API detailnya, lihat DeregisterImagedi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini membatalkan pendaftaran yang ditentukan. AMI

```
Unregister-EC2Image -ImageId ami-12345678
```

- Untuk API detailnya, lihat DeregisterImagedi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DescribeAccountAttributes`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribeAccountAttributes`.

CLI

AWS CLI

Untuk menjelaskan semua atribut untuk AWS akun Anda

Contoh ini menjelaskan atribut untuk AWS akun Anda.

Perintah:

```
aws ec2 describe-account-attributes
```

Output:


```
{
    "AccountAttributes": [
        {
            "AttributeName": "vpc-max-security-groups-per-interface",
            "AttributeValues": [
                {
                    "AttributeValue": "5"
                }
            ]
        },
        {
            "AttributeName": "max-instances",
            "AttributeValues": [
                {
                    "AttributeValue": "20"
                }
            ]
        },
        {
            "AttributeName": "supported-platforms",
            "AttributeValues": [
                {
                    "AttributeValue": "EC2"
                },
                {
                    "AttributeValue": "VPC"
                }
            ]
        },
        {
            "AttributeName": "default-vpc",
            "AttributeValues": [
                {
                    "AttributeValue": "none"
                }
            ]
        },
        {
            "AttributeName": "max-elastic-ips",
            "AttributeValues": [
                {
                    "AttributeValue": "5"
```

```
                }
            ]
        },
        {
            "AttributeName": "vpc-max-elastic-ips",
            "AttributeValues": [
                {
                    "AttributeValue": "5"
                }
            ]
        }
    ]
}
```

Untuk mendeskripsikan satu atribut untuk AWS akun Anda

Contoh ini menjelaskan `supported-platforms` atribut untuk AWS akun Anda.

Perintah:

```
aws ec2 describe-account-attributes --attribute-names supported-platforms
```

Output:

```
{
    "AccountAttributes": [
        {
            "AttributeName": "supported-platforms",
            "AttributeValues": [
                {
                    "AttributeValue": "EC2"
                },
                {
                    "AttributeValue": "VPC"
                }
            ]
        }
    ]
}
```

- Untuk API detailnya, lihat DescribeAccountAttributesdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menjelaskan apakah Anda dapat meluncurkan instance ke EC2 -Classic dan EC2 - VPC di wilayah, atau hanya ke EC2 -. VPC

```
(Get-EC2AccountAttribute -AttributeName supported-platforms).AttributeValues
```

Output:

```
AttributeValue
--------------
EC2
VPC
```

Contoh 2: Contoh ini menjelaskan default AndaVPC, atau 'tidak ada' jika Anda tidak memiliki default VPC di wilayah tersebut.

```
(Get-EC2AccountAttribute -AttributeName default-vpc).AttributeValues
```

Output:

```
AttributeValue
--------------
vpc-12345678
```

Contoh 3: Contoh ini menjelaskan jumlah maksimum instans On-Demand yang dapat Anda jalankan.

```
(Get-EC2AccountAttribute -AttributeName max-instances).AttributeValues
```

Output:

```
AttributeValue
--------------
20
```

- Untuk API detailnya, lihat DescribeAccountAttributesdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DescribeAddresses`** dengan AWS SDK atau CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribeAddresses`.

C++

SDKuntuk C ++

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
//! Describe all Elastic IP addresses.
/*!
  \param clientConfiguration: AWS client configuration.
  \return bool: Function succeeded.
 */
bool AwsDoc::EC2::describeAddresses(
        const Aws::Client::ClientConfiguration &clientConfiguration) {
    Aws::EC2::EC2Client ec2Client(clientConfiguration);
    Aws::EC2::Model::DescribeAddressesRequest request;
    Aws::EC2::Model::DescribeAddressesOutcome outcome =
 ec2Client.DescribeAddresses(request);
    if (outcome.IsSuccess()) {
        std::cout << std::left << std::setw(20) << "InstanceId" <<
                  std::setw(15) << "Public IP" << std::setw(10) << "Domain" <<
                  std::setw(30) << "Allocation ID" << std::setw(25) <<
                  "NIC ID" << std::endl;

        const Aws::Vector<Aws::EC2::Model::Address> &addresses =
 outcome.GetResult().GetAddresses();
        for (const auto &address: addresses) {
            Aws::String domainString =
                    Aws::EC2::Model::DomainTypeMapper::GetNameForDomainType(
                            address.GetDomain());
```

```
            std::cout << std::left << std::setw(20) <<
                      address.GetInstanceId() << std::setw(15) <<
                      address.GetPublicIp() << std::setw(10) << domainString <<
                      std::setw(30) << address.GetAllocationId() << std::setw(25)
                      << address.GetNetworkInterfaceId() << std::endl;
        }
    } else {
        std::cerr << "Failed to describe Elastic IP addresses:" <<
                  outcome.GetError().GetMessage() << std::endl;
    }

    return outcome.IsSuccess();
}
```

- Untuk API detailnya, lihat DescribeAddressesdi AWS SDK for C++ APIReferensi.

CLI

AWS CLI

Contoh 1: Untuk mengambil detail tentang semua alamat IP Elastis Anda

Contoh `describe addresses` berikut menampilkan detail tentang alamat IP Elastis Anda.

```
aws ec2 describe-addresses
```

Output:

```
{
    "Addresses": [
        {
            "InstanceId": "i-1234567890abcdef0",
            "PublicIp": "198.51.100.0",
            "PublicIpv4Pool": "amazon",
            "Domain": "standard"
        },
        {
            "Domain": "vpc",
            "PublicIpv4Pool": "amazon",
            "InstanceId": "i-1234567890abcdef0",
            "NetworkInterfaceId": "eni-12345678",
```

```
            "AssociationId": "eipassoc-12345678",
            "NetworkInterfaceOwnerId": "123456789012",
            "PublicIp": "203.0.113.0",
            "AllocationId": "eipalloc-12345678",
            "PrivateIpAddress": "10.0.1.241"
        }
    ]
}
```

Contoh 2: Untuk mengambil detail alamat IP Elastis Anda untuk EC2 - VPC

`describe-addresses`Contoh berikut menampilkan detail tentang alamat IP Elastis Anda untuk digunakan dengan instance di file. VPC

```
aws ec2 describe-addresses \
    --filters "Name=domain,Values=vpc"
```

Output:

```
{
    "Addresses": [
        {
            "Domain": "vpc",
            "PublicIpv4Pool": "amazon",
            "InstanceId": "i-1234567890abcdef0",
            "NetworkInterfaceId": "eni-12345678",
            "AssociationId": "eipassoc-12345678",
            "NetworkInterfaceOwnerId": "123456789012",
            "PublicIp": "203.0.113.0",
            "AllocationId": "eipalloc-12345678",
            "PrivateIpAddress": "10.0.1.241"
        }
    ]
}
```

Contoh 3: Untuk mengambil detail tentang alamat IP Elastis yang ditentukan oleh ID alokasi

`describe-addresses`Contoh berikut menampilkan rincian tentang alamat IP Elastis dengan ID alokasi yang ditentukan, yang dikaitkan dengan instance di EC2 -VPC.

```
aws ec2 describe-addresses \
    --allocation-ids eipalloc-282d9641
```

Output:

```
{
    "Addresses": [
        {
            "Domain": "vpc",
            "PublicIpv4Pool": "amazon",
            "InstanceId": "i-1234567890abcdef0",
            "NetworkInterfaceId": "eni-1a2b3c4d",
            "AssociationId": "eipassoc-123abc12",
            "NetworkInterfaceOwnerId": "1234567891012",
            "PublicIp": "203.0.113.25",
            "AllocationId": "eipalloc-282d9641",
            "PrivateIpAddress": "10.251.50.12"
        }
    ]
}
```

Contoh 4: Untuk mengambil rincian tentang alamat IP Elastis yang ditentukan oleh alamat IP VPC pribadinya

`describe-addresses`Contoh berikut menampilkan rincian tentang alamat IP Elastis yang terkait dengan alamat IP pribadi tertentu di EC2 -VPC.

```
aws ec2 describe-addresses \
    --filters "Name=private-ip-address,Values=10.251.50.12"
```

Contoh 5: Untuk mengambil detail tentang alamat IP Elastis di EC2 -Classic

TThe`describe-addresses`contoh berikut menampilkan rincian tentang alamat IP Elastis Anda untuk digunakan di EC2 -Classic.

```
aws ec2 describe-addresses \
    --filters "Name=domain,Values=standard"
```

Output:

```
{
    "Addresses": [
        {
            "InstanceId": "i-1234567890abcdef0",
```

```
            "PublicIp": "203.0.110.25",
            "PublicIpv4Pool": "amazon",
            "Domain": "standard"
        }
    ]
}
```

Contoh 6: Untuk mengambil detail tentang alamat IP Elastis yang ditentukan oleh alamat IP publiknya

`describe-addresses`Contoh berikut menampilkan rincian tentang alamat IP Elastis dengan nilai`203.0.110.25`, yang dikaitkan dengan sebuah instance di EC2 -Classic.

```
aws ec2 describe-addresses \
    --public-ips 203.0.110.25
```

Output:

```
{
    "Addresses": [
        {
            "InstanceId": "i-1234567890abcdef0",
            "PublicIp": "203.0.110.25",
            "PublicIpv4Pool": "amazon",
            "Domain": "standard"
        }
    ]
}
```

- Untuk API detailnya, lihat DescribeAddressesdi Referensi AWS CLI Perintah.

JavaScript

SDKuntuk JavaScript (v3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
import { DescribeAddressesCommand, EC2Client } from "@aws-sdk/client-ec2";

/**
 * Describes the specified Elastic IP addresses or all of your Elastic IP
 addresses.
 * @param {{ allocationId: string }} options
 */
export const main = async ({ allocationId }) => {
  const client = new EC2Client({});
  const command = new DescribeAddressesCommand({
    // You can omit this property to show all addresses.
    AllocationIds: [allocationId],
  });

  try {
    const { Addresses } = await client.send(command);
    const addressList = Addresses.map((address) => ` • ${address.PublicIp}`);
    console.log("Elastic IP addresses:");
    console.log(addressList.join("\n"));
  } catch (caught) {
    if (
      caught instanceof Error &&
      caught.name === "InvalidAllocationID.NotFound"
    ) {
      console.warn(`${caught.message}. Please provide a valid AllocationId.`);
    } else {
      throw caught;
    }
  }
};
```

- Untuk API detailnya, lihat DescribeAddressesdi AWS SDK for JavaScript APIReferensi.

## PowerShell

### Alat untuk PowerShell

Contoh 1: Contoh ini menjelaskan alamat IP Elastis yang ditentukan untuk instance di EC2 - Classic.

```
Get-EC2Address -AllocationId eipalloc-12345678
```

Output:

```
AllocationId            : eipalloc-12345678
AssociationId           : eipassoc-12345678
Domain                  : vpc
InstanceId              : i-87654321
NetworkInterfaceId      : eni-12345678
NetworkInterfaceOwnerId : 12345678
PrivateIpAddress        : 10.0.2.172
PublicIp                : 198.51.100.2
```

Contoh 2: Contoh ini menjelaskan alamat IP Elastis Anda untuk instance di file. VPC Sintaks ini membutuhkan PowerShell versi 3 atau yang lebih baru.

```
Get-EC2Address -Filter @{ Name="domain";Values="vpc" }
```

Contoh 3: Contoh ini menjelaskan alamat IP Elastis yang ditentukan untuk instance di EC2 - Classic.

```
Get-EC2Address -PublicIp 203.0.113.17
```

Output:

```
AllocationId            :
AssociationId           :
Domain                  : standard
InstanceId              : i-12345678
NetworkInterfaceId      :
NetworkInterfaceOwnerId :
PrivateIpAddress        :
PublicIp                : 203.0.113.17
```

Contoh 4: Contoh ini menjelaskan alamat IP Elastis Anda untuk instance di EC2 -Classic. Sintaks ini membutuhkan PowerShell versi 3 atau yang lebih baru.

```
Get-EC2Address -Filter @{ Name="domain";Values="standard" }
```

Contoh 5: Contoh ini menjelaskan semua alamat IP Elastis Anda.

```
Get-EC2Address
```

Contoh 6: Contoh ini mengembalikan IP publik dan pribadi untuk id contoh yang disediakan dalam filter

```
Get-EC2Address -Region eu-west-1 -Filter @{Name="instance-
id";Values="i-0c12d3f4f567ffb89"} | Select-Object PrivateIpAddress, PublicIp
```

Output:

```
PrivateIpAddress PublicIp
---------------- --------
10.0.0.99        63.36.5.227
```

Contoh 7: Contoh ini mengambil semua Elastic IPs dengan id alokasi, id asosiasi dan id instance

```
Get-EC2Address -Region eu-west-1 | Select-Object InstanceId, AssociationId,
 AllocationId, PublicIp
```

Output:

```
InstanceId          AssociationId              AllocationId
 PublicIp
----------          -------------              ------------
 --------
                                               eipalloc-012e3b456789e1fad
 17.212.120.178
i-0c123dfd3415bac67 eipassoc-0e123456bb7890bdb eipalloc-01cd23ebf45f7890c
 17.212.124.77
                                               eipalloc-012345678eeabcfad
 17.212.225.7
i-0123d405c67e89a0c eipassoc-0c123b456783966ba eipalloc-0123cdd456a8f7892
 37.216.52.173
i-0f1bf2f34c5678d09 eipassoc-0e12934568a952d96 eipalloc-0e1c23e4d5e6789e4
 37.218.222.278
i-012e3cb4df567e8aa eipassoc-0d1b2fa4d67d03810 eipalloc-0123f456f78a01b58
 37.210.82.27
i-0123bcf4b567890e1 eipassoc-01d2345f678903fb1 eipalloc-0e1db23cfef5c45c7
 37.215.222.270
```

Contoh 8: Contoh ini mengambil daftar alamat EC2 IP yang cocok dengan kunci tag 'Kategori' dengan nilai 'Prod'

```
Get-EC2Address -Filter @{Name="tag:Category";Values="Prod"}
```

Output:

```
AllocationId            : eipalloc-0123f456f81a01b58
AssociationId           : eipassoc-0d1b23a456d103810
CustomerOwnedIp         :
CustomerOwnedIpv4Pool   :
Domain                  : vpc
InstanceId              : i-012e3cb4df567e1aa
NetworkBorderGroup      : eu-west-1
NetworkInterfaceId      : eni-0123f41d5a60d5f40
NetworkInterfaceOwnerId : 123456789012
PrivateIpAddress        : 192.168.1.84
PublicIp                : 34.250.81.29
PublicIpv4Pool          : amazon
Tags                    : {Category, Name}
```

- Untuk API detailnya, lihat DescribeAddressesdi AWS Tools for PowerShell Referensi Cmdlet.

## SAP ABAP

### SDKuntuk SAP ABAP

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    TRY.
        oo_result = lo_ec2->describeaddresses( ) .                      "
 oo_result is returned for testing purposes. "
        DATA(lt_addresses) = oo_result->get_addresses( ).
        MESSAGE 'Retrieved information about Elastic IP addresses.' TYPE 'I'.
      CATCH /aws1/cx_rt_service_generic INTO DATA(lo_exception).
        DATA(lv_error) = |"{ lo_exception->av_err_code }" - { lo_exception-
>av_err_msg }|.
        MESSAGE lv_error TYPE 'E'.
```

```
    ENDTRY.
```

- Untuk API detailnya, lihat DescribeAddresses AWSSDKuntuk SAP ABAP API referensi.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DescribeAvailabilityZones`** dengan AWS SDK atau CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribeAvailabilityZones`.

Contoh tindakan adalah kutipan kode dari program yang lebih besar dan harus dijalankan dalam konteks. Anda dapat melihat tindakan ini dalam konteks dalam contoh kode berikut:

- Membangun dan mengelola layanan yang tangguh

.NET

AWS SDK for .NET

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    /// <summary>
    /// Get a list of Availability Zones in the AWS Region of the Amazon EC2
Client.
    /// </summary>
    /// <returns>A list of availability zones.</returns>
    public async Task<List<string>> DescribeAvailabilityZones()
    {
        try
        {
            var zoneResponse = await _amazonEc2.DescribeAvailabilityZonesAsync(
                new DescribeAvailabilityZonesRequest());
```

```
            return zoneResponse.AvailabilityZones.Select(z =>
 z.ZoneName).ToList();
        }
        catch (AmazonEC2Exception ec2Exception)
        {
            _logger.LogError($"An Amazon EC2 error occurred while listing
 availability zones.: {ec2Exception.Message}");
            throw;
        }
        catch (Exception ex)
        {
            _logger.LogError($"An error occurred while listing availability
 zones.: {ex.Message}");
            throw;
        }
    }
```

- Untuk API detailnya, lihat DescribeAvailabilityZonesdi AWS SDK for .NET APIReferensi.

C++

SDKuntuk C ++

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
//! DescribeAvailabilityZones
/*!
  \param clientConfiguration: AWS client configuration.
  \return bool: Function succeeded.
*/
int AwsDoc::EC2::describeAvailabilityZones(const Aws::Client::ClientConfiguration
 &clientConfiguration) {
    Aws::EC2::EC2Client ec2Client(clientConfiguration);
    Aws::EC2::Model::DescribeAvailabilityZonesRequest request;
    Aws::EC2::Model::DescribeAvailabilityZonesOutcome outcome =
 ec2Client.DescribeAvailabilityZones(request);
```

```
    if (outcome.IsSuccess()) {
        std::cout << std::left <<
                  std::setw(32) << "ZoneName" <<
                  std::setw(20) << "State" <<
                  std::setw(32) << "Region" << std::endl;

        const auto &zones =
                outcome.GetResult().GetAvailabilityZones();

        for (const auto &zone: zones) {
            Aws::String stateString =

 Aws::EC2::Model::AvailabilityZoneStateMapper::GetNameForAvailabilityZoneState(
                            zone.GetState());
            std::cout << std::left <<
                      std::setw(32) << zone.GetZoneName() <<
                      std::setw(20) << stateString <<
                      std::setw(32) << zone.GetRegionName() << std::endl;
        }
    } else {
        std::cerr << "Failed to describe availability zones:" <<
                  outcome.GetError().GetMessage() << std::endl;

    }

    return outcome.IsSuccess();
}
```

- Untuk API detailnya, lihat DescribeAvailabilityZonesdi AWS SDK for C++ APIReferensi.

CLI

AWS CLI

Untuk menjelaskan Zona Ketersediaan Anda

Contoh `describe-availability-zones` berikut menampilkan detail untuk Zona Ketersediaan yang tersedia untuk Anda. Responsnya mencakup Zona Ketersediaan hanya untuk Wilayah saat ini. Dalam contoh ini, respons menggunakan default profil Wilayah `us-west-2` (Oregon).

```
aws ec2 describe-availability-zones
```

Output:


```
{
    "AvailabilityZones": [
        {
            "State": "available",
            "OptInStatus": "opt-in-not-required",
            "Messages": [],
            "RegionName": "us-west-2",
            "ZoneName": "us-west-2a",
            "ZoneId": "usw2-az1",
            "GroupName": "us-west-2",
            "NetworkBorderGroup": "us-west-2"
        },
        {
            "State": "available",
            "OptInStatus": "opt-in-not-required",
            "Messages": [],
            "RegionName": "us-west-2",
            "ZoneName": "us-west-2b",
            "ZoneId": "usw2-az2",
            "GroupName": "us-west-2",
            "NetworkBorderGroup": "us-west-2"
        },
        {
            "State": "available",
            "OptInStatus": "opt-in-not-required",
            "Messages": [],
            "RegionName": "us-west-2",
            "ZoneName": "us-west-2c",
            "ZoneId": "usw2-az3",
            "GroupName": "us-west-2",
            "NetworkBorderGroup": "us-west-2"
        },
        {
            "State": "available",
            "OptInStatus": "opt-in-not-required",
            "Messages": [],
            "RegionName": "us-west-2",
            "ZoneName": "us-west-2d",
            "ZoneId": "usw2-az4",
```

```
            "GroupName": "us-west-2",
            "NetworkBorderGroup": "us-west-2"
        },
        {
            "State": "available",
            "OptInStatus": "opted-in",
            "Messages": [],
            "RegionName": "us-west-2",
            "ZoneName": "us-west-2-lax-1a",
            "ZoneId": "usw2-lax1-az1",
            "GroupName": "us-west-2-lax-1",
            "NetworkBorderGroup": "us-west-2-lax-1"
        }
    ]
}
```

- Untuk API detailnya, lihat DescribeAvailabilityZonesdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menjelaskan Availability Zone untuk wilayah saat ini yang tersedia untuk Anda.

```
Get-EC2AvailabilityZone
```

Output:

```
Messages    RegionName    State        ZoneName
--------    ----------    -----        --------
{}          us-west-2     available    us-west-2a
{}          us-west-2     available    us-west-2b
{}          us-west-2     available    us-west-2c
```

Contoh 2: Contoh ini menjelaskan Availability Zone yang berada dalam keadaan terganggu. Sintaks yang digunakan oleh contoh ini membutuhkan PowerShell versi 3 atau lebih tinggi.

```
Get-EC2AvailabilityZone -Filter @{ Name="state";Values="impaired" }
```

Contoh 3: Dengan PowerShell versi 2, Anda harus menggunakan New-Object untuk membuat filter.

```
$filter = New-Object Amazon.EC2.Model.Filter
$filter.Name = "state"
$filter.Values = "impaired"

Get-EC2AvailabilityZone -Filter $filter
```

- Untuk API detailnya, lihat DescribeAvailabilityZonesdi AWS Tools for PowerShell Referensi Cmdlet.

Python

SDKuntuk Python (Boto3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
class AutoScalingWrapper:
    """
    Encapsulates Amazon EC2 Auto Scaling and EC2 management actions.
    """

    def __init__(
        self,
        resource_prefix: str,
        inst_type: str,
        ami_param: str,
        autoscaling_client: boto3.client,
        ec2_client: boto3.client,
        ssm_client: boto3.client,
        iam_client: boto3.client,
    ):
        """
        Initializes the AutoScaler class with the necessary parameters.
```

```
        :param resource_prefix: The prefix for naming AWS resources that are
created by this class.
        :param inst_type: The type of EC2 instance to create, such as t3.micro.
        :param ami_param: The Systems Manager parameter used to look up the AMI
that is created.
        :param autoscaling_client: A Boto3 EC2 Auto Scaling client.
        :param ec2_client: A Boto3 EC2 client.
        :param ssm_client: A Boto3 Systems Manager client.
        :param iam_client: A Boto3 IAM client.
        """
        self.inst_type = inst_type
        self.ami_param = ami_param
        self.autoscaling_client = autoscaling_client
        self.ec2_client = ec2_client
        self.ssm_client = ssm_client
        self.iam_client = iam_client
        sts_client = boto3.client("sts")
        self.account_id = sts_client.get_caller_identity()["Account"]

        self.key_pair_name = f"{resource_prefix}-key-pair"
        self.launch_template_name = f"{resource_prefix}-template-"
        self.group_name = f"{resource_prefix}-group"

        # Happy path
        self.instance_policy_name = f"{resource_prefix}-pol"
        self.instance_role_name = f"{resource_prefix}-role"
        self.instance_profile_name = f"{resource_prefix}-prof"

        # Failure mode
        self.bad_creds_policy_name = f"{resource_prefix}-bc-pol"
        self.bad_creds_role_name = f"{resource_prefix}-bc-role"
        self.bad_creds_profile_name = f"{resource_prefix}-bc-prof"


    def get_availability_zones(self) -> List[str]:
        """
        Gets a list of Availability Zones in the AWS Region of the Amazon EC2
client.

        :return: The list of Availability Zones for the client Region.
        """
        try:
            response = self.ec2_client.describe_availability_zones()
            zones = [zone["ZoneName"] for zone in response["AvailabilityZones"]]
```

```
            log.info(f"Retrieved {len(zones)} availability zones: {zones}.")
        except ClientError as err:
            log.error("Failed to retrieve availability zones.")
            log.error(f"Full error:\n\t{err}")
        else:
            return zones
```

- Untuk API detailnya, lihat DescribeAvailabilityZones AWSSDKReferensi Python (Boto3). API

SAP ABAP

SDKuntuk SAP ABAP

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    TRY.
        oo_result = lo_ec2->describeavailabilityzones( ) .
 " oo_result is returned for testing purposes. "
        DATA(lt_zones) = oo_result->get_availabilityzones( ).
        MESSAGE 'Retrieved information about Availability Zones.' TYPE 'I'.

      CATCH /aws1/cx_rt_service_generic INTO DATA(lo_exception).
        DATA(lv_error) = |"{ lo_exception->av_err_code }" - { lo_exception-
>av_err_msg }|.
        MESSAGE lv_error TYPE 'E'.
    ENDTRY.
```

- Untuk API detailnya, lihat DescribeAvailabilityZones AWSSDKuntuk SAP ABAP API referensi.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DescribeBundleTasks`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribeBundleTasks`.

CLI

AWS CLI

Untuk menggambarkan tugas bundel Anda

Contoh ini menjelaskan semua tugas bundel Anda.

Perintah:

```
aws ec2 describe-bundle-tasks
```

Output:

```
{
  "BundleTasks": [
    {
      "UpdateTime": "2015-09-15T13:26:54.000Z",
      "InstanceId": "i-1234567890abcdef0",
      "Storage": {
        "S3": {
            "Prefix": "winami",
            "Bucket": "bundletasks"
        }
      },
      "State": "bundling",
      "StartTime": "2015-09-15T13:24:35.000Z",
      "Progress": "3%",
      "BundleId": "bun-2a4e041c"
    }
  ]
}
```

- Untuk API detailnya, lihat DescribeBundleTasksdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menjelaskan tugas bundel yang ditentukan.

```
Get-EC2BundleTask -BundleId bun-12345678
```

Contoh 2: Contoh ini menjelaskan tugas bundel yang statusnya 'lengkap' atau 'gagal'.

```
$filter = New-Object Amazon.EC2.Model.Filter
$filter.Name = "state"
$filter.Values = @( "complete", "failed" )

Get-EC2BundleTask -Filter $filter
```

- Untuk API detailnya, lihat DescribeBundleTasksdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DescribeCapacityReservations`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribeCapacityReservations`.

CLI

AWS CLI

Contoh 1: Untuk menggambarkan satu atau lebih reservasi kapasitas Anda

`describe-capacity-reservations`Contoh berikut menampilkan detail tentang semua reservasi kapasitas Anda di AWS Wilayah saat ini.

```
aws ec2 describe-capacity-reservations
```

Output:

```
{
    "CapacityReservations": [
        {
            "CapacityReservationId": "cr-1234abcd56EXAMPLE ",
            "EndDateType": "unlimited",
            "AvailabilityZone": "eu-west-1a",
            "InstanceMatchCriteria": "open",
            "Tags": [],
            "EphemeralStorage": false,
            "CreateDate": "2019-08-16T09:03:18.000Z",
            "AvailableInstanceCount": 1,
            "InstancePlatform": "Linux/UNIX",
            "TotalInstanceCount": 1,
            "State": "active",
            "Tenancy": "default",
            "EbsOptimized": true,
            "InstanceType": "a1.medium"
        },
        {
            "CapacityReservationId": "cr-abcdEXAMPLE9876ef ",
            "EndDateType": "unlimited",
            "AvailabilityZone": "eu-west-1a",
            "InstanceMatchCriteria": "open",
            "Tags": [],
            "EphemeralStorage": false,
            "CreateDate": "2019-08-07T11:34:19.000Z",
            "AvailableInstanceCount": 3,
            "InstancePlatform": "Linux/UNIX",
            "TotalInstanceCount": 3,
            "State": "cancelled",
            "Tenancy": "default",
            "EbsOptimized": true,
            "InstanceType": "m5.large"
        }
    ]
}
```

Contoh 2: Untuk menggambarkan satu atau lebih reservasi kapasitas Anda

`describe-capacity-reservations`Contoh berikut menampilkan rincian tentang reservasi kapasitas yang ditentukan.

```
aws ec2 describe-capacity-reservations \
```

```
    --capacity-reservation-ids cr-1234abcd56EXAMPLE
```

Output:

```
{
    "CapacityReservations": [
        {
            "CapacityReservationId": "cr-1234abcd56EXAMPLE",
            "EndDateType": "unlimited",
            "AvailabilityZone": "eu-west-1a",
            "InstanceMatchCriteria": "open",
            "Tags": [],
            "EphemeralStorage": false,
            "CreateDate": "2019-08-16T09:03:18.000Z",
            "AvailableInstanceCount": 1,
            "InstancePlatform": "Linux/UNIX",
            "TotalInstanceCount": 1,
            "State": "active",
            "Tenancy": "default",
            "EbsOptimized": true,
            "InstanceType": "a1.medium"
        }
    ]
}
```

Untuk informasi selengkapnya, lihat Melihat Reservasi Kapasitas di Panduan Pengguna Amazon Elastic Compute Cloud untuk Instans Linux.

- Untuk API detailnya, lihat DescribeCapacityReservationsdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menjelaskan satu atau beberapa Reservasi Kapasitas Anda untuk wilayah tersebut

```
Get-EC2CapacityReservation -Region eu-west-1
```

Output:

```
AvailabilityZone       : eu-west-1b
```

```
AvailableInstanceCount : 2
CapacityReservationId  : cr-0c1f2345db6f7cdba
CreateDate             : 3/28/2019 9:29:41 AM
EbsOptimized           : True
EndDate                : 1/1/0001 12:00:00 AM
EndDateType            : unlimited
EphemeralStorage       : False
InstanceMatchCriteria  : open
InstancePlatform       : Windows
InstanceType           : m4.xlarge
State                  : active
Tags                   : {}
Tenancy                : default
TotalInstanceCount     : 2
```

- Untuk API detailnya, lihat DescribeCapacityReservationsdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DescribeCustomerGateways`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribeCustomerGateways`.

CLI

AWS CLI

Untuk mendeskripsikan gateway pelanggan Anda

Contoh ini menjelaskan gateway pelanggan Anda.

Perintah:

```
aws ec2 describe-customer-gateways
```

Output:

```
{
```

```
    "CustomerGateways": [
        {
            "CustomerGatewayId": "cgw-b4dc3961",
            "IpAddress": "203.0.113.12",
            "State": "available",
            "Type": "ipsec.1",
            "BgpAsn": "65000"
        },
        {
            "CustomerGatewayId": "cgw-0e11f167",
            "IpAddress": "12.1.2.3",
            "State": "available",
            "Type": "ipsec.1",
            "BgpAsn": "65534"
        }
    ]
}
```

Untuk menggambarkan gateway pelanggan tertentu

Contoh ini menjelaskan gateway pelanggan yang ditentukan.

Perintah:

```
aws ec2 describe-customer-gateways --customer-gateway-ids cgw-0e11f167
```

Output:

```
{
    "CustomerGateways": [
        {
            "CustomerGatewayId": "cgw-0e11f167",
            "IpAddress": "12.1.2.3",
            "State": "available",
            "Type": "ipsec.1",
            "BgpAsn": "65534"
        }
    ]
}
```

- Untuk API detailnya, lihat DescribeCustomerGatewaysdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menjelaskan gateway pelanggan yang ditentukan.

```
Get-EC2CustomerGateway -CustomerGatewayId cgw-1a2b3c4d
```

Output:

```
BgpAsn            : 65534
CustomerGatewayId : cgw-1a2b3c4d
IpAddress         : 203.0.113.12
State             : available
Tags              : {}
Type              : ipsec.1
```

Contoh 2: Contoh ini menjelaskan gateway pelanggan yang statusnya tertunda atau tersedia.

```
$filter = New-Object Amazon.EC2.Model.Filter
$filter.Name = "state"
$filter.Values = @( "pending", "available" )

Get-EC2CustomerGateway -Filter $filter
```

Contoh 3: Contoh ini menjelaskan semua gateway pelanggan Anda.

```
Get-EC2CustomerGateway
```

- Untuk API detailnya, lihat DescribeCustomerGatewaysdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DescribeDhcpOptions`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribeDhcpOptions`.

CLI

AWS CLI

Contoh 1: Untuk menjelaskan DHCP pilihan Anda

`describe-dhcp-options`Contoh berikut mengambil rincian tentang DHCP pilihan Anda.

```
aws ec2 describe-dhcp-options
```

Output:

```
{
    "DhcpOptions": [
        {
            "DhcpConfigurations": [
                {
                    "Key": "domain-name",
                    "Values": [
                        {
                            "Value": "us-east-2.compute.internal"
                        }
                    ]
                },
                {
                    "Key": "domain-name-servers",
                    "Values": [
                        {
                            "Value": "AmazonProvidedDNS"
                        }
                    ]
                }
            ],
            "DhcpOptionsId": "dopt-19edf471",
            "OwnerId": "111122223333"
        },
        {
            "DhcpConfigurations": [
                {
                    "Key": "domain-name",
                    "Values": [
                        {
                            "Value": "us-east-2.compute.internal"
```

```
                        }
                    ]
                },
                {
                    "Key": "domain-name-servers",
                    "Values": [
                        {
                            "Value": "AmazonProvidedDNS"
                        }
                    ]
                }
            ],
            "DhcpOptionsId": "dopt-fEXAMPLE",
            "OwnerId": "111122223333"
        }
    ]
}
```

Untuk informasi selengkapnya, lihat Bekerja dengan Set DHCP Opsi di Panduan AWS VPC Pengguna.

Contoh 2: Untuk menjelaskan DHCP opsi Anda dan memfilter output

`describe-dhcp-options`Contoh berikut menjelaskan DHCP opsi Anda dan menggunakan filter untuk mengembalikan hanya DHCP opsi yang dimiliki `example.com` untuk server nama domain. Contoh menggunakan `--query` parameter untuk menampilkan hanya informasi konfigurasi dan ID dalam output.

```
aws ec2 describe-dhcp-options \
    --filters Name=key,Values=domain-name-servers Name=value,Values=example.com \
    --query "DhcpOptions[*].[DhcpConfigurations,DhcpOptionsId]"
```

Output:

```
[
    [
        [
            {
                "Key": "domain-name",
                "Values": [
                    {
                        "Value": "example.com"
```

```
                    }
                ]
            },
            {
                "Key": "domain-name-servers",
                "Values": [
                    {
                        "Value": "172.16.16.16"
                    }
                ]
            }
        ],
        "dopt-001122334455667ab"
    ]
]
```

Untuk informasi selengkapnya, lihat Bekerja dengan Set DHCP Opsi di Panduan AWS VPC Pengguna.

- Untuk API detailnya, lihat DescribeDhcpOptionsdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini mencantumkan set DHCP opsi Anda.

```
Get-EC2DhcpOption
```

Output:

```
DhcpConfigurations                    DhcpOptionsId    Tag
------------------                    -------------    ---
{domain-name, domain-name-servers}    dopt-1a2b3c4d    {}
{domain-name, domain-name-servers}    dopt-2a3b4c5d    {}
{domain-name-servers}                 dopt-3a4b5c6d    {}
```

Contoh 2: Contoh ini mendapatkan detail konfigurasi untuk set DHCP opsi yang ditentukan.

```
(Get-EC2DhcpOption -DhcpOptionsId dopt-1a2b3c4d).DhcpConfigurations
```

Output:

```
Key                    Values
---                    ------
domain-name            {abc.local}
domain-name-servers    {10.0.0.101, 10.0.0.102}
```

- Untuk API detailnya, lihat DescribeDhcpOptionsdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DescribeFlowLogs`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribeFlowLogs`.

CLI

AWS CLI

Contoh 1: Untuk mendeskripsikan semua log aliran Anda

`describe-flow-logs`Contoh berikut menampilkan detail untuk semua log aliran Anda.

```
aws ec2 describe-flow-logs
```

Output:

```
{
    "FlowLogs": [
        {
            "CreationTime": "2018-02-21T13:22:12.644Z",
            "DeliverLogsPermissionArn": "arn:aws:iam::123456789012:role/flow-
logs-role",
            "DeliverLogsStatus": "SUCCESS",
            "FlowLogId": "fl-aabbccdd112233445",
            "MaxAggregationInterval": 600,
            "FlowLogStatus": "ACTIVE",
            "LogGroupName": "FlowLogGroup",
            "ResourceId": "subnet-12345678901234567",
            "TrafficType": "ALL",
```

```
            "LogDestinationType": "cloud-watch-logs",
            "LogFormat": "${version} ${account-id} ${interface-id} ${srcaddr}
 ${dstaddr} ${srcport} ${dstport} ${protocol} ${packets} ${bytes} ${start} ${end}
 ${action} ${log-status}"
        },
        {
            "CreationTime": "2020-02-04T15:22:29.986Z",
            "DeliverLogsStatus": "SUCCESS",
            "FlowLogId": "fl-01234567890123456",
            "MaxAggregationInterval": 60,
            "FlowLogStatus": "ACTIVE",
            "ResourceId": "vpc-00112233445566778",
            "TrafficType": "ACCEPT",
            "LogDestinationType": "s3",
            "LogDestination": "arn:aws:s3:::my-flow-log-bucket/custom",
            "LogFormat": "${version} ${vpc-id} ${subnet-id} ${instance-id}
 ${interface-id} ${account-id} ${type} ${srcaddr} ${dstaddr} ${srcport}
 ${dstport} ${pkt-srcaddr} ${pkt-dstaddr} ${protocol} ${bytes} ${packets}
 ${start} ${end} ${action} ${tcp-flags} ${log-status}"
        }
    ]
}
```

Contoh 2: Untuk mendeskripsikan subset dari log aliran Anda

`describe-flow-logs`Contoh berikut menggunakan filter untuk menampilkan detail hanya untuk log aliran yang ada di grup log yang ditentukan di Amazon CloudWatch Logs.

```
aws ec2 describe-flow-logs \
    --filter "Name=log-group-name,Values=MyFlowLogs"
```

- Untuk API detailnya, lihat DescribeFlowLogsdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menjelaskan satu atau lebih flow log dengan tipe tujuan log 's3'

```
Get-EC2FlowLog -Filter @{Name="log-destination-type";Values="s3"}
```

Output:

```
CreationTime             : 2/25/2019 9:07:36 PM
DeliverLogsErrorMessage  :
DeliverLogsPermissionArn :
DeliverLogsStatus        : SUCCESS
FlowLogId                : fl-01b2e3d45f67f8901
FlowLogStatus            : ACTIVE
LogDestination           : arn:aws:s3:::my-bucket-dd-tata
LogDestinationType       : s3
LogGroupName             :
ResourceId               : eni-01d2dda3456b7e890
TrafficType              : ALL
```

- Untuk API detailnya, lihat DescribeFlowLogsdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DescribeHostReservationOfferings`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribeHostReservationOfferings`.

CLI

AWS CLI

Untuk menjelaskan penawaran Reservasi Tuan Rumah Khusus

Contoh ini menjelaskan Reservasi Tuan Rumah Khusus untuk keluarga instans M4 yang tersedia untuk dibeli.

Perintah:

```
aws ec2 describe-host-reservation-offerings --filter Name=instance-
family,Values=m4
```

Output:

```
{
  "OfferingSet": [
      {
          "HourlyPrice": "1.499",
```

```
            "OfferingId": "hro-03f707bf363b6b324",
            "InstanceFamily": "m4",
            "PaymentOption": "NoUpfront",
            "UpfrontPrice": "0.000",
            "Duration": 31536000
        },
        {
            "HourlyPrice": "1.045",
            "OfferingId": "hro-0ef9181cabdef7a02",
            "InstanceFamily": "m4",
            "PaymentOption": "NoUpfront",
            "UpfrontPrice": "0.000",
            "Duration": 94608000
        },
        {
            "HourlyPrice": "0.714",
            "OfferingId": "hro-04567a15500b92a51",
            "InstanceFamily": "m4",
            "PaymentOption": "PartialUpfront",
            "UpfrontPrice": "6254.000",
            "Duration": 31536000
        },
        {
            "HourlyPrice": "0.484",
            "OfferingId": "hro-0d5d7a9d23ed7fbfe",
            "InstanceFamily": "m4",
            "PaymentOption": "PartialUpfront",
            "UpfrontPrice": "12720.000",
            "Duration": 94608000
        },
        {
            "HourlyPrice": "0.000",
            "OfferingId": "hro-05da4108ca998c2e5",
            "InstanceFamily": "m4",
            "PaymentOption": "AllUpfront",
            "UpfrontPrice": "23913.000",
            "Duration": 94608000
        },
        {
            "HourlyPrice": "0.000",
            "OfferingId": "hro-0a9f9be3b95a3dc8f",
            "InstanceFamily": "m4",
            "PaymentOption": "AllUpfront",
            "UpfrontPrice": "12257.000",
```

```
            "Duration": 31536000
        }
    ]
}
```

- Untuk API detailnya, lihat DescribeHostReservationOfferingsdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menjelaskan reservasi Host Khusus yang tersedia untuk dibeli untuk filter yang diberikan 'instance-family' di mana " PaymentOption NoUpfront

```
Get-EC2HostReservationOffering -Filter @{Name="instance-family";Values="m4"} |
 Where-Object PaymentOption -eq NoUpfront
```

Output:

```
CurrencyCode   :
Duration       : 94608000
HourlyPrice    : 1.307
InstanceFamily : m4
OfferingId     : hro-0c1f234567890d9ab
PaymentOption  : NoUpfront
UpfrontPrice   : 0.000

CurrencyCode   :
Duration       : 31536000
HourlyPrice    : 1.830
InstanceFamily : m4
OfferingId     : hro-04ad12aaaf34b5a67
PaymentOption  : NoUpfront
UpfrontPrice   : 0.000
```

- Untuk API detailnya, lihat DescribeHostReservationOfferingsdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DescribeHosts`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribeHosts`.

CLI

AWS CLI

Untuk melihat detail tentang Host Khusus

`describe-hosts`Contoh berikut menampilkan detail untuk Host `available` Khusus di AWS akun Anda.

```
aws ec2 describe-hosts --filter "Name=state,Values=available"
```

Output:

```
{
    "Hosts": [
        {
            "HostId": "h-07879acf49EXAMPLE",
            "Tags": [
                {
                    "Value": "production",
                    "Key": "purpose"
                }
            ],
            "HostProperties": {
                "Cores": 48,
                "TotalVCpus": 96,
                "InstanceType": "m5.large",
                "Sockets": 2
            },
            "Instances": [],
            "State": "available",
            "AvailabilityZone": "eu-west-1a",
            "AvailableCapacity": {
                "AvailableInstanceCapacity": [
```

```
                    {
                        "AvailableCapacity": 48,
                        "InstanceType": "m5.large",
                        "TotalCapacity": 48
                    }
                ],
                "AvailableVCpus": 96
            },
            "HostRecovery": "on",
            "AllocationTime": "2019-08-19T08:57:44.000Z",
            "AutoPlacement": "off"
        }
    ]
}
```

Untuk informasi selengkapnya, lihat Melihat Host Khusus di Panduan Pengguna Amazon Elastic Compute Cloud untuk Instans Linux.

- Untuk API detailnya, lihat DescribeHostsdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini mengembalikan rincian EC2 host

```
Get-EC2Host
```

Output:

```
AllocationTime    : 3/23/2019 4:55:22 PM
AutoPlacement     : off
AvailabilityZone  : eu-west-1b
AvailableCapacity : Amazon.EC2.Model.AvailableCapacity
ClientToken       :
HostId            : h-01e23f4cd567890f1
HostProperties    : Amazon.EC2.Model.HostProperties
HostReservationId :
Instances         : {}
ReleaseTime       : 1/1/0001 12:00:00 AM
State             : available
Tags              : {}
```

Contoh 2: Contoh ini menanyakan host AvailableInstanceCapacity h-01e23f4cd567899f1

```
Get-EC2Host -HostId h-01e23f4cd567899f1 | Select-Object -ExpandProperty
 AvailableCapacity | Select-Object -expand AvailableInstanceCapacity
```

Output:

```
AvailableCapacity InstanceType TotalCapacity
----------------- ------------ -------------
11                m4.xlarge    11
```

- Untuk API detailnya, lihat DescribeHostsdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DescribeIamInstanceProfileAssociations`** dengan AWS SDK atau CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribeIamInstanceProfileAssociations`.

Contoh tindakan adalah kutipan kode dari program yang lebih besar dan harus dijalankan dalam konteks. Anda dapat melihat tindakan ini dalam konteks dalam contoh kode berikut:

- Membangun dan mengelola layanan yang tangguh

.NET

AWS SDK for .NET

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    /// <summary>
```

```
    /// Get the instance profile association data for an instance.
    /// </summary>
    /// <param name="instanceId">The Id of the instance.</param>
    /// <returns>Instance profile associations data.</returns>
    public async Task<IamInstanceProfileAssociation> GetInstanceProfile(string
instanceId)
    {
        try
        {
            var response = await
_amazonEc2.DescribeIamInstanceProfileAssociationsAsync(
                new DescribeIamInstanceProfileAssociationsRequest()
                {
                    Filters = new List<Amazon.EC2.Model.Filter>()
                    {
                        new("instance-id", new List<string>() { instanceId })
                    },
                });
            return response.IamInstanceProfileAssociations[0];
        }
        catch (AmazonEC2Exception ec2Exception)
        {
            if (ec2Exception.ErrorCode == "InvalidInstanceID.NotFound")
            {
                _logger.LogError(ec2Exception, $"Instance {instanceId} not
found");
            }

            throw;
        }
        catch (Exception ex)
        {
            _logger.LogError(ex, $"An error occurred while creating the
template.: {ex.Message}");
            throw;
        }
    }
```

- Untuk API detailnya, lihat DescribeIamInstanceProfileAssociationsdi AWS SDK for .NET APIReferensi.

CLI

AWS CLI

Untuk menggambarkan asosiasi profil IAM contoh

Contoh ini menjelaskan semua asosiasi profil IAM instans Anda.

Perintah:

```
aws ec2 describe-iam-instance-profile-associations
```

Output:

```
{
  "IamInstanceProfileAssociations": [
      {
          "InstanceId": "i-09eb09efa73ec1dee",
          "State": "associated",
          "AssociationId": "iip-assoc-0db249b1f25fa24b8",
          "IamInstanceProfile": {
              "Id": "AIPAJVQN4F5WVLGCJDRGM",
              "Arn": "arn:aws:iam::123456789012:instance-profile/admin-role"
          }
      },
      {
          "InstanceId": "i-0402909a2f4dffd14",
          "State": "associating",
          "AssociationId": "iip-assoc-0d1ec06278d29f44a",
          "IamInstanceProfile": {
              "Id": "AGJAJVQN4F5WVLGCJABCM",
              "Arn": "arn:aws:iam::123456789012:instance-profile/user1-role"
          }
      }
   ]
}
```

- Untuk API detailnya, lihat DescribeIamInstanceProfileAssociationsdi Referensi AWS CLI Perintah.

JavaScript

SDKuntuk JavaScript (v3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
const ec2Client = new EC2Client({});
const { IamInstanceProfileAssociations } = await ec2Client.send(
  new DescribeIamInstanceProfileAssociationsCommand({
    Filters: [
      { Name: "instance-id", Values: [state.targetInstance.InstanceId] },
    ],
  }),
);
```

- Untuk API detailnya, lihat DescribeIamInstanceProfileAssociationsdi AWS SDK for JavaScript APIReferensi.

Python

SDKuntuk Python (Boto3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
class AutoScalingWrapper:
    """
    Encapsulates Amazon EC2 Auto Scaling and EC2 management actions.
    """

    def __init__(
        self,
```

```
        resource_prefix: str,
        inst_type: str,
        ami_param: str,
        autoscaling_client: boto3.client,
        ec2_client: boto3.client,
        ssm_client: boto3.client,
        iam_client: boto3.client,
    ):
        """
        Initializes the AutoScaler class with the necessary parameters.

        :param resource_prefix: The prefix for naming AWS resources that are
created by this class.
        :param inst_type: The type of EC2 instance to create, such as t3.micro.
        :param ami_param: The Systems Manager parameter used to look up the AMI
that is created.
        :param autoscaling_client: A Boto3 EC2 Auto Scaling client.
        :param ec2_client: A Boto3 EC2 client.
        :param ssm_client: A Boto3 Systems Manager client.
        :param iam_client: A Boto3 IAM client.
        """
        self.inst_type = inst_type
        self.ami_param = ami_param
        self.autoscaling_client = autoscaling_client
        self.ec2_client = ec2_client
        self.ssm_client = ssm_client
        self.iam_client = iam_client
        sts_client = boto3.client("sts")
        self.account_id = sts_client.get_caller_identity()["Account"]

        self.key_pair_name = f"{resource_prefix}-key-pair"
        self.launch_template_name = f"{resource_prefix}-template-"
        self.group_name = f"{resource_prefix}-group"

        # Happy path
        self.instance_policy_name = f"{resource_prefix}-pol"
        self.instance_role_name = f"{resource_prefix}-role"
        self.instance_profile_name = f"{resource_prefix}-prof"

        # Failure mode
        self.bad_creds_policy_name = f"{resource_prefix}-bc-pol"
        self.bad_creds_role_name = f"{resource_prefix}-bc-role"
        self.bad_creds_profile_name = f"{resource_prefix}-bc-prof"
```

```
    def get_instance_profile(self, instance_id: str) -> Dict[str, Any]:
        """
        Gets data about the profile associated with an instance.

        :param instance_id: The ID of the instance to look up.
        :return: The profile data.
        """
        try:
            response =
self.ec2_client.describe_iam_instance_profile_associations(
                Filters=[{"Name": "instance-id", "Values": [instance_id]}]
            )
            if not response["IamInstanceProfileAssociations"]:
                log.info(f"No instance profile found for instance
{instance_id}.")
            profile_data = response["IamInstanceProfileAssociations"][0]
            log.info(f"Retrieved instance profile for instance {instance_id}.")
            return profile_data
        except ClientError as err:
            log.error(
                f"Failed to retrieve instance profile for instance
{instance_id}."
            )
            error_code = err.response["Error"]["Code"]
            if error_code == "InvalidInstanceID.NotFound":
                log.error(f"The instance ID '{instance_id}' does not exist.")
            log.error(f"Full error:\n\t{err}")
```

- Untuk API detailnya, lihat DescribeIamInstanceProfileAssociations AWSSDKReferensi Python (Boto3). API

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DescribeIdFormat`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribeIdFormat`.

CLI

AWS CLI

Contoh 1: Untuk mendeskripsikan format ID sumber daya

`describe-id-format`Contoh berikut menjelaskan format ID untuk grup keamanan.

```
aws ec2 describe-id-format \
    --resource security-group
```

Dalam contoh output berikut, `Deadline` nilai menunjukkan bahwa batas waktu untuk jenis sumber daya ini untuk secara permanen beralih dari format ID pendek ke format ID panjang berakhir pada 00:00 UTC pada tanggal 15 Agustus 2018.

```
{
    "Statuses": [
        {
            "Deadline": "2018-08-15T00:00:00.000Z",
            "Resource": "security-group",
            "UseLongIds": true
        }
    ]
}
```

Contoh 2: Untuk mendeskripsikan format ID untuk semua sumber daya

`describe-id-format`Contoh berikut menjelaskan format ID untuk semua jenis sumber daya. Semua jenis sumber daya yang mendukung format ID pendek dialihkan untuk menggunakan format ID panjang.

```
aws ec2 describe-id-format
```

- Untuk API detailnya, lihat DescribeIdFormatdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menjelaskan format ID untuk jenis sumber daya yang ditentukan.

```
Get-EC2IdFormat -Resource instance
```

Output:

```
Resource       UseLongIds
--------       ----------
instance       False
```

Contoh 2: Contoh ini menjelaskan format ID untuk semua jenis sumber daya yang mendukung lebih lamaIDs.

```
Get-EC2IdFormat
```

Output:

```
Resource       UseLongIds
--------       ----------
reservation    False
instance       False
```

- Untuk API detailnya, lihat DescribeIdFormatdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DescribeIdentityIdFormat`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribeIdentityIdFormat`.

CLI

AWS CLI

Untuk mendeskripsikan format ID untuk IAM peran

`describe-identity-id-format`Contoh berikut menjelaskan format ID yang diterima oleh instance yang dibuat oleh IAM peran `EC2Role` di AWS akun Anda.

```
aws ec2 describe-identity-id-format \
    --principal-arn arn:aws:iam::123456789012:role/my-iam-role \
    --resource instance
```

Output berikut menunjukkan bahwa instance yang dibuat oleh peran ini diterima IDs dalam format ID panjang.

```
{
    "Statuses": [
        {
            "Deadline": "2016-12-15T00:00:00Z",
            "Resource": "instance",
            "UseLongIds": true
        }
    ]
}
```

Untuk mendeskripsikan format ID untuk IAM pengguna

`describe-identity-id-format`Contoh berikut menjelaskan format ID yang diterima oleh snapshot yang dibuat oleh IAM pengguna `AdminUser` di AWS akun Anda.

```
aws ec2 describe-identity-id-format \
    --principal-arn arn:aws:iam::123456789012:user/AdminUser \
    --resource snapshot
```

Output menunjukkan bahwa snapshot yang dibuat oleh pengguna ini menerima IDs dalam format ID panjang.

```
{
    "Statuses": [
        {
            "Deadline": "2016-12-15T00:00:00Z",
            "Resource": "snapshot",
            "UseLongIds": true
        }
    ]
}
```

- Untuk API detailnya, lihat DescribeIdentityIdFormatdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini mengembalikan format ID untuk sumber 'image' untuk peran yang diberikan

```
Get-EC2IdentityIdFormat -PrincipalArn arn:aws:iam::123456789511:role/JDBC -
Resource image
```

Output:

```
Deadline             Resource UseLongIds
--------             -------- ----------
8/2/2018 11:30:00 PM image    True
```

- Untuk API detailnya, lihat DescribeIdentityIdFormatdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DescribeImageAttribute`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribeImageAttribute`.

CLI

AWS CLI

Untuk menjelaskan izin peluncuran untuk AMI

Contoh ini menjelaskan izin peluncuran untuk yang ditentukanAMI.

Perintah:

```
aws ec2 describe-image-attribute --image-id ami-5731123e --
attribute launchPermission
```

Output:

```
{
    "LaunchPermissions": [
        {
            "UserId": "123456789012"
        }
    ],
    "ImageId": "ami-5731123e",
}
```

Untuk mendeskripsikan kode produk untuk sebuah AMI

Contoh ini menjelaskan kode produk untuk yang ditentukanAMI. Perhatikan bahwa ini tidak AMI memiliki kode produk.

Perintah:

```
aws ec2 describe-image-attribute --image-id ami-5731123e --attribute productCodes
```

Output:

```
{
    "ProductCodes": [],
    "ImageId": "ami-5731123e",
}
```

- Untuk API detailnya, lihat DescribeImageAttributedi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini mendapatkan deskripsi untuk yang ditentukanAMI.

```
Get-EC2ImageAttribute -ImageId ami-12345678 -Attribute description
```

Output:

```
BlockDeviceMappings : {}
```

```
Description         : My image description
ImageId             : ami-12345678
KernelId            :
LaunchPermissions   : {}
ProductCodes        : {}
RamdiskId           :
SriovNetSupport     :
```

Contoh 2: Contoh ini mendapatkan izin peluncuran untuk yang ditentukanAMI.

```
Get-EC2ImageAttribute -ImageId ami-12345678 -Attribute launchPermission
```

Output:

```
BlockDeviceMappings : {}
Description         :
ImageId             : ami-12345678
KernelId            :
LaunchPermissions   : {all}
ProductCodes        : {}
RamdiskId           :
SriovNetSupport     :
```

Contoh 3: Contoh ini menguji apakah jaringan yang ditingkatkan diaktifkan.

```
Get-EC2ImageAttribute -ImageId ami-12345678 -Attribute sriovNetSupport
```

Output:

```
BlockDeviceMappings : {}
Description         :
ImageId             : ami-12345678
KernelId            :
LaunchPermissions   : {}
ProductCodes        : {}
RamdiskId           :
SriovNetSupport     : simple
```

- Untuk API detailnya, lihat DescribeImageAttributedi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DescribeImages`** dengan AWS SDK atau CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribeImages`.

Contoh tindakan adalah kutipan kode dari program yang lebih besar dan harus dijalankan dalam konteks. Anda dapat melihat tindakan ini dalam konteks dalam contoh kode berikut:

- Pelajari dasar-dasarnya

Bash

AWS CLI dengan skrip Bash

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
#############################################################################
# function ec2_describe_images
#
# This function describes one or more Amazon Elastic Compute Cloud (Amazon EC2)
 images.
#
# Parameters:
#       -i image_ids - A space-separated  list of image IDs (optional).
#       -h - Display help.
#
# And:
#       0 - If successful.
#       1 - If it fails.
#############################################################################
function ec2_describe_images() {
  local image_ids response
  local option OPTARG # Required to use getopts command in a function.
```

```
 # bashsupport disable=BP5008
 function usage() {
   echo "function ec2_describe_images"
   echo "Describes one or more Amazon Elastic Compute Cloud (Amazon EC2)
images."
   echo "  -i image_ids - A space-separated list of image IDs (optional)."
   echo "  -h - Display help."
   echo ""
 }

 # Retrieve the calling parameters.
 while getopts "i:h" option; do
   case "${option}" in
     i) image_ids="${OPTARG}" ;;
     h)
       usage
       return 0
       ;;
     \?)
       echo "Invalid parameter"
       usage
       return 1
       ;;
   esac
 done
 export OPTIND=1

 local aws_cli_args=()

 if [[ -n "$image_ids" ]]; then
   # shellcheck disable=SC2206
   aws_cli_args+=("--image-ids" $image_ids)
 fi

 response=$(aws ec2 describe-images \
   "${aws_cli_args[@]}" \
   --query 'Images[*].[Description,Architecture,ImageId]' \
   --output text) || {
   aws_cli_error_log ${?}
   errecho "ERROR: AWS reports describe-images operation failed.$response"
   return 1
 }

 echo "$response"
```

```
  return 0
}
```

Fungsi utilitas yang digunakan dalam contoh ini.

```
###############################################################################
# function errecho
#
# This function outputs everything sent to it to STDERR (standard error output).
###############################################################################
function errecho() {
  printf "%s\n" "$*" 1>&2
}

###############################################################################
# function aws_cli_error_log()
#
# This function is used to log the error messages from the AWS CLI.
#
# The function expects the following argument:
#         $1 - The error code returned by the AWS CLI.
#
#  Returns:
#          0: - Success.
#
###############################################################################
function aws_cli_error_log() {
  local err_code=$1
  errecho "Error code : $err_code"
  if [ "$err_code" == 1 ]; then
    errecho "  One or more S3 transfers failed."
  elif [ "$err_code" == 2 ]; then
    errecho "  Command line failed to parse."
  elif [ "$err_code" == 130 ]; then
    errecho "  Process received SIGINT."
  elif [ "$err_code" == 252 ]; then
    errecho "  Command syntax invalid."
  elif [ "$err_code" == 253 ]; then
    errecho "  The system environment or configuration was invalid."
  elif [ "$err_code" == 254 ]; then
    errecho "  The service returned an error."
```

```
  elif [ "$err_code" == 255 ]; then
    errecho "  255 is a catch-all error."
  fi

  return 0
}
```

- Untuk API detailnya, lihat DescribeImagesdi Referensi AWS CLI Perintah.

CLI

AWS CLI

Contoh 1: Untuk menggambarkan AMI

`describe-images`Contoh berikut menjelaskan yang ditentukan AMI di Wilayah tertentu.

```
aws ec2 describe-images \
    --region us-east-1 \
    --image-ids ami-1234567890EXAMPLE
```

Output:

```
{
    "Images": [
        {
            "VirtualizationType": "hvm",
            "Description": "Provided by Red Hat, Inc.",
            "PlatformDetails": "Red Hat Enterprise Linux",
            "EnaSupport": true,
            "Hypervisor": "xen",
            "State": "available",
            "SriovNetSupport": "simple",
            "ImageId": "ami-1234567890EXAMPLE",
            "UsageOperation": "RunInstances:0010",
            "BlockDeviceMappings": [
                {
                    "DeviceName": "/dev/sda1",
                    "Ebs": {
                        "SnapshotId": "snap-111222333444aaabb",
                        "DeleteOnTermination": true,
                        "VolumeType": "gp2",
```

```
                        "VolumeSize": 10,
                        "Encrypted": false
                    }
                }
            ],
            "Architecture": "x86_64",
            "ImageLocation": "123456789012/RHEL-8.0.0_HVM-20190618-x86_64-1-
Hourly2-GP2",
            "RootDeviceType": "ebs",
            "OwnerId": "123456789012",
            "RootDeviceName": "/dev/sda1",
            "CreationDate": "2019-05-10T13:17:12.000Z",
            "Public": true,
            "ImageType": "machine",
            "Name": "RHEL-8.0.0_HVM-20190618-x86_64-1-Hourly2-GP2"
        }
    ]
}
```

Untuk informasi selengkapnya, lihat Gambar Mesin Amazon (AMI) di Panduan EC2 Pengguna Amazon.

Contoh 2: Untuk mendeskripsikan AMIs berdasarkan filter

`describe-images`Contoh berikut menjelaskan Windows AMIs yang disediakan oleh Amazon yang didukung oleh AmazonEBS.

```
aws ec2 describe-images \
    --owners amazon \
    --filters "Name=platform,Values=windows" "Name=root-device-type,Values=ebs"
```

Untuk contoh output `describe-images`, lihat Contoh 1.

Untuk contoh tambahan menggunakan filter, lihat Mencantumkan dan memfilter sumber daya Anda di Panduan EC2 Pengguna Amazon.

Contoh 3: Untuk mendeskripsikan AMIs berdasarkan tag

`describe-images`Contoh berikut menjelaskan semua AMIs yang memiliki tag`Type=Custom`. Contoh menggunakan `--query` parameter untuk menampilkan hanya AMIIDs.

```
aws ec2 describe-images \
```

```
    --filters "Name=tag:Type,Values=Custom" \
    --query 'Images[*].[ImageId]' \
    --output text
```

Output:

```
ami-1234567890EXAMPLE
ami-0abcdef1234567890
```

Untuk contoh tambahan menggunakan filter tag, lihat Bekerja dengan tag di Panduan EC2 Pengguna Amazon.

- Untuk API detailnya, lihat DescribeImagesdi Referensi AWS CLI Perintah.

JavaScript

SDKuntuk JavaScript (v3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
import { EC2Client, paginateDescribeImages } from "@aws-sdk/client-ec2";

/**
 * Describes the specified images (AMIs, AKIs, and ARIs) available to you or all
 of the images available to you.
 * @param {{ architecture: string, pageSize: number }} options
 */
export const main = async ({ architecture, pageSize }) => {
  pageSize = Number.parseInt(pageSize);
  const client = new EC2Client({});

  // The paginate function is a wrapper around the base command.
  const paginator = paginateDescribeImages(
    // Without limiting the page size, this call can take a long time. pageSize
 is just sugar for
    // the MaxResults property in the base command.
    { client, pageSize },
```

```
    {
      // There are almost 70,000 images available. Be specific with your
 filtering
      // to increase efficiency.
      // See https://docs.aws.amazon.com/AWSJavaScriptSDK/v3/latest/clients/
client-ec2/interfaces/describeimagescommandinput.html#filters
      Filters: [{ Name: "architecture", Values: [architecture] }],
    },
  );

  /**
   * @type {import('@aws-sdk/client-ec2').Image[]}
   */
  const images = [];
  let recordsScanned = 0;

  try {
    for await (const page of paginator) {
      recordsScanned += pageSize;
      if (page.Images.length) {
        images.push(...page.Images);
        break;
      }
      console.log(
        `No matching image found yet. Searched ${recordsScanned} records.`,
      );
    }

    if (images.length) {
      console.log(
        `Found ${images.length} images:\n\n${images.map((image) =>
 image.Name).join("\n")}\n`,
      );
    } else {
      console.log(
        `No matching images found. Searched ${recordsScanned} records.\n`,
      );
    }

    return images;
  } catch (caught) {
    if (caught instanceof Error && caught.name === "InvalidParameterValue") {
      console.warn(`${caught.message}`);
      return [];
```

```
    }
    throw caught;
  }
};
```

- Untuk API detailnya, lihat DescribeImagesdi AWS SDK for JavaScript APIReferensi.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menjelaskan yang ditentukanAMI.

```
Get-EC2Image -ImageId ami-12345678
```

Output:

```
Architecture        : x86_64
BlockDeviceMappings : {/dev/xvda}
CreationDate        : 2014-10-20T00:56:28.000Z
Description         : My image
Hypervisor          : xen
ImageId             : ami-12345678
ImageLocation       : 123456789012/my-image
ImageOwnerAlias     :
ImageType           : machine
KernelId            :
Name                : my-image
OwnerId             : 123456789012
Platform            :
ProductCodes        : {}
Public              : False
RamdiskId           :
RootDeviceName      : /dev/xvda
RootDeviceType      : ebs
SriovNetSupport     : simple
State               : available
StateReason         :
Tags                : {Name}
VirtualizationType  : hvm
```

Contoh 2: Contoh ini menggambarkan AMIs yang Anda miliki.

```
Get-EC2Image -owner self
```

Contoh 3: Contoh ini menjelaskan publik AMIs yang menjalankan Microsoft Windows Server.

```
Get-EC2Image -Filter @{ Name="platform"; Values="windows" }
```

Contoh 4: Contoh ini menjelaskan semua publik AMIs di wilayah 'us-west-2'.

```
Get-EC2Image -Region us-west-2
```

- Untuk API detailnya, lihat DescribeImagesdi AWS Tools for PowerShell Referensi Cmdlet.

Python

SDKuntuk Python (Boto3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
class EC2InstanceWrapper:
    """Encapsulates Amazon Elastic Compute Cloud (Amazon EC2) instance actions
 using the client interface."""

    def __init__(
        self, ec2_client: Any, instances: Optional[List[Dict[str, Any]]] = None
    ) -> None:
        """
        Initializes the EC2InstanceWrapper with an EC2 client and optional
 instances.

        :param ec2_client: A Boto3 Amazon EC2 client. This client provides low-
level
                           access to AWS EC2 services.
        :param instances: A list of dictionaries representing Boto3 Instance
 objects. These are high-level objects that
```

```
                        wrap instance actions.
        """
        self.ec2_client = ec2_client
        self.instances = instances or []

    @classmethod
    def from_client(cls) -> "EC2InstanceWrapper":
        """
        Creates an EC2InstanceWrapper instance with a default EC2 client.

        :return: An instance of EC2InstanceWrapper initialized with the default
EC2 client.
        """
        ec2_client = boto3.client("ec2")
        return cls(ec2_client)


    def get_images(self, image_ids: List[str]) -> List[Dict[str, Any]]:
        """
        Gets information about Amazon Machine Images (AMIs) from a list of AMI
IDs.

        :param image_ids: The list of AMI IDs to look up.
        :return: A list of dictionaries representing the requested AMIs.
        """
        try:
            response = self.ec2_client.describe_images(ImageIds=image_ids)
            images = response["Images"]
        except ClientError as err:
            logger.error(f"Failed to stop AMI(s): {','.join(map(str,
image_ids))}")
            error_code = err.response["Error"]["Code"]
            if error_code == "InvalidAMIID.NotFound":
                logger.error("One or more of the AMI IDs does not exist.")
            raise
        return images
```

- Untuk API detailnya, lihat DescribeImages AWSSDKReferensi Python (Boto3). API

Rust

SDKuntuk Rust

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
   pub async fn list_images(&self, ids: Vec<Parameter>) -> Result<Vec<Image>,
EC2Error> {
       let image_ids = ids.into_iter().filter_map(|p| p.value).collect();
       let output = self
           .client
           .describe_images()
           .set_image_ids(Some(image_ids))
           .send()
           .await?;

       let images = output.images.unwrap_or_default();
       if images.is_empty() {
           Err(EC2Error::new("No images for selected AMIs"))
       } else {
           Ok(images)
       }
   }
```

Menggunakan fungsi list_images dengan SSM to limit berdasarkan lingkungan Anda. Untuk detail lebih lanjut tentangSSM, lihat https://docs.aws.amazon.com/systems-manager/ latest/ userguide/example GetParameters _ssm_ _section.html.

```
   async fn find_image(&mut self) -> Result<ScenarioImage, EC2Error> {
       let params: Vec<Parameter> = self
           .ssm
           .list_path("/aws/service/ami-amazon-linux-latest")
           .await
           .map_err(|e| e.add_message("Could not find parameters for available
images"))?
           .into_iter()
```

```
            .filter(|param| param.name().is_some_and(|name|
 name.contains("amzn2")))
            .collect();
        let amzn2_images: Vec<ScenarioImage> = self
            .ec2
            .list_images(params)
            .await
            .map_err(|e| e.add_message("Could not find images"))?
            .into_iter()
            .map(ScenarioImage::from)
            .collect();
        println!("We will now create an instance from an Amazon Linux 2 AMI");
        let ami = self.util.select_scenario_image(amzn2_images)?;
        Ok(ami)
    }
```

- Untuk API detailnya, lihat DescribeImages AWSSDKAPIreferensi Rust.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DescribeImportImageTasks`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribeImportImageTasks`.

CLI

AWS CLI

Untuk memantau tugas impor gambar

`describe-import-image-tasks`Contoh berikut memeriksa status tugas gambar impor yang ditentukan.

```
aws ec2 describe-import-image-tasks \
    --import-task-ids import-ami-1234567890abcdef0
```

Output untuk tugas impor gambar yang sedang berlangsung.

```
{
```

```
    "ImportImageTasks": [
        {
            "ImportTaskId": "import-ami-1234567890abcdef0",
            "Progress": "28",
            "SnapshotDetails": [
                {
                    "DiskImageSize": 705638400.0,
                    "Format": "ova",
                    "Status": "completed",
                    "UserBucket": {
                        "S3Bucket": "my-import-bucket",
                        "S3Key": "vms/my-server-vm.ova"
                    }
                }
            ],
            "Status": "active",
            "StatusMessage": "converting"
        }
    ]
}
```

Output untuk tugas gambar impor yang selesai. ID yang dihasilkan AMI disediakan oleh`ImageId`.

```
{
    "ImportImageTasks": [
        {
            "ImportTaskId": "import-ami-1234567890abcdef0",
            "ImageId": "ami-1234567890abcdef0",
            "SnapshotDetails": [
                {
                    "DiskImageSize": 705638400.0,
                    "Format": "ova",
                    "SnapshotId": "snap-1234567890abcdef0"
                    "Status": "completed",
                    "UserBucket": {
                        "S3Bucket": "my-import-bucket",
                        "S3Key": "vms/my-server-vm.ova"
                    }
                }
            ],
            "Status": "completed"
        }
```

```
    ]
}
```

- Untuk API detailnya, lihat DescribeImportImageTasksdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menjelaskan tugas impor gambar yang ditentukan.

```
Get-EC2ImportImageTask -ImportTaskId import-ami-hgfedcba
```

Output:

```
Architecture    : x86_64
Description     : Windows Image 2
Hypervisor      :
ImageId         : ami-1a2b3c4d
ImportTaskId    : import-ami-hgfedcba
LicenseType     : AWS
Platform        : Windows
Progress        :
SnapshotDetails : {/dev/sda1}
Status          : completed
StatusMessage   :
```

Contoh 2: Contoh ini menjelaskan semua tugas impor gambar Anda.

```
Get-EC2ImportImageTask
```

Output:

```
Architecture    :
Description     : Windows Image 1
Hypervisor      :
ImageId         :
ImportTaskId    : import-ami-abcdefgh
LicenseType     : AWS
Platform        : Windows
```

```
Progress        :
SnapshotDetails : {}
Status          : deleted
StatusMessage   : User initiated task cancelation

Architecture    : x86_64
Description     : Windows Image 2
Hypervisor      :
ImageId         : ami-1a2b3c4d
ImportTaskId    : import-ami-hgfedcba
LicenseType     : AWS
Platform        : Windows
Progress        :
SnapshotDetails : {/dev/sda1}
Status          : completed
StatusMessage   :
```

- Untuk API detailnya, lihat DescribeImportImageTasksdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DescribeImportSnapshotTasks`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribeImportSnapshotTasks`.

CLI

AWS CLI

Untuk memantau tugas snapshot impor

`describe-import-snapshot-tasks`Contoh berikut memeriksa status tugas snapshot impor yang ditentukan.

```
aws ec2 describe-import-snapshot-tasks \
    --import-task-ids import-snap-1234567890abcdef0
```

Output untuk tugas snapshot impor yang sedang berlangsung:

```
{
    "ImportSnapshotTasks": [
        {
            "Description": "My server VMDK",
            "ImportTaskId": "import-snap-1234567890abcdef0",
            "SnapshotTaskDetail": {
                "Description": "My server VMDK",
                "DiskImageSize": "705638400.0",
                "Format": "VMDK",
                "Progress": "42",
                "Status": "active",
                "StatusMessage": "downloading/converting",
                "UserBucket": {
                    "S3Bucket": "my-import-bucket",
                    "S3Key": "vms/my-server-vm.vmdk"
                }
            }
        }
    ]
}
```

Output untuk tugas snapshot impor yang selesai. ID snapshot yang dihasilkan disediakan olehSnapshotId.

```
{
    "ImportSnapshotTasks": [
        {
            "Description": "My server VMDK",
            "ImportTaskId": "import-snap-1234567890abcdef0",
            "SnapshotTaskDetail": {
                "Description": "My server VMDK",
                "DiskImageSize": "705638400.0",
                "Format": "VMDK",
                "SnapshotId": "snap-1234567890abcdef0"
                "Status": "completed",
                "UserBucket": {
                    "S3Bucket": "my-import-bucket",
                    "S3Key": "vms/my-server-vm.vmdk"
                }
            }
        }
    ]
```

```
}
```

- Untuk API detailnya, lihat DescribeImportSnapshotTasksdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menjelaskan tugas impor snapshot yang ditentukan.

```
Get-EC2ImportSnapshotTask -ImportTaskId import-snap-abcdefgh
```

Output:

```
Description             ImportTaskId               SnapshotTaskDetail

-----------------       --------------------       ------------------

Disk Image Import 1     import-snap-abcdefgh
 Amazon.EC2.Model.SnapshotTaskDetail
```

Contoh 2: Contoh ini menjelaskan semua tugas impor snapshot Anda.

```
Get-EC2ImportSnapshotTask
```

Output:

```
Description             ImportTaskId               SnapshotTaskDetail

-----------------       --------------------       ------------------

Disk Image Import 1     import-snap-abcdefgh
 Amazon.EC2.Model.SnapshotTaskDetail
Disk Image Import 2     import-snap-hgfedcba
 Amazon.EC2.Model.SnapshotTaskDetail
```

- Untuk API detailnya, lihat DescribeImportSnapshotTasksdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan `DescribeInstanceAttribute` dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribeInstanceAttribute`.

CLI

AWS CLI

Untuk menggambarkan jenis instance

Contoh ini menjelaskan jenis instance dari instance yang ditentukan.

Perintah:

```
aws ec2 describe-instance-attribute --instance-id i-1234567890abcdef0 --
attribute instanceType
```

Output:

```
{
    "InstanceId": "i-1234567890abcdef0"
    "InstanceType": {
        "Value": "t1.micro"
    }
}
```

Untuk menggambarkan disableApiTermination atribut

Contoh ini menjelaskan `disableApiTermination` atribut dari contoh yang ditentukan.

Perintah:

```
aws ec2 describe-instance-attribute --instance-id i-1234567890abcdef0 --
attribute disableApiTermination
```

Output:

```
{
"InstanceId": "i-1234567890abcdef0"
    "DisableApiTermination": {
        "Value": "false"
    }
}
```

Untuk mendeskripsikan pemetaan perangkat blok untuk sebuah instance

Contoh ini menjelaskan `blockDeviceMapping` atribut dari contoh yang ditentukan.

Perintah:

```
aws ec2 describe-instance-attribute --instance-id i-1234567890abcdef0 --
attribute blockDeviceMapping
```

Output:

```
{
    "InstanceId": "i-1234567890abcdef0"
    "BlockDeviceMappings": [
        {
            "DeviceName": "/dev/sda1",
            "Ebs": {
                "Status": "attached",
                "DeleteOnTermination": true,
                "VolumeId": "vol-049df61146c4d7901",
                "AttachTime": "2013-05-17T22:42:34.000Z"
            }
        },
        {
            "DeviceName": "/dev/sdf",
            "Ebs": {
                "Status": "attached",
                "DeleteOnTermination": false,
                "VolumeId": "vol-049df61146c4d7901",
                "AttachTime": "2013-09-10T23:07:00.000Z"
            }
        }
    ],
}
```

- Untuk API detailnya, lihat DescribeInstanceAttributedi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menjelaskan jenis instance dari instance yang ditentukan.

```
Get-EC2InstanceAttribute -InstanceId i-12345678 -Attribute instanceType
```

Output:

```
InstanceType                     : t2.micro
```

Contoh 2: Contoh ini menjelaskan apakah jaringan yang disempurnakan diaktifkan untuk instance tertentu.

```
Get-EC2InstanceAttribute -InstanceId i-12345678 -Attribute sriovNetSupport
```

Output:

```
SriovNetSupport                  : simple
```

Contoh 3: Contoh ini menjelaskan grup keamanan untuk instance tertentu.

```
(Get-EC2InstanceAttribute -InstanceId i-12345678 -Attribute groupSet).Groups
```

Output:

```
GroupId
-------
sg-12345678
sg-45678901
```

Contoh 4: Contoh ini menjelaskan apakah EBS optimasi diaktifkan untuk instance tertentu.

```
Get-EC2InstanceAttribute -InstanceId i-12345678 -Attribute ebsOptimized
```

Output:

```
EbsOptimized                    : False
```

Contoh 5: Contoh ini menjelaskan atribut disableApiTermination " dari contoh yang ditentukan.

```
Get-EC2InstanceAttribute -InstanceId i-12345678 -Attribute disableApiTermination
```

Output:

```
DisableApiTermination           : False
```

Contoh 6: Contoh ini menjelaskan atribut 'instanceInitiatedShutdownPerilaku' dari contoh yang ditentukan.

```
Get-EC2InstanceAttribute -InstanceId i-12345678 -Attribute
 instanceInitiatedShutdownBehavior
```

Output:

```
InstanceInitiatedShutdownBehavior : stop
```

- Untuk API detailnya, lihat DescribeInstanceAttributedi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DescribeInstanceStatus`** dengan AWS SDK atau CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribeInstanceStatus`.

CLI

AWS CLI

Untuk menjelaskan status instans

Contoh `describe-instance-status` berikut menjelaskan status saat ini dari instans tertentu.

```
aws ec2 describe-instance-status \
    --instance-ids i-1234567890abcdef0
```

Output:

```
{
    "InstanceStatuses": [
        {
            "InstanceId": "i-1234567890abcdef0",
            "InstanceState": {
                "Code": 16,
                "Name": "running"
            },
            "AvailabilityZone": "us-east-1d",
            "SystemStatus": {
                "Status": "ok",
                "Details": [
                    {
                        "Status": "passed",
                        "Name": "reachability"
                    }
                ]
            },
            "InstanceStatus": {
                "Status": "ok",
                "Details": [
                    {
                        "Status": "passed",
                        "Name": "reachability"
                    }
                ]
            }
        }
    ]
}
```

Untuk informasi selengkapnya, lihat Memantau status instans Anda di Panduan EC2 Pengguna Amazon.

- Untuk API detailnya, lihat DescribeInstanceStatusdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menjelaskan status instance yang ditentukan.

```
Get-EC2InstanceStatus -InstanceId i-12345678
```

Output:

```
AvailabilityZone : us-west-2a
Events           : {}
InstanceId       : i-12345678
InstanceState    : Amazon.EC2.Model.InstanceState
Status           : Amazon.EC2.Model.InstanceStatusSummary
SystemStatus     : Amazon.EC2.Model.InstanceStatusSummary
```

```
$status = Get-EC2InstanceStatus -InstanceId i-12345678
$status.InstanceState
```

Output:

```
Code    Name
----    ----
16      running
```

```
$status.Status
```

Output:

```
Details           Status
-------           ------
{reachability}    ok
```

```
$status.SystemStatus
```

Output:

```
Details           Status
-------           ------
```

```
{reachability}    ok
```

- Untuk API detailnya, lihat DescribeInstanceStatusdi AWS Tools for PowerShell Referensi Cmdlet.

Rust

SDKuntuk Rust

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
async fn show_all_events(client: &Client) -> Result<(), Error> {
    let resp = client.describe_regions().send().await.unwrap();

    for region in resp.regions.unwrap_or_default() {
        let reg: &'static str =
 Box::leak(Box::from(region.region_name().unwrap()));
        let region_provider =
 RegionProviderChain::default_provider().or_else(reg);
        let config = aws_config::from_env().region(region_provider).load().await;
        let new_client = Client::new(&config);

        let resp = new_client.describe_instance_status().send().await;

        println!("Instances in region {}:", reg);
        println!();

        for status in resp.unwrap().instance_statuses() {
            println!(
                "  Events scheduled for instance ID: {}",
                status.instance_id().unwrap_or_default()
            );
            for event in status.events() {
                println!("    Event ID:     {}",
 event.instance_event_id().unwrap());
                println!("    Description:  {}", event.description().unwrap());
                println!("    Event code:   {}", event.code().unwrap().as_ref());
```

```
                println!();
            }
        }
    }

    Ok(())
}
```

- Untuk API detailnya, lihat DescribeInstanceStatus AWSSDKAPIreferensi Rust.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DescribeInstanceTypes`** dengan AWS SDK atau CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribeInstanceTypes`.

Contoh tindakan adalah kutipan kode dari program yang lebih besar dan harus dijalankan dalam konteks. Anda dapat melihat tindakan ini dalam konteks dalam contoh kode berikut:

- Pelajari dasar-dasarnya

.NET

AWS SDK for .NET

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    /// <summary>
    /// Describe the instance types available.
    /// </summary>
    /// <returns>A list of instance type information.</returns>
    public async Task<List<InstanceTypeInfo>>
DescribeInstanceTypes(ArchitectureValues architecture)
```

```
    {
        try
        {
            var request = new DescribeInstanceTypesRequest();

            var filters = new List<Filter>
            {
                new Filter("processor-info.supported-architecture",
                    new List<string> { architecture.ToString() })
            };
            filters.Add(new Filter("instance-type", new() { "*.micro",
"*.small" }));

            request.Filters = filters;
            var instanceTypes = new List<InstanceTypeInfo>();

            var paginator = _amazonEC2.Paginators.DescribeInstanceTypes(request);
            await foreach (var instanceType in paginator.InstanceTypes)
            {
                instanceTypes.Add(instanceType);
            }

            return instanceTypes;
        }
        catch (AmazonEC2Exception ec2Exception)
        {
            if (ec2Exception.ErrorCode == "InvalidParameterValue")
            {
                _logger.LogError(
                    $"Parameters are invalid. Ensure architecture and size
strings conform to DescribeInstanceTypes API reference.");
            }

            throw;
        }
        catch (Exception ex)
        {
            Console.WriteLine($"Couldn't delete the security group because:
{ex.Message}");
            throw;
        }
    }
```

- Untuk API detailnya, lihat DescribeInstanceTypesdi AWS SDK for .NET APIReferensi.

## Bash

### AWS CLI dengan skrip Bash

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
##############################################################################
# ec2_describe_instance_types
#
# This function describes EC2 instance types filtered by processor architecture
# and optionally by instance type. It takes the following arguments:
#
# -a, --architecture ARCHITECTURE  Specify the processor architecture (e.g.,
 x86_64)
# -t, --type INSTANCE_TYPE         Comma-separated list of instance types (e.g.,
 t2.micro)
# -h, --help                       Show the usage help
#
# The function prints the instance type and supported architecture for each
# matching instance type.
##############################################################################
function ec2_describe_instance_types() {
  local architecture=""
  local instance_types=""

  # bashsupport disable=BP5008
  function usage() {
    echo "Usage: ec2_describe_instance_types [-a|--architecture ARCHITECTURE] [-
t|--type INSTANCE_TYPE] [-h|--help]"
    echo "  -a, --architecture ARCHITECTURE  Specify the processor architecture
 (e.g., x86_64)"
    echo "  -t, --type INSTANCE_TYPE         Comma-separated list of instance
 types (e.g., t2.micro)"
    echo "  -h, --help                       Show this help message"
  }
```

```
  while [[ $# -gt 0 ]]; do
    case "$1" in
      -a | --architecture)
        architecture="$2"
        shift 2
        ;;
      -t | --type)
        instance_types="$2"
        shift 2
        ;;
      -h | --help)
        usage
        return 0
        ;;
      *)
        echo "Unknown argument: $1"
        return 1
        ;;
    esac
  done

  if [[ -z "$architecture" ]]; then
    errecho "Error: Architecture not specified."
    usage
    return 1
  fi

  if [[ -z "$instance_types" ]]; then
    errecho "Error: Instance type not specified."
    usage
    return 1
  fi

  local tmp_json_file="temp_ec2.json"
  echo -n '[
    {
      "Name": "processor-info.supported-architecture",
      "Values": [' >"$tmp_json_file"

  local items
  IFS=',' read -ra items <<<"$architecture"
  local array_size
  array_size=${#items[@]}
  for i in $(seq 0 $((array_size - 1))); do
```

```
    echo -n '"'"${items[$i]}"'"' >>"$tmp_json_file"
    if [[ $i -lt $((array_size - 1)) ]]; then
      echo -n ',' >>"$tmp_json_file"
    fi
  done
  echo -n ']},
    {
    "Name": "instance-type",
      "Values": [' >>"$tmp_json_file"
  IFS=',' read -ra items <<<"$instance_types"
  local array_size
  array_size=${#items[@]}
  for i in $(seq 0 $((array_size - 1))); do
    echo -n '"'"${items[$i]}"'"' >>"$tmp_json_file"
    if [[ $i -lt $((array_size - 1)) ]]; then
      echo -n ',' >>"$tmp_json_file"
    fi
  done

  echo -n ']}]' >>"$tmp_json_file"

  local response
  response=$(aws ec2 describe-instance-types --filters file://"$tmp_json_file" \
    --query 'InstanceTypes[*].[InstanceType]' --output text)

  local error_code=$?

  rm "$tmp_json_file"

  if [[ $error_code -ne 0 ]]; then
    aws_cli_error_log $error_code
    echo "ERROR: AWS reports describe-instance-types operation failed."
    return 1
  fi

  echo "$response"
  return 0
}
```

Fungsi utilitas yang digunakan dalam contoh ini.

```
###############################################################################
```

```
# function errecho
#
# This function outputs everything sent to it to STDERR (standard error output).
#############################################################################
function errecho() {
  printf "%s\n" "$*" 1>&2
}

#############################################################################
# function aws_cli_error_log()
#
# This function is used to log the error messages from the AWS CLI.
#
# The function expects the following argument:
#         $1 - The error code returned by the AWS CLI.
#
#  Returns:
#          0: - Success.
#
#############################################################################
function aws_cli_error_log() {
  local err_code=$1
  errecho "Error code : $err_code"
  if [ "$err_code" == 1 ]; then
    errecho "  One or more S3 transfers failed."
  elif [ "$err_code" == 2 ]; then
    errecho "  Command line failed to parse."
  elif [ "$err_code" == 130 ]; then
    errecho "  Process received SIGINT."
  elif [ "$err_code" == 252 ]; then
    errecho "  Command syntax invalid."
  elif [ "$err_code" == 253 ]; then
    errecho "  The system environment or configuration was invalid."
  elif [ "$err_code" == 254 ]; then
    errecho "  The service returned an error."
  elif [ "$err_code" == 255 ]; then
    errecho "  255 is a catch-all error."
  fi

  return 0
}
```

- Untuk API detailnya, lihat DescribeInstanceTypesdi Referensi AWS CLI Perintah.

## CLI

### AWS CLI

#### Contoh 1: Untuk menjelaskan tipe instans

Contoh `describe-instance-types` berikut menampilkan detail untuk tipe instans tertentu.

```
aws ec2 describe-instance-types \
    --instance-types t2.micro
```

Output:

```
{
    "InstanceTypes": [
        {
            "InstanceType": "t2.micro",
            "CurrentGeneration": true,
            "FreeTierEligible": true,
            "SupportedUsageClasses": [
                "on-demand",
                "spot"
            ],
            "SupportedRootDeviceTypes": [
                "ebs"
            ],
            "BareMetal": false,
            "Hypervisor": "xen",
            "ProcessorInfo": {
                "SupportedArchitectures": [
                    "i386",
                    "x86_64"
                ],
                "SustainedClockSpeedInGhz": 2.5
            },
            "VCpuInfo": {
                "DefaultVCpus": 1,
                "DefaultCores": 1,
                "DefaultThreadsPerCore": 1,
                "ValidCores": [
                    1
                ],
                "ValidThreadsPerCore": [
```

```
                    1
                ]
            },
            "MemoryInfo": {
                "SizeInMiB": 1024
            },
            "InstanceStorageSupported": false,
            "EbsInfo": {
                "EbsOptimizedSupport": "unsupported",
                "EncryptionSupport": "supported"
            },
            "NetworkInfo": {
                "NetworkPerformance": "Low to Moderate",
                "MaximumNetworkInterfaces": 2,
                "Ipv4AddressesPerInterface": 2,
                "Ipv6AddressesPerInterface": 2,
                "Ipv6Supported": true,
                "EnaSupport": "unsupported"
            },
            "PlacementGroupInfo": {
                "SupportedStrategies": [
                    "partition",
                    "spread"
                ]
            },
            "HibernationSupported": false,
            "BurstablePerformanceSupported": true,
            "DedicatedHostsSupported": false,
            "AutoRecoverySupported": true
        }
    ]
}
```

Untuk informasi selengkapnya, lihat Jenis Instans di Panduan Pengguna Amazon Elastic Compute Cloud untuk Instans Linux.

Contoh 2: Untuk memfilter tipe instans yang tersedia

Anda dapat menentukan filter guna mencakup hasil untuk tipe instans yang memiliki karakteristik khusus. Contoh `describe-instance-types` berikut mencantumkan tipe instans yang mendukung hibernasi.

```
aws ec2 describe-instance-types \
```

```
    --filters Name=hibernation-supported,Values=true --query
'InstanceTypes[*].InstanceType'
```

Output:

```
[
    "m5.8xlarge",
    "r3.large",
    "c3.8xlarge",
    "r5.large",
    "m4.4xlarge",
    "c4.large",
    "m5.xlarge",
    "m4.xlarge",
    "c3.large",
    "c4.8xlarge",
    "c4.4xlarge",
    "c5.xlarge",
    "c5.12xlarge",
    "r5.4xlarge",
    "c5.4xlarge"
]
```

Untuk informasi selengkapnya, lihat Jenis Instans di Panduan Pengguna Amazon Elastic Compute Cloud untuk Instans Linux.

- Untuk API detailnya, lihat DescribeInstanceTypesdi Referensi AWS CLI Perintah.

Java

SDKuntuk Java 2.x

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    /**
     * Asynchronously retrieves the instance types available in the current AWS
region.
```

```
    * <p>
    * This method uses the AWS SDK's asynchronous API to fetch the available
instance types
    * and then processes the response. It logs the memory information, network
information,
    * and instance type for each instance type returned. Additionally, it
returns a
    * {@link CompletableFuture} that resolves to the instance type string for
the "t2.2xlarge"
    * instance type, if it is found in the response. If the "t2.2xlarge"
instance type is not
    * found, an empty string is returned.
    * </p>
    *
    * @return a {@link CompletableFuture} that resolves to the instance type
string for the
    * "t2.2xlarge" instance type, or an empty string if the instance type is not
found
    */
   public CompletableFuture<String> getInstanceTypesAsync() {
       DescribeInstanceTypesRequest typesRequest =
DescribeInstanceTypesRequest.builder()
           .maxResults(10)
           .build();

       CompletableFuture<DescribeInstanceTypesResponse> response =
getAsyncClient().describeInstanceTypes(typesRequest);
       response.whenComplete((resp, ex) -> {
           if (resp != null) {
               List<InstanceTypeInfo> instanceTypes = resp.instanceTypes();
               for (InstanceTypeInfo type : instanceTypes) {
                   logger.info("The memory information of this type is " +
type.memoryInfo().sizeInMiB());
                   logger.info("Network information is " +
type.networkInfo().toString());
                   logger.info("Instance type is " +
type.instanceType().toString());
               }
           } else {
               throw (RuntimeException) ex;
           }
       });

       return response.thenApply(resp -> {
```

```
            for (InstanceTypeInfo type : resp.instanceTypes()) {
                String instanceType = type.instanceType().toString();
                if (instanceType.equals("t2.2xlarge")) {
                    return instanceType;
                }
            }
            return "";
        });
    }
```

- Untuk API detailnya, lihat DescribeInstanceTypesdi AWS SDK for Java 2.x APIReferensi.

## JavaScript

### SDKuntuk JavaScript (v3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
import { EC2Client, paginateDescribeInstanceTypes } from "@aws-sdk/client-ec2";

/**
 * Describes the specified instance types. By default, all instance types for the
 * current Region are described. Alternatively, you can filter the results.
 * @param {{ pageSize: string, supportedArch: string[], freeTier: boolean }}
 options
 */
export const main = async ({ pageSize, supportedArch, freeTier }) => {
  pageSize = Number.parseInt(pageSize);
  const client = new EC2Client({});

  // The paginate function is a wrapper around the underlying command.
  const paginator = paginateDescribeInstanceTypes(
    // Without limiting the page size, this call can take a long time. pageSize
 is just sugar for
    // the MaxResults property in the underlying command.
    { client, pageSize },
    {
```

```
      Filters: [
        {
          Name: "processor-info.supported-architecture",
          Values: supportedArch,
        },
        { Name: "free-tier-eligible", Values: [freeTier ? "true" : "false"] },
      ],
    },
  );

  try {
    /**
     * @type {import('@aws-sdk/client-ec2').InstanceTypeInfo[]}
     */
    const instanceTypes = [];

    for await (const page of paginator) {
      if (page.InstanceTypes.length) {
        instanceTypes.push(...page.InstanceTypes);

        // When we have at least 1 result, we can stop.
        if (instanceTypes.length >= 1) {
          break;
        }
      }
    }
    console.log(
      `Memory size in MiB for matching instance types:\n\n
${instanceTypes.map((it) => `${it.InstanceType}: ${it.MemoryInfo.SizeInMiB}
 MiB`).join("\n")}`,
    );
  } catch (caught) {
    if (caught instanceof Error && caught.name === "InvalidParameterValue") {
      console.warn(`${caught.message}`);
      return [];
    }
    throw caught;
  }
};
```

- Untuk API detailnya, lihat DescribeInstanceTypesdi AWS SDK for JavaScript APIReferensi.

Kotlin

SDKuntuk Kotlin

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
// Get a list of instance types.
suspend fun getInstanceTypesSc(): String {
    var instanceType = ""
    val filterObs = ArrayList<Filter>()
    val filter =
        Filter {
            name = "processor-info.supported-architecture"
            values = listOf("arm64")
        }

    filterObs.add(filter)
    val typesRequest =
        DescribeInstanceTypesRequest {
            filters = filterObs
            maxResults = 10
        }
    Ec2Client { region = "us-west-2" }.use { ec2 ->
        val response = ec2.describeInstanceTypes(typesRequest)
        response.instanceTypes?.forEach { type ->
            println("The memory information of this type is
 ${type.memoryInfo?.sizeInMib}")
            println("Maximum number of network cards is
 ${type.networkInfo?.maximumNetworkCards}")
            instanceType = type.instanceType.toString()
        }
        return instanceType
    }
}
```

- Untuk API detailnya, lihat DescribeInstanceTypes AWSSDKAPIreferensi Kotlin.

Python

SDKuntuk Python (Boto3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
class EC2InstanceWrapper:
    """Encapsulates Amazon Elastic Compute Cloud (Amazon EC2) instance actions
 using the client interface."""

    def __init__(
        self, ec2_client: Any, instances: Optional[List[Dict[str, Any]]] = None
    ) -> None:
        """
        Initializes the EC2InstanceWrapper with an EC2 client and optional
 instances.

        :param ec2_client: A Boto3 Amazon EC2 client. This client provides low-
level
                           access to AWS EC2 services.
        :param instances: A list of dictionaries representing Boto3 Instance
 objects. These are high-level objects that
                          wrap instance actions.
        """
        self.ec2_client = ec2_client
        self.instances = instances or []

    @classmethod
    def from_client(cls) -> "EC2InstanceWrapper":
        """
        Creates an EC2InstanceWrapper instance with a default EC2 client.

        :return: An instance of EC2InstanceWrapper initialized with the default
 EC2 client.
        """
        ec2_client = boto3.client("ec2")
        return cls(ec2_client)
```

```
    def get_instance_types(
        self, architecture: str = "x86_64", sizes: List[str] = ["*.micro",
 "*.small"]
    ) -> List[Dict[str, Any]]:
        """
        Gets instance types that support the specified architecture and size.
        See https://docs.aws.amazon.com/AWSEC2/latest/APIReference/
API_DescribeInstanceTypes.html
        for a list of allowable parameters.

        :param architecture: The architecture supported by instance types.
 Default: 'x86_64'.
        :param sizes: The size of instance types. Default: '*.micro', '*.small',
        :return: A list of dictionaries representing instance types that support
 the specified architecture and size.
        """
        try:
            inst_types = []
            paginator = self.ec2_client.get_paginator("describe_instance_types")
            for page in paginator.paginate(
                Filters=[
                    {
                        "Name": "processor-info.supported-architecture",
                        "Values": [architecture],
                    },
                    {"Name": "instance-type", "Values": sizes},
                ]
            ):
                inst_types += page["InstanceTypes"]
        except ClientError as err:
            logger.error(
                f"Failed to get instance types: {architecture},
 {','.join(map(str, sizes))}"
            )
            error_code = err.response["Error"]["Code"]
            if error_code == "InvalidParameterValue":
                logger.error(
                    "Parameters are invalid. "
                    "Ensure architecture and size strings conform to
 DescribeInstanceTypes API reference."
                )
            raise
        else:
```

```
            return inst_types


```

- Untuk API detailnya, lihat DescribeInstanceTypes AWSSDKReferensi Python (Boto3). API

Rust

SDKuntuk Rust

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
   /// List instance types that match an image's architecture and are free tier
eligible.
   pub async fn list_instance_types(&self, image: &Image) ->
Result<Vec<InstanceType>, EC2Error> {
       let architecture = format!(
           "{}",
           image.architecture().ok_or_else(|| EC2Error::new(format!(
               "Image {:?} does not have a listed architecture",
               image.image_id()
           )))?
       );
       let free_tier_eligible_filter = Filter::builder()
           .name("free-tier-eligible")
           .values("false")
           .build();
       let supported_architecture_filter = Filter::builder()
           .name("processor-info.supported-architecture")
           .values(architecture)
           .build();
       let response = self
           .client
           .describe_instance_types()
           .filters(free_tier_eligible_filter)
           .filters(supported_architecture_filter)
           .send()
           .await?;
```

```
        Ok(response
            .instance_types
            .unwrap_or_default()
            .into_iter()
            .filter_map(|iti| iti.instance_type)
            .collect())
    }
```

- Untuk API detailnya, lihat DescribeInstanceTypes AWSSDKAPIreferensi Rust.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DescribeInstances`** dengan AWS SDK atau CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribeInstances`.

Contoh tindakan adalah kutipan kode dari program yang lebih besar dan harus dijalankan dalam konteks. Anda dapat melihat tindakan ini dalam konteks dalam contoh kode berikut:

- Pelajari dasar-dasarnya
- Membangun dan mengelola layanan yang tangguh

.NET

AWS SDK for .NET

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    /// <summary>
    /// Get information about EC2 instances with a particular state.
    /// </summary>
    /// <param name="tagName">The name of the tag to filter on.</param>
```

```
    /// <param name="tagValue">The value of the tag to look for.</param>
    /// <returns>True if successful.</returns>
    public async Task<bool> GetInstancesWithState(string state)
    {
        try
        {
            // Filters the results of the instance list.
            var filters = new List<Filter>
            {
                new Filter
                {
                    Name = $"instance-state-name",
                    Values = new List<string> { state, },
                },
            };
            var request = new DescribeInstancesRequest { Filters = filters, };

            Console.WriteLine($"\nShowing instances with state {state}");
            var paginator = _amazonEC2.Paginators.DescribeInstances(request);

            await foreach (var response in paginator.Responses)
            {
                foreach (var reservation in response.Reservations)
                {
                    foreach (var instance in reservation.Instances)
                    {
                        Console.Write($"Instance ID: {instance.InstanceId} ");
                        Console.WriteLine($"\tCurrent State:
{instance.State.Name}");
                    }
                }
            }

            return true;
        }
        catch (AmazonEC2Exception ec2Exception)
        {
            if (ec2Exception.ErrorCode == "InvalidParameterValue")
            {
                _logger.LogError(
                    $"Invalid parameter value for filtering instances.");
            }

            return false;
```

```
        }
        catch (Exception ex)
        {
            Console.WriteLine($"Couldn't list instances because: {ex.Message}");
            return false;
        }
    }
```

- Untuk API detailnya, lihat DescribeInstancesdi AWS SDK for .NET APIReferensi.

## Bash

### AWS CLI dengan skrip Bash

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
###############################################################################
# function ec2_describe_instances
#
# This function describes one or more Amazon Elastic Compute Cloud (Amazon EC2)
 instances.
#
# Parameters:
#       -i instance_id - The ID of the instance to describe (optional).
#       -q query - The query to filter the response (optional).
#       -h - Display help.
#
# Returns:
#       0 - If successful.
#       1 - If it fails.
###############################################################################
function ec2_describe_instances() {
  local instance_id query response
  local option OPTARG # Required to use getopts command in a function.

  # bashsupport disable=BP5008
  function usage() {
```

```
    echo "function ec2_describe_instances"
    echo "Describes one or more Amazon Elastic Compute Cloud (Amazon EC2)
 instances."
    echo "  -i instance_id - The ID of the instance to describe (optional)."
    echo "  -q query - The query to filter the response (optional)."
    echo "  -h - Display help."
    echo ""
  }

  # Retrieve the calling parameters.
  while getopts "i:q:h" option; do
    case "${option}" in
      i) instance_id="${OPTARG}" ;;
      q) query="${OPTARG}" ;;
      h)
        usage
        return 0
        ;;
      \?)
        echo "Invalid parameter"
        usage
        return 1
        ;;
    esac
  done
  export OPTIND=1

  local aws_cli_args=()

  if [[ -n "$instance_id" ]]; then
    # shellcheck disable=SC2206
    aws_cli_args+=("--instance-ids" $instance_id)
  fi

  local query_arg=""
  if [[ -n "$query" ]]; then
    query_arg="--query '$query'"
  else
    query_arg="--query Reservations[*].Instances[*].
[InstanceId,ImageId,InstanceType,KeyName,VpcId,PublicIpAddress,State.Name]"
  fi

  # shellcheck disable=SC2086
  response=$(aws ec2 describe-instances \
```

```
    "${aws_cli_args[@]}" \
    $query_arg \
    --output text) || {
    aws_cli_error_log ${?}
    errecho "ERROR: AWS reports describe-instances operation failed.$response"
    return 1
  }

  echo "$response"

  return 0
}
```

Fungsi utilitas yang digunakan dalam contoh ini.

```
###############################################################################
# function errecho
#
# This function outputs everything sent to it to STDERR (standard error output).
###############################################################################
function errecho() {
  printf "%s\n" "$*" 1>&2
}

###############################################################################
# function aws_cli_error_log()
#
# This function is used to log the error messages from the AWS CLI.
#
# The function expects the following argument:
#         $1 - The error code returned by the AWS CLI.
#
#  Returns:
#          0: - Success.
#
###############################################################################
function aws_cli_error_log() {
  local err_code=$1
  errecho "Error code : $err_code"
  if [ "$err_code" == 1 ]; then
    errecho "  One or more S3 transfers failed."
  elif [ "$err_code" == 2 ]; then
```

```
    errecho "  Command line failed to parse."
  elif [ "$err_code" == 130 ]; then
    errecho "  Process received SIGINT."
  elif [ "$err_code" == 252 ]; then
    errecho "  Command syntax invalid."
  elif [ "$err_code" == 253 ]; then
    errecho "  The system environment or configuration was invalid."
  elif [ "$err_code" == 254 ]; then
    errecho "  The service returned an error."
  elif [ "$err_code" == 255 ]; then
    errecho "  255 is a catch-all error."
  fi

  return 0
}
```

- Untuk API detailnya, lihat DescribeInstancesdi Referensi AWS CLI Perintah.

C++

SDKuntuk C ++

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
//! Describe all Amazon Elastic Compute Cloud (Amazon EC2) instances associated
 with an account.
/*!
  \param clientConfiguration: AWS client configuration.
  \return bool: Function succeeded.
 */
bool AwsDoc::EC2::describeInstances(
        const Aws::Client::ClientConfiguration &clientConfiguration) {
    Aws::EC2::EC2Client ec2Client(clientConfiguration);
    Aws::EC2::Model::DescribeInstancesRequest request;
    bool header = false;
    bool done = false;
    while (!done) {
```

```
       Aws::EC2::Model::DescribeInstancesOutcome outcome =
ec2Client.DescribeInstances(request);
       if (outcome.IsSuccess()) {
           if (!header) {
               std::cout << std::left <<
                         std::setw(48) << "Name" <<
                         std::setw(20) << "ID" <<
                         std::setw(25) << "Ami" <<
                         std::setw(15) << "Type" <<
                         std::setw(15) << "State" <<
                         std::setw(15) << "Monitoring" << std::endl;
               header = true;
           }

           const std::vector<Aws::EC2::Model::Reservation> &reservations =
                   outcome.GetResult().GetReservations();

           for (const auto &reservation: reservations) {
               const std::vector<Aws::EC2::Model::Instance> &instances =
                       reservation.GetInstances();
               for (const auto &instance: instances) {
                   Aws::String instanceStateString =

Aws::EC2::Model::InstanceStateNameMapper::GetNameForInstanceStateName(
                                   instance.GetState().GetName());

                   Aws::String typeString =

Aws::EC2::Model::InstanceTypeMapper::GetNameForInstanceType(
                                   instance.GetInstanceType());

                   Aws::String monitorString =

Aws::EC2::Model::MonitoringStateMapper::GetNameForMonitoringState(
                                   instance.GetMonitoring().GetState());
                   Aws::String name = "Unknown";

                   const std::vector<Aws::EC2::Model::Tag> &tags =
instance.GetTags();
                   auto nameIter = std::find_if(tags.cbegin(), tags.cend(),
                                                [](const Aws::EC2::Model::Tag
&tag) {
                                                    return tag.GetKey() ==
"Name";
```

```
                                                });
                    if (nameIter != tags.cend()) {
                        name = nameIter->GetValue();
                    }
                    std::cout <<
                              std::setw(48) << name <<
                              std::setw(20) << instance.GetInstanceId() <<
                              std::setw(25) << instance.GetImageId() <<
                              std::setw(15) << typeString <<
                              std::setw(15) << instanceStateString <<
                              std::setw(15) << monitorString << std::endl;
                }
            }

            if (!outcome.GetResult().GetNextToken().empty()) {
                request.SetNextToken(outcome.GetResult().GetNextToken());
            } else {
                done = true;
            }
        } else {
            std::cerr << "Failed to describe EC2 instances:" <<
                      outcome.GetError().GetMessage() << std::endl;
            return false;
        }
    }

    return true;
}
```

- Untuk API detailnya, lihat DescribeInstancesdi AWS SDK for C++ APIReferensi.

## CLI

### AWS CLI

#### Contoh 1: Untuk menjelaskan instans

Contoh `describe-instances` berikut menjelaskan instans tertentu.

```
aws ec2 describe-instances \
    --instance-ids i-1234567890abcdef0
```

Output:


```
{
    "Reservations": [
        {
            "Groups": [],
            "Instances": [
                {
                    "AmiLaunchIndex": 0,
                    "ImageId": "ami-0abcdef1234567890",
                    "InstanceId": "i-1234567890abcdef0",
                    "InstanceType": "t3.nano",
                    "KeyName": "my-key-pair",
                    "LaunchTime": "2022-11-15T10:48:59+00:00",
                    "Monitoring": {
                        "State": "disabled"
                    },
                    "Placement": {
                        "AvailabilityZone": "us-east-2a",
                        "GroupName": "",
                        "Tenancy": "default"
                    },
                    "PrivateDnsName": "ip-10-0-0-157.us-east-2.compute.internal",
                    "PrivateIpAddress": "10-0-0-157",
                    "ProductCodes": [],
                    "PublicDnsName": "ec2-34-253-223-13.us-
east-2.compute.amazonaws.com",
                    "PublicIpAddress": "34.253.223.13",
                    "State": {
                        "Code": 16,
                        "Name": "running"
                    },
                    "StateTransitionReason": "",
                    "SubnetId": "subnet-04a636d18e83cfacb",
                    "VpcId": "vpc-1234567890abcdef0",
                    "Architecture": "x86_64",
                    "BlockDeviceMappings": [
                        {
                            "DeviceName": "/dev/xvda",
                            "Ebs": {
                                "AttachTime": "2022-11-15T10:49:00+00:00",
                                "DeleteOnTermination": true,
                                "Status": "attached",
                                "VolumeId": "vol-02e6ccdca7de29cf2"
```

```
                            }
                        }
                    ],
                    "ClientToken": "1234abcd-1234-abcd-1234-d46a8903e9bc",
                    "EbsOptimized": true,
                    "EnaSupport": true,
                    "Hypervisor": "xen",
                    "IamInstanceProfile": {
                        "Arn": "arn:aws:iam::111111111111:instance-profile/
AmazonSSMRoleForInstancesQuickSetup",
                        "Id": "11111111111111111111"
                    },
                    "NetworkInterfaces": [
                        {
                            "Association": {
                                "IpOwnerId": "amazon",
                                "PublicDnsName": "ec2-34-253-223-13.us-
east-2.compute.amazonaws.com",
                                "PublicIp": "34.253.223.13"
                            },
                            "Attachment": {
                                "AttachTime": "2022-11-15T10:48:59+00:00",
                                "AttachmentId": "eni-attach-1234567890abcdefg",
                                "DeleteOnTermination": true,
                                "DeviceIndex": 0,
                                "Status": "attached",
                                "NetworkCardIndex": 0
                            },
                            "Description": "",
                            "Groups": [
                                {
                                    "GroupName": "launch-wizard-146",
                                    "GroupId": "sg-1234567890abcdefg"
                                }
                            ],
                            "Ipv6Addresses": [],
                            "MacAddress": "00:11:22:33:44:55",
                            "NetworkInterfaceId": "eni-1234567890abcdefg",
                            "OwnerId": "104024344472",
                            "PrivateDnsName": "ip-10-0-0-157.us-
east-2.compute.internal",
                            "PrivateIpAddress": "10-0-0-157",
                            "PrivateIpAddresses": [
                                {
```

```
                                    "Association": {
                                        "IpOwnerId": "amazon",
                                        "PublicDnsName": "ec2-34-253-223-13.us-
east-2.compute.amazonaws.com",
                                        "PublicIp": "34.253.223.13"
                                    },
                                    "Primary": true,
                                    "PrivateDnsName": "ip-10-0-0-157.us-
east-2.compute.internal",
                                    "PrivateIpAddress": "10-0-0-157"
                                }
                            ],
                            "SourceDestCheck": true,
                            "Status": "in-use",
                            "SubnetId": "subnet-1234567890abcdefg",
                            "VpcId": "vpc-1234567890abcdefg",
                            "InterfaceType": "interface"
                        }
                    ],
                    "RootDeviceName": "/dev/xvda",
                    "RootDeviceType": "ebs",
                    "SecurityGroups": [
                        {
                            "GroupName": "launch-wizard-146",
                            "GroupId": "sg-1234567890abcdefg"
                        }
                    ],
                    "SourceDestCheck": true,
                    "Tags": [
                        {
                            "Key": "Name",
                            "Value": "my-instance"
                        }
                    ],
                    "VirtualizationType": "hvm",
                    "CpuOptions": {
                        "CoreCount": 1,
                        "ThreadsPerCore": 2
                    },
                    "CapacityReservationSpecification": {
                        "CapacityReservationPreference": "open"
                    },
                    "HibernationOptions": {
                        "Configured": false
```

```
                    },
                    "MetadataOptions": {
                        "State": "applied",
                        "HttpTokens": "optional",
                        "HttpPutResponseHopLimit": 1,
                        "HttpEndpoint": "enabled",
                        "HttpProtocolIpv6": "disabled",
                        "InstanceMetadataTags": "enabled"
                    },
                    "EnclaveOptions": {
                        "Enabled": false
                    },
                    "PlatformDetails": "Linux/UNIX",
                    "UsageOperation": "RunInstances",
                    "UsageOperationUpdateTime": "2022-11-15T10:48:59+00:00",
                    "PrivateDnsNameOptions": {
                        "HostnameType": "ip-name",
                        "EnableResourceNameDnsARecord": true,
                        "EnableResourceNameDnsAAAARecord": false
                    },
                    "MaintenanceOptions": {
                        "AutoRecovery": "default"
                    }
                }
            ],
            "OwnerId": "111111111111",
            "ReservationId": "r-1234567890abcdefg"
        }
    ]
}
```


Contoh 2: Untuk memfilter instans dengan tipe tertentu

Contoh `describe-instances` berikut menggunakan filter guna mencakup hasil untuk instans dari tipe tertentu.

```
aws ec2 describe-instances \
    --filters Name=instance-type,Values=m5.large
```

Untuk contoh output, lihat Contoh 1.

Untuk informasi selengkapnya, lihat Daftar dan filter menggunakan Panduan EC2 Pengguna Amazon. CLI

Contoh 3: Untuk memfilter instans dengan tipe dan Zona Ketersediaan tertentu

Contoh `describe-instances` berikut menggunakan banyak filter guna mencakup hasil untuk instans dengan tipe tertentu yang juga ada di Zona Ketersediaan tertentu.

```
aws ec2 describe-instances \
    --filters Name=instance-type,Values=t2.micro,t3.micro Name=availability-zone,Values=us-east-2c
```

Untuk contoh output, lihat Contoh 1.

Contoh 4: Untuk memfilter instance dengan tipe tertentu dan Availability Zone menggunakan file JSON

`describe-instances`Contoh berikut menggunakan file JSON input untuk melakukan pemfilteran yang sama seperti contoh sebelumnya. Ketika filter menjadi lebih rumit, mereka dapat lebih mudah untuk menentukan dalam JSON file.

```
aws ec2 describe-instances \
    --filters file://filters.json
```

Isi dari `filters.json`:

```
[
    {
        "Name": "instance-type",
        "Values": ["t2.micro", "t3.micro"]
    },
    {
        "Name": "availability-zone",
        "Values": ["us-east-2c"]
    }
]
```

Untuk contoh output, lihat Contoh 1.

Contoh 5: Untuk memfilter instans dengan tanda Pemilik tertentu

Contoh `describe-instances` berikut menggunakan filter tanda guna mencakup hasil untuk instans yang memiliki tanda dengan kunci tanda tertentu (Pemilik), terlepas dari nilai tandanya.

```
aws ec2 describe-instances \
    --filters "Name=tag-key,Values=Owner"
```

Untuk contoh output, lihat Contoh 1.

Contoh 6: Untuk memfilter instans dengan nilai tanda my-team tertentu

Contoh `describe-instances` berikut menggunakan filter tanda guna mencakup hasil untuk instans yang memiliki tanda dengan kunci tanda tertentu (my-team), terlepas dari nilai tandanya.

```
aws ec2 describe-instances \
    --filters "Name=tag-value,Values=my-team"
```

Untuk contoh output, lihat Contoh 1.

Contoh 7: Untuk memfilter instans dengan tanda Pemilik dan nilai my-team tertentu

Contoh `describe-instances` berikut menggunakan filter tanda guna mencakup hasil untuk instans yang memiliki tanda tertentu (Pemilik=my-team).

```
aws ec2 describe-instances \
    --filters "Name=tag:Owner,Values=my-team"
```

Untuk contoh output, lihat Contoh 1.

Contoh 8: Untuk menampilkan hanya instance dan subnet IDs untuk semua instance

`describe-instances`Contoh berikut menggunakan `--query` parameter untuk menampilkan hanya instance dan subnet IDs untuk semua instance, dalam JSON format.

Linux dan macOS:

```
aws ec2 describe-instances \
    --query 'Reservations[*].Instances[*].{Instance:InstanceId,Subnet:SubnetId}'
 \
    --output json
```

Windows:

```
aws ec2 describe-instances ^
    --query "Reservations[*].Instances[*].
{Instance:InstanceId,Subnet:SubnetId}" ^
    --output json
```

Output:

```
[
    {
        "Instance": "i-057750d42936e468a",
        "Subnet": "subnet-069beee9b12030077"
    },
    {
        "Instance": "i-001efd250faaa6ffa",
        "Subnet": "subnet-0b715c6b7db68927a"
    },
    {
        "Instance": "i-027552a73f021f3bd",
        "Subnet": "subnet-0250c25a1f4e15235"
    }
    ...
]
```

Contoh 9: Untuk memfilter instance dari jenis yang ditentukan dan hanya menampilkan instance mereka IDs

`describe-instances`Contoh berikut menggunakan filter untuk cakupan hasil untuk contoh dari jenis yang ditentukan dan `--query` parameter untuk menampilkan hanya contohIDs.

```
aws ec2 describe-instances \
    --filters "Name=instance-type,Values=t2.micro" \
    --query "Reservations[*].Instances[*].[InstanceId]" \
    --output text
```

Output:

```
i-031c0dc19de2fb70c
i-00d8bff789a736b75
i-0b715c6b7db68927a
i-0626d4edd54f1286d
i-00b8ae04f9f99908e
```

```
i-0fc71c25d2374130c
```

Contoh 10: Untuk memfilter instance dari tipe yang ditentukan dan hanya menampilkan instancenyaIDs, Availability Zone, dan nilai tag yang ditentukan

Contoh `describe-instances` berikut menampilkan ID instans, Zona Ketersediaan, dan nilai dari tanda `Name` untuk instans yang memiliki tanda dengan nama `tag-key`, dalam format tabel.

Linux dan macOS:

```
aws ec2 describe-instances \
    --filters Name=tag-key,Values=Name \
    --query 'Reservations[*].Instances[*].
{Instance:InstanceId,AZ:Placement.AvailabilityZone,Name:Tags[?Key==`Name`]|
[0].Value}' \
    --output table
```

Windows:

```
aws ec2 describe-instances ^
    --filters Name=tag-key,Values=Name ^
    --query "Reservations[*].Instances[*].
{Instance:InstanceId,AZ:Placement.AvailabilityZone,Name:Tags[?Key=='Name']|
[0].Value}" ^
    --output table
```

Output:

```
-------------------------------------------------------------
|                    DescribeInstances                      |
+--------------+-----------------------+--------------------+
|      AZ      |       Instance        |        Name        |
+--------------+-----------------------+--------------------+
|  us-east-2b  |  i-057750d42936e468a  |  my-prod-server    |
|  us-east-2a  |  i-001efd250faaa6ffa  |  test-server-1     |
|  us-east-2a  |  i-027552a73f021f3bd  |  test-server-2     |
+--------------+-----------------------+--------------------+
```

Contoh 11: Untuk menjelaskan instans dalam grup penempatan partisi

Contoh `describe-instances` berikut menjelaskan instans tertentu. Output-nya mencakup informasi penempatan untuk instans, yang berisi nama grup penempatan dan nomor partisi untuk instans tersebut.

```
aws ec2 describe-instances \
    --instance-ids i-0123a456700123456 \
    --query "Reservations[*].Instances[*].Placement"
```

Output:

```
[
    [
        {
            "AvailabilityZone": "us-east-1c",
            "GroupName": "HDFS-Group-A",
            "PartitionNumber": 3,
            "Tenancy": "default"
        }

    ]
]
```

Untuk informasi selengkapnya, lihat Menjelaskan instance dalam grup penempatan di EC2Panduan Pengguna Amazon.

Contoh 12: Untuk memfilter ke instans dengan grup penempatan dan nomor partisi tertentu

Contoh `describe-instances` berikut memfilter hasil menjadi hanya instans dengan grup penempatan dan nomor partisi tertentu.

```
aws ec2 describe-instances \
    --filters "Name=placement-group-name,Values=HDFS-Group-A" "Name=placement-
partition-number,Values=7"
```

Berikut ini hanya menunjukkan informasi yang relevan dari output.

```
"Instances": [
    {
        "InstanceId": "i-0123a456700123456",
        "InstanceType": "r4.large",
```

```
        "Placement": {
            "AvailabilityZone": "us-east-1c",
            "GroupName": "HDFS-Group-A",
            "PartitionNumber": 7,
            "Tenancy": "default"
        }
    },
    {
        "InstanceId": "i-9876a543210987654",
        "InstanceType": "r4.large",
        "Placement": {
            "AvailabilityZone": "us-east-1c",
            "GroupName": "HDFS-Group-A",
            "PartitionNumber": 7,
            "Tenancy": "default"
        }
    ],
```

Untuk informasi selengkapnya, lihat Menjelaskan instance dalam grup penempatan di EC2Panduan Pengguna Amazon.

Contoh 13: Untuk memfilter ke instans yang dikonfigurasikan guna memungkinkan akses ke tanda dari metadata instans

Contoh `describe-instances` berikut memfilter hasil menjadi hanya instans yang dikonfigurasikan guna memungkinkan akses ke tanda instans dari metadata instans.

```
aws ec2 describe-instances \
    --filters "Name=metadata-options.instance-metadata-tags,Values=enabled" \
    --query "Reservations[*].Instances[*].InstanceId" \
    --output text
```

Berikut menunjukkan output yang diharapkan.

```
i-1234567890abcdefg
i-abcdefg1234567890
i-11111111aaaaaaaaa
i-aaaaaaaa111111111
```

Untuk informasi selengkapnya, lihat Bekerja dengan tag instance dalam metadata instans di EC2Panduan Pengguna Amazon.

- Untuk API detailnya, lihat DescribeInstancesdi Referensi AWS CLI Perintah.

Java

SDKuntuk Java 2.x

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
   /**
    * Asynchronously describes an AWS EC2 image with the specified image ID.
    *
    * @param imageId the ID of the image to be described
    * @return a {@link CompletableFuture} that, when completed, contains the ID
of the described image
    * @throws RuntimeException if no images are found with the provided image
ID, or if an error occurs during the AWS API call
    */
   public CompletableFuture<String> describeImageAsync(String imageId) {
       DescribeImagesRequest imagesRequest = DescribeImagesRequest.builder()
           .imageIds(imageId)
           .build();

       AtomicReference<String> imageIdRef = new AtomicReference<>();
       DescribeImagesPublisher paginator =
getAsyncClient().describeImagesPaginator(imagesRequest);
       return paginator.subscribe(response -> {
           response.images().stream()
               .filter(image -> image.imageId().equals(imageId))
               .findFirst()
               .ifPresent(image -> {
                   logger.info("The description of the image is " +
image.description());
                   logger.info("The name of the image is " + image.name());
                   imageIdRef.set(image.imageId());
               });
       }).thenApply(v -> {
           String id = imageIdRef.get();
           if (id == null) {
```

```
                throw new RuntimeException("No images found with the provided
 image ID.");
            }
            return id;
        }).exceptionally(ex -> {
            logger.info("Failed to describe image: " + ex.getMessage());
            throw new RuntimeException("Failed to describe image", ex);
        });
    }
```

- Untuk API detailnya, lihat DescribeInstancesdi AWS SDK for Java 2.x APIReferensi.

## JavaScript

### SDKuntuk JavaScript (v3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
import { EC2Client, paginateDescribeInstances } from "@aws-sdk/client-ec2";

/**
 * List all of your EC2 instances running with the provided architecture that
 * were launched in the past month.
 * @param {{ pageSize: string, architectures: string[] }} options
 */
export const main = async ({ pageSize, architectures }) => {
  pageSize = Number.parseInt(pageSize);
  const client = new EC2Client({});
  const d = new Date();
  const year = d.getFullYear();
  const month = `0${d.getMonth() + 1}`.slice(-2);
  const launchTimePattern = `${year}-${month}-*`;

  const paginator = paginateDescribeInstances(
    {
      client,
      pageSize,
```

```
    },
    {
      Filters: [
        { Name: "architecture", Values: architectures },
        { Name: "instance-state-name", Values: ["running"] },
        {
          Name: "launch-time",
          Values: [launchTimePattern],
        },
      ],
    },
  );

  try {
    /**
     * @type {import('@aws-sdk/client-ec2').Instance[]}
     */
    const instanceList = [];
    for await (const page of paginator) {
      const { Reservations } = page;
      for (const reservation of Reservations) {
        instanceList.push(...reservation.Instances);
      }
    }
    console.log(
      `Running instances launched this month:\n\n${instanceList.map((instance) =>
 instance.InstanceId).join("\n")}`,
    );
  } catch (caught) {
    if (caught instanceof Error && caught.name === "InvalidParameterValue") {
      console.warn(`${caught.message}.`);
    } else {
      throw caught;
    }
  }
};
```

- Untuk API detailnya, lihat DescribeInstancesdi AWS SDK for JavaScript APIReferensi.

Kotlin

SDKuntuk Kotlin

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
suspend fun describeEC2Instances() {
    val request =
        DescribeInstancesRequest {
            maxResults = 6
        }

    Ec2Client { region = "us-west-2" }.use { ec2 ->
        val response = ec2.describeInstances(request)
        response.reservations?.forEach { reservation ->
            reservation.instances?.forEach { instance ->
                println("Instance Id is ${instance.instanceId}")
                println("Image id is ${instance.imageId}")
                println("Instance type is ${instance.instanceType}")
                println("Instance state name is ${instance.state?.name}")
                println("monitoring information is
 ${instance.monitoring?.state}")
            }
        }
    }
}
```

- Untuk API detailnya, lihat DescribeInstances AWSSDKAPIreferensi Kotlin.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menjelaskan contoh yang ditentukan.

```
(Get-EC2Instance -InstanceId i-12345678).Instances
```

Output:

```
AmiLaunchIndex        : 0
Architecture          : x86_64
BlockDeviceMappings   : {/dev/sda1}
ClientToken           : TleEy1448154045270
EbsOptimized          : False
Hypervisor            : xen
IamInstanceProfile    : Amazon.EC2.Model.IamInstanceProfile
ImageId               : ami-12345678
InstanceId            : i-12345678
InstanceLifecycle     :
InstanceType          : t2.micro
KernelId              :
KeyName               : my-key-pair
LaunchTime            : 12/4/2015 4:44:40 PM
Monitoring            : Amazon.EC2.Model.Monitoring
NetworkInterfaces     : {ip-10-0-2-172.us-west-2.compute.internal}
Placement             : Amazon.EC2.Model.Placement
Platform              : Windows
PrivateDnsName        : ip-10-0-2-172.us-west-2.compute.internal
PrivateIpAddress      : 10.0.2.172
ProductCodes          : {}
PublicDnsName         :
PublicIpAddress       :
RamdiskId             :
RootDeviceName        : /dev/sda1
RootDeviceType        : ebs
SecurityGroups        : {default}
SourceDestCheck       : True
SpotInstanceRequestId :
SriovNetSupport       :
State                 : Amazon.EC2.Model.InstanceState
StateReason           :
StateTransitionReason :
SubnetId              : subnet-12345678
Tags                  : {Name}
VirtualizationType    : hvm
VpcId                 : vpc-12345678
```

Contoh 2: Contoh ini menjelaskan semua instans Anda di wilayah saat ini, dikelompokkan berdasarkan reservasi. Untuk melihat detail instance, perluas koleksi Instances dalam setiap objek reservasi.

```
Get-EC2Instance
```

Output:

```
GroupNames    : {}
Groups        : {}
Instances     : {}
OwnerId       : 123456789012
RequesterId   : 226008221399
ReservationId : r-c5df370c

GroupNames    : {}
Groups        : {}
Instances     : {}
OwnerId       : 123456789012
RequesterId   : 854251627541
ReservationId : r-63e65bab
...
```

Contoh 3: Contoh ini menggambarkan penggunaan filter untuk query untuk EC2 instance dalam subnet tertentu dari sebuah. VPC

```
(Get-EC2Instance -Filter @{Name="vpc-id";Values="vpc-1a2bc34d"},@{Name="subnet-
id";Values="subnet-1a2b3c4d"}).Instances
```

Output:

```
InstanceId          InstanceType Platform PrivateIpAddress PublicIpAddress
 SecurityGroups SubnetId        VpcId
----------          ------------ -------- ---------------- --------------
 -------------- --------        -----
i-01af...82cf180e19 t2.medium    Windows  10.0.0.98                      ...
         subnet-1a2b3c4d vpc-1a2b3c4d
i-0374...7e9d5b0c45 t2.xlarge    Windows  10.0.0.53                      ...
         subnet-1a2b3c4d vpc-1a2b3c4d
```

- Untuk API detailnya, lihat DescribeInstancesdi AWS Tools for PowerShell Referensi Cmdlet.

Python

SDKuntuk Python (Boto3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
class EC2InstanceWrapper:
    """Encapsulates Amazon Elastic Compute Cloud (Amazon EC2) instance actions
 using the client interface."""

    def __init__(
        self, ec2_client: Any, instances: Optional[List[Dict[str, Any]]] = None
    ) -> None:
        """
        Initializes the EC2InstanceWrapper with an EC2 client and optional
 instances.

        :param ec2_client: A Boto3 Amazon EC2 client. This client provides low-
level
                           access to AWS EC2 services.
        :param instances: A list of dictionaries representing Boto3 Instance
 objects. These are high-level objects that
                          wrap instance actions.
        """
        self.ec2_client = ec2_client
        self.instances = instances or []

    @classmethod
    def from_client(cls) -> "EC2InstanceWrapper":
        """
        Creates an EC2InstanceWrapper instance with a default EC2 client.

        :return: An instance of EC2InstanceWrapper initialized with the default
 EC2 client.
        """
        ec2_client = boto3.client("ec2")
        return cls(ec2_client)
```

```
    def display(self, state_filter: Optional[str] = "running") -> None:
        """
        Displays information about instances, filtering by the specified state.

        :param state_filter: The instance state to include in the output. Only
 instances in this state
                             will be displayed. Default is 'running'. Example
 states: 'running', 'stopped'.
        """
        if not self.instances:
            logger.info("No instances to display.")
            return

        instance_ids = [instance["InstanceId"] for instance in self.instances]
        paginator = self.ec2_client.get_paginator("describe_instances")
        page_iterator = paginator.paginate(InstanceIds=instance_ids)

        try:
            for page in page_iterator:
                for reservation in page["Reservations"]:
                    for instance in reservation["Instances"]:
                        instance_state = instance["State"]["Name"]

                        # Apply the state filter (default is 'running')
                        if state_filter and instance_state != state_filter:
                            continue  # Skip this instance if it doesn't match
 the filter

                        # Create a formatted string with instance details
                        instance_info = (
                            f"• ID: {instance['InstanceId']}\n"
                            f"• Image ID: {instance['ImageId']}\n"
                            f"• Instance type: {instance['InstanceType']}\n"
                            f"• Key name: {instance['KeyName']}\n"
                            f"• VPC ID: {instance['VpcId']}\n"
                            f"• Public IP: {instance.get('PublicIpAddress', 'N/
A')}\n"
                            f"• State: {instance_state}"
                        )
                        print(instance_info)

        except ClientError as err:
            logger.error(
```

```
                f"Failed to display instance(s). : {' '.join(map(str,
 instance_ids))}"
            )
            error_code = err.response["Error"]["Code"]
            if error_code == "InvalidInstanceID.NotFound":
                logger.error(
                    "One or more instance IDs do not exist. "
                    "Please verify the instance IDs and try again."
                )
                raise
```

- Untuk API detailnya, lihat DescribeInstances AWSSDKReferensi Python (Boto3). API

## Ruby

### SDKuntuk Ruby

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
require 'aws-sdk-ec2'

# @param ec2_resource [Aws::EC2::Resource] An initialized EC2 resource object.
# @example
#   list_instance_ids_states(Aws::EC2::Resource.new(region: 'us-west-2'))
def list_instance_ids_states(ec2_resource)
  response = ec2_resource.instances
  if response.count.zero?
    puts 'No instances found.'
  else
    puts 'Instances -- ID, state:'
    response.each do |instance|
      puts "#{instance.id}, #{instance.state.name}"
    end
  end
rescue StandardError => e
```

```
  puts "Error getting information about instances: #{e.message}"
end

# Example usage:
def run_me
  region = ''
  # Print usage information and then stop.
  if ARGV[0] == '--help' || ARGV[0] == '-h'
    puts 'Usage:   ruby ec2-ruby-example-get-all-instance-info.rb REGION'
    # Replace us-west-2 with the AWS Region you're using for Amazon EC2.
    puts 'Example: ruby ec2-ruby-example-get-all-instance-info.rb us-west-2'
    exit 1
  # If no values are specified at the command prompt, use these default values.
  # Replace us-west-2 with the AWS Region you're using for Amazon EC2.
  elsif ARGV.count.zero?
    region = 'us-west-2'
  # Otherwise, use the values as specified at the command prompt.
  else
    region = ARGV[0]
  end
  ec2_resource = Aws::EC2::Resource.new(region: region)
  list_instance_ids_states(ec2_resource)
end

run_me if $PROGRAM_NAME == __FILE__
```

- Untuk API detailnya, lihat DescribeInstancesdi AWS SDK for Ruby APIReferensi.

Rust

SDKuntuk Rust

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

Ambil detail untuk sebuah EC2 Instance.

```
   pub async fn describe_instance(&self, instance_id: &str) -> Result<Instance,
EC2Error> {
       let response = self
           .client
           .describe_instances()
           .instance_ids(instance_id)
           .send()
           .await?;

       let instance = response
           .reservations()
           .first()
           .ok_or_else(|| EC2Error::new(format!("No instance reservations for
{instance_id}")))?
           .instances()
           .first()
           .ok_or_else(|| {
               EC2Error::new(format!("No instances in reservation for
{instance_id}"))
           })?;

       Ok(instance.clone())
   }
```

Setelah membuat EC2 instance, ambil dan simpan detailnya.

```
   /// Create an EC2 instance with the given ID on a given type, using a
   /// generated KeyPair and applying a list of security groups.
   pub async fn create(
       &mut self,
       ec2: &EC2,
       image_id: &str,
       instance_type: InstanceType,
       key_pair: &KeyPairInfo,
       security_groups: Vec<&SecurityGroup>,
   ) -> Result<(), EC2Error> {
       let instance_id = ec2
           .create_instance(image_id, instance_type, key_pair, security_groups)
           .await?;
       let instance = ec2.describe_instance(&instance_id).await?;
       self.instance = Some(instance);
       Ok(())
```

```
    }
```

- Untuk API detailnya, lihat DescribeInstances AWSSDKAPIreferensi Rust.

## SAP ABAP

### SDKuntuk SAP ABAP

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    TRY.
        oo_result = lo_ec2->describeinstances( ) .                      "
oo_result is returned for testing purposes. "

        " Retrieving details of EC2 instances. "
        DATA: lv_istance_id    TYPE /aws1/ec2string,
              lv_status        TYPE /aws1/ec2instancestatename,
              lv_instance_type TYPE /aws1/ec2instancetype,
              lv_image_id      TYPE /aws1/ec2string.
        LOOP AT oo_result->get_reservations( ) INTO DATA(lo_reservation).
          LOOP AT lo_reservation->get_instances( ) INTO DATA(lo_instance).
            lv_istance_id = lo_instance->get_instanceid( ).
            lv_status =  lo_instance->get_state( )->get_name( ).
            lv_instance_type = lo_instance->get_instancetype( ).
            lv_image_id = lo_instance->get_imageid( ).
          ENDLOOP.
        ENDLOOP.
        MESSAGE 'Retrieved information about EC2 instances.' TYPE 'I'.
      CATCH /aws1/cx_rt_service_generic INTO DATA(lo_exception).
        DATA(lv_error) = |"{ lo_exception->av_err_code }" - { lo_exception-
>av_err_msg }|.
        MESSAGE lv_error TYPE 'E'.
    ENDTRY.
```

- Untuk API detailnya, lihat DescribeInstances AWSSDKuntuk SAP ABAP API referensi.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DescribeInternetGateways`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribeInternetGateways`.

CLI

AWS CLI

Untuk menggambarkan gateway internet

`describe-internet-gateways`Contoh berikut menjelaskan gateway internet yang ditentukan.

```
aws ec2 describe-internet-gateways \
    --internet-gateway-ids igw-0d0fb496b3EXAMPLE
```

Output:

```
{
    "InternetGateways": [
        {
            "Attachments": [
                {
                    "State": "available",
                    "VpcId": "vpc-0a60eb65b4EXAMPLE"
                }
            ],
            "InternetGatewayId": "igw-0d0fb496b3EXAMPLE",
            "OwnerId": "123456789012",
            "Tags": [
                {
                    "Key": "Name",
                    "Value": "my-igw"
                }
            ]
        }
    ]
}
```

Untuk informasi selengkapnya, lihat gateway Internet di VPCPanduan Pengguna Amazon.

- Untuk API detailnya, lihat DescribeInternetGatewaysdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menjelaskan gateway Internet yang ditentukan.

```
Get-EC2InternetGateway -InternetGatewayId igw-1a2b3c4d
```

Output:

```
Attachments       InternetGatewayId     Tags
-----------       -----------------     ----
{vpc-1a2b3c4d}    igw-1a2b3c4d          {}
```

Contoh 2: Contoh ini menjelaskan semua gateway Internet Anda.

```
Get-EC2InternetGateway
```

Output:

```
Attachments       InternetGatewayId     Tags
-----------       -----------------     ----
{vpc-1a2b3c4d}    igw-1a2b3c4d          {}
{}                igw-2a3b4c5d          {}
```

- Untuk API detailnya, lihat DescribeInternetGatewaysdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DescribeKeyPairs`** dengan AWS SDK atau CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribeKeyPairs`.

Contoh tindakan adalah kutipan kode dari program yang lebih besar dan harus dijalankan dalam konteks. Anda dapat melihat tindakan ini dalam konteks dalam contoh kode berikut:

- Pelajari dasar-dasarnya

.NET

AWS SDK for .NET

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
/// <summary>
/// Get information about an Amazon EC2 key pair.
/// </summary>
/// <param name="keyPairName">The name of the key pair.</param>
/// <returns>A list of key pair information.</returns>
public async Task<List<KeyPairInfo>> DescribeKeyPairs(string keyPairName)
{
    try
    {
        var request = new DescribeKeyPairsRequest();
        if (!string.IsNullOrEmpty(keyPairName))
        {
            request = new DescribeKeyPairsRequest
            {
                KeyNames = new List<string> { keyPairName }
            };
        }

        var response = await _amazonEC2.DescribeKeyPairsAsync(request);
        return response.KeyPairs.ToList();
    }
    catch (AmazonEC2Exception ec2Exception)
    {
        if (ec2Exception.ErrorCode == "InvalidKeyPair.NotFound")
        {
            _logger.LogError(
```

```
                    $"A key pair called {keyPairName} does not exist.");
            }

            throw;
        }
        catch (Exception ex)
        {
            _logger.LogError(
                $"An error occurred while describing the key pair.:
{ex.Message}");
            throw;
        }
    }
```

- Untuk API detailnya, lihat DescribeKeyPairsdi AWS SDK for .NET APIReferensi.

## Bash

### AWS CLI dengan skrip Bash

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
###############################################################################
# function ec2_describe_key_pairs
#
# This function describes one or more Amazon Elastic Compute Cloud (Amazon EC2)
 key pairs.
#
# Parameters:
#       -h - Display help.
#
# And:
#       0 - If successful.
#       1 - If it fails.
###############################################################################
function ec2_describe_key_pairs() {
```

```
  local option OPTARG # Required to use getopts command in a function.

  # bashsupport disable=BP5008
  function usage() {
    echo "function ec2_describe_key_pairs"
    echo "Describes one or more Amazon Elastic Compute Cloud (Amazon EC2) key
 pairs."
    echo "  -h - Display help."
    echo ""
  }

  # Retrieve the calling parameters.
  while getopts "h" option; do
    case "${option}" in
      h)
        usage
        return 0
        ;;
      \?)
        echo "Invalid parameter"
        usage
        return 1
        ;;
    esac
  done
  export OPTIND=1

  local response

  response=$(aws ec2 describe-key-pairs \
    --query 'KeyPairs[*].[KeyName, KeyFingerprint]' \
    --output text) || {
    aws_cli_error_log ${?}
    errecho "ERROR: AWS reports describe-key-pairs operation failed.$response"
    return 1
  }

  echo "$response"

  return 0
}
```

Fungsi utilitas yang digunakan dalam contoh ini.

```
##############################################################################
# function errecho
#
# This function outputs everything sent to it to STDERR (standard error output).
##############################################################################
function errecho() {
  printf "%s\n" "$*" 1>&2
}

##############################################################################
# function aws_cli_error_log()
#
# This function is used to log the error messages from the AWS CLI.
#
# The function expects the following argument:
#         $1 - The error code returned by the AWS CLI.
#
#  Returns:
#          0: - Success.
#
##############################################################################
function aws_cli_error_log() {
  local err_code=$1
  errecho "Error code : $err_code"
  if [ "$err_code" == 1 ]; then
    errecho "  One or more S3 transfers failed."
  elif [ "$err_code" == 2 ]; then
    errecho "  Command line failed to parse."
  elif [ "$err_code" == 130 ]; then
    errecho "  Process received SIGINT."
  elif [ "$err_code" == 252 ]; then
    errecho "  Command syntax invalid."
  elif [ "$err_code" == 253 ]; then
    errecho "  The system environment or configuration was invalid."
  elif [ "$err_code" == 254 ]; then
    errecho "  The service returned an error."
  elif [ "$err_code" == 255 ]; then
    errecho "  255 is a catch-all error."
  fi

  return 0
}
```

- Untuk API detailnya, lihat DescribeKeyPairsdi Referensi AWS CLI Perintah.

C++

SDKuntuk C ++

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
//! Describe all Amazon Elastic Compute Cloud (Amazon EC2) instance key pairs.
/*!
  \param clientConfiguration: AWS client configuration.
  \return bool: Function succeeded.
 */
bool AwsDoc::EC2::describeKeyPairs(
        const Aws::Client::ClientConfiguration &clientConfiguration) {
    Aws::EC2::EC2Client ec2Client(clientConfiguration);
    Aws::EC2::Model::DescribeKeyPairsRequest request;

    Aws::EC2::Model::DescribeKeyPairsOutcome outcome =
 ec2Client.DescribeKeyPairs(request);
    if (outcome.IsSuccess()) {
        std::cout << std::left <<
                  std::setw(32) << "Name" <<
                  std::setw(64) << "Fingerprint" << std::endl;

        const std::vector<Aws::EC2::Model::KeyPairInfo> &key_pairs =
                outcome.GetResult().GetKeyPairs();
        for (const auto &key_pair: key_pairs) {
            std::cout << std::left <<
                      std::setw(32) << key_pair.GetKeyName() <<
                      std::setw(64) << key_pair.GetKeyFingerprint() << std::endl;
        }
    } else {
        std::cerr << "Failed to describe key pairs:" <<
                  outcome.GetError().GetMessage() << std::endl;
    }
```

```
    return outcome.IsSuccess();
}
```

- Untuk API detailnya, lihat DescribeKeyPairsdi AWS SDK for C++ APIReferensi.

CLI

AWS CLI

Untuk menampilkan pasangan kunci

Contoh `describe-key-pairs` berikut menampilkan informasi tentang pasangan kunci tertentu.

```
aws ec2 describe-key-pairs \
    --key-names my-key-pair
```

Output:

```
{
    "KeyPairs": [
        {
            "KeyPairId": "key-0b94643da6EXAMPLE",
            "KeyFingerprint":
 "1f:51:ae:28:bf:89:e9:d8:1f:25:5d:37:2d:7d:b8:ca:9f:f5:f1:6f",
            "KeyName": "my-key-pair",
            "KeyType": "rsa",
            "Tags": [],
            "CreateTime": "2022-05-27T21:51:16.000Z"
        }
    ]
}
```

Untuk informasi selengkapnya, lihat Menjelaskan kunci publik di Panduan EC2 Pengguna Amazon.

- Untuk API detailnya, lihat DescribeKeyPairsdi Referensi AWS CLI Perintah.

Java

SDKuntuk Java 2.x

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
   /**
    * Asynchronously describes the key pairs associated with the current AWS
account.
    *
    * @return a {@link CompletableFuture} containing the {@link
DescribeKeyPairsResponse} object, which provides
    * information about the key pairs.
    */
   public CompletableFuture<DescribeKeyPairsResponse> describeKeysAsync() {
       CompletableFuture<DescribeKeyPairsResponse> responseFuture =
getAsyncClient().describeKeyPairs();
       responseFuture.whenComplete((response, exception) -> {
           if (exception != null) {
             throw new RuntimeException("Failed to describe key pairs: " +
exception.getMessage(), exception);
           }
       });

       return responseFuture;
   }
```

- Untuk API detailnya, lihat DescribeKeyPairsdi AWS SDK for Java 2.x APIReferensi.

JavaScript

SDKuntuk JavaScript (v3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
import { DescribeKeyPairsCommand, EC2Client } from "@aws-sdk/client-ec2";

/**
 * List all key pairs in the current AWS account.
 * @param {{ dryRun: boolean }}
 */
export const main = async ({ dryRun }) => {
  const client = new EC2Client({});
  const command = new DescribeKeyPairsCommand({ DryRun: dryRun });

  try {
    const { KeyPairs } = await client.send(command);
    const keyPairList = KeyPairs.map(
      (kp) => ` • ${kp.KeyPairId}: ${kp.KeyName}`,
    ).join("\n");
    console.log("The following key pairs were found in your account:");
    console.log(keyPairList);
  } catch (caught) {
    if (caught instanceof Error && caught.name === "DryRunOperation") {
      console.log(`${caught.message}`);
    } else {
      throw caught;
    }
  }
};
```

- Untuk API detailnya, lihat DescribeKeyPairsdi AWS SDK for JavaScript APIReferensi.

Kotlin

SDKuntuk Kotlin

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
suspend fun describeEC2Keys() {
    Ec2Client { region = "us-west-2" }.use { ec2 ->
        val response = ec2.describeKeyPairs(DescribeKeyPairsRequest {})
        response.keyPairs?.forEach { keyPair ->
            println("Found key pair with name ${keyPair.keyName} and fingerprint
 ${ keyPair.keyFingerprint}")
        }
    }
}
```

- Untuk API detailnya, lihat DescribeKeyPairs AWSSDKAPIreferensi Kotlin.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menjelaskan key pair yang ditentukan.

```
Get-EC2KeyPair -KeyName my-key-pair
```

Output:

```
KeyFingerprint                                                  KeyName
--------------                                                  -------
1f:51:ae:28:bf:89:e9:d8:1f:25:5d:37:2d:7d:b8:ca:9f:f5:f1:6f my-key-pair
```

Contoh 2: Contoh ini menjelaskan semua pasangan kunci Anda.

```
Get-EC2KeyPair
```

- Untuk API detailnya, lihat DescribeKeyPairsdi AWS Tools for PowerShell Referensi Cmdlet.

Python

SDKuntuk Python (Boto3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
class KeyPairWrapper:
    """
    Encapsulates Amazon Elastic Compute Cloud (Amazon EC2) key pair actions.
    This class provides methods to create, list, and delete EC2 key pairs.
    """

    def __init__(
        self,
        ec2_client: boto3.client,
        key_file_dir: Union[tempfile.TemporaryDirectory, str],
        key_pair: Optional[dict] = None,
    ):
        """
        Initializes the KeyPairWrapper with the specified EC2 client, key file
 directory,
        and an optional key pair.

        :param ec2_client: A Boto3 Amazon EC2 client. This client provides low-
level
                           access to AWS EC2 services.
        :param key_file_dir: The folder where the private key information is
 stored.
                             This should be a secure folder.
        :param key_pair: A dictionary representing the Boto3 KeyPair object.
                         This is a high-level object that wraps key pair actions.
 Optional.
        """
        self.ec2_client = ec2_client
        self.key_pair = key_pair
        self.key_file_path: Optional[str] = None
```

```
        self.key_file_dir = key_file_dir

    @classmethod
    def from_client(cls) -> "KeyPairWrapper":
        """
        Class method to create an instance of KeyPairWrapper using a new EC2
client
        and a temporary directory for storing key files.

        :return: An instance of KeyPairWrapper.
        """
        ec2_client = boto3.client("ec2")
        return cls(ec2_client, tempfile.TemporaryDirectory())


    def list(self, limit: Optional[int] = None) -> None:
        """
        Displays a list of key pairs for the current account.

        WARNING: Results are not paginated.

        :param limit: The maximum number of key pairs to list. If not specified,
                      all key pairs will be listed.
        :raises ClientError: If there is an error in listing the key pairs.
        """
        try:
            response = self.ec2_client.describe_key_pairs()
            key_pairs = response.get("KeyPairs", [])

            if limit:
                key_pairs = key_pairs[:limit]

            for key_pair in key_pairs:
                logger.info(
                    f"Found {key_pair['KeyType']} key '{key_pair['KeyName']}'
with fingerprint:"
                )
                logger.info(f"\t{key_pair['KeyFingerprint']}")
        except ClientError as err:
            logger.error(f"Failed to list key pairs: {str(err)}")
            raise
```

- Untuk API detailnya, lihat DescribeKeyPairs AWSSDKReferensi Python (Boto3). API

Rust

SDKuntuk Rust

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    pub async fn list_key_pair(&self) -> Result<Vec<KeyPairInfo>, EC2Error> {
        let output = self.client.describe_key_pairs().send().await?;
        Ok(output.key_pairs.unwrap_or_default())
    }
```

- Untuk API detailnya, lihat DescribeKeyPairs AWSSDKAPIreferensi Rust.

SAP ABAP

SDKuntuk SAP ABAP

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    TRY.
        oo_result = lo_ec2->describekeypairs( ) .                       "
 oo_result is returned for testing purposes. "
        DATA(lt_key_pairs) = oo_result->get_keypairs( ).
        MESSAGE 'Retrieved information about key pairs.' TYPE 'I'.
      CATCH /aws1/cx_rt_service_generic INTO DATA(lo_exception).
        DATA(lv_error) = |"{ lo_exception->av_err_code }" - { lo_exception-
>av_err_msg }|.
        MESSAGE lv_error TYPE 'E'.
```

```
    ENDTRY.
```

- Untuk API detailnya, lihat DescribeKeyPairs AWSSDKuntuk SAP ABAP API referensi.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DescribeNetworkAcls`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribeNetworkAcls`.

CLI

AWS CLI

Untuk mendeskripsikan jaringan Anda ACLs

`describe-network-acls`Contoh berikut mengambil rincian tentang jaringan ACLs Anda.

```
aws ec2 describe-network-acls
```

Output:

```
{
    "NetworkAcls": [
        {
            "Associations": [
                {
                    "NetworkAclAssociationId": "aclassoc-0c1679dc41EXAMPLE",
                    "NetworkAclId": "acl-0ea1f54ca7EXAMPLE",
                    "SubnetId": "subnet-0931fc2fa5EXAMPLE"
                }
            ],
            "Entries": [
                {
                    "CidrBlock": "0.0.0.0/0",
                    "Egress": true,
                    "Protocol": "-1",
                    "RuleAction": "allow",
                    "RuleNumber": 100
```

```
                },
                {
                    "CidrBlock": "0.0.0.0/0",
                    "Egress": true,
                    "Protocol": "-1",
                    "RuleAction": "deny",
                    "RuleNumber": 32767
                },
                {
                    "CidrBlock": "0.0.0.0/0",
                    "Egress": false,
                    "Protocol": "-1",
                    "RuleAction": "allow",
                    "RuleNumber": 100
                },
                {
                    "CidrBlock": "0.0.0.0/0",
                    "Egress": false,
                    "Protocol": "-1",
                    "RuleAction": "deny",
                    "RuleNumber": 32767
                }
            ],
            "IsDefault": true,
            "NetworkAclId": "acl-0ea1f54ca7EXAMPLE",
            "Tags": [],
            "VpcId": "vpc-06e4ab6c6cEXAMPLE",
            "OwnerId": "111122223333"
        },
        {
            "Associations": [],
            "Entries": [
                {
                    "CidrBlock": "0.0.0.0/0",
                    "Egress": true,
                    "Protocol": "-1",
                    "RuleAction": "allow",
                    "RuleNumber": 100
                },
                {
                    "Egress": true,
                    "Ipv6CidrBlock": "::/0",
                    "Protocol": "-1",
                    "RuleAction": "allow",
```

```
                    "RuleNumber": 101
                },
                {
                    "CidrBlock": "0.0.0.0/0",
                    "Egress": true,
                    "Protocol": "-1",
                    "RuleAction": "deny",
                    "RuleNumber": 32767
                },
                {
                    "Egress": true,
                    "Ipv6CidrBlock": "::/0",
                    "Protocol": "-1",
                    "RuleAction": "deny",
                    "RuleNumber": 32768
                },
                {
                    "CidrBlock": "0.0.0.0/0",
                    "Egress": false,
                    "Protocol": "-1",
                    "RuleAction": "allow",
                    "RuleNumber": 100
                },
                {
                    "Egress": false,
                    "Ipv6CidrBlock": "::/0",
                    "Protocol": "-1",
                    "RuleAction": "allow",
                    "RuleNumber": 101
                },
                {
                    "CidrBlock": "0.0.0.0/0",
                    "Egress": false,
                    "Protocol": "-1",
                    "RuleAction": "deny",
                    "RuleNumber": 32767
                },
                {
                    "Egress": false,
                    "Ipv6CidrBlock": "::/0",
                    "Protocol": "-1",
                    "RuleAction": "deny",
                    "RuleNumber": 32768
                }
```

```
            ],
            "IsDefault": true,
            "NetworkAclId": "acl-0e2a78e4e2EXAMPLE",
            "Tags": [],
            "VpcId": "vpc-03914afb3eEXAMPLE",
            "OwnerId": "111122223333"
        }
    ]
}
```

Untuk informasi selengkapnya, lihat Jaringan ACLs di Panduan AWS VPC Pengguna.

- Untuk API detailnya, lihat DescribeNetworkAclsdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menjelaskan jaringan yang ditentukanACL.

```
Get-EC2NetworkAcl -NetworkAclId acl-12345678
```

Output:

```
Associations : {aclassoc-1a2b3c4d}
Entries      : {Amazon.EC2.Model.NetworkAclEntry,
 Amazon.EC2.Model.NetworkAclEntry}
IsDefault    : False
NetworkAclId : acl-12345678
Tags         : {Name}
VpcId        : vpc-12345678
```

Contoh 2: Contoh ini menjelaskan aturan untuk jaringan yang ditentukanACL.

```
(Get-EC2NetworkAcl -NetworkAclId acl-12345678).Entries
```

Output:

```
CidrBlock    : 0.0.0.0/0
Egress       : True
IcmpTypeCode :
PortRange    :
```

```
Protocol     : -1
RuleAction   : deny
RuleNumber   : 32767

CidrBlock    : 0.0.0.0/0
Egress       : False
IcmpTypeCode :
PortRange    :
Protocol     : -1
RuleAction   : deny
RuleNumber   : 32767
```

Contoh 3: Contoh ini menjelaskan semua jaringan AndaACLs.

```
Get-EC2NetworkAcl
```

- Untuk API detailnya, lihat DescribeNetworkAclsdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DescribeNetworkInterfaceAttribute`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribeNetworkInterfaceAttribute`.

CLI

AWS CLI

Untuk menggambarkan atribut lampiran dari antarmuka jaringan

Perintah contoh ini menjelaskan `attachment` atribut antarmuka jaringan yang ditentukan.

Perintah:

```
aws ec2 describe-network-interface-attribute --network-interface-id eni-686ea200
 --attribute attachment
```

Output:

```
{
  "NetworkInterfaceId": "eni-686ea200",
  "Attachment": {
      "Status": "attached",
      "DeviceIndex": 0,
      "AttachTime": "2015-05-21T20:02:20.000Z",
      "InstanceId": "i-1234567890abcdef0",
      "DeleteOnTermination": true,
      "AttachmentId": "eni-attach-43348162",
      "InstanceOwnerId": "123456789012"
  }
}
```

Untuk menggambarkan atribut deskripsi antarmuka jaringan

Perintah contoh ini menjelaskan `description` atribut antarmuka jaringan yang ditentukan.

Perintah:

```
aws ec2 describe-network-interface-attribute --network-interface-id eni-686ea200
 --attribute description
```

Output:

```
{
  "NetworkInterfaceId": "eni-686ea200",
  "Description": {
      "Value": "My description"
  }
}
```

Untuk menggambarkan groupSet atribut antarmuka jaringan

Perintah contoh ini menjelaskan `groupSet` atribut antarmuka jaringan yang ditentukan.

Perintah:

```
aws ec2 describe-network-interface-attribute --network-interface-id eni-686ea200
 --attribute groupSet
```

Output:

```
{
  "NetworkInterfaceId": "eni-686ea200",
  "Groups": [
      {
          "GroupName": "my-security-group",
          "GroupId": "sg-903004f8"
      }
  ]
}
```

Untuk menggambarkan sourceDestCheck atribut antarmuka jaringan

Perintah contoh ini menjelaskan `sourceDestCheck` atribut antarmuka jaringan yang ditentukan.

Perintah:

```
aws ec2 describe-network-interface-attribute --network-interface-id eni-686ea200
 --attribute sourceDestCheck
```

Output:

```
{
  "NetworkInterfaceId": "eni-686ea200",
  "SourceDestCheck": {
      "Value": true
  }
}
```

- Untuk API detailnya, lihat DescribeNetworkInterfaceAttributedi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menjelaskan antarmuka jaringan yang ditentukan.

```
Get-EC2NetworkInterfaceAttribute -NetworkInterfaceId eni-12345678 -Attribute
 Attachment
```

Output:

```
Attachment         : Amazon.EC2.Model.NetworkInterfaceAttachment
```

Contoh 2: Contoh ini menjelaskan antarmuka jaringan yang ditentukan.

```
Get-EC2NetworkInterfaceAttribute -NetworkInterfaceId eni-12345678 -Attribute
 Description
```

Output:

```
Description        : My description
```

Contoh 3: Contoh ini menjelaskan antarmuka jaringan yang ditentukan.

```
Get-EC2NetworkInterfaceAttribute -NetworkInterfaceId eni-12345678 -Attribute
 GroupSet
```

Output:

```
Groups             : {my-security-group}
```

Contoh 4: Contoh ini menjelaskan antarmuka jaringan yang ditentukan.

```
Get-EC2NetworkInterfaceAttribute -NetworkInterfaceId eni-12345678 -Attribute
 SourceDestCheck
```

Output:

```
SourceDestCheck    : True
```

- Untuk API detailnya, lihat DescribeNetworkInterfaceAttributedi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DescribeNetworkInterfaces`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribeNetworkInterfaces`.

CLI

AWS CLI

Untuk mendeskripsikan antarmuka jaringan Anda

Contoh ini menjelaskan semua antarmuka jaringan Anda.

Perintah:

```
aws ec2 describe-network-interfaces
```

Output:

```
{
  "NetworkInterfaces": [
      {
          "Status": "in-use",
          "MacAddress": "02:2f:8f:b0:cf:75",
          "SourceDestCheck": true,
          "VpcId": "vpc-a01106c2",
          "Description": "my network interface",
          "Association": {
              "PublicIp": "203.0.113.12",
              "AssociationId": "eipassoc-0fbb766a",
              "PublicDnsName": "ec2-203-0-113-12.compute-1.amazonaws.com",
              "IpOwnerId": "123456789012"
          },
          "NetworkInterfaceId": "eni-e5aa89a3",
          "PrivateIpAddresses": [
              {
                  "PrivateDnsName": "ip-10-0-1-17.ec2.internal",
                  "Association": {
                      "PublicIp": "203.0.113.12",
                      "AssociationId": "eipassoc-0fbb766a",
                      "PublicDnsName":
 "ec2-203-0-113-12.compute-1.amazonaws.com",
                      "IpOwnerId": "123456789012"
                  },
                  "Primary": true,
                  "PrivateIpAddress": "10.0.1.17"
              }
          ],
          "RequesterManaged": false,
```

```
            "Ipv6Addresses": [],
            "PrivateDnsName": "ip-10-0-1-17.ec2.internal",
            "AvailabilityZone": "us-east-1d",
            "Attachment": {
                "Status": "attached",
                "DeviceIndex": 1,
                "AttachTime": "2013-11-30T23:36:42.000Z",
                "InstanceId": "i-1234567890abcdef0",
                "DeleteOnTermination": false,
                "AttachmentId": "eni-attach-66c4350a",
                "InstanceOwnerId": "123456789012"
            },
            "Groups": [
                {
                    "GroupName": "default",
                    "GroupId": "sg-8637d3e3"
                }
            ],
            "SubnetId": "subnet-b61f49f0",
            "OwnerId": "123456789012",
            "TagSet": [],
            "PrivateIpAddress": "10.0.1.17"
        },
        {
            "Status": "in-use",
            "MacAddress": "02:58:f5:ef:4b:06",
            "SourceDestCheck": true,
            "VpcId": "vpc-a01106c2",
            "Description": "Primary network interface",
            "Association": {
                "PublicIp": "198.51.100.0",
                "IpOwnerId": "amazon"
            },
            "NetworkInterfaceId": "eni-f9ba99bf",
            "PrivateIpAddresses": [
                {
                    "Association": {
                        "PublicIp": "198.51.100.0",
                        "IpOwnerId": "amazon"
                    },
                    "Primary": true,
                    "PrivateIpAddress": "10.0.1.149"
                }
            ],
```

```
            "RequesterManaged": false,
            "Ipv6Addresses": [],
            "AvailabilityZone": "us-east-1d",
            "Attachment": {
                "Status": "attached",
                "DeviceIndex": 0,
                "AttachTime": "2013-11-30T23:35:33.000Z",
                "InstanceId": "i-0598c7d356eba48d7",
                "DeleteOnTermination": true,
                "AttachmentId": "eni-attach-1b9db777",
                "InstanceOwnerId": "123456789012"
            },
            "Groups": [
                {
                    "GroupName": "default",
                    "GroupId": "sg-8637d3e3"
                }
            ],
            "SubnetId": "subnet-b61f49f0",
            "OwnerId": "123456789012",
            "TagSet": [],
            "PrivateIpAddress": "10.0.1.149"
        }
    ]
}
```

Contoh ini menjelaskan antarmuka jaringan yang memiliki tag dengan kunci `Purpose` dan nilainya`Prod`.

Perintah:

```
aws ec2 describe-network-interfaces --filters Name=tag:Purpose,Values=Prod
```

Output:

```
{
    "NetworkInterfaces": [
        {
            "Status": "available",
            "MacAddress": "12:2c:bd:f9:bf:17",
            "SourceDestCheck": true,
            "VpcId": "vpc-8941ebec",
            "Description": "ProdENI",
```

```
            "NetworkInterfaceId": "eni-b9a5ac93",
            "PrivateIpAddresses": [
                {
                    "PrivateDnsName": "ip-10-0-1-55.ec2.internal",
                    "Primary": true,
                    "PrivateIpAddress": "10.0.1.55"
                },
                {
                    "PrivateDnsName": "ip-10-0-1-117.ec2.internal",
                    "Primary": false,
                    "PrivateIpAddress": "10.0.1.117"
                }
            ],
            "RequesterManaged": false,
            "PrivateDnsName": "ip-10-0-1-55.ec2.internal",
            "AvailabilityZone": "us-east-1d",
            "Ipv6Addresses": [],
            "Groups": [
                {
                    "GroupName": "MySG",
                    "GroupId": "sg-905002f5"
                }
            ],
            "SubnetId": "subnet-31d6c219",
            "OwnerId": "123456789012",
            "TagSet": [
                {
                    "Value": "Prod",
                    "Key": "Purpose"
                }
            ],
            "PrivateIpAddress": "10.0.1.55"
        }
    ]
}
```

- Untuk API detailnya, lihat DescribeNetworkInterfacesdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menjelaskan antarmuka jaringan yang ditentukan.

```
Get-EC2NetworkInterface -NetworkInterfaceId eni-12345678
```

Output:

```
Association        :
Attachment         : Amazon.EC2.Model.NetworkInterfaceAttachment
AvailabilityZone   : us-west-2c
Description        :
Groups             : {my-security-group}
MacAddress         : 0a:e9:a6:19:4c:7f
NetworkInterfaceId : eni-12345678
OwnerId            : 123456789012
PrivateDnsName     : ip-10-0-0-107.us-west-2.compute.internal
PrivateIpAddress   : 10.0.0.107
PrivateIpAddresses : {ip-10-0-0-107.us-west-2.compute.internal}
RequesterId        :
RequesterManaged   : False
SourceDestCheck    : True
Status             : in-use
SubnetId           : subnet-1a2b3c4d
TagSet             : {}
VpcId              : vpc-12345678
```

Contoh 2: Contoh ini menjelaskan semua antarmuka jaringan Anda.

```
Get-EC2NetworkInterface
```

- Untuk API detailnya, lihat DescribeNetworkInterfacesdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DescribePlacementGroups`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribePlacementGroups`.

CLI

AWS CLI

Untuk menggambarkan grup penempatan Anda

Perintah contoh ini menjelaskan semua grup penempatan Anda.

Perintah:

```
aws ec2 describe-placement-groups
```

Output:

```
{
    "PlacementGroups": [
        {
            "GroupName": "my-cluster",
            "State": "available",
            "Strategy": "cluster"
        },
        ...
    ]
}
```

- Untuk API detailnya, lihat DescribePlacementGroupsdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menjelaskan grup penempatan yang ditentukan.

```
Get-EC2PlacementGroup -GroupName my-placement-group
```

Output:

```
GroupName             State        Strategy
---------             -----        --------
my-placement-group    available    cluster
```

- Untuk API detailnya, lihat DescribePlacementGroupsdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DescribePrefixLists`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribePrefixLists`.

CLI

AWS CLI

Untuk menggambarkan daftar awalan

Contoh ini mencantumkan semua daftar awalan yang tersedia untuk wilayah tersebut.

Perintah:

```
aws ec2 describe-prefix-lists
```

Output:

```
{
  "PrefixLists": [
    {
      "PrefixListName": "com.amazonaws.us-east-1.s3",
      "Cidrs": [
        "54.231.0.0/17"
      ],
      "PrefixListId": "pl-63a5400a"
    }
  ]
}
```

- Untuk API detailnya, lihat DescribePrefixListsdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini mengambil yang tersedia Layanan AWS dalam format daftar awalan untuk wilayah tersebut

```
Get-EC2PrefixList
```

Output:

```
Cidrs                                          PrefixListId PrefixListName
-----                                          ------------ --------------
{52.94.5.0/24, 52.119.240.0/21, 52.94.24.0/23} pl-6fa54006  com.amazonaws.eu-
west-1.dynamodb
{52.218.0.0/17, 54.231.128.0/19}               pl-6da54004  com.amazonaws.eu-
west-1.s3
```

- Untuk API detailnya, lihat DescribePrefixListsdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DescribeRegions`** dengan AWS SDK atau CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribeRegions`.

C++

SDKuntuk C ++

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
//! Describe all Amazon Elastic Compute Cloud (Amazon EC2) Regions.
```

```
/*!
  \param clientConfiguration: AWS client configuration.
  \return bool: Function succeeded.
 */
bool AwsDoc::EC2::describeRegions(
        const Aws::Client::ClientConfiguration &clientConfiguration) {
    Aws::EC2::EC2Client ec2Client(clientConfiguration);

    Aws::EC2::Model::DescribeRegionsRequest request;
    Aws::EC2::Model::DescribeRegionsOutcome outcome =
 ec2Client.DescribeRegions(request);
    if (outcome.IsSuccess()) {
        std::cout << std::left <<
                  std::setw(32) << "RegionName" <<
                  std::setw(64) << "Endpoint" << std::endl;

        const auto &regions = outcome.GetResult().GetRegions();
        for (const auto &region: regions) {
            std::cout << std::left <<
                      std::setw(32) << region.GetRegionName() <<
                      std::setw(64) << region.GetEndpoint() << std::endl;
        }
    } else {
        std::cerr << "Failed to describe regions:" <<
                  outcome.GetError().GetMessage() << std::endl;
    }

    std::cout << std::endl;

    return outcome.IsSuccess();

}
```

- Untuk API detailnya, lihat DescribeRegionsdi AWS SDK for C++ APIReferensi.

CLI

AWS CLI

Contoh 1: Untuk menjelaskan semua Wilayah yang diaktifkan

Contoh `describe-regions` berikut menjelaskan semua Wilayah yang diaktifkan untuk akun Anda.

```
aws ec2 describe-regions
```

Output:

```
{
    "Regions": [
        {
            "Endpoint": "ec2.eu-north-1.amazonaws.com",
            "RegionName": "eu-north-1",
            "OptInStatus": "opt-in-not-required"
        },
        {
            "Endpoint": "ec2.ap-south-1.amazonaws.com",
            "RegionName": "ap-south-1",
            "OptInStatus": "opt-in-not-required"
        },
        {
            "Endpoint": "ec2.eu-west-3.amazonaws.com",
            "RegionName": "eu-west-3",
            "OptInStatus": "opt-in-not-required"
        },
        {
            "Endpoint": "ec2.eu-west-2.amazonaws.com",
            "RegionName": "eu-west-2",
            "OptInStatus": "opt-in-not-required"
        },
        {
            "Endpoint": "ec2.eu-west-1.amazonaws.com",
            "RegionName": "eu-west-1",
            "OptInStatus": "opt-in-not-required"
        },
        {
            "Endpoint": "ec2.ap-northeast-3.amazonaws.com",
            "RegionName": "ap-northeast-3",
            "OptInStatus": "opt-in-not-required"
        },
        {
            "Endpoint": "ec2.ap-northeast-2.amazonaws.com",
            "RegionName": "ap-northeast-2",
            "OptInStatus": "opt-in-not-required"
```

```
        },
        {
            "Endpoint": "ec2.ap-northeast-1.amazonaws.com",
            "RegionName": "ap-northeast-1",
            "OptInStatus": "opt-in-not-required"
        },
        {
            "Endpoint": "ec2.sa-east-1.amazonaws.com",
            "RegionName": "sa-east-1",
            "OptInStatus": "opt-in-not-required"
        },
        {
            "Endpoint": "ec2.ca-central-1.amazonaws.com",
            "RegionName": "ca-central-1",
            "OptInStatus": "opt-in-not-required"
        },
        {
            "Endpoint": "ec2.ap-southeast-1.amazonaws.com",
            "RegionName": "ap-southeast-1",
            "OptInStatus": "opt-in-not-required"
        },
        {
            "Endpoint": "ec2.ap-southeast-2.amazonaws.com",
            "RegionName": "ap-southeast-2",
            "OptInStatus": "opt-in-not-required"
        },
        {
            "Endpoint": "ec2.eu-central-1.amazonaws.com",
            "RegionName": "eu-central-1",
            "OptInStatus": "opt-in-not-required"
        },
        {
            "Endpoint": "ec2.us-east-1.amazonaws.com",
            "RegionName": "us-east-1",
            "OptInStatus": "opt-in-not-required"
        },
        {
            "Endpoint": "ec2.us-east-2.amazonaws.com",
            "RegionName": "us-east-2",
            "OptInStatus": "opt-in-not-required"
        },
        {
            "Endpoint": "ec2.us-west-1.amazonaws.com",
            "RegionName": "us-west-1",
```

```
            "OptInStatus": "opt-in-not-required"
        },
        {
            "Endpoint": "ec2.us-west-2.amazonaws.com",
            "RegionName": "us-west-2",
            "OptInStatus": "opt-in-not-required"
        }
    ]
}
```

Untuk informasi selengkapnya, lihat Wilayah dan Zona di Panduan EC2 Pengguna Amazon.

Contoh 2: Untuk menjelaskan Wilayah yang diaktifkan dengan titik akhir yang namanya berisi string tertentu

Contoh `describe-regions` berikut menjelaskan semua Wilayah yang telah Anda aktifkan yang memiliki string “us” di titik akhir.

```
aws ec2 describe-regions \
    --filters "Name=endpoint,Values=*us*"
```

Output:

```
{
    "Regions": [
        {
            "Endpoint": "ec2.us-east-1.amazonaws.com",
            "RegionName": "us-east-1"
        },
        {
            "Endpoint": "ec2.us-east-2.amazonaws.com",
            "RegionName": "us-east-2"
        },
        {
            "Endpoint": "ec2.us-west-1.amazonaws.com",
            "RegionName": "us-west-1"
        },
        {
            "Endpoint": "ec2.us-west-2.amazonaws.com",
            "RegionName": "us-west-2"
        }
    ]
```

```
}
```

Untuk informasi selengkapnya, lihat Wilayah dan Zona di Panduan EC2 Pengguna Amazon.

Contoh 3: Untuk menjelaskan semua Wilayah

Contoh `describe-regions` berikut menjelaskan semua Wilayah yang tersedia, termasuk Wilayah yang dinonaktifkan.

```
aws ec2 describe-regions \
    --all-regions
```

Output:

```
{
    "Regions": [
        {
            "Endpoint": "ec2.eu-north-1.amazonaws.com",
            "RegionName": "eu-north-1",
            "OptInStatus": "opt-in-not-required"
        },
        {
            "Endpoint": "ec2.ap-south-1.amazonaws.com",
            "RegionName": "ap-south-1",
            "OptInStatus": "opt-in-not-required"
        },
        {
            "Endpoint": "ec2.eu-west-3.amazonaws.com",
            "RegionName": "eu-west-3",
            "OptInStatus": "opt-in-not-required"
        },
        {
            "Endpoint": "ec2.eu-west-2.amazonaws.com",
            "RegionName": "eu-west-2",
            "OptInStatus": "opt-in-not-required"
        },
        {
            "Endpoint": "ec2.eu-west-1.amazonaws.com",
            "RegionName": "eu-west-1",
            "OptInStatus": "opt-in-not-required"
        },
        {
            "Endpoint": "ec2.ap-northeast-3.amazonaws.com",
```

```
            "RegionName": "ap-northeast-3",
            "OptInStatus": "opt-in-not-required"
        },
        {
            "Endpoint": "ec2.me-south-1.amazonaws.com",
            "RegionName": "me-south-1",
            "OptInStatus": "not-opted-in"
        },
        {
            "Endpoint": "ec2.ap-northeast-2.amazonaws.com",
            "RegionName": "ap-northeast-2",
            "OptInStatus": "opt-in-not-required"
        },
        {
            "Endpoint": "ec2.ap-northeast-1.amazonaws.com",
            "RegionName": "ap-northeast-1",
            "OptInStatus": "opt-in-not-required"
        },
        {
            "Endpoint": "ec2.sa-east-1.amazonaws.com",
            "RegionName": "sa-east-1",
            "OptInStatus": "opt-in-not-required"
        },
        {
            "Endpoint": "ec2.ca-central-1.amazonaws.com",
            "RegionName": "ca-central-1",
            "OptInStatus": "opt-in-not-required"
        },
        {
            "Endpoint": "ec2.ap-east-1.amazonaws.com",
            "RegionName": "ap-east-1",
            "OptInStatus": "not-opted-in"
        },
        {
            "Endpoint": "ec2.ap-southeast-1.amazonaws.com",
            "RegionName": "ap-southeast-1",
            "OptInStatus": "opt-in-not-required"
        },
        {
            "Endpoint": "ec2.ap-southeast-2.amazonaws.com",
            "RegionName": "ap-southeast-2",
            "OptInStatus": "opt-in-not-required"
        },
        {
```

```
            "Endpoint": "ec2.eu-central-1.amazonaws.com",
            "RegionName": "eu-central-1",
            "OptInStatus": "opt-in-not-required"
        },
        {
            "Endpoint": "ec2.us-east-1.amazonaws.com",
            "RegionName": "us-east-1",
            "OptInStatus": "opt-in-not-required"
        },
        {
            "Endpoint": "ec2.us-east-2.amazonaws.com",
            "RegionName": "us-east-2",
            "OptInStatus": "opt-in-not-required"
        },
        {
            "Endpoint": "ec2.us-west-1.amazonaws.com",
            "RegionName": "us-west-1",
            "OptInStatus": "opt-in-not-required"
        },
        {
            "Endpoint": "ec2.us-west-2.amazonaws.com",
            "RegionName": "us-west-2",
            "OptInStatus": "opt-in-not-required"
        }
    ]
}
```

Untuk informasi selengkapnya, lihat Wilayah dan Zona di Panduan EC2 Pengguna Amazon.

Contoh 4: Untuk mencantumkan nama Wilayah saja

Contoh `describe-regions` berikut menggunakan parameter `--query` untuk memfilter output dan hanya mengembalikan nama Wilayah sebagai teks.

```
aws ec2 describe-regions \
    --all-regions \
    --query "Regions[].{Name:RegionName}" \
    --output text
```

Output:

```
eu-north-1
```

```
ap-south-1
eu-west-3
eu-west-2
eu-west-1
ap-northeast-3
ap-northeast-2
me-south-1
ap-northeast-1
sa-east-1
ca-central-1
ap-east-1
ap-southeast-1
ap-southeast-2
eu-central-1
us-east-1
us-east-2
us-west-1
us-west-2
```

Untuk informasi selengkapnya, lihat Wilayah dan Zona di Panduan EC2 Pengguna Amazon.

- Untuk API detailnya, lihat DescribeRegionsdi Referensi AWS CLI Perintah.

JavaScript

SDKuntuk JavaScript (v3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
import { DescribeRegionsCommand, EC2Client } from "@aws-sdk/client-ec2";

/**
 * List all available AWS regions.
 * @param {{ regionNames: string[], includeOptInRegions: boolean }} options
 */
export const main = async ({ regionNames, includeOptInRegions }) => {
  const client = new EC2Client({});
  const command = new DescribeRegionsCommand({
```

```
    // By default this command will not show regions that require you to opt-in.
    // When AllRegions is true, even the regions that require opt-in will be
 returned.
    AllRegions: includeOptInRegions,
    // You can omit the Filters property if you want to get all regions.
    Filters: regionNames?.length
      ? [
          {
            Name: "region-name",
            // You can specify multiple values for a filter.
            // You can also use '*' as a wildcard. This will return all
            // of the regions that start with `us-east-`.
            Values: regionNames,
          },
        ]
      : undefined,
  });

  try {
    const { Regions } = await client.send(command);
    const regionsList = Regions.map((reg) => ` • ${reg.RegionName}`);
    console.log("Found regions:");
    console.log(regionsList.join("\n"));
  } catch (caught) {
    if (caught instanceof Error && caught.name === "DryRunOperation") {
      console.log(`${caught.message}`);
    } else {
      throw caught;
    }
  }
};
```

- Untuk API detailnya, lihat DescribeRegionsdi AWS SDK for JavaScript APIReferensi.

## PowerShell

### Alat untuk PowerShell

Contoh 1: Contoh ini menjelaskan wilayah yang tersedia untuk Anda.

```
Get-EC2Region
```

Output:

```
Endpoint                            RegionName
--------                            ----------
ec2.eu-west-1.amazonaws.com         eu-west-1
ec2.ap-southeast-1.amazonaws.com    ap-southeast-1
ec2.ap-southeast-2.amazonaws.com    ap-southeast-2
ec2.eu-central-1.amazonaws.com      eu-central-1
ec2.ap-northeast-1.amazonaws.com    ap-northeast-1
ec2.us-east-1.amazonaws.com         us-east-1
ec2.sa-east-1.amazonaws.com         sa-east-1
ec2.us-west-1.amazonaws.com         us-west-1
ec2.us-west-2.amazonaws.com         us-west-2
```

- Untuk API detailnya, lihat DescribeRegionsdi AWS Tools for PowerShell Referensi Cmdlet.

## Ruby

### SDKuntuk Ruby

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
require 'aws-sdk-ec2'

# @param ec2_client [Aws::EC2::Client] An initialized EC2 client.
# @example
#   list_regions_endpoints(Aws::EC2::Client.new(region: 'us-west-2'))
def list_regions_endpoints(ec2_client)
  result = ec2_client.describe_regions
  # Enable pretty printing.
  max_region_string_length = 16
  max_endpoint_string_length = 33
  # Print header.
  print 'Region'
  print ' ' * (max_region_string_length - 'Region'.length)
  print "  Endpoint\n"
```

```
  print '-' * max_region_string_length
  print '  '
  print '-' * max_endpoint_string_length
  print "\n"
  # Print Regions and their endpoints.
  result.regions.each do |region|
    print region.region_name
    print ' ' * (max_region_string_length - region.region_name.length)
    print '  '
    print region.endpoint
    print "\n"
  end
end

# Displays a list of Amazon Elastic Compute Cloud (Amazon EC2)
# Availability Zones available to you depending on the AWS Region
# of the Amazon EC2 client.
#
# @param ec2_client [Aws::EC2::Client] An initialized EC2 client.
# @example
#   list_availability_zones(Aws::EC2::Client.new(region: 'us-west-2'))
def list_availability_zones(ec2_client)
  result = ec2_client.describe_availability_zones
  # Enable pretty printing.
  max_region_string_length = 16
  max_zone_string_length = 18
  max_state_string_length = 9
  # Print header.
  print 'Region'
  print ' ' * (max_region_string_length - 'Region'.length)
  print '  Zone'
  print ' ' * (max_zone_string_length - 'Zone'.length)
  print "  State\n"
  print '-' * max_region_string_length
  print '  '
  print '-' * max_zone_string_length
  print '  '
  print '-' * max_state_string_length
  print "\n"
  # Print Regions, Availability Zones, and their states.
  result.availability_zones.each do |zone|
    print zone.region_name
    print ' ' * (max_region_string_length - zone.region_name.length)
    print '  '
```

```
    print zone.zone_name
    print ' ' * (max_zone_string_length - zone.zone_name.length)
    print '  '
    print zone.state
    # Print any messages for this Availability Zone.
    if zone.messages.count.positive?
      print "\n"
      puts '  Messages for this zone:'
      zone.messages.each do |message|
        print "    #{message.message}\n"
      end
    end
    print "\n"
  end
end

# Example usage:
def run_me
  region = ''
  # Print usage information and then stop.
  if ARGV[0] == '--help' || ARGV[0] == '-h'
    puts 'Usage:   ruby ec2-ruby-example-regions-availability-zones.rb REGION'
    # Replace us-west-2 with the AWS Region you're using for Amazon EC2.
    puts 'Example: ruby ec2-ruby-example-regions-availability-zones.rb us-west-2'
    exit 1
  # If no values are specified at the command prompt, use these default values.
  # Replace us-west-2 with the AWS Region you're using for Amazon EC2.
  elsif ARGV.count.zero?
    region = 'us-west-2'
  # Otherwise, use the values as specified at the command prompt.
  else
    region = ARGV[0]
  end

  ec2_client = Aws::EC2::Client.new(region: region)

  puts 'AWS Regions for Amazon EC2 that are available to you:'
  list_regions_endpoints(ec2_client)
  puts "\n\nAmazon EC2 Availability Zones that are available to you for AWS
 Region '#{region}':"
  list_availability_zones(ec2_client)
end

run_me if $PROGRAM_NAME == __FILE__
```

- Untuk API detailnya, lihat DescribeRegionsdi AWS SDK for Ruby APIReferensi.

Rust

SDKuntuk Rust

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
async fn show_regions(client: &Client) -> Result<(), Error> {
    let rsp = client.describe_regions().send().await?;

    println!("Regions:");
    for region in rsp.regions() {
        println!("  {}", region.region_name().unwrap());
    }

    Ok(())
}
```

- Untuk API detailnya, lihat DescribeRegions AWSSDKAPIreferensi Rust.

SAP ABAP

SDKuntuk SAP ABAP

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    TRY.
```

```
        oo_result = lo_ec2->describeregions( ) .                        "
 oo_result is returned for testing purposes. "
        DATA(lt_regions) = oo_result->get_regions( ).
        MESSAGE 'Retrieved information about Regions.' TYPE 'I'.
      CATCH /aws1/cx_rt_service_generic INTO DATA(lo_exception).
        DATA(lv_error) = |"{ lo_exception->av_err_code }" - { lo_exception-
>av_err_msg }|.
        MESSAGE lv_error TYPE 'E'.
    ENDTRY.
```

- Untuk API detailnya, lihat DescribeRegions AWSSDKuntuk SAP ABAP API referensi.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DescribeRouteTables`** dengan AWS SDK atau CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribeRouteTables`.

CLI

AWS CLI

Untuk menggambarkan tabel rute Anda

`describe-route-tables`Contoh berikut mengambil rincian tentang tabel rute Anda

```
aws ec2 describe-route-tables
```

Output:

```
{
    "RouteTables": [
        {
            "Associations": [
                {
                    "Main": true,
                    "RouteTableAssociationId": "rtbassoc-0df3f54e06EXAMPLE",
                    "RouteTableId": "rtb-09ba434c1bEXAMPLE"
```

```
                }
            ],
            "PropagatingVgws": [],
            "RouteTableId": "rtb-09ba434c1bEXAMPLE",
            "Routes": [
                {
                    "DestinationCidrBlock": "10.0.0.0/16",
                    "GatewayId": "local",
                    "Origin": "CreateRouteTable",
                    "State": "active"
                },
                {
                    "DestinationCidrBlock": "0.0.0.0/0",
                    "NatGatewayId": "nat-06c018cbd8EXAMPLE",
                    "Origin": "CreateRoute",
                    "State": "blackhole"
                }
            ],
            "Tags": [],
            "VpcId": "vpc-0065acced4EXAMPLE",
            "OwnerId": "111122223333"
        },
        {
            "Associations": [
                {
                    "Main": true,
                    "RouteTableAssociationId": "rtbassoc-9EXAMPLE",
                    "RouteTableId": "rtb-a1eec7de"
                }
            ],
            "PropagatingVgws": [],
            "RouteTableId": "rtb-a1eec7de",
            "Routes": [
                {
                    "DestinationCidrBlock": "172.31.0.0/16",
                    "GatewayId": "local",
                    "Origin": "CreateRouteTable",
                    "State": "active"
                },
                {
                    "DestinationCidrBlock": "0.0.0.0/0",
                    "GatewayId": "igw-fEXAMPLE",
                    "Origin": "CreateRoute",
                    "State": "active"
```

```
                }
            ],
            "Tags": [],
            "VpcId": "vpc-3EXAMPLE",
            "OwnerId": "111122223333"
        },
        {
            "Associations": [
                {
                    "Main": false,
                    "RouteTableAssociationId": "rtbassoc-0b100c28b2EXAMPLE",
                    "RouteTableId": "rtb-07a98f76e5EXAMPLE",
                    "SubnetId": "subnet-0d3d002af8EXAMPLE"
                }
            ],
            "PropagatingVgws": [],
            "RouteTableId": "rtb-07a98f76e5EXAMPLE",
            "Routes": [
                {
                    "DestinationCidrBlock": "10.0.0.0/16",
                    "GatewayId": "local",
                    "Origin": "CreateRouteTable",
                    "State": "active"
                },
                {
                    "DestinationCidrBlock": "0.0.0.0/0",
                    "GatewayId": "igw-06cf664d80EXAMPLE",
                    "Origin": "CreateRoute",
                    "State": "active"
                }
            ],
            "Tags": [],
            "VpcId": "vpc-0065acced4EXAMPLE",
            "OwnerId": "111122223333"
        }
    ]
}
```

Untuk informasi selengkapnya, lihat Bekerja dengan Tabel Rute di Panduan AWS VPC Pengguna.

- Untuk API detailnya, lihat DescribeRouteTablesdi Referensi AWS CLI Perintah.

## PHP

### SDKuntuk PHP

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    /**
     * @param array $routeTableIds
     * @param array $filters
     * @return array
     */
    public function describeRouteTables(array $routeTableIds = [], array $filters
= []): array
    {
        $parameters = [];
        if($routeTableIds){
            $parameters['RouteTableIds'] = $routeTableIds;
        }
        if($filters){
            $parameters['Filters'] = $filters;
        }
        try {
            $paginator = $this->ec2Client->getPaginator("DescribeRouteTables",
$parameters);
            $contents = [];
            foreach ($paginator as $result) {
                foreach ($result['RouteTables'] as $object) {
                    $contents[] = $object['RouteTableId'];
                }
            }
        }catch (Ec2Exception $caught){
            echo "There was a problem paginating the results of
DescribeRouteTables: {$caught->getAwsErrorMessage()}\n";
            throw $caught;
        }
        return $contents;
    }
```

- Untuk API detailnya, lihat DescribeRouteTablesdi AWS SDK for PHP APIReferensi.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menjelaskan semua tabel rute Anda.

```
Get-EC2RouteTable
```

Output:

```
DestinationCidrBlock    : 10.0.0.0/16
DestinationPrefixListId :
GatewayId               : local
InstanceId              :
InstanceOwnerId         :
NetworkInterfaceId      :
Origin                  : CreateRouteTable
State                   : active
VpcPeeringConnectionId  :

DestinationCidrBlock    : 0.0.0.0/0
DestinationPrefixListId :
GatewayId               : igw-1a2b3c4d
InstanceId              :
InstanceOwnerId         :
NetworkInterfaceId      :
Origin                  : CreateRoute
State                   : active
VpcPeeringConnectionId  :
```

Contoh 2: Contoh ini mengembalikan rincian untuk tabel rute yang ditentukan.

```
Get-EC2RouteTable -RouteTableId rtb-1a2b3c4d
```

Contoh 3: Contoh ini menjelaskan tabel rute untuk yang ditentukanVPC.

```
Get-EC2RouteTable -Filter @{ Name="vpc-id"; Values="vpc-1a2b3c4d" }
```

Output:

```
Associations    : {rtbassoc-12345678}
PropagatingVgws : {}
Routes          : {, }
RouteTableId    : rtb-1a2b3c4d
Tags            : {}
VpcId           : vpc-1a2b3c4d
```

- Untuk API detailnya, lihat DescribeRouteTablesdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DescribeScheduledInstanceAvailability`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribeScheduledInstanceAvailability`.

CLI

AWS CLI

Untuk menggambarkan jadwal yang tersedia

Contoh ini menjelaskan jadwal yang terjadi setiap minggu pada hari Minggu, dimulai pada tanggal yang ditentukan.

Perintah:

```
aws ec2 describe-scheduled-instance-availability --
recurrence Frequency=Weekly,Interval=1,OccurrenceDays=[1] --first-slot-start-
time-range EarliestTime=2016-01-31T00:00:00Z,LatestTime=2016-01-31T04:00:00Z
```

Output:

```
{
  "ScheduledInstanceAvailabilitySet": [
    {
        "AvailabilityZone": "us-west-2b",
        "TotalScheduledInstanceHours": 1219,
        "PurchaseToken": "eyJ2IjoiMSIsInMiOjEsImMiOi...",
        "MinTermDurationInDays": 366,
        "AvailableInstanceCount": 20,
        "Recurrence": {
            "OccurrenceDaySet": [
                1
            ],
            "Interval": 1,
            "Frequency": "Weekly",
            "OccurrenceRelativeToEnd": false
        },
        "Platform": "Linux/UNIX",
        "FirstSlotStartTime": "2016-01-31T00:00:00Z",
        "MaxTermDurationInDays": 366,
        "SlotDurationInHours": 23,
        "NetworkPlatform": "EC2-VPC",
        "InstanceType": "c4.large",
        "HourlyPrice": "0.095"
    },
    ...
  ]
}
```

Untuk mempersempit hasil, Anda dapat menambahkan filter yang menentukan sistem operasi, jaringan, dan jenis instance.

Perintah:

--filter name=Platform, Nilai = Linux/name=Network-platform, Nilai = - Nama=Jenis contohUNIX, nilai = C4.large EC2 VPC

- Untuk API detailnya, lihat DescribeScheduledInstanceAvailabilitydi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menjelaskan jadwal yang terjadi setiap minggu pada hari Minggu, dimulai pada tanggal yang ditentukan.

```
Get-EC2ScheduledInstanceAvailability -Recurrence_Frequency
 Weekly -Recurrence_Interval 1 -Recurrence_OccurrenceDay 1 -
FirstSlotStartTimeRange_EarliestTime 2016-01-31T00:00:00Z -
FirstSlotStartTimeRange_LatestTime 2016-01-31T04:00:00Z
```

Output:

```
AvailabilityZone            : us-west-2b
AvailableInstanceCount      : 20
FirstSlotStartTime          : 1/31/2016 8:00:00 AM
HourlyPrice                 : 0.095
InstanceType                : c4.large
MaxTermDurationInDays       : 366
MinTermDurationInDays       : 366
NetworkPlatform             : EC2-VPC
Platform                    : Linux/UNIX
PurchaseToken               : eyJ2IjoiMSIsInMiOjEsImMiOi...
Recurrence                  : Amazon.EC2.Model.ScheduledInstanceRecurrence
SlotDurationInHours         : 23
TotalScheduledInstanceHours : 1219

...
```

Contoh 2: Untuk mempersempit hasil, Anda dapat menambahkan filter untuk kriteria seperti sistem operasi, jaringan, dan jenis instance.

```
-Filter @{ Name="platform";Values="Linux/UNIX" },@{ Name="network-
platform";Values="EC2-VPC" },@{ Name="instance-type";Values="c4.large" }
```

- Untuk API detailnya, lihat DescribeScheduledInstanceAvailabilitydi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan `DescribeScheduledInstances` dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribeScheduledInstances`.

CLI

AWS CLI

Untuk mendeskripsikan Instans Terjadwal Anda

Contoh ini menjelaskan Instance Terjadwal yang ditentukan.

Perintah:

```
aws ec2 describe-scheduled-instances --scheduled-instance-
ids sci-1234-1234-1234-1234-123456789012
```

Output:

```
{
  "ScheduledInstanceSet": [
      {
          "AvailabilityZone": "us-west-2b",
          "ScheduledInstanceId": "sci-1234-1234-1234-1234-123456789012",
          "HourlyPrice": "0.095",
          "CreateDate": "2016-01-25T21:43:38.612Z",
          "Recurrence": {
              "OccurrenceDaySet": [
                  1
              ],
              "Interval": 1,
              "Frequency": "Weekly",
              "OccurrenceRelativeToEnd": false,
              "OccurrenceUnit": ""
          },
          "Platform": "Linux/UNIX",
          "TermEndDate": "2017-01-31T09:00:00Z",
          "InstanceCount": 1,
          "SlotDurationInHours": 32,
```

```
            "TermStartDate": "2016-01-31T09:00:00Z",
            "NetworkPlatform": "EC2-VPC",
            "TotalScheduledInstanceHours": 1696,
            "NextSlotStartTime": "2016-01-31T09:00:00Z",
            "InstanceType": "c4.large"
        }
    ]
}
```

Contoh ini menjelaskan semua Instans Terjadwal Anda.

Perintah:

```
aws ec2 describe-scheduled-instances
```

- Untuk API detailnya, lihat DescribeScheduledInstancesdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menjelaskan Instance Terjadwal yang ditentukan.

```
Get-EC2ScheduledInstance -ScheduledInstanceId
 sci-1234-1234-1234-1234-123456789012
```

Output:

```
AvailabilityZone            : us-west-2b
CreateDate                  : 1/25/2016 1:43:38 PM
HourlyPrice                 : 0.095
InstanceCount               : 1
InstanceType                : c4.large
NetworkPlatform             : EC2-VPC
NextSlotStartTime           : 1/31/2016 1:00:00 AM
Platform                    : Linux/UNIX
PreviousSlotEndTime         :
Recurrence                  : Amazon.EC2.Model.ScheduledInstanceRecurrence
ScheduledInstanceId         : sci-1234-1234-1234-1234-123456789012
SlotDurationInHours         : 32
TermEndDate                 : 1/31/2017 1:00:00 AM
TermStartDate               : 1/31/2016 1:00:00 AM
```

```
TotalScheduledInstanceHours : 1696
```

Contoh 2: Contoh ini menjelaskan semua Instans Terjadwal Anda.

```
Get-EC2ScheduledInstance
```

- Untuk API detailnya, lihat DescribeScheduledInstancesdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DescribeSecurityGroups`** dengan AWS SDK atau CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribeSecurityGroups`.

Contoh tindakan adalah kutipan kode dari program yang lebih besar dan harus dijalankan dalam konteks. Anda dapat melihat tindakan ini dalam konteks dalam contoh kode berikut:

- Pelajari dasar-dasarnya

.NET

AWS SDK for .NET

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    /// <summary>
    /// Retrieve information for one or all Amazon EC2 security group.
    /// </summary>
    /// <param name="groupId">The optional Id of a specific Amazon EC2 security
group.</param>
    /// <returns>A list of security group information.</returns>
    public async Task<List<SecurityGroup>> DescribeSecurityGroups(string groupId)
    {
```

```
        try
        {
            var securityGroups = new List<SecurityGroup>();
            var request = new DescribeSecurityGroupsRequest();

            if (!string.IsNullOrEmpty(groupId))
            {
                var groupIds = new List<string> { groupId };
                request.GroupIds = groupIds;
            }

            var paginatorForSecurityGroups =
                _amazonEC2.Paginators.DescribeSecurityGroups(request);

            await foreach (var securityGroup in
paginatorForSecurityGroups.SecurityGroups)
            {
                securityGroups.Add(securityGroup);
            }

            return securityGroups;

        }
        catch (AmazonEC2Exception ec2Exception)
        {
            if (ec2Exception.ErrorCode == "InvalidGroup.NotFound")
            {
                _logger.LogError(
                    $"A security group {groupId} does not exist.");
            }

            throw;
        }
        catch (Exception ex)
        {
            _logger.LogError(
                $"An error occurred while listing security groups.
{ex.Message}");
            throw;
        }
    }

    /// <summary>
    /// Display the information returned by the call to
```

```
    /// DescribeSecurityGroupsAsync.
    /// </summary>
    /// <param name="securityGroup">A list of security group information.</param>
    public void DisplaySecurityGroupInfoAsync(SecurityGroup securityGroup)
    {
        Console.WriteLine($"{securityGroup.GroupName}");
        Console.WriteLine("Ingress permissions:");
        securityGroup.IpPermissions.ForEach(permission =>
        {
            Console.WriteLine($"\tFromPort: {permission.FromPort}");
            Console.WriteLine($"\tIpProtocol: {permission.IpProtocol}");

            Console.Write($"\tIpv4Ranges: ");
            permission.Ipv4Ranges.ForEach(range =>
{ Console.Write($"{range.CidrIp} "); });

            Console.WriteLine($"\n\tIpv6Ranges:");
            permission.Ipv6Ranges.ForEach(range =>
{ Console.Write($"{range.CidrIpv6} "); });

            Console.Write($"\n\tPrefixListIds: ");
            permission.PrefixListIds.ForEach(id => Console.Write($"{id.Id} "));

            Console.WriteLine($"\n\tTo Port: {permission.ToPort}");
        });
        Console.WriteLine("Egress permissions:");
        securityGroup.IpPermissionsEgress.ForEach(permission =>
        {
            Console.WriteLine($"\tFromPort: {permission.FromPort}");
            Console.WriteLine($"\tIpProtocol: {permission.IpProtocol}");

            Console.Write($"\tIpv4Ranges: ");
            permission.Ipv4Ranges.ForEach(range =>
{ Console.Write($"{range.CidrIp} "); });

            Console.WriteLine($"\n\tIpv6Ranges:");
            permission.Ipv6Ranges.ForEach(range =>
{ Console.Write($"{range.CidrIpv6} "); });

            Console.Write($"\n\tPrefixListIds: ");
            permission.PrefixListIds.ForEach(id => Console.Write($"{id.Id} "));

            Console.WriteLine($"\n\tTo Port: {permission.ToPort}");
        });
```

```
    }
```

- Untuk API detailnya, lihat DescribeSecurityGroupsdi AWS SDK for .NET APIReferensi.

## Bash

### AWS CLI dengan skrip Bash

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
###############################################################################
# function ec2_describe_security_groups
#
# This function describes one or more Amazon Elastic Compute Cloud (Amazon EC2)
 security groups.
#
# Parameters:
#       -g security_group_id - The ID of the security group to describe
 (optional).
#
# And:
#       0 - If successful.
#       1 - If it fails.
###############################################################################
function ec2_describe_security_groups() {
  local security_group_id response
  local option OPTARG # Required to use getopts command in a function.

  # bashsupport disable=BP5008
  function usage() {
    echo "function ec2_describe_security_groups"
    echo "Describes one or more Amazon Elastic Compute Cloud (Amazon EC2)
 security groups."
    echo "  -g security_group_id - The ID of the security group to describe
 (optional)."
    echo ""
```

```
  }

  # Retrieve the calling parameters.
  while getopts "g:h" option; do
    case "${option}" in
      g) security_group_id="${OPTARG}" ;;
      h)
        usage
        return 0
        ;;
      \?)
        echo "Invalid parameter"
        usage
        return 1
        ;;
    esac
  done
  export OPTIND=1

  local query="SecurityGroups[*].[GroupName, GroupId, VpcId, IpPermissions[*].
[IpProtocol, FromPort, ToPort, IpRanges[*].CidrIp]]"

  if [[ -n "$security_group_id" ]]; then
    response=$(aws ec2 describe-security-groups --group-ids "$security_group_id"
 --query "${query}" --output text)
  else
    response=$(aws ec2 describe-security-groups --query "${query}" --output text)
  fi

  local error_code=${?}

  if [[ $error_code -ne 0 ]]; then
    aws_cli_error_log $error_code
    errecho "ERROR: AWS reports describe-security-groups operation failed.
$response"
    return 1
  fi

  echo "$response"

  return 0
}
```

Fungsi utilitas yang digunakan dalam contoh ini.

```
##############################################################################
# function errecho
#
# This function outputs everything sent to it to STDERR (standard error output).
##############################################################################
function errecho() {
  printf "%s\n" "$*" 1>&2
}

##############################################################################
# function aws_cli_error_log()
#
# This function is used to log the error messages from the AWS CLI.
#
# The function expects the following argument:
#         $1 - The error code returned by the AWS CLI.
#
#  Returns:
#          0: - Success.
#
##############################################################################
function aws_cli_error_log() {
  local err_code=$1
  errecho "Error code : $err_code"
  if [ "$err_code" == 1 ]; then
    errecho "  One or more S3 transfers failed."
  elif [ "$err_code" == 2 ]; then
    errecho "  Command line failed to parse."
  elif [ "$err_code" == 130 ]; then
    errecho "  Process received SIGINT."
  elif [ "$err_code" == 252 ]; then
    errecho "  Command syntax invalid."
  elif [ "$err_code" == 253 ]; then
    errecho "  The system environment or configuration was invalid."
  elif [ "$err_code" == 254 ]; then
    errecho "  The service returned an error."
  elif [ "$err_code" == 255 ]; then
    errecho "  255 is a catch-all error."
  fi

  return 0
}
```

- Untuk API detailnya, lihat DescribeSecurityGroupsdi Referensi AWS CLI Perintah.

C++

SDKuntuk C ++

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
//! Describe all Amazon Elastic Compute Cloud (Amazon EC2) security groups, or a
 specific group.
/*!
  \param groupID: A group ID, ignored if empty.
  \param clientConfiguration: AWS client configuration.
  \return bool: Function succeeded.
 */
bool AwsDoc::EC2::describeSecurityGroups(const Aws::String &groupID,
                                         const Aws::Client::ClientConfiguration
 &clientConfiguration) {
    Aws::EC2::EC2Client ec2Client(clientConfiguration);
    Aws::EC2::Model::DescribeSecurityGroupsRequest request;

    if (!groupID.empty()) {
        request.AddGroupIds(groupID);
    }

    Aws::String nextToken;
    do {
        if (!nextToken.empty()) {
            request.SetNextToken(nextToken);
        }

        Aws::EC2::Model::DescribeSecurityGroupsOutcome outcome =
 ec2Client.DescribeSecurityGroups(request);
        if (outcome.IsSuccess()) {
            std::cout << std::left <<
                      std::setw(32) << "Name" <<
```

```
                    std::setw(30) << "GroupId" <<
                    std::setw(30) << "VpcId" <<
                    std::setw(64) << "Description" << std::endl;

            const std::vector<Aws::EC2::Model::SecurityGroup> &securityGroups =
                    outcome.GetResult().GetSecurityGroups();

            for (const auto &securityGroup: securityGroups) {
                std::cout << std::left <<
                          std::setw(32) << securityGroup.GetGroupName() <<
                          std::setw(30) << securityGroup.GetGroupId() <<
                          std::setw(30) << securityGroup.GetVpcId() <<
                          std::setw(64) << securityGroup.GetDescription() <<
                          std::endl;
            }
        } else {
            std::cerr << "Failed to describe security groups:" <<
                      outcome.GetError().GetMessage() << std::endl;
            return false;
        }

        nextToken = outcome.GetResult().GetNextToken();
    } while (!nextToken.empty());

    return true;
}
```

- Untuk API detailnya, lihat DescribeSecurityGroupsdi AWS SDK for C++ APIReferensi.

## CLI

### AWS CLI

#### Contoh 1: Untuk menjelaskan grup keamanan

Contoh `describe-security-groups` berikut menjelaskan grup keamanan tertentu.

```
aws ec2 describe-security-groups \
    --group-ids sg-903004f8
```

Output:

```
{
    "SecurityGroups": [
        {
            "IpPermissionsEgress": [
                {
                    "IpProtocol": "-1",
                    "IpRanges": [
                        {
                            "CidrIp": "0.0.0.0/0"
                        }
                    ],
                    "UserIdGroupPairs": [],
                    "PrefixListIds": []
                }
            ],
            "Description": "My security group",
            "Tags": [
                {
                    "Value": "SG1",
                    "Key": "Name"
                }
            ],
            "IpPermissions": [
                {
                    "IpProtocol": "-1",
                    "IpRanges": [],
                    "UserIdGroupPairs": [
                        {
                            "UserId": "123456789012",
                            "GroupId": "sg-903004f8"
                        }
                    ],
                    "PrefixListIds": []
                },
                {
                    "PrefixListIds": [],
                    "FromPort": 22,
                    "IpRanges": [
                        {
                            "Description": "Access from NY office",
                            "CidrIp": "203.0.113.0/24"
                        }
                    ],
```

```
                    "ToPort": 22,
                    "IpProtocol": "tcp",
                    "UserIdGroupPairs": []
                    }
            ],
            "GroupName": "MySecurityGroup",
            "VpcId": "vpc-1a2b3c4d",
            "OwnerId": "123456789012",
            "GroupId": "sg-903004f8",
        }
    ]
}
```

Contoh 2: Untuk menjelaskan grup keamanan yang memiliki aturan khusus

`describe-security-groups`Contoh berikut menggunakan filter untuk cakupan hasil ke grup keamanan yang memiliki aturan yang memungkinkan SSH lalu lintas (port 22) dan aturan yang memungkinkan lalu lintas dari semua alamat (`0.0.0.0/0`). Contoh tersebut menggunakan parameter `--query` untuk hanya menampilkan nama grup keamanan. Grup keamanan harus cocok dengan semua filter yang akan dikembalikan dalam hasil; namun, satu aturan tidak harus cocok dengan semua filter. Misalnya, output mengembalikan grup keamanan dengan aturan yang memungkinkan SSH lalu lintas dari alamat IP tertentu dan aturan lain yang memungkinkan HTTP lalu lintas dari semua alamat.

```
aws ec2 describe-security-groups \
    --filters Name=ip-permission.from-port,Values=22 Name=ip-permission.to-
port,Values=22 Name=ip-permission.cidr,Values='0.0.0.0/0' \
    --query "SecurityGroups[*].[GroupName]" \
    --output text
```

Output:

```
default
my-security-group
web-servers
launch-wizard-1
```

Contoh 3: Untuk menjelaskan grup keamanan berdasarkan tanda

Contoh `describe-security-groups` berikut menggunakan filter guna mencakup hasil untuk grup keamanan yang menyertakan `test` dalam nama grup keamanan dan yang

memiliki tanda `Test=To-delete`. Contoh menggunakan `--query` parameter untuk menampilkan hanya nama dan IDs kelompok keamanan.

```
aws ec2 describe-security-groups \
    --filters Name=group-name,Values=*test* Name=tag:Test,Values=To-delete \
    --query "SecurityGroups[*].{Name:GroupName,ID:GroupId}"
```

Output:

```
[
    {
        "Name": "testfornewinstance",
        "ID": "sg-33bb22aa"
    },
    {
        "Name": "newgrouptest",
        "ID": "sg-1a2b3c4d"
    }
]
```

Untuk contoh tambahan menggunakan filter tag, lihat Bekerja dengan tag di Panduan EC2 Pengguna Amazon.

- Untuk API detailnya, lihat DescribeSecurityGroupsdi Referensi AWS CLI Perintah.

Java

SDKuntuk Java 2.x

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    /**
     * Asynchronously describes the security groups for the specified group ID.
     *
     * @param groupName the name of the security group to describe
```

```
    * @return a {@link CompletableFuture} that represents the asynchronous
operation
    *         of describing the security groups. The future will complete with a
    *         {@link DescribeSecurityGroupsResponse} object that contains the
    *         security group information.
    */
   public CompletableFuture<String> describeSecurityGroupArnByNameAsync(String
groupName) {
       DescribeSecurityGroupsRequest request =
DescribeSecurityGroupsRequest.builder()
           .groupNames(groupName)
           .build();

       DescribeSecurityGroupsPublisher paginator =
getAsyncClient().describeSecurityGroupsPaginator(request);
       AtomicReference<String> groupIdRef = new AtomicReference<>();
       return paginator.subscribe(response -> {
           response.securityGroups().stream()
               .filter(securityGroup ->
securityGroup.groupName().equals(groupName))
               .findFirst()
               .ifPresent(securityGroup ->
groupIdRef.set(securityGroup.groupId()));
       }).thenApply(v -> {
           String groupId = groupIdRef.get();
           if (groupId == null) {
               throw new RuntimeException("No security group found with the
name: " + groupName);
           }
           return groupId;
       }).exceptionally(ex -> {
           logger.info("Failed to describe security group: " + ex.getMessage());
           throw new RuntimeException("Failed to describe security group", ex);
       });
   }
```

- Untuk API detailnya, lihat DescribeSecurityGroupsdi AWS SDK for Java 2.x APIReferensi.

JavaScript

SDKuntuk JavaScript (v3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
import { DescribeSecurityGroupsCommand, EC2Client } from "@aws-sdk/client-ec2";

/**
 * Describes the specified security groups or all of your security groups.
 * @param {{ groupIds: string[] }} options
 */
export const main = async ({ groupIds = [] }) => {
  const client = new EC2Client({});
  const command = new DescribeSecurityGroupsCommand({
    GroupIds: groupIds,
  });

  try {
    const { SecurityGroups } = await client.send(command);
    const sgList = SecurityGroups.map(
      (sg) => `• ${sg.GroupName} (${sg.GroupId}): ${sg.Description}`,
    ).join("\n");
    if (sgList.length) {
      console.log(`Security groups:\n${sgList}`);
    } else {
      console.log("No security groups found.");
    }
  } catch (caught) {
    if (caught instanceof Error && caught.name === "InvalidGroupId.Malformed") {
      console.warn(`${caught.message}. Please provide a valid GroupId.`);
    } else if (
      caught instanceof Error &&
      caught.name === "InvalidGroup.NotFound"
    ) {
      console.warn(caught.message);
    } else {
      throw caught;
```

```
    }
  }
};
```

- Untuk API detailnya, lihat DescribeSecurityGroupsdi AWS SDK for JavaScript APIReferensi.

Kotlin

SDKuntuk Kotlin

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
suspend fun describeEC2SecurityGroups(groupId: String) {
    val request =
        DescribeSecurityGroupsRequest {
            groupIds = listOf(groupId)
        }

    Ec2Client { region = "us-west-2" }.use { ec2 ->

        val response = ec2.describeSecurityGroups(request)
        response.securityGroups?.forEach { group ->
            println("Found Security Group with id ${group.groupId}, vpc id
 ${group.vpcId} and description ${group.description}")
        }
    }
}
```

- Untuk API detailnya, lihat DescribeSecurityGroups AWSSDKAPIreferensi Kotlin.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menjelaskan grup keamanan yang ditentukan untuk fileVPC. Saat bekerja dengan grup keamanan milik a VPC Anda harus menggunakan ID grup keamanan (- GroupId parameter), bukan nama (- GroupName parameter), untuk mereferensikan grup.

```
Get-EC2SecurityGroup -GroupId sg-12345678
```

Output:

```
Description         : default VPC security group
GroupId             : sg-12345678
GroupName           : default
IpPermissions       : {Amazon.EC2.Model.IpPermission}
IpPermissionsEgress : {Amazon.EC2.Model.IpPermission}
OwnerId             : 123456789012
Tags                : {}
VpcId               : vpc-12345678
```

Contoh 2: Contoh ini menjelaskan grup keamanan yang ditentukan untuk EC2 -Classic. Saat bekerja dengan grup keamanan untuk EC2 -Classic Anda dapat menggunakan nama grup (- GroupName parameter) atau ID grup (- GroupId parameter) untuk mereferensikan grup keamanan.

```
Get-EC2SecurityGroup -GroupName my-security-group
```

Output:

```
Description         : my security group
GroupId             : sg-45678901
GroupName           : my-security-group
IpPermissions       : {Amazon.EC2.Model.IpPermission,
 Amazon.EC2.Model.IpPermission}
IpPermissionsEgress : {}
OwnerId             : 123456789012
Tags                : {}
VpcId               :
```

Contoh 3: Contoh ini mengambil semua grup keamanan untuk vpc-0fc1ff23456b789eb

```
Get-EC2SecurityGroup -Filter @{Name="vpc-id";Values="vpc-0fc1ff23456b789eb"}
```

- Untuk API detailnya, lihat DescribeSecurityGroupsdi AWS Tools for PowerShell Referensi Cmdlet.

Python

SDKuntuk Python (Boto3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
class SecurityGroupWrapper:
    """Encapsulates Amazon Elastic Compute Cloud (Amazon EC2) security group
 actions."""

    def __init__(self, ec2_client: boto3.client, security_group: Optional[str] =
 None):
        """
        Initializes the SecurityGroupWrapper with an EC2 client and an optional
 security group ID.

        :param ec2_client: A Boto3 Amazon EC2 client. This client provides low-
level
                           access to AWS EC2 services.
        :param security_group: The ID of a security group to manage. This is a
 high-level identifier
                               that represents the security group.
        """
        self.ec2_client = ec2_client
        self.security_group = security_group

    @classmethod
    def from_client(cls) -> "SecurityGroupWrapper":
        """
        Creates a SecurityGroupWrapper instance with a default EC2 client.
```

```
        :return: An instance of SecurityGroupWrapper initialized with the default
EC2 client.
        """
        ec2_client = boto3.client("ec2")
        return cls(ec2_client)


    def describe(self, security_group_id: Optional[str] = None) -> bool:
        """
        Displays information about the specified security group or all security
groups if no ID is provided.

        :param security_group_id: The ID of the security group to describe.
                                  If None, an open search is performed to
describe all security groups.
        :returns: True if the description is successful.
        :raises ClientError: If there is an error describing the security
group(s), such as an invalid security group ID.
        """
        try:
            paginator = self.ec2_client.get_paginator("describe_security_groups")

            if security_group_id is None:
                # If no ID is provided, return all security groups.
                page_iterator = paginator.paginate()
            else:
                page_iterator = paginator.paginate(GroupIds=[security_group_id])

            for page in page_iterator:
                for security_group in page["SecurityGroups"]:
                    print(f"Security group: {security_group['GroupName']}")
                    print(f"\tID: {security_group['GroupId']}")
                    print(f"\tVPC: {security_group['VpcId']}")
                    if security_group["IpPermissions"]:
                        print("Inbound permissions:")
                        pp(security_group["IpPermissions"])

            return True
        except ClientError as err:
            logger.error("Failed to describe security group(s).")
            if err.response["Error"]["Code"] == "InvalidGroup.NotFound":
                logger.error(
                    f"Security group {security_group_id} does not exist "
                    f"because the specified security group ID was not found."
```

```
                )
            raise
```

- Untuk API detailnya, lihat DescribeSecurityGroups AWSSDKReferensi Python (Boto3). API

Rust

SDKuntuk Rust

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
async fn show_security_groups(client: &aws_sdk_ec2::Client, group_ids:
 Vec<String>) {
    let response = client
        .describe_security_groups()
        .set_group_ids(Some(group_ids))
        .send()
        .await;

    match response {
        Ok(output) => {
            for group in output.security_groups() {
                println!(
                    "Found Security Group {} ({}), vpc id {} and description {}",
                    group.group_name().unwrap_or("unknown"),
                    group.group_id().unwrap_or("id-unknown"),
                    group.vpc_id().unwrap_or("vpcid-unknown"),
                    group.description().unwrap_or("(none)")
                );
            }
        }
        Err(err) => {
            let err = err.into_service_error();
            let meta = err.meta();
            let message = meta.message().unwrap_or("unknown");
            let code = meta.code().unwrap_or("unknown");
```

```
            eprintln!("Error listing EC2 Security Groups: ({code}) {message}");
        }
    }
}
```

- Untuk API detailnya, lihat DescribeSecurityGroups AWSSDKAPIreferensi Rust.

SAP ABAP

SDKuntuk SAP ABAP

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    TRY.
        DATA lt_group_ids TYPE /aws1/
cl_ec2groupidstrlist_w=>tt_groupidstringlist.
        APPEND NEW /aws1/cl_ec2groupidstrlist_w( iv_value = iv_group_id ) TO
 lt_group_ids.
        oo_result = lo_ec2->describesecuritygroups( it_groupids = lt_group_ids ).
         " oo_result is returned for testing purposes. "
        DATA(lt_security_groups) = oo_result->get_securitygroups( ).
        MESSAGE 'Retrieved information about security groups.' TYPE 'I'.
      CATCH /aws1/cx_rt_service_generic INTO DATA(lo_exception).
        DATA(lv_error) = |"{ lo_exception->av_err_code }" - { lo_exception-
>av_err_msg }|.
        MESSAGE lv_error TYPE 'E'.
    ENDTRY.
```

- Untuk API detailnya, lihat DescribeSecurityGroups AWSSDKuntuk SAP ABAP API referensi.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DescribeSnapshotAttribute`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribeSnapshotAttribute`.

CLI

AWS CLI

Untuk mendeskripsikan atribut snapshot untuk snapshot

`describe-snapshot-attribute`Contoh berikut mencantumkan akun yang digunakan untuk berbagi snapshot.

```
aws ec2 describe-snapshot-attribute \
    --snapshot-id snap-01234567890abcedf \
    --attribute createVolumePermission
```

Output:

```
{
    "SnapshotId": "snap-01234567890abcedf",
    "CreateVolumePermissions": [
        {
            "UserId": "123456789012"
        }
    ]
}
```

Untuk informasi selengkapnya, lihat Membagikan EBS snapshot Amazon di Panduan Pengguna Amazon Elastic Compute Cloud.

- Untuk API detailnya, lihat DescribeSnapshotAttributedi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menjelaskan atribut tertentu dari snapshot yang ditentukan.

```
Get-EC2SnapshotAttribute -SnapshotId snap-12345678 -Attribute ProductCodes
```

Output:

```
CreateVolumePermissions    ProductCodes    SnapshotId
-----------------------    ------------    ----------
{}                         {}              snap-12345678
```

Contoh 2: Contoh ini menjelaskan atribut tertentu dari snapshot yang ditentukan.

```
(Get-EC2SnapshotAttribute -SnapshotId snap-12345678 -Attribute
 CreateVolumePermission).CreateVolumePermissions
```

Output:

```
Group    UserId
-----    ------
all
```

- Untuk API detailnya, lihat DescribeSnapshotAttributedi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DescribeSnapshots`** dengan AWS SDK atau CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribeSnapshots`.

CLI

AWS CLI

Contoh 1: Untuk menjelaskan snapshot

Contoh `describe-snapshots` berikut menjelaskan snapshot tertentu.

```
aws ec2 describe-snapshots \
    --snapshot-ids snap-1234567890abcdef0
```

Output:

```
{
```

```
    "Snapshots": [
        {
            "Description": "This is my snapshot",
            "Encrypted": false,
            "VolumeId": "vol-049df61146c4d7901",
            "State": "completed",
            "VolumeSize": 8,
            "StartTime": "2019-02-28T21:28:32.000Z",
            "Progress": "100%",
            "OwnerId": "012345678910",
            "SnapshotId": "snap-01234567890abcdef",
            "Tags": [
                {
                    "Key": "Stack",
                    "Value": "test"
                }
            ]
        }
    ]
}
```

Untuk informasi selengkapnya, lihat EBSsnapshot Amazon di Panduan EC2 Pengguna Amazon.

Contoh 2: Untuk menjelaskan snapshot berdasarkan filter

`describe-snapshots`Contoh berikut menggunakan filter untuk mencakupkan hasil ke snapshot yang dimiliki oleh AWS akun Anda yang berada dalam `pending` status. Contoh menggunakan `--query` parameter untuk hanya menampilkan snapshot IDs dan waktu snapshot dimulai.

```
aws ec2 describe-snapshots \
    --owner-ids self \
    --filters Name=status,Values=pending \
    --query "Snapshots[*].{ID:SnapshotId,Time:StartTime}"
```

Output:

```
[
    {
        "ID": "snap-1234567890abcdef0",
        "Time": "2019-08-04T12:48:18.000Z"
```

```
    },
    {
        "ID": "snap-066877671789bd71b",
        "Time": "2019-08-04T02:45:16.000Z
    },
    ...
]
```

Contoh `describe-snapshots` berikut menggunakan filter guna mencakup hasil untuk snapshot yang dibuat dari volume tertentu. Contoh menggunakan `--query` parameter untuk hanya menampilkan snapshotIDs.

```
aws ec2 describe-snapshots \
    --filters Name=volume-id,Values=049df61146c4d7901 \
    --query "Snapshots[*].[SnapshotId]" \
    --output text
```

Output:

```
snap-1234567890abcdef0
snap-08637175a712c3fb9
...
```

Untuk contoh tambahan menggunakan filter, lihat Mencantumkan dan memfilter sumber daya Anda di Panduan EC2 Pengguna Amazon.

Contoh 3: Untuk menjelaskan snapshot berdasarkan tanda

Contoh `describe-snapshots` berikut menggunakan filter tanda guna mencakup hasil untuk snapshot yang memiliki tanda `Stack=Prod`.

```
aws ec2 describe-snapshots \
    --filters Name=tag:Stack,Values=prod
```

Untuk contoh output `describe-snapshots`, lihat Contoh 1.

Untuk contoh tambahan menggunakan filter tag, lihat Bekerja dengan tag di Panduan EC2 Pengguna Amazon.

Contoh 4: Untuk menjelaskan snapshot berdasarkan usia

`describe-snapshots`Contoh berikut menggunakan JMESPath ekspresi untuk menggambarkan semua snapshot yang dibuat oleh AWS akun Anda sebelum tanggal yang ditentukan. Ini hanya menampilkan snapshotIDs.

```
aws ec2 describe-snapshots \
    --owner-ids 012345678910 \
    --query "Snapshots[?(StartTime<='2020-03-31')].[SnapshotId]"
```

Untuk contoh tambahan menggunakan filter, lihat Mencantumkan dan memfilter sumber daya Anda di Panduan EC2 Pengguna Amazon.

Contoh 5: Untuk melihat snapshot yang diarsipkan saja

Contoh `describe-snapshots` berikut hanya mencantumkan snapshot yang disimpan di tingkat arsip.

```
aws ec2 describe-snapshots \
    --filters "Name=storage-tier,Values=archive"
```

Output:

```
{
    "Snapshots": [
        {
            "Description": "Snap A",
            "Encrypted": false,
            "VolumeId": "vol-01234567890aaaaaa",
            "State": "completed",
            "VolumeSize": 8,
            "StartTime": "2021-09-07T21:00:00.000Z",
            "Progress": "100%",
            "OwnerId": "123456789012",
            "SnapshotId": "snap-01234567890aaaaaa",
            "StorageTier": "archive",
            "Tags": []
        },
    ]
}
```

Untuk informasi selengkapnya, buka Lihat snapshot yang diarsipkan di Panduan Pengguna Amazon Elastic Compute Cloud.

- Untuk API detailnya, lihat DescribeSnapshotsdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menjelaskan snapshot yang ditentukan.

```
Get-EC2Snapshot -SnapshotId snap-12345678
```

Output:

```
DataEncryptionKeyId :
Description         : Created by CreateImage(i-1a2b3c4d) for ami-12345678 from
 vol-12345678
Encrypted           : False
KmsKeyId            :
OwnerAlias          :
OwnerId             : 123456789012
Progress            : 100%
SnapshotId          : snap-12345678
StartTime           : 10/23/2014 6:01:28 AM
State               : completed
StateMessage        :
Tags                : {}
VolumeId            : vol-12345678
VolumeSize          : 8
```

Contoh 2: Contoh ini menjelaskan snapshot yang memiliki tag 'Nama'.

```
Get-EC2Snapshot | ? { $_.Tags.Count -gt 0 -and $_.Tags.Key -eq "Name" }
```

Contoh 3: Contoh ini menjelaskan snapshot yang memiliki tag 'Nama' dengan nilai 'TestValue'.

```
Get-EC2Snapshot | ? { $_.Tags.Count -gt 0 -and $_.Tags.Key -eq "Name" -and
 $_.Tags.Value -eq "TestValue" }
```

Contoh 4: Contoh ini menjelaskan semua snapshot Anda.

```
Get-EC2Snapshot -Owner self
```

- Untuk API detailnya, lihat DescribeSnapshotsdi AWS Tools for PowerShell Referensi Cmdlet.

Rust

SDKuntuk Rust

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

Menampilkan status snapshot.

```
async fn show_state(client: &Client, id: &str) -> Result<(), Error> {
    let resp = client
        .describe_snapshots()
        .filters(Filter::builder().name("snapshot-id").values(id).build())
        .send()
        .await?;

    println!(
        "State: {}",
        resp.snapshots().first().unwrap().state().unwrap().as_ref()
    );

    Ok(())
}
```

```
async fn show_snapshots(client: &Client) -> Result<(), Error> {
    // "self" represents your account ID.
    // You can list the snapshots for any account by replacing
    // "self" with that account ID.
    let resp = client.describe_snapshots().owner_ids("self").send().await?;
    let snapshots = resp.snapshots();
    let length = snapshots.len();

    for snapshot in snapshots {
        println!(
```

```
            "ID:          {}",
            snapshot.snapshot_id().unwrap_or_default()
        );
        println!(
            "Description: {}",
            snapshot.description().unwrap_or_default()
        );
        println!("State:       {}", snapshot.state().unwrap().as_ref());
        println!();
    }

    println!();
    println!("Found {} snapshot(s)", length);
    println!();

    Ok(())
}
```

- Untuk API detailnya, lihat DescribeSnapshots AWSSDKAPIreferensi Rust.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DescribeSpotDatafeedSubscription`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribeSpotDatafeedSubscription`.

CLI

AWS CLI

Untuk mendeskripsikan langganan datafeed Instance Spot untuk sebuah akun

Perintah contoh ini menjelaskan umpan data untuk akun.

Perintah:

```
aws ec2 describe-spot-datafeed-subscription
```

Output:

```
{
    "SpotDatafeedSubscription": {
        "OwnerId": "123456789012",
        "Prefix": "spotdata",
        "Bucket": "my-s3-bucket",
        "State": "Active"
    }
}
```

- Untuk API detailnya, lihat DescribeSpotDatafeedSubscriptiondi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menjelaskan umpan data instans Spot Anda.

```
Get-EC2SpotDatafeedSubscription
```

Output:

```
Bucket  : my-s3-bucket
Fault   :
OwnerId : 123456789012
Prefix  : spotdata
State   : Active
```

- Untuk API detailnya, lihat DescribeSpotDatafeedSubscriptiondi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DescribeSpotFleetInstances`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribeSpotFleetInstances`.

CLI

AWS CLI

Untuk menggambarkan Instans Spot yang terkait dengan armada Spot

Perintah contoh ini mencantumkan instance Spot yang terkait dengan armada Spot yang ditentukan.

Perintah:

```
aws ec2 describe-spot-fleet-instances --spot-fleet-request-id sfr-73fbd2ce-aa30-494c-8788-1cee4EXAMPLE
```

Output:

```
{
  "ActiveInstances": [
      {
          "InstanceId": "i-1234567890abcdef0",
          "InstanceType": "m3.medium",
          "SpotInstanceRequestId": "sir-08b93456"
      },
      ...
  ],
  "SpotFleetRequestId": "sfr-73fbd2ce-aa30-494c-8788-1cee4EXAMPLE"
}
```

- Untuk API detailnya, lihat DescribeSpotFleetInstancesdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menjelaskan instance yang terkait dengan permintaan armada Spot yang ditentukan.

```
Get-EC2SpotFleetInstance -SpotFleetRequestId sfr-73fbd2ce-aa30-494c-8788-1cee4EXAMPLE
```

Output:

```
InstanceId    InstanceType    SpotInstanceRequestId
----------    ------------    ---------------------
i-f089262a    c3.large        sir-12345678
i-7e8b24a4    c3.large        sir-87654321
```

- Untuk API detailnya, lihat DescribeSpotFleetInstancesdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DescribeSpotFleetRequestHistory`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribeSpotFleetRequestHistory`.

CLI

AWS CLI

Untuk menggambarkan sejarah armada Spot

Perintah contoh ini mengembalikan riwayat untuk armada Spot yang ditentukan mulai pada waktu yang ditentukan.

Perintah:

```
aws ec2 describe-spot-fleet-request-history --spot-fleet-request-id sfr-73fbd2ce-aa30-494c-8788-1cee4EXAMPLE --start-time 2015-05-26T00:00:00Z
```

Contoh keluaran berikut menunjukkan keberhasilan peluncuran dua Instans Spot untuk armada Spot.

Output:

```
{
  "HistoryRecords": [
      {
          "Timestamp": "2015-05-26T23:17:20.697Z",
```

```
            "EventInformation": {
                "EventSubType": "submitted"
            },
            "EventType": "fleetRequestChange"
        },
        {
            "Timestamp": "2015-05-26T23:17:20.873Z",
            "EventInformation": {
                "EventSubType": "active"
            },
            "EventType": "fleetRequestChange"
        },
        {
            "Timestamp": "2015-05-26T23:21:21.712Z",
            "EventInformation": {
                "InstanceId": "i-1234567890abcdef0",
                "EventSubType": "launched"
            },
            "EventType": "instanceChange"
        },
        {
            "Timestamp": "2015-05-26T23:21:21.816Z",
            "EventInformation": {
                "InstanceId": "i-1234567890abcdef1",
                "EventSubType": "launched"
            },
            "EventType": "instanceChange"
        }
    ],
    "SpotFleetRequestId": "sfr-73fbd2ce-aa30-494c-8788-1cee4EXAMPLE",
    "NextToken": "CpHNsscimcV5oH7bSbub03CI2Qms5+ypNpNm
+53MNlR0YcXAkp0xFlfKf91yVxSExmbtma3awYxMFzNA663ZskT0AHtJ6TCb2Z8bQC2EnZgyELbymtWPfpZ1ZbauV
+P+TfGlWxWWB/Vr5dk5d4LfdgA/DRAHUrYgxzrEXAMPLE=",
    "StartTime": "2015-05-26T00:00:00Z"
}
```


- Untuk API detailnya, lihat DescribeSpotFleetRequestHistorydi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menjelaskan riwayat permintaan armada Spot yang ditentukan.

```
Get-EC2SpotFleetRequestHistory -SpotFleetRequestId sfr-73fbd2ce-
aa30-494c-8788-1cee4EXAMPLE -StartTime 2015-12-26T00:00:00Z
```

Output:

```
HistoryRecords     : {Amazon.EC2.Model.HistoryRecord,
 Amazon.EC2.Model.HistoryRecord...}
LastEvaluatedTime  : 12/26/2015 8:29:11 AM
NextToken          :
SpotFleetRequestId : sfr-088bc5f1-7e7b-451a-bd13-757f10672b93
StartTime          : 12/25/2015 8:00:00 AM
```

```
(Get-EC2SpotFleetRequestHistory -SpotFleetRequestId sfr-73fbd2ce-
aa30-494c-8788-1cee4EXAMPLE -StartTime 2015-12-26T00:00:00Z).HistoryRecords
```

Output:

```
EventInformation                    EventType            Timestamp
----------------                    ---------            ---------
Amazon.EC2.Model.EventInformation    fleetRequestChange    12/26/2015 8:23:33 AM
Amazon.EC2.Model.EventInformation    fleetRequestChange    12/26/2015 8:23:33 AM
Amazon.EC2.Model.EventInformation    fleetRequestChange    12/26/2015 8:23:33 AM
Amazon.EC2.Model.EventInformation    launched              12/26/2015 8:25:34 AM
Amazon.EC2.Model.EventInformation    launched              12/26/2015 8:25:05 AM
```

- Untuk API detailnya, lihat DescribeSpotFleetRequestHistorydi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DescribeSpotFleetRequests`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribeSpotFleetRequests`.

CLI

AWS CLI

Untuk menjelaskan permintaan armada Spot Anda

Contoh ini menjelaskan semua permintaan armada Spot Anda.

Perintah:

```
aws ec2 describe-spot-fleet-requests
```

Output:

```
{
  "SpotFleetRequestConfigs": [
      {
          "SpotFleetRequestId": "sfr-73fbd2ce-aa30-494c-8788-1cee4EXAMPLE",
          "SpotFleetRequestConfig": {
              "TargetCapacity": 20,
              "LaunchSpecifications": [
                  {
                      "EbsOptimized": false,
                      "NetworkInterfaces": [
                          {
                              "SubnetId": "subnet-a61dafcf",
                              "DeviceIndex": 0,
                              "DeleteOnTermination": false,
                              "AssociatePublicIpAddress": true,
                              "SecondaryPrivateIpAddressCount": 0
                          }
                      ],
                      "InstanceType": "cc2.8xlarge",
                      "ImageId": "ami-1a2b3c4d"
                  },
                  {
                      "EbsOptimized": false,
                      "NetworkInterfaces": [
                          {
                              "SubnetId": "subnet-a61dafcf",
                              "DeviceIndex": 0,
                              "DeleteOnTermination": false,
                              "AssociatePublicIpAddress": true,
                              "SecondaryPrivateIpAddressCount": 0
```

```
                        }
                    ],
                    "InstanceType": "r3.8xlarge",
                    "ImageId": "ami-1a2b3c4d"
                }
            ],
            "SpotPrice": "0.05",
            "IamFleetRole": "arn:aws:iam::123456789012:role/my-spot-fleet-role"
        },
        "SpotFleetRequestState": "active"
    },
    {
        "SpotFleetRequestId": "sfr-306341ed-9739-402e-881b-ce47bEXAMPLE",
        "SpotFleetRequestConfig": {
            "TargetCapacity": 20,
            "LaunchSpecifications": [
                {
                    "EbsOptimized": false,
                    "NetworkInterfaces": [
                        {
                            "SubnetId": "subnet-6e7f829e",
                            "DeviceIndex": 0,
                            "DeleteOnTermination": false,
                            "AssociatePublicIpAddress": true,
                            "SecondaryPrivateIpAddressCount": 0
                        }
                    ],
                    "InstanceType": "m3.medium",
                    "ImageId": "ami-1a2b3c4d"
                }
            ],
            "SpotPrice": "0.05",
            "IamFleetRole": "arn:aws:iam::123456789012:role/my-spot-fleet-role"
        },
        "SpotFleetRequestState": "active"
    }
  ]
}
```

Untuk menjelaskan permintaan armada Spot

Contoh ini menjelaskan permintaan armada Spot yang ditentukan.

Perintah:

```
aws ec2 describe-spot-fleet-requests --spot-fleet-request-ids sfr-73fbd2ce-aa30-494c-8788-1cee4EXAMPLE
```

Output:

```
{
  "SpotFleetRequestConfigs": [
      {
          "SpotFleetRequestId": "sfr-73fbd2ce-aa30-494c-8788-1cee4EXAMPLE",
          "SpotFleetRequestConfig": {
              "TargetCapacity": 20,
              "LaunchSpecifications": [
                  {
                      "EbsOptimized": false,
                      "NetworkInterfaces": [
                          {
                              "SubnetId": "subnet-a61dafcf",
                              "DeviceIndex": 0,
                              "DeleteOnTermination": false,
                              "AssociatePublicIpAddress": true,
                              "SecondaryPrivateIpAddressCount": 0
                          }
                      ],
                      "InstanceType": "cc2.8xlarge",
                      "ImageId": "ami-1a2b3c4d"
                  },
                  {
                      "EbsOptimized": false,
                      "NetworkInterfaces": [
                          {
                              "SubnetId": "subnet-a61dafcf",
                              "DeviceIndex": 0,
                              "DeleteOnTermination": false,
                              "AssociatePublicIpAddress": true,
                              "SecondaryPrivateIpAddressCount": 0
                          }
                      ],
                      "InstanceType": "r3.8xlarge",
                      "ImageId": "ami-1a2b3c4d"
                  }
              ],
              "SpotPrice": "0.05",
              "IamFleetRole": "arn:aws:iam::123456789012:role/my-spot-fleet-role"
```

```
            },
            "SpotFleetRequestState": "active"
        }
    ]
}
```

- Untuk API detailnya, lihat DescribeSpotFleetRequestsdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menjelaskan permintaan armada Spot yang ditentukan.

```
Get-EC2SpotFleetRequest -SpotFleetRequestId sfr-73fbd2ce-
aa30-494c-8788-1cee4EXAMPLE | format-list
```

Output:

```
ConfigData            : Amazon.EC2.Model.SpotFleetRequestConfigData
CreateTime            : 12/26/2015 8:23:33 AM
SpotFleetRequestId    : sfr-73fbd2ce-aa30-494c-8788-1cee4EXAMPLE
SpotFleetRequestState : active
```

Contoh 2: Contoh ini menjelaskan semua permintaan armada Spot Anda.

```
Get-EC2SpotFleetRequest
```

- Untuk API detailnya, lihat DescribeSpotFleetRequestsdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DescribeSpotInstanceRequests`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribeSpotInstanceRequests`.

CLI

AWS CLI

Contoh 1: Untuk mendeskripsikan permintaan Instans Spot

`describe-spot-instance-requests`Contoh berikut menjelaskan permintaan Instans Spot yang ditentukan.

```
aws ec2 describe-spot-instance-requests \
    --spot-instance-request-ids sir-08b93456
```

Output:

```
{
    "SpotInstanceRequests": [
        {
            "CreateTime": "2018-04-30T18:14:55.000Z",
            "InstanceId": "i-1234567890abcdef1",
            "LaunchSpecification": {
                "InstanceType": "t2.micro",
                "ImageId": "ami-003634241a8fcdec0",
                "KeyName": "my-key-pair",
                "SecurityGroups": [
                    {
                        "GroupName": "default",
                        "GroupId": "sg-e38f24a7"
                    }
                ],
                "BlockDeviceMappings": [
                    {
                        "DeviceName": "/dev/sda1",
                        "Ebs": {
                            "DeleteOnTermination": true,
                            "SnapshotId": "snap-0e54a519c999adbbd",
                            "VolumeSize": 8,
                            "VolumeType": "standard",
                            "Encrypted": false
                        }
                    }
                ],
                "NetworkInterfaces": [
                    {
```

```
                        "DeleteOnTermination": true,
                        "DeviceIndex": 0,
                        "SubnetId": "subnet-049df61146c4d7901"
                    }
                ],
                "Placement": {
                    "AvailabilityZone": "us-east-2b",
                    "Tenancy": "default"
                },
                "Monitoring": {
                    "Enabled": false
                }
            },
            "LaunchedAvailabilityZone": "us-east-2b",
            "ProductDescription": "Linux/UNIX",
            "SpotInstanceRequestId": "sir-08b93456",
            "SpotPrice": "0.010000"
            "State": "active",
            "Status": {
                "Code": "fulfilled",
                "Message": "Your Spot request is fulfilled.",
                "UpdateTime": "2018-04-30T18:16:21.000Z"
            },
            "Tags": [],
            "Type": "one-time",
            "InstanceInterruptionBehavior": "terminate"
        }
    ]
}
```

Contoh 2: Untuk menjelaskan permintaan Instans Spot berdasarkan filter

`describe-spot-instance-requests`Contoh berikut menggunakan filter untuk membuat cakupan hasil ke permintaan Instance Spot dengan jenis instans yang ditentukan di Availability Zone yang ditentukan. Contoh menggunakan `--query` parameter untuk menampilkan hanya contohIDs.

```
aws ec2 describe-spot-instance-requests \
    --filters Name=launch.instance-type,Values=m3.medium Name=launched-
availability-zone,Values=us-east-2a \
    --query "SpotInstanceRequests[*].[InstanceId]" \
    --output text
```

Output:

```
i-057750d42936e468a
i-001efd250faaa6ffa
i-027552a73f021f3bd
...
```

Untuk contoh tambahan menggunakan filter, lihat Mencantumkan dan memfilter sumber daya Anda di Panduan Pengguna Amazon Elastic Compute Cloud.

Contoh 3: Untuk menjelaskan permintaan Instans Spot berdasarkan tag

`describe-spot-instance-requests`Contoh berikut menggunakan filter tag untuk cakupan hasil ke permintaan Spot Instance yang memiliki tag`cost-center=cc123`.

```
aws ec2 describe-spot-instance-requests \
    --filters Name=tag:cost-center,Values=cc123
```

Untuk contoh output `describe-spot-instance-requests`, lihat Contoh 1.

Untuk contoh tambahan menggunakan filter tag, lihat Bekerja dengan tag di Panduan EC2 Pengguna Amazon.

- Untuk API detailnya, lihat DescribeSpotInstanceRequestsdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menjelaskan permintaan instance Spot yang ditentukan.

```
Get-EC2SpotInstanceRequest -SpotInstanceRequestId sir-12345678
```

Output:

```
ActualBlockHourlyPrice   :
AvailabilityZoneGroup    :
BlockDurationMinutes     : 0
CreateTime               : 4/8/2015 2:51:33 PM
Fault                    :
InstanceId               : i-12345678
LaunchedAvailabilityZone : us-west-2b
```

```
LaunchGroup              :
LaunchSpecification      : Amazon.EC2.Model.LaunchSpecification
ProductDescription       : Linux/UNIX
SpotInstanceRequestId    : sir-12345678
SpotPrice                : 0.020000
State                    : active
Status                   : Amazon.EC2.Model.SpotInstanceStatus
Tags                     : {Name}
Type                     : one-time
```

Contoh 2: Contoh ini menjelaskan semua permintaan instans Spot Anda.

```
Get-EC2SpotInstanceRequest
```

- Untuk API detailnya, lihat DescribeSpotInstanceRequestsdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DescribeSpotPriceHistory`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribeSpotPriceHistory`.

CLI

AWS CLI

Untuk menggambarkan sejarah harga Spot

Perintah contoh ini mengembalikan riwayat Harga Spot untuk instance m1.xlarge untuk hari tertentu di bulan Januari.

Perintah:

```
aws ec2 describe-spot-price-history --instance-types m1.xlarge --start-
time 2014-01-06T07:08:09 --end-time 2014-01-06T08:09:10
```

Output:

```
{
```

```
  "SpotPriceHistory": [
          {
              "Timestamp": "2014-01-06T07:10:55.000Z",
              "ProductDescription": "SUSE Linux",
              "InstanceType": "m1.xlarge",
              "SpotPrice": "0.087000",
              "AvailabilityZone": "us-west-1b"
          },
          {
              "Timestamp": "2014-01-06T07:10:55.000Z",
              "ProductDescription": "SUSE Linux",
              "InstanceType": "m1.xlarge",
              "SpotPrice": "0.087000",
              "AvailabilityZone": "us-west-1c"
          },
          {
              "Timestamp": "2014-01-06T05:42:36.000Z",
              "ProductDescription": "SUSE Linux (Amazon VPC)",
              "InstanceType": "m1.xlarge",
              "SpotPrice": "0.087000",
              "AvailabilityZone": "us-west-1a"
      },
      ...
}
```

Untuk menggambarkan sejarah harga Spot untuk Linux/ Amazon UNIX VPC

Perintah contoh ini mengembalikan riwayat Harga Spot untuk m1.xlarge, VPC instans UNIX Linux/Amazon untuk hari tertentu di bulan Januari.

Perintah:

```
aws ec2 describe-spot-price-history --instance-types m1.xlarge --product-
description "Linux/UNIX (Amazon VPC)" --start-time 2014-01-06T07:08:09 --end-
time 2014-01-06T08:09:10
```

Output:

```
{
  "SpotPriceHistory": [
      {
          "Timestamp": "2014-01-06T04:32:53.000Z",
          "ProductDescription": "Linux/UNIX (Amazon VPC)",
```

```
            "InstanceType": "m1.xlarge",
            "SpotPrice": "0.080000",
            "AvailabilityZone": "us-west-1a"
        },
        {
            "Timestamp": "2014-01-05T11:28:26.000Z",
            "ProductDescription": "Linux/UNIX (Amazon VPC)",
            "InstanceType": "m1.xlarge",
            "SpotPrice": "0.080000",
            "AvailabilityZone": "us-west-1c"
        }
    ]
}
```

- Untuk API detailnya, lihat DescribeSpotPriceHistorydi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini mendapatkan 10 entri terakhir dalam riwayat harga Spot untuk jenis instans tertentu dan Availability Zone. Perhatikan bahwa nilai yang ditentukan untuk AvailabilityZone parameter - harus valid untuk nilai wilayah yang diberikan ke parameter - Region cmdlet (tidak ditampilkan dalam contoh) atau ditetapkan sebagai default di shell. Perintah contoh ini mengasumsikan wilayah default 'us-west-2' telah disetel di lingkungan.

```
Get-EC2SpotPriceHistory -InstanceType c3.large -AvailabilityZone us-west-2a -
MaxResult 10
```

Output:

```
AvailabilityZone   : us-west-2a
InstanceType       : c3.large
Price              : 0.017300
ProductDescription : Linux/UNIX (Amazon VPC)
Timestamp          : 12/25/2015 7:39:49 AM

AvailabilityZone   : us-west-2a
InstanceType       : c3.large
Price              : 0.017200
ProductDescription : Linux/UNIX (Amazon VPC)
Timestamp          : 12/25/2015 7:38:29 AM
```

```
AvailabilityZone   : us-west-2a
InstanceType       : c3.large
Price              : 0.017300
ProductDescription : Linux/UNIX (Amazon VPC)
Timestamp          : 12/25/2015 6:57:13 AM
...
```

- Untuk API detailnya, lihat DescribeSpotPriceHistorydi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DescribeSubnets`** dengan AWS SDK atau CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribeSubnets`.

Contoh tindakan adalah kutipan kode dari program yang lebih besar dan harus dijalankan dalam konteks. Anda dapat melihat tindakan ini dalam konteks dalam contoh kode berikut:

- Membangun dan mengelola layanan yang tangguh

.NET

AWS SDK for .NET

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
/// <summary>
/// Get all the subnets for a Vpc in a set of availability zones.
/// </summary>
/// <param name="vpcId">The Id of the Vpc.</param>
/// <param name="availabilityZones">The list of availability zones.</param>
/// <returns>The collection of subnet objects.</returns>
```

```
   public async Task<List<Subnet>> GetAllVpcSubnetsForZones(string vpcId,
List<string> availabilityZones)
   {
       try
       {
           var subnets = new List<Subnet>();
           var subnetPaginator = _amazonEc2.Paginators.DescribeSubnets(
               new DescribeSubnetsRequest()
               {
                   Filters = new List<Amazon.EC2.Model.Filter>()
                   {
                       new("vpc-id", new List<string>() { vpcId }),
                       new("availability-zone", availabilityZones),
                       new("default-for-az", new List<string>() { "true" })
                   }
               });

           // Get the entire list using the paginator.
           await foreach (var subnet in subnetPaginator.Subnets)
           {
               subnets.Add(subnet);
           }

           return subnets;
       }
       catch (AmazonEC2Exception ec2Exception)
       {
           if (ec2Exception.ErrorCode == "InvalidVpcID.NotFound")
           {
               _logger.LogError(ec2Exception, $"The specified VPC ID {vpcId}
does not exist.");
           }

           throw;
       }
       catch (Exception ex)
       {
           _logger.LogError(ex, $"An error occurred while describing the
subnets.: {ex.Message}");
           throw;
       }
   }
```

- Untuk API detailnya, lihat DescribeSubnetsdi AWS SDK for .NET APIReferensi.

CLI

AWS CLI

Contoh 1: Untuk menjelaskan semua subnet Anda

Contoh `describe-subnets` berikut menampilkan detail subnet Anda.

```
aws ec2 describe-subnets
```

Output:

```
{
    "Subnets": [
        {
            "AvailabilityZone": "us-east-1d",
            "AvailabilityZoneId": "use1-az2",
            "AvailableIpAddressCount": 4089,
            "CidrBlock": "172.31.80.0/20",
            "DefaultForAz": true,
            "MapPublicIpOnLaunch": false,
            "MapCustomerOwnedIpOnLaunch": true,
            "State": "available",
            "SubnetId": "subnet-0bb1c79de3EXAMPLE",
            "VpcId": "vpc-0ee975135dEXAMPLE",
            "OwnerId": "111122223333",
            "AssignIpv6AddressOnCreation": false,
            "Ipv6CidrBlockAssociationSet": [],
            "CustomerOwnedIpv4Pool:": 'pool-2EXAMPLE',
            "SubnetArn": "arn:aws:ec2:us-east-2:111122223333:subnet/
subnet-0bb1c79de3EXAMPLE",
            "EnableDns64": false,
            "Ipv6Native": false,
            "PrivateDnsNameOptionsOnLaunch": {
                "HostnameType": "ip-name",
                "EnableResourceNameDnsARecord": false,
                "EnableResourceNameDnsAAAARecord": false
            }
        },
        {
            "AvailabilityZone": "us-east-1d",
```

```
            "AvailabilityZoneId": "use1-az2",
            "AvailableIpAddressCount": 4089,
            "CidrBlock": "172.31.80.0/20",
            "DefaultForAz": true,
            "MapPublicIpOnLaunch": true,
            "MapCustomerOwnedIpOnLaunch": false,
            "State": "available",
            "SubnetId": "subnet-8EXAMPLE",
            "VpcId": "vpc-3EXAMPLE",
            "OwnerId": "1111222233333",
            "AssignIpv6AddressOnCreation": false,
            "Ipv6CidrBlockAssociationSet": [],
            "Tags": [
                {
                    "Key": "Name",
                    "Value": "MySubnet"
                }
            ],
            "SubnetArn": "arn:aws:ec2:us-east-1:111122223333:subnet/
subnet-8EXAMPLE",
            "EnableDns64": false,
            "Ipv6Native": false,
            "PrivateDnsNameOptionsOnLaunch": {
                "HostnameType": "ip-name",
                "EnableResourceNameDnsARecord": false,
                "EnableResourceNameDnsAAAARecord": false
            }
        }
    ]
}
```

Untuk informasi selengkapnya, lihat Bekerja dengan VPCs dan Subnet di Panduan AWS VPC Pengguna.

Contoh 2: Untuk menggambarkan subnet tertentu VPC

`describe-subnets`Contoh berikut menggunakan filter untuk mengambil rincian untuk subnet yang ditentukan. VPC

```
aws ec2 describe-subnets \
    --filters "Name=vpc-id,Values=vpc-3EXAMPLE"
```

Output:

```
{
    "Subnets": [
        {
            "AvailabilityZone": "us-east-1d",
            "AvailabilityZoneId": "use1-az2",
            "AvailableIpAddressCount": 4089,
            "CidrBlock": "172.31.80.0/20",
            "DefaultForAz": true,
            "MapPublicIpOnLaunch": true,
            "MapCustomerOwnedIpOnLaunch": false,
            "State": "available",
            "SubnetId": "subnet-8EXAMPLE",
            "VpcId": "vpc-3EXAMPLE",
            "OwnerId": "1111222233333",
            "AssignIpv6AddressOnCreation": false,
            "Ipv6CidrBlockAssociationSet": [],
            "Tags": [
                {
                    "Key": "Name",
                    "Value": "MySubnet"
                }
            ],
            "SubnetArn": "arn:aws:ec2:us-east-1:111122223333:subnet/
subnet-8EXAMPLE",
            "EnableDns64": false,
            "Ipv6Native": false,
            "PrivateDnsNameOptionsOnLaunch": {
                "HostnameType": "ip-name",
                "EnableResourceNameDnsARecord": false,
                "EnableResourceNameDnsAAAARecord": false
            }
        }
    ]
}
```


Untuk informasi selengkapnya, lihat Bekerja dengan VPCs dan Subnet di Panduan AWS VPC Pengguna.

Contoh 3: Untuk menjelaskan subnet dengan tanda tertentu

`describe-subnets`Contoh berikut menggunakan filter untuk mengambil rincian subnet tersebut dengan tag `CostCenter=123` dan `--query` parameter untuk menampilkan subnet subnet IDs dengan tag ini.

```
aws ec2 describe-subnets \
    --filters "Name=tag:CostCenter,Values=123" \
    --query "Subnets[*].SubnetId" \
    --output text
```

Output:

```
subnet-0987a87c8b37348ef
subnet-02a95061c45f372ee
subnet-03f720e7de2788d73
```

Untuk informasi selengkapnya, lihat Bekerja dengan VPCs dan Subnet di Panduan VPC Pengguna Amazon.

- Untuk API detailnya, lihat DescribeSubnetsdi Referensi AWS CLI Perintah.

JavaScript

SDKuntuk JavaScript (v3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
const client = new EC2Client({});
const { Subnets } = await client.send(
  new DescribeSubnetsCommand({
    Filters: [
      { Name: "vpc-id", Values: [state.defaultVpc] },
      { Name: "availability-zone", Values: state.availabilityZoneNames },
      { Name: "default-for-az", Values: ["true"] },
    ],
  }),
);
```

- Untuk API detailnya, lihat DescribeSubnetsdi AWS SDK for JavaScript APIReferensi.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menjelaskan subnet yang ditentukan.

```
Get-EC2Subnet -SubnetId subnet-1a2b3c4d
```

Output:

```
AvailabilityZone        : us-west-2c
AvailableIpAddressCount : 251
CidrBlock               : 10.0.0.0/24
DefaultForAz            : False
MapPublicIpOnLaunch     : False
State                   : available
SubnetId                : subnet-1a2b3c4d
Tags                    : {}
VpcId                   : vpc-12345678
```

Contoh 2: Contoh ini menjelaskan semua subnet Anda.

```
Get-EC2Subnet
```

- Untuk API detailnya, lihat DescribeSubnetsdi AWS Tools for PowerShell Referensi Cmdlet.

Python

SDKuntuk Python (Boto3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
class AutoScalingWrapper:
    """
    Encapsulates Amazon EC2 Auto Scaling and EC2 management actions.
    """
```

```
    def __init__(
        self,
        resource_prefix: str,
        inst_type: str,
        ami_param: str,
        autoscaling_client: boto3.client,
        ec2_client: boto3.client,
        ssm_client: boto3.client,
        iam_client: boto3.client,
    ):
        """
        Initializes the AutoScaler class with the necessary parameters.

        :param resource_prefix: The prefix for naming AWS resources that are
created by this class.
        :param inst_type: The type of EC2 instance to create, such as t3.micro.
        :param ami_param: The Systems Manager parameter used to look up the AMI
that is created.
        :param autoscaling_client: A Boto3 EC2 Auto Scaling client.
        :param ec2_client: A Boto3 EC2 client.
        :param ssm_client: A Boto3 Systems Manager client.
        :param iam_client: A Boto3 IAM client.
        """
        self.inst_type = inst_type
        self.ami_param = ami_param
        self.autoscaling_client = autoscaling_client
        self.ec2_client = ec2_client
        self.ssm_client = ssm_client
        self.iam_client = iam_client
        sts_client = boto3.client("sts")
        self.account_id = sts_client.get_caller_identity()["Account"]

        self.key_pair_name = f"{resource_prefix}-key-pair"
        self.launch_template_name = f"{resource_prefix}-template-"
        self.group_name = f"{resource_prefix}-group"

        # Happy path
        self.instance_policy_name = f"{resource_prefix}-pol"
        self.instance_role_name = f"{resource_prefix}-role"
        self.instance_profile_name = f"{resource_prefix}-prof"

        # Failure mode
        self.bad_creds_policy_name = f"{resource_prefix}-bc-pol"
```

```
        self.bad_creds_role_name = f"{resource_prefix}-bc-role"
        self.bad_creds_profile_name = f"{resource_prefix}-bc-prof"


    def get_subnets(self, vpc_id: str, zones: List[str] = None) -> List[Dict[str,
Any]]:
        """
        Gets the default subnets in a VPC for a specified list of Availability
Zones.

        :param vpc_id: The ID of the VPC to look up.
        :param zones: The list of Availability Zones to look up.
        :return: The list of subnets found.
        """
        # Ensure that 'zones' is a list, even if None is passed
        if zones is None:
            zones = []
        try:
            paginator = self.ec2_client.get_paginator("describe_subnets")
            page_iterator = paginator.paginate(
                Filters=[
                    {"Name": "vpc-id", "Values": [vpc_id]},
                    {"Name": "availability-zone", "Values": zones},
                    {"Name": "default-for-az", "Values": ["true"]},
                ]
            )

            subnets = []
            for page in page_iterator:
                subnets.extend(page["Subnets"])

            log.info("Found %s subnets for the specified zones.", len(subnets))
            return subnets
        except ClientError as err:
            log.error(
                f"Failed to retrieve subnets for VPC '{vpc_id}' in zones
{zones}."
            )
            error_code = err.response["Error"]["Code"]
            if error_code == "InvalidVpcID.NotFound":
                log.error(
                    "The specified VPC ID does not exist. "
                    "Please check the VPC ID and try again."
                )
```

```
            # Add more error-specific handling as needed
            log.error(f"Full error:\n\t{err}")
```

- Untuk API detailnya, lihat DescribeSubnets AWSSDKReferensi Python (Boto3). API

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DescribeTags`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribeTags`.

CLI

AWS CLI

Contoh 1: Untuk mendeskripsikan semua tag untuk satu sumber daya

`describe-tags`Contoh berikut menjelaskan tag untuk contoh tertentu.

```
aws ec2 describe-tags \
    --filters "Name=resource-id,Values=i-1234567890abcdef8"
```

Output:

```
{
    "Tags": [
        {
            "ResourceType": "instance",
            "ResourceId": "i-1234567890abcdef8",
            "Value": "Test",
            "Key": "Stack"
        },
        {
            "ResourceType": "instance",
            "ResourceId": "i-1234567890abcdef8",
            "Value": "Beta Server",
            "Key": "Name"
        }
```

```
    ]
}
```

Contoh 2: Untuk mendeskripsikan semua tag untuk jenis sumber daya

`describe-tags`Contoh berikut menjelaskan tag untuk volume Anda.

```
aws ec2 describe-tags \
    --filters "Name=resource-type,Values=volume"
```

Output:

```
{
    "Tags": [
        {
            "ResourceType": "volume",
            "ResourceId": "vol-1234567890abcdef0",
            "Value": "Project1",
            "Key": "Purpose"
        },
        {
            "ResourceType": "volume",
            "ResourceId": "vol-049df61146c4d7901",
            "Value": "Logs",
            "Key": "Purpose"
        }
    ]
}
```

Contoh 3: Untuk mendeskripsikan semua tag Anda

`describe-tags`Contoh berikut menjelaskan tag untuk semua sumber daya Anda.

```
aws ec2 describe-tags
```

Contoh 4: Untuk mendeskripsikan tag untuk sumber daya Anda berdasarkan kunci tag

`describe-tags`Contoh berikut menjelaskan tag untuk sumber daya Anda yang memiliki tag dengan kunci`Stack`.

```
aws ec2 describe-tags \
```

```
    --filters Name=key,Values=Stack
```

Output:

```
{
    "Tags": [
        {
            "ResourceType": "volume",
            "ResourceId": "vol-027552a73f021f3b",
            "Value": "Production",
            "Key": "Stack"
        },
        {
            "ResourceType": "instance",
            "ResourceId": "i-1234567890abcdef8",
            "Value": "Test",
            "Key": "Stack"
        }
    ]
}
```

Contoh 5: Untuk mendeskripsikan tag untuk sumber daya Anda berdasarkan kunci tag dan nilai tag

`describe-tags`Contoh berikut menjelaskan tag untuk sumber daya Anda yang memiliki tag`Stack=Test`.

```
aws ec2 describe-tags \
    --filters Name=key,Values=Stack Name=value,Values=Test
```

Output:

```
{
    "Tags": [
        {
            "ResourceType": "image",
            "ResourceId": "ami-3ac336533f021f3bd",
            "Value": "Test",
            "Key": "Stack"
        },
        {
            "ResourceType": "instance",
```

```
            "ResourceId": "i-1234567890abcdef8",
            "Value": "Test",
            "Key": "Stack"
        }
    ]
}
```

`describe-tags`Contoh berikut menggunakan sintaks alternatif untuk menggambarkan sumber daya dengan tag`Stack=Test`.

```
aws ec2 describe-tags \
    --filters "Name=tag:Stack,Values=Test"
```

`describe-tags`Contoh berikut menjelaskan tag untuk semua instance Anda yang memiliki tag dengan kunci `Purpose` dan tanpa nilai.

```
aws ec2 describe-tags \
    --filters "Name=resource-
type,Values=instance" "Name=key,Values=Purpose" "Name=value,Values="
```

Output:

```
{
    "Tags": [
        {
            "ResourceType": "instance",
            "ResourceId": "i-1234567890abcdef5",
            "Value": null,
            "Key": "Purpose"
        }
    ]
}
```

- Untuk API detailnya, lihat DescribeTagsdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini mengambil tag untuk 'image' tipe sumber daya

```
Get-EC2Tag -Filter @{Name="resource-type";Values="image"}
```

Output:

```
Key         ResourceId            ResourceType Value
---         ----------            ------------ -----
Name        ami-0a123b4ccb567a8ea image        Win7-Imported
auto-delete ami-0a123b4ccb567a8ea image        never
```

Contoh 2: Contoh ini mengambil semua tag untuk semua sumber daya dan mengelompokkannya berdasarkan jenis sumber daya

```
Get-EC2Tag | Group-Object resourcetype
```

Output:

```
Count Name                      Group
----- ----                      -----
    9 subnet                    {Amazon.EC2.Model.TagDescription,
 Amazon.EC2.Model.TagDescription, Amazon.EC2.Model.TagDescription,
 Amazon.EC2.Model.TagDescription...}
   53 instance                  {Amazon.EC2.Model.TagDescription,
 Amazon.EC2.Model.TagDescription, Amazon.EC2.Model.TagDescription,
 Amazon.EC2.Model.TagDescription...}
    3 route-table               {Amazon.EC2.Model.TagDescription,
 Amazon.EC2.Model.TagDescription, Amazon.EC2.Model.TagDescription}
    5 security-group            {Amazon.EC2.Model.TagDescription,
 Amazon.EC2.Model.TagDescription, Amazon.EC2.Model.TagDescription,
 Amazon.EC2.Model.TagDescription...}
   30 volume                    {Amazon.EC2.Model.TagDescription,
 Amazon.EC2.Model.TagDescription, Amazon.EC2.Model.TagDescription,
 Amazon.EC2.Model.TagDescription...}
    1 internet-gateway          {Amazon.EC2.Model.TagDescription}
    3 network-interface         {Amazon.EC2.Model.TagDescription,
 Amazon.EC2.Model.TagDescription, Amazon.EC2.Model.TagDescription}
    4 elastic-ip                {Amazon.EC2.Model.TagDescription,
 Amazon.EC2.Model.TagDescription, Amazon.EC2.Model.TagDescription,
 Amazon.EC2.Model.TagDescription}
    1 dhcp-options              {Amazon.EC2.Model.TagDescription}
    2 image                     {Amazon.EC2.Model.TagDescription,
 Amazon.EC2.Model.TagDescription}
```

```
    3 vpc                        {Amazon.EC2.Model.TagDescription,
 Amazon.EC2.Model.TagDescription, Amazon.EC2.Model.TagDescription}
```

Contoh 3: Contoh ini menampilkan semua sumber daya dengan tag 'auto-delete' dengan nilai 'no' untuk wilayah tertentu

```
Get-EC2Tag -Region eu-west-1 -Filter @{Name="tag:auto-delete";Values="no"}
```

Output:

```
Key         ResourceId            ResourceType Value
---         ----------            ------------ -----
auto-delete i-0f1bce234d5dd678b   instance     no
auto-delete vol-01d234aa5678901a2 volume       no
auto-delete vol-01234bfb5def6f7b8 volume       no
auto-delete vol-01ccb23f4c5e67890 volume       no
```

Contoh 4: Contoh ini memperoleh semua sumber daya dengan tag 'hapus otomatis' dengan nilai 'no' dan filter lebih lanjut di pipa berikutnya untuk mengurai hanya jenis sumber daya 'instance' dan akhirnya membuat tag 'ThisInstance' untuk setiap sumber daya instance dengan nilai menjadi id instance itu sendiri

```
Get-EC2Tag -Region eu-west-1 -Filter @{Name="tag:auto-delete";Values="no"}
 | Where-Object ResourceType -eq "instance" | ForEach-Object {New-EC2Tag -
ResourceId $_.ResourceId -Tag @{Key="ThisInstance";Value=$_.ResourceId}}
```

Contoh 5: Contoh ini mengambil tag untuk semua sumber daya instance serta kunci 'Nama' dan menampilkannya dalam format tabel

```
Get-EC2Tag -Filter @{Name="resource-
type";Values="instance"},@{Name="key";Values="Name"} | Select-Object ResourceId,
 @{Name="Name-Tag";Expression={$PSItem.Value}} | Format-Table -AutoSize
```

Output:

```
ResourceId          Name-Tag
----------          --------
i-012e3cb4df567e1aa jump1
i-01c23a45d6fc7a89f repro-3
```

- Untuk API detailnya, lihat DescribeTagsdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DescribeVolumeAttribute`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribeVolumeAttribute`.

CLI

AWS CLI

Untuk menggambarkan atribut volume

Perintah contoh ini menjelaskan `autoEnableIo` atribut volume dengan ID`vol-049df61146c4d7901`.

Perintah:

```
aws ec2 describe-volume-attribute --volume-id vol-049df61146c4d7901 --
attribute autoEnableIO
```

Output:

```
{
    "AutoEnableIO": {
        "Value": false
    },
    "VolumeId": "vol-049df61146c4d7901"
}
```

- Untuk API detailnya, lihat DescribeVolumeAttributedi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menjelaskan atribut tertentu dari volume yang ditentukan.

```
Get-EC2VolumeAttribute -VolumeId vol-12345678 -Attribute AutoEnableIO
```

Output:

```
AutoEnableIO    ProductCodes    VolumeId
------------    ------------    --------
False           {}              vol-12345678
```

- Untuk API detailnya, lihat DescribeVolumeAttributedi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DescribeVolumeStatus`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribeVolumeStatus`.

CLI

AWS CLI

Untuk menggambarkan status satu volume

Perintah contoh ini menjelaskan status untuk volume`vol-1234567890abcdef0`.

Perintah:

```
aws ec2 describe-volume-status --volume-ids vol-1234567890abcdef0
```

Output:

```
{
    "VolumeStatuses": [
        {
            "VolumeStatus": {
                "Status": "ok",
                "Details": [
                    {
                        "Status": "passed",
```

```
                        "Name": "io-enabled"
                    },
                    {
                        "Status": "not-applicable",
                        "Name": "io-performance"
                    }
                ]
            },
            "AvailabilityZone": "us-east-1a",
            "VolumeId": "vol-1234567890abcdef0",
            "Actions": [],
            "Events": []
        }
    ]
}
```

Untuk menggambarkan status volume yang terganggu

Perintah contoh ini menjelaskan status untuk semua volume yang terganggu. Dalam contoh output ini, tidak ada volume yang terganggu.

Perintah:

```
aws ec2 describe-volume-status --filters Name=volume-
status.status,Values=impaired
```

Output:

```
{
    "VolumeStatuses": []
}
```

Jika Anda memiliki volume dengan pemeriksaan status gagal (status terganggu), lihat Bekerja dengan Volume yang Terganggu di Panduan EC2 Pengguna Amazon.

- Untuk API detailnya, lihat DescribeVolumeStatusdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menjelaskan status volume yang ditentukan.

```
Get-EC2VolumeStatus -VolumeId vol-12345678
```

Output:

```
Actions          : {}
AvailabilityZone : us-west-2a
Events           : {}
VolumeId         : vol-12345678
VolumeStatus     : Amazon.EC2.Model.VolumeStatusInfo
```

```
(Get-EC2VolumeStatus -VolumeId vol-12345678).VolumeStatus
```

Output:

```
Details                         Status
-------                         ------
{io-enabled, io-performance}    ok
```

```
(Get-EC2VolumeStatus -VolumeId vol-12345678).VolumeStatus.Details
```

Output:

```
Name                            Status
----                            ------
io-enabled                      passed
io-performance                  not-applicable
```

- Untuk API detailnya, lihat DescribeVolumeStatusdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DescribeVolumes`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribeVolumes`.

CLI

AWS CLI

Contoh 1: Untuk menggambarkan volume

`describe-volumes`Contoh berikut menjelaskan volume yang ditentukan di Wilayah saat ini.

```
aws ec2 describe-volumes \
    --volume-ids vol-049df61146c4d7901 vol-1234567890abcdef0
```

Output:

```
{
    "Volumes": [
        {
            "AvailabilityZone": "us-east-1a",
            "Attachments": [
                {
                    "AttachTime": "2013-12-18T22:35:00.000Z",
                    "InstanceId": "i-1234567890abcdef0",
                    "VolumeId": "vol-049df61146c4d7901",
                    "State": "attached",
                    "DeleteOnTermination": true,
                    "Device": "/dev/sda1"
                }
            ],
            "Encrypted": true,
            "KmsKeyId": "arn:aws:kms:us-east-2a:123456789012:key/8c5b2c63-
b9bc-45a3-a87a-5513eEXAMPLE,
            "VolumeType": "gp2",
            "VolumeId": "vol-049df61146c4d7901",
            "State": "in-use",
            "Iops": 100,
            "SnapshotId": "snap-1234567890abcdef0",
            "CreateTime": "2019-12-18T22:35:00.084Z",
            "Size": 8
        },
        {
            "AvailabilityZone": "us-east-1a",
            "Attachments": [],
            "Encrypted": false,
            "VolumeType": "gp2",
```

```
            "VolumeId": "vol-1234567890abcdef0",
            "State": "available",
            "Iops": 300,
            "SnapshotId": "",
            "CreateTime": "2020-02-27T00:02:41.791Z",
            "Size": 100
        }
    ]
}
```

Contoh 2: Untuk menggambarkan volume yang dilampirkan ke instance tertentu

`describe-volumes`Contoh berikut menjelaskan semua volume yang keduanya dilampirkan ke instance tertentu dan diatur untuk menghapus ketika instance berakhir.

```
aws ec2 describe-volumes \
    --region us-east-1 \
    --filters Name=attachment.instance-
id,Values=i-1234567890abcdef0 Name=attachment.delete-on-termination,Values=true
```

Untuk contoh output `describe-volumes`, lihat Contoh 1.

Contoh 3: Untuk menjelaskan volume yang tersedia di Availability Zone tertentu

`describe-volumes`Contoh berikut menjelaskan semua volume yang memiliki status `available` dan berada di Availability Zone yang ditentukan.

```
aws ec2 describe-volumes \
    --filters Name=status,Values=available Name=availability-zone,Values=us-
east-1a
```

Untuk contoh output `describe-volumes`, lihat Contoh 1.

Contoh 4: Untuk menggambarkan volume berdasarkan tag

`describe-volumes`Contoh berikut menjelaskan semua volume yang memiliki kunci tag `Name` dan nilai yang dimulai dengan`Test`. Output kemudian disaring dengan query yang hanya menampilkan tag dan IDs volume.

```
aws ec2 describe-volumes \
    --filters Name=tag:Name,Values=Test* \
```

```
    --query "Volumes[*].{ID:VolumeId,Tag:Tags}"
```

Output:

```
[
    {
        "Tag": [
            {
                "Value": "Test2",
                "Key": "Name"
            }
        ],
        "ID": "vol-1234567890abcdef0"
    },
    {
        "Tag": [
            {
                "Value": "Test1",
                "Key": "Name"
            }
        ],
        "ID": "vol-049df61146c4d7901"
    }
]
```

Untuk contoh tambahan menggunakan filter tag, lihat Bekerja dengan tag di Panduan EC2 Pengguna Amazon.

- Untuk API detailnya, lihat DescribeVolumesdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menjelaskan EBS volume yang ditentukan.

```
Get-EC2Volume -VolumeId vol-12345678
```

Output:

```
Attachments      : {}
AvailabilityZone : us-west-2c
```

```
CreateTime       : 7/17/2015 4:35:19 PM
Encrypted        : False
Iops             : 90
KmsKeyId         :
Size             : 30
SnapshotId       : snap-12345678
State            : in-use
Tags             : {}
VolumeId         : vol-12345678
VolumeType       : standard
```

Contoh 2: Contoh ini menjelaskan EBS volume Anda yang memiliki status 'tersedia'.

```
Get-EC2Volume -Filter @{ Name="status"; Values="available" }
```

Output:

```
Attachments      : {}
AvailabilityZone : us-west-2c
CreateTime       : 12/21/2015 2:31:29 PM
Encrypted        : False
Iops             : 60
KmsKeyId         :
Size             : 20
SnapshotId       : snap-12345678
State            : available
Tags             : {}
VolumeId         : vol-12345678
VolumeType       : gp2
...
```

Contoh 3: Contoh ini menjelaskan semua EBS volume Anda.

```
Get-EC2Volume
```

- Untuk API detailnya, lihat DescribeVolumesdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DescribeVpcAttribute`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribeVpcAttribute`.

CLI

AWS CLI

Untuk menggambarkan enableDnsSupport atribut

Contoh ini menjelaskan `enableDnsSupport` atribut. Atribut ini menunjukkan apakah DNS resolusi diaktifkan untukVPC. Jika atribut ini`true`, DNS server Amazon menyelesaikan DNS nama host untuk instance Anda ke alamat IP yang sesuai; jika tidak, tidak.

Perintah:

```
aws ec2 describe-vpc-attribute --vpc-id vpc-a01106c2 --attribute enableDnsSupport
```

Output:

```
{
    "VpcId": "vpc-a01106c2",
    "EnableDnsSupport": {
        "Value": true
    }
}
```

Untuk menggambarkan enableDnsHostnames atribut

Contoh ini menjelaskan `enableDnsHostnames` atribut. Atribut ini menunjukkan apakah instance diluncurkan di nama DNS host VPC get. Jika atribut ini`true`, contoh di VPC mendapatkan DNS nama host; jika tidak, mereka tidak.

Perintah:

```
aws ec2 describe-vpc-attribute --vpc-id vpc-a01106c2 --
attribute enableDnsHostnames
```

Output:

```
{
```

```
    "VpcId": "vpc-a01106c2",
    "EnableDnsHostnames": {
        "Value": true
    }
}
```

- Untuk API detailnya, lihat DescribeVpcAttributedi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menjelaskan atribut enableDnsSupport ".

```
Get-EC2VpcAttribute -VpcId vpc-12345678 -Attribute enableDnsSupport
```

Output:

```
EnableDnsSupport
----------------
True
```

Contoh 2: Contoh ini menjelaskan atribut enableDnsHostnames ".

```
Get-EC2VpcAttribute -VpcId vpc-12345678 -Attribute enableDnsHostnames
```

Output:

```
EnableDnsHostnames
------------------
True
```

- Untuk API detailnya, lihat DescribeVpcAttributedi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DescribeVpcClassicLink`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribeVpcClassicLink`.

CLI

AWS CLI

Untuk menggambarkan ClassicLink status Anda VPCs

Contoh ini mencantumkan ClassicLink status vpc-88888888.

Perintah:

```
aws ec2 describe-vpc-classic-link --vpc-id vpc-88888888
```

Output:

```
{
  "Vpcs": [
    {
      "ClassicLinkEnabled": true,
      "VpcId": "vpc-88888888",
      "Tags": [
        {
          "Value": "classiclinkvpc",
          "Key": "Name"
        }
      ]
    }
  ]
}
```

Contoh ini hanya mencantumkan VPCs yang diaktifkan untuk Classiclink (nilai filter `is-classic-link-enabled` disetel ke`true`).

Perintah:

```
aws ec2 describe-vpc-classic-link --filter "Name=is-classic-link-enabled,Values=true"
```

- Untuk API detailnya, lihat DescribeVpcClassicLinkdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh di atas mengembalikan semua VPCs dengan ClassicLinkEnabled negara mereka untuk wilayah

```
Get-EC2VpcClassicLink -Region eu-west-1
```

Output:

```
ClassicLinkEnabled Tags   VpcId
------------------ ----   -----
False              {Name} vpc-0fc1ff23f45b678eb
False              {}     vpc-01e23c4a5d6db78e9
False              {Name} vpc-0123456b078b9d01f
False              {}     vpc-12cf3b4f
False              {Name} vpc-0b12d3456a7e8901d
```

- Untuk API detailnya, lihat DescribeVpcClassicLinkdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DescribeVpcClassicLinkDnsSupport`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribeVpcClassicLinkDnsSupport`.

CLI

AWS CLI

Untuk menggambarkan ClassicLink DNS dukungan untuk Anda VPCs

Contoh ini menjelaskan status ClassicLink DNS dukungan semua AndaVPCs.

Perintah:

```
aws ec2 describe-vpc-classic-link-dns-support
```

Output:

```
{
  "Vpcs": [
    {
      "VpcId": "vpc-88888888",
      "ClassicLinkDnsSupported": true
    },
    {
      "VpcId": "vpc-1a2b3c4d",
      "ClassicLinkDnsSupported": false
    }
  ]
}
```

- Untuk API detailnya, lihat DescribeVpcClassicLinkDnsSupportdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menjelaskan status ClassicLink DNS dukungan VPCs untuk wilayah eu-west-1

```
Get-EC2VpcClassicLinkDnsSupport -VpcId vpc-0b12d3456a7e8910d -Region eu-west-1
```

Output:

```
ClassicLinkDnsSupported VpcId
----------------------- -----
False                   vpc-0b12d3456a7e8910d
False                   vpc-12cf3b4f
```

- Untuk API detailnya, lihat DescribeVpcClassicLinkDnsSupportdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DescribeVpcEndpointServices`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribeVpcEndpointServices`.

CLI

AWS CLI

Contoh 1: Untuk mendeskripsikan semua VPC layanan endpoint

Contoh "describe-vpc-endpoint-services" berikut mencantumkan semua layanan VPC endpoint untuk suatu AWS Wilayah.

```
aws ec2 describe-vpc-endpoint-services
```

Output:

```
{
    "ServiceDetails": [
        {
            "ServiceType": [
                {
                    "ServiceType": "Gateway"
                }
            ],
            "AcceptanceRequired": false,
            "ServiceName": "com.amazonaws.us-east-1.dynamodb",
            "VpcEndpointPolicySupported": true,
            "Owner": "amazon",
            "AvailabilityZones": [
                "us-east-1a",
                "us-east-1b",
                "us-east-1c",
                "us-east-1d",
                "us-east-1e",
                "us-east-1f"
            ],
            "BaseEndpointDnsNames": [
                "dynamodb.us-east-1.amazonaws.com"
            ]
        },
        {
            "ServiceType": [
```

```
                {
                    "ServiceType": "Interface"
                }
            ],
            "PrivateDnsName": "ec2.us-east-1.amazonaws.com",
            "ServiceName": "com.amazonaws.us-east-1.ec2",
            "VpcEndpointPolicySupported": false,
            "Owner": "amazon",
            "AvailabilityZones": [
                "us-east-1a",
                "us-east-1b",
                "us-east-1c",
                "us-east-1d",
                "us-east-1e",
                "us-east-1f"
            ],
            "AcceptanceRequired": false,
            "BaseEndpointDnsNames": [
                "ec2.us-east-1.vpce.amazonaws.com"
            ]
        },
        {
            "ServiceType": [
                {
                    "ServiceType": "Interface"
                }
            ],
            "PrivateDnsName": "ssm.us-east-1.amazonaws.com",
            "ServiceName": "com.amazonaws.us-east-1.ssm",
            "VpcEndpointPolicySupported": true,
            "Owner": "amazon",
            "AvailabilityZones": [
                "us-east-1a",
                "us-east-1b",
                "us-east-1c",
                "us-east-1d",
                "us-east-1e"
            ],
            "AcceptanceRequired": false,
            "BaseEndpointDnsNames": [
                "ssm.us-east-1.vpce.amazonaws.com"
            ]
        }
    ],
```

```
    "ServiceNames": [
        "com.amazonaws.us-east-1.dynamodb",
        "com.amazonaws.us-east-1.ec2",
        "com.amazonaws.us-east-1.ec2messages",
        "com.amazonaws.us-east-1.elasticloadbalancing",
        "com.amazonaws.us-east-1.kinesis-streams",
        "com.amazonaws.us-east-1.s3",
        "com.amazonaws.us-east-1.ssm"
    ]
}
```

Untuk informasi selengkapnya, lihat Melihat nama AWS layanan yang tersedia di Panduan Pengguna untuk AWS PrivateLink.

Contoh 2: Untuk menjelaskan detail tentang layanan endpoint

Contoh "describe-vpc-endpoint-services" berikut mencantumkan rincian srvice endpoint antarmuka Amazon S3

```
aws ec2 describe-vpc-endpoint-services \
    --filter "Name=service-type,Values=Interface" Name=service-
name,Values=com.amazonaws.us-east-1.s3
```

Output:

```
{
    "ServiceDetails": [
        {
            "ServiceName": "com.amazonaws.us-east-1.s3",
            "ServiceId": "vpce-svc-081d84efcdEXAMPLE",
            "ServiceType": [
                {
                    "ServiceType": "Interface"
                }
            ],
            "AvailabilityZones": [
                "us-east-1a",
                "us-east-1b",
                "us-east-1c",
                "us-east-1d",
                "us-east-1e",
            "us-east-1f"
            ],
```

```
            "Owner": "amazon",
            "BaseEndpointDnsNames": [
                "s3.us-east-1.vpce.amazonaws.com"
            ],
            "VpcEndpointPolicySupported": true,
            "AcceptanceRequired": false,
            "ManagesVpcEndpoints": false,
            "Tags": []
        }
    ],
    "ServiceNames": [
        "com.amazonaws.us-east-1.s3"
    ]
}
```

Untuk informasi selengkapnya, lihat Melihat nama AWS layanan yang tersedia di Panduan Pengguna untuk AWS PrivateLink.

- Untuk API detailnya, lihat DescribeVpcEndpointServicesdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menjelaskan layanan EC2 VPC endpoint dengan filter yang diberikan, dalam hal ini com.amazonaws.eu-west-1.ecs. Selanjutnya, itu juga memperluas ServiceDetails properti dan menampilkan detailnya

```
Get-EC2VpcEndpointService -Region eu-west-1 -MaxResult 5 -Filter @{Name="service-
name";Values="com.amazonaws.eu-west-1.ecs"} | Select-Object -ExpandProperty
 ServiceDetails
```

Output:

```
AcceptanceRequired         : False
AvailabilityZones          : {eu-west-1a, eu-west-1b, eu-west-1c}
BaseEndpointDnsNames       : {ecs.eu-west-1.vpce.amazonaws.com}
Owner                      : amazon
PrivateDnsName             : ecs.eu-west-1.amazonaws.com
ServiceName                : com.amazonaws.eu-west-1.ecs
ServiceType                : {Amazon.EC2.Model.ServiceTypeDetail}
VpcEndpointPolicySupported : False
```

Contoh 2: Contoh ini mengambil semua layanan EC2 VPC Endpoint dan mengembalikan “ssm” yang ServiceNames cocok

```
Get-EC2VpcEndpointService -Region eu-west-1 | Select-Object -ExpandProperty
 Servicenames | Where-Object { -match "ssm"}
```

Output:

```
com.amazonaws.eu-west-1.ssm
com.amazonaws.eu-west-1.ssmmessages
```

- Untuk API detailnya, lihat DescribeVpcEndpointServicesdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DescribeVpcEndpoints`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribeVpcEndpoints`.

CLI

AWS CLI

Untuk menggambarkan titik VPC akhir Anda

`describe-vpc-endpoints`Contoh berikut menampilkan detail untuk semua VPC titik akhir Anda.

```
aws ec2 describe-vpc-endpoints
```

Output:

```
{
    "VpcEndpoints": [
        {
            "PolicyDocument": "{\"Version\":\"2008-10-17\",\"Statement\":
[{\"Effect\":\"Allow\",\"Principal\":\"*\",\"Action\":\"*\",\"Resource\":\"*
\"}]}",
```

```
            "VpcId": "vpc-aabb1122",
            "NetworkInterfaceIds": [],
            "SubnetIds": [],
            "PrivateDnsEnabled": true,
            "State": "available",
            "ServiceName": "com.amazonaws.us-east-1.dynamodb",
            "RouteTableIds": [
                "rtb-3d560345"
            ],
            "Groups": [],
            "VpcEndpointId": "vpce-032a826a",
            "VpcEndpointType": "Gateway",
            "CreationTimestamp": "2017-09-05T20:41:28Z",
            "DnsEntries": [],
            "OwnerId": "123456789012"
        },
        {
            "PolicyDocument": "{\n  \"Statement\": [\n    {\n      \"Action\":
\"*\", \n      \"Effect\": \"Allow\", \n      \"Principal\": \"*\", \n
\"Resource\": \"*\"\n    }\n  ]\n}",
            "VpcId": "vpc-1a2b3c4d",
            "NetworkInterfaceIds": [
                "eni-2ec2b084",
                "eni-1b4a65cf"
            ],
            "SubnetIds": [
                "subnet-d6fcaa8d",
                "subnet-7b16de0c"
            ],
            "PrivateDnsEnabled": false,
            "State": "available",
            "ServiceName": "com.amazonaws.us-east-1.elasticloadbalancing",
            "RouteTableIds": [],
            "Groups": [
                {
                    "GroupName": "default",
                    "GroupId": "sg-54e8bf31"
                }
            ],
            "VpcEndpointId": "vpce-0f89a33420c1931d7",
            "VpcEndpointType": "Interface",
            "CreationTimestamp": "2017-09-05T17:55:27.583Z",
            "DnsEntries": [
                {
```

```
                    "HostedZoneId": "Z7HUB22UULQXV",
                    "DnsName": "vpce-0f89a33420c1931d7-
bluzidnv.elasticloadbalancing.us-east-1.vpce.amazonaws.com"
                },
                {
                    "HostedZoneId": "Z7HUB22UULQXV",
                    "DnsName": "vpce-0f89a33420c1931d7-bluzidnv-us-
east-1b.elasticloadbalancing.us-east-1.vpce.amazonaws.com"
                },
                {
                    "HostedZoneId": "Z7HUB22UULQXV",
                    "DnsName": "vpce-0f89a33420c1931d7-bluzidnv-us-
east-1a.elasticloadbalancing.us-east-1.vpce.amazonaws.com"
                }
            ],
            "OwnerId": "123456789012"
        },
        {
            "VpcEndpointId": "vpce-aabbaabbaabbaabba",
            "VpcEndpointType": "GatewayLoadBalancer",
            "VpcId": "vpc-111122223333aabbc",
            "ServiceName": "com.amazonaws.vpce.us-east-1.vpce-
svc-123123a1c43abc123",
            "State": "available",
            "SubnetIds": [
                "subnet-0011aabbcc2233445"
            ],
            "RequesterManaged": false,
            "NetworkInterfaceIds": [
                "eni-01010120203030405"
            ],
            "CreationTimestamp": "2020-11-11T08:06:03.522Z",
            "Tags": [],
            "OwnerId": "123456789012"
        }
    ]
}
```


Untuk informasi selengkapnya, lihat VPCtitik akhir di Panduan VPC Pengguna Amazon.

- Untuk API detailnya, lihat DescribeVpcEndpointsdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menjelaskan satu atau beberapa VPC titik akhir Anda untuk wilayah eu-west-1. Kemudian pipa output ke perintah berikutnya, yang memilih VpcEndpointId properti dan mengembalikan array VPC ID sebagai string array

```
Get-EC2VpcEndpoint -Region eu-west-1 | Select-Object -ExpandProperty
 VpcEndpointId
```

Output:

```
vpce-01a2ab3f4f5cc6f7d
vpce-01d2b345a6787890b
vpce-0012e34d567890e12
vpce-0c123db4567890123
```

Contoh 2: Contoh ini menjelaskan semua titik akhir vpc untuk wilayah eu-west-1 dan memilih,, dan properti untuk menyajikannya dalam format tabel VpcEndpointId VpcId ServiceName PrivateDnsEnabled

```
Get-EC2VpcEndpoint -Region eu-west-1 | Select-Object VpcEndpointId, VpcId,
 ServiceName, PrivateDnsEnabled | Format-Table -AutoSize
```

Output:

```
VpcEndpointId          VpcId                ServiceName
 PrivateDnsEnabled
-------------          -----                -----------
 -----------------
vpce-02a2ab2f2f2cc2f2d vpc-0fc6ff46f65b039eb com.amazonaws.eu-west-1.ssm
             True
vpce-01d1b111a1114561b vpc-0fc6ff46f65b039eb com.amazonaws.eu-west-1.ec2
             True
vpce-0011e23d45167e838 vpc-0fc6ff46f65b039eb com.amazonaws.eu-west-1.ec2messages
             True
vpce-0c123db4567890123 vpc-0fc6ff46f65b039eb com.amazonaws.eu-west-1.ssmmessages
             True
```

Contoh 3: Contoh ini mengekspor dokumen kebijakan untuk VPC Endpoint vpce-01a2ab3f4f5cc6f7d ke dalam file json

```
Get-EC2VpcEndpoint -Region eu-west-1 -VpcEndpointId vpce-01a2ab3f4f5cc6f7d |
 Select-Object -expand PolicyDocument | Out-File vpce_policyDocument.json
```

- Untuk API detailnya, lihat DescribeVpcEndpointsdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DescribeVpcs`** dengan AWS SDK atau CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribeVpcs`.

Contoh tindakan adalah kutipan kode dari program yang lebih besar dan harus dijalankan dalam konteks. Anda dapat melihat tindakan ini dalam konteks dalam contoh kode berikut:

- Membangun dan mengelola layanan yang tangguh

.NET

AWS SDK for .NET

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    /// <summary>
    /// Get the default VPC for the account.
    /// </summary>
    /// <returns>The default VPC object.</returns>
    public async Task<Vpc> GetDefaultVpc()
    {
        try
        {
```

```
            var vpcResponse = await _amazonEc2.DescribeVpcsAsync(
                new DescribeVpcsRequest()
                {
                    Filters = new List<Amazon.EC2.Model.Filter>()
                    {
                        new("is-default", new List<string>() { "true" })
                    }
                });
            return vpcResponse.Vpcs[0];
        }
        catch (AmazonEC2Exception ec2Exception)
        {
            if (ec2Exception.ErrorCode == "UnauthorizedOperation")
            {
                _logger.LogError(ec2Exception, $"You do not have the necessary
permissions to describe VPCs.");
            }

            throw;
        }
        catch (Exception ex)
        {
            _logger.LogError(ex, $"An error occurred while describing the vpcs.:
{ex.Message}");
            throw;
        }
    }
```

- Untuk API detailnya, lihat DescribeVpcsdi AWS SDK for .NET APIReferensi.

## CLI

### AWS CLI

#### Contoh 1: Untuk menggambarkan semua VPCs

`describe-vpcs`Contoh berikut mengambil detail tentang AndaVPCs.

```
aws ec2 describe-vpcs
```

Output:

```
{
    "Vpcs": [
        {
            "CidrBlock": "30.1.0.0/16",
            "DhcpOptionsId": "dopt-19edf471",
            "State": "available",
            "VpcId": "vpc-0e9801d129EXAMPLE",
            "OwnerId": "111122223333",
            "InstanceTenancy": "default",
            "CidrBlockAssociationSet": [
                {
                    "AssociationId": "vpc-cidr-assoc-062c64cfafEXAMPLE",
                    "CidrBlock": "30.1.0.0/16",
                    "CidrBlockState": {
                        "State": "associated"
                    }
                }
            ],
            "IsDefault": false,
            "Tags": [
                {
                    "Key": "Name",
                    "Value": "Not Shared"
                }
            ]
        },
        {
            "CidrBlock": "10.0.0.0/16",
            "DhcpOptionsId": "dopt-19edf471",
            "State": "available",
            "VpcId": "vpc-06e4ab6c6cEXAMPLE",
            "OwnerId": "222222222222",
            "InstanceTenancy": "default",
            "CidrBlockAssociationSet": [
                {
                    "AssociationId": "vpc-cidr-assoc-00b17b4eddEXAMPLE",
                    "CidrBlock": "10.0.0.0/16",
                    "CidrBlockState": {
                        "State": "associated"
                    }
                }
            ],
            "IsDefault": false,
```

```
            "Tags": [
                {
                    "Key": "Name",
                    "Value": "Shared VPC"
                }
            ]
        }
    ]
}
```

Contoh 2: Untuk menggambarkan yang ditentukan VPC

`describe-vpcs`Contoh berikut mengambil rincian untuk yang ditentukanVPC.

```
aws ec2 describe-vpcs \
    --vpc-ids vpc-06e4ab6c6cEXAMPLE
```

Output:

```
{
    "Vpcs": [
        {
            "CidrBlock": "10.0.0.0/16",
            "DhcpOptionsId": "dopt-19edf471",
            "State": "available",
            "VpcId": "vpc-06e4ab6c6cEXAMPLE",
            "OwnerId": "111122223333",
            "InstanceTenancy": "default",
            "CidrBlockAssociationSet": [
                {
                    "AssociationId": "vpc-cidr-assoc-00b17b4eddEXAMPLE",
                    "CidrBlock": "10.0.0.0/16",
                    "CidrBlockState": {
                        "State": "associated"
                    }
                }
            ],
            "IsDefault": false,
            "Tags": [
                {
                    "Key": "Name",
                    "Value": "Shared VPC"
                }
```

```
            ]
        }
    ]
}
```

- Untuk API detailnya, lihat DescribeVpcsdi Referensi AWS CLI Perintah.

JavaScript

SDKuntuk JavaScript (v3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
const client = new EC2Client({});
const { Vpcs } = await client.send(
  new DescribeVpcsCommand({
    Filters: [{ Name: "is-default", Values: ["true"] }],
  }),
);
```

- Untuk API detailnya, lihat DescribeVpcsdi AWS SDK for JavaScript APIReferensi.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menjelaskan yang ditentukanVPC.

```
Get-EC2Vpc -VpcId vpc-12345678
```

Output:

```
CidrBlock       : 10.0.0.0/16
DhcpOptionsId   : dopt-1a2b3c4d
```

```
InstanceTenancy : default
IsDefault       : False
State           : available
Tags            : {Name}
VpcId           : vpc-12345678
```

Contoh 2: Contoh ini menjelaskan default VPC (hanya ada satu per wilayah). Jika akun Anda mendukung EC2 -Classic di wilayah ini, tidak ada defaultVPC.

```
Get-EC2Vpc -Filter @{Name="isDefault"; Values="true"}
```

Output:

```
CidrBlock       : 172.31.0.0/16
DhcpOptionsId   : dopt-12345678
InstanceTenancy : default
IsDefault       : True
State           : available
Tags            : {}
VpcId           : vpc-45678901
```

Contoh 3: Contoh ini menjelaskan VPCs yang cocok dengan filter yang ditentukan (yaitu, memiliki CIDR yang cocok dengan nilai '10.0.0.0/16' dan berada dalam status 'tersedia').

```
Get-EC2Vpc -Filter @{Name="cidr";
 Values="10.0.0.0/16"},@{Name="state";Values="available"}
```

Contoh 4: Contoh ini menjelaskan semua AndaVPCs.

```
Get-EC2Vpc
```

- Untuk API detailnya, lihat DescribeVpcsdi AWS Tools for PowerShell Referensi Cmdlet.

Python

SDKuntuk Python (Boto3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
class AutoScalingWrapper:
    """
    Encapsulates Amazon EC2 Auto Scaling and EC2 management actions.
    """

    def __init__(
        self,
        resource_prefix: str,
        inst_type: str,
        ami_param: str,
        autoscaling_client: boto3.client,
        ec2_client: boto3.client,
        ssm_client: boto3.client,
        iam_client: boto3.client,
    ):
        """
        Initializes the AutoScaler class with the necessary parameters.

        :param resource_prefix: The prefix for naming AWS resources that are
 created by this class.
        :param inst_type: The type of EC2 instance to create, such as t3.micro.
        :param ami_param: The Systems Manager parameter used to look up the AMI
 that is created.
        :param autoscaling_client: A Boto3 EC2 Auto Scaling client.
        :param ec2_client: A Boto3 EC2 client.
        :param ssm_client: A Boto3 Systems Manager client.
        :param iam_client: A Boto3 IAM client.
        """
        self.inst_type = inst_type
        self.ami_param = ami_param
        self.autoscaling_client = autoscaling_client
        self.ec2_client = ec2_client
```

```
        self.ssm_client = ssm_client
        self.iam_client = iam_client
        sts_client = boto3.client("sts")
        self.account_id = sts_client.get_caller_identity()["Account"]

        self.key_pair_name = f"{resource_prefix}-key-pair"
        self.launch_template_name = f"{resource_prefix}-template-"
        self.group_name = f"{resource_prefix}-group"

        # Happy path
        self.instance_policy_name = f"{resource_prefix}-pol"
        self.instance_role_name = f"{resource_prefix}-role"
        self.instance_profile_name = f"{resource_prefix}-prof"

        # Failure mode
        self.bad_creds_policy_name = f"{resource_prefix}-bc-pol"
        self.bad_creds_role_name = f"{resource_prefix}-bc-role"
        self.bad_creds_profile_name = f"{resource_prefix}-bc-prof"


    def get_default_vpc(self) -> Dict[str, Any]:
        """
        Gets the default VPC for the account.

        :return: Data about the default VPC.
        """
        try:
            response = self.ec2_client.describe_vpcs(
                Filters=[{"Name": "is-default", "Values": ["true"]}]
            )
        except ClientError as err:
            error_code = err.response["Error"]["Code"]
            log.error("Failed to retrieve the default VPC.")
            if error_code == "UnauthorizedOperation":
                log.error(
                    "You do not have the necessary permissions to describe VPCs.
"
                    "Ensure that your AWS IAM user or role has the correct
permissions."
                )
            elif error_code == "InvalidParameterValue":
                log.error(
                    "One or more parameters are invalid. Check the request
parameters."
```

```
                )

            log.error(f"Full error:\n\t{err}")
        else:
            if "Vpcs" in response and response["Vpcs"]:
                log.info(f"Retrieved default VPC: {response['Vpcs'][0]
['VpcId']}")
                return response["Vpcs"][0]
            else:
                pass
```

- Untuk API detailnya, lihat DescribeVpcs AWSSDKReferensi Python (Boto3). API

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DescribeVpnConnections`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribeVpnConnections`.

CLI

AWS CLI

Contoh 1: Untuk mendeskripsikan VPN koneksi Anda

`describe-vpn-connections`Contoh berikut menjelaskan semua Site-to-Site VPN koneksi Anda.

```
aws ec2 describe-vpn-connections
```

Output:

```
{
    "VpnConnections": [
        {
            "CustomerGatewayConfiguration": "...configuration information...",
            "CustomerGatewayId": "cgw-01234567abcde1234",
```

```
            "Category": "VPN",
            "State": "available",
            "Type": "ipsec.1",
            "VpnConnectionId": "vpn-1122334455aabbccd",
            "TransitGatewayId": "tgw-00112233445566aab",
            "Options": {
                "EnableAcceleration": false,
                "StaticRoutesOnly": true,
                "LocalIpv4NetworkCidr": "0.0.0.0/0",
                "RemoteIpv4NetworkCidr": "0.0.0.0/0",
                "TunnelInsideIpVersion": "ipv4"
            },
            "Routes": [],
            "Tags": [
                {
                    "Key": "Name",
                    "Value": "CanadaVPN"
                }
            ],
            "VgwTelemetry": [
                {
                    "AcceptedRouteCount": 0,
                    "LastStatusChange": "2020-07-29T10:35:11.000Z",
                    "OutsideIpAddress": "203.0.113.3",
                    "Status": "DOWN",
                    "StatusMessage": ""
                },
                {
                    "AcceptedRouteCount": 0,
                    "LastStatusChange": "2020-09-02T09:09:33.000Z",
                    "OutsideIpAddress": "203.0.113.5",
                    "Status": "UP",
                    "StatusMessage": ""
                }
            ]
        }
    ]
}
```


Untuk informasi selengkapnya, lihat Cara AWS Site-to-Site VPN kerja di Panduan AWS Site-to-Site VPN Pengguna.

Contoh 2: Untuk menggambarkan VPN koneksi Anda yang tersedia

`describe-vpn-connections`Contoh berikut menjelaskan Site-to-Site VPN koneksi Anda dengan keadaan`available`.

```
aws ec2 describe-vpn-connections \
    --filters "Name=state,Values=available"
```

Untuk informasi selengkapnya, lihat Cara AWS Site-to-Site VPN kerja di Panduan AWS Site-to-Site VPN Pengguna.

- Untuk API detailnya, lihat DescribeVpnConnectionsdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menjelaskan VPN koneksi yang ditentukan.

```
Get-EC2VpnConnection -VpnConnectionId vpn-12345678
```

Output:

```
CustomerGatewayConfiguration : [XML document]
CustomerGatewayId            : cgw-1a2b3c4d
Options                      : Amazon.EC2.Model.VpnConnectionOptions
Routes                       : {Amazon.EC2.Model.VpnStaticRoute}
State                        : available
Tags                         : {}
Type                         : ipsec.1
VgwTelemetry                 : {Amazon.EC2.Model.VgwTelemetry,
 Amazon.EC2.Model.VgwTelemetry}
VpnConnectionId              : vpn-12345678
VpnGatewayId                 : vgw-1a2b3c4d
```

Contoh 2: Contoh ini menjelaskan VPN koneksi apa pun yang statusnya tertunda atau tersedia.

```
$filter = New-Object Amazon.EC2.Model.Filter
$filter.Name = "state"
$filter.Values = @( "pending", "available" )

Get-EC2VpnConnection -Filter $filter
```

Contoh 3: Contoh ini menjelaskan semua VPN koneksi Anda.

```
Get-EC2VpnConnection
```

- Untuk API detailnya, lihat DescribeVpnConnectionsdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DescribeVpnGateways`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DescribeVpnGateways`.

CLI

AWS CLI

Untuk menggambarkan gateway pribadi virtual Anda

Contoh ini menjelaskan gateway pribadi virtual Anda.

Perintah:

```
aws ec2 describe-vpn-gateways
```

Output:

```
{
    "VpnGateways": [
        {
            "State": "available",
            "Type": "ipsec.1",
            "VpnGatewayId": "vgw-f211f09b",
            "VpcAttachments": [
                {
                    "State": "attached",
                    "VpcId": "vpc-98eb5ef5"
                }
            ]
```

```
        },
        {
            "State": "available",
            "Type": "ipsec.1",
            "VpnGatewayId": "vgw-9a4cacf3",
            "VpcAttachments": [
                {
                    "State": "attaching",
                    "VpcId": "vpc-a01106c2"
                }
            ]
        }
    ]
}
```

- Untuk API detailnya, lihat DescribeVpnGatewaysdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menjelaskan gateway pribadi virtual yang ditentukan.

```
Get-EC2VpnGateway -VpnGatewayId vgw-1a2b3c4d
```

Output:

```
AvailabilityZone :
State            : available
Tags             : {}
Type             : ipsec.1
VpcAttachments   : {vpc-12345678}
VpnGatewayId     : vgw-1a2b3c4d
```

Contoh 2: Contoh ini menjelaskan gateway pribadi virtual yang statusnya tertunda atau tersedia.

```
$filter = New-Object Amazon.EC2.Model.Filter
$filter.Name = "state"
$filter.Values = @( "pending", "available" )
```

```
Get-EC2VpnGateway -Filter $filter
```

Contoh 3: Contoh ini menjelaskan semua gateway pribadi virtual Anda.

```
Get-EC2VpnGateway
```

- Untuk API detailnya, lihat DescribeVpnGatewaysdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DetachInternetGateway`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DetachInternetGateway`.

CLI

AWS CLI

Untuk melepaskan gateway internet dari Anda VPC

`detach-internet-gateway`Contoh berikut melepaskan gateway internet yang ditentukan dari yang spesifikVPC.

```
aws ec2 detach-internet-gateway \
    --internet-gateway-id igw-0d0fb496b3EXAMPLE \
    --vpc-id vpc-0a60eb65b4EXAMPLE
```

Perintah ini tidak menghasilkan output.

Untuk informasi selengkapnya, lihat gateway Internet di VPCPanduan Pengguna Amazon.

- Untuk API detailnya, lihat DetachInternetGatewaydi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini melepaskan gateway Internet yang ditentukan dari yang ditentukanVPC.

```
Dismount-EC2InternetGateway -InternetGatewayId igw-1a2b3c4d -VpcId vpc-12345678
```

- Untuk API detailnya, lihat DetachInternetGatewaydi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DetachNetworkInterface`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DetachNetworkInterface`.

CLI

AWS CLI

Untuk melepaskan antarmuka jaringan dari instans Anda

Contoh ini melepaskan antarmuka jaringan yang ditentukan dari contoh yang ditentukan. Jika perintah berhasil, tidak ada output yang akan ditampilkan.

Perintah:

```
aws ec2 detach-network-interface --attachment-id eni-attach-66c4350a
```

- Untuk API detailnya, lihat DetachNetworkInterfacedi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menghapus lampiran yang ditentukan antara antarmuka jaringan dan instance.

```
Dismount-EC2NetworkInterface -AttachmentId eni-attach-1a2b3c4d -Force
```

- Untuk API detailnya, lihat DetachNetworkInterfacedi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DetachVolume`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DetachVolume`.

CLI

AWS CLI

Untuk melepaskan volume dari sebuah instance

Perintah contoh ini melepaskan volume (`vol-049df61146c4d7901`) dari instance yang dilampirkan.

Perintah:

```
aws ec2 detach-volume --volume-id vol-1234567890abcdef0
```

Output:

```
{
    "AttachTime": "2014-02-27T19:23:06.000Z",
    "InstanceId": "i-1234567890abcdef0",
    "VolumeId": "vol-049df61146c4d7901",
    "State": "detaching",
    "Device": "/dev/sdb"
}
```

- Untuk API detailnya, lihat DetachVolumedi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini melepaskan volume yang ditentukan.

```
Dismount-EC2Volume -VolumeId vol-12345678
```

Output:

```
AttachTime          : 12/22/2015 1:53:58 AM
DeleteOnTermination : False
Device              : /dev/sdh
InstanceId          : i-1a2b3c4d
State               : detaching
VolumeId            : vol-12345678
```

Contoh 2: Anda juga dapat menentukan ID instans dan nama perangkat untuk memastikan bahwa Anda melepaskan volume yang benar.

```
Dismount-EC2Volume -VolumeId vol-12345678 -InstanceId i-1a2b3c4d -Device /dev/sdh
```

- Untuk API detailnya, lihat DetachVolumedi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DetachVpnGateway`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DetachVpnGateway`.

CLI

AWS CLI

Untuk melepaskan gateway pribadi virtual dari Anda VPC

Contoh ini melepaskan gateway pribadi virtual yang ditentukan dari yang ditentukanVPC. Jika perintah berhasil, tidak ada output yang akan ditampilkan.

Perintah:

```
aws ec2 detach-vpn-gateway --vpn-gateway-id vgw-9a4cacf3 --vpc-id vpc-a01106c2
```

- Untuk API detailnya, lihat DetachVpnGatewaydi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini melepaskan gateway pribadi virtual yang ditentukan dari yang ditentukanVPC.

```
Dismount-EC2VpnGateway -VpnGatewayId vgw-1a2b3c4d -VpcId vpc-12345678
```

- Untuk API detailnya, lihat DetachVpnGatewaydi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DisableVgwRoutePropagation`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DisableVgwRoutePropagation`.

CLI

AWS CLI

Untuk menonaktifkan propagasi rute

Contoh ini menonaktifkan gateway pribadi virtual yang ditentukan dari menyebarkan rute statis ke tabel rute yang ditentukan. Jika perintah berhasil, tidak ada output yang akan ditampilkan.

Perintah:

```
aws ec2 disable-vgw-route-propagation --route-table-id rtb-22574640 --gateway-
id vgw-9a4cacf3
```

- Untuk API detailnya, lihat DisableVgwRoutePropagationdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menonaktifkan VGW dari rute penyebaran otomatis ke tabel routing yang ditentukan.

```
Disable-EC2VgwRoutePropagation -RouteTableId rtb-12345678 -GatewayId vgw-1a2b3c4d
```

- Untuk API detailnya, lihat DisableVgwRoutePropagationdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DisableVpcClassicLink`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DisableVpcClassicLink`.

CLI

AWS CLI

Untuk menonaktifkan ClassicLink untuk a VPC

Contoh ini menonaktifkan ClassicLink untuk vpc-8888888.

Perintah:

```
aws ec2 disable-vpc-classic-link --vpc-id vpc-88888888
```

Output:

```
{
  "Return": true
}
```

- Untuk API detailnya, lihat DisableVpcClassicLinkdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menonaktifkan EC2VpcClassicLink untuk vpc-01e23c4a5d6db78e9. Ia mengembalikan True atau False

```
Disable-EC2VpcClassicLink -VpcId vpc-01e23c4a5d6db78e9
```

- Untuk API detailnya, lihat DisableVpcClassicLinkdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DisableVpcClassicLinkDnsSupport`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DisableVpcClassicLinkDnsSupport`.

CLI

AWS CLI

Untuk menonaktifkan ClassicLink DNS dukungan untuk VPC

Contoh ini menonaktifkan ClassicLink DNS dukungan untuk`vpc-88888888`.

Perintah:

```
aws ec2 disable-vpc-classic-link-dns-support --vpc-id vpc-88888888
```

Output:

```
{
  "Return": true
}
```

- Untuk API detailnya, lihat DisableVpcClassicLinkDnsSupportdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menonaktifkan ClassicLink DNS dukungan untuk vpc-0b12d3456a7e8910d

```
Disable-EC2VpcClassicLinkDnsSupport -VpcId vpc-0b12d3456a7e8910d
```

- Untuk API detailnya, lihat DisableVpcClassicLinkDnsSupportdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DisassociateAddress`** dengan AWS SDK atau CLI

Contoh kode berikut menunjukkan cara menggunakan`DisassociateAddress`.

Contoh tindakan adalah kutipan kode dari program yang lebih besar dan harus dijalankan dalam konteks. Anda dapat melihat tindakan ini dalam konteks dalam contoh kode berikut:

- Pelajari dasar-dasarnya

.NET

AWS SDK for .NET

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    /// <summary>
    /// Disassociate an Elastic IP address from an EC2 instance.
    /// </summary>
    /// <param name="associationId">The association Id.</param>
```

```
    /// <returns>A Boolean value indicating the success of the action.</returns>
    public async Task<bool> DisassociateIp(string associationId)
    {
        try
        {
            var response = await _amazonEC2.DisassociateAddressAsync(
                new DisassociateAddressRequest { AssociationId =
associationId });
            return response.HttpStatusCode == HttpStatusCode.OK;
        }
        catch (AmazonEC2Exception ec2Exception)
        {
            if (ec2Exception.ErrorCode == "InvalidAssociationID.NotFound")
            {
                _logger.LogError(
                    $"AssociationId is invalid, unable to disassociate address.
{ec2Exception.Message}");
            }

            return false;
        }
        catch (Exception ex)
        {
            _logger.LogError(
                $"An error occurred while disassociating the Elastic IP.:
{ex.Message}");
            return false;
        }
    }
```

- Untuk API detailnya, lihat DisassociateAddressdi AWS SDK for .NET APIReferensi.

## Bash

### AWS CLI dengan skrip Bash

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
##############################################################################
# function ec2_disassociate_address
#
# This function disassociates an Elastic IP address from an Amazon Elastic
 Compute Cloud (Amazon EC2) instance.
#
# Parameters:
#       -a association_id - The association ID that represents the association of
 the Elastic IP address with an instance.
#
# And:
#       0 - If successful.
#       1 - If it fails.
#
##############################################################################
function ec2_disassociate_address() {
  local association_id response

  # Function to display usage information
  function usage() {
    echo "function ec2_disassociate_address"
    echo "Disassociates an Elastic IP address from an Amazon Elastic Compute
 Cloud (Amazon EC2) instance."
    echo "  -a association_id - The association ID that represents the
 association of the Elastic IP address with an instance."
    echo ""
  }

  # Parse the command-line arguments
  while getopts "a:h" option; do
    case "${option}" in
      a) association_id="${OPTARG}" ;;
      h)
        usage
        return 0
        ;;
      \?)
        echo "Invalid parameter"
        usage
        return 1
        ;;
    esac
  done
```

```
  export OPTIND=1

  # Validate the input parameters
  if [[ -z "$association_id" ]]; then
    errecho "ERROR: You must provide an association ID with the -a parameter."
    return 1
  fi

  response=$(aws ec2 disassociate-address \
    --association-id "$association_id") || {
    aws_cli_error_log ${?}
    errecho "ERROR: AWS reports disassociate-address operation failed."
    errecho "$response"
    return 1
  }

  return 0
}
```

Fungsi utilitas yang digunakan dalam contoh ini.

```
###############################################################################
# function errecho
#
# This function outputs everything sent to it to STDERR (standard error output).
###############################################################################
function errecho() {
  printf "%s\n" "$*" 1>&2
}

###############################################################################
# function aws_cli_error_log()
#
# This function is used to log the error messages from the AWS CLI.
#
# The function expects the following argument:
#         $1 - The error code returned by the AWS CLI.
#
#  Returns:
#          0: - Success.
#
###############################################################################
```

```
function aws_cli_error_log() {
  local err_code=$1
  errecho "Error code : $err_code"
  if [ "$err_code" == 1 ]; then
    errecho "  One or more S3 transfers failed."
  elif [ "$err_code" == 2 ]; then
    errecho "  Command line failed to parse."
  elif [ "$err_code" == 130 ]; then
    errecho "  Process received SIGINT."
  elif [ "$err_code" == 252 ]; then
    errecho "  Command syntax invalid."
  elif [ "$err_code" == 253 ]; then
    errecho "  The system environment or configuration was invalid."
  elif [ "$err_code" == 254 ]; then
    errecho "  The service returned an error."
  elif [ "$err_code" == 255 ]; then
    errecho "  255 is a catch-all error."
  fi

  return 0
}
```

- Untuk API detailnya, lihat DisassociateAddressdi Referensi AWS CLI Perintah.

CLI

AWS CLI

Untuk memisahkan alamat IP Elastis di EC2 -Classic

Contoh ini memisahkan alamat IP Elastis dari sebuah instance di EC2 -Classic. Jika perintah berhasil, tidak ada output yang akan ditampilkan.

Perintah:

```
aws ec2 disassociate-address --public-ip 198.51.100.0
```

Untuk memisahkan alamat IP Elastis di EC2 - VPC

Contoh ini memisahkan alamat IP Elastis dari sebuah instance di file. VPC Jika perintah berhasil, tidak ada output yang akan ditampilkan.

Perintah:

```
aws ec2 disassociate-address --association-id eipassoc-2bebb745
```

- Untuk API detailnya, lihat DisassociateAddressdi Referensi AWS CLI Perintah.

Java

SDKuntuk Java 2.x

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
   /**
    * Disassociates an Elastic IP address from an instance asynchronously.
    *
    * @param associationId The ID of the association you want to disassociate.
    * @return a {@link CompletableFuture} representing the asynchronous
operation of disassociating the address. The
    *         {@link CompletableFuture} will complete with a {@link
DisassociateAddressResponse} when the operation is
    *         finished.
    * @throws RuntimeException if the disassociation of the address fails.
    */
   public CompletableFuture<DisassociateAddressResponse>
disassociateAddressAsync(String associationId) {
       Ec2AsyncClient ec2 = getAsyncClient();
       DisassociateAddressRequest addressRequest =
DisassociateAddressRequest.builder()
           .associationId(associationId)
           .build();

       // Disassociate the address asynchronously.
       CompletableFuture<DisassociateAddressResponse> response =
ec2.disassociateAddress(addressRequest);
       response.whenComplete((resp, ex) -> {
           if (ex != null) {
              throw new RuntimeException("Failed to disassociate address", ex);
```

```
            }
        });

        return response;
    }
```

- Untuk API detailnya, lihat DisassociateAddressdi AWS SDK for Java 2.x APIReferensi.

JavaScript

SDKuntuk JavaScript (v3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
import { DisassociateAddressCommand, EC2Client } from "@aws-sdk/client-ec2";

/**
 * Disassociate an Elastic IP address from an instance.
 * @param {{ associationId: string }} options
 */
export const main = async ({ associationId }) => {
  const client = new EC2Client({});
  const command = new DisassociateAddressCommand({
    // You can also use PublicIp, but that is for EC2 classic which is being
 retired.
    AssociationId: associationId,
  });

  try {
    await client.send(command);
    console.log("Successfully disassociated address");
  } catch (caught) {
    if (
      caught instanceof Error &&
      caught.name === "InvalidAssociationID.NotFound"
    ) {
      console.warn(`${caught.message}.`);
```

```
    } else {
      throw caught;
    }
  }
};
```

- Untuk API detailnya, lihat DisassociateAddressdi AWS SDK for JavaScript APIReferensi.

Kotlin

SDKuntuk Kotlin

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
suspend fun disassociateAddressSc(associationIdVal: String?) {
    val addressRequest =
        DisassociateAddressRequest {
            associationId = associationIdVal
        }
    Ec2Client { region = "us-west-2" }.use { ec2 ->
        ec2.disassociateAddress(addressRequest)
        println("You successfully disassociated the address!")
    }
}
```

- Untuk API detailnya, lihat DisassociateAddress AWSSDKAPIreferensi Kotlin.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini memisahkan alamat IP Elastis yang ditentukan dari instance yang ditentukan dalam file. VPC

```
Unregister-EC2Address -AssociationId eipassoc-12345678
```

Contoh 2: Contoh ini memisahkan alamat IP Elastis yang ditentukan dari instance yang ditentukan di EC2 -Classic.

```
Unregister-EC2Address -PublicIp 203.0.113.17
```

- Untuk API detailnya, lihat DisassociateAddressdi AWS Tools for PowerShell Referensi Cmdlet.

Python

SDKuntuk Python (Boto3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
class ElasticIpWrapper:
    """Encapsulates Amazon Elastic Compute Cloud (Amazon EC2) Elastic IP address
 actions using the client interface."""

    class ElasticIp:
        """Represents an Elastic IP and its associated instance."""

        def __init__(
            self, allocation_id: str, public_ip: str, instance_id: Optional[str]
 = None
        ) -> None:
            """
            Initializes the ElasticIp object.

            :param allocation_id: The allocation ID of the Elastic IP.
            :param public_ip: The public IP address of the Elastic IP.
            :param instance_id: The ID of the associated EC2 instance, if any.
            """
            self.allocation_id = allocation_id
            self.public_ip = public_ip
```

```
            self.instance_id = instance_id

    def __init__(self, ec2_client: Any) -> None:
        """
        Initializes the ElasticIpWrapper with an EC2 client.

        :param ec2_client: A Boto3 Amazon EC2 client. This client provides low-
level
                           access to AWS EC2 services.
        """
        self.ec2_client = ec2_client
        self.elastic_ips: List[ElasticIpWrapper.ElasticIp] = []

    @classmethod
    def from_client(cls) -> "ElasticIpWrapper":
        """
        Creates an ElasticIpWrapper instance with a default EC2 client.

        :return: An instance of ElasticIpWrapper initialized with the default EC2
 client.
        """
        ec2_client = boto3.client("ec2")
        return cls(ec2_client)


    def disassociate(self, allocation_id: str) -> None:
        """
        Removes an association between an Elastic IP address and an instance.
 When the
        association is removed, the instance is assigned a new public IP address.

        :param allocation_id: The allocation ID of the Elastic IP to
 disassociate.
        :raises ClientError: If the disassociation fails, such as when the
 association ID is not found.
        """
        elastic_ip = self.get_elastic_ip_by_allocation(self.elastic_ips,
 allocation_id)
        if elastic_ip is None or elastic_ip.instance_id is None:
            logger.info(
                f"No association found for Elastic IP with allocation ID
 {allocation_id}."
            )
            return
```

```
        try:
            # Retrieve the association ID before disassociating
            response =
self.ec2_client.describe_addresses(AllocationIds=[allocation_id])
            association_id = response["Addresses"][0].get("AssociationId")

            if association_id:

self.ec2_client.disassociate_address(AssociationId=association_id)
                elastic_ip.instance_id = None  # Remove the instance association
            else:
                logger.info(
                    f"No Association ID found for Elastic IP with allocation ID
{allocation_id}."
                )

        except ClientError as err:
            if err.response["Error"]["Code"] == "InvalidAssociationID.NotFound":
                logger.error(
                    f"Failed to disassociate Elastic IP {allocation_id} "
                    "because the specified association ID for the Elastic IP
address was not found. "
                    "Verify the association ID and ensure the Elastic IP is
currently associated with a "
                    "resource before attempting to disassociate it."
                )
            raise
```

- Untuk API detailnya, lihat DisassociateAddress AWSSDKReferensi Python (Boto3). API

Rust

SDKuntuk Rust

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
   pub async fn disassociate_ip_address(&self, association_id: &str) ->
Result<(), EC2Error> {
        self.client
            .disassociate_address()
            .association_id(association_id)
            .send()
            .await?;
        Ok(())
    }
```

- Untuk API detailnya, lihat DisassociateAddress AWSSDKAPIreferensi Rust.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`DisassociateRouteTable`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`DisassociateRouteTable`.

CLI

AWS CLI

Untuk memisahkan tabel rute

Contoh ini memisahkan tabel rute yang ditentukan dari subnet yang ditentukan. Jika perintah berhasil, tidak ada output yang akan ditampilkan.

Perintah:

```
aws ec2 disassociate-route-table --association-id rtbassoc-781d0d1a
```

- Untuk API detailnya, lihat DisassociateRouteTabledi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menghapus asosiasi tertentu antara tabel rute dan subnet.

```
Unregister-EC2RouteTable -AssociationId rtbassoc-1a2b3c4d
```

- Untuk API detailnya, lihat DisassociateRouteTabledi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`EnableVgwRoutePropagation`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`EnableVgwRoutePropagation`.

CLI

AWS CLI

Untuk mengaktifkan propagasi rute

Contoh ini memungkinkan gateway pribadi virtual yang ditentukan untuk menyebarkan rute statis ke tabel rute yang ditentukan. Jika perintah berhasil, tidak ada output yang akan ditampilkan.

Perintah:

```
aws ec2 enable-vgw-route-propagation --route-table-id rtb-22574640 --gateway-
id vgw-9a4cacf3
```

- Untuk API detailnya, lihat EnableVgwRoutePropagationdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini memungkinkan yang ditentukan VGW untuk menyebarkan rute secara otomatis ke tabel routing yang ditentukan.

```
Enable-EC2VgwRoutePropagation -RouteTableId rtb-12345678 -GatewayId vgw-1a2b3c4d
```

- Untuk API detailnya, lihat EnableVgwRoutePropagationdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`EnableVolumeIo`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`EnableVolumeIo`.

CLI

AWS CLI

Untuk mengaktifkan I/O untuk volume

Contoh ini memungkinkan I/O pada volume`vol-1234567890abcdef0`.

Perintah:

```
aws ec2 enable-volume-io --volume-id vol-1234567890abcdef0
```

Output:

```
{
  "Return": true
}
```

- Untuk API detailnya, lihat EnableVolumeIodi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini memungkinkan operasi I/O untuk volume yang ditentukan, jika operasi I/O dinonaktifkan.

```
Enable-EC2VolumeIO -VolumeId vol-12345678
```

- Untuk API detailnya, lihat EnableVolumeIodi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`EnableVpcClassicLink`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`EnableVpcClassicLink`.

CLI

AWS CLI

Untuk mengaktifkan VPC untuk ClassicLink

Contoh ini memungkinkan vpc-8888888 untuk. ClassicLink

Perintah:

```
aws ec2 enable-vpc-classic-link --vpc-id vpc-88888888
```

Output:

```
{
  "Return": true
}
```

- Untuk API detailnya, lihat EnableVpcClassicLinkdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini memungkinkan VPC vpc-0123456b789b0d12f untuk ClassicLink

```
Enable-EC2VpcClassicLink -VpcId vpc-0123456b789b0d12f
```

Output:

```
True
```

- Untuk API detailnya, lihat EnableVpcClassicLinkdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`EnableVpcClassicLinkDnsSupport`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`EnableVpcClassicLinkDnsSupport`.

CLI

AWS CLI

Untuk mengaktifkan ClassicLink DNS dukungan untuk VPC

Contoh ini memungkinkan ClassicLink DNS dukungan untuk`vpc-88888888`.

Perintah:

```
aws ec2 enable-vpc-classic-link-dns-support --vpc-id vpc-88888888
```

Output:

```
{
  "Return": true
}
```

- Untuk API detailnya, lihat EnableVpcClassicLinkDnsSupportdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini memungkinkan vpc-0b12d3456a7e8910d untuk mendukung resolusi nama host DNS ClassicLink

```
Enable-EC2VpcClassicLinkDnsSupport -VpcId vpc-0b12d3456a7e8910d -Region eu-west-1
```

- Untuk API detailnya, lihat EnableVpcClassicLinkDnsSupportdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`GetConsoleOutput`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`GetConsoleOutput`.

CLI

AWS CLI

Contoh 1: Untuk mendapatkan output konsol

`get-console-output`Contoh berikut mendapatkan output konsol untuk instance Linux tertentu.

```
aws ec2 get-console-output \
    --instance-id i-1234567890abcdef0
```

Output:

```
{
    "InstanceId": "i-1234567890abcdef0",
    "Timestamp": "2013-07-25T21:23:53.000Z",
    "Output": "..."
}
```

Untuk informasi selengkapnya, lihat Output konsol instans di Panduan EC2 Pengguna Amazon.

Contoh 2: Untuk mendapatkan keluaran konsol terbaru

`get-console-output`Contoh berikut mendapatkan output konsol terbaru untuk instance Linux yang ditentukan.

```
aws ec2 get-console-output \
    --instance-id i-1234567890abcdef0 \
    --latest \
    --output text
```

Output:

```
i-1234567890abcdef0 [    0.000000] Command line: root=LABEL=/ console=tty1
 console=ttyS0 selinux=0 nvme_core.io_timeout=4294967295
[    0.000000] x86/fpu: Supporting XSAVE feature 0x001: 'x87 floating point
 registers'
[    0.000000] x86/fpu: Supporting XSAVE feature 0x002: 'SSE registers'
[    0.000000] x86/fpu: Supporting XSAVE feature 0x004: 'AVX registers'
...
Cloud-init v. 0.7.6 finished at Wed, 09 May 2018 19:01:13 +0000. Datasource
 DataSourceEc2.  Up 21.50 seconds
Amazon Linux AMI release 2018.03
Kernel 4.14.26-46.32.amzn1.x
```

Untuk informasi selengkapnya, lihat Output konsol instans di Panduan EC2 Pengguna Amazon.

- Untuk API detailnya, lihat GetConsoleOutputdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini mendapatkan output konsol untuk instance Linux yang ditentukan. Output konsol dikodekan.

```
Get-EC2ConsoleOutput -InstanceId i-0e19abcd47c123456
```

Output:

```
InstanceId          Output
----------          ------
i-0e194d3c47c123637 WyAgICAwLjAwMDAwMF0gQ29tbW...bGU9dHR5UzAgc2Vs
```

Contoh 2: Contoh ini menyimpan output konsol yang dikodekan dalam variabel dan kemudian menerjemahkannya.

```
$Output_encoded = (Get-EC2ConsoleOutput -InstanceId i-0e19abcd47c123456).Output
[System.Text.Encoding]::UTF8.GetString([System.Convert]::FromBase64String($Output_encoded
```

- Untuk API detailnya, lihat GetConsoleOutputdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`GetHostReservationPurchasePreview`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`GetHostReservationPurchasePreview`.

CLI

AWS CLI

Untuk mendapatkan pratinjau pembelian untuk Reservasi Tuan Rumah Khusus

Contoh ini memberikan pratinjau biaya untuk Reservasi Host Khusus yang ditentukan untuk Host Khusus yang ditentukan di akun Anda.

Perintah:

```
aws ec2 get-host-reservation-purchase-preview --offering-id hro-03f707bf363b6b324
 --host-id-set h-013abcd2a00cbd123
```

Output:

```
{
  "TotalHourlyPrice": "1.499",
  "Purchase": [
      {
          "HourlyPrice": "1.499",
          "InstanceFamily": "m4",
          "PaymentOption": "NoUpfront",
          "HostIdSet": [
              "h-013abcd2a00cbd123"
          ],
          "UpfrontPrice": "0.000",
          "Duration": 31536000
```

```
        }
    ],
    "TotalUpfrontPrice": "0.000"
}
```

- Untuk API detailnya, lihat GetHostReservationPurchasePreviewdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menampilkan pratinjau pembelian reservasi dengan konfigurasi yang cocok dengan Host Khusus Anda h-01e23f4cd567890f1

```
Get-EC2HostReservationPurchasePreview -OfferingId hro-0c1f23456789d0ab -HostIdSet
 h-01e23f4cd567890f1
```

Output:

```
CurrencyCode Purchase TotalHourlyPrice TotalUpfrontPrice
------------ -------- ---------------- -----------------
             {}       1.307            0.000
```

- Untuk API detailnya, lihat GetHostReservationPurchasePreviewdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`GetPasswordData`** dengan AWS SDK atau CLI

Contoh kode berikut menunjukkan cara menggunakan`GetPasswordData`.

CLI

AWS CLI

Untuk mendapatkan kata sandi terenkripsi

Contoh ini mendapatkan kata sandi terenkripsi.

Perintah:

```
aws ec2 get-password-data --instance-id i-1234567890abcdef0
```

Output:

```
{
    "InstanceId": "i-1234567890abcdef0",
    "Timestamp": "2013-08-07T22:18:38.000Z",
    "PasswordData": "gSlJFq+VpcZXqy+iktxMF6NyxQ4qCrT4+gaOuNOenX1MmgXPTj7XEXAMPLE
UQ+YeFfb+L1U4C4AKv652Ux1iRB3CPTYP7WmU3TUnhsuBd+p6LVk7T2lKUml6OXbk6WPW1VYYm/TRPB1
e1DQ7PY4an/DgZT4mwcpRFigzhniQgDDeO1InvSDcwoUTwNs0Y1S8ouri2W4n5GNlriM3Q0AnNVelVz/
53TkDtxbNoU606M1gK9zUWSxqEgwvbV2j8c5rP0WCuaMWSFl4ziDu4bd7q+4RSyi8NUsVWnKZ4aEZffu
DPGzKrF5yLlf3etP2L4ZR6CvG7K1hx7VKOQVN32Dajw=="
}
```

Untuk mendapatkan kata sandi yang didekripsi

Contoh ini mendapatkan kata sandi yang didekripsi.

Perintah:

```
aws ec2 get-password-data --instance-id  i-1234567890abcdef0 --priv-launch-key C:
\Keys\MyKeyPair.pem
```

Output:

```
{
    "InstanceId": "i-1234567890abcdef0",
    "Timestamp": "2013-08-30T23:18:05.000Z",
    "PasswordData": "&ViJ652e*u"
}
```

- Untuk API detailnya, lihat GetPasswordDatadi Referensi AWS CLI Perintah.

Java

SDKuntuk Java 2.x

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
import software.amazon.awssdk.regions.Region;
import software.amazon.awssdk.services.ec2.Ec2AsyncClient;
import software.amazon.awssdk.services.ec2.model.*;
import java.util.concurrent.CompletableFuture;

/**
 * Before running this Java V2 code example, set up your development
 * environment, including your credentials.
 *
 * For more information, see the following documentation topic:
 *
 * https://docs.aws.amazon.com/sdk-for-java/latest/developer-guide/get-
started.html
 */
public class GetPasswordData {

    public static void main(String[] args) {
        final String usage = """

                Usage:
                   <instanceId>

                Where:
                   instanceId - An instance id value that you can obtain from the
 AWS Management Console.\s
             """;

        if (args.length != 1) {
            System.out.println(usage);
            System.exit(1);
        }
        String instanceId = args[0];
```

```
        Ec2AsyncClient ec2AsyncClient = Ec2AsyncClient.builder()
            .region(Region.US_EAST_1)
            .build();

        try {
            CompletableFuture<Void> future = getPasswordDataAsync(ec2AsyncClient,
instanceId);
            future.join();
        } catch (RuntimeException rte) {
            System.err.println("An exception occurred: " + (rte.getCause() !=
null ? rte.getCause().getMessage() : rte.getMessage()));
        }
    }

    /**
     * Fetches the password data for the specified EC2 instance asynchronously.
     *
     * @param ec2AsyncClient the EC2 asynchronous client to use for the request
     * @param instanceId instanceId the ID of the EC2 instance for which you want
to fetch the password data
     * @return a {@link CompletableFuture} that completes when the password data
has been fetched
     * @throws RuntimeException if there was a failure in fetching the password
data
     */
    public static CompletableFuture<Void> getPasswordDataAsync(Ec2AsyncClient
ec2AsyncClient, String instanceId) {
        GetPasswordDataRequest getPasswordDataRequest =
GetPasswordDataRequest.builder()
            .instanceId(instanceId)
            .build();


        CompletableFuture<GetPasswordDataResponse> response =
ec2AsyncClient.getPasswordData(getPasswordDataRequest);
        response.whenComplete((getPasswordDataResponse, ex) -> {
            if (ex != null) {
                throw new RuntimeException("Failed to get password data for
instance: " + instanceId, ex);
            } else if (getPasswordDataResponse == null ||
getPasswordDataResponse.passwordData().isEmpty()) {
                throw new RuntimeException("No password data found for instance:
" + instanceId);
            } else {
```

```
                String encryptedPasswordData =
 getPasswordDataResponse.passwordData();
                System.out.println("Encrypted Password Data: " +
 encryptedPasswordData);
            }
        });

        return response.thenApply(resp -> null);
    }
}
```

- Untuk API detailnya, lihat GetPasswordDatadi AWS SDK for Java 2.x APIReferensi.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini mendekripsi kata sandi yang EC2 ditetapkan Amazon ke akun Administrator untuk instance Windows yang ditentukan. Sebagai file PEM ditentukan, pengaturan sakelar -Decrypt secara otomatis diasumsikan.

```
Get-EC2PasswordData -InstanceId i-12345678 -PemFile C:\path\my-key-pair.pem
```

Output:

```
mYZ(PA9?C)Q
```

Contoh 2: ( PowerShell Hanya Windows) Memeriksa instance untuk menentukan nama keypair yang digunakan untuk meluncurkan instance dan kemudian mencoba menemukan data keypair yang sesuai di penyimpanan konfigurasi Toolkit for Visual AWS Studio. Jika data keypair ditemukan, kata sandi didekripsi.

```
Get-EC2PasswordData -InstanceId i-12345678 -Decrypt
```

Output:

```
mYZ(PA9?C)Q
```

Contoh 3: Mengembalikan data kata sandi terenkripsi untuk contoh.

```
Get-EC2PasswordData -InstanceId i-12345678
```

Output:

```
iVz3BAK/WAXV.....dqt8WeMA==
```

- Untuk API detailnya, lihat GetPasswordDatadi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`ImportImage`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`ImportImage`.

CLI

AWS CLI

Untuk mengimpor file gambar VM sebagai AMI

`import-image`Contoh berikut mengimpor yang ditentukanOVA.

```
aws ec2 import-image \
  --disk-containers Format=ova,UserBucket="{S3Bucket=my-import-bucket,S3Key=vms/
my-server-vm.ova}"
```

Output:

```
{
    "ImportTaskId": "import-ami-1234567890abcdef0",
    "Progress": "2",
    "SnapshotDetails": [
        {
            "DiskImageSize": 0.0,
            "Format": "ova",
            "UserBucket": {
                "S3Bucket": "my-import-bucket",
                "S3Key": "vms/my-server-vm.ova"
            }
```

```
        }
    ],
    "Status": "active",
    "StatusMessage": "pending"
}
```

- Untuk API detailnya, lihat ImportImagedi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini mengimpor image mesin virtual disk tunggal dari bucket Amazon S3 yang ditentukan ke EC2 Amazon dengan token idempotensi. Contoh ini mengharuskan Peran Layanan Impor VM dengan nama default 'vmimport' ada, dengan kebijakan yang mengizinkan akses EC2 Amazon ke bucket yang ditentukan, seperti yang dijelaskan dalam topik Prekuisisi Impor VM. Untuk menggunakan peran kustom, tentukan nama peran menggunakan **-RoleName** parameter.

```
$container = New-Object Amazon.EC2.Model.ImageDiskContainer
$container.Format="VMDK"
$container.UserBucket = New-Object Amazon.EC2.Model.UserBucket
$container.UserBucket.S3Bucket = "amzn-s3-demo-bucket"
$container.UserBucket.S3Key = "Win_2008_Server_Standard_SP2_64-bit-disk1.vmdk"

$parms = @{
    "ClientToken"="idempotencyToken"
    "Description"="Windows 2008 Standard Image Import"
    "Platform"="Windows"
    "LicenseType"="AWS"
}

Import-EC2Image -DiskContainer $container @parms
```

Output:

```
Architecture    :
Description     : Windows 2008 Standard Image
Hypervisor      :
ImageId         :
ImportTaskId    : import-ami-abcdefgh
```

```
LicenseType     : AWS
Platform        : Windows
Progress        : 2
SnapshotDetails : {}
Status          : active
StatusMessage   : pending
```

- Untuk API detailnya, lihat ImportImagedi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`ImportKeyPair`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`ImportKeyPair`.

CLI

AWS CLI

Untuk mengimpor kunci publik

Pertama, buat key pair dengan alat pilihan Anda. Misalnya, gunakan perintah ssh-keygen ini:

Perintah:

```
ssh-keygen -t rsa -C "my-key" -f ~/.ssh/my-key
```

Output:

```
Generating public/private rsa key pair.
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /home/ec2-user/.ssh/my-key.
Your public key has been saved in /home/ec2-user/.ssh/my-key.pub.
...
```

Perintah contoh ini mengimpor kunci publik yang ditentukan.

Perintah:

```
aws ec2 import-key-pair --key-name "my-key" --public-key-material fileb://~/.ssh/
my-key.pub
```

Output:

```
{
  "KeyName": "my-key",
  "KeyFingerprint": "1f:51:ae:28:bf:89:e9:d8:1f:25:5d:37:2d:7d:b8:ca"
}
```

- Untuk API detailnya, lihat ImportKeyPairdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini mengimpor kunci publik keEC2. Baris pertama menyimpan isi file kunci publik (*.pub) dalam variabel. **$publickey** Selanjutnya, contoh mengkonversi UTF8 format file kunci publik ke string Base64-encoded, dan menyimpan string dikonversi dalam variabel. **$pkbase64** Pada baris terakhir, kunci publik yang dikonversi diimpor keEC2. Cmdlet mengembalikan sidik jari kunci dan nama sebagai hasil.

```
$publickey=[Io.File]::ReadAllText("C:\Users\TestUser\.ssh\id_rsa.pub")
$pkbase64 =
 [System.Convert]::ToBase64String([System.Text.Encoding]::UTF8.GetBytes($publickey))
Import-EC2KeyPair -KeyName Example-user-key -PublicKey $pkbase64
```

Output:

```
KeyFingerprint                                  KeyName
--------------                                  -------
do:d0:15:8f:79:97:12:be:00:fd:df:31:z3:b1:42:z1 Example-user-key
```

- Untuk API detailnya, lihat ImportKeyPairdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`ImportSnapshot`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`ImportSnapshot`.

CLI

AWS CLI

Untuk mengimpor snapshot

`import-snapshot`Contoh berikut mengimpor disk yang ditentukan sebagai snapshot.

```
aws ec2 import-snapshot \
    --description "My server VMDK" \
    --disk-container Format=VMDK,UserBucket={S3Bucket=my-import-bucket,S3Key=vms/
my-server-vm.vmdk}
```

Output:

```
{
    "Description": "My server VMDK",
    "ImportTaskId": "import-snap-1234567890abcdef0",
    "SnapshotTaskDetail": {
        "Description": "My server VMDK",
        "DiskImageSize": "0.0",
        "Format": "VMDK",
        "Progress": "3",
        "Status": "active",
        "StatusMessage": "pending"
        "UserBucket": {
            "S3Bucket": "my-import-bucket",
            "S3Key": "vms/my-server-vm.vmdk"
        }
    }
}
```

- Untuk API detailnya, lihat ImportSnapshotdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini mengimpor gambar disk VM format 'VMDK' ke snapshot AmazonEBS. Contoh ini memerlukan Peran Layanan Impor VM dengan nama default 'vmimport', dengan kebijakan yang memungkinkan EC2 Amazon mengakses bucket yang ditentukan, seperti yang dijelaskan dalam topik **`VM Import Prequisites`** di http://docs.aws.amazon. com/AWSEC2/latest/WindowsGuide/VMImportPrerequisites.html. Untuk menggunakan peran kustom, tentukan nama peran menggunakan **`-RoleName`** parameter.

```
$parms = @{
    "ClientToken"="idempotencyToken"
    "Description"="Disk Image Import"
    "DiskContainer_Description" = "Data disk"
    "DiskContainer_Format" = "VMDK"
    "DiskContainer_S3Bucket" = "amzn-s3-demo-bucket"
    "DiskContainer_S3Key" = "datadiskimage.vmdk"
}

Import-EC2Snapshot @parms
```

Output:

```
Description            ImportTaskId               SnapshotTaskDetail

-----------------      --------------------       ------------------

Disk Image Import      import-snap-abcdefgh
 Amazon.EC2.Model.SnapshotTaskDetail
```

- Untuk API detailnya, lihat ImportSnapshotdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`ModifyCapacityReservation`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`ModifyCapacityReservation`.

CLI

AWS CLI

Contoh 1: Untuk mengubah jumlah instans yang dicadangkan oleh reservasi kapasitas yang ada

`modify-capacity-reservation`Contoh berikut mengubah jumlah contoh yang kapasitas cadangan kapasitas reservasi.

```
aws ec2 modify-capacity-reservation \
    --capacity-reservation-id cr-1234abcd56EXAMPLE \
    --instance-count 5
```

Output:

```
{
    "Return": true
}
```

Contoh 2: Untuk mengubah tanggal dan waktu akhir reservasi kapasitas yang ada

`modify-capacity-reservation`Contoh berikut memodifikasi reservasi kapasitas yang ada untuk berakhir pada tanggal dan waktu yang ditentukan.

```
aws ec2 modify-capacity-reservation \
    --capacity-reservation-id cr-1234abcd56EXAMPLE \
    --end-date-type limited \
    --end-date 2019-08-31T23:59:59Z
```

Untuk informasi selengkapnya, lihat Memodifikasi Reservasi Kapasitas di Panduan Pengguna Amazon Elastic Compute Cloud untuk Instans Linux.

- Untuk API detailnya, lihat ModifyCapacityReservationdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini memodifikasi CapacityReservationId cr-0c1f2345db6f7cdba dengan mengubah hitungan instane menjadi 1

```
Edit-EC2CapacityReservation -CapacityReservationId cr-0c1f2345db6f7cdba -
InstanceCount 1
```

Output:

```
True
```

- Untuk API detailnya, lihat ModifyCapacityReservationdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`ModifyHosts`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`ModifyHosts`.

CLI

AWS CLI

Contoh 1: Untuk mengaktifkan penempatan otomatis untuk Host Khusus

`modify-hosts`Contoh berikut memungkinkan penempatan otomatis untuk Host Khusus sehingga menerima peluncuran instans yang tidak ditargetkan yang cocok dengan konfigurasi tipe instance-nya.

```
aws ec2 modify-hosts \
    --host-id h-06c2f189b4EXAMPLE \
    --auto-placement on
```

Output:

```
{
    "Successful": [
        "h-06c2f189b4EXAMPLE"
    ],
    "Unsuccessful": []
```

```
}
```

Contoh 2: Untuk mengaktifkan pemulihan host untuk Host Khusus

`modify-hosts`Contoh berikut memungkinkan pemulihan host untuk Host Khusus yang ditentukan.

```
aws ec2 modify-hosts \
    --host-id h-06c2f189b4EXAMPLE \
    --host-recovery on
```

Output:

```
{
    "Successful": [
        "h-06c2f189b4EXAMPLE"
    ],
    "Unsuccessful": []
}
```

Untuk informasi selengkapnya, lihat Memodifikasi Penempatan Otomatis Host Khusus di Panduan Pengguna Amazon Elastic Compute Cloud untuk Instans Linux.

- Untuk API detailnya, lihat ModifyHostsdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini memodifikasi AutoPlacement pengaturan ke off untuk host khusus h-01e23f4cd567890f3

```
Edit-EC2Host -HostId h-03e09f8cd681609f3 -AutoPlacement off
```

Output:

```
Successful            Unsuccessful
----------            ------------
{h-01e23f4cd567890f3} {}
```

- Untuk API detailnya, lihat ModifyHostsdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`ModifyIdFormat`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`ModifyIdFormat`.

CLI

AWS CLI

Untuk mengaktifkan format ID yang lebih panjang untuk sumber daya

`modify-id-format`Contoh berikut memungkinkan format ID yang lebih panjang untuk jenis `instance` sumber daya.

```
aws ec2 modify-id-format \
    --resource instance \
    --use-long-ids
```

Untuk menonaktifkan format ID yang lebih panjang untuk sumber daya

`modify-id-format`Contoh berikut menonaktifkan format ID yang lebih panjang untuk jenis `instance` sumber daya.

```
aws ec2 modify-id-format \
    --resource instance \
    --no-use-long-ids
```

`modify-id-format`Contoh berikut memungkinkan format ID yang lebih panjang untuk semua jenis sumber daya yang didukung yang berada dalam periode keikutsertaannya.

```
aws ec2 modify-id-format \
    --resource all-current \
    --use-long-ids
```

- Untuk API detailnya, lihat ModifyIdFormatdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini memungkinkan format ID yang lebih panjang untuk jenis sumber daya yang ditentukan.

```
Edit-EC2IdFormat -Resource instance -UseLongId $true
```

Contoh 2: Contoh ini menonaktifkan format ID yang lebih panjang untuk jenis sumber daya yang ditentukan.

```
Edit-EC2IdFormat -Resource instance -UseLongId $false
```

- Untuk API detailnya, lihat ModifyIdFormatdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`ModifyImageAttribute`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`ModifyImageAttribute`.

CLI

AWS CLI

Contoh 1: Untuk membuat AMI publik

`modify-instance-attribute`Contoh berikut membuat AMI publik yang ditentukan.

```
aws ec2 modify-image-attribute \
    --image-id ami-5731123e \
    --launch-permission "Add=[{Group=all}]"
```

Perintah ini tidak menghasilkan output.

Contoh 2: Untuk membuat AMI pribadi

`modify-instance-attribute`Contoh berikut membuat AMI pribadi yang ditentukan.

```
aws ec2 modify-image-attribute \
    --image-id ami-5731123e \
    --launch-permission "Remove=[{Group=all}]"
```

Perintah ini tidak menghasilkan output.

Contoh 3: Untuk memberikan izin peluncuran ke AWS akun

`modify-instance-attribute`Contoh berikut memberikan izin peluncuran ke akun yang ditentukan AWS .

```
aws ec2 modify-image-attribute \
    --image-id ami-5731123e \
    --launch-permission "Add=[{UserId=123456789012}]"
```

Perintah ini tidak menghasilkan output.

Contoh 4: Untuk menghapus izin peluncuran dari AWS akun

`modify-instance-attribute`Contoh berikut menghapus izin peluncuran dari AWS akun yang ditentukan.

```
aws ec2 modify-image-attribute \
    --image-id ami-5731123e \
    --launch-permission "Remove=[{UserId=123456789012}]"
```

- Untuk API detailnya, lihat ModifyImageAttributedi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini memperbarui deskripsi untuk yang ditentukanAMI.

```
Edit-EC2ImageAttribute -ImageId ami-12345678 -Description "New description"
```

Contoh 2: Contoh ini membuat AMI publik (misalnya, jadi apa pun Akun AWS dapat menggunakannya).

```
Edit-EC2ImageAttribute -ImageId ami-12345678 -Attribute launchPermission -
OperationType add -UserGroup all
```

Contoh 3: Contoh ini membuat AMI pribadi (misalnya, sehingga hanya Anda sebagai pemilik yang dapat menggunakannya).

```
Edit-EC2ImageAttribute -ImageId ami-12345678 -Attribute launchPermission -
OperationType remove -UserGroup all
```

Contoh 4: Contoh ini memberikan izin peluncuran ke yang ditentukan Akun AWS.

```
Edit-EC2ImageAttribute -ImageId ami-12345678 -Attribute launchPermission -
OperationType add -UserId 111122223333
```

Contoh 5: Contoh ini menghapus izin peluncuran dari yang ditentukan Akun AWS.

```
Edit-EC2ImageAttribute -ImageId ami-12345678 -Attribute launchPermission -
OperationType remove -UserId 111122223333
```

- Untuk API detailnya, lihat ModifyImageAttributedi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`ModifyInstanceAttribute`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`ModifyInstanceAttribute`.

CLI

AWS CLI

Contoh 1: Untuk memodifikasi jenis instance

`modify-instance-attribute`Contoh berikut memodifikasi jenis instance dari instance tertentu. Instans harus berada dalam status `stopped`.

```
aws ec2 modify-instance-attribute \
```

```
    --instance-id i-1234567890abcdef0 \
    --instance-type "{\"Value\": \"m1.small\"}"
```

Perintah ini tidak menghasilkan output.

Contoh 2: Untuk mengaktifkan jaringan yang disempurnakan pada sebuah instance

`modify-instance-attribute`Contoh berikut memungkinkan jaringan ditingkatkan untuk contoh tertentu. Instans harus berada dalam status `stopped`.

```
aws ec2 modify-instance-attribute \
    --instance-id i-1234567890abcdef0 \
    --sriov-net-support simple
```

Perintah ini tidak menghasilkan output.

Contoh 3: Untuk memodifikasi sourceDestCheck atribut

`modify-instance-attribute`Contoh berikut menetapkan `sourceDestCheck` atribut dari contoh yang ditentukan untuk`true`. Contohnya harus dalam aVPC.

```
aws ec2 modify-instance-attribute --instance-id i-1234567890abcdef0 --source-
dest-check "{\"Value\": true}"
```

Perintah ini tidak menghasilkan output.

Contoh 4: Untuk memodifikasi deleteOnTermination atribut volume root

`modify-instance-attribute`Contoh berikut menyetel `deleteOnTermination` atribut untuk volume root instance yang EBS didukung Amazon yang ditentukan. `false` Secara default, atribut ini `true` untuk volume root.

Perintah:

```
aws ec2 modify-instance-attribute \
  --instance-id i-1234567890abcdef0 \
  --block-device-mappings "[{\"DeviceName\": \"/dev/sda1\",\"Ebs\":
{\"DeleteOnTermination\":false}}]"
```

Perintah ini tidak menghasilkan output.

Contoh 5: Untuk memodifikasi data pengguna yang dilampirkan ke sebuah instance

`modify-instance-attribute`Contoh berikut menambahkan isi file `UserData.txt` sebagai UserData untuk contoh yang ditentukan.

Isi file asli`UserData.txt`:

```
#!/bin/bash
yum update -y
service httpd start
chkconfig httpd on
```

Isi file harus dikodekan base64. Perintah pertama mengonversi file teks ke base64 dan menyimpannya sebagai file baru.

Versi perintah Linux/macOS:

```
base64 UserData.txt > UserData.base64.txt
```

Perintah ini tidak menghasilkan output.

Versi Windows dari perintah:

```
certutil -encode UserData.txt tmp.b64 && findstr /v /c:- tmp.b64 >
 UserData.base64.txt
```

Output:

```
Input Length = 67
Output Length = 152
CertUtil: -encode command completed successfully.
```

Sekarang Anda dapat mereferensikan file itu dalam CLI perintah berikut:

```
aws ec2 modify-instance-attribute \
    --instance-id=i-09b5a14dbca622e76 \
    --attribute userData --value file://UserData.base64.txt
```

Perintah ini tidak menghasilkan output.

Untuk informasi selengkapnya, lihat Data Pengguna dan AWS CLI di Panduan EC2 Pengguna.

- Untuk API detailnya, lihat ModifyInstanceAttributedi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini memodifikasi jenis instance dari instance yang ditentukan.

```
Edit-EC2InstanceAttribute -InstanceId i-12345678 -InstanceType m3.medium
```

Contoh 2: Contoh ini memungkinkan peningkatan jaringan untuk instance tertentu, dengan menentukan “sederhana” sebagai nilai dari parameter dukungan jaringan virtualisasi I/O root tunggal (SR-IOV), -.. SriovNetSupport

```
Edit-EC2InstanceAttribute -InstanceId i-12345678 -SriovNetSupport "simple"
```

Contoh 3: Contoh ini memodifikasi grup keamanan untuk instance tertentu. Contohnya harus dalam aVPC. Anda harus menentukan ID dari setiap grup keamanan, bukan nama.

```
Edit-EC2InstanceAttribute -InstanceId i-12345678 -Group @( "sg-12345678",
 "sg-45678901" )
```

Contoh 4: Contoh ini memungkinkan optimasi EBS I/O untuk instance tertentu. Fitur ini tidak tersedia dengan semua jenis instance. Biaya penggunaan tambahan berlaku saat menggunakan instans yang EBS dioptimalkan.

```
Edit-EC2InstanceAttribute -InstanceId i-12345678 -EbsOptimized $true
```

Contoh 5: Contoh ini memungkinkan pemeriksaan sumber/tujuan untuk contoh yang ditentukan. Sebagai NAT contoh untuk melakukanNAT, nilainya harus 'salah'.

```
Edit-EC2InstanceAttribute -InstanceId i-12345678 -SourceDestCheck $true
```

Contoh 6: Contoh ini menonaktifkan penghentian untuk contoh yang ditentukan.

```
Edit-EC2InstanceAttribute -InstanceId i-12345678 -DisableApiTermination $true
```

Contoh 7: Contoh ini mengubah instance tertentu sehingga berakhir ketika shutdown dimulai dari instance.

```
Edit-EC2InstanceAttribute -InstanceId i-12345678 -
InstanceInitiatedShutdownBehavior terminate
```

- Untuk API detailnya, lihat ModifyInstanceAttributedi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`ModifyInstanceCreditSpecification`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`ModifyInstanceCreditSpecification`.

CLI

AWS CLI

Untuk memodifikasi opsi kredit untuk CPU penggunaan instance

Contoh ini memodifikasi opsi kredit untuk CPU penggunaan instance yang ditentukan di wilayah tertentu menjadi “tidak terbatas”. Opsi kredit yang valid adalah “standar” dan “tidak terbatas”.

Perintah:

```
aws ec2 modify-instance-credit-specification --instance-credit-
specification "InstanceId=i-1234567890abcdef0,CpuCredits=unlimited"
```

Output:

```
{
  "SuccessfulInstanceCreditSpecifications": [
    {
      "InstanceId": "i-1234567890abcdef0"
    }
  ],
  "UnsuccessfulInstanceCreditSpecifications": []
}
```

- Untuk API detailnya, lihat ModifyInstanceCreditSpecificationdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Ini memungkinkan kredit tak terbatas T2 misalnya i-01234567890abcdef.

```
$Credit = New-Object -TypeName
 Amazon.EC2.Model.InstanceCreditSpecificationRequest
$Credit.InstanceId = "i-01234567890abcdef"
$Credit.CpuCredits = "unlimited"
Edit-EC2InstanceCreditSpecification -InstanceCreditSpecification $Credit
```

- Untuk API detailnya, lihat ModifyInstanceCreditSpecificationdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`ModifyNetworkInterfaceAttribute`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`ModifyNetworkInterfaceAttribute`.

CLI

AWS CLI

Untuk memodifikasi atribut lampiran antarmuka jaringan

Perintah contoh ini memodifikasi `attachment` atribut antarmuka jaringan yang ditentukan.

Perintah:

```
aws ec2 modify-network-interface-attribute --network-interface-id eni-686ea200 --
attachment AttachmentId=eni-attach-43348162,DeleteOnTermination=false
```

Untuk memodifikasi atribut deskripsi antarmuka jaringan

Perintah contoh ini memodifikasi `description` atribut antarmuka jaringan yang ditentukan.

Perintah:

```
aws ec2 modify-network-interface-attribute --network-interface-id eni-686ea200 --
description "My description"
```

Untuk memodifikasi groupSet atribut antarmuka jaringan

Perintah contoh ini memodifikasi `groupSet` atribut antarmuka jaringan yang ditentukan.

Perintah:

```
aws ec2 modify-network-interface-attribute --network-interface-id eni-686ea200 --
groups sg-903004f8 sg-1a2b3c4d
```

Untuk memodifikasi sourceDestCheck atribut antarmuka jaringan

Perintah contoh ini memodifikasi `sourceDestCheck` atribut antarmuka jaringan yang ditentukan.

Perintah:

```
aws ec2 modify-network-interface-attribute --network-interface-id eni-686ea200 --
no-source-dest-check
```

- Untuk API detailnya, lihat ModifyNetworkInterfaceAttributedi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini memodifikasi antarmuka jaringan yang ditentukan sehingga lampiran yang ditentukan dihapus pada penghentian.

```
Edit-EC2NetworkInterfaceAttribute -NetworkInterfaceId eni-1a2b3c4d -
Attachment_AttachmentId eni-attach-1a2b3c4d -Attachment_DeleteOnTermination $true
```

Contoh 2: Contoh ini memodifikasi deskripsi antarmuka jaringan yang ditentukan.

```
Edit-EC2NetworkInterfaceAttribute -NetworkInterfaceId eni-1a2b3c4d -Description
 "my description"
```

Contoh 3: Contoh ini memodifikasi grup keamanan untuk antarmuka jaringan yang ditentukan.

```
Edit-EC2NetworkInterfaceAttribute -NetworkInterfaceId eni-1a2b3c4d -Groups
 sg-1a2b3c4d
```

Contoh 4: Contoh ini menonaktifkan pemeriksaan sumber/tujuan untuk antarmuka jaringan yang ditentukan.

```
Edit-EC2NetworkInterfaceAttribute -NetworkInterfaceId eni-1a2b3c4d -
SourceDestCheck $false
```

- Untuk API detailnya, lihat ModifyNetworkInterfaceAttributedi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`ModifyReservedInstances`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`ModifyReservedInstances`.

CLI

AWS CLI

Untuk memodifikasi Instans Cadangan

Perintah contoh ini memindahkan Instans Cadangan ke Availability Zone lain di wilayah yang sama.

Perintah:

```
aws ec2 modify-reserved-instances --reserved-instances-ids b847fa93-
e282-4f55-b59a-1342f5bd7c02 --target-configurations AvailabilityZone=us-
west-1c,Platform=EC2-Classic,InstanceCount=10
```

Output:

```
{
  "ReservedInstancesModificationId": "rimod-d3ed4335-b1d3-4de6-ab31-0f13aaf46687"
}
```

Untuk memodifikasi platform jaringan Instans Cadangan

Perintah contoh ini mengonversi EC2 -Classic Reserved Instances menjadi -. EC2 VPC

Perintah:

```
aws ec2 modify-reserved-instances --reserved-instances-ids f127bd27-
edb7-44c9-a0eb-0d7e09259af0 --target-configurations AvailabilityZone=us-
west-1c,Platform=EC2-VPC,InstanceCount=5
```

Output:

```
{
  "ReservedInstancesModificationId": "rimod-82fa9020-668f-4fb6-945d-61537009d291"
}
```

Untuk informasi selengkapnya, lihat Memodifikasi Instans Cadangan Anda di EC2Panduan Pengguna Amazon.

Untuk mengubah ukuran instans dari Instans Cadangan

Perintah contoh ini memodifikasi Instans Cadangan yang memiliki 10 m1.small Linux/ instance di us-west-1c sehingga 8 UNIX instance m1.small menjadi 2 instance m1.large, dan 2 m1.small sisanya menjadi 1 m1.medium instance di Availability Zone yang sama. Perintah:

```
aws ec2 modify-reserved-instances --reserved-instances-
ids 1ba8e2e3-3556-4264-949e-63ee671405a9 --target-
configurations AvailabilityZone=us-west-1c,Platform=EC2-
Classic,InstanceCount=2,InstanceType=m1.large AvailabilityZone=us-
west-1c,Platform=EC2-Classic,InstanceCount=1,InstanceType=m1.medium
```

Output:

```
{
    "ReservedInstancesModificationId": "rimod-acc5f240-080d-4717-
b3e3-1c6b11fa00b6"
}
```

Untuk informasi selengkapnya, lihat Memodifikasi Ukuran Instans Reservasi Anda di EC2Panduan Pengguna Amazon.

- Untuk API detailnya, lihat ModifyReservedInstancesdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini memodifikasi Availability Zone, jumlah instans, dan platform untuk instans Cadangan yang ditentukan.

```
$config = New-Object Amazon.EC2.Model.ReservedInstancesConfiguration
$config.AvailabilityZone = "us-west-2a"
$config.InstanceCount = 1
$config.Platform = "EC2-VPC"

Edit-EC2ReservedInstance `
-ReservedInstancesId @("FE32132D-70D5-4795-B400-AE435EXAMPLE",
 "0CC556F3-7AB8-4C00-B0E5-98666EXAMPLE") `
-TargetConfiguration $config
```

- Untuk API detailnya, lihat ModifyReservedInstancesdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`ModifySnapshotAttribute`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`ModifySnapshotAttribute`.

CLI

AWS CLI

Contoh 1: Untuk memodifikasi atribut snapshot

`modify-snapshot-attribute`Contoh berikut memperbarui `createVolumePermission` atribut untuk snapshot yang ditentukan, menghapus izin volume untuk pengguna tertentu.

```
aws ec2 modify-snapshot-attribute \
    --snapshot-id snap-1234567890abcdef0 \
    --attribute createVolumePermission \
    --operation-type remove \
```

```
    --user-ids 123456789012
```

Contoh 2: Untuk membuat snapshot publik

`modify-snapshot-attribute`Contoh berikut membuat snapshot yang ditentukan publik.

```
aws ec2 modify-snapshot-attribute \
    --snapshot-id snap-1234567890abcdef0 \
    --attribute createVolumePermission \
    --operation-type add \
    --group-names all
```

- Untuk API detailnya, lihat ModifySnapshotAttributedi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini membuat snapshot yang ditentukan publik dengan menyetel CreateVolumePermission atributnya.

```
Edit-EC2SnapshotAttribute -SnapshotId snap-12345678 -Attribute
 CreateVolumePermission -OperationType Add -GroupName all
```

- Untuk API detailnya, lihat ModifySnapshotAttributedi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`ModifySpotFleetRequest`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`ModifySpotFleetRequest`.

CLI

AWS CLI

Untuk mengubah permintaan armada Spot

Perintah contoh ini memperbarui kapasitas target permintaan armada Spot yang ditentukan.

Perintah:

```
aws ec2 modify-spot-fleet-request --target-capacity 20 --spot-fleet-request-
id sfr-73fbd2ce-aa30-494c-8788-1cee4EXAMPLE
```

Output:

```
{
    "Return": true
}
```

Perintah contoh ini mengurangi kapasitas target permintaan armada Spot yang ditentukan tanpa menghentikan Instans Spot apa pun sebagai hasilnya.

Perintah:

```
aws ec2 modify-spot-fleet-request --target-capacity 10 --excess-capacity-
termination-policy NoTermination --spot-fleet-request-ids sfr-73fbd2ce-
aa30-494c-8788-1cee4EXAMPLE
```

Output:

```
{
    "Return": true
}
```

- Untuk API detailnya, lihat ModifySpotFleetRequestdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini memperbarui kapasitas target permintaan armada Spot yang ditentukan.

```
Edit-EC2SpotFleetRequest -SpotFleetRequestId sfr-73fbd2ce-
aa30-494c-8788-1cee4EXAMPLE -TargetCapacity 10
```

Output:

```
True
```

- Untuk API detailnya, lihat ModifySpotFleetRequestdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`ModifySubnetAttribute`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`ModifySubnetAttribute`.

CLI

AWS CLI

Untuk mengubah perilaku IPv4 pengalamatan publik subnet

Contoh ini memodifikasi subnet-1a2b3c4d untuk menentukan bahwa semua instance yang diluncurkan ke subnet ini diberi alamat publik. IPv4 Jika perintah berhasil, tidak ada output yang akan ditampilkan.

Perintah:

```
aws ec2 modify-subnet-attribute --subnet-id subnet-1a2b3c4d --map-public-ip-on-
launch
```

Untuk mengubah perilaku pengalamatan subnet IPv6

Contoh ini memodifikasi subnet-1a2b3c4d untuk menentukan bahwa semua instance yang diluncurkan ke subnet ini diberi alamat dari rentang subnet. IPv6

Perintah:

```
aws ec2 modify-subnet-attribute --subnet-id subnet-1a2b3c4d --assign-ipv6-
address-on-creation
```

Untuk informasi selengkapnya, lihat Alamat IP di Panduan Pengguna Cloud Pribadi AWS Virtual AndaVPC.

- Untuk API detailnya, lihat ModifySubnetAttributedi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini memungkinkan pengalamatan IP publik untuk subnet yang ditentukan.

```
Edit-EC2SubnetAttribute -SubnetId subnet-1a2b3c4d -MapPublicIpOnLaunch $true
```

Contoh 2: Contoh ini menonaktifkan pengalamatan IP publik untuk subnet yang ditentukan.

```
Edit-EC2SubnetAttribute -SubnetId subnet-1a2b3c4d -MapPublicIpOnLaunch $false
```

- Untuk API detailnya, lihat ModifySubnetAttributedi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`ModifyVolumeAttribute`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`ModifyVolumeAttribute`.

CLI

AWS CLI

Untuk memodifikasi atribut volume

Contoh ini menetapkan `autoEnableIo` atribut volume dengan ID `vol-1234567890abcdef0` ke`true`. Jika perintah berhasil, tidak ada output yang akan ditampilkan.

Perintah:

```
aws ec2 modify-volume-attribute --volume-id vol-1234567890abcdef0 --auto-enable-io
```

- Untuk API detailnya, lihat ModifyVolumeAttributedi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini memodifikasi atribut tertentu dari volume yang ditentukan. Operasi I/O untuk volume secara otomatis dilanjutkan setelah ditangguhkan karena data yang berpotensi tidak konsisten.

```
Edit-EC2VolumeAttribute -VolumeId vol-12345678 -AutoEnableIO $true
```

- Untuk API detailnya, lihat ModifyVolumeAttributedi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`ModifyVpcAttribute`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`ModifyVpcAttribute`.

CLI

AWS CLI

Untuk memodifikasi enableDnsSupport atribut

Contoh ini memodifikasi `enableDnsSupport` atribut. Atribut ini menunjukkan apakah DNS resolusi diaktifkan untukVPC. Jika atribut ini`true`, DNS server Amazon menyelesaikan DNS nama host untuk instance Anda ke alamat IP yang sesuai; jika tidak, tidak. Jika perintah berhasil, tidak ada output yang akan ditampilkan.

Perintah:

```
aws ec2 modify-vpc-attribute --vpc-id vpc-a01106c2 --enable-dns-support "{\"Value
\":false}"
```

Untuk memodifikasi enableDnsHostnames atribut

Contoh ini memodifikasi `enableDnsHostnames` atribut. Atribut ini menunjukkan apakah instance diluncurkan di nama DNS host VPC get. Jika atribut ini`true`, contoh di VPC

mendapatkan DNS nama host; jika tidak, mereka tidak. Jika perintah berhasil, tidak ada output yang akan ditampilkan.

Perintah:

```
aws ec2 modify-vpc-attribute --vpc-id vpc-a01106c2 --enable-dns-hostnames
 "{\"Value\":false}"
```

- Untuk API detailnya, lihat ModifyVpcAttributedi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini memungkinkan dukungan untuk DNS nama host untuk yang ditentukanVPC.

```
Edit-EC2VpcAttribute -VpcId vpc-12345678 -EnableDnsHostnames $true
```

Contoh 2: Contoh ini menonaktifkan dukungan untuk DNS nama host untuk yang ditentukan. VPC

```
Edit-EC2VpcAttribute -VpcId vpc-12345678 -EnableDnsHostnames $false
```

Contoh 3: Contoh ini memungkinkan dukungan untuk DNS resolusi untuk yang ditentukanVPC.

```
Edit-EC2VpcAttribute -VpcId vpc-12345678 -EnableDnsSupport $true
```

Contoh 4: Contoh ini menonaktifkan dukungan untuk DNS resolusi untuk yang ditentukanVPC.

```
Edit-EC2VpcAttribute -VpcId vpc-12345678 -EnableDnsSupport $false
```

- Untuk API detailnya, lihat ModifyVpcAttributedi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`MonitorInstances`** dengan AWS SDK atau CLI

Contoh kode berikut menunjukkan cara menggunakan`MonitorInstances`.

C++

SDKuntuk C ++

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
//! Enable detailed monitoring for an Amazon Elastic Compute Cloud (Amazon EC2)
 instance.
/*!
  \param instanceId: An EC2 instance ID.
  \param clientConfiguration: AWS client configuration.
  \return bool: Function succeeded.
 */
bool AwsDoc::EC2::enableMonitoring(const Aws::String &instanceId,
                                   const Aws::Client::ClientConfiguration
 &clientConfiguration) {
    Aws::EC2::EC2Client ec2Client(clientConfiguration);
    Aws::EC2::Model::MonitorInstancesRequest request;
    request.AddInstanceIds(instanceId);
    request.SetDryRun(true);

    Aws::EC2::Model::MonitorInstancesOutcome dryRunOutcome =
 ec2Client.MonitorInstances(request);
    if (dryRunOutcome.IsSuccess()) {
        std::cerr
                << "Failed dry run to enable monitoring on instance. A dry run
 should trigger an error."
                <<
                std::endl;
        return false;
    } else if (dryRunOutcome.GetError().GetErrorType()
               != Aws::EC2::EC2Errors::DRY_RUN_OPERATION) {
        std::cerr << "Failed dry run to enable monitoring on instance " <<
                  instanceId << ": " << dryRunOutcome.GetError().GetMessage() <<
```

```
                std::endl;
        return false;
    }

    request.SetDryRun(false);
    Aws::EC2::Model::MonitorInstancesOutcome monitorInstancesOutcome =
 ec2Client.MonitorInstances(request);
    if (!monitorInstancesOutcome.IsSuccess()) {
        std::cerr << "Failed to enable monitoring on instance " <<
                  instanceId << ": " <<
                  monitorInstancesOutcome.GetError().GetMessage() << std::endl;
    } else {
        std::cout << "Successfully enabled monitoring on instance " <<
                  instanceId << std::endl;
    }

    return monitorInstancesOutcome.IsSuccess();
}
```

- Untuk API detailnya, lihat MonitorInstancesdi AWS SDK for C++ APIReferensi.

CLI

AWS CLI

Untuk mengaktifkan pemantauan yang mendetail untuk instans

Perintah contoh ini mengaktifkan pemantauan yang mendetail untuk instans tertentu.

Perintah:

```
aws ec2 monitor-instances --instance-ids i-1234567890abcdef0
```

Output:

```
{
  "InstanceMonitorings": [
      {
          "InstanceId": "i-1234567890abcdef0",
          "Monitoring": {
              "State": "pending"
```

```
            }
        }
    ]
}
```

- Untuk API detailnya, lihat MonitorInstancesdi Referensi AWS CLI Perintah.

JavaScript

SDKuntuk JavaScript (v3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
import { EC2Client, MonitorInstancesCommand } from "@aws-sdk/client-ec2";

/**
 * Turn on detailed monitoring for the selected instance.
 * By default, metrics are sent to Amazon CloudWatch every 5 minutes.
 * For a cost you can enable detailed monitoring which sends metrics every
 minute.
 * @param {{ instanceIds: string[] }} options
 */
export const main = async ({ instanceIds }) => {
  const client = new EC2Client({});
  const command = new MonitorInstancesCommand({
    InstanceIds: instanceIds,
  });

  try {
    const { InstanceMonitorings } = await client.send(command);
    const instancesBeingMonitored = InstanceMonitorings.map(
      (im) =>
        ` • Detailed monitoring state for ${im.InstanceId} is
 ${im.Monitoring.State}.`,
    );
    console.log("Monitoring status:");
    console.log(instancesBeingMonitored.join("\n"));
  } catch (caught) {
```

```
    if (caught instanceof Error && caught.name === "InvalidParameterValue") {
      console.warn(`${caught.message}`);
    } else {
      throw caught;
    }
  }
};
```

- Untuk API detailnya, lihat MonitorInstancesdi AWS SDK for JavaScript APIReferensi.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini memungkinkan pemantauan terperinci untuk contoh yang ditentukan.

```
Start-EC2InstanceMonitoring -InstanceId i-12345678
```

Output:

```
InstanceId    Monitoring
----------    ----------
i-12345678    Amazon.EC2.Model.Monitoring
```

- Untuk API detailnya, lihat MonitorInstancesdi AWS Tools for PowerShell Referensi Cmdlet.

SAP ABAP

SDKuntuk SAP ABAP

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    DATA lt_instance_ids TYPE /aws1/
cl_ec2instidstringlist_w=>tt_instanceidstringlist.
```

```
    APPEND NEW /aws1/cl_ec2instidstringlist_w( iv_value = iv_instance_id ) TO
 lt_instance_ids.

    "Perform dry run"
    TRY.
        " DryRun is set to true. This checks for the required permissions to
 monitor the instance without actually making the request. "
        lo_ec2->monitorinstances(
          it_instanceids = lt_instance_ids
          iv_dryrun = abap_true
        ).
      CATCH /aws1/cx_rt_service_generic INTO DATA(lo_exception).
        " If the error code returned is `DryRunOperation`, then you have the
 required permissions to monitor this instance. "
        IF lo_exception->av_err_code = 'DryRunOperation'.
          MESSAGE 'Dry run to enable detailed monitoring completed.' TYPE 'I'.
          " DryRun is set to false to enable detailed monitoring. "
          lo_ec2->monitorinstances(
            it_instanceids = lt_instance_ids
            iv_dryrun = abap_false
          ).
          MESSAGE 'Detailed monitoring enabled.' TYPE 'I'.
          " If the error code returned is `UnauthorizedOperation`, then you don't
 have the required permissions to monitor this instance. "
        ELSEIF lo_exception->av_err_code = 'UnauthorizedOperation'.
          MESSAGE 'Dry run to enable detailed monitoring failed. User does not
 have the permissions to monitor the instance.' TYPE 'E'.
        ELSE.
          DATA(lv_error) = |"{ lo_exception->av_err_code }" - { lo_exception-
>av_err_msg }|.
          MESSAGE lv_error TYPE 'E'.
        ENDIF.
    ENDTRY.
```

- Untuk API detailnya, lihat MonitorInstances AWSSDKuntuk SAP ABAP API referensi.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`MoveAddressToVpc`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`MoveAddressToVpc`.

CLI

AWS CLI

Untuk memindahkan alamat ke EC2 - VPC

Contoh ini memindahkan alamat IP Elastis 54.123.4.56 ke platform -. EC2 VPC

Perintah:

```
aws ec2 move-address-to-vpc --public-ip 54.123.4.56
```

Output:

```
{
  "Status": "MoveInProgress"
}
```

- Untuk API detailnya, lihat MoveAddressToVpcdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini memindahkan EC2 instance dengan alamat IP publik 12.345.67.89 ke VPC platform EC2 - di wilayah AS Timur (Virginia Utara).

```
Move-EC2AddressToVpc -PublicIp 12.345.67.89 -Region us-east-1
```

Contoh 2: Contoh ini menyalurkan hasil Get-EC2Instance perintah ke Move-EC2AddressToVpc cmdlet. Get-EC2InstancePerintah mendapat instance yang ditentukan oleh ID instance, kemudian mengembalikan properti alamat IP publik dari instance tersebut.

```
(Get-EC2Instance -Instance i-12345678).Instances.PublicIpAddress | Move-
EC2AddressToVpc
```

- Untuk API detailnya, lihat MoveAddressToVpcdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`PurchaseHostReservation`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`PurchaseHostReservation`.

CLI

AWS CLI

Untuk membeli Reservasi Tuan Rumah Khusus

Contoh ini membeli penawaran Reservasi Host Khusus yang ditentukan untuk Host Khusus yang ditentukan di akun Anda.

Perintah:

```
aws ec2 purchase-host-reservation --offering-id hro-03f707bf363b6b324 --host-id-set h-013abcd2a00cbd123
```

Output:

```
{
  "TotalHourlyPrice": "1.499",
  "Purchase": [
      {
          "HourlyPrice": "1.499",
          "InstanceFamily": "m4",
          "PaymentOption": "NoUpfront",
          "HostIdSet": [
              "h-013abcd2a00cbd123"
          ],
          "HostReservationId": "hr-0d418a3a4ffc669ae",
          "UpfrontPrice": "0.000",
          "Duration": 31536000
      }
  ],
```

```
  "TotalUpfrontPrice": "0.000"
}
```

- Untuk API detailnya, lihat PurchaseHostReservationdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini membeli reservasi yang menawarkan hro-0c1f23456789d0ab dengan konfigurasi yang cocok dengan Host Khusus Anda h-01e23f4cd567890f1

```
New-EC2HostReservation -OfferingId hro-0c1f23456789d0ab HostIdSet
 h-01e23f4cd567890f1
```

Output:

```
ClientToken       :
CurrencyCode      :
Purchase          : {hr-0123f4b5d67bedc89}
TotalHourlyPrice  : 1.307
TotalUpfrontPrice : 0.000
```

- Untuk API detailnya, lihat PurchaseHostReservationdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`PurchaseScheduledInstances`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`PurchaseScheduledInstances`.

CLI

AWS CLI

Untuk membeli Instance Terjadwal

Contoh ini membeli Instance Terjadwal.

Perintah:

```
aws ec2 purchase-scheduled-instances --purchase-requests file://purchase-request.json
```

Permintaan pembelian.json:

```
[
    {
        "PurchaseToken": "eyJ2IjoiMSIsInMiOjEsImMiOi...",
        "InstanceCount": 1
    }
]
```

Output:

```
{
  "ScheduledInstanceSet": [
      {
          "AvailabilityZone": "us-west-2b",
          "ScheduledInstanceId": "sci-1234-1234-1234-1234-123456789012",
          "HourlyPrice": "0.095",
          "CreateDate": "2016-01-25T21:43:38.612Z",
          "Recurrence": {
              "OccurrenceDaySet": [
                  1
              ],
              "Interval": 1,
              "Frequency": "Weekly",
              "OccurrenceRelativeToEnd": false,
              "OccurrenceUnit": ""
          },
          "Platform": "Linux/UNIX",
          "TermEndDate": "2017-01-31T09:00:00Z",
          "InstanceCount": 1,
          "SlotDurationInHours": 32,
          "TermStartDate": "2016-01-31T09:00:00Z",
          "NetworkPlatform": "EC2-VPC",
          "TotalScheduledInstanceHours": 1696,
          "NextSlotStartTime": "2016-01-31T09:00:00Z",
          "InstanceType": "c4.large"
      }
```

```
  ]
}
```

- Untuk API detailnya, lihat PurchaseScheduledInstancesdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini membeli Instance Terjadwal.

```
$request = New-Object Amazon.EC2.Model.PurchaseRequest
$request.InstanceCount = 1
$request.PurchaseToken = "eyJ2IjoiMSIsInMiOjEsImMiOi..."
New-EC2ScheduledInstancePurchase -PurchaseRequest $request
```

Output:

```
AvailabilityZone            : us-west-2b
CreateDate                  : 1/25/2016 1:43:38 PM
HourlyPrice                 : 0.095
InstanceCount               : 1
InstanceType                : c4.large
NetworkPlatform             : EC2-VPC
NextSlotStartTime           : 1/31/2016 1:00:00 AM
Platform                    : Linux/UNIX
PreviousSlotEndTime         :
Recurrence                  : Amazon.EC2.Model.ScheduledInstanceRecurrence
ScheduledInstanceId         : sci-1234-1234-1234-1234-123456789012
SlotDurationInHours         : 32
TermEndDate                 : 1/31/2017 1:00:00 AM
TermStartDate               : 1/31/2016 1:00:00 AM
TotalScheduledInstanceHours : 1696
```

- Untuk API detailnya, lihat PurchaseScheduledInstancesdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`RebootInstances`** dengan AWS SDK atau CLI

Contoh kode berikut menunjukkan cara menggunakan`RebootInstances`.

Contoh tindakan adalah kutipan kode dari program yang lebih besar dan harus dijalankan dalam konteks. Anda dapat melihat tindakan ini dalam konteks dalam contoh kode berikut:

- Membangun dan mengelola layanan yang tangguh

.NET

AWS SDK for .NET

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

Reboot sebuah instance dengan ID-nya.

```
    /// <summary>
    /// Reboot a specific EC2 instance.
    /// </summary>
    /// <param name="ec2InstanceId">The instance Id of the instance that will be
rebooted.</param>
    /// <returns>Async Task.</returns>
    public async Task<bool> RebootInstances(string ec2InstanceId)
    {
        try
        {
            var request = new RebootInstancesRequest
            {
                InstanceIds = new List<string> { ec2InstanceId },
            };

            await _amazonEC2.RebootInstancesAsync(request);

            // Wait for the instance to be running.
            Console.Write("Waiting for the instance to start.");
            await WaitForInstanceState(ec2InstanceId, InstanceStateName.Running);
```

```
            return true;
        }
        catch (AmazonEC2Exception ec2Exception)
        {
            if (ec2Exception.ErrorCode == "InvalidInstanceId")
            {
                _logger.LogError(
                    $"InstanceId {ec2InstanceId} is invalid, unable to reboot.
{ec2Exception.Message}");
            }
            return false;
        }
        catch (Exception ex)
        {
            _logger.LogError(
                $"An error occurred while rebooting the instance
{ec2InstanceId}.: {ex.Message}");
            return false;
        }
    }

    /// <summary>
    /// Wait until an EC2 instance is in a specified state.
    /// </summary>
    /// <param name="instanceId">The instance Id.</param>
    /// <param name="stateName">The state to wait for.</param>
    /// <returns>A Boolean value indicating the success of the action.</returns>
    public async Task<bool> WaitForInstanceState(string instanceId,
InstanceStateName stateName)
    {
        var request = new DescribeInstancesRequest
        {
            InstanceIds = new List<string> { instanceId }
        };

        // Wait until the instance is in the specified state.
        var hasState = false;
        do
        {
            // Wait 5 seconds.
            Thread.Sleep(5000);

            // Check for the desired state.
            var response = await _amazonEC2.DescribeInstancesAsync(request);
```

```
            var instance = response.Reservations[0].Instances[0];
            hasState = instance.State.Name == stateName;
            Console.Write(". ");
        } while (!hasState);

        return hasState;
    }
```

Ganti profil untuk instans, boot ulang, dan mulai ulang server web.

```
    /// <summary>
    /// Replace the profile associated with a running instance. After the profile
is replaced, the instance
    /// is rebooted to ensure that it uses the new profile. When the instance is
ready, Systems Manager is
    /// used to restart the Python web server.
    /// </summary>
    /// <param name="instanceId">The Id of the instance to update.</param>
    /// <param name="credsProfileName">The name of the new profile to associate
with the specified instance.</param>
    /// <param name="associationId">The Id of the existing profile association
for the instance.</param>
    /// <returns>Async task.</returns>
    public async Task ReplaceInstanceProfile(string instanceId, string
credsProfileName, string associationId)
    {
        try
        {
            await _amazonEc2.ReplaceIamInstanceProfileAssociationAsync(
                new ReplaceIamInstanceProfileAssociationRequest()
                {
                    AssociationId = associationId,
                    IamInstanceProfile = new IamInstanceProfileSpecification()
                    {
                        Name = credsProfileName
                    }
                });
            // Allow time before resetting.
            Thread.Sleep(25000);

            await _amazonEc2.RebootInstancesAsync(
```

```
                new RebootInstancesRequest(new List<string>() { instanceId }));
            Thread.Sleep(25000);
            var instanceReady = false;
            var retries = 5;
            while (retries-- > 0 && !instanceReady)
            {
                var instancesPaginator =
                    _amazonSsm.Paginators.DescribeInstanceInformation(
                        new DescribeInstanceInformationRequest());
                // Get the entire list using the paginator.
                await foreach (var instance in
instancesPaginator.InstanceInformationList)
                {
                    instanceReady = instance.InstanceId == instanceId;
                    if (instanceReady)
                    {
                        break;
                    }
                }
            }
            Console.WriteLine("Waiting for instance to be running.");
            await WaitForInstanceState(instanceId, InstanceStateName.Running);
            Console.WriteLine("Instance ready.");
            Console.WriteLine($"Sending restart command to instance
{instanceId}");
            await _amazonSsm.SendCommandAsync(
                new SendCommandRequest()
                {
                    InstanceIds = new List<string>() { instanceId },
                    DocumentName = "AWS-RunShellScript",
                    Parameters = new Dictionary<string, List<string>>()
                    {
                        {
                            "commands",
                            new List<string>() { "cd / && sudo python3 server.py
80" }
                        }
                    }
                });
            Console.WriteLine($"Restarted the web server on instance
{instanceId}");
        }
        catch (AmazonEC2Exception ec2Exception)
        {
```

```
            if (ec2Exception.ErrorCode == "InvalidInstanceID.NotFound")
            {
                _logger.LogError(ec2Exception, $"Instance {instanceId} not
 found");
            }

            throw;
        }
        catch (Exception ex)
        {
            _logger.LogError(ex, $"An error occurred while replacing the
 template.: {ex.Message}");
            throw;
        }
    }
```

- Untuk API detailnya, lihat RebootInstancesdi AWS SDK for .NET APIReferensi.

C++

SDKuntuk C ++

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
//! Reboot an Amazon Elastic Compute Cloud (Amazon EC2) instance.
/*!
  \param instanceID: An EC2 instance ID.
  \param clientConfiguration: AWS client configuration.
  \return bool: Function succeeded.
 */
bool AwsDoc::EC2::rebootInstance(const Aws::String &instanceId,
                                 const Aws::Client::ClientConfiguration
 &clientConfiguration) {
    Aws::EC2::EC2Client ec2Client(clientConfiguration);

    Aws::EC2::Model::RebootInstancesRequest request;
    request.AddInstanceIds(instanceId);
```

```
    request.SetDryRun(true);

    Aws::EC2::Model::RebootInstancesOutcome dry_run_outcome =
 ec2Client.RebootInstances(request);
    if (dry_run_outcome.IsSuccess()) {
        std::cerr
                << "Failed dry run to reboot on instance. A dry run should
 trigger an error."
                <<
                std::endl;
        return false;
    } else if (dry_run_outcome.GetError().GetErrorType()
               != Aws::EC2::EC2Errors::DRY_RUN_OPERATION) {
        std::cout << "Failed dry run to reboot instance " << instanceId << ": "
                  << dry_run_outcome.GetError().GetMessage() << std::endl;
        return false;
    }

    request.SetDryRun(false);
    Aws::EC2::Model::RebootInstancesOutcome outcome =
 ec2Client.RebootInstances(request);
    if (!outcome.IsSuccess()) {
        std::cout << "Failed to reboot instance " << instanceId << ": " <<
                  outcome.GetError().GetMessage() << std::endl;
    } else {
        std::cout << "Successfully rebooted instance " << instanceId <<
                  std::endl;
    }

    return outcome.IsSuccess();
}
```

- Untuk API detailnya, lihat RebootInstancesdi AWS SDK for C++ APIReferensi.

CLI

AWS CLI

Untuk me-reboot EC2 instance Amazon

Contoh ini melakukan boot ulang instans tertentu. Jika perintah berhasil, tidak ada output yang akan ditampilkan.

Perintah:

```
aws ec2 reboot-instances --instance-ids i-1234567890abcdef5
```

Untuk informasi selengkapnya, lihat Melakukan Boot Ulang Instans Anda di Panduan Pengguna Amazon Elastic Compute Cloud.

- Untuk API detailnya, lihat RebootInstancesdi Referensi AWS CLI Perintah.

JavaScript

SDKuntuk JavaScript (v3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
import { EC2Client, RebootInstancesCommand } from "@aws-sdk/client-ec2";

/**
 * Requests a reboot of the specified instances. This operation is asynchronous;
 * it only queues a request to reboot the specified instances.
 * @param {{ instanceIds: string[] }} options
 */
export const main = async ({ instanceIds }) => {
  const client = new EC2Client({});
  const command = new RebootInstancesCommand({
    InstanceIds: instanceIds,
  });

  try {
    await client.send(command);
    console.log("Instance rebooted successfully.");
  } catch (caught) {
    if (
      caught instanceof Error &&
      caught.name === "InvalidInstanceID.NotFound"
    ) {
      console.warn(
```

```
        `${caught.message}. Please provide the InstanceId of a valid instance to
 reboot.`,
      );
    } else {
      throw caught;
    }
  }
};
```

- Untuk API detailnya, lihat RebootInstancesdi AWS SDK for JavaScript APIReferensi.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini me-reboot instance yang ditentukan.

```
Restart-EC2Instance -InstanceId i-12345678
```

- Untuk API detailnya, lihat RebootInstancesdi AWS Tools for PowerShell Referensi Cmdlet.

Python

SDKuntuk Python (Boto3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
class AutoScalingWrapper:
    """
    Encapsulates Amazon EC2 Auto Scaling and EC2 management actions.
    """

    def __init__(
        self,
        resource_prefix: str,
        inst_type: str,
```

```
        ami_param: str,
        autoscaling_client: boto3.client,
        ec2_client: boto3.client,
        ssm_client: boto3.client,
        iam_client: boto3.client,
    ):
        """
        Initializes the AutoScaler class with the necessary parameters.

        :param resource_prefix: The prefix for naming AWS resources that are
created by this class.
        :param inst_type: The type of EC2 instance to create, such as t3.micro.
        :param ami_param: The Systems Manager parameter used to look up the AMI
that is created.
        :param autoscaling_client: A Boto3 EC2 Auto Scaling client.
        :param ec2_client: A Boto3 EC2 client.
        :param ssm_client: A Boto3 Systems Manager client.
        :param iam_client: A Boto3 IAM client.
        """
        self.inst_type = inst_type
        self.ami_param = ami_param
        self.autoscaling_client = autoscaling_client
        self.ec2_client = ec2_client
        self.ssm_client = ssm_client
        self.iam_client = iam_client
        sts_client = boto3.client("sts")
        self.account_id = sts_client.get_caller_identity()["Account"]

        self.key_pair_name = f"{resource_prefix}-key-pair"
        self.launch_template_name = f"{resource_prefix}-template-"
        self.group_name = f"{resource_prefix}-group"

        # Happy path
        self.instance_policy_name = f"{resource_prefix}-pol"
        self.instance_role_name = f"{resource_prefix}-role"
        self.instance_profile_name = f"{resource_prefix}-prof"

        # Failure mode
        self.bad_creds_policy_name = f"{resource_prefix}-bc-pol"
        self.bad_creds_role_name = f"{resource_prefix}-bc-role"
        self.bad_creds_profile_name = f"{resource_prefix}-bc-prof"


    def replace_instance_profile(
```

```
        self,
        instance_id: str,
        new_instance_profile_name: str,
        profile_association_id: str,
    ) -> None:
        """
        Replaces the profile associated with a running instance. After the
profile is
        replaced, the instance is rebooted to ensure that it uses the new
profile. When
        the instance is ready, Systems Manager is used to restart the Python web
server.

        :param instance_id: The ID of the instance to restart.
        :param new_instance_profile_name: The name of the new profile to
associate with
                                          the specified instance.
        :param profile_association_id: The ID of the existing profile association
for the
                                       instance.
        """
        try:
            self.ec2_client.replace_iam_instance_profile_association(
                IamInstanceProfile={"Name": new_instance_profile_name},
                AssociationId=profile_association_id,
            )
            log.info(
                "Replaced instance profile for association %s with profile %s.",
                profile_association_id,
                new_instance_profile_name,
            )
            time.sleep(5)

            self.ec2_client.reboot_instances(InstanceIds=[instance_id])
            log.info("Rebooting instance %s.", instance_id)
            waiter = self.ec2_client.get_waiter("instance_running")
            log.info("Waiting for instance %s to be running.", instance_id)
            waiter.wait(InstanceIds=[instance_id])
            log.info("Instance %s is now running.", instance_id)

            self.ssm_client.send_command(
                InstanceIds=[instance_id],
                DocumentName="AWS-RunShellScript",
                Parameters={"commands": ["cd / && sudo python3 server.py 80"]},
```

```
            )
            log.info(f"Restarted the Python web server on instance
'{instance_id}'.")
        except ClientError as err:
            log.error("Failed to replace instance profile.")
            error_code = err.response["Error"]["Code"]
            if error_code == "InvalidAssociationID.NotFound":
                log.error(
                    f"Association ID '{profile_association_id}' does not exist."
                    "Please check the association ID and try again."
                )
            if error_code == "InvalidInstanceId":
                log.error(
                    f"The specified instance ID '{instance_id}' does not exist or
is not available for SSM. "
                    f"Please verify the instance ID and try again."
                )
            log.error(f"Full error:\n\t{err}")
```

- Untuk API detailnya, lihat RebootInstances AWSSDKReferensi Python (Boto3). API

Rust

SDKuntuk Rust

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    pub async fn reboot(&self, ec2: &EC2) -> Result<(), EC2Error> {
        if self.instance.is_some() {
            ec2.reboot_instance(self.instance_id()).await?;
            ec2.wait_for_instance_stopped(self.instance_id(), None)
                .await?;
            ec2.wait_for_instance_ready(self.instance_id(), None)
                .await?;
        }
        Ok(())
```

```
    }
```

```
    pub async fn reboot_instance(&self, instance_id: &str) -> Result<(),
EC2Error> {
        tracing::info!("Rebooting instance {instance_id}");

        self.client
            .reboot_instances()
            .instance_ids(instance_id)
            .send()
            .await?;

        Ok(())
    }
```

Pelayan misalnya berada di negara berhenti dan siap, menggunakan Pelayan. API Menggunakan Waiters API membutuhkan `use aws_sdk_ec2: :client: :Waiters` dalam file rust.

```
    /// Wait for an instance to be ready and status ok (default wait 60 seconds)
    pub async fn wait_for_instance_ready(
        &self,
        instance_id: &str,
        duration: Option<Duration>,
    ) -> Result<(), EC2Error> {
        self.client
            .wait_until_instance_status_ok()
            .instance_ids(instance_id)
            .wait(duration.unwrap_or(Duration::from_secs(60)))
            .await
            .map_err(|err| match err {
                WaiterError::ExceededMaxWait(exceeded) => EC2Error(format!(
                    "Exceeded max time ({}s) waiting for instance to start.",
                    exceeded.max_wait().as_secs()
                )),
                _ => EC2Error::from(err),
            })?;
        Ok(())
    }

    pub async fn wait_for_instance_stopped(
        &self,
```

```
        instance_id: &str,
        duration: Option<Duration>,
    ) -> Result<(), EC2Error> {
        self.client
            .wait_until_instance_stopped()
            .instance_ids(instance_id)
            .wait(duration.unwrap_or(Duration::from_secs(60)))
            .await
            .map_err(|err| match err {
                WaiterError::ExceededMaxWait(exceeded) => EC2Error(format!(
                    "Exceeded max time ({}s) waiting for instance to stop.",
                    exceeded.max_wait().as_secs(),
                )),
                _ => EC2Error::from(err),
            })?;
        Ok(())
    }
```

- Untuk API detailnya, lihat RebootInstances AWSSDKAPIreferensi Rust.

## SAP ABAP

### SDKuntuk SAP ABAP

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    DATA lt_instance_ids TYPE /aws1/
cl_ec2instidstringlist_w=>tt_instanceidstringlist.
    APPEND NEW /aws1/cl_ec2instidstringlist_w( iv_value = iv_instance_id ) TO
 lt_instance_ids.

    "Perform dry run"
    TRY.
        " DryRun is set to true. This checks for the required permissions to
 reboot the instance without actually making the request. "
        lo_ec2->rebootinstances(
          it_instanceids = lt_instance_ids
```

```
          iv_dryrun = abap_true
        ).
      CATCH /aws1/cx_rt_service_generic INTO DATA(lo_exception).
        " If the error code returned is `DryRunOperation`, then you have the
 required permissions to reboot this instance. "
        IF lo_exception->av_err_code = 'DryRunOperation'.
          MESSAGE 'Dry run to reboot instance completed.' TYPE 'I'.
          " DryRun is set to false to make a reboot request. "
          lo_ec2->rebootinstances(
             it_instanceids = lt_instance_ids
             iv_dryrun = abap_false
           ).
          MESSAGE 'Instance rebooted.' TYPE 'I'.
          " If the error code returned is `UnauthorizedOperation`, then you don't
 have the required permissions to reboot this instance. "
        ELSEIF lo_exception->av_err_code = 'UnauthorizedOperation'.
          MESSAGE 'Dry run to reboot instance failed. User does not have
 permissions to reboot the instance.' TYPE 'E'.
        ELSE.
          DATA(lv_error) = |"{ lo_exception->av_err_code }" - { lo_exception-
>av_err_msg }|.
          MESSAGE lv_error TYPE 'E'.
        ENDIF.
    ENDTRY.
```

- Untuk API detailnya, lihat RebootInstances AWSSDKuntuk SAP ABAP API referensi.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`RegisterImage`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`RegisterImage`.

CLI

AWS CLI

Contoh 1: Untuk mendaftarkan file AMI menggunakan manifes

`register-image`Contoh berikut mendaftarkan AMI penggunaan file manifes yang ditentukan di Amazon S3.

```
aws ec2 register-image \
    --name my-image \
    --image-location my-s3-bucket/myimage/image.manifest.xml
```

Output:

```
{
    "ImageId": "ami-1234567890EXAMPLE"
}
```

Untuk informasi selengkapnya, lihat Gambar Mesin Amazon (AMI) di Panduan EC2 Pengguna Amazon.

Contoh 2: Untuk mendaftarkan snapshot AMI menggunakan perangkat root

`register-image`Contoh berikut mendaftarkan AMI penggunaan snapshot yang ditentukan dari volume EBS root sebagai perangkat. `/dev/xvda` Pemetaan perangkat blok juga mencakup volume 100 EBS GiB kosong sebagai perangkat. `/dev/xvdf`

```
aws ec2 register-image \
    --name my-image \
    --root-device-name /dev/xvda \
    --block-device-mappings DeviceName=/dev/
xvda,Ebs={SnapshotId=snap-0db2cf683925d191f} DeviceName=/dev/
xvdf,Ebs={VolumeSize=100}
```

Output:

```
{
    "ImageId": "ami-1a2b3c4d5eEXAMPLE"
}
```

Untuk informasi selengkapnya, lihat Gambar Mesin Amazon (AMI) di Panduan EC2 Pengguna Amazon.

- Untuk API detailnya, lihat RegisterImagedi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini mendaftarkan AMI penggunaan file manifes yang ditentukan di Amazon S3.

```
Register-EC2Image -ImageLocation amzn-s3-demo-bucket/my-web-server-ami/
image.manifest.xml -Name my-web-server-ami
```

- Untuk API detailnya, lihat RegisterImagedi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`RejectVpcPeeringConnection`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`RejectVpcPeeringConnection`.

CLI

AWS CLI

Untuk menolak koneksi VPC peering

Contoh ini menolak permintaan koneksi VPC peering yang ditentukan.

Perintah:

```
aws ec2 reject-vpc-peering-connection --vpc-peering-connection-id pcx-1a2b3c4d
```

Output:

```
{
    "Return": true
}
```

- Untuk API detailnya, lihat RejectVpcPeeringConnectiondi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh di atas menolak permintaan VpcPeering permintaan id pcx-01a2b3ce45fe67eb8

```
Deny-EC2VpcPeeringConnection -VpcPeeringConnectionId pcx-01a2b3ce45fe67eb8
```

- Untuk API detailnya, lihat RejectVpcPeeringConnectiondi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`ReleaseAddress`** dengan AWS SDK atau CLI

Contoh kode berikut menunjukkan cara menggunakan`ReleaseAddress`.

Contoh tindakan adalah kutipan kode dari program yang lebih besar dan harus dijalankan dalam konteks. Anda dapat melihat tindakan ini dalam konteks dalam contoh kode berikut:

- Pelajari dasar-dasarnya

.NET

AWS SDK for .NET

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    /// <summary>
    /// Release an Elastic IP address. After the Elastic IP address is released,
    /// it can no longer be used.
    /// </summary>
```

```
    /// <param name="allocationId">The allocation Id of the Elastic IP address.</
param>
    /// <returns>True if successful.</returns>
    public async Task<bool> ReleaseAddress(string allocationId)
    {
        try
        {
            var request = new ReleaseAddressRequest { AllocationId =
 allocationId };

            var response = await _amazonEC2.ReleaseAddressAsync(request);
            return response.HttpStatusCode == HttpStatusCode.OK;
        }
        catch (AmazonEC2Exception ec2Exception)
        {
            if (ec2Exception.ErrorCode == "InvalidAllocationID.NotFound")
            {
                _logger.LogError(
                    $"AllocationId {allocationId} was not found.
 {ec2Exception.Message}");
            }

            return false;
        }
        catch (Exception ex)
        {
            _logger.LogError(
                $"An error occurred while releasing the AllocationId
 {allocationId}.: {ex.Message}");
            return false;
        }
    }
```

- Untuk API detailnya, lihat ReleaseAddressdi AWS SDK for .NET APIReferensi.

## Bash

### AWS CLI dengan skrip Bash

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
###############################################################################
# function ec2_release_address
#
# This function releases an Elastic IP address from an Amazon Elastic Compute
 Cloud (Amazon EC2) instance.
#
# Parameters:
#       -a allocation_id - The allocation ID of the Elastic IP address to
 release.
#
# Returns:
#       0 - If successful.
#       1 - If it fails.
#
###############################################################################
function ec2_release_address() {
  local allocation_id response

  # Function to display usage information
  function usage() {
    echo "function ec2_release_address"
    echo "Releases an Elastic IP address from an Amazon Elastic Compute Cloud
 (Amazon EC2) instance."
    echo "  -a allocation_id - The allocation ID of the Elastic IP address to
 release."
    echo ""
  }

  # Parse the command-line arguments
  while getopts "a:h" option; do
    case "${option}" in
      a) allocation_id="${OPTARG}" ;;
```

```
      h)
        usage
        return 0
        ;;
      \?)
        echo "Invalid parameter"
        usage
        return 1
        ;;
    esac
  done
  export OPTIND=1

  # Validate the input parameters
  if [[ -z "$allocation_id" ]]; then
    errecho "ERROR: You must provide an allocation ID with the -a parameter."
    return 1
  fi

  response=$(aws ec2 release-address \
    --allocation-id "$allocation_id") || {
    aws_cli_error_log ${?}
    errecho "ERROR: AWS reports release-address operation failed."
    errecho "$response"
    return 1
  }

  return 0
}
```

Fungsi utilitas yang digunakan dalam contoh ini.

```
###############################################################################
# function errecho
#
# This function outputs everything sent to it to STDERR (standard error output).
###############################################################################
function errecho() {
  printf "%s\n" "$*" 1>&2
}

###############################################################################
```

```
# function aws_cli_error_log()
#
# This function is used to log the error messages from the AWS CLI.
#
# The function expects the following argument:
#         $1 - The error code returned by the AWS CLI.
#
#  Returns:
#          0: - Success.
#
################################################################################
function aws_cli_error_log() {
  local err_code=$1
  errecho "Error code : $err_code"
  if [ "$err_code" == 1 ]; then
    errecho "  One or more S3 transfers failed."
  elif [ "$err_code" == 2 ]; then
    errecho "  Command line failed to parse."
  elif [ "$err_code" == 130 ]; then
    errecho "  Process received SIGINT."
  elif [ "$err_code" == 252 ]; then
    errecho "  Command syntax invalid."
  elif [ "$err_code" == 253 ]; then
    errecho "  The system environment or configuration was invalid."
  elif [ "$err_code" == 254 ]; then
    errecho "  The service returned an error."
  elif [ "$err_code" == 255 ]; then
    errecho "  255 is a catch-all error."
  fi

  return 0
}
```

- Untuk API detailnya, lihat ReleaseAddressdi Referensi AWS CLI Perintah.

C++

SDKuntuk C ++

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
//! Release an Elastic IP address.
/*!
  \param clientConfiguration: AWS client configuration.
  \return bool: Function succeeded.
 */
bool AwsDoc::EC2::releaseAddress(const Aws::String &allocationID,
                                 const Aws::Client::ClientConfiguration
 &clientConfiguration) {
    Aws::EC2::EC2Client ec2(clientConfiguration);

    Aws::EC2::Model::ReleaseAddressRequest request;
    request.SetAllocationId(allocationID);

    Aws::EC2::Model::ReleaseAddressOutcome outcome = ec2.ReleaseAddress(request);
    if (!outcome.IsSuccess()) {
        std::cerr << "Failed to release Elastic IP address " <<
                  allocationID << ":" << outcome.GetError().GetMessage() <<
                  std::endl;
    } else {
        std::cout << "Successfully released Elastic IP address " <<
                  allocationID << std::endl;
    }

    return outcome.IsSuccess();
}
```

- Untuk API detailnya, lihat ReleaseAddressdi AWS SDK for C++ APIReferensi.

CLI

AWS CLI

Untuk merilis alamat IP Elastis untuk EC2 -Classic

Contoh ini merilis alamat IP Elastis untuk digunakan dengan instance di EC2 -Classic. Jika perintah berhasil, tidak ada output yang akan ditampilkan.

Perintah:

```
aws ec2 release-address --public-ip 198.51.100.0
```

Untuk merilis alamat IP Elastis untuk EC2 - VPC

Contoh ini merilis alamat IP Elastis untuk digunakan dengan instance di file. VPC Jika perintah berhasil, tidak ada output yang akan ditampilkan.

Perintah:

```
aws ec2 release-address --allocation-id eipalloc-64d5890a
```

- Untuk API detailnya, lihat ReleaseAddressdi Referensi AWS CLI Perintah.

Java

SDKuntuk Java 2.x

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    /**
     * Releases an Elastic IP address asynchronously.
     *
     * @param allocId the allocation ID of the Elastic IP address to be released
     * @return a {@link CompletableFuture} representing the asynchronous
operation of releasing the Elastic IP address
     */
```

```
    public CompletableFuture<ReleaseAddressResponse>
releaseEC2AddressAsync(String allocId) {
        ReleaseAddressRequest request = ReleaseAddressRequest.builder()
            .allocationId(allocId)
            .build();

        CompletableFuture<ReleaseAddressResponse> response =
getAsyncClient().releaseAddress(request);
        response.whenComplete((resp, ex) -> {
            if (ex != null) {
                throw new RuntimeException("Failed to release Elastic IP
address", ex);
            }
        });

        return response;
    }
```

- Untuk API detailnya, lihat ReleaseAddressdi AWS SDK for Java 2.x APIReferensi.

JavaScript

SDKuntuk JavaScript (v3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
import { ReleaseAddressCommand, EC2Client } from "@aws-sdk/client-ec2";

/**
 * Release an Elastic IP address.
 * @param {{ allocationId: string }} options
 */
export const main = async ({ allocationId }) => {
  const client = new EC2Client({});
  const command = new ReleaseAddressCommand({
    // You can also use PublicIp, but that is for EC2 classic which is being
retired.
```

```
    AllocationId: allocationId,
  });

  try {
    await client.send(command);
    console.log("Successfully released address.");
  } catch (caught) {
    if (
      caught instanceof Error &&
      caught.name === "InvalidAllocationID.NotFound"
    ) {
      console.warn(`${caught.message}. Please provide a valid AllocationID.`);
    } else {
      throw caught;
    }
  }
};
```

- Untuk API detailnya, lihat ReleaseAddressdi AWS SDK for JavaScript APIReferensi.

Kotlin

SDKuntuk Kotlin

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
suspend fun releaseEC2AddressSc(allocId: String?) {
    val request =
        ReleaseAddressRequest {
            allocationId = allocId
        }

    Ec2Client { region = "us-west-2" }.use { ec2 ->
        ec2.releaseAddress(request)
        println("Successfully released Elastic IP address $allocId")
    }
}
```

- Untuk API detailnya, lihat ReleaseAddress AWSSDKAPIreferensi Kotlin.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini merilis alamat IP Elastis yang ditentukan untuk instance dalam file. VPC

```
Remove-EC2Address -AllocationId eipalloc-12345678 -Force
```

Contoh 2: Contoh ini merilis alamat IP Elastis yang ditentukan untuk instance di EC2 -Classic.

```
Remove-EC2Address -PublicIp 198.51.100.2 -Force
```

- Untuk API detailnya, lihat ReleaseAddressdi AWS Tools for PowerShell Referensi Cmdlet.

Python

SDKuntuk Python (Boto3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
class ElasticIpWrapper:
    """Encapsulates Amazon Elastic Compute Cloud (Amazon EC2) Elastic IP address
 actions using the client interface."""

    class ElasticIp:
        """Represents an Elastic IP and its associated instance."""

        def __init__(
            self, allocation_id: str, public_ip: str, instance_id: Optional[str]
 = None
        ) -> None:
            """
```

```
            Initializes the ElasticIp object.

            :param allocation_id: The allocation ID of the Elastic IP.
            :param public_ip: The public IP address of the Elastic IP.
            :param instance_id: The ID of the associated EC2 instance, if any.
            """
            self.allocation_id = allocation_id
            self.public_ip = public_ip
            self.instance_id = instance_id

    def __init__(self, ec2_client: Any) -> None:
        """
        Initializes the ElasticIpWrapper with an EC2 client.

        :param ec2_client: A Boto3 Amazon EC2 client. This client provides low-
level
                           access to AWS EC2 services.
        """
        self.ec2_client = ec2_client
        self.elastic_ips: List[ElasticIpWrapper.ElasticIp] = []

    @classmethod
    def from_client(cls) -> "ElasticIpWrapper":
        """
        Creates an ElasticIpWrapper instance with a default EC2 client.

        :return: An instance of ElasticIpWrapper initialized with the default EC2
 client.
        """
        ec2_client = boto3.client("ec2")
        return cls(ec2_client)


    def release(self, allocation_id: str) -> None:
        """
        Releases an Elastic IP address. After the Elastic IP address is released,
        it can no longer be used.

        :param allocation_id: The allocation ID of the Elastic IP to release.
        :raises ClientError: If the release fails, such as when the Elastic IP
 address is not found.
        """
        elastic_ip = self.get_elastic_ip_by_allocation(self.elastic_ips,
 allocation_id)
```

```
        if elastic_ip is None:
            logger.info(f"No Elastic IP found with allocation ID
{allocation_id}.")
            return

        try:
            self.ec2_client.release_address(AllocationId=allocation_id)
            self.elastic_ips.remove(elastic_ip)  # Remove the Elastic IP from the
list
        except ClientError as err:
            if err.response["Error"]["Code"] == "InvalidAddress.NotFound":
                logger.error(
                    f"Failed to release Elastic IP address {allocation_id} "
                    "because it could not be found. Verify the Elastic IP address
"
                    "and ensure it is allocated to your account in the correct
region "
                    "before attempting to release it."
                )
            raise
```

- Untuk API detailnya, lihat ReleaseAddress AWSSDKReferensi Python (Boto3). API

Ruby

SDKuntuk Ruby

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
# Releases an Elastic IP address from an
# Amazon Elastic Compute Cloud (Amazon EC2) instance.
#
# Prerequisites:
#
# - An Amazon EC2 instance with an associated Elastic IP address.
#
```

```
# @param ec2_client [Aws::EC2::Client] An initialized EC2 client.
# @param allocation_id [String] The ID of the allocation corresponding to
#   the Elastic IP address.
# @return [Boolean] true if the Elastic IP address was released;
#   otherwise, false.
# @example
#   exit 1 unless elastic_ip_address_released?(
#     Aws::EC2::Client.new(region: 'us-west-2'),
#     'eipalloc-04452e528a66279EX'
#   )
def elastic_ip_address_released?(ec2_client, allocation_id)
  ec2_client.release_address(allocation_id: allocation_id)
  true
rescue StandardError => e
  puts("Error releasing Elastic IP address: #{e.message}")
  false
end
```

- Untuk API detailnya, lihat ReleaseAddressdi AWS SDK for Ruby APIReferensi.

Rust

SDKuntuk Rust

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    pub async fn deallocate_ip_address(&self, allocation_id: &str) -> Result<(),
EC2Error> {
        self.client
            .release_address()
            .allocation_id(allocation_id)
            .send()
            .await?;
        Ok(())
    }
```

- Untuk API detailnya, lihat ReleaseAddress AWSSDKAPIreferensi Rust.

SAP ABAP

SDKuntuk SAP ABAP

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    TRY.
        lo_ec2->releaseaddress( iv_allocationid = iv_allocation_id ).
        MESSAGE 'Elastic IP address released.' TYPE 'I'.
      CATCH /aws1/cx_rt_service_generic INTO DATA(lo_exception).
        DATA(lv_error) = |"{ lo_exception->av_err_code }" - { lo_exception-
>av_err_msg }|.
        MESSAGE lv_error TYPE 'E'.
    ENDTRY.
```

- Untuk API detailnya, lihat ReleaseAddress AWSSDKuntuk SAP ABAP API referensi.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`ReleaseHosts`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`ReleaseHosts`.

CLI

AWS CLI

Untuk melepaskan host Khusus dari akun Anda

Untuk melepaskan host Khusus dari akun Anda. Instance yang ada di host harus dihentikan atau dihentikan sebelum host dapat dirilis.

Perintah:

```
aws ec2 release-hosts --host-id=h-0029d6e3cacf1b3da
```

Output:

```
{
    "Successful":  [
        "h-0029d6e3cacf1b3da"
         ],
  "Unsuccessful": []

 }
```

- Untuk API detailnya, lihat ReleaseHostsdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini merilis ID host yang diberikan h-0badafd1dcb2f3456

```
Remove-EC2Host -HostId h-0badafd1dcb2f3456
```

Output:

```
Confirm
Are you sure you want to perform this action?
Performing the operation "Remove-EC2Host (ReleaseHosts)" on target
 "h-0badafd1dcb2f3456".
[Y] Yes  [A] Yes to All  [N] No  [L] No to All  [S] Suspend  [?] Help (default is
 "Y"): Y

Successful            Unsuccessful
----------            ------------
{h-0badafd1dcb2f3456} {}
```

- Untuk API detailnya, lihat ReleaseHostsdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`ReplaceIamInstanceProfileAssociation`** dengan AWS SDK atau CLI

Contoh kode berikut menunjukkan cara menggunakan`ReplaceIamInstanceProfileAssociation`.

Contoh tindakan adalah kutipan kode dari program yang lebih besar dan harus dijalankan dalam konteks. Anda dapat melihat tindakan ini dalam konteks dalam contoh kode berikut:

- Membangun dan mengelola layanan yang tangguh

.NET

AWS SDK for .NET

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
   /// <summary>
   /// Replace the profile associated with a running instance. After the profile
is replaced, the instance
   /// is rebooted to ensure that it uses the new profile. When the instance is
ready, Systems Manager is
   /// used to restart the Python web server.
   /// </summary>
   /// <param name="instanceId">The Id of the instance to update.</param>
   /// <param name="credsProfileName">The name of the new profile to associate
with the specified instance.</param>
   /// <param name="associationId">The Id of the existing profile association
for the instance.</param>
   /// <returns>Async task.</returns>
   public async Task ReplaceInstanceProfile(string instanceId, string
credsProfileName, string associationId)
   {
       try
```

```
        {
            await _amazonEc2.ReplaceIamInstanceProfileAssociationAsync(
                new ReplaceIamInstanceProfileAssociationRequest()
                {
                    AssociationId = associationId,
                    IamInstanceProfile = new IamInstanceProfileSpecification()
                    {
                        Name = credsProfileName
                    }
                });
            // Allow time before resetting.
            Thread.Sleep(25000);

            await _amazonEc2.RebootInstancesAsync(
                new RebootInstancesRequest(new List<string>() { instanceId }));
            Thread.Sleep(25000);
            var instanceReady = false;
            var retries = 5;
            while (retries-- > 0 && !instanceReady)
            {
                var instancesPaginator =
                    _amazonSsm.Paginators.DescribeInstanceInformation(
                        new DescribeInstanceInformationRequest());
                // Get the entire list using the paginator.
                await foreach (var instance in
instancesPaginator.InstanceInformationList)
                {
                    instanceReady = instance.InstanceId == instanceId;
                    if (instanceReady)
                    {
                        break;
                    }
                }
            }
            Console.WriteLine("Waiting for instance to be running.");
            await WaitForInstanceState(instanceId, InstanceStateName.Running);
            Console.WriteLine("Instance ready.");
            Console.WriteLine($"Sending restart command to instance
{instanceId}");
            await _amazonSsm.SendCommandAsync(
                new SendCommandRequest()
                {
                    InstanceIds = new List<string>() { instanceId },
                    DocumentName = "AWS-RunShellScript",
```

```
                    Parameters = new Dictionary<string, List<string>>()
                    {
                        {
                            "commands",
                            new List<string>() { "cd / && sudo python3 server.py
80" }
                        }
                    }
                });
            Console.WriteLine($"Restarted the web server on instance
{instanceId}");
        }
        catch (AmazonEC2Exception ec2Exception)
        {
            if (ec2Exception.ErrorCode == "InvalidInstanceID.NotFound")
            {
                _logger.LogError(ec2Exception, $"Instance {instanceId} not
found");
            }

            throw;
        }
        catch (Exception ex)
        {
            _logger.LogError(ex, $"An error occurred while replacing the
template.: {ex.Message}");
            throw;
        }
    }
```

- Untuk API detailnya, lihat ReplaceIamInstanceProfileAssociationdi AWS SDK for .NET APIReferensi.

CLI

AWS CLI

Untuk mengganti profil IAM instance untuk sebuah instance

Contoh ini menggantikan profil IAM instance yang diwakili oleh asosiasi `iip-assoc-060bae234aac2e7fa` dengan profil IAM instance bernama`AdminRole`.

```
aws ec2 replace-iam-instance-profile-association \
    --iam-instance-profile Name=AdminRole \
    --association-id iip-assoc-060bae234aac2e7fa
```

Output:

```
{
    "IamInstanceProfileAssociation": {
        "InstanceId": "i-087711ddaf98f9489",
        "State": "associating",
        "AssociationId": "iip-assoc-0b215292fab192820",
        "IamInstanceProfile": {
            "Id": "AIPAJLNLDX3AMYZNWYYAY",
            "Arn": "arn:aws:iam::123456789012:instance-profile/AdminRole"
        }
    }
}
```

- Untuk API detailnya, lihat ReplaceIamInstanceProfileAssociationdi Referensi AWS CLI Perintah.

JavaScript

SDKuntuk JavaScript (v3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
  await retry({ intervalInMs: 1000, maxRetries: 30 }, () =>
    ec2Client.send(
      new ReplaceIamInstanceProfileAssociationCommand({
        AssociationId: state.instanceProfileAssociationId,
        IamInstanceProfile: { Name: NAMES.ssmOnlyInstanceProfileName },
      }),
    ),
  );
```

- Untuk API detailnya, lihat ReplaceIamInstanceProfileAssociationdi AWS SDK for JavaScript APIReferensi.

Python

SDKuntuk Python (Boto3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

Contoh ini mengganti profil instans dari instans yang sedang berjalan, menyalakan ulang instans, dan mengirimkan perintah ke instans tersebut setelah dimulai.

```
class AutoScalingWrapper:
    """
    Encapsulates Amazon EC2 Auto Scaling and EC2 management actions.
    """

    def __init__(
        self,
        resource_prefix: str,
        inst_type: str,
        ami_param: str,
        autoscaling_client: boto3.client,
        ec2_client: boto3.client,
        ssm_client: boto3.client,
        iam_client: boto3.client,
    ):
        """
        Initializes the AutoScaler class with the necessary parameters.

        :param resource_prefix: The prefix for naming AWS resources that are
 created by this class.
        :param inst_type: The type of EC2 instance to create, such as t3.micro.
        :param ami_param: The Systems Manager parameter used to look up the AMI
 that is created.
        :param autoscaling_client: A Boto3 EC2 Auto Scaling client.
        :param ec2_client: A Boto3 EC2 client.
```

```
        :param ssm_client: A Boto3 Systems Manager client.
        :param iam_client: A Boto3 IAM client.
        """
        self.inst_type = inst_type
        self.ami_param = ami_param
        self.autoscaling_client = autoscaling_client
        self.ec2_client = ec2_client
        self.ssm_client = ssm_client
        self.iam_client = iam_client
        sts_client = boto3.client("sts")
        self.account_id = sts_client.get_caller_identity()["Account"]

        self.key_pair_name = f"{resource_prefix}-key-pair"
        self.launch_template_name = f"{resource_prefix}-template-"
        self.group_name = f"{resource_prefix}-group"

        # Happy path
        self.instance_policy_name = f"{resource_prefix}-pol"
        self.instance_role_name = f"{resource_prefix}-role"
        self.instance_profile_name = f"{resource_prefix}-prof"

        # Failure mode
        self.bad_creds_policy_name = f"{resource_prefix}-bc-pol"
        self.bad_creds_role_name = f"{resource_prefix}-bc-role"
        self.bad_creds_profile_name = f"{resource_prefix}-bc-prof"


    def replace_instance_profile(
        self,
        instance_id: str,
        new_instance_profile_name: str,
        profile_association_id: str,
    ) -> None:
        """
        Replaces the profile associated with a running instance. After the
profile is
        replaced, the instance is rebooted to ensure that it uses the new
profile. When
        the instance is ready, Systems Manager is used to restart the Python web
server.

        :param instance_id: The ID of the instance to restart.
        :param new_instance_profile_name: The name of the new profile to
associate with
```

```
                                          the specified instance.
        :param profile_association_id: The ID of the existing profile association
for the
                                       instance.
        """
        try:
            self.ec2_client.replace_iam_instance_profile_association(
                IamInstanceProfile={"Name": new_instance_profile_name},
                AssociationId=profile_association_id,
            )
            log.info(
                "Replaced instance profile for association %s with profile %s.",
                profile_association_id,
                new_instance_profile_name,
            )
            time.sleep(5)

            self.ec2_client.reboot_instances(InstanceIds=[instance_id])
            log.info("Rebooting instance %s.", instance_id)
            waiter = self.ec2_client.get_waiter("instance_running")
            log.info("Waiting for instance %s to be running.", instance_id)
            waiter.wait(InstanceIds=[instance_id])
            log.info("Instance %s is now running.", instance_id)

            self.ssm_client.send_command(
                InstanceIds=[instance_id],
                DocumentName="AWS-RunShellScript",
                Parameters={"commands": ["cd / && sudo python3 server.py 80"]},
            )
            log.info(f"Restarted the Python web server on instance
'{instance_id}'.")
        except ClientError as err:
            log.error("Failed to replace instance profile.")
            error_code = err.response["Error"]["Code"]
            if error_code == "InvalidAssociationID.NotFound":
                log.error(
                    f"Association ID '{profile_association_id}' does not exist."
                    "Please check the association ID and try again."
                )
            if error_code == "InvalidInstanceId":
                log.error(
                    f"The specified instance ID '{instance_id}' does not exist or
is not available for SSM. "
                    f"Please verify the instance ID and try again."
```

```
                )
            log.error(f"Full error:\n\t{err}")
```

- Untuk API detailnya, lihat ReplaceIamInstanceProfileAssociation AWSSDKReferensi Python (Boto3). API

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`ReplaceNetworkAclAssociation`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`ReplaceNetworkAclAssociation`.

CLI

AWS CLI

Untuk mengganti jaringan yang ACL terkait dengan subnet

Contoh ini mengaitkan jaringan tertentu ACL dengan subnet untuk asosiasi jaringan ACL yang ditentukan.

Perintah:

```
aws ec2 replace-network-acl-association --association-id aclassoc-e5b95c8c --
network-acl-id acl-5fb85d36
```

Output:

```
{
    "NewAssociationId": "aclassoc-3999875b"
}
```

- Untuk API detailnya, lihat ReplaceNetworkAclAssociationdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini mengaitkan jaringan tertentu ACL dengan subnet untuk asosiasi jaringan ACL yang ditentukan.

```
Set-EC2NetworkAclAssociation -NetworkAclId acl-12345678 -AssociationId
 aclassoc-1a2b3c4d
```

Output:

```
aclassoc-87654321
```

- Untuk API detailnya, lihat ReplaceNetworkAclAssociationdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`ReplaceNetworkAclEntry`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`ReplaceNetworkAclEntry`.

CLI

AWS CLI

Untuk mengganti ACL entri jaringan

Contoh ini menggantikan entri untuk jaringan ACL yang ditentukan. Aturan baru 100 memungkinkan masuknya lalu lintas dari 203.0.113.12/24 pada UDP port 53 () ke subnet terkait. DNS

Perintah:

```
aws ec2 replace-network-acl-entry --network-acl-id acl-5fb85d36 --ingress --rule-
number 100 --protocol udp --port-range From=53,To=53 --cidr-block 203.0.113.12/24
 --rule-action allow
```

- Untuk API detailnya, lihat ReplaceNetworkAclEntrydi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menggantikan entri yang ditentukan untuk jaringan ACL yang ditentukan. Aturan baru memungkinkan lalu lintas masuk dari alamat yang ditentukan ke subnet terkait.

```
Set-EC2NetworkAclEntry -NetworkAclId acl-12345678 -Egress $false -RuleNumber 100
 -Protocol 17 -PortRange_From 53 -PortRange_To 53 -CidrBlock 203.0.113.12/24 -
RuleAction allow
```

- Untuk API detailnya, lihat ReplaceNetworkAclEntrydi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`ReplaceRoute`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`ReplaceRoute`.

CLI

AWS CLI

Untuk mengganti rute

Contoh ini menggantikan rute yang ditentukan dalam tabel rute yang ditentukan. Rute baru cocok dengan yang ditentukan CIDR dan mengirimkan lalu lintas ke gateway pribadi virtual yang ditentukan. Jika perintah berhasil, tidak ada output yang akan ditampilkan.

Perintah:

```
aws ec2 replace-route --route-table-id rtb-22574640 --destination-cidr-
block 10.0.0.0/16 --gateway-id vgw-9a4cacf3
```

- Untuk API detailnya, lihat ReplaceRoutedi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menggantikan rute yang ditentukan untuk tabel rute yang ditentukan. Rute baru mengirimkan lalu lintas yang ditentukan ke gateway pribadi virtual yang ditentukan.

```
Set-EC2Route -RouteTableId rtb-1a2b3c4d -DestinationCidrBlock 10.0.0.0/24 -
GatewayId vgw-1a2b3c4d
```

- Untuk API detailnya, lihat ReplaceRoutedi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`ReplaceRouteTableAssociation`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`ReplaceRouteTableAssociation`.

CLI

AWS CLI

Untuk mengganti tabel rute yang terkait dengan subnet

Contoh ini mengaitkan tabel rute yang ditentukan dengan subnet untuk asosiasi tabel rute yang ditentukan.

Perintah:

```
aws ec2 replace-route-table-association --association-id rtbassoc-781d0d1a --
route-table-id rtb-22574640
```

Output:

```
{
    "NewAssociationId": "rtbassoc-3a1f0f58"
}
```

- Untuk API detailnya, lihat ReplaceRouteTableAssociationdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini mengaitkan tabel rute yang ditentukan dengan subnet untuk asosiasi tabel rute yang ditentukan.

```
Set-EC2RouteTableAssociation -RouteTableId rtb-1a2b3c4d -AssociationId
 rtbassoc-12345678
```

Output:

```
rtbassoc-87654321
```

- Untuk API detailnya, lihat ReplaceRouteTableAssociationdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`ReportInstanceStatus`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`ReportInstanceStatus`.

CLI

AWS CLI

Untuk melaporkan umpan balik status untuk sebuah instance

Perintah contoh ini melaporkan umpan balik status untuk instance tertentu.

Perintah:

```
aws ec2 report-instance-status --instances i-1234567890abcdef0 --status impaired
 --reason-codes unresponsive
```

- Untuk API detailnya, lihat ReportInstanceStatusdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini melaporkan umpan balik status untuk contoh yang ditentukan.

```
Send-EC2InstanceStatus -Instance i-12345678 -Status impaired -ReasonCode
 unresponsive
```

- Untuk API detailnya, lihat ReportInstanceStatusdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`RequestSpotFleet`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`RequestSpotFleet`.

CLI

AWS CLI

Untuk meminta armada Spot di subnet dengan harga terendah

Perintah contoh ini membuat permintaan armada Spot dengan dua spesifikasi peluncuran yang hanya berbeda dengan subnet. Armada Spot meluncurkan instans di subnet yang ditentukan dengan harga terendah. Jika instance diluncurkan secara defaultVPC, mereka menerima alamat IP publik secara default. Jika instance diluncurkan secara nondefaultVPC, mereka tidak menerima alamat IP publik secara default.

Perhatikan bahwa Anda tidak dapat menentukan subnet yang berbeda dari Availability Zone yang sama dalam permintaan armada Spot.

Perintah:

```
aws ec2 request-spot-fleet --spot-fleet-request-config file://config.json
```

config.json:

```
{
  "SpotPrice": "0.04",
  "TargetCapacity": 2,
  "IamFleetRole": "arn:aws:iam::123456789012:role/my-spot-fleet-role",
  "LaunchSpecifications": [
      {
          "ImageId": "ami-1a2b3c4d",
          "KeyName": "my-key-pair",
          "SecurityGroups": [
              {
                  "GroupId": "sg-1a2b3c4d"
              }
          ],
          "InstanceType": "m3.medium",
          "SubnetId": "subnet-1a2b3c4d, subnet-3c4d5e6f",
          "IamInstanceProfile": {
              "Arn": "arn:aws:iam::123456789012:instance-profile/my-iam-role"
          }
      }
  ]
}
```

Output:

```
{
  "SpotFleetRequestId": "sfr-73fbd2ce-aa30-494c-8788-1cee4EXAMPLE"
}
```

Untuk meminta armada Spot di Availability Zone dengan harga terendah

Perintah contoh ini membuat permintaan armada Spot dengan dua spesifikasi peluncuran yang hanya berbeda dengan Availability Zone. Armada Spot meluncurkan instans di Availability Zone yang ditentukan dengan harga terendah. Jika akun Anda mendukung EC2 - VPC saja, Amazon EC2 meluncurkan instans Spot di subnet default Availability Zone. Jika akun Anda mendukung EC2 -Classic, Amazon EC2 meluncurkan instans di EC2 -Classic di Availability Zone.

Perintah:

```
aws ec2 request-spot-fleet --spot-fleet-request-config file://config.json
```

config.json:

```
{
  "SpotPrice": "0.04",
  "TargetCapacity": 2,
  "IamFleetRole": "arn:aws:iam::123456789012:role/my-spot-fleet-role",
  "LaunchSpecifications": [
      {
          "ImageId": "ami-1a2b3c4d",
          "KeyName": "my-key-pair",
          "SecurityGroups": [
              {
                  "GroupId": "sg-1a2b3c4d"
              }
          ],
          "InstanceType": "m3.medium",
          "Placement": {
              "AvailabilityZone": "us-west-2a, us-west-2b"
          },
          "IamInstanceProfile": {
              "Arn": "arn:aws:iam::123456789012:instance-profile/my-iam-role"
          }
      }
  ]
}
```

Untuk meluncurkan instans Spot di subnet dan menetapkannya alamat IP publik

Perintah contoh ini menetapkan alamat publik ke instance yang diluncurkan secara nondefault. VPC Perhatikan bahwa ketika Anda menentukan antarmuka jaringan, Anda harus menyertakan ID subnet dan ID grup keamanan menggunakan antarmuka jaringan.

Perintah:

```
aws ec2 request-spot-fleet --spot-fleet-request-config file://config.json
```

config.json:

```
{
  "SpotPrice": "0.04",
  "TargetCapacity": 2,
  "IamFleetRole": "arn:aws:iam::123456789012:role/my-spot-fleet-role",
```

```
  "LaunchSpecifications": [
      {
          "ImageId": "ami-1a2b3c4d",
          "KeyName": "my-key-pair",
          "InstanceType": "m3.medium",
          "NetworkInterfaces": [
              {
                  "DeviceIndex": 0,
                  "SubnetId": "subnet-1a2b3c4d",
                  "Groups": [ "sg-1a2b3c4d" ],
                  "AssociatePublicIpAddress": true
              }
          ],
          "IamInstanceProfile": {
              "Arn": "arn:aws:iam::880185128111:instance-profile/my-iam-role"
          }
      }
  ]
}
```

Untuk meminta armada Spot menggunakan strategi alokasi yang beragam

Perintah contoh ini membuat permintaan armada Spot yang meluncurkan 30 instance menggunakan strategi alokasi yang beragam. Spesifikasi peluncuran berbeda menurut jenis instans. Armada Spot mendistribusikan instans di seluruh spesifikasi peluncuran sehingga ada 10 instance dari setiap jenis.

Perintah:

```
aws ec2 request-spot-fleet --spot-fleet-request-config file://config.json
```

config.json:

```
{
  "SpotPrice": "0.70",
  "TargetCapacity": 30,
  "AllocationStrategy": "diversified",
  "IamFleetRole": "arn:aws:iam::123456789012:role/my-spot-fleet-role",
  "LaunchSpecifications": [
      {
          "ImageId": "ami-1a2b3c4d",
          "InstanceType": "c4.2xlarge",
```

```
            "SubnetId": "subnet-1a2b3c4d"
        },
        {
            "ImageId": "ami-1a2b3c4d",
            "InstanceType": "m3.2xlarge",
            "SubnetId": "subnet-1a2b3c4d"
        },
        {
            "ImageId": "ami-1a2b3c4d",
            "InstanceType": "r3.2xlarge",
            "SubnetId": "subnet-1a2b3c4d"
        }
    ]
}
```

Untuk informasi selengkapnya, lihat Permintaan Armada Spot di Panduan Pengguna Amazon Elastic Compute Cloud.

- Untuk API detailnya, lihat RequestSpotFleetdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini membuat permintaan armada Spot di Availability Zone dengan harga terendah untuk jenis instans yang ditentukan. Jika akun Anda mendukung EC2 - VPC saja, armada Spot meluncurkan instans di Availability Zone dengan harga terendah yang memiliki subnet default. Jika akun Anda mendukung EC2 -Classic, armada Spot meluncurkan instans di EC2 -Classic di Availability Zone dengan harga terendah. Perhatikan bahwa harga yang Anda bayar tidak akan melebihi harga Spot yang ditentukan untuk permintaan tersebut.

```
$sg = New-Object Amazon.EC2.Model.GroupIdentifier
$sg.GroupId = "sg-12345678"
$lc = New-Object Amazon.EC2.Model.SpotFleetLaunchSpecification
$lc.ImageId = "ami-12345678"
$lc.InstanceType = "m3.medium"
$lc.SecurityGroups.Add($sg)
Request-EC2SpotFleet -SpotFleetRequestConfig_SpotPrice 0.04 `
-SpotFleetRequestConfig_TargetCapacity 2 `
-SpotFleetRequestConfig_IamFleetRole arn:aws:iam::123456789012:role/my-spot-
fleet-role `
-SpotFleetRequestConfig_LaunchSpecification $lc
```

- Untuk API detailnya, lihat RequestSpotFleetdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`RequestSpotInstances`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`RequestSpotInstances`.

CLI

AWS CLI

Untuk meminta Instans Spot

Perintah contoh ini membuat permintaan Instans Spot satu kali untuk lima instance di Availability Zone yang ditentukan. Jika akun Anda mendukung EC2 - VPC saja, Amazon EC2 meluncurkan instance di subnet default dari Availability Zone yang ditentukan. Jika akun Anda mendukung EC2 -Classic, Amazon EC2 meluncurkan instance di EC2 -Classic di Availability Zone yang ditentukan.

Perintah:

```
aws ec2 request-spot-instances --spot-price "0.03" --instance-count 5 --
type "one-time" --launch-specification file://specification.json
```

Spesifikasi.json:

```
{
  "ImageId": "ami-1a2b3c4d",
  "KeyName": "my-key-pair",
  "SecurityGroupIds": [ "sg-1a2b3c4d" ],
  "InstanceType": "m3.medium",
  "Placement": {
    "AvailabilityZone": "us-west-2a"
  },
  "IamInstanceProfile": {
      "Arn": "arn:aws:iam::123456789012:instance-profile/my-iam-role"
  }
```

```
}
```

Output:

```
{
  "SpotInstanceRequests": [
      {
          "Status": {
              "UpdateTime": "2014-03-25T20:54:21.000Z",
              "Code": "pending-evaluation",
              "Message": "Your Spot request has been submitted for review, and is
 pending evaluation."
          },
          "ProductDescription": "Linux/UNIX",
          "SpotInstanceRequestId": "sir-df6f405d",
          "State": "open",
          "LaunchSpecification": {
              "Placement": {
                  "AvailabilityZone": "us-west-2a"
              },
              "ImageId": "ami-1a2b3c4d",
              "KeyName": "my-key-pair",
              "SecurityGroups": [
                  {
                      "GroupName": "my-security-group",
                      "GroupId": "sg-1a2b3c4d"
                  }
              ],
              "Monitoring": {
                  "Enabled": false
              },
              "IamInstanceProfile": {
                  "Arn": "arn:aws:iam::123456789012:instance-profile/my-iam-role"
              },
              "InstanceType": "m3.medium"
          },
          "Type": "one-time",
          "CreateTime": "2014-03-25T20:54:20.000Z",
          "SpotPrice": "0.050000"
      },
      ...
  ]
}
```

Perintah contoh ini membuat permintaan Instans Spot satu kali untuk lima instance di subnet yang ditentukan. Amazon EC2 meluncurkan instance di subnet yang ditentukan. Jika nondefaultVPC, instance tidak menerima alamat IP publik secara default. VPC

Perintah:

```
aws ec2 request-spot-instances --spot-price "0.050" --instance-count 5 --
type "one-time" --launch-specification file://specification.json
```

Spesifikasi.json:

```
{
  "ImageId": "ami-1a2b3c4d",
  "SecurityGroupIds": [ "sg-1a2b3c4d" ],
  "InstanceType": "m3.medium",
  "SubnetId": "subnet-1a2b3c4d",
  "IamInstanceProfile": {
      "Arn": "arn:aws:iam::123456789012:instance-profile/my-iam-role"
  }
}
```

Output:

```
{
  "SpotInstanceRequests": [
      {
          "Status": {
             "UpdateTime": "2014-03-25T22:21:58.000Z",
             "Code": "pending-evaluation",
             "Message": "Your Spot request has been submitted for review, and is
 pending evaluation."
          },
          "ProductDescription": "Linux/UNIX",
          "SpotInstanceRequestId": "sir-df6f405d",
          "State": "open",
          "LaunchSpecification": {
             "Placement": {
                 "AvailabilityZone": "us-west-2a"
             }
             "ImageId": "ami-1a2b3c4d"
             "SecurityGroups": [
                 {
```

```
                    "GroupName": "my-security-group",
                    "GroupID": "sg-1a2b3c4d"
                }
            ]
            "SubnetId": "subnet-1a2b3c4d",
            "Monitoring": {
                "Enabled": false
            },
            "IamInstanceProfile": {
                "Arn": "arn:aws:iam::123456789012:instance-profile/my-iam-role"
            },
            "InstanceType": "m3.medium",
        },
        "Type": "one-time",
        "CreateTime": "2014-03-25T22:21:58.000Z",
        "SpotPrice": "0.050000"
      },
      ...
  ]
}
```

Contoh ini menetapkan alamat IP publik ke Instans Spot yang Anda luncurkan secara nondefault. VPC Perhatikan bahwa ketika Anda menentukan antarmuka jaringan, Anda harus menyertakan ID subnet dan ID grup keamanan menggunakan antarmuka jaringan.

Perintah:

```
aws ec2 request-spot-instances --spot-price "0.050" --instance-count 1 --
type "one-time" --launch-specification file://specification.json
```

Spesifikasi.json:

```
{
  "ImageId": "ami-1a2b3c4d",
  "KeyName": "my-key-pair",
  "InstanceType": "m3.medium",
  "NetworkInterfaces": [
    {
      "DeviceIndex": 0,
      "SubnetId": "subnet-1a2b3c4d",
      "Groups": [ "sg-1a2b3c4d" ],
      "AssociatePublicIpAddress": true
```

```
    }
  ],
  "IamInstanceProfile": {
      "Arn": "arn:aws:iam::123456789012:instance-profile/my-iam-role"
  }
}
```

- Untuk API detailnya, lihat RequestSpotInstancesdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini meminta instance Spot satu kali di subnet yang ditentukan. Perhatikan bahwa grup keamanan harus dibuat untuk VPC yang berisi subnet yang ditentukan, dan harus ditentukan oleh ID menggunakan antarmuka jaringan. Saat Anda menentukan antarmuka jaringan, Anda harus menyertakan ID subnet menggunakan antarmuka jaringan.

```
$n = New-Object Amazon.EC2.Model.InstanceNetworkInterfaceSpecification
$n.DeviceIndex = 0
$n.SubnetId = "subnet-12345678"
$n.Groups.Add("sg-12345678")
Request-EC2SpotInstance -InstanceCount 1 -SpotPrice 0.050 -Type one-time `
-IamInstanceProfile_Arn arn:aws:iam::123456789012:instance-profile/my-iam-role `
-LaunchSpecification_ImageId ami-12345678 `
-LaunchSpecification_InstanceType m3.medium `
-LaunchSpecification_NetworkInterface $n
```

Output:

```
ActualBlockHourlyPrice   :
AvailabilityZoneGroup    :
BlockDurationMinutes     : 0
CreateTime               : 12/26/2015 7:44:10 AM
Fault                    :
InstanceId               :
LaunchedAvailabilityZone :
LaunchGroup              :
LaunchSpecification      : Amazon.EC2.Model.LaunchSpecification
ProductDescription       : Linux/UNIX
SpotInstanceRequestId    : sir-12345678
```

```
SpotPrice                : 0.050000
State                    : open
Status                   : Amazon.EC2.Model.SpotInstanceStatus
Tags                     : {}
Type                     : one-time
```

- Untuk API detailnya, lihat RequestSpotInstancesdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`ResetImageAttribute`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`ResetImageAttribute`.

CLI

AWS CLI

Untuk mengatur ulang launchPermission atribut

Contoh ini me-reset `launchPermission` atribut untuk yang ditentukan AMI ke nilai defaultnya. Secara default, AMIs bersifat pribadi. Jika perintah berhasil, tidak ada output yang akan ditampilkan.

Perintah:

```
aws ec2 reset-image-attribute --image-id ami-5731123e --
attribute launchPermission
```

- Untuk API detailnya, lihat ResetImageAttributedi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini me-reset atribut 'launchPermission' ke nilai defaultnya. Secara default, AMIs bersifat pribadi.

```
Reset-EC2ImageAttribute -ImageId ami-12345678 -Attribute launchPermission
```

- Untuk API detailnya, lihat ResetImageAttributedi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`ResetInstanceAttribute`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`ResetInstanceAttribute`.

CLI

AWS CLI

Untuk mengatur ulang sourceDestCheck atribut

Contoh ini me-reset `sourceDestCheck` atribut dari instance tertentu. Contohnya harus dalam aVPC. Jika perintah berhasil, tidak ada output yang akan ditampilkan.

Perintah:

```
aws ec2 reset-instance-attribute --instance-id i-1234567890abcdef0 --
attribute sourceDestCheck
```

Untuk mengatur ulang atribut kernel

Contoh ini me-reset `kernel` atribut dari instance tertentu. Instans harus berada dalam status `stopped`. Jika perintah berhasil, tidak ada output yang akan ditampilkan.

Perintah:

```
aws ec2 reset-instance-attribute --instance-id i-1234567890abcdef0 --
attribute kernel
```

Untuk mengatur ulang atribut ramdisk

Contoh ini me-reset `ramdisk` atribut dari instance tertentu. Instans harus berada dalam status `stopped`. Jika perintah berhasil, tidak ada output yang akan ditampilkan.

Perintah:

```
aws ec2 reset-instance-attribute --instance-id i-1234567890abcdef0 --
attribute ramdisk
```

- Untuk API detailnya, lihat ResetInstanceAttributedi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini me-reset atribut sriovNetSupport '' untuk instance tertentu.

```
Reset-EC2InstanceAttribute -InstanceId i-12345678 -Attribute sriovNetSupport
```

Contoh 2: Contoh ini me-reset atribut ebsOptimized '' untuk instance tertentu.

```
Reset-EC2InstanceAttribute -InstanceId i-12345678 -Attribute ebsOptimized
```

Contoh 3: Contoh ini me-reset atribut sourceDestCheck '' untuk instance tertentu.

```
Reset-EC2InstanceAttribute -InstanceId i-12345678 -Attribute sourceDestCheck
```

Contoh 4: Contoh ini me-reset atribut disableApiTermination '' untuk instance tertentu.

```
Reset-EC2InstanceAttribute -InstanceId i-12345678 -Attribute
 disableApiTermination
```

Contoh 5: Contoh ini me-reset atribut 'instanceInitiatedShutdownBehavior' untuk instance tertentu.

```
Reset-EC2InstanceAttribute -InstanceId i-12345678 -Attribute
 instanceInitiatedShutdownBehavior
```

- Untuk API detailnya, lihat ResetInstanceAttributedi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`ResetNetworkInterfaceAttribute`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`ResetNetworkInterfaceAttribute`.

CLI

AWS CLI

Untuk mengatur ulang atribut antarmuka jaringan

`reset-network-interface-attribute`Contoh berikut me-reset nilai atribut pemeriksaan sumber/tujuan ke. `true`

```
aws ec2 reset-network-interface-attribute \
    --network-interface-id eni-686ea200 \
    --source-dest-check
```

Perintah ini tidak menghasilkan output.

- Untuk API detailnya, lihat ResetNetworkInterfaceAttributedi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini mengatur ulang pemeriksaan sumber/tujuan untuk antarmuka jaringan yang ditentukan.

```
Reset-EC2NetworkInterfaceAttribute -NetworkInterfaceId eni-1a2b3c4d -
SourceDestCheck
```

- Untuk API detailnya, lihat ResetNetworkInterfaceAttributedi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`ResetSnapshotAttribute`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`ResetSnapshotAttribute`.

CLI

AWS CLI

Untuk mengatur ulang atribut snapshot

Contoh ini mengatur ulang izin volume buat untuk snapshot. `snap-1234567890abcdef0` Jika perintah berhasil, tidak ada output yang akan ditampilkan.

Perintah:

```
aws ec2 reset-snapshot-attribute --snapshot-id snap-1234567890abcdef0 --
attribute createVolumePermission
```

- Untuk API detailnya, lihat ResetSnapshotAttributedi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini mengatur ulang atribut tertentu dari snapshot yang ditentukan.

```
Reset-EC2SnapshotAttribute -SnapshotId snap-12345678 -Attribute
 CreateVolumePermission
```

- Untuk API detailnya, lihat ResetSnapshotAttributedi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`RevokeSecurityGroupEgress`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`RevokeSecurityGroupEgress`.

CLI

AWS CLI

Contoh 1: Untuk menghapus aturan yang memungkinkan lalu lintas keluar ke rentang alamat tertentu

`revoke-security-group-egress`Contoh perintah berikut menghapus aturan yang memberikan akses ke rentang alamat yang ditentukan pada TCP port 80.

```
aws ec2 revoke-security-group-egress \
    --group-id sg-026c12253ce15eff7 \
    --ip-
permissions [{IpProtocol=tcp,FromPort=80,ToPort=80,IpRanges=[{CidrIp=10.0.0.0/16}]
```

Perintah ini tidak menghasilkan output.

Untuk informasi selengkapnya, lihat Grup keamanan di Panduan EC2 Pengguna Amazon.

Contoh 2: Untuk menghapus aturan yang memungkinkan lalu lintas keluar ke grup keamanan tertentu

`revoke-security-group-egress`Contoh perintah berikut menghapus aturan yang memberikan akses ke grup keamanan tertentu pada TCP port 80.

```
aws ec2 revoke-security-group-egress \
    --group-id sg-026c12253ce15eff7 \
    --ip-permissions '[{"IpProtocol": "tcp", "FromPort": 443, "ToPort":
 443,"UserIdGroupPairs": [{"GroupId": "sg-06df23a01ff2df86d"}]}]'
```

Perintah ini tidak menghasilkan output.

Untuk informasi selengkapnya, lihat Grup keamanan di Panduan EC2 Pengguna Amazon.

- Untuk API detailnya, lihat RevokeSecurityGroupEgressdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menghapus aturan untuk grup keamanan yang ditentukan untuk EC2 - VPC. Ini mencabut akses ke rentang alamat IP yang ditentukan pada TCP port 80. Sintaks yang digunakan oleh contoh ini membutuhkan PowerShell versi 3 atau lebih tinggi.

```
$ip = @{ IpProtocol="tcp"; FromPort="80"; ToPort="80";
 IpRanges="203.0.113.0/24" }
Revoke-EC2SecurityGroupEgress -GroupId sg-12345678 -IpPermission $ip
```

Contoh 2: Dengan PowerShell versi 2, Anda harus menggunakan New-Object untuk membuat objek. IpPermission

```
$ip = New-Object Amazon.EC2.Model.IpPermission
$ip.IpProtocol = "tcp"
$ip.FromPort = 80
$ip.ToPort = 80
$ip.IpRanges.Add("203.0.113.0/24")
Revoke-EC2SecurityGroupEgress -GroupId sg-12345678 -IpPermission $ip
```

Contoh 3: Contoh ini mencabut akses ke grup keamanan sumber yang ditentukan pada TCP port 80.

```
$ug = New-Object Amazon.EC2.Model.UserIdGroupPair
$ug.GroupId = "sg-1a2b3c4d"
$ug.UserId = "123456789012"
Revoke-EC2SecurityGroupEgress -GroupId sg-12345678 -IpPermission
 @( @{ IpProtocol="tcp"; FromPort="80"; ToPort="80"; UserIdGroupPairs=$ug } )
```

- Untuk API detailnya, lihat RevokeSecurityGroupEgressdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`RevokeSecurityGroupIngress`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`RevokeSecurityGroupIngress`.

CLI

AWS CLI

Contoh 1: Untuk menghapus aturan dari grup keamanan

`revoke-security-group-ingress`Contoh berikut menghapus akses TCP port 22 untuk rentang `203.0.113.0/24` alamat dari grup keamanan yang ditentukan untuk defaultVPC.

```
aws ec2 revoke-security-group-ingress \
    --group-name mySecurityGroup
    --protocol tcp \
    --port 22 \
    --cidr 203.0.113.0/24
```

Perintah ini tidak menghasilkan output jika berhasil.

Untuk informasi selengkapnya, lihat Grup keamanan di Panduan EC2 Pengguna Amazon.

Contoh 2: Untuk menghapus aturan menggunakan set izin IP

`revoke-security-group-ingress`Contoh berikut menggunakan `ip-permissions` parameter untuk menghapus aturan masuk yang memungkinkan ICMP pesan `Destination Unreachable: Fragmentation Needed and Don't Fragment was Set` (Tipe 3, Kode 4).

```
aws ec2 revoke-security-group-ingress \
    --group-id sg-026c12253ce15eff7 \
    --ip-
permissions IpProtocol=icmp,FromPort=3,ToPort=4,IpRanges=[{CidrIp=0.0.0.0/0}]
```

Perintah ini tidak menghasilkan output jika berhasil.

Untuk informasi selengkapnya, lihat Grup keamanan di Panduan EC2 Pengguna Amazon.

- Untuk API detailnya, lihat RevokeSecurityGroupIngressdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini mencabut akses ke TCP port 22 dari rentang alamat yang ditentukan untuk grup keamanan yang ditentukan untuk EC2 -VPC. Perhatikan bahwa Anda harus mengidentifikasi grup keamanan untuk EC2 - VPC menggunakan ID grup keamanan bukan nama grup keamanan. Sintaks yang digunakan oleh contoh ini membutuhkan PowerShell versi 3 atau lebih tinggi.

```
$ip = @{ IpProtocol="tcp"; FromPort="22"; ToPort="22";
 IpRanges="203.0.113.0/24" }
Revoke-EC2SecurityGroupIngress -GroupId sg-12345678 -IpPermission $ip
```

Contoh 2: Dengan PowerShell versi 2, Anda harus menggunakan New-Object untuk membuat objek. IpPermission

```
$ip = New-Object Amazon.EC2.Model.IpPermission
$ip.IpProtocol = "tcp"
$ip.FromPort = 22
$ip.ToPort = 22
$ip.IpRanges.Add("203.0.113.0/24")

Revoke-EC2SecurityGroupIngress -GroupId sg-12345678 -IpPermission $ip
```

Contoh 3: Contoh ini mencabut akses ke TCP port 22 dari rentang alamat yang ditentukan untuk grup keamanan yang ditentukan untuk EC2 -Classic. Sintaks yang digunakan oleh contoh ini membutuhkan PowerShell versi 3 atau lebih tinggi.

```
$ip = @{ IpProtocol="tcp"; FromPort="22"; ToPort="22";
 IpRanges="203.0.113.0/24" }

Revoke-EC2SecurityGroupIngress -GroupName "my-security-group" -IpPermission $ip
```

Contoh 4: Dengan PowerShell versi 2, Anda harus menggunakan New-Object untuk membuat objek. IpPermission

```
$ip = New-Object Amazon.EC2.Model.IpPermission
$ip.IpProtocol = "tcp"
$ip.FromPort = 22
```

```
$ip.ToPort = 22
$ip.IpRanges.Add("203.0.113.0/24")

Revoke-EC2SecurityGroupIngress -GroupName "my-security-group" -IpPermission $ip
```

- Untuk API detailnya, lihat RevokeSecurityGroupIngressdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`RunInstances`** dengan AWS SDK atau CLI

Contoh kode berikut menunjukkan cara menggunakan`RunInstances`.

Contoh tindakan adalah kutipan kode dari program yang lebih besar dan harus dijalankan dalam konteks. Anda dapat melihat tindakan ini dalam konteks dalam contoh kode berikut:

- Pelajari dasar-dasarnya

.NET

AWS SDK for .NET

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    /// <summary>
    /// Create and run an EC2 instance.
    /// </summary>
    /// <param name="ImageId">The image Id of the image used as a basis for the
    /// EC2 instance.</param>
    /// <param name="instanceType">The instance type of the EC2 instance to
create.</param>
    /// <param name="keyName">The name of the key pair to associate with the
    /// instance.</param>
```

```
   /// <param name="groupId">The Id of the Amazon EC2 security group that will
be
   /// allowed to interact with the new EC2 instance.</param>
   /// <returns>The instance Id of the new EC2 instance.</returns>
   public async Task<string> RunInstances(string imageId, string instanceType,
string keyName, string groupId)
   {
       try
       {
           var request = new RunInstancesRequest
           {
               ImageId = imageId,
               InstanceType = instanceType,
               KeyName = keyName,
               MinCount = 1,
               MaxCount = 1,
               SecurityGroupIds = new List<string> { groupId }
           };
           var response = await _amazonEC2.RunInstancesAsync(request);
           var instanceId = response.Reservation.Instances[0].InstanceId;

           Console.Write("Waiting for the instance to start.");
           await WaitForInstanceState(instanceId, InstanceStateName.Running);

           return instanceId;
       }
       catch (AmazonEC2Exception ec2Exception)
       {
           if (ec2Exception.ErrorCode == "InvalidGroupId.NotFound")
           {
               _logger.LogError(
                   $"GroupId {groupId} was not found. {ec2Exception.Message}");
           }

           throw;
       }
       catch (Exception ex)
       {
           _logger.LogError(
               $"An error occurred while running the instance.: {ex.Message}");
           throw;
       }
   }
```

- Untuk API detailnya, lihat RunInstancesdi AWS SDK for .NET APIReferensi.

Bash

AWS CLI dengan skrip Bash

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
###############################################################################
# function ec2_run_instances
#
# This function launches one or more Amazon Elastic Compute Cloud (Amazon EC2)
 instances.
#
# Parameters:
#       -i image_id - The ID of the Amazon Machine Image (AMI) to use.
#       -t instance_type - The instance type to use (e.g., t2.micro).
#       -k key_pair_name - The name of the key pair to use.
#       -s security_group_id - The ID of the security group to use.
#       -c count - The number of instances to launch (default: 1).
#       -h - Display help.
#
# Returns:
#       0 - If successful.
#       1 - If it fails.
###############################################################################
function ec2_run_instances() {
  local image_id instance_type key_pair_name security_group_id count response
  local option OPTARG # Required to use getopts command in a function.

  # bashsupport disable=BP5008
  function usage() {
    echo "function ec2_run_instances"
    echo "Launches one or more Amazon Elastic Compute Cloud (Amazon EC2)
 instances."
    echo "  -i image_id - The ID of the Amazon Machine Image (AMI) to use."
```

```
    echo "  -t instance_type - The instance type to use (e.g., t2.micro)."
    echo "  -k key_pair_name - The name of the key pair to use."
    echo "  -s security_group_id - The ID of the security group to use."
    echo "  -c count - The number of instances to launch (default: 1)."
    echo "  -h - Display help."
    echo ""
  }

  # Retrieve the calling parameters.
  while getopts "i:t:k:s:c:h" option; do
    case "${option}" in
      i) image_id="${OPTARG}" ;;
      t) instance_type="${OPTARG}" ;;
      k) key_pair_name="${OPTARG}" ;;
      s) security_group_id="${OPTARG}" ;;
      c) count="${OPTARG}" ;;
      h)
        usage
        return 0
        ;;
      \?)
        echo "Invalid parameter"
        usage
        return 1
        ;;
    esac
  done
  export OPTIND=1

  if [[ -z "$image_id" ]]; then
    errecho "ERROR: You must provide an Amazon Machine Image (AMI) ID with the -i
parameter."
    usage
    return 1
  fi

  if [[ -z "$instance_type" ]]; then
    errecho "ERROR: You must provide an instance type with the -t parameter."
    usage
    return 1
  fi

  if [[ -z "$key_pair_name" ]]; then
    errecho "ERROR: You must provide a key pair name with the -k parameter."
```

```
    usage
    return 1
  fi

  if [[ -z "$security_group_id" ]]; then
    errecho "ERROR: You must provide a security group ID with the -s parameter."
    usage
    return 1
  fi

  if [[ -z "$count" ]]; then
    count=1
  fi

  response=$(aws ec2 run-instances \
    --image-id "$image_id" \
    --instance-type "$instance_type" \
    --key-name "$key_pair_name" \
    --security-group-ids "$security_group_id" \
    --count "$count" \
    --query 'Instances[*].[InstanceId]' \
    --output text) || {
    aws_cli_error_log ${?}
    errecho "ERROR: AWS reports run-instances operation failed.$response"
    return 1
  }

  echo "$response"

  return 0
}
```

Fungsi utilitas yang digunakan dalam contoh ini.

```
###############################################################################
# function errecho
#
# This function outputs everything sent to it to STDERR (standard error output).
###############################################################################
function errecho() {
  printf "%s\n" "$*" 1>&2
}
```

```
##############################################################################
# function aws_cli_error_log()
#
# This function is used to log the error messages from the AWS CLI.
#
# The function expects the following argument:
#         $1 - The error code returned by the AWS CLI.
#
#  Returns:
#          0: - Success.
#
##############################################################################
function aws_cli_error_log() {
  local err_code=$1
  errecho "Error code : $err_code"
  if [ "$err_code" == 1 ]; then
    errecho "  One or more S3 transfers failed."
  elif [ "$err_code" == 2 ]; then
    errecho "  Command line failed to parse."
  elif [ "$err_code" == 130 ]; then
    errecho "  Process received SIGINT."
  elif [ "$err_code" == 252 ]; then
    errecho "  Command syntax invalid."
  elif [ "$err_code" == 253 ]; then
    errecho "  The system environment or configuration was invalid."
  elif [ "$err_code" == 254 ]; then
    errecho "  The service returned an error."
  elif [ "$err_code" == 255 ]; then
    errecho "  255 is a catch-all error."
  fi

  return 0
}
```

- Untuk API detailnya, lihat RunInstancesdi Referensi AWS CLI Perintah.

C++

SDKuntuk C ++

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
//! Launch an Amazon Elastic Compute Cloud (Amazon EC2) instance.
/*!
  \param instanceName: A name for the EC2 instance.
  \param amiId: An Amazon Machine Image (AMI) identifier.
  \param[out] instanceID: String to return the instance ID.
  \param clientConfiguration: AWS client configuration.
  \return bool: Function succeeded.
 */
bool AwsDoc::EC2::runInstance(const Aws::String &instanceName,
                              const Aws::String &amiId,
                              Aws::String &instanceID,
                              const Aws::Client::ClientConfiguration
 &clientConfiguration) {
    Aws::EC2::EC2Client ec2Client(clientConfiguration);

    Aws::EC2::Model::RunInstancesRequest runRequest;
    runRequest.SetImageId(amiId);
    runRequest.SetInstanceType(Aws::EC2::Model::InstanceType::t1_micro);
    runRequest.SetMinCount(1);
    runRequest.SetMaxCount(1);

    Aws::EC2::Model::RunInstancesOutcome runOutcome = ec2Client.RunInstances(
            runRequest);
    if (!runOutcome.IsSuccess()) {
        std::cerr << "Failed to launch EC2 instance " << instanceName <<
                  " based on ami " << amiId << ":" <<
                  runOutcome.GetError().GetMessage() << std::endl;
        return false;
    }

    const Aws::Vector<Aws::EC2::Model::Instance> &instances =
 runOutcome.GetResult().GetInstances();
```

```
    if (instances.empty()) {
        std::cerr << "Failed to launch EC2 instance " << instanceName <<
                  " based on ami " << amiId << ":" <<
                  runOutcome.GetError().GetMessage() << std::endl;
        return false;
    }

    instanceID = instances[0].GetInstanceId();

    return true;
}
```

- Untuk API detailnya, lihat RunInstancesdi AWS SDK for C++ APIReferensi.

## CLI

### AWS CLI

#### Contoh 1: Untuk meluncurkan instans ke subnet default

`run-instances`Contoh berikut meluncurkan satu instance tipe `t2.micro` ke subnet default untuk Wilayah saat ini dan mengaitkannya dengan subnet default untuk default VPC untuk Wilayah. Key pair bersifat opsional jika Anda tidak berencana untuk terhubung ke instans Anda menggunakan SSH (Linux) atau RDP (Windows).

```
aws ec2 run-instances \
    --image-id ami-0abcdef1234567890 \
    --instance-type t2.micro \
    --key-name MyKeyPair
```

Output:

```
{
    "Instances": [
        {
            "AmiLaunchIndex": 0,
            "ImageId": "ami-0abcdef1234567890",
            "InstanceId": "i-1231231230abcdef0",
            "InstanceType": "t2.micro",
            "KeyName": "MyKeyPair",
            "LaunchTime": "2018-05-10T08:05:20.000Z",
```

```
            "Monitoring": {
                "State": "disabled"
            },
            "Placement": {
                "AvailabilityZone": "us-east-2a",
                "GroupName": "",
                "Tenancy": "default"
            },
            "PrivateDnsName": "ip-10-0-0-157.us-east-2.compute.internal",
            "PrivateIpAddress": "10.0.0.157",
            "ProductCodes": [],
            "PublicDnsName": "",
            "State": {
                "Code": 0,
                "Name": "pending"
            },
            "StateTransitionReason": "",
            "SubnetId": "subnet-04a636d18e83cfacb",
            "VpcId": "vpc-1234567890abcdef0",
            "Architecture": "x86_64",
            "BlockDeviceMappings": [],
            "ClientToken": "",
            "EbsOptimized": false,
            "Hypervisor": "xen",
            "NetworkInterfaces": [
                {
                    "Attachment": {
                        "AttachTime": "2018-05-10T08:05:20.000Z",
                        "AttachmentId": "eni-attach-0e325c07e928a0405",
                        "DeleteOnTermination": true,
                        "DeviceIndex": 0,
                        "Status": "attaching"
                    },
                    "Description": "",
                    "Groups": [
                        {
                            "GroupName": "MySecurityGroup",
                            "GroupId": "sg-0598c7d356eba48d7"
                        }
                    ],
                    "Ipv6Addresses": [],
                    "MacAddress": "0a:ab:58:e0:67:e2",
                    "NetworkInterfaceId": "eni-0c0a29997760baee7",
                    "OwnerId": "123456789012",
```

```
                    "PrivateDnsName": "ip-10-0-0-157.us-east-2.compute.internal",
                    "PrivateIpAddress": "10.0.0.157",
                    "PrivateIpAddresses": [
                        {
                            "Primary": true,
                            "PrivateDnsName": "ip-10-0-0-157.us-
east-2.compute.internal",
                            "PrivateIpAddress": "10.0.0.157"
                        }
                    ],
                    "SourceDestCheck": true,
                    "Status": "in-use",
                    "SubnetId": "subnet-04a636d18e83cfacb",
                    "VpcId": "vpc-1234567890abcdef0",
                    "InterfaceType": "interface"
                }
            ],
            "RootDeviceName": "/dev/xvda",
            "RootDeviceType": "ebs",
            "SecurityGroups": [
                {
                    "GroupName": "MySecurityGroup",
                    "GroupId": "sg-0598c7d356eba48d7"
                }
            ],
            "SourceDestCheck": true,
            "StateReason": {
                "Code": "pending",
                "Message": "pending"
            },
            "Tags": [],
            "VirtualizationType": "hvm",
            "CpuOptions": {
                "CoreCount": 1,
                "ThreadsPerCore": 1
            },
            "CapacityReservationSpecification": {
                "CapacityReservationPreference": "open"
            },
            "MetadataOptions": {
                "State": "pending",
                "HttpTokens": "optional",
                "HttpPutResponseHopLimit": 1,
                "HttpEndpoint": "enabled"
```

```
            }
        }
    ],
    "OwnerId": "123456789012",
    "ReservationId": "r-02a3f596d91211712"
}
```

Contoh 2: Untuk meluncurkan instans ke subnet non-default dan menambahkan alamat IP publik

Contoh `run-instances` berikut meminta alamat IP publik untuk instans yang Anda luncurkan ke subnet non-default. Instans tersebut dikaitkan dengan grup keamanan tertentu.

```
aws ec2 run-instances \
    --image-id ami-0abcdef1234567890 \
    --instance-type t2.micro \
    --subnet-id subnet-08fc749671b2d077c \
    --security-group-ids sg-0b0384b66d7d692f9 \
    --associate-public-ip-address \
    --key-name MyKeyPair
```

Untuk contoh output `run-instances`, lihat Contoh 1.

Contoh 3: Untuk meluncurkan instans dengan volume tambahan

Contoh `run-instances` berikut menggunakan pemetaan perangkat blok, yang ditentukan dalam mapping.json, untuk melampirkan volume tambahan saat peluncuran. Pemetaan perangkat blok dapat menentukan EBS volume, volume penyimpanan instans, atau EBS volume dan volume penyimpanan instance.

```
aws ec2 run-instances \
    --image-id ami-0abcdef1234567890 \
    --instance-type t2.micro \
    --subnet-id subnet-08fc749671b2d077c \
    --security-group-ids sg-0b0384b66d7d692f9 \
    --key-name MyKeyPair \
    --block-device-mappings file://mapping.json
```

Isi dari `mapping.json`. Contoh ini menambahkan EBS volume `/dev/sdh` kosong dengan ukuran 100 GiB.

```
[
```

```
    {
        "DeviceName": "/dev/sdh",
        "Ebs": {
            "VolumeSize": 100
        }
    }
]
```

Isi dari `mapping.json`. Contoh ini menambahkan `ephemeral1` sebagai volume penyimpanan instans.

```
[
    {
        "DeviceName": "/dev/sdc",
        "VirtualName": "ephemeral1"
    }
]
```

Untuk contoh output `run-instances`, lihat Contoh 1.

Untuk informasi selengkapnya tentang memblokir pemetaan perangkat, lihat Memblokir pemetaan perangkat di Panduan Pengguna Amazon EC2.

Contoh 4: Untuk meluncurkan instans dan menambahkan tanda pada pembuatan

Contoh `run-instances` berikut menambahkan tanda dengan kunci `webserver` dan nilai `production` pada instans. Perintah ini juga menerapkan tag dengan kunci dari `cost-center` dan nilai `cc123` untuk EBS volume apa pun yang dibuat (dalam hal ini, volume root).

```
aws ec2 run-instances \
    --image-id ami-0abcdef1234567890 \
    --instance-type t2.micro \
    --count 1 \
    --subnet-id subnet-08fc749671b2d077c \
    --key-name MyKeyPair \
    --security-group-ids sg-0b0384b66d7d692f9 \
    --tag-specifications
 'ResourceType=instance,Tags=[{Key=webserver,Value=production}]'
 'ResourceType=volume,Tags=[{Key=cost-center,Value=cc123}]'
```

Untuk contoh output `run-instances`, lihat Contoh 1.

Contoh 5: Untuk meluncurkan instans dengan data pengguna

Contoh `run-instances` berikut meneruskan data pengguna dalam file bernama `my_script.txt` yang berisi skrip konfigurasi untuk instans Anda. Skrip berjalan saat peluncuran.

```
aws ec2 run-instances \
    --image-id ami-0abcdef1234567890 \
    --instance-type t2.micro \
    --count 1 \
    --subnet-id subnet-08fc749671b2d077c \
    --key-name MyKeyPair \
    --security-group-ids sg-0b0384b66d7d692f9 \
    --user-data file://my_script.txt
```

Untuk contoh output `run-instances`, lihat Contoh 1.

Untuk informasi selengkapnya tentang data pengguna instans, lihat Bekerja dengan data pengguna instans di Panduan EC2 Pengguna Amazon.

Contoh 6: Untuk meluncurkan instans performa yang dapat melonjak

Contoh `run-instances` berikut meluncurkan instans t2.micro dengan opsi kredit `unlimited`. Ketika meluncurkan instans T2, jika Anda tidak menentukan `--credit-specification`, default-nya adalah opsi kredit `standard`. Ketika meluncurkan instans T3, default-nya adalah opsi kredit `unlimited`.

```
aws ec2 run-instances \
    --image-id ami-0abcdef1234567890 \
    --instance-type t2.micro \
    --count 1 \
    --subnet-id subnet-08fc749671b2d077c \
    --key-name MyKeyPair \
    --security-group-ids sg-0b0384b66d7d692f9 \
    --credit-specification CpuCredits=unlimited
```

Untuk contoh output `run-instances`, lihat Contoh 1.

Untuk informasi selengkapnya tentang instans performa burstable, lihat Instans performa Burstable di Panduan Pengguna Amazon. EC2

- Untuk API detailnya, lihat RunInstancesdi Referensi AWS CLI Perintah.

Java

SDKuntuk Java 2.x

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
   /**
    * Runs an EC2 instance asynchronously.
    *
    * @param instanceType The instance type to use for the EC2 instance.
    * @param keyName The name of the key pair to associate with the EC2
instance.
    * @param groupName The name of the security group to associate with the EC2
instance.
    * @param amiId The ID of the Amazon Machine Image (AMI) to use for the EC2
instance.
    * @return A {@link CompletableFuture} that completes with the ID of the
started EC2 instance.
    * @throws RuntimeException If there is an error running the EC2 instance.
    */
   public CompletableFuture<String> runInstanceAsync(String instanceType, String
keyName, String groupName, String amiId) {
       RunInstancesRequest runRequest = RunInstancesRequest.builder()
           .instanceType(instanceType)
           .keyName(keyName)
           .securityGroups(groupName)
           .maxCount(1)
           .minCount(1)
           .imageId(amiId)
           .build();

       CompletableFuture<RunInstancesResponse> responseFuture =
getAsyncClient().runInstances(runRequest);
       return responseFuture.thenCompose(response -> {
           String instanceIdVal = response.instances().get(0).instanceId();
           System.out.println("Going to start an EC2 instance and use a waiter
to wait for it to be in running state");
           return getAsyncClient().waiter()
```

```
                .waitUntilInstanceExists(r -> r.instanceIds(instanceIdVal))
                .thenCompose(waitResponse -> getAsyncClient().waiter()
                    .waitUntilInstanceRunning(r -> r.instanceIds(instanceIdVal))
                    .thenApply(runningResponse -> instanceIdVal));
        }).exceptionally(throwable -> {
            // Handle any exceptions that occurred during the async call
            throw new RuntimeException("Failed to run EC2 instance: " +
 throwable.getMessage(), throwable);
        });
    }
```

- Untuk API detailnya, lihat RunInstancesdi AWS SDK for Java 2.x APIReferensi.

JavaScript

SDKuntuk JavaScript (v3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
import { EC2Client, RunInstancesCommand } from "@aws-sdk/client-ec2";

/**
 * Create new EC2 instances.
 * @param {{
 *  keyName: string,
 *  securityGroupIds: string[],
 *  imageId: string,
 *  instanceType: import('@aws-sdk/client-ec2')._InstanceType,
 *  minCount?: number,
 *  maxCount?: number }} options
 */
export const main = async ({
  keyName,
  securityGroupIds,
  imageId,
  instanceType,
  minCount = "1",
```

```
  maxCount = "1",
}) => {
  const client = new EC2Client({});
  minCount = Number.parseInt(minCount);
  maxCount = Number.parseInt(maxCount);
  const command = new RunInstancesCommand({
    // Your key pair name.
    KeyName: keyName,
    // Your security group.
    SecurityGroupIds: securityGroupIds,
    // An Amazon Machine Image (AMI). There are multiple ways to search for AMIs.
 For more information, see:
    // https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/finding-an-ami.html
    ImageId: imageId,
    // An instance type describing the resources provided to your instance. There
 are multiple
    // ways to search for instance types. For more information see:
    // https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/instance-
discovery.html
    InstanceType: instanceType,
    // Availability Zones have capacity limitations that may impact your ability
 to launch instances.
    // The `RunInstances` operation will only succeed if it can allocate at least
 the `MinCount` of instances.
    // However, EC2 will attempt to launch up to the `MaxCount` of instances,
 even if the full request cannot be satisfied.
    // If you need a specific number of instances, use `MinCount` and `MaxCount`
 set to the same value.
    // If you want to launch up to a certain number of instances, use `MaxCount`
 and let EC2 provision as many as possible.
    // If you require a minimum number of instances, but do not want to exceed a
 maximum, use both `MinCount` and `MaxCount`.
    MinCount: minCount,
    MaxCount: maxCount,
  });

  try {
    const { Instances } = await client.send(command);
    const instanceList = Instances.map(
      (instance) => `• ${instance.InstanceId}`,
    ).join("\n");
    console.log(`Launched instances:\n${instanceList}`);
  } catch (caught) {
    if (caught instanceof Error && caught.name === "ResourceCountExceeded") {
```

```
      console.warn(`${caught.message}`);
    } else {
      throw caught;
    }
  }
};
```

- Untuk API detailnya, lihat RunInstancesdi AWS SDK for JavaScript APIReferensi.

## Kotlin

### SDKuntuk Kotlin

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
suspend fun createEC2Instance(
    name: String,
    amiId: String,
): String? {
    val request =
        RunInstancesRequest {
            imageId = amiId
            instanceType = InstanceType.T1Micro
            maxCount = 1
            minCount = 1
        }

    Ec2Client { region = "us-west-2" }.use { ec2 ->
        val response = ec2.runInstances(request)
        val instanceId = response.instances?.get(0)?.instanceId
        val tag =
            Tag {
                key = "Name"
                value = name
            }

        val requestTags =
```

```
            CreateTagsRequest {
                resources = listOf(instanceId.toString())
                tags = listOf(tag)
            }
        ec2.createTags(requestTags)
        println("Successfully started EC2 Instance $instanceId based on AMI
 $amiId")
        return instanceId
    }
}
```

- Untuk API detailnya, lihat RunInstances AWSSDKAPIreferensi Kotlin.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini meluncurkan satu instance dari yang ditentukan AMI dalam EC2 -Classic atau default. VPC

```
New-EC2Instance -ImageId ami-12345678 -MinCount 1 -MaxCount 1 -InstanceType
 m3.medium -KeyName my-key-pair -SecurityGroup my-security-group
```

Contoh 2: Contoh ini meluncurkan satu instance dari yang ditentukan AMI dalam file. VPC

```
New-EC2Instance -ImageId ami-12345678 -MinCount 1 -MaxCount 1 -SubnetId
 subnet-12345678 -InstanceType t2.micro -KeyName my-key-pair -SecurityGroupId
 sg-12345678
```

Contoh 3: Untuk menambahkan EBS volume atau volume penyimpanan instance, tentukan pemetaan perangkat blok dan tambahkan ke perintah. Contoh ini menambahkan volume penyimpanan instance.

```
$bdm = New-Object Amazon.EC2.Model.BlockDeviceMapping
$bdm.VirtualName = "ephemeral0"
$bdm.DeviceName = "/dev/sdf"

New-EC2Instance -ImageId ami-12345678 -BlockDeviceMapping $bdm ...
```

Contoh 4: Untuk menentukan salah satu Windows saat iniAMIs, dapatkan AMI ID-nya menggunakanGet-EC2ImageByName. Contoh ini meluncurkan instance dari basis saat ini AMI untuk Windows Server 2016.

```
$ami = Get-EC2ImageByName WINDOWS_2016_BASE

New-EC2Instance -ImageId $ami.ImageId ...
```

Contoh 5: Meluncurkan instance ke lingkungan host khusus yang ditentukan.

```
New-EC2Instance -ImageId ami-1a2b3c4d -InstanceType m4.large -KeyName my-key-pair
 -SecurityGroupId sg-1a2b3c4d  -AvailabilityZone us-west-1a -Tenancy host -HostID
 h-1a2b3c4d5e6f1a2b3
```

Contoh 6: Permintaan ini meluncurkan dua instance dan menerapkan tag dengan kunci server web dan nilai produksi ke instance. Permintaan juga menerapkan tag dengan kunci cost-center dan nilai cc123 ke volume yang dibuat (dalam hal ini, volume root untuk setiap instance).

```
$tag1 = @{ Key="webserver"; Value="production" }
$tag2 = @{ Key="cost-center"; Value="cc123" }

$tagspec1 = new-object Amazon.EC2.Model.TagSpecification
$tagspec1.ResourceType = "instance"
$tagspec1.Tags.Add($tag1)

$tagspec2 = new-object Amazon.EC2.Model.TagSpecification
$tagspec2.ResourceType = "volume"
$tagspec2.Tags.Add($tag2)

New-EC2Instance -ImageId "ami-1a2b3c4d" -KeyName "my-key-pair" -MaxCount 2 -
InstanceType "t2.large" -SubnetId "subnet-1a2b3c4d" -TagSpecification $tagspec1,
$tagspec2
```

- Untuk API detailnya, lihat RunInstancesdi AWS Tools for PowerShell Referensi Cmdlet.

Python

SDKuntuk Python (Boto3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
class EC2InstanceWrapper:
    """Encapsulates Amazon Elastic Compute Cloud (Amazon EC2) instance actions
 using the client interface."""

    def __init__(
        self, ec2_client: Any, instances: Optional[List[Dict[str, Any]]] = None
    ) -> None:
        """
        Initializes the EC2InstanceWrapper with an EC2 client and optional
 instances.

        :param ec2_client: A Boto3 Amazon EC2 client. This client provides low-
level
                           access to AWS EC2 services.
        :param instances: A list of dictionaries representing Boto3 Instance
 objects. These are high-level objects that
                          wrap instance actions.
        """
        self.ec2_client = ec2_client
        self.instances = instances or []

    @classmethod
    def from_client(cls) -> "EC2InstanceWrapper":
        """
        Creates an EC2InstanceWrapper instance with a default EC2 client.

        :return: An instance of EC2InstanceWrapper initialized with the default
 EC2 client.
        """
        ec2_client = boto3.client("ec2")
        return cls(ec2_client)
```

```
   def create(
       self,
       image_id: str,
       instance_type: str,
       key_pair_name: str,
       security_group_ids: Optional[List[str]] = None,
   ) -> List[Dict[str, Any]]:
       """
       Creates a new EC2 instance in the default VPC of the current account.

       The instance starts immediately after it is created.

       :param image_id: The ID of the Amazon Machine Image (AMI) to use for the
instance.
       :param instance_type: The type of instance to create, such as 't2.micro'.
       :param key_pair_name: The name of the key pair to use for SSH access.
       :param security_group_ids: A list of security group IDs to associate with
the instance.
                                  If not specified, the default security group
of the VPC is used.
       :return: A list of dictionaries representing Boto3 Instance objects
representing the newly created instances.
       """
       try:
           instance_params = {
               "ImageId": image_id,
               "InstanceType": instance_type,
               "KeyName": key_pair_name,
           }
           if security_group_ids is not None:
               instance_params["SecurityGroupIds"] = security_group_ids

           response = self.ec2_client.run_instances(
               **instance_params, MinCount=1, MaxCount=1
           )
           instance = response["Instances"][0]
           self.instances.append(instance)
           waiter = self.ec2_client.get_waiter("instance_running")
           waiter.wait(InstanceIds=[instance["InstanceId"]])
       except ClientError as err:
           params_str = "\n\t".join(
               f"{key}: {value}" for key, value in instance_params.items()
           )
```

```
            logger.error(
                f"Failed to complete instance creation request.\nRequest details:
{params_str}"
            )
            error_code = err.response["Error"]["Code"]
            if error_code == "InstanceLimitExceeded":
                logger.error(
                    (
                        f"Insufficient capacity for instance type
 '{instance_type}'. "
                        "Terminate unused instances or contact AWS Support for a
 limit increase."
                    )
                )
            if error_code == "InsufficientInstanceCapacity":
                logger.error(
                    (
                        f"Insufficient capacity for instance type
 '{instance_type}'. "
                        "Select a different instance type or launch in a
 different availability zone."
                    )
                )
            raise
        return self.instances
```

- Untuk API detailnya, lihat RunInstances AWSSDKReferensi Python (Boto3). API

## Rust

### SDKuntuk Rust

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    pub async fn create_instance<'a>(
        &self,
```

```
        image_id: &'a str,
        instance_type: InstanceType,
        key_pair: &'a KeyPairInfo,
        security_groups: Vec<&'a SecurityGroup>,
    ) -> Result<String, EC2Error> {
        let run_instances = self
            .client
            .run_instances()
            .image_id(image_id)
            .instance_type(instance_type)
            .key_name(
                key_pair
                    .key_name()
                    .ok_or_else(|| EC2Error::new("Missing key name when launching
instance"))?,
            )
            .set_security_group_ids(Some(
                security_groups
                    .iter()
                    .filter_map(|sg| sg.group_id.clone())
                    .collect(),
            ))
            .min_count(1)
            .max_count(1)
            .send()
            .await?;

        if run_instances.instances().is_empty() {
            return Err(EC2Error::new("Failed to create instance"));
        }

        let instance_id = run_instances.instances()[0].instance_id().unwrap();
        let response = self
            .client
            .create_tags()
            .resources(instance_id)
            .tags(
                Tag::builder()
                    .key("Name")
                    .value("From SDK Examples")
                    .build(),
            )
            .send()
            .await;
```

```
        match response {
            Ok(_) => tracing::info!("Created {instance_id} and applied tags."),
            Err(err) => {
                tracing::info!("Error applying tags to {instance_id}: {err:?}");
                return Err(err.into());
            }
        }

        tracing::info!("Instance is created.");

        Ok(instance_id.to_string())
    }
```

- Untuk API detailnya, lihat RunInstances AWSSDKAPIreferensi Rust.

## SAP ABAP

### SDKuntuk SAP ABAP

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    " Create tags for resource created during instance launch. "
    DATA lt_tagspecifications TYPE /aws1/
cl_ec2tagspecification=>tt_tagspecificationlist.
    DATA ls_tagspecifications LIKE LINE OF lt_tagspecifications.
    ls_tagspecifications =  NEW /aws1/cl_ec2tagspecification(
      iv_resourcetype = 'instance'
      it_tags = VALUE /aws1/cl_ec2tag=>tt_taglist(
        ( NEW /aws1/cl_ec2tag( iv_key = 'Name' iv_value = iv_tag_value ) )
      )
    ).
    APPEND ls_tagspecifications TO lt_tagspecifications.

    TRY.
        " Create/launch Amazon Elastic Compute Cloud (Amazon EC2) instance. "
```

```
        oo_result = lo_ec2->runinstances(                              " oo_result
 is returned for testing purposes. "
          iv_imageid = iv_ami_id
          iv_instancetype = 't2.micro'
          iv_maxcount = 1
          iv_mincount = 1
          it_tagspecifications = lt_tagspecifications
          iv_subnetid = iv_subnet_id
        ).
        MESSAGE 'EC2 instance created.' TYPE 'I'.
      CATCH /aws1/cx_rt_service_generic INTO DATA(lo_exception).
        DATA(lv_error) = |"{ lo_exception->av_err_code }" - { lo_exception-
>av_err_msg }|.
        MESSAGE lv_error TYPE 'E'.
    ENDTRY.
```

- Untuk API detailnya, lihat RunInstances AWSSDKuntuk SAP ABAP API referensi.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`RunScheduledInstances`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`RunScheduledInstances`.

CLI

AWS CLI

Untuk meluncurkan Instance Terjadwal

Contoh ini meluncurkan Instance Terjadwal yang ditentukan dalam file. VPC

Perintah:

```
aws ec2 run-scheduled-instances --scheduled-instance-
id sci-1234-1234-1234-1234-123456789012 --instance-count 1 --launch-
specification file://launch-specification.json
```

Launch-specification.json:

```
{
  "ImageId": "ami-12345678",
  "KeyName": "my-key-pair",
  "InstanceType": "c4.large",
  "NetworkInterfaces": [
    {
        "DeviceIndex": 0,
        "SubnetId": "subnet-12345678",
        "AssociatePublicIpAddress": true,
        "Groups": ["sg-12345678"]
    }
  ],
  "IamInstanceProfile": {
      "Name": "my-iam-role"
  }
}
```

Output:

```
{
  "InstanceIdSet": [
      "i-1234567890abcdef0"
  ]
}
```

Contoh ini meluncurkan Instance Terjadwal yang ditentukan di EC2 -Classic.

Perintah:

```
aws ec2 run-scheduled-instances --scheduled-instance-
id sci-1234-1234-1234-1234-123456789012 --instance-count 1 --launch-
specification file://launch-specification.json
```

Launch-specification.json:

```
{
  "ImageId": "ami-12345678",
  "KeyName": "my-key-pair",
  "SecurityGroupIds": ["sg-12345678"],
  "InstanceType": "c4.large",
  "Placement": {
    "AvailabilityZone": "us-west-2b"
```

```
  }
  "IamInstanceProfile": {
      "Name": "my-iam-role"
  }
}
```

Output:

```
{
  "InstanceIdSet": [
      "i-1234567890abcdef0"
  ]
}
```

- Untuk API detailnya, lihat RunScheduledInstancesdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini meluncurkan Instance Terjadwal yang ditentukan.

```
New-EC2ScheduledInstance -ScheduledInstanceId
 sci-1234-1234-1234-1234-123456789012 -InstanceCount 1 `
-IamInstanceProfile_Name my-iam-role `
-LaunchSpecification_ImageId ami-12345678 `
-LaunchSpecification_InstanceType c4.large `
-LaunchSpecification_SubnetId subnet-12345678`
-LaunchSpecification_SecurityGroupId sg-12345678
```

- Untuk API detailnya, lihat RunScheduledInstancesdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`StartInstances`** dengan AWS SDK atau CLI

Contoh kode berikut menunjukkan cara menggunakan`StartInstances`.

Contoh tindakan adalah kutipan kode dari program yang lebih besar dan harus dijalankan dalam konteks. Anda dapat melihat tindakan ini dalam konteks dalam contoh kode berikut:

- Pelajari dasar-dasarnya

.NET

AWS SDK for .NET

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
/// <summary>
/// Start an EC2 instance.
/// </summary>
/// <param name="ec2InstanceId">The instance Id of the Amazon EC2 instance
/// to start.</param>
/// <returns>Async task.</returns>
public async Task StartInstances(string ec2InstanceId)
{
    try
    {
        var request = new StartInstancesRequest
        {
            InstanceIds = new List<string> { ec2InstanceId },
        };

        await _amazonEC2.StartInstancesAsync(request);

        Console.Write("Waiting for instance to start. ");
        await WaitForInstanceState(ec2InstanceId, InstanceStateName.Running);
    }
    catch (AmazonEC2Exception ec2Exception)
    {
        if (ec2Exception.ErrorCode == "InvalidInstanceId")
        {
            _logger.LogError(
```

```
                    $"InstanceId is invalid, unable to start.
{ec2Exception.Message}");
            }

            throw;
        }
        catch (Exception ex)
        {
            _logger.LogError(
                $"An error occurred while starting the instance.: {ex.Message}");
            throw;
        }
    }

    /// <summary>
    /// Wait until an EC2 instance is in a specified state.
    /// </summary>
    /// <param name="instanceId">The instance Id.</param>
    /// <param name="stateName">The state to wait for.</param>
    /// <returns>A Boolean value indicating the success of the action.</returns>
    public async Task<bool> WaitForInstanceState(string instanceId,
InstanceStateName stateName)
    {
        var request = new DescribeInstancesRequest
        {
            InstanceIds = new List<string> { instanceId }
        };

        // Wait until the instance is in the specified state.
        var hasState = false;
        do
        {
            // Wait 5 seconds.
            Thread.Sleep(5000);

            // Check for the desired state.
            var response = await _amazonEC2.DescribeInstancesAsync(request);
            var instance = response.Reservations[0].Instances[0];
            hasState = instance.State.Name == stateName;
            Console.Write(". ");
        } while (!hasState);

        return hasState;
    }
```

- Untuk API detailnya, lihat StartInstancesdi AWS SDK for .NET APIReferensi.

## Bash

### AWS CLI dengan skrip Bash

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
###############################################################################
# function ec2_start_instances
#
# This function starts one or more Amazon Elastic Compute Cloud (Amazon EC2)
 instances.
#
# Parameters:
#       -i instance_id - The ID(s) of the instance(s) to start (comma-separated).
#       -h - Display help.
#
# Returns:
#       0 - If successful.
#       1 - If it fails.
###############################################################################
function ec2_start_instances() {
  local instance_ids
  local option OPTARG # Required to use getopts command in a function.

  # bashsupport disable=BP5008
  function usage() {
    echo "function ec2_start_instances"
    echo "Starts one or more Amazon Elastic Compute Cloud (Amazon EC2)
 instances."
    echo "  -i instance_id - The ID(s) of the instance(s) to start (comma-
separated)."
    echo "  -h - Display help."
    echo ""
```

```
  }

  # Retrieve the calling parameters.
  while getopts "i:h" option; do
    case "${option}" in
      i) instance_ids="${OPTARG}" ;;
      h)
        usage
        return 0
        ;;
      \?)
        echo "Invalid parameter"
        usage
        return 1
        ;;
    esac
  done
  export OPTIND=1

  if [[ -z "$instance_ids" ]]; then
    errecho "ERROR: You must provide one or more instance IDs with the -i
 parameter."
    usage
    return 1
  fi

  response=$(aws ec2 start-instances \
    --instance-ids "${instance_ids}") || {
    aws_cli_error_log ${?}
    errecho "ERROR: AWS reports start-instances operation failed with $response."
    return 1
  }

  return 0
}
```

Fungsi utilitas yang digunakan dalam contoh ini.

```
###############################################################################
# function errecho
#
# This function outputs everything sent to it to STDERR (standard error output).
```

```
###############################################################################
function errecho() {
  printf "%s\n" "$*" 1>&2
}

###############################################################################
# function aws_cli_error_log()
#
# This function is used to log the error messages from the AWS CLI.
#
# The function expects the following argument:
#         $1 - The error code returned by the AWS CLI.
#
#  Returns:
#          0: - Success.
#
###############################################################################
function aws_cli_error_log() {
  local err_code=$1
  errecho "Error code : $err_code"
  if [ "$err_code" == 1 ]; then
    errecho "  One or more S3 transfers failed."
  elif [ "$err_code" == 2 ]; then
    errecho "  Command line failed to parse."
  elif [ "$err_code" == 130 ]; then
    errecho "  Process received SIGINT."
  elif [ "$err_code" == 252 ]; then
    errecho "  Command syntax invalid."
  elif [ "$err_code" == 253 ]; then
    errecho "  The system environment or configuration was invalid."
  elif [ "$err_code" == 254 ]; then
    errecho "  The service returned an error."
  elif [ "$err_code" == 255 ]; then
    errecho "  255 is a catch-all error."
  fi

  return 0
}
```

- Untuk API detailnya, lihat StartInstancesdi Referensi AWS CLI Perintah.

C++

SDKuntuk C ++

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
//! Start an Amazon Elastic Compute Cloud (Amazon EC2) instance.
/*!
  \param instanceID: An EC2 instance ID.
  \param clientConfiguration: AWS client configuration.
  \return bool: Function succeeded.
 */
bool AwsDoc::EC2::startInstance(const Aws::String &instanceId,
                                const Aws::Client::ClientConfiguration
 &clientConfiguration) {
    Aws::EC2::EC2Client ec2Client(clientConfiguration);

    Aws::EC2::Model::StartInstancesRequest startRequest;
    startRequest.AddInstanceIds(instanceId);
    startRequest.SetDryRun(true);

    Aws::EC2::Model::StartInstancesOutcome dryRunOutcome =
 ec2Client.StartInstances(startRequest);
    if (dryRunOutcome.IsSuccess()) {
        std::cerr
                << "Failed dry run to start instance. A dry run should trigger an
 error."
                << std::endl;
        return false;
    } else if (dryRunOutcome.GetError().GetErrorType() !=
               Aws::EC2::EC2Errors::DRY_RUN_OPERATION) {
        std::cout << "Failed dry run to start instance " << instanceId << ": "
                  << dryRunOutcome.GetError().GetMessage() << std::endl;
        return false;
    }

    startRequest.SetDryRun(false);
```

```
    Aws::EC2::Model::StartInstancesOutcome startInstancesOutcome =
 ec2Client.StartInstances(startRequest);

    if (!startInstancesOutcome.IsSuccess()) {
        std::cout << "Failed to start instance " << instanceId << ": " <<
                  startInstancesOutcome.GetError().GetMessage() << std::endl;
    } else {
        std::cout << "Successfully started instance " << instanceId <<
                  std::endl;
    }

    return startInstancesOutcome.IsSuccess();
}
```

- Untuk API detailnya, lihat StartInstancesdi AWS SDK for C++ APIReferensi.

CLI

AWS CLI

Untuk memulai EC2 instance Amazon

Contoh ini memulai instance yang EBS didukung Amazon yang ditentukan.

Perintah:

```
aws ec2 start-instances --instance-ids i-1234567890abcdef0
```

Output:

```
{
    "StartingInstances": [
        {
            "InstanceId": "i-1234567890abcdef0",
            "CurrentState": {
                "Code": 0,
                "Name": "pending"
            },
            "PreviousState": {
                "Code": 80,
                "Name": "stopped"
```

```
            }
        }
    ]
}
```

Untuk informasi selengkapnya, lihat Hentikan dan Mulai Instans Anda di Panduan Pengguna Amazon Elastic Compute Cloud.

- Untuk API detailnya, lihat StartInstancesdi Referensi AWS CLI Perintah.

Java

SDKuntuk Java 2.x

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
   /**
    * Starts an Amazon EC2 instance asynchronously and waits until it is in the
"running" state.
    *
    * @param instanceId the ID of the instance to start
    * @return a {@link CompletableFuture} that completes when the instance has
been started and is in the "running" state, or exceptionally if an error occurs
    */
   public CompletableFuture<Void> startInstanceAsync(String instanceId) {
       StartInstancesRequest startRequest = StartInstancesRequest.builder()
           .instanceIds(instanceId)
           .build();

       Ec2AsyncWaiter ec2Waiter = Ec2AsyncWaiter.builder()
           .client(getAsyncClient())
           .build();

       DescribeInstancesRequest describeRequest =
DescribeInstancesRequest.builder()
           .instanceIds(instanceId)
           .build();
```

```
        logger.info("Starting instance " + instanceId + " and waiting for it to
 run.");
        CompletableFuture<Void> resultFuture = new CompletableFuture<>();
        return getAsyncClient().startInstances(startRequest)
            .thenCompose(response ->
                ec2Waiter.waitUntilInstanceRunning(describeRequest)
            )
            .thenAccept(waiterResponse -> {
                logger.info("Successfully started instance " + instanceId);
                resultFuture.complete(null);
            })
            .exceptionally(throwable -> {
                resultFuture.completeExceptionally(new RuntimeException("Failed
 to start instance: " + throwable.getMessage(), throwable));
                return null;
            });
    }
```

- Untuk API detailnya, lihat StartInstancesdi AWS SDK for Java 2.x APIReferensi.

JavaScript

SDKuntuk JavaScript (v3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
import { EC2Client, StartInstancesCommand } from "@aws-sdk/client-ec2";
import { fileURLToPath } from "node:url";
import { parseArgs } from "node:util";

/**
 * Starts an Amazon EBS-backed instance that you've previously stopped.
 * @param {{ instanceIds }} options
 */
export const main = async ({ instanceIds }) => {
  const client = new EC2Client({});
  const command = new StartInstancesCommand({
```

```
    InstanceIds: instanceIds,
  });

  try {
    const { StartingInstances } = await client.send(command);
    const instanceIdList = StartingInstances.map(
      (instance) => ` • ${instance.InstanceId}`,
    );
    console.log("Starting instances:");
    console.log(instanceIdList.join("\n"));
  } catch (caught) {
    if (
      caught instanceof Error &&
      caught.name === "InvalidInstanceID.NotFound"
    ) {
      console.warn(`${caught.message}`);
    } else {
      throw caught;
    }
  }
};
```

- Untuk API detailnya, lihat StartInstancesdi AWS SDK for JavaScript APIReferensi.

Kotlin

SDKuntuk Kotlin

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
suspend fun startInstanceSc(instanceId: String) {
    val request =
        StartInstancesRequest {
            instanceIds = listOf(instanceId)
        }

    Ec2Client { region = "us-west-2" }.use { ec2 ->
```

```
        ec2.startInstances(request)
        println("Waiting until instance $instanceId starts. This will take a few
 minutes.")
        ec2.waitUntilInstanceRunning {
            // suspend call
            instanceIds = listOf(instanceId)
        }
        println("Successfully started instance $instanceId")
    }
}
```

- Untuk API detailnya, lihat StartInstances AWSSDKAPIreferensi Kotlin.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini memulai instance yang ditentukan.

```
Start-EC2Instance -InstanceId i-12345678
```

Output:

```
CurrentState                    InstanceId    PreviousState
------------                    ----------    -------------
Amazon.EC2.Model.InstanceState    i-12345678    Amazon.EC2.Model.InstanceState
```

Contoh 2: Contoh ini memulai instance yang ditentukan.

```
@("i-12345678", "i-76543210") | Start-EC2Instance
```

Contoh 3: Contoh ini memulai kumpulan instance yang saat ini dihentikan. Objek Instance yang dikembalikan oleh Get-EC2Instance disalurkan keStart-EC2Instance. Sintaks yang digunakan oleh contoh ini membutuhkan PowerShell versi 3 atau lebih tinggi.

```
(Get-EC2Instance -Filter @{ Name="instance-state-name";
 Values="stopped"}).Instances | Start-EC2Instance
```

Contoh 4: Dengan PowerShell versi 2, Anda harus menggunakan New-Object untuk membuat filter untuk parameter Filter.

```
$filter = New-Object Amazon.EC2.Model.Filter
$filter.Name = "instance-state-name"
$filter.Values = "stopped"

(Get-EC2Instance -Filter $filter).Instances | Start-EC2Instance
```

- Untuk API detailnya, lihat StartInstancesdi AWS Tools for PowerShell Referensi Cmdlet.

Python

SDKuntuk Python (Boto3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
class EC2InstanceWrapper:
    """Encapsulates Amazon Elastic Compute Cloud (Amazon EC2) instance actions
 using the client interface."""

    def __init__(
        self, ec2_client: Any, instances: Optional[List[Dict[str, Any]]] = None
    ) -> None:
        """
        Initializes the EC2InstanceWrapper with an EC2 client and optional
 instances.

        :param ec2_client: A Boto3 Amazon EC2 client. This client provides low-
level
                           access to AWS EC2 services.
        :param instances: A list of dictionaries representing Boto3 Instance
 objects. These are high-level objects that
                          wrap instance actions.
        """
        self.ec2_client = ec2_client
        self.instances = instances or []
```

```
    @classmethod
    def from_client(cls) -> "EC2InstanceWrapper":
        """
        Creates an EC2InstanceWrapper instance with a default EC2 client.

        :return: An instance of EC2InstanceWrapper initialized with the default
EC2 client.
        """
        ec2_client = boto3.client("ec2")
        return cls(ec2_client)


    def start(self) -> Optional[Dict[str, Any]]:
        """
        Starts instances and waits for them to be in a running state.

        :return: The response to the start request.
        """
        if not self.instances:
            logger.info("No instances to start.")
            return None

        instance_ids = [instance["InstanceId"] for instance in self.instances]
        try:
            start_response =
self.ec2_client.start_instances(InstanceIds=instance_ids)
            waiter = self.ec2_client.get_waiter("instance_running")
            waiter.wait(InstanceIds=instance_ids)
            return start_response
        except ClientError as err:
            logger.error(
                f"Failed to start instance(s): {','.join(map(str,
instance_ids))}"
            )
            error_code = err.response["Error"]["Code"]
            if error_code == "IncorrectInstanceState":
                logger.error(
                    "Couldn't start instance(s) because they are in an incorrect
state. "
                    "Ensure the instances are in a stopped state before starting
them."
                )
            raise
```

- Untuk API detailnya, lihat StartInstances AWSSDKReferensi Python (Boto3). API

Ruby

SDKuntuk Ruby

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
require 'aws-sdk-ec2'

# Attempts to start an Amazon Elastic Compute Cloud (Amazon EC2) instance.
#
# Prerequisites:
#
# - The Amazon EC2 instance.
#
# @param ec2_client [Aws::EC2::Client] An initialized EC2 client.
# @param instance_id [String] The ID of the instance.
# @return [Boolean] true if the instance was started; otherwise, false.
# @example
#   exit 1 unless instance_started?(
#     Aws::EC2::Client.new(region: 'us-west-2'),
#     'i-123abc'
#   )
def instance_started?(ec2_client, instance_id)
  response = ec2_client.describe_instance_status(instance_ids: [instance_id])

  if response.instance_statuses.count.positive?
    state = response.instance_statuses[0].instance_state.name
    case state
    when 'pending'
      puts 'Error starting instance: the instance is pending. Try again later.'
      return false
    when 'running'
```

```
      puts 'The instance is already running.'
      return true
    when 'terminated'
      puts 'Error starting instance: ' \
        'the instance is terminated, so you cannot start it.'
      return false
    end
  end

  ec2_client.start_instances(instance_ids: [instance_id])
  ec2_client.wait_until(:instance_running, instance_ids: [instance_id])
  puts 'Instance started.'
  true
rescue StandardError => e
  puts "Error starting instance: #{e.message}"
  false
end

# Example usage:
def run_me
  instance_id = ''
  region = ''
  # Print usage information and then stop.
  if ARGV[0] == '--help' || ARGV[0] == '-h'
    puts 'Usage:   ruby ec2-ruby-example-start-instance-i-123abc.rb ' \
      'INSTANCE_ID REGION '
    # Replace us-west-2 with the AWS Region you're using for Amazon EC2.
    puts 'Example: ruby ec2-ruby-example-start-instance-i-123abc.rb ' \
      'i-123abc us-west-2'
    exit 1
  # If no values are specified at the command prompt, use these default values.
  # Replace us-west-2 with the AWS Region you're using for Amazon EC2.
  elsif ARGV.count.zero?
    instance_id = 'i-123abc'
    region = 'us-west-2'
  # Otherwise, use the values as specified at the command prompt.
  else
    instance_id = ARGV[0]
    region = ARGV[1]
  end

  ec2_client = Aws::EC2::Client.new(region: region)

  puts "Attempting to start instance '#{instance_id}' " \
```

```
    '(this might take a few minutes)...'
  return if instance_started?(ec2_client, instance_id)

  puts 'Could not start instance.'
end

run_me if $PROGRAM_NAME == __FILE__
```

- Untuk API detailnya, lihat StartInstancesdi AWS SDK for Ruby APIReferensi.

Rust

SDKuntuk Rust

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

Mulai EC2 Instance dengan ID Instance.

```
    pub async fn start_instance(&self, instance_id: &str) -> Result<(), EC2Error>
{
        tracing::info!("Starting instance {instance_id}");

        self.client
            .start_instances()
            .instance_ids(instance_id)
            .send()
            .await?;

        tracing::info!("Started instance.");

        Ok(())
    }
```

Tunggu instance berada dalam status siap dan status ok, menggunakan PelayanAPI. Menggunakan Waiters API membutuhkan `use aws_sdk_ec2: :client: :Waiters` dalam file rust.

```
    /// Wait for an instance to be ready and status ok (default wait 60 seconds)
    pub async fn wait_for_instance_ready(
        &self,
        instance_id: &str,
        duration: Option<Duration>,
    ) -> Result<(), EC2Error> {
        self.client
            .wait_until_instance_status_ok()
            .instance_ids(instance_id)
            .wait(duration.unwrap_or(Duration::from_secs(60)))
            .await
            .map_err(|err| match err {
                WaiterError::ExceededMaxWait(exceeded) => EC2Error(format!(
                    "Exceeded max time ({}s) waiting for instance to start.",
                    exceeded.max_wait().as_secs()
                )),
                _ => EC2Error::from(err),
            })?;
        Ok(())
    }
```

- Untuk API detailnya, lihat StartInstances AWSSDKAPIreferensi Rust.

## SAP ABAP

### SDKuntuk SAP ABAP

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    DATA lt_instance_ids TYPE /aws1/
cl_ec2instidstringlist_w=>tt_instanceidstringlist.
    APPEND NEW /aws1/cl_ec2instidstringlist_w( iv_value = iv_instance_id ) TO
 lt_instance_ids.

    "Perform dry run"
```

```
    TRY.
        " DryRun is set to true. This checks for the required permissions to
 start the instance without actually making the request. "
        lo_ec2->startinstances(
          it_instanceids = lt_instance_ids
          iv_dryrun = abap_true
        ).
      CATCH /aws1/cx_rt_service_generic INTO DATA(lo_exception).
        " If the error code returned is `DryRunOperation`, then you have the
 required permissions to start this instance. "
        IF lo_exception->av_err_code = 'DryRunOperation'.
          MESSAGE 'Dry run to start instance completed.' TYPE 'I'.
          " DryRun is set to false to start instance. "
          oo_result = lo_ec2->startinstances(           " oo_result is returned
 for testing purposes. "
            it_instanceids = lt_instance_ids
            iv_dryrun = abap_false
          ).
          MESSAGE 'Successfully started the EC2 instance.' TYPE 'I'.
          " If the error code returned is `UnauthorizedOperation`, then you don't
 have the required permissions to start this instance. "
        ELSEIF lo_exception->av_err_code = 'UnauthorizedOperation'.
          MESSAGE 'Dry run to start instance failed. User does not have
 permissions to start the instance.' TYPE 'E'.
        ELSE.
          DATA(lv_error) = |"{ lo_exception->av_err_code }" - { lo_exception-
>av_err_msg }|.
          MESSAGE lv_error TYPE 'E'.
        ENDIF.
    ENDTRY.
```

- Untuk API detailnya, lihat StartInstances AWSSDKuntuk SAP ABAP API referensi.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`StopInstances`** dengan AWS SDK atau CLI

Contoh kode berikut menunjukkan cara menggunakan`StopInstances`.

Contoh tindakan adalah kutipan kode dari program yang lebih besar dan harus dijalankan dalam konteks. Anda dapat melihat tindakan ini dalam konteks dalam contoh kode berikut:

- Pelajari dasar-dasarnya

.NET

AWS SDK for .NET

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
/// <summary>
/// Stop an EC2 instance.
/// </summary>
/// <param name="ec2InstanceId">The instance Id of the EC2 instance to
/// stop.</param>
/// <returns>Async task.</returns>
public async Task StopInstances(string ec2InstanceId)
{
    try
    {
        var request = new StopInstancesRequest
        {
            InstanceIds = new List<string> { ec2InstanceId },
        };

        await _amazonEC2.StopInstancesAsync(request);
        Console.Write("Waiting for the instance to stop.");
        await WaitForInstanceState(ec2InstanceId, InstanceStateName.Stopped);

        Console.WriteLine("\nThe instance has stopped.");
    }
    catch (AmazonEC2Exception ec2Exception)
    {
        if (ec2Exception.ErrorCode == "InvalidInstanceId")
        {
            _logger.LogError(
```

```
                    $"InstanceId is invalid, unable to stop.
{ec2Exception.Message}");
            }

            throw;
        }
        catch (Exception ex)
        {
            _logger.LogError(
                $"An error occurred while stopping the instance.: {ex.Message}");
            throw;
        }
    }

    /// <summary>
    /// Wait until an EC2 instance is in a specified state.
    /// </summary>
    /// <param name="instanceId">The instance Id.</param>
    /// <param name="stateName">The state to wait for.</param>
    /// <returns>A Boolean value indicating the success of the action.</returns>
    public async Task<bool> WaitForInstanceState(string instanceId,
InstanceStateName stateName)
    {
        var request = new DescribeInstancesRequest
        {
            InstanceIds = new List<string> { instanceId }
        };

        // Wait until the instance is in the specified state.
        var hasState = false;
        do
        {
            // Wait 5 seconds.
            Thread.Sleep(5000);

            // Check for the desired state.
            var response = await _amazonEC2.DescribeInstancesAsync(request);
            var instance = response.Reservations[0].Instances[0];
            hasState = instance.State.Name == stateName;
            Console.Write(". ");
        } while (!hasState);

        return hasState;
    }
```

- Untuk API detailnya, lihat StopInstancesdi AWS SDK for .NET APIReferensi.

## Bash

### AWS CLI dengan skrip Bash

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
###############################################################################
# function ec2_stop_instances
#
# This function stops one or more Amazon Elastic Compute Cloud (Amazon EC2)
 instances.
#
# Parameters:
#       -i instance_id - The ID(s) of the instance(s) to stop (comma-separated).
#       -h - Display help.
#
# Returns:
#       0 - If successful.
#       1 - If it fails.
###############################################################################
function ec2_stop_instances() {
  local instance_ids
  local option OPTARG # Required to use getopts command in a function.

  # bashsupport disable=BP5008
  function usage() {
    echo "function ec2_stop_instances"
    echo "Stops one or more Amazon Elastic Compute Cloud (Amazon EC2) instances."
    echo "  -i instance_id - The ID(s) of the instance(s) to stop (comma-
separated)."
    echo "  -h - Display help."
    echo ""
  }
```

```
  # Retrieve the calling parameters.
  while getopts "i:h" option; do
    case "${option}" in
      i) instance_ids="${OPTARG}" ;;
      h)
        usage
        return 0
        ;;
      \?)
        echo "Invalid parameter"
        usage
        return 1
        ;;
    esac
  done
  export OPTIND=1

  if [[ -z "$instance_ids" ]]; then
    errecho "ERROR: You must provide one or more instance IDs with the -i
 parameter."
    usage
    return 1
  fi

  response=$(aws ec2 stop-instances \
    --instance-ids "${instance_ids}") || {
    aws_cli_error_log ${?}
    errecho "ERROR: AWS reports stop-instances operation failed with $response."
    return 1
  }

  return 0
}
```

Fungsi utilitas yang digunakan dalam contoh ini.

```
###############################################################################
# function errecho
#
# This function outputs everything sent to it to STDERR (standard error output).
###############################################################################
```

```
function errecho() {
  printf "%s\n" "$*" 1>&2
}

###############################################################################
# function aws_cli_error_log()
#
# This function is used to log the error messages from the AWS CLI.
#
# The function expects the following argument:
#         $1 - The error code returned by the AWS CLI.
#
#  Returns:
#          0: - Success.
#
###############################################################################
function aws_cli_error_log() {
  local err_code=$1
  errecho "Error code : $err_code"
  if [ "$err_code" == 1 ]; then
    errecho "  One or more S3 transfers failed."
  elif [ "$err_code" == 2 ]; then
    errecho "  Command line failed to parse."
  elif [ "$err_code" == 130 ]; then
    errecho "  Process received SIGINT."
  elif [ "$err_code" == 252 ]; then
    errecho "  Command syntax invalid."
  elif [ "$err_code" == 253 ]; then
    errecho "  The system environment or configuration was invalid."
  elif [ "$err_code" == 254 ]; then
    errecho "  The service returned an error."
  elif [ "$err_code" == 255 ]; then
    errecho "  255 is a catch-all error."
  fi

  return 0
}
```

- Untuk API detailnya, lihat StopInstancesdi Referensi AWS CLI Perintah.

C++

SDKuntuk C ++

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
//! Stop an EC2 instance.
/*!
  \param instanceID: An EC2 instance ID.
  \param clientConfiguration: AWS client configuration.
  \return bool: Function succeeded.
 */
bool AwsDoc::EC2::stopInstance(const Aws::String &instanceId,
                               const Aws::Client::ClientConfiguration
 &clientConfiguration) {
    Aws::EC2::EC2Client ec2Client(clientConfiguration);
    Aws::EC2::Model::StopInstancesRequest request;
    request.AddInstanceIds(instanceId);
    request.SetDryRun(true);

    Aws::EC2::Model::StopInstancesOutcome dryRunOutcome =
 ec2Client.StopInstances(request);
    if (dryRunOutcome.IsSuccess()) {
        std::cerr
                << "Failed dry run to stop instance. A dry run should trigger an
 error."
                << std::endl;
        return false;
    } else if (dryRunOutcome.GetError().GetErrorType() !=
               Aws::EC2::EC2Errors::DRY_RUN_OPERATION) {
        std::cout << "Failed dry run to stop instance " << instanceId << ": "
                  << dryRunOutcome.GetError().GetMessage() << std::endl;
        return false;
    }

    request.SetDryRun(false);
    Aws::EC2::Model::StopInstancesOutcome outcome =
 ec2Client.StopInstances(request);
```

```
    if (!outcome.IsSuccess()) {
        std::cout << "Failed to stop instance " << instanceId << ": " <<
                  outcome.GetError().GetMessage() << std::endl;
    } else {
        std::cout << "Successfully stopped instance " << instanceId <<
                  std::endl;
    }

    return outcome.IsSuccess();
}

void PrintUsage() {
    std::cout << "Usage: run_start_stop_instance <instance_id> <start|stop>" <<
              std::endl;
}
```

- Untuk API detailnya, lihat StopInstancesdi AWS SDK for C++ APIReferensi.

CLI

AWS CLI

Contoh 1: Untuk menghentikan EC2 instance Amazon

`stop-instances`Contoh berikut menghentikan instance yang EBS didukung Amazon yang ditentukan.

```
aws ec2 stop-instances \
    --instance-ids i-1234567890abcdef0
```

Output:

```
{
    "StoppingInstances": [
        {
            "InstanceId": "i-1234567890abcdef0",
            "CurrentState": {
                "Code": 64,
                "Name": "stopping"
            },
            "PreviousState": {
```

```
                "Code": 16,
                "Name": "running"
            }
        }
    ]
}
```

Untuk informasi selengkapnya, lihat Hentikan dan Mulai Instans Anda di Panduan Pengguna Amazon Elastic Compute Cloud.

Contoh 2: Untuk hibernasi instans Amazon EC2

`stop-instances`Contoh berikut hibernasi instance yang EBS didukung Amazon jika instance diaktifkan untuk hibernasi dan memenuhi prasyarat hibernasi. Setelah instans dimasukkan ke hibernasi, instans berhenti.

```
aws ec2 stop-instances \
    --instance-ids i-1234567890abcdef0 \
    --hibernate
```

Output:

```
{
    "StoppingInstances": [
        {
            "CurrentState": {
                "Code": 64,
                "Name": "stopping"
            },
            "InstanceId": "i-1234567890abcdef0",
            "PreviousState": {
                "Code": 16,
                "Name": "running"
            }
        }
    ]
}
```

Untuk informasi selengkapnya, lihat Hibernasikan instans Linux Sesuai Permintaan Anda di Panduan Pengguna Amazon Elastic Compute Cloud.

- Untuk API detailnya, lihat StopInstancesdi Referensi AWS CLI Perintah.

Java

SDKuntuk Java 2.x

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
   /**
    * Stops the EC2 instance with the specified ID asynchronously and waits for
the instance to stop.
    *
    * @param instanceId the ID of the EC2 instance to stop
    * @return a {@link CompletableFuture} that completes when the instance has
been stopped, or exceptionally if an error occurs
    */
   public CompletableFuture<Void> stopInstanceAsync(String instanceId) {
       StopInstancesRequest stopRequest = StopInstancesRequest.builder()
           .instanceIds(instanceId)
           .build();

       DescribeInstancesRequest describeRequest =
DescribeInstancesRequest.builder()
           .instanceIds(instanceId)
           .build();

       Ec2AsyncWaiter ec2Waiter = Ec2AsyncWaiter.builder()
           .client(getAsyncClient())
           .build();

       CompletableFuture<Void> resultFuture = new CompletableFuture<>();
       logger.info("Stopping instance " + instanceId + " and waiting for it to
stop.");
       getAsyncClient().stopInstances(stopRequest)
           .thenCompose(response -> {
               if (response.stoppingInstances().isEmpty()) {
                   return CompletableFuture.failedFuture(new
RuntimeException("No instances were stopped. Please check the instance ID: " +
instanceId));
               }
```

```
                return ec2Waiter.waitUntilInstanceStopped(describeRequest);
            })
            .thenAccept(waiterResponse -> {
                logger.info("Successfully stopped instance " + instanceId);
                resultFuture.complete(null);
            })
            .exceptionally(throwable -> {
                logger.error("Failed to stop instance " + instanceId + ": " +
 throwable.getMessage(), throwable);
                resultFuture.completeExceptionally(new RuntimeException("Failed
 to stop instance: " + throwable.getMessage(), throwable));
                return null;
            });

        return resultFuture;
    }
```

- Untuk API detailnya, lihat StopInstancesdi AWS SDK for Java 2.x APIReferensi.

## JavaScript

### SDKuntuk JavaScript (v3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
import { EC2Client, StopInstancesCommand } from "@aws-sdk/client-ec2";
import { fileURLToPath } from "node:url";
import { parseArgs } from "node:util";

/**
 * Stop one or more EC2 instances.
 * @param {{ instanceIds: string[] }} options
 */
export const main = async ({ instanceIds }) => {
  const client = new EC2Client({});
  const command = new StopInstancesCommand({
    InstanceIds: instanceIds,
```

```
  });

  try {
    const { StoppingInstances } = await client.send(command);
    const instanceIdList = StoppingInstances.map(
      (instance) => ` • ${instance.InstanceId}`,
    );
    console.log("Stopping instances:");
    console.log(instanceIdList.join("\n"));
  } catch (caught) {
    if (
      caught instanceof Error &&
      caught.name === "InvalidInstanceID.NotFound"
    ) {
      console.warn(`${caught.message}`);
    } else {
      throw caught;
    }
  }
};
```

- Untuk API detailnya, lihat StopInstancesdi AWS SDK for JavaScript APIReferensi.

Kotlin

SDKuntuk Kotlin

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
suspend fun stopInstanceSc(instanceId: String) {
    val request =
        StopInstancesRequest {
            instanceIds = listOf(instanceId)
        }

    Ec2Client { region = "us-west-2" }.use { ec2 ->
        ec2.stopInstances(request)
```

```
        println("Waiting until instance $instanceId stops. This will take a few
 minutes.")
        ec2.waitUntilInstanceStopped {
            // suspend call
            instanceIds = listOf(instanceId)
        }
        println("Successfully stopped instance $instanceId")
    }
}
```

- Untuk API detailnya, lihat StopInstances AWSSDKAPIreferensi Kotlin.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menghentikan instance yang ditentukan.

```
Stop-EC2Instance -InstanceId i-12345678
```

Output:

```
CurrentState                    InstanceId    PreviousState
------------                    ----------    -------------
Amazon.EC2.Model.InstanceState    i-12345678    Amazon.EC2.Model.InstanceState
```

- Untuk API detailnya, lihat StopInstancesdi AWS Tools for PowerShell Referensi Cmdlet.

Python

SDKuntuk Python (Boto3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
class EC2InstanceWrapper:
```

```
    """Encapsulates Amazon Elastic Compute Cloud (Amazon EC2) instance actions
 using the client interface."""

    def __init__(
        self, ec2_client: Any, instances: Optional[List[Dict[str, Any]]] = None
    ) -> None:
        """
        Initializes the EC2InstanceWrapper with an EC2 client and optional
 instances.

        :param ec2_client: A Boto3 Amazon EC2 client. This client provides low-
level
                           access to AWS EC2 services.
        :param instances: A list of dictionaries representing Boto3 Instance
 objects. These are high-level objects that
                          wrap instance actions.
        """
        self.ec2_client = ec2_client
        self.instances = instances or []

    @classmethod
    def from_client(cls) -> "EC2InstanceWrapper":
        """
        Creates an EC2InstanceWrapper instance with a default EC2 client.

        :return: An instance of EC2InstanceWrapper initialized with the default
 EC2 client.
        """
        ec2_client = boto3.client("ec2")
        return cls(ec2_client)


    def stop(self) -> Optional[Dict[str, Any]]:
        """
        Stops instances and waits for them to be in a stopped state.

        :return: The response to the stop request, or None if there are no
 instances to stop.
        """
        if not self.instances:
            logger.info("No instances to stop.")
            return None

        instance_ids = [instance["InstanceId"] for instance in self.instances]
```

```
        try:
            # Attempt to stop the instances
            stop_response =
 self.ec2_client.stop_instances(InstanceIds=instance_ids)
            waiter = self.ec2_client.get_waiter("instance_stopped")
            waiter.wait(InstanceIds=instance_ids)
        except ClientError as err:
            logger.error(
                f"Failed to stop instance(s): {','.join(map(str, instance_ids))}"
            )
            error_code = err.response["Error"]["Code"]
            if error_code == "IncorrectInstanceState":
                logger.error(
                    "Couldn't stop instance(s) because they are in an incorrect
 state. "
                    "Ensure the instances are in a running state before stopping
 them."
                )
            raise
        return stop_response
```

- Untuk API detailnya, lihat StopInstances AWSSDKReferensi Python (Boto3). API

Ruby

SDKuntuk Ruby

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
require 'aws-sdk-ec2'

# Prerequisites:
#
# - The Amazon EC2 instance.
#
```

```
# @param ec2_client [Aws::EC2::Client] An initialized EC2 client.
# @param instance_id [String] The ID of the instance.
# @return [Boolean] true if the instance was stopped; otherwise, false.
# @example
#   exit 1 unless instance_stopped?(
#     Aws::EC2::Client.new(region: 'us-west-2'),
#     'i-123abc'
#   )
def instance_stopped?(ec2_client, instance_id)
  response = ec2_client.describe_instance_status(instance_ids: [instance_id])

  if response.instance_statuses.count.positive?
    state = response.instance_statuses[0].instance_state.name
    case state
    when 'stopping'
      puts 'The instance is already stopping.'
      return true
    when 'stopped'
      puts 'The instance is already stopped.'
      return true
    when 'terminated'
      puts 'Error stopping instance: ' \
        'the instance is terminated, so you cannot stop it.'
      return false
    end
  end

  ec2_client.stop_instances(instance_ids: [instance_id])
  ec2_client.wait_until(:instance_stopped, instance_ids: [instance_id])
  puts 'Instance stopped.'
  true
rescue StandardError => e
  puts "Error stopping instance: #{e.message}"
  false
end

# Example usage:
def run_me
  instance_id = ''
  region = ''
  # Print usage information and then stop.
  if ARGV[0] == '--help' || ARGV[0] == '-h'
    puts 'Usage:   ruby ec2-ruby-example-stop-instance-i-123abc.rb ' \
      'INSTANCE_ID REGION '
```

```
    # Replace us-west-2 with the AWS Region you're using for Amazon EC2.
    puts 'Example: ruby ec2-ruby-example-start-instance-i-123abc.rb ' \
      'i-123abc us-west-2'
    exit 1
  # If no values are specified at the command prompt, use these default values.
  # Replace us-west-2 with the AWS Region you're using for Amazon EC2.
  elsif ARGV.count.zero?
    instance_id = 'i-123abc'
    region = 'us-west-2'
  # Otherwise, use the values as specified at the command prompt.
  else
    instance_id = ARGV[0]
    region = ARGV[1]
  end

  ec2_client = Aws::EC2::Client.new(region: region)

  puts "Attempting to stop instance '#{instance_id}' " \
    '(this might take a few minutes)...'
  return if instance_stopped?(ec2_client, instance_id)

  puts 'Could not stop instance.'
end

run_me if $PROGRAM_NAME == __FILE__
```

- Untuk API detailnya, lihat StopInstancesdi AWS SDK for Ruby APIReferensi.

## Rust

### SDKuntuk Rust

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    pub async fn stop_instance(&self, instance_id: &str) -> Result<(), EC2Error>
{
        tracing::info!("Stopping instance {instance_id}");
```

```
        self.client
            .stop_instances()
            .instance_ids(instance_id)
            .send()
            .await?;

        self.wait_for_instance_stopped(instance_id, None).await?;

        tracing::info!("Stopped instance.");

        Ok(())
    }
```

Tunggu instance berada dalam keadaan berhenti, menggunakan PelayanAPI. Menggunakan Waiters API membutuhkan `use aws_sdk_ec2: :client: :Waiters` dalam file rust.

```
    pub async fn stop_instance(&self, instance_id: &str) -> Result<(), EC2Error>
{
        tracing::info!("Stopping instance {instance_id}");

        self.client
            .stop_instances()
            .instance_ids(instance_id)
            .send()
            .await?;

        self.wait_for_instance_stopped(instance_id, None).await?;

        tracing::info!("Stopped instance.");

        Ok(())
    }
```

- Untuk API detailnya, lihat StopInstances AWSSDKAPIreferensi Rust.

## SAP ABAP

### SDKuntuk SAP ABAP

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    DATA lt_instance_ids TYPE /aws1/
cl_ec2instidstringlist_w=>tt_instanceidstringlist.
    APPEND NEW /aws1/cl_ec2instidstringlist_w( iv_value = iv_instance_id ) TO
 lt_instance_ids.

    "Perform dry run"
    TRY.
        " DryRun is set to true. This checks for the required permissions to stop
 the instance without actually making the request. "
        lo_ec2->stopinstances(
          it_instanceids = lt_instance_ids
          iv_dryrun = abap_true
        ).
      CATCH /aws1/cx_rt_service_generic INTO DATA(lo_exception).
        " If the error code returned is `DryRunOperation`, then you have the
 required permissions to stop this instance. "
        IF lo_exception->av_err_code = 'DryRunOperation'.
          MESSAGE 'Dry run to stop instance completed.' TYPE 'I'.
          " DryRun is set to false to stop instance. "
          oo_result = lo_ec2->stopinstances(           " oo_result is returned
 for testing purposes. "
            it_instanceids = lt_instance_ids
            iv_dryrun = abap_false
          ).
          MESSAGE 'Successfully stopped the EC2 instance.' TYPE 'I'.
          " If the error code returned is `UnauthorizedOperation`, then you don't
 have the required permissions to stop this instance. "
        ELSEIF lo_exception->av_err_code = 'UnauthorizedOperation'.
          MESSAGE 'Dry run to stop instance failed. User does not have
 permissions to stop the instance.' TYPE 'E'.
        ELSE.
```

```
          DATA(lv_error) = |"{ lo_exception->av_err_code }" - { lo_exception-
>av_err_msg }|.
          MESSAGE lv_error TYPE 'E'.
        ENDIF.
    ENDTRY.
```

- Untuk API detailnya, lihat StopInstances AWSSDKuntuk SAP ABAP API referensi.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`TerminateInstances`** dengan AWS SDK atau CLI

Contoh kode berikut menunjukkan cara menggunakan`TerminateInstances`.

Contoh tindakan adalah kutipan kode dari program yang lebih besar dan harus dijalankan dalam konteks. Anda dapat melihat tindakan ini dalam konteks dalam contoh kode berikut:

- Pelajari dasar-dasarnya

.NET

AWS SDK for .NET

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    /// <summary>
    /// Terminate an EC2 instance.
    /// </summary>
    /// <param name="ec2InstanceId">The instance Id of the EC2 instance
    /// to terminate.</param>
    /// <returns>Async task.</returns>
    public async Task<List<InstanceStateChange>> TerminateInstances(string
ec2InstanceId)
```

```
    {
        try
        {
            var request = new TerminateInstancesRequest
            {
                InstanceIds = new List<string> { ec2InstanceId }
            };

            var response = await _amazonEC2.TerminateInstancesAsync(request);
            Console.Write("Waiting for the instance to terminate.");
            await WaitForInstanceState(ec2InstanceId,
InstanceStateName.Terminated);

            Console.WriteLine($"\nThe instance {ec2InstanceId} has been
terminated.");
            return response.TerminatingInstances;
        }
        catch (AmazonEC2Exception ec2Exception)
        {
            if (ec2Exception.ErrorCode == "InvalidInstanceId")
            {
                _logger.LogError(
                    $"InstanceId is invalid, unable to terminate.
{ec2Exception.Message}");
            }

            throw;
        }
        catch (Exception ex)
        {
            _logger.LogError(
                $"An error occurred while terminating the instance.:
{ex.Message}");
            throw;
        }
    }

    /// <summary>
    /// Wait until an EC2 instance is in a specified state.
    /// </summary>
    /// <param name="instanceId">The instance Id.</param>
    /// <param name="stateName">The state to wait for.</param>
    /// <returns>A Boolean value indicating the success of the action.</returns>
```

```
    public async Task<bool> WaitForInstanceState(string instanceId,
InstanceStateName stateName)
    {
        var request = new DescribeInstancesRequest
        {
            InstanceIds = new List<string> { instanceId }
        };

        // Wait until the instance is in the specified state.
        var hasState = false;
        do
        {
            // Wait 5 seconds.
            Thread.Sleep(5000);

            // Check for the desired state.
            var response = await _amazonEC2.DescribeInstancesAsync(request);
            var instance = response.Reservations[0].Instances[0];
            hasState = instance.State.Name == stateName;
            Console.Write(". ");
        } while (!hasState);

        return hasState;
    }
```

- Untuk API detailnya, lihat TerminateInstancesdi AWS SDK for .NET APIReferensi.

## Bash

### AWS CLI dengan skrip Bash

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
#############################################################################
# function ec2_terminate_instances
#
```

```
# This function terminates one or more Amazon Elastic Compute Cloud (Amazon EC2)
# instances using the AWS CLI.
#
# Parameters:
#       -i instance_ids - A space-separated list of instance IDs.
#       -h - Display help.
#
# Returns:
#       0 - If successful.
#       1 - If it fails.
###############################################################################
function ec2_terminate_instances() {
  local instance_ids response
  local option OPTARG # Required to use getopts command in a function.

  # bashsupport disable=BP5008
  function usage() {
    echo "function ec2_terminate_instances"
    echo "Terminates one or more Amazon Elastic Compute Cloud (Amazon EC2)
 instances."
    echo "  -i instance_ids - A space-separated list of instance IDs."
    echo "  -h - Display help."
    echo ""
  }

  # Retrieve the calling parameters.
  while getopts "i:h" option; do
    case "${option}" in
      i) instance_ids="${OPTARG}" ;;
      h)
        usage
        return 0
        ;;
      \?)
        echo "Invalid parameter"
        usage
        return 1
        ;;
    esac
  done
  export OPTIND=1

  # Check if instance ID is provided
  if [[ -z "${instance_ids}" ]]; then
```

```
    echo "Error: Missing required instance IDs parameter."
    usage
    return 1
  fi

  # shellcheck disable=SC2086
  response=$(aws ec2 terminate-instances \
    "--instance-ids" $instance_ids \
    --query 'TerminatingInstances[*].[InstanceId,CurrentState.Name]' \
    --output text) || {
    aws_cli_error_log ${?}
    errecho "ERROR: AWS reports terminate-instances operation failed.$response"
    return 1
  }

  return 0
}
```

Fungsi utilitas yang digunakan dalam contoh ini.

```
###############################################################################
# function errecho
#
# This function outputs everything sent to it to STDERR (standard error output).
###############################################################################
function errecho() {
  printf "%s\n" "$*" 1>&2
}

###############################################################################
# function aws_cli_error_log()
#
# This function is used to log the error messages from the AWS CLI.
#
# The function expects the following argument:
#         $1 - The error code returned by the AWS CLI.
#
#  Returns:
#          0: - Success.
#
###############################################################################
function aws_cli_error_log() {
```

```
  local err_code=$1
  errecho "Error code : $err_code"
  if [ "$err_code" == 1 ]; then
    errecho "  One or more S3 transfers failed."
  elif [ "$err_code" == 2 ]; then
    errecho "  Command line failed to parse."
  elif [ "$err_code" == 130 ]; then
    errecho "  Process received SIGINT."
  elif [ "$err_code" == 252 ]; then
    errecho "  Command syntax invalid."
  elif [ "$err_code" == 253 ]; then
    errecho "  The system environment or configuration was invalid."
  elif [ "$err_code" == 254 ]; then
    errecho "  The service returned an error."
  elif [ "$err_code" == 255 ]; then
    errecho "  255 is a catch-all error."
  fi

  return 0
}
```

- Untuk API detailnya, lihat TerminateInstancesdi Referensi AWS CLI Perintah.

C++

SDKuntuk C ++

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
//! Terminate an Amazon Elastic Compute Cloud (Amazon EC2) instance.
/*!
  \param instanceID: An EC2 instance ID.
  \param clientConfiguration: AWS client configuration.
  \return bool: Function succeeded.
 */
bool AwsDoc::EC2::terminateInstances(const Aws::String &instanceID,
```

```
                                        const Aws::Client::ClientConfiguration
 &clientConfiguration) {
    Aws::EC2::EC2Client ec2Client(clientConfiguration);

    Aws::EC2::Model::TerminateInstancesRequest request;
    request.SetInstanceIds({instanceID});

    Aws::EC2::Model::TerminateInstancesOutcome outcome =
            ec2Client.TerminateInstances(request);
    if (outcome.IsSuccess()) {
        std::cout << "Ec2 instance '" << instanceID <<
                  "' was terminated." << std::endl;
    } else {
        std::cerr << "Failed to terminate ec2 instance " << instanceID <<
                  ", " <<
                  outcome.GetError().GetMessage() << std::endl;
        return false;
    }

    return outcome.IsSuccess();
}
```

- Untuk API detailnya, lihat TerminateInstancesdi AWS SDK for C++ APIReferensi.

CLI

AWS CLI

Untuk mengakhiri instans Amazon EC2

Contoh ini mengakhiri instans tertentu.

Perintah:

```
aws ec2 terminate-instances --instance-ids i-1234567890abcdef0
```

Output:

```
{
    "TerminatingInstances": [
        {
```

```
            "InstanceId": "i-1234567890abcdef0",
            "CurrentState": {
                "Code": 32,
                "Name": "shutting-down"
            },
            "PreviousState": {
                "Code": 16,
                "Name": "running"
            }
        }
    ]
}
```

Untuk informasi selengkapnya, lihat Menggunakan EC2 Instans Amazon di Panduan Pengguna Antarmuka Baris AWS Perintah.

- Untuk API detailnya, lihat TerminateInstancesdi Referensi AWS CLI Perintah.

Java

SDKuntuk Java 2.x

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
   /**
    * Terminates an EC2 instance asynchronously and waits for it to reach the
terminated state.
    *
    * @param instanceId the ID of the EC2 instance to terminate
    * @return a {@link CompletableFuture} that completes when the instance has
been terminated
    * @throws RuntimeException if there is no response from the AWS SDK or if
there is a failure during the termination process
    */
   public CompletableFuture<Object> terminateEC2Async(String instanceId) {
       TerminateInstancesRequest terminateRequest =
TerminateInstancesRequest.builder()
           .instanceIds(instanceId)
```

```
            .build();

        CompletableFuture<TerminateInstancesResponse> responseFuture =
getAsyncClient().terminateInstances(terminateRequest);
        return responseFuture.thenCompose(terminateResponse -> {
            if (terminateResponse == null) {
                throw new RuntimeException("No response received for terminating
instance " + instanceId);
            }
            System.out.println("Going to terminate an EC2 instance and use a
waiter to wait for it to be in terminated state");
            return getAsyncClient().waiter()
                .waitUntilInstanceTerminated(r -> r.instanceIds(instanceId))
                .thenApply(waiterResponse -> null);
        }).exceptionally(throwable -> {
            // Handle any exceptions that occurred during the async call
            throw new RuntimeException("Failed to terminate EC2 instance: " +
throwable.getMessage(), throwable);
        });
    }
```

- Untuk API detailnya, lihat TerminateInstancesdi AWS SDK for Java 2.x APIReferensi.

JavaScript

SDKuntuk JavaScript (v3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
import { EC2Client, TerminateInstancesCommand } from "@aws-sdk/client-ec2";
import { fileURLToPath } from "node:url";
import { parseArgs } from "node:util";

/**
 * Terminate one or more EC2 instances.
 * @param {{ instanceIds: string[] }} options
 */
```

```
export const main = async ({ instanceIds }) => {
  const client = new EC2Client({});
  const command = new TerminateInstancesCommand({
    InstanceIds: instanceIds,
  });

  try {
    const { TerminatingInstances } = await client.send(command);
    const instanceList = TerminatingInstances.map(
      (instance) => ` • ${instance.InstanceId}`,
    );
    console.log("Terminating instances:");
    console.log(instanceList.join("\n"));
  } catch (caught) {
    if (
      caught instanceof Error &&
      caught.name === "InvalidInstanceID.NotFound"
    ) {
      console.warn(`${caught.message}`);
    } else {
      throw caught;
    }
  }
};
```

- Untuk API detailnya, lihat TerminateInstancesdi AWS SDK for JavaScript APIReferensi.

## Kotlin

### SDKuntuk Kotlin

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
suspend fun terminateEC2(instanceID: String) {
    val request =
        TerminateInstancesRequest {
            instanceIds = listOf(instanceID)
```

```
        }

    Ec2Client { region = "us-west-2" }.use { ec2 ->
        val response = ec2.terminateInstances(request)
        response.terminatingInstances?.forEach { instance ->
            println("The ID of the terminated instance is
 ${instance.instanceId}")
        }
    }
}
```

- Untuk API detailnya, lihat TerminateInstances AWSSDKAPIreferensi Kotlin.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini mengakhiri instance yang ditentukan (instance mungkin berjalan atau dalam keadaan 'berhenti'). Cmdlet akan meminta konfirmasi sebelum melanjutkan; gunakan sakelar -Force untuk menekan prompt.

```
Remove-EC2Instance -InstanceId i-12345678
```

Output:

```
CurrentState                    InstanceId    PreviousState
------------                    ----------    -------------
Amazon.EC2.Model.InstanceState    i-12345678    Amazon.EC2.Model.InstanceState
```

- Untuk API detailnya, lihat TerminateInstancesdi AWS Tools for PowerShell Referensi Cmdlet.

Python

SDKuntuk Python (Boto3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
class EC2InstanceWrapper:
    """Encapsulates Amazon Elastic Compute Cloud (Amazon EC2) instance actions
 using the client interface."""

    def __init__(
        self, ec2_client: Any, instances: Optional[List[Dict[str, Any]]] = None
    ) -> None:
        """
        Initializes the EC2InstanceWrapper with an EC2 client and optional
 instances.

        :param ec2_client: A Boto3 Amazon EC2 client. This client provides low-
level
                           access to AWS EC2 services.
        :param instances: A list of dictionaries representing Boto3 Instance
 objects. These are high-level objects that
                          wrap instance actions.
        """
        self.ec2_client = ec2_client
        self.instances = instances or []

    @classmethod
    def from_client(cls) -> "EC2InstanceWrapper":
        """
        Creates an EC2InstanceWrapper instance with a default EC2 client.

        :return: An instance of EC2InstanceWrapper initialized with the default
 EC2 client.
        """
        ec2_client = boto3.client("ec2")
        return cls(ec2_client)
```

```
    def terminate(self) -> None:
        """
        Terminates instances and waits for them to reach the terminated state.
        """
        if not self.instances:
            logger.info("No instances to terminate.")
            return

        instance_ids = [instance["InstanceId"] for instance in self.instances]
        try:
            self.ec2_client.terminate_instances(InstanceIds=instance_ids)
            waiter = self.ec2_client.get_waiter("instance_terminated")
            waiter.wait(InstanceIds=instance_ids)
            self.instances.clear()
            for instance_id in instance_ids:
                print(f"• Instance ID: {instance_id}\n" f"• Action: Terminated")

        except ClientError as err:
            logger.error(
                f"Failed instance termination details:\n\t{str(self.instances)}"
            )
            error_code = err.response["Error"]["Code"]
            if error_code == "InvalidInstanceID.NotFound":
                logger.error(
                    "One or more instance IDs do not exist. "
                    "Please verify the instance IDs and try again."
                )
            raise
```

- Untuk API detailnya, lihat TerminateInstances AWSSDKReferensi Python (Boto3). API

## Ruby

### SDKuntuk Ruby

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
require 'aws-sdk-ec2'

# Prerequisites:
#
# - The Amazon EC2 instance.
#
# @param ec2_client [Aws::EC2::Client] An initialized EC2 client.
# @param instance_id [String] The ID of the instance.
# @return [Boolean] true if the instance was terminated; otherwise, false.
# @example
#   exit 1 unless instance_terminated?(
#     Aws::EC2::Client.new(region: 'us-west-2'),
#     'i-123abc'
#   )
def instance_terminated?(ec2_client, instance_id)
  response = ec2_client.describe_instance_status(instance_ids: [instance_id])

  if response.instance_statuses.count.positive? &&
     response.instance_statuses[0].instance_state.name == 'terminated'

    puts 'The instance is already terminated.'
    return true
  end

  ec2_client.terminate_instances(instance_ids: [instance_id])
  ec2_client.wait_until(:instance_terminated, instance_ids: [instance_id])
  puts 'Instance terminated.'
  true
rescue StandardError => e
  puts "Error terminating instance: #{e.message}"
  false
end

# Example usage:
def run_me
  instance_id = ''
  region = ''
  # Print usage information and then stop.
  if ARGV[0] == '--help' || ARGV[0] == '-h'
    puts 'Usage:   ruby ec2-ruby-example-terminate-instance-i-123abc.rb ' \
      'INSTANCE_ID REGION '
    # Replace us-west-2 with the AWS Region you're using for Amazon EC2.
```

```
    puts 'Example: ruby ec2-ruby-example-terminate-instance-i-123abc.rb ' \
      'i-123abc us-west-2'
    exit 1
  # If no values are specified at the command prompt, use these default values.
  # Replace us-west-2 with the AWS Region you're using for Amazon EC2.
  elsif ARGV.count.zero?
    instance_id = 'i-123abc'
    region = 'us-west-2'
  # Otherwise, use the values as specified at the command prompt.
  else
    instance_id = ARGV[0]
    region = ARGV[1]
  end

  ec2_client = Aws::EC2::Client.new(region: region)

  puts "Attempting to terminate instance '#{instance_id}' " \
    '(this might take a few minutes)...'
  return if instance_terminated?(ec2_client, instance_id)

  puts 'Could not terminate instance.'
end

run_me if $PROGRAM_NAME == __FILE__
```

- Untuk API detailnya, lihat TerminateInstancesdi AWS SDK for Ruby APIReferensi.

## Rust

### SDKuntuk Rust

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
    pub async fn delete_instance(&self, instance_id: &str) -> Result<(),
EC2Error> {
        tracing::info!("Deleting instance with id {instance_id}");
        self.stop_instance(instance_id).await?;
```

```
        self.client
            .terminate_instances()
            .instance_ids(instance_id)
            .send()
            .await?;
        self.wait_for_instance_terminated(instance_id).await?;
        tracing::info!("Terminated instance with id {instance_id}");
        Ok(())
    }
```

Tunggu instans berada dalam keadaan dihentikan, menggunakan PelayanAPI. Menggunakan Waiters API membutuhkan `use aws_sdk_ec2: :client: :Waiters` dalam file rust.

```
    async fn wait_for_instance_terminated(&self, instance_id: &str) -> Result<(),
EC2Error> {
        self.client
            .wait_until_instance_terminated()
            .instance_ids(instance_id)
            .wait(Duration::from_secs(60))
            .await
            .map_err(|err| match err {
                WaiterError::ExceededMaxWait(exceeded) => EC2Error(format!(
                    "Exceeded max time ({}s) waiting for instance to terminate.",
                    exceeded.max_wait().as_secs(),
                )),
                _ => EC2Error::from(err),
            })?;
        Ok(())
    }
```

- Untuk API detailnya, lihat TerminateInstances AWSSDKAPIreferensi Rust.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`UnassignPrivateIpAddresses`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`UnassignPrivateIpAddresses`.

CLI

AWS CLI

Untuk membatalkan penetapan alamat IP pribadi sekunder dari antarmuka jaringan

Contoh ini membatalkan penetapan alamat IP pribadi yang ditentukan dari antarmuka jaringan yang ditentukan. Jika perintah berhasil, tidak ada output yang akan ditampilkan.

Perintah:

```
aws ec2 unassign-private-ip-addresses --network-interface-id eni-e5aa89a3 --
private-ip-addresses 10.0.0.82
```

- Untuk API detailnya, lihat UnassignPrivateIpAddressesdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini membatalkan penetapan alamat IP pribadi yang ditentukan dari antarmuka jaringan yang ditentukan.

```
Unregister-EC2PrivateIpAddress -NetworkInterfaceId eni-1a2b3c4d -PrivateIpAddress
 10.0.0.82
```

- Untuk API detailnya, lihat UnassignPrivateIpAddressesdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`UnmonitorInstances`** dengan AWS SDK atau CLI

Contoh kode berikut menunjukkan cara menggunakan`UnmonitorInstances`.

Contoh tindakan adalah kutipan kode dari program yang lebih besar dan harus dijalankan dalam konteks. Anda dapat melihat tindakan ini dalam konteks dalam contoh kode berikut:

- Pelajari dasar-dasarnya

C++

SDKuntuk C ++

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
//! Disable monitoring for an EC2 instance.
/*!
  \param instanceId: An EC2 instance ID.
  \param clientConfiguration: AWS client configuration.
  \return bool: Function succeeded.
 */
bool AwsDoc::EC2::disableMonitoring(const Aws::String &instanceId,
                                    const Aws::Client::ClientConfiguration
 &clientConfiguration) {
    Aws::EC2::EC2Client ec2Client(clientConfiguration);
    Aws::EC2::Model::UnmonitorInstancesRequest unrequest;
    unrequest.AddInstanceIds(instanceId);
    unrequest.SetDryRun(true);

    Aws::EC2::Model::UnmonitorInstancesOutcome dryRunOutcome =
 ec2Client.UnmonitorInstances(unrequest);
    if (dryRunOutcome.IsSuccess()) {
        std::cerr
                << "Failed dry run to disable monitoring on instance. A dry run
 should trigger an error."
                <<
                std::endl;
        return false;
    } else if (dryRunOutcome.GetError().GetErrorType() !=
               Aws::EC2::EC2Errors::DRY_RUN_OPERATION) {
        std::cout << "Failed dry run to disable monitoring on instance " <<
                  instanceId << ": " << dryRunOutcome.GetError().GetMessage() <<
                  std::endl;
        return false;
    }
```

```
    unrequest.SetDryRun(false);
    Aws::EC2::Model::UnmonitorInstancesOutcome unmonitorInstancesOutcome =
 ec2Client.UnmonitorInstances(unrequest);
    if (!unmonitorInstancesOutcome.IsSuccess()) {
        std::cout << "Failed to disable monitoring on instance " << instanceId
                  << ": " << unmonitorInstancesOutcome.GetError().GetMessage() <<
                  std::endl;
    } else {
        std::cout << "Successfully disable monitoring on instance " <<
                  instanceId << std::endl;
    }

    return unmonitorInstancesOutcome.IsSuccess();
}
```

- Untuk API detailnya, lihat UnmonitorInstancesdi AWS SDK for C++ APIReferensi.

CLI

AWS CLI

Untuk menonaktifkan pemantauan yang mendetail untuk instans

Perintah contoh ini menonaktifkan pemantauan yang mendetail untuk instans tertentu.

Perintah:

```
aws ec2 unmonitor-instances --instance-ids i-1234567890abcdef0
```

Output:

```
{
  "InstanceMonitorings": [
      {
          "InstanceId": "i-1234567890abcdef0",
          "Monitoring": {
              "State": "disabling"
          }
      }
  ]
```

```
}
```

- Untuk API detailnya, lihat UnmonitorInstancesdi Referensi AWS CLI Perintah.

JavaScript

SDKuntuk JavaScript (v3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

```
import { EC2Client, UnmonitorInstancesCommand } from "@aws-sdk/client-ec2";
import { fileURLToPath } from "node:url";
import { parseArgs } from "node:util";

/**
 * Turn off detailed monitoring for the selected instance.
 * @param {{ instanceIds: string[] }} options
 */
export const main = async ({ instanceIds }) => {
  const client = new EC2Client({});
  const command = new UnmonitorInstancesCommand({
    InstanceIds: instanceIds,
  });

  try {
    const { InstanceMonitorings } = await client.send(command);
    const instanceMonitoringsList = InstanceMonitorings.map(
      (im) =>
        ` • Detailed monitoring state for ${im.InstanceId} is
 ${im.Monitoring.State}.`,
    );
    console.log("Monitoring status:");
    console.log(instanceMonitoringsList.join("\n"));
  } catch (caught) {
    if (
      caught instanceof Error &&
      caught.name === "InvalidInstanceID.NotFound"
    ) {
```

```
      console.warn(`${caught.message}`);
    } else {
      throw caught;
    }
  }
};
```

- Untuk API detailnya, lihat UnmonitorInstancesdi AWS SDK for JavaScript APIReferensi.

PowerShell

Alat untuk PowerShell

Contoh 1: Contoh ini menonaktifkan pemantauan terperinci untuk contoh yang ditentukan.

```
Stop-EC2InstanceMonitoring -InstanceId i-12345678
```

Output:

```
InstanceId    Monitoring
----------    ----------
i-12345678    Amazon.EC2.Model.Monitoring
```

- Untuk API detailnya, lihat UnmonitorInstancesdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

## Gunakan **`UpdateSecurityGroupRuleDescriptionsIngress`** dengan CLI

Contoh kode berikut menunjukkan cara menggunakan`UpdateSecurityGroupRuleDescriptionsIngress`.

CLI

AWS CLI

Contoh 1: Untuk memperbarui deskripsi aturan grup keamanan masuk dengan sumber CIDR

`update-security-group-rule-descriptions-ingress`Contoh berikut memperbarui deskripsi untuk aturan grup keamanan untuk port dan rentang IPv4 alamat yang ditentukan. Deskripsi '`SSH access from ABC office`' menggantikan deskripsi yang ada untuk aturan.

```
aws ec2 update-security-group-rule-descriptions-ingress \
    --group-id sg-02f0d35a850ba727f \
    --ip-permissions
 IpProtocol=tcp,FromPort=22,ToPort=22,IpRanges='[{CidrIp=203.0.113.0/16,Description="SSH
 access from corpnet"}]'
```

Output:

```
{
    "Return": true
}
```

Untuk informasi selengkapnya, lihat Aturan grup keamanan di Panduan EC2 Pengguna Amazon.

Contoh 2: Untuk memperbarui deskripsi aturan grup keamanan masuk dengan sumber daftar awalan

`update-security-group-rule-descriptions-ingress`Contoh berikut memperbarui deskripsi untuk aturan grup keamanan untuk port dan daftar awalan yang ditentukan. Deskripsi '`SSH access from ABC office`' menggantikan deskripsi yang ada untuk aturan.

```
aws ec2 update-security-group-rule-descriptions-ingress \
    --group-id sg-02f0d35a850ba727f \
    --ip-permissions
 IpProtocol=tcp,FromPort=22,ToPort=22,PrefixListIds='[{PrefixListId=pl-12345678,Descripti
 access from corpnet"}]'
```

Output:

```
{
    "Return": true
}
```

Untuk informasi selengkapnya, lihat Aturan grup keamanan di Panduan EC2 Pengguna Amazon.

- Untuk API detailnya, lihat UpdateSecurityGroupRuleDescriptionsIngressdi Referensi AWS CLI Perintah.

PowerShell

Alat untuk PowerShell

Contoh 1: Memperbarui deskripsi aturan grup keamanan ingress (inbound) yang ada.

```
$existingInboundRule = Get-EC2SecurityGroupRule -SecurityGroupRuleId
 "sgr-1234567890"
$ruleWithUpdatedDescription = [Amazon.EC2.Model.SecurityGroupRuleDescription]@{
  "SecurityGroupRuleId" = $existingInboundRule.SecurityGroupRuleId
  "Description" = "Updated rule description"
}

Update-EC2SecurityGroupRuleIngressDescription -GroupId
 $existingInboundRule.GroupId -SecurityGroupRuleDescription
 $ruleWithUpdatedDescription
```

Contoh 2: Menghapus deskripsi aturan grup keamanan ingress (inbound) yang ada (dengan menghilangkan parameter dalam permintaan).

```
$existingInboundRule = Get-EC2SecurityGroupRule -SecurityGroupRuleId
 "sgr-1234567890"
$ruleWithoutDescription = [Amazon.EC2.Model.SecurityGroupRuleDescription]@{
  "SecurityGroupRuleId" = $existingInboundRule.SecurityGroupRuleId
}

Update-EC2SecurityGroupRuleIngressDescription -GroupId
 $existingInboundRule.GroupId -SecurityGroupRuleDescription
 $ruleWithoutDescription
```

- Untuk API detailnya, lihat UpdateSecurityGroupRuleDescriptionsIngressdi AWS Tools for PowerShell Referensi Cmdlet.

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

# Skenario untuk Amazon EC2 menggunakan AWS SDKs

Contoh kode berikut menunjukkan cara menerapkan skenario umum di Amazon EC2 dengan AWS SDKs. Skenario ini menunjukkan kepada Anda cara menyelesaikan tugas tertentu dengan memanggil beberapa fungsi di Amazon EC2 atau digabungkan dengan yang lain Layanan AWS. Setiap skenario menyertakan tautan ke kode sumber lengkap, di mana Anda dapat menemukan instruksi tentang cara mengatur dan menjalankan kode.

Skenario menargetkan tingkat pengalaman menengah untuk membantu Anda memahami tindakan layanan dalam konteks.

Contoh

- Membangun dan mengelola layanan tangguh menggunakan AWS SDK

## Membangun dan mengelola layanan tangguh menggunakan AWS SDK

Contoh kode berikut menunjukkan cara membuat layanan web dengan beban seimbang yang mengembalikan rekomendasi buku, film, dan lagu. Contoh ini menunjukkan cara layanan tersebut merespons kegagalan, serta cara merestrukturisasi layanan agar lebih tangguh ketika terjadi kegagalan.

- Gunakan grup EC2 Auto Scaling Amazon untuk membuat instans Amazon Elastic Compute Cloud (AmazonEC2) berdasarkan template peluncuran dan menyimpan jumlah instans dalam rentang yang ditentukan.
- Menangani dan mendistribusikan HTTP permintaan dengan Elastic Load Balancing.
- Memantau kondisi instans dalam grup Auto Scaling dan meneruskan permintaan hanya ke instans yang sehat.
- Jalankan server web Python pada setiap EC2 instance untuk menangani HTTP permintaan. Server web merespons dengan memberikan rekomendasi dan melakukan pemeriksaan kondisi.
- Menyimulasikan layanan yang direkomendasikan dengan tabel Amazon DynamoDB.
- Kontrol respons server web terhadap permintaan dan pemeriksaan kesehatan dengan memperbarui AWS Systems Manager parameter.

.NET

AWS SDK for .NET

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

Menjalankan skenario interaktif di prompt perintah.

```
    static async Task Main(string[] args)
    {
        _configuration = new ConfigurationBuilder()
            .SetBasePath(Directory.GetCurrentDirectory())
            .AddJsonFile("settings.json") // Load settings from .json file.
            .AddJsonFile("settings.local.json",
                true) // Optionally, load local settings.
            .Build();


        // Set up dependency injection for the AWS services.
        using var host = Host.CreateDefaultBuilder(args)
            .ConfigureLogging(logging =>
                logging.AddFilter("System", LogLevel.Debug)
                    .AddFilter<DebugLoggerProvider>("Microsoft",
LogLevel.Information)
                    .AddFilter<ConsoleLoggerProvider>("Microsoft",
LogLevel.Trace))
            .ConfigureServices((_, services) =>
                services.AddAWSService<IAmazonIdentityManagementService>()
                    .AddAWSService<IAmazonDynamoDB>()
                    .AddAWSService<IAmazonElasticLoadBalancingV2>()
                    .AddAWSService<IAmazonSimpleSystemsManagement>()
                    .AddAWSService<IAmazonAutoScaling>()
                    .AddAWSService<IAmazonEC2>()
                    .AddTransient<AutoScalerWrapper>()
                    .AddTransient<ElasticLoadBalancerWrapper>()
                    .AddTransient<SmParameterWrapper>()
                    .AddTransient<Recommendations>()
                    .AddSingleton<IConfiguration>(_configuration)
            )
```

```
            .Build();

        ServicesSetup(host);
        ResourcesSetup();

        try
        {
            Console.WriteLine(new string('-', 80));
            Console.WriteLine("Welcome to the Resilient Architecture Example
Scenario.");
            Console.WriteLine(new string('-', 80));
            await Deploy(true);

            Console.WriteLine("Now let's begin the scenario.");
            Console.WriteLine(new string('-', 80));
            await Demo(true);

            Console.WriteLine(new string('-', 80));
            Console.WriteLine("Finally, let's clean up our resources.");
            Console.WriteLine(new string('-', 80));

            await DestroyResources(true);

            Console.WriteLine(new string('-', 80));
            Console.WriteLine("Resilient Architecture Example Scenario is
complete.");
            Console.WriteLine(new string('-', 80));
        }
        catch (Exception ex)
        {
            Console.WriteLine(new string('-', 80));
            Console.WriteLine($"There was a problem running the scenario:
{ex.Message}");
            await DestroyResources(true);
            Console.WriteLine(new string('-', 80));
        }
    }

    /// <summary>
    /// Setup any common resources, also used for integration testing.
    /// </summary>
    public static void ResourcesSetup()
    {
        _httpClient = new HttpClient();
```

```
    }

    /// <summary>
    /// Populate the services for use within the console application.
    /// </summary>
    /// <param name="host">The services host.</param>
    private static void ServicesSetup(IHost host)
    {
        _elasticLoadBalancerWrapper =
host.Services.GetRequiredService<ElasticLoadBalancerWrapper>();
        _iamClient =
host.Services.GetRequiredService<IAmazonIdentityManagementService>();
        _recommendations = host.Services.GetRequiredService<Recommendations>();
        _autoScalerWrapper =
host.Services.GetRequiredService<AutoScalerWrapper>();
        _smParameterWrapper =
host.Services.GetRequiredService<SmParameterWrapper>();
    }

    /// <summary>
    /// Deploy necessary resources for the scenario.
    /// </summary>
    /// <param name="interactive">True to run as interactive.</param>
    /// <returns>True if successful.</returns>
    public static async Task<bool> Deploy(bool interactive)
    {
        var protocol = "HTTP";
        var port = 80;
        var sshPort = 22;

        Console.WriteLine(
            "\nFor this demo, we'll use the AWS SDK for .NET to create several
AWS resources\n" +
            "to set up a load-balanced web service endpoint and explore some ways
to make it resilient\n" +
            "against various kinds of failures.\n\n" +
            "Some of the resources create by this demo are:\n");

        Console.WriteLine(
            "\t* A DynamoDB table that the web service depends on to provide
book, movie, and song recommendations.");
        Console.WriteLine(
            "\t* An EC2 launch template that defines EC2 instances that each
contain a Python web server.");
```

```
        Console.WriteLine(
            "\t* An EC2 Auto Scaling group that manages EC2 instances across
several Availability Zones.");
        Console.WriteLine(
            "\t* An Elastic Load Balancing (ELB) load balancer that targets the
Auto Scaling group to distribute requests.");
        Console.WriteLine(new string('-', 80));
        Console.WriteLine("Press Enter when you're ready to start deploying
resources.");
        if (interactive)
            Console.ReadLine();

        // Create and populate the DynamoDB table.
        var databaseTableName = _configuration["databaseName"];
        var recommendationsPath = Path.Join(_configuration["resourcePath"],
            "recommendations_objects.json");
        Console.WriteLine($"Creating and populating a DynamoDB table named
{databaseTableName}.");
        await _recommendations.CreateDatabaseWithName(databaseTableName);
        await _recommendations.PopulateDatabase(databaseTableName,
recommendationsPath);
        Console.WriteLine(new string('-', 80));

        // Create the EC2 Launch Template.

        Console.WriteLine(
            $"Creating an EC2 launch template that runs
'server_startup_script.sh' when an instance starts.\n"
            + "\nThis script starts a Python web server defined in the
`server.py` script. The web server\n"
            + "listens to HTTP requests on port 80 and responds to requests to
'/' and to '/healthcheck'.\n"
            + "For demo purposes, this server is run as the root user. In
production, the best practice is to\n"
            + "run a web server, such as Apache, with least-privileged
credentials.");
        Console.WriteLine(
            "\nThe template also defines an IAM policy that each instance uses to
assume a role that grants\n"
            + "permissions to access the DynamoDB recommendation table and
Systems Manager parameters\n"
            + "that control the flow of the demo.");

        var startupScriptPath = Path.Join(_configuration["resourcePath"],
```

```
            "server_startup_script.sh");
        var instancePolicyPath = Path.Join(_configuration["resourcePath"],
            "instance_policy.json");
        await _autoScalerWrapper.CreateTemplate(startupScriptPath,
instancePolicyPath);
        Console.WriteLine(new string('-', 80));

        Console.WriteLine(
            "Creating an EC2 Auto Scaling group that maintains three EC2
instances, each in a different\n"
            + "Availability Zone.\n");
        var zones = await _autoScalerWrapper.DescribeAvailabilityZones();
        await _autoScalerWrapper.CreateGroupOfSize(3,
_autoScalerWrapper.GroupName, zones);
        Console.WriteLine(new string('-', 80));

        Console.WriteLine(
            "At this point, you have EC2 instances created. Once each instance
starts, it listens for\n"
            + "HTTP requests. You can see these instances in the console or
continue with the demo.\n");

        Console.WriteLine(new string('-', 80));
        Console.WriteLine("Press Enter when you're ready to continue.");
        if (interactive)
            Console.ReadLine();

        Console.WriteLine("Creating variables that control the flow of the
demo.");
        await _smParameterWrapper.Reset();

        Console.WriteLine(
            "\nCreating an Elastic Load Balancing target group and load balancer.
The target group\n"
            + "defines how the load balancer connects to instances. The load
balancer provides a\n"
            + "single endpoint where clients connect and dispatches requests to
instances in the group.");

        var defaultVpc = await _autoScalerWrapper.GetDefaultVpc();
        var subnets = await
_autoScalerWrapper.GetAllVpcSubnetsForZones(defaultVpc.VpcId, zones);
        var subnetIds = subnets.Select(s => s.SubnetId).ToList();
```

```
        var targetGroup = await
 _elasticLoadBalancerWrapper.CreateTargetGroupOnVpc(_elasticLoadBalancerWrapper.TargetGro
 protocol, port, defaultVpc.VpcId);

        await
 _elasticLoadBalancerWrapper.CreateLoadBalancerAndListener(_elasticLoadBalancerWrapper.Lo
 subnetIds, targetGroup);
        await
 _autoScalerWrapper.AttachLoadBalancerToGroup(_autoScalerWrapper.GroupName,
 targetGroup.TargetGroupArn);
        Console.WriteLine("\nVerifying access to the load balancer endpoint...");
        var endPoint = await
 _elasticLoadBalancerWrapper.GetEndpointForLoadBalancerByName(_elasticLoadBalancerWrapper
        var loadBalancerAccess = await
 _elasticLoadBalancerWrapper.VerifyLoadBalancerEndpoint(endPoint);

        if (!loadBalancerAccess)
        {
            Console.WriteLine("\nCouldn't connect to the load balancer, verifying
 that the port is open...");

            var ipString = await _httpClient.GetStringAsync("https://
checkip.amazonaws.com");
            ipString = ipString.Trim();

            var defaultSecurityGroup = await
 _autoScalerWrapper.GetDefaultSecurityGroupForVpc(defaultVpc);
            var portIsOpen =
 _autoScalerWrapper.VerifyInboundPortForGroup(defaultSecurityGroup, port,
 ipString);
            var sshPortIsOpen =
 _autoScalerWrapper.VerifyInboundPortForGroup(defaultSecurityGroup, sshPort,
 ipString);

            if (!portIsOpen)
            {
                Console.WriteLine(
                    "\nFor this example to work, the default security group for
 your default VPC must\n"
                    + "allows access from this computer. You can either add it
 automatically from this\n"
                    + "example or add it yourself using the AWS Management
 Console.\n");
```

```
                if (!interactive || GetYesNoResponse(
                        "Do you want to add a rule to the security group to allow
inbound traffic from your computer's IP address?"))
                {
                    await
_autoScalerWrapper.OpenInboundPort(defaultSecurityGroup.GroupId, port,
ipString);
                }
            }

            if (!sshPortIsOpen)
            {
                if (!interactive || GetYesNoResponse(
                        "Do you want to add a rule to the security group to allow
inbound SSH traffic for debugging from your computer's IP address?"))
                {
                    await
_autoScalerWrapper.OpenInboundPort(defaultSecurityGroup.GroupId, sshPort,
ipString);
                }
            }
            loadBalancerAccess = await
_elasticLoadBalancerWrapper.VerifyLoadBalancerEndpoint(endPoint);
        }

        if (loadBalancerAccess)
        {
            Console.WriteLine("Your load balancer is ready. You can access it by
browsing to:");
            Console.WriteLine($"\thttp://{endPoint}\n");
        }
        else
        {
            Console.WriteLine(
                "\nCouldn't get a successful response from the load balancer
endpoint. Troubleshoot by\n"
                + "manually verifying that your VPC and security group are
configured correctly and that\n"
                + "you can successfully make a GET request to the load balancer
endpoint:\n");
            Console.WriteLine($"\thttp://{endPoint}\n");
        }
        Console.WriteLine(new string('-', 80));
```

```
        Console.WriteLine("Press Enter when you're ready to continue with the
demo.");
        if (interactive)
            Console.ReadLine();
        return true;
    }

    /// <summary>
    /// Demonstrate the steps of the scenario.
    /// </summary>
    /// <param name="interactive">True to run as an interactive scenario.</param>
    /// <returns>Async task.</returns>
    public static async Task<bool> Demo(bool interactive)
    {
        var ssmOnlyPolicy = Path.Join(_configuration["resourcePath"],
            "ssm_only_policy.json");

        Console.WriteLine(new string('-', 80));
        Console.WriteLine("Resetting parameters to starting values for demo.");
        await _smParameterWrapper.Reset();

        Console.WriteLine("\nThis part of the demonstration shows how to toggle
different parts of the system\n" +
                          "to create situations where the web service fails, and
shows how using a resilient\n" +
                          "architecture can keep the web service running in spite
of these failures.");
        Console.WriteLine(new string('-', 88));
        Console.WriteLine("At the start, the load balancer endpoint returns
recommendations and reports that all targets are healthy.");
        if (interactive)
            await DemoActionChoices();

        Console.WriteLine($"The web service running on the EC2 instances gets
recommendations by querying a DynamoDB table.\n" +
                          $"The table name is contained in a Systems Manager
parameter named '{_smParameterWrapper.TableParameter}'.\n" +
                          $"To simulate a failure of the recommendation service,
let's set this parameter to name a non-existent table.\n");
        await
_smParameterWrapper.PutParameterByName(_smParameterWrapper.TableParameter,
"this-is-not-a-table");
        Console.WriteLine("\nNow, sending a GET request to the load balancer
endpoint returns a failure code. But, the service reports as\n" +
```

```
                        "healthy to the load balancer because shallow health
checks don't check for failure of the recommendation service.");
       if (interactive)
           await DemoActionChoices();

       Console.WriteLine("Instead of failing when the recommendation service
fails, the web service can return a static response.");
       Console.WriteLine("While this is not a perfect solution, it presents the
customer with a somewhat better experience than failure.");

       await
_smParameterWrapper.PutParameterByName(_smParameterWrapper.FailureResponseParameter,
"static");

       Console.WriteLine("\nNow, sending a GET request to the load balancer
endpoint returns a static response.");
       Console.WriteLine("The service still reports as healthy because health
checks are still shallow.");
       if (interactive)
           await DemoActionChoices();

       Console.WriteLine("Let's reinstate the recommendation service.\n");
       await
_smParameterWrapper.PutParameterByName(_smParameterWrapper.TableParameter,
_smParameterWrapper.TableName);
       Console.WriteLine(
           "\nLet's also substitute bad credentials for one of the instances in
the target group so that it can't\n" +
           "access the DynamoDB recommendation table.\n"
       );
       await _autoScalerWrapper.CreateInstanceProfileWithName(
           _autoScalerWrapper.BadCredsPolicyName,
           _autoScalerWrapper.BadCredsRoleName,
           _autoScalerWrapper.BadCredsProfileName,
           ssmOnlyPolicy,
           new List<string> { "AmazonSSMManagedInstanceCore" }
       );
       var instances = await
_autoScalerWrapper.GetInstancesByGroupName(_autoScalerWrapper.GroupName);
       var badInstanceId = instances.First();
       var instanceProfile = await
_autoScalerWrapper.GetInstanceProfile(badInstanceId);
       Console.WriteLine(
```

```
            $"Replacing the profile for instance {badInstanceId} with a profile
that contains\n" +
            "bad credentials...\n"
        );
        await _autoScalerWrapper.ReplaceInstanceProfile(
            badInstanceId,
            _autoScalerWrapper.BadCredsProfileName,
            instanceProfile.AssociationId
        );
        Console.WriteLine(
            "Now, sending a GET request to the load balancer endpoint returns
either a recommendation or a static response,\n" +
            "depending on which instance is selected by the load balancer.\n"
        );
        if (interactive)
            await DemoActionChoices();

        Console.WriteLine("\nLet's implement a deep health check. For this demo,
a deep health check tests whether");
        Console.WriteLine("the web service can access the DynamoDB table that it
depends on for recommendations. Note that");
        Console.WriteLine("the deep health check is only for ELB routing and not
for Auto Scaling instance health.");
        Console.WriteLine("This kind of deep health check is not recommended for
Auto Scaling instance health, because it");
        Console.WriteLine("risks accidental termination of all instances in the
Auto Scaling group when a dependent service fails.");

        Console.WriteLine("\nBy implementing deep health checks, the load
balancer can detect when one of the instances is failing");
        Console.WriteLine("and take that instance out of rotation.");

        await
_smParameterWrapper.PutParameterByName(_smParameterWrapper.HealthCheckParameter,
"deep");

        Console.WriteLine($"\nNow, checking target health indicates that the
instance with bad credentials ({badInstanceId})");
        Console.WriteLine("is unhealthy. Note that it might take a minute or two
for the load balancer to detect the unhealthy");
        Console.WriteLine("instance. Sending a GET request to the load balancer
endpoint always returns a recommendation, because");
        Console.WriteLine("the load balancer takes unhealthy instances out of its
rotation.");
```

```
        if (interactive)
            await DemoActionChoices();

        Console.WriteLine("\nBecause the instances in this demo are controlled by
an auto scaler, the simplest way to fix an unhealthy");
        Console.WriteLine("instance is to terminate it and let the auto scaler
start a new instance to replace it.");

        await _autoScalerWrapper.TryTerminateInstanceById(badInstanceId);

        Console.WriteLine($"\nEven while the instance is terminating and the new
instance is starting, sending a GET");
        Console.WriteLine("request to the web service continues to get a
successful recommendation response because");
        Console.WriteLine("starts and reports as healthy, it is included in the
load balancing rotation.");
        Console.WriteLine("Note that terminating and replacing an instance
typically takes several minutes, during which time you");
        Console.WriteLine("can see the changing health check status until the new
instance is running and healthy.");

        if (interactive)
            await DemoActionChoices();

        Console.WriteLine("\nIf the recommendation service fails now, deep health
checks mean all instances report as unhealthy.");

        await
_smParameterWrapper.PutParameterByName(_smParameterWrapper.TableParameter,
"this-is-not-a-table");

        Console.WriteLine($"\nWhen all instances are unhealthy, the load balancer
continues to route requests even to");
        Console.WriteLine("unhealthy instances, allowing them to fail open and
return a static response rather than fail");
        Console.WriteLine("closed and report failure to the customer.");

        if (interactive)
            await DemoActionChoices();
        await _smParameterWrapper.Reset();

        Console.WriteLine(new string('-', 80));
        return true;
```

```
    }

    /// <summary>
    /// Clean up the resources from the scenario.
    /// </summary>
    /// <param name="interactive">True to ask the user for cleanup.</param>
    /// <returns>Async task.</returns>
    public static async Task<bool> DestroyResources(bool interactive)
    {
        Console.WriteLine(new string('-', 80));
        Console.WriteLine(
            "To keep things tidy and to avoid unwanted charges on your account,
we can clean up all AWS resources\n" +
            "that were created for this demo."
        );

        if (!interactive || GetYesNoResponse("Do you want to clean up all demo
resources? (y/n) "))
        {
            await
_elasticLoadBalancerWrapper.DeleteLoadBalancerByName(_elasticLoadBalancerWrapper.LoadBal
            await
_elasticLoadBalancerWrapper.DeleteTargetGroupByName(_elasticLoadBalancerWrapper.TargetGr
            await
_autoScalerWrapper.TerminateAndDeleteAutoScalingGroupWithName(_autoScalerWrapper.GroupNa
            await
_autoScalerWrapper.DeleteKeyPairByName(_autoScalerWrapper.KeyPairName);
            await
_autoScalerWrapper.DeleteTemplateByName(_autoScalerWrapper.LaunchTemplateName);
            await _autoScalerWrapper.DeleteInstanceProfile(
                _autoScalerWrapper.BadCredsProfileName,
                _autoScalerWrapper.BadCredsRoleName
            );
            await
_recommendations.DestroyDatabaseByName(_recommendations.TableName);
        }
        else
        {
            Console.WriteLine(
                "Ok, we'll leave the resources intact.\n" +
                "Don't forget to delete them when you're done with them or you
might incur unexpected charges."
            );
        }
```

```
        Console.WriteLine(new string('-', 80));
        return true;
    }
```

Buat kelas yang membungkus Auto Scaling dan tindakan AmazonEC2.

```
/// <summary>
/// Encapsulates Amazon EC2 Auto Scaling and EC2 management methods.
/// </summary>
public class AutoScalerWrapper
{
    private readonly IAmazonAutoScaling _amazonAutoScaling;
    private readonly IAmazonEC2 _amazonEc2;
    private readonly IAmazonSimpleSystemsManagement _amazonSsm;
    private readonly IAmazonIdentityManagementService _amazonIam;
    private readonly ILogger<AutoScalerWrapper> _logger;

    private readonly string _instanceType = "";
    private readonly string _amiParam = "";
    private readonly string _launchTemplateName = "";
    private readonly string _groupName = "";
    private readonly string _instancePolicyName = "";
    private readonly string _instanceRoleName = "";
    private readonly string _instanceProfileName = "";
    private readonly string _badCredsProfileName = "";
    private readonly string _badCredsRoleName = "";
    private readonly string _badCredsPolicyName = "";
    private readonly string _keyPairName = "";

    public string GroupName => _groupName;
    public string KeyPairName => _keyPairName;
    public string LaunchTemplateName => _launchTemplateName;
    public string InstancePolicyName => _instancePolicyName;
    public string BadCredsProfileName => _badCredsProfileName;
    public string BadCredsRoleName => _badCredsRoleName;
    public string BadCredsPolicyName => _badCredsPolicyName;

    /// <summary>
    /// Constructor for the AutoScalerWrapper.
    /// </summary>
    /// <param name="amazonAutoScaling">The injected AutoScaling client.</param>
```

```
    /// <param name="amazonEc2">The injected EC2 client.</param>
    /// <param name="amazonIam">The injected IAM client.</param>
    /// <param name="amazonSsm">The injected SSM client.</param>
    public AutoScalerWrapper(
        IAmazonAutoScaling amazonAutoScaling,
        IAmazonEC2 amazonEc2,
        IAmazonSimpleSystemsManagement amazonSsm,
        IAmazonIdentityManagementService amazonIam,
        IConfiguration configuration,
        ILogger<AutoScalerWrapper> logger)
    {
        _amazonAutoScaling = amazonAutoScaling;
        _amazonEc2 = amazonEc2;
        _amazonSsm = amazonSsm;
        _amazonIam = amazonIam;
        _logger = logger;

        var prefix = configuration["resourcePrefix"];
        _instanceType = configuration["instanceType"];
        _amiParam = configuration["amiParam"];

        _launchTemplateName = prefix + "-template";
        _groupName = prefix + "-group";
        _instancePolicyName = prefix + "-pol";
        _instanceRoleName = prefix + "-role";
        _instanceProfileName = prefix + "-prof";
        _badCredsPolicyName = prefix + "-bc-pol";
        _badCredsRoleName = prefix + "-bc-role";
        _badCredsProfileName = prefix + "-bc-prof";
        _keyPairName = prefix + "-key-pair";
    }

    /// <summary>
    /// Create a policy, role, and profile that is associated with instances with
a specified name.
    /// An instance's associated profile defines a role that is assumed by the
    /// instance.The role has attached policies that specify the AWS permissions
granted to
    /// clients that run on the instance.
    /// </summary>
    /// <param name="policyName">Name to use for the policy.</param>
    /// <param name="roleName">Name to use for the role.</param>
    /// <param name="profileName">Name to use for the profile.</param>
    /// <param name="ssmOnlyPolicyFile">Path to a policy file for SSM.</param>
```

```
    /// <param name="awsManagedPolicies">AWS Managed policies to be attached to
the role.</param>
    /// <returns>The Arn of the profile.</returns>
    public async Task<string> CreateInstanceProfileWithName(
        string policyName,
        string roleName,
        string profileName,
        string ssmOnlyPolicyFile,
        List<string>? awsManagedPolicies = null)
    {

        var assumeRoleDoc = "{" +
                                    "\"Version\": \"2012-10-17\"," +
                                    "\"Statement\": [{" +
                                         "\"Effect\": \"Allow\"," +
                                         "\"Principal\": {" +
                                         "\"Service\": [" +
                                             "\"ec2.amazonaws.com\"" +
                                         "]" +
                                         "}," +
                                    "\"Action\": \"sts:AssumeRole\"" +
                                    "}]" +
                                "}";

        var policyDocument = await File.ReadAllTextAsync(ssmOnlyPolicyFile);

        var policyArn = "";

        try
        {
            var createPolicyResult = await _amazonIam.CreatePolicyAsync(
                new CreatePolicyRequest
                {
                    PolicyName = policyName,
                    PolicyDocument = policyDocument
                });
            policyArn = createPolicyResult.Policy.Arn;
        }
        catch (EntityAlreadyExistsException)
        {
            // The policy already exists, so we look it up to get the Arn.
            var policiesPaginator = _amazonIam.Paginators.ListPolicies(
                new ListPoliciesRequest()
                {
```

```
                    Scope = PolicyScopeType.Local
                });
            // Get the entire list using the paginator.
            await foreach (var policy in policiesPaginator.Policies)
            {
                if (policy.PolicyName.Equals(policyName))
                {
                    policyArn = policy.Arn;
                }
            }

            if (policyArn == null)
            {
                throw new InvalidOperationException("Policy not found");
            }
        }

        try
        {
            await _amazonIam.CreateRoleAsync(new CreateRoleRequest()
            {
                RoleName = roleName,
                AssumeRolePolicyDocument = assumeRoleDoc,
            });
            await _amazonIam.AttachRolePolicyAsync(new AttachRolePolicyRequest()
            {
                RoleName = roleName,
                PolicyArn = policyArn
            });
            if (awsManagedPolicies != null)
            {
                foreach (var awsPolicy in awsManagedPolicies)
                {
                    await _amazonIam.AttachRolePolicyAsync(new
AttachRolePolicyRequest()
                    {
                        PolicyArn = $"arn:aws:iam::aws:policy/{awsPolicy}",
                        RoleName = roleName
                    });
                }
            }
        }
        catch (EntityAlreadyExistsException)
        {
```

```
            Console.WriteLine("Role already exists.");
        }

        string profileArn = "";
        try
        {
            var profileCreateResponse = await
_amazonIam.CreateInstanceProfileAsync(
                new CreateInstanceProfileRequest()
                {
                    InstanceProfileName = profileName
                });
            // Allow time for the profile to be ready.
            profileArn = profileCreateResponse.InstanceProfile.Arn;
            Thread.Sleep(10000);
            await _amazonIam.AddRoleToInstanceProfileAsync(
                new AddRoleToInstanceProfileRequest()
                {
                    InstanceProfileName = profileName,
                    RoleName = roleName
                });

        }
        catch (EntityAlreadyExistsException)
        {
            Console.WriteLine("Policy already exists.");
            var profileGetResponse = await _amazonIam.GetInstanceProfileAsync(
                new GetInstanceProfileRequest()
                {
                    InstanceProfileName = profileName
                });
            profileArn = profileGetResponse.InstanceProfile.Arn;
        }
        return profileArn;
    }

    /// <summary>
    /// Create a new key pair and save the file.
    /// </summary>
    /// <param name="newKeyPairName">The name of the new key pair.</param>
    /// <returns>Async task.</returns>
    public async Task CreateKeyPair(string newKeyPairName)
    {
        try
```

```
        {
            var keyResponse = await _amazonEc2.CreateKeyPairAsync(
                new CreateKeyPairRequest() { KeyName = newKeyPairName });
            await File.WriteAllTextAsync($"{newKeyPairName}.pem",
                keyResponse.KeyPair.KeyMaterial);
            Console.WriteLine($"Created key pair {newKeyPairName}.");
        }
        catch (AlreadyExistsException)
        {
            Console.WriteLine("Key pair already exists.");
        }
    }

    /// <summary>
    /// Delete the key pair and file by name.
    /// </summary>
    /// <param name="deleteKeyPairName">The key pair to delete.</param>
    /// <returns>Async task.</returns>
    public async Task DeleteKeyPairByName(string deleteKeyPairName)
    {
        try
        {
            await _amazonEc2.DeleteKeyPairAsync(
                new DeleteKeyPairRequest() { KeyName = deleteKeyPairName });
            File.Delete($"{deleteKeyPairName}.pem");
        }
        catch (FileNotFoundException)
        {
            Console.WriteLine($"Key pair {deleteKeyPairName} not found.");
        }
    }

    /// <summary>
    /// Creates an Amazon EC2 launch template to use with Amazon EC2 Auto
Scaling.
    /// The launch template specifies a Bash script in its user data field that
runs after
    /// the instance is started. This script installs the Python packages and
starts a Python
    /// web server on the instance.
    /// </summary>
    /// <param name="startupScriptPath">The path to a Bash script file that is
run.</param>
```

```
   /// <param name="instancePolicyPath">The path to a permissions policy to
create and attach to the profile.</param>
   /// <returns>The template object.</returns>
   public async Task<Amazon.EC2.Model.LaunchTemplate> CreateTemplate(string
startupScriptPath, string instancePolicyPath)
   {
       try
       {
           await CreateKeyPair(_keyPairName);
           await CreateInstanceProfileWithName(_instancePolicyName,
_instanceRoleName,
               _instanceProfileName, instancePolicyPath);

           var startServerText = await File.ReadAllTextAsync(startupScriptPath);
           var plainTextBytes =
System.Text.Encoding.UTF8.GetBytes(startServerText);

           var amiLatest = await _amazonSsm.GetParameterAsync(
               new GetParameterRequest() { Name = _amiParam });
           var amiId = amiLatest.Parameter.Value;
           var launchTemplateResponse = await
_amazonEc2.CreateLaunchTemplateAsync(
               new CreateLaunchTemplateRequest()
               {
                   LaunchTemplateName = _launchTemplateName,
                   LaunchTemplateData = new RequestLaunchTemplateData()
                   {
                       InstanceType = _instanceType,
                       ImageId = amiId,
                       IamInstanceProfile =
                           new

LaunchTemplateIamInstanceProfileSpecificationRequest()
                           {
                               Name = _instanceProfileName
                           },
                       KeyName = _keyPairName,
                       UserData = System.Convert.ToBase64String(plainTextBytes)
                   }
               });
           return launchTemplateResponse.LaunchTemplate;
       }
       catch (AmazonEC2Exception ec2Exception)
       {
```

```
            if (ec2Exception.ErrorCode ==
"InvalidLaunchTemplateName.AlreadyExistsException")
            {
                _logger.LogError($"Could not create the template, the name
{_launchTemplateName} already exists. " +
                                 $"Please try again with a unique name.");
            }

            throw;
        }
        catch (Exception ex)
        {
            _logger.LogError($"An error occurred while creating the template.:
{ex.Message}");
            throw;
        }
    }

    /// <summary>
    /// Get a list of Availability Zones in the AWS Region of the Amazon EC2
Client.
    /// </summary>
    /// <returns>A list of availability zones.</returns>
    public async Task<List<string>> DescribeAvailabilityZones()
    {
        try
        {
            var zoneResponse = await _amazonEc2.DescribeAvailabilityZonesAsync(
                new DescribeAvailabilityZonesRequest());
            return zoneResponse.AvailabilityZones.Select(z =>
z.ZoneName).ToList();
        }
        catch (AmazonEC2Exception ec2Exception)
        {
            _logger.LogError($"An Amazon EC2 error occurred while listing
availability zones.: {ec2Exception.Message}");
            throw;
        }
        catch (Exception ex)
        {
            _logger.LogError($"An error occurred while listing availability
zones.: {ex.Message}");
            throw;
        }
```

```
    }

    /// <summary>
    /// Create an EC2 Auto Scaling group of a specified size and name.
    /// </summary>
    /// <param name="groupSize">The size for the group.</param>
    /// <param name="groupName">The name for the group.</param>
    /// <param name="availabilityZones">The availability zones for the group.</
param>
    /// <returns>Async task.</returns>
    public async Task CreateGroupOfSize(int groupSize, string groupName,
 List<string> availabilityZones)
    {
        try
        {
            await _amazonAutoScaling.CreateAutoScalingGroupAsync(
                new CreateAutoScalingGroupRequest()
                {
                    AutoScalingGroupName = groupName,
                    AvailabilityZones = availabilityZones,
                    LaunchTemplate =
                        new
 Amazon.AutoScaling.Model.LaunchTemplateSpecification()
                        {
                            LaunchTemplateName = _launchTemplateName,
                            Version = "$Default"
                        },
                    MaxSize = groupSize,
                    MinSize = groupSize
                });
            Console.WriteLine($"Created EC2 Auto Scaling group {groupName} with
 size {groupSize}.");
        }
        catch (EntityAlreadyExistsException)
        {
            Console.WriteLine($"EC2 Auto Scaling group {groupName} already
 exists.");
        }
    }

    /// <summary>
    /// Get the default VPC for the account.
    /// </summary>
    /// <returns>The default VPC object.</returns>
```

```
    public async Task<Vpc> GetDefaultVpc()
    {
        try
        {
            var vpcResponse = await _amazonEc2.DescribeVpcsAsync(
                new DescribeVpcsRequest()
                {
                    Filters = new List<Amazon.EC2.Model.Filter>()
                    {
                        new("is-default", new List<string>() { "true" })
                    }
                });
            return vpcResponse.Vpcs[0];
        }
        catch (AmazonEC2Exception ec2Exception)
        {
            if (ec2Exception.ErrorCode == "UnauthorizedOperation")
            {
                _logger.LogError(ec2Exception, $"You do not have the necessary
permissions to describe VPCs.");
            }

            throw;
        }
        catch (Exception ex)
        {
            _logger.LogError(ex, $"An error occurred while describing the vpcs.:
{ex.Message}");
            throw;
        }
    }

    /// <summary>
    /// Get all the subnets for a Vpc in a set of availability zones.
    /// </summary>
    /// <param name="vpcId">The Id of the Vpc.</param>
    /// <param name="availabilityZones">The list of availability zones.</param>
    /// <returns>The collection of subnet objects.</returns>
    public async Task<List<Subnet>> GetAllVpcSubnetsForZones(string vpcId,
List<string> availabilityZones)
    {
        try
        {
            var subnets = new List<Subnet>();
```

```
            var subnetPaginator = _amazonEc2.Paginators.DescribeSubnets(
                new DescribeSubnetsRequest()
                {
                    Filters = new List<Amazon.EC2.Model.Filter>()
                    {
                        new("vpc-id", new List<string>() { vpcId }),
                        new("availability-zone", availabilityZones),
                        new("default-for-az", new List<string>() { "true" })
                    }
                });

            // Get the entire list using the paginator.
            await foreach (var subnet in subnetPaginator.Subnets)
            {
                subnets.Add(subnet);
            }

            return subnets;
        }
        catch (AmazonEC2Exception ec2Exception)
        {
            if (ec2Exception.ErrorCode == "InvalidVpcID.NotFound")
            {
                _logger.LogError(ec2Exception, $"The specified VPC ID {vpcId}
does not exist.");
            }

            throw;
        }
        catch (Exception ex)
        {
            _logger.LogError(ex, $"An error occurred while describing the
subnets.: {ex.Message}");
            throw;
        }
    }

    /// <summary>
    /// Delete a launch template by name.
    /// </summary>
    /// <param name="templateName">The name of the template to delete.</param>
    /// <returns>Async task.</returns>
    public async Task DeleteTemplateByName(string templateName)
    {
```

```
        try
        {
            await _amazonEc2.DeleteLaunchTemplateAsync(
                new DeleteLaunchTemplateRequest()
                {
                    LaunchTemplateName = templateName
                });
        }
        catch (AmazonEC2Exception ec2Exception)
        {
            if (ec2Exception.ErrorCode ==
"InvalidLaunchTemplateName.NotFoundException")
            {
                _logger.LogError(
                    $"Could not delete the template, the name
{_launchTemplateName} was not found.");
            }

            throw;
        }
        catch (Exception ex)
        {
            _logger.LogError($"An error occurred while deleting the template.:
{ex.Message}");
            throw;
        }
    }

    /// <summary>
    /// Detaches a role from an instance profile, detaches policies from the
role,
    /// and deletes all the resources.
    /// </summary>
    /// <param name="profileName">The name of the profile to delete.</param>
    /// <param name="roleName">The name of the role to delete.</param>
    /// <returns>Async task.</returns>
    public async Task DeleteInstanceProfile(string profileName, string roleName)
    {
        try
        {
            await _amazonIam.RemoveRoleFromInstanceProfileAsync(
                new RemoveRoleFromInstanceProfileRequest()
                {
                    InstanceProfileName = profileName,
```

```
                    RoleName = roleName
                });
            await _amazonIam.DeleteInstanceProfileAsync(
                new DeleteInstanceProfileRequest() { InstanceProfileName =
profileName });
            var attachedPolicies = await
_amazonIam.ListAttachedRolePoliciesAsync(
                new ListAttachedRolePoliciesRequest() { RoleName = roleName });
            foreach (var policy in attachedPolicies.AttachedPolicies)
            {
                await _amazonIam.DetachRolePolicyAsync(
                    new DetachRolePolicyRequest()
                    {
                        RoleName = roleName,
                        PolicyArn = policy.PolicyArn
                    });
                // Delete the custom policies only.
                if (!policy.PolicyArn.StartsWith("arn:aws:iam::aws"))
                {
                    await _amazonIam.DeletePolicyAsync(
                        new Amazon.IdentityManagement.Model.DeletePolicyRequest()
                        {
                            PolicyArn = policy.PolicyArn
                        });
                }
            }

            await _amazonIam.DeleteRoleAsync(
                new DeleteRoleRequest() { RoleName = roleName });
        }
        catch (NoSuchEntityException)
        {
            Console.WriteLine($"Instance profile {profileName} does not exist.");
        }
    }

    /// <summary>
    /// Gets data about the instances in an EC2 Auto Scaling group by its group
name.
    /// </summary>
    /// <param name="group">The name of the auto scaling group.</param>
    /// <returns>A collection of instance Ids.</returns>
    public async Task<IEnumerable<string>> GetInstancesByGroupName(string group)
    {
```

```
        var instanceResponse = await
_amazonAutoScaling.DescribeAutoScalingGroupsAsync(
            new DescribeAutoScalingGroupsRequest()
            {
                AutoScalingGroupNames = new List<string>() { group }
            });
        var instanceIds = instanceResponse.AutoScalingGroups.SelectMany(
            g => g.Instances.Select(i => i.InstanceId));
        return instanceIds;
    }

    /// <summary>
    /// Get the instance profile association data for an instance.
    /// </summary>
    /// <param name="instanceId">The Id of the instance.</param>
    /// <returns>Instance profile associations data.</returns>
    public async Task<IamInstanceProfileAssociation> GetInstanceProfile(string
instanceId)
    {
        try
        {
            var response = await
_amazonEc2.DescribeIamInstanceProfileAssociationsAsync(
                new DescribeIamInstanceProfileAssociationsRequest()
                {
                    Filters = new List<Amazon.EC2.Model.Filter>()
                    {
                        new("instance-id", new List<string>() { instanceId })
                    },
                });
            return response.IamInstanceProfileAssociations[0];
        }
        catch (AmazonEC2Exception ec2Exception)
        {
            if (ec2Exception.ErrorCode == "InvalidInstanceID.NotFound")
            {
                _logger.LogError(ec2Exception, $"Instance {instanceId} not
found");
            }

            throw;
        }
        catch (Exception ex)
        {
```

```
            _logger.LogError(ex, $"An error occurred while creating the
template.: {ex.Message}");
            throw;
        }
    }

    /// <summary>
    /// Replace the profile associated with a running instance. After the profile
is replaced, the instance
    /// is rebooted to ensure that it uses the new profile. When the instance is
ready, Systems Manager is
    /// used to restart the Python web server.
    /// </summary>
    /// <param name="instanceId">The Id of the instance to update.</param>
    /// <param name="credsProfileName">The name of the new profile to associate
with the specified instance.</param>
    /// <param name="associationId">The Id of the existing profile association
for the instance.</param>
    /// <returns>Async task.</returns>
    public async Task ReplaceInstanceProfile(string instanceId, string
credsProfileName, string associationId)
    {
        try
        {
            await _amazonEc2.ReplaceIamInstanceProfileAssociationAsync(
                new ReplaceIamInstanceProfileAssociationRequest()
                {
                    AssociationId = associationId,
                    IamInstanceProfile = new IamInstanceProfileSpecification()
                    {
                        Name = credsProfileName
                    }
                });
            // Allow time before resetting.
            Thread.Sleep(25000);

            await _amazonEc2.RebootInstancesAsync(
                new RebootInstancesRequest(new List<string>() { instanceId }));
            Thread.Sleep(25000);
            var instanceReady = false;
            var retries = 5;
            while (retries-- > 0 && !instanceReady)
            {
                var instancesPaginator =
```

```
                    _amazonSsm.Paginators.DescribeInstanceInformation(
                        new DescribeInstanceInformationRequest());
                // Get the entire list using the paginator.
                await foreach (var instance in
instancesPaginator.InstanceInformationList)
                {
                    instanceReady = instance.InstanceId == instanceId;
                    if (instanceReady)
                    {
                        break;
                    }
                }
            }
            Console.WriteLine("Waiting for instance to be running.");
            await WaitForInstanceState(instanceId, InstanceStateName.Running);
            Console.WriteLine("Instance ready.");
            Console.WriteLine($"Sending restart command to instance
{instanceId}");
            await _amazonSsm.SendCommandAsync(
                new SendCommandRequest()
                {
                    InstanceIds = new List<string>() { instanceId },
                    DocumentName = "AWS-RunShellScript",
                    Parameters = new Dictionary<string, List<string>>()
                    {
                        {
                            "commands",
                            new List<string>() { "cd / && sudo python3 server.py
80" }
                        }
                    }
                });
            Console.WriteLine($"Restarted the web server on instance
{instanceId}");
        }
        catch (AmazonEC2Exception ec2Exception)
        {
            if (ec2Exception.ErrorCode == "InvalidInstanceID.NotFound")
            {
                _logger.LogError(ec2Exception, $"Instance {instanceId} not
found");
            }

            throw;
```

```
        }
        catch (Exception ex)
        {
            _logger.LogError(ex, $"An error occurred while replacing the
template.: {ex.Message}");
            throw;
        }
    }

    /// <summary>
    /// Try to terminate an instance by its Id.
    /// </summary>
    /// <param name="instanceId">The Id of the instance to terminate.</param>
    /// <returns>Async task.</returns>
    public async Task TryTerminateInstanceById(string instanceId)
    {
        var stopping = false;
        Console.WriteLine($"Stopping {instanceId}...");
        while (!stopping)
        {
            try
            {
                await
_amazonAutoScaling.TerminateInstanceInAutoScalingGroupAsync(
                    new TerminateInstanceInAutoScalingGroupRequest()
                    {
                        InstanceId = instanceId,
                        ShouldDecrementDesiredCapacity = false
                    });
                stopping = true;
            }
            catch (ScalingActivityInProgressException)
            {
                Console.WriteLine($"Scaling activity in progress for
{instanceId}. Waiting...");
                Thread.Sleep(10000);
            }
        }
    }

    /// <summary>
    /// Tries to delete the EC2 Auto Scaling group. If the group is in use or in
progress,
    /// waits and retries until the group is successfully deleted.
```

```
    /// </summary>
    /// <param name="groupName">The name of the group to try to delete.</param>
    /// <returns>Async task.</returns>
    public async Task TryDeleteGroupByName(string groupName)
    {
        var stopped = false;
        while (!stopped)
        {
            try
            {
                await _amazonAutoScaling.DeleteAutoScalingGroupAsync(
                    new DeleteAutoScalingGroupRequest()
                    {
                        AutoScalingGroupName = groupName
                    });
                stopped = true;
            }
            catch (Exception e)
                when ((e is ScalingActivityInProgressException)
                      || (e is Amazon.AutoScaling.Model.ResourceInUseException))
            {
                Console.WriteLine($"Some instances are still running.
Waiting...");
                Thread.Sleep(10000);
            }
        }
    }

    /// <summary>
    /// Terminate instances and delete the Auto Scaling group by name.
    /// </summary>
    /// <param name="groupName">The name of the group to delete.</param>
    /// <returns>Async task.</returns>
    public async Task TerminateAndDeleteAutoScalingGroupWithName(string
groupName)
    {
        var describeGroupsResponse = await
_amazonAutoScaling.DescribeAutoScalingGroupsAsync(
            new DescribeAutoScalingGroupsRequest()
            {
                AutoScalingGroupNames = new List<string>() { groupName }
            });
        if (describeGroupsResponse.AutoScalingGroups.Any())
        {
```

```
            // Update the size to 0.
            await _amazonAutoScaling.UpdateAutoScalingGroupAsync(
                new UpdateAutoScalingGroupRequest()
                {
                    AutoScalingGroupName = groupName,
                    MinSize = 0
                });
            var group = describeGroupsResponse.AutoScalingGroups[0];
            foreach (var instance in group.Instances)
            {
                await TryTerminateInstanceById(instance.InstanceId);
            }

            await TryDeleteGroupByName(groupName);
        }
        else
        {
            Console.WriteLine($"No groups found with name {groupName}.");
        }
    }


    /// <summary>
    /// Get the default security group for a specified Vpc.
    /// </summary>
    /// <param name="vpc">The Vpc to search.</param>
    /// <returns>The default security group.</returns>
    public async Task<SecurityGroup> GetDefaultSecurityGroupForVpc(Vpc vpc)
    {
        var groupResponse = await _amazonEc2.DescribeSecurityGroupsAsync(
            new DescribeSecurityGroupsRequest()
            {
                Filters = new List<Amazon.EC2.Model.Filter>()
                {
                    new ("group-name", new List<string>() { "default" }),
                    new ("vpc-id", new List<string>() { vpc.VpcId })
                }
            });
        return groupResponse.SecurityGroups[0];
    }

    /// <summary>
    /// Verify the default security group of a Vpc allows ingress from the
calling computer.
```

```
   /// This can be done by allowing ingress from this computer's IP address.
   /// In some situations, such as connecting from a corporate network, you must
instead specify
   /// a prefix list Id. You can also temporarily open the port to any IP
address while running this example.
   /// If you do, be sure to remove public access when you're done.
   /// </summary>
   /// <param name="vpc">The group to check.</param>
   /// <param name="port">The port to verify.</param>
   /// <param name="ipAddress">This computer's IP address.</param>
   /// <returns>True if the ip address is allowed on the group.</returns>
   public bool VerifyInboundPortForGroup(SecurityGroup group, int port, string
ipAddress)
   {
       var portIsOpen = false;
       foreach (var ipPermission in group.IpPermissions)
       {
           if (ipPermission.FromPort == port)
           {
               foreach (var ipRange in ipPermission.Ipv4Ranges)
               {
                   var cidr = ipRange.CidrIp;
                   if (cidr.StartsWith(ipAddress) || cidr == "0.0.0.0/0")
                   {
                       portIsOpen = true;
                   }
               }

               if (ipPermission.PrefixListIds.Any())
               {
                   portIsOpen = true;
               }

               if (!portIsOpen)
               {
                   Console.WriteLine("The inbound rule does not appear to be
open to either this computer's IP\n" +
                                     "address, to all IP addresses (0.0.0.0/0),
or to a prefix list ID.");
               }
               else
               {
                   break;
               }
```

```
            }
        }

        return portIsOpen;
    }

    /// <summary>
    /// Add an ingress rule to the specified security group that allows access on
 the
    /// specified port from the specified IP address.
    /// </summary>
    /// <param name="groupId">The Id of the security group to modify.</param>
    /// <param name="port">The port to open.</param>
    /// <param name="ipAddress">The IP address to allow access.</param>
    /// <returns>Async task.</returns>
    public async Task OpenInboundPort(string groupId, int port, string ipAddress)
    {
        await _amazonEc2.AuthorizeSecurityGroupIngressAsync(
            new AuthorizeSecurityGroupIngressRequest()
            {
                GroupId = groupId,
                IpPermissions = new List<IpPermission>()
                {
                    new IpPermission()
                    {
                        FromPort = port,
                        ToPort = port,
                        IpProtocol = "tcp",
                        Ipv4Ranges = new List<IpRange>()
                        {
                            new IpRange() { CidrIp = $"{ipAddress}/32" }
                        }
                    }
                }
            });
    }

    /// <summary>
    /// Attaches an Elastic Load Balancing (ELB) target group to this EC2 Auto
 Scaling group.
    /// The
    /// </summary>
    /// <param name="autoScalingGroupName">The name of the Auto Scaling group.</
param>
```

```
    /// <param name="targetGroupArn">The Arn for the target group.</param>
    /// <returns>Async task.</returns>
    public async Task AttachLoadBalancerToGroup(string autoScalingGroupName,
 string targetGroupArn)
    {
        await _amazonAutoScaling.AttachLoadBalancerTargetGroupsAsync(
            new AttachLoadBalancerTargetGroupsRequest()
            {
                AutoScalingGroupName = autoScalingGroupName,
                TargetGroupARNs = new List<string>() { targetGroupArn }
            });
    }

    /// <summary>
    /// Wait until an EC2 instance is in a specified state.
    /// </summary>
    /// <param name="instanceId">The instance Id.</param>
    /// <param name="stateName">The state to wait for.</param>
    /// <returns>A Boolean value indicating the success of the action.</returns>
    public async Task<bool> WaitForInstanceState(string instanceId,
 InstanceStateName stateName)
    {
        var request = new DescribeInstancesRequest
        {
            InstanceIds = new List<string> { instanceId }
        };

        // Wait until the instance is in the specified state.
        var hasState = false;
        do
        {
            // Wait 5 seconds.
            Thread.Sleep(5000);

            // Check for the desired state.
            var response = await _amazonEc2.DescribeInstancesAsync(request);
            var instance = response.Reservations[0].Instances[0];
            hasState = instance.State.Name == stateName;
            Console.Write(". ");
        } while (!hasState);

        return hasState;
    }
}
```

Membuat kelas yang menggabungkan tindakan Penyeimbangan Beban Elastis.

```
/// <summary>
/// Encapsulates Elastic Load Balancer actions.
/// </summary>
public class ElasticLoadBalancerWrapper
{
    private readonly IAmazonElasticLoadBalancingV2 _amazonElasticLoadBalancingV2;
    private string? _endpoint = null;
    private readonly string _targetGroupName = "";
    private readonly string _loadBalancerName = "";
    HttpClient _httpClient = new();

    public string TargetGroupName => _targetGroupName;
    public string LoadBalancerName => _loadBalancerName;

    /// <summary>
    /// Constructor for the Elastic Load Balancer wrapper.
    /// </summary>
    /// <param name="amazonElasticLoadBalancingV2">The injected load balancing v2
 client.</param>
    /// <param name="configuration">The injected configuration.</param>
    public ElasticLoadBalancerWrapper(
        IAmazonElasticLoadBalancingV2 amazonElasticLoadBalancingV2,
        IConfiguration configuration)
    {
        _amazonElasticLoadBalancingV2 = amazonElasticLoadBalancingV2;
        var prefix = configuration["resourcePrefix"];
        _targetGroupName = prefix + "-tg";
        _loadBalancerName = prefix + "-lb";
    }

    /// <summary>
    /// Get the HTTP Endpoint of a load balancer by its name.
    /// </summary>
    /// <param name="loadBalancerName">The name of the load balancer.</param>
    /// <returns>The HTTP endpoint.</returns>
    public async Task<string> GetEndpointForLoadBalancerByName(string
 loadBalancerName)
    {
```

```
        if (_endpoint == null)
        {
            var endpointResponse =
                await _amazonElasticLoadBalancingV2.DescribeLoadBalancersAsync(
                    new DescribeLoadBalancersRequest()
                    {
                        Names = new List<string>() { loadBalancerName }
                    });
            _endpoint = endpointResponse.LoadBalancers[0].DNSName;
        }

        return _endpoint;
    }

    /// <summary>
    /// Return the GET response for an endpoint as text.
    /// </summary>
    /// <param name="endpoint">The endpoint for the request.</param>
    /// <returns>The request response.</returns>
    public async Task<string> GetEndPointResponse(string endpoint)
    {
        var endpointResponse = await _httpClient.GetAsync($"http://{endpoint}");
        var textResponse = await endpointResponse.Content.ReadAsStringAsync();
        return textResponse!;
    }

    /// <summary>
    /// Get the target health for a group by name.
    /// </summary>
    /// <param name="groupName">The name of the group.</param>
    /// <returns>The collection of health descriptions.</returns>
    public async Task<List<TargetHealthDescription>>
CheckTargetHealthForGroup(string groupName)
    {
        List<TargetHealthDescription> result = null!;
        try
        {
            var groupResponse =
                await _amazonElasticLoadBalancingV2.DescribeTargetGroupsAsync(
                    new DescribeTargetGroupsRequest()
                    {
                        Names = new List<string>() { groupName }
                    });
            var healthResponse =
```

```
                await _amazonElasticLoadBalancingV2.DescribeTargetHealthAsync(
                    new DescribeTargetHealthRequest()
                    {
                        TargetGroupArn =
 groupResponse.TargetGroups[0].TargetGroupArn
                    });
            ;
            result = healthResponse.TargetHealthDescriptions;
        }
        catch (TargetGroupNotFoundException)
        {
            Console.WriteLine($"Target group {groupName} not found.");
        }
        return result;
    }

    /// <summary>
    /// Create an Elastic Load Balancing target group. The target group specifies
 how the load balancer forwards
    /// requests to instances in the group and how instance health is checked.
    ///
    /// To speed up this demo, the health check is configured with shortened
 times and lower thresholds. In production,
    /// you might want to decrease the sensitivity of your health checks to avoid
 unwanted failures.
    /// </summary>
    /// <param name="groupName">The name for the group.</param>
    /// <param name="protocol">The protocol, such as HTTP.</param>
    /// <param name="port">The port to use to forward requests, such as 80.</
param>
    /// <param name="vpcId">The Id of the Vpc in which the load balancer
 exists.</param>
    /// <returns>The new TargetGroup object.</returns>
    public async Task<TargetGroup> CreateTargetGroupOnVpc(string groupName,
 ProtocolEnum protocol, int port, string vpcId)
    {
        var createResponse = await
 _amazonElasticLoadBalancingV2.CreateTargetGroupAsync(
            new CreateTargetGroupRequest()
            {
                Name = groupName,
                Protocol = protocol,
                Port = port,
                HealthCheckPath = "/healthcheck",
```

```
                HealthCheckIntervalSeconds = 10,
                HealthCheckTimeoutSeconds = 5,
                HealthyThresholdCount = 2,
                UnhealthyThresholdCount = 2,
                VpcId = vpcId
            });
        var targetGroup = createResponse.TargetGroups[0];
        return targetGroup;
    }

    /// <summary>
    /// Create an Elastic Load Balancing load balancer that uses the specified
subnets
    /// and forwards requests to the specified target group.
    /// </summary>
    /// <param name="name">The name for the new load balancer.</param>
    /// <param name="subnetIds">Subnets for the load balancer.</param>
    /// <param name="targetGroup">Target group for forwarded requests.</param>
    /// <returns>The new LoadBalancer object.</returns>
    public async Task<LoadBalancer> CreateLoadBalancerAndListener(string name,
List<string> subnetIds, TargetGroup targetGroup)
    {
        var createLbResponse = await
_amazonElasticLoadBalancingV2.CreateLoadBalancerAsync(
            new CreateLoadBalancerRequest()
            {
                Name = name,
                Subnets = subnetIds
            });
        var loadBalancerArn = createLbResponse.LoadBalancers[0].LoadBalancerArn;

        // Wait for load balancer to be available.
        var loadBalancerReady = false;
        while (!loadBalancerReady)
        {
            try
            {
                var describeResponse =
                    await
_amazonElasticLoadBalancingV2.DescribeLoadBalancersAsync(
                        new DescribeLoadBalancersRequest()
                        {
                            Names = new List<string>() { name }
                        });
```

```
                var loadBalancerState =
describeResponse.LoadBalancers[0].State.Code;

                loadBalancerReady = loadBalancerState ==
LoadBalancerStateEnum.Active;
            }
            catch (LoadBalancerNotFoundException)
            {
                loadBalancerReady = false;
            }
            Thread.Sleep(10000);
        }
        // Create the listener.
        await _amazonElasticLoadBalancingV2.CreateListenerAsync(
            new CreateListenerRequest()
            {
                LoadBalancerArn = loadBalancerArn,
                Protocol = targetGroup.Protocol,
                Port = targetGroup.Port,
                DefaultActions = new List<Action>()
                {
                    new Action()
                    {
                        Type = ActionTypeEnum.Forward,
                        TargetGroupArn = targetGroup.TargetGroupArn
                    }
                }
            });
        return createLbResponse.LoadBalancers[0];
    }

    /// <summary>
    /// Verify this computer can successfully send a GET request to the
    /// load balancer endpoint.
    /// </summary>
    /// <param name="endpoint">The endpoint to check.</param>
    /// <returns>True if successful.</returns>
    public async Task<bool> VerifyLoadBalancerEndpoint(string endpoint)
    {
        var success = false;
        var retries = 3;
        while (!success && retries > 0)
        {
```

```
            try
            {
                var endpointResponse = await _httpClient.GetAsync($"http://
{endpoint}");
                Console.WriteLine($"Response: {endpointResponse.StatusCode}.");

                if (endpointResponse.IsSuccessStatusCode)
                {
                    success = true;
                }
                else
                {
                    retries = 0;
                }
            }
            catch (HttpRequestException)
            {
                Console.WriteLine("Connection error, retrying...");
                retries--;
                Thread.Sleep(10000);
            }
        }

        return success;
    }

    /// <summary>
    /// Delete a load balancer by its specified name.
    /// </summary>
    /// <param name="name">The name of the load balancer to delete.</param>
    /// <returns>Async task.</returns>
    public async Task DeleteLoadBalancerByName(string name)
    {
        try
        {
            var describeLoadBalancerResponse =
                await _amazonElasticLoadBalancingV2.DescribeLoadBalancersAsync(
                    new DescribeLoadBalancersRequest()
                    {
                        Names = new List<string>() { name }
                    });
            var lbArn =
 describeLoadBalancerResponse.LoadBalancers[0].LoadBalancerArn;
            await _amazonElasticLoadBalancingV2.DeleteLoadBalancerAsync(
```

```
                new DeleteLoadBalancerRequest()
                {
                    LoadBalancerArn = lbArn
                }
            );
        }
        catch (LoadBalancerNotFoundException)
        {
            Console.WriteLine($"Load balancer {name} not found.");
        }
    }

    /// <summary>
    /// Delete a TargetGroup by its specified name.
    /// </summary>
    /// <param name="groupName">Name of the group to delete.</param>
    /// <returns>Async task.</returns>
    public async Task DeleteTargetGroupByName(string groupName)
    {
        var done = false;
        while (!done)
        {
            try
            {
                var groupResponse =
                    await
_amazonElasticLoadBalancingV2.DescribeTargetGroupsAsync(
                        new DescribeTargetGroupsRequest()
                        {
                            Names = new List<string>() { groupName }
                        });

                var targetArn = groupResponse.TargetGroups[0].TargetGroupArn;
                await _amazonElasticLoadBalancingV2.DeleteTargetGroupAsync(
                    new DeleteTargetGroupRequest() { TargetGroupArn =
targetArn });
                Console.WriteLine($"Deleted load balancing target group
{groupName}.");
                done = true;
            }
            catch (TargetGroupNotFoundException)
            {
                Console.WriteLine(
                    $"Target group {groupName} not found, could not delete.");
```

```
                done = true;
            }
            catch (ResourceInUseException)
            {
                Console.WriteLine("Target group not yet released, waiting...");
                Thread.Sleep(10000);
            }
        }
    }
}
```

Membuat kelas yang menggunakan DynamoDB untuk menyimulasikan layanan yang direkomendasikan.

```
/// <summary>
/// Encapsulates a DynamoDB table to use as a service that recommends books,
 movies, and songs.
/// </summary>
public class Recommendations
{
    private readonly IAmazonDynamoDB _amazonDynamoDb;
    private readonly DynamoDBContext _context;
    private readonly string _tableName;

    public string TableName => _tableName;

    /// <summary>
    /// Constructor for the Recommendations service.
    /// </summary>
    /// <param name="amazonDynamoDb">The injected DynamoDb client.</param>
    /// <param name="configuration">The injected configuration.</param>
    public Recommendations(IAmazonDynamoDB amazonDynamoDb, IConfiguration
 configuration)
    {
        _amazonDynamoDb = amazonDynamoDb;
        _context = new DynamoDBContext(_amazonDynamoDb);
        _tableName = configuration["databaseName"]!;
    }

    /// <summary>
    /// Create the DynamoDb table with a specified name.
    /// </summary>
```

```
    /// <param name="tableName">The name for the table.</param>
    /// <returns>True when ready.</returns>
    public async Task<bool> CreateDatabaseWithName(string tableName)
    {
        try
        {
            Console.Write($"Creating table {tableName}...");
            var createRequest = new CreateTableRequest()
            {
                TableName = tableName,
                AttributeDefinitions = new List<AttributeDefinition>()
                    {
                        new AttributeDefinition()
                        {
                            AttributeName = "MediaType",
                            AttributeType = ScalarAttributeType.S
                        },
                        new AttributeDefinition()
                        {
                            AttributeName = "ItemId",
                            AttributeType = ScalarAttributeType.N
                        }
                    },
                KeySchema = new List<KeySchemaElement>()
                    {
                        new KeySchemaElement()
                        {
                            AttributeName = "MediaType",
                            KeyType = KeyType.HASH
                        },
                        new KeySchemaElement()
                        {
                            AttributeName = "ItemId",
                            KeyType = KeyType.RANGE
                        }
                    },
                ProvisionedThroughput = new ProvisionedThroughput()
                {
                    ReadCapacityUnits = 5,
                    WriteCapacityUnits = 5
                }
            };
            await _amazonDynamoDb.CreateTableAsync(createRequest);
```

```
            // Wait until the table is ACTIVE and then report success.
            Console.Write("\nWaiting for table to become active...");

            var request = new DescribeTableRequest
            {
                TableName = tableName
            };

            TableStatus status;
            do
            {
                Thread.Sleep(2000);

                var describeTableResponse = await
 _amazonDynamoDb.DescribeTableAsync(request);
                status = describeTableResponse.Table.TableStatus;

                Console.Write(".");
            }
            while (status != "ACTIVE");

            return status == TableStatus.ACTIVE;
        }
        catch (ResourceInUseException)
        {
            Console.WriteLine($"Table {tableName} already exists.");
            return false;
        }
    }

    /// <summary>
    /// Populate the database table with data from a specified path.
    /// </summary>
    /// <param name="databaseTableName">The name of the table.</param>
    /// <param name="recommendationsPath">The path of the recommendations data.</
param>
    /// <returns>Async task.</returns>
    public async Task PopulateDatabase(string databaseTableName, string
 recommendationsPath)
    {
        var recommendationsText = await
 File.ReadAllTextAsync(recommendationsPath);
        var records =
```

```
 JsonSerializer.Deserialize<RecommendationModel[]>(recommendationsText);
        var batchWrite = _context.CreateBatchWrite<RecommendationModel>();

        foreach (var record in records!)
        {
            batchWrite.AddPutItem(record);
        }

        await batchWrite.ExecuteAsync();
    }

    /// <summary>
    /// Delete the recommendation table by name.
    /// </summary>
    /// <param name="tableName">The name of the recommendation table.</param>
    /// <returns>Async task.</returns>
    public async Task DestroyDatabaseByName(string tableName)
    {
        try
        {
            await _amazonDynamoDb.DeleteTableAsync(
                new DeleteTableRequest() { TableName = tableName });
            Console.WriteLine($"Table {tableName} was deleted.");
        }
        catch (ResourceNotFoundException)
        {
            Console.WriteLine($"Table {tableName} not found");
        }
    }
}
```

Membuat kelas yang mengabungkan tindakan Systems Manager.

```
/// <summary>
/// Encapsulates Systems Manager parameter operations. This example uses these
 parameters
/// to drive the demonstration of resilient architecture, such as failure of a
 dependency or
/// how the service responds to a health check.
/// </summary>
public class SmParameterWrapper
```

```
{
    private readonly IAmazonSimpleSystemsManagement
 _amazonSimpleSystemsManagement;

    private readonly string _tableParameter = "doc-example-resilient-
architecture-table";
    private readonly string _failureResponseParameter = "doc-example-resilient-
architecture-failure-response";
    private readonly string _healthCheckParameter = "doc-example-resilient-
architecture-health-check";
    private readonly string _tableName = "";

    public string TableParameter => _tableParameter;
    public string TableName => _tableName;
    public string HealthCheckParameter => _healthCheckParameter;
    public string FailureResponseParameter => _failureResponseParameter;

    /// <summary>
    /// Constructor for the SmParameterWrapper.
    /// </summary>
    /// <param name="amazonSimpleSystemsManagement">The injected Simple Systems
 Management client.</param>
    /// <param name="configuration">The injected configuration.</param>
    public SmParameterWrapper(IAmazonSimpleSystemsManagement
 amazonSimpleSystemsManagement, IConfiguration configuration)
    {
        _amazonSimpleSystemsManagement = amazonSimpleSystemsManagement;
        _tableName = configuration["databaseName"]!;
    }

    /// <summary>
    /// Reset the Systems Manager parameters to starting values for the demo.
    /// </summary>
    /// <returns>Async task.</returns>
    public async Task Reset()
    {
        await this.PutParameterByName(_tableParameter, _tableName);
        await this.PutParameterByName(_failureResponseParameter, "none");
        await this.PutParameterByName(_healthCheckParameter, "shallow");
    }

    /// <summary>
    /// Set the value of a named Systems Manager parameter.
    /// </summary>
```

```
    /// <param name="name">The name of the parameter.</param>
    /// <param name="value">The value to set.</param>
    /// <returns>Async task.</returns>
    public async Task PutParameterByName(string name, string value)
    {
        await _amazonSimpleSystemsManagement.PutParameterAsync(
            new PutParameterRequest() { Name = name, Value = value, Overwrite =
 true });
    }
}
```

- Untuk API detailnya, lihat topik berikut di AWS SDK for .NET APIReferensi.
  - AttachLoadBalancerTargetGroups
  - CreateAutoScalingGroup
  - CreateInstanceProfile
  - CreateLaunchTemplate
  - CreateListener
  - CreateLoadBalancer
  - CreateTargetGroup
  - DeleteAutoScalingGroup
  - DeleteInstanceProfile
  - DeleteLaunchTemplate
  - DeleteLoadBalancer
  - DeleteTargetGroup
  - DescribeAutoScalingGroups
  - DescribeAvailabilityZones
  - DescribeIamInstanceProfileAssociations
  - DescribeInstances
  - DescribeLoadBalancers
  - DescribeSubnets
  - DescribeTargetGroups
  - DescribeTargetHealth
  - DescribeVpcs

- RebootInstances
- ReplaceIamInstanceProfileAssociation
- TerminateInstanceInAutoScalingGroup
- UpdateAutoScalingGroup

Java

SDKuntuk Java 2.x

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

Menjalankan skenario interaktif di prompt perintah.

```
public class Main {

    public static final String fileName = "C:\\AWS\\resworkflow\
\recommendations.json"; // Modify file location.
    public static final String tableName = "doc-example-recommendation-service";
    public static final String startScript = "C:\\AWS\\resworkflow\
\server_startup_script.sh"; // Modify file location.
    public static final String policyFile = "C:\\AWS\\resworkflow\
\instance_policy.json"; // Modify file location.
    public static final String ssmJSON = "C:\\AWS\\resworkflow\
\ssm_only_policy.json"; // Modify file location.
    public static final String failureResponse = "doc-example-resilient-
architecture-failure-response";
    public static final String healthCheck = "doc-example-resilient-architecture-
health-check";
    public static final String templateName = "doc-example-resilience-template";
    public static final String roleName = "doc-example-resilience-role";
    public static final String policyName = "doc-example-resilience-pol";
    public static final String profileName = "doc-example-resilience-prof";

    public static final String badCredsProfileName = "doc-example-resilience-
prof-bc";
```

```
    public static final String targetGroupName = "doc-example-resilience-tg";
    public static final String autoScalingGroupName = "doc-example-resilience-
group";
    public static final String lbName = "doc-example-resilience-lb";
    public static final String protocol = "HTTP";
    public static final int port = 80;

    public static final String DASHES = new String(new char[80]).replace("\0",
 "-");

    public static void main(String[] args) throws IOException,
 InterruptedException {
        Scanner in = new Scanner(System.in);
        Database database = new Database();
        AutoScaler autoScaler = new AutoScaler();
        LoadBalancer loadBalancer = new LoadBalancer();

        System.out.println(DASHES);
        System.out.println("Welcome to the demonstration of How to Build and
 Manage a Resilient Service!");
        System.out.println(DASHES);

        System.out.println(DASHES);
        System.out.println("A - SETUP THE RESOURCES");
        System.out.println("Press Enter when you're ready to start deploying
 resources.");
        in.nextLine();
        deploy(loadBalancer);
        System.out.println(DASHES);
        System.out.println(DASHES);
        System.out.println("B - DEMO THE RESILIENCE FUNCTIONALITY");
        System.out.println("Press Enter when you're ready.");
        in.nextLine();
        demo(loadBalancer);
        System.out.println(DASHES);

        System.out.println(DASHES);
        System.out.println("C - DELETE THE RESOURCES");
        System.out.println("""
                This concludes the demo of how to build and manage a resilient
 service.
                To keep things tidy and to avoid unwanted charges on your
 account, we can clean up all AWS resources
                that were created for this demo.
```

```
                """);

        System.out.println("\n Do you want to delete the resources (y/n)? ");
        String userInput = in.nextLine().trim().toLowerCase(); // Capture user
input

        if (userInput.equals("y")) {
            // Delete resources here
            deleteResources(loadBalancer, autoScaler, database);
            System.out.println("Resources deleted.");
        } else {
            System.out.println("""
                    Okay, we'll leave the resources intact.
                    Don't forget to delete them when you're done with them or you
might incur unexpected charges.
                    """);
        }
        System.out.println(DASHES);

        System.out.println(DASHES);
        System.out.println("The example has completed. ");
        System.out.println("\n Thanks for watching!");
        System.out.println(DASHES);
    }

    // Deletes the AWS resources used in this example.
    private static void deleteResources(LoadBalancer loadBalancer, AutoScaler
autoScaler, Database database)
            throws IOException, InterruptedException {
        loadBalancer.deleteLoadBalancer(lbName);
        System.out.println("*** Wait 30 secs for resource to be deleted");
        TimeUnit.SECONDS.sleep(30);
        loadBalancer.deleteTargetGroup(targetGroupName);
        autoScaler.deleteAutoScaleGroup(autoScalingGroupName);
        autoScaler.deleteRolesPolicies(policyName, roleName, profileName);
        autoScaler.deleteTemplate(templateName);
        database.deleteTable(tableName);
    }

    private static void deploy(LoadBalancer loadBalancer) throws
InterruptedException, IOException {
        Scanner in = new Scanner(System.in);
        System.out.println(
                """
```

```
                        For this demo, we'll use the AWS SDK for Java (v2) to
create several AWS resources
                        to set up a load-balanced web service endpoint and
explore some ways to make it resilient
                        against various kinds of failures.

                        Some of the resources create by this demo are:
                        \t* A DynamoDB table that the web service depends on to
provide book, movie, and song recommendations.
                        \t* An EC2 launch template that defines EC2 instances
that each contain a Python web server.
                        \t* An EC2 Auto Scaling group that manages EC2 instances
across several Availability Zones.
                        \t* An Elastic Load Balancing (ELB) load balancer that
targets the Auto Scaling group to distribute requests.
                        """);

        System.out.println("Press Enter when you're ready.");
        in.nextLine();
        System.out.println(DASHES);

        System.out.println(DASHES);
        System.out.println("Creating and populating a DynamoDB table named " +
tableName);
        Database database = new Database();
        database.createTable(tableName, fileName);
        System.out.println(DASHES);

        System.out.println(DASHES);
        System.out.println("""
                Creating an EC2 launch template that runs '{startup_script}' when
an instance starts.
                This script starts a Python web server defined in the `server.py`
script. The web server
                listens to HTTP requests on port 80 and responds to requests to
'/' and to '/healthcheck'.
                For demo purposes, this server is run as the root user. In
production, the best practice is to
                run a web server, such as Apache, with least-privileged
credentials.

                The template also defines an IAM policy that each instance uses
to assume a role that grants
```

```
                permissions to access the DynamoDB recommendation table and
Systems Manager parameters
                that control the flow of the demo.
                """);

        LaunchTemplateCreator templateCreator = new LaunchTemplateCreator();
        templateCreator.createTemplate(policyFile, policyName, profileName,
startScript, templateName, roleName);
        System.out.println(DASHES);

        System.out.println(DASHES);
        System.out.println(
                "Creating an EC2 Auto Scaling group that maintains three EC2
instances, each in a different Availability Zone.");
        System.out.println("*** Wait 30 secs for the VPC to be created");
        TimeUnit.SECONDS.sleep(30);
        AutoScaler autoScaler = new AutoScaler();
        String[] zones = autoScaler.createGroup(3, templateName,
autoScalingGroupName);

        System.out.println("""
                At this point, you have EC2 instances created. Once each instance
starts, it listens for
                HTTP requests. You can see these instances in the console or
continue with the demo.
                Press Enter when you're ready to continue.
                """);

        in.nextLine();
        System.out.println(DASHES);

        System.out.println(DASHES);
        System.out.println("Creating variables that control the flow of the
demo.");
        ParameterHelper paramHelper = new ParameterHelper();
        paramHelper.reset();
        System.out.println(DASHES);

        System.out.println(DASHES);
        System.out.println("""
                Creating an Elastic Load Balancing target group and load
balancer. The target group
                defines how the load balancer connects to instances. The load
balancer provides a
```

```
                single endpoint where clients connect and dispatches requests to
instances in the group.
                """);

        String vpcId = autoScaler.getDefaultVPC();
        List<Subnet> subnets = autoScaler.getSubnets(vpcId, zones);
        System.out.println("You have retrieved a list with " + subnets.size() + "
subnets");
        String targetGroupArn = loadBalancer.createTargetGroup(protocol, port,
vpcId, targetGroupName);
        String elbDnsName = loadBalancer.createLoadBalancer(subnets,
targetGroupArn, lbName, port, protocol);
        autoScaler.attachLoadBalancerTargetGroup(autoScalingGroupName,
targetGroupArn);
        System.out.println("Verifying access to the load balancer endpoint...");
        boolean wasSuccessul =
loadBalancer.verifyLoadBalancerEndpoint(elbDnsName);
        if (!wasSuccessul) {
            System.out.println("Couldn't connect to the load balancer, verifying
that the port is open...");
            CloseableHttpClient httpClient = HttpClients.createDefault();

            // Create an HTTP GET request to "http://checkip.amazonaws.com"
            HttpGet httpGet = new HttpGet("http://checkip.amazonaws.com");
            try {
                // Execute the request and get the response
                HttpResponse response = httpClient.execute(httpGet);

                // Read the response content.
                String ipAddress =
IOUtils.toString(response.getEntity().getContent(),
StandardCharsets.UTF_8).trim();

                // Print the public IP address.
                System.out.println("Public IP Address: " + ipAddress);
                GroupInfo groupInfo = autoScaler.verifyInboundPort(vpcId, port,
ipAddress);
                if (!groupInfo.isPortOpen()) {
                    System.out.println("""
                            For this example to work, the default security group
for your default VPC must
                            allow access from this computer. You can either add
it automatically from this
```

```
                            example or add it yourself using the AWS Management
Console.
                            """);

                    System.out.println(
                            "Do you want to add a rule to security group " +
groupInfo.getGroupName() + " to allow");
                    System.out.println("inbound traffic on port " + port + " from
your computer's IP address (y/n) ");
                    String ans = in.nextLine();
                    if ("y".equalsIgnoreCase(ans)) {
                        autoScaler.openInboundPort(groupInfo.getGroupName(),
String.valueOf(port), ipAddress);
                        System.out.println("Security group rule added.");
                    } else {
                        System.out.println("No security group rule added.");
                    }
                }

            } catch (AutoScalingException e) {
                e.printStackTrace();
            }
        } else if (wasSuccessul) {
            System.out.println("Your load balancer is ready. You can access it by
browsing to:");
            System.out.println("\t http://" + elbDnsName);
        } else {
            System.out.println("Couldn't get a successful response from the load
balancer endpoint. Troubleshoot by");
            System.out.println("manually verifying that your VPC and security
group are configured correctly and that");
            System.out.println("you can successfully make a GET request to the
load balancer.");
        }

        System.out.println("Press Enter when you're ready to continue with the
demo.");
        in.nextLine();
    }

    // A method that controls the demo part of the Java program.
    public static void demo(LoadBalancer loadBalancer) throws IOException,
InterruptedException {
        ParameterHelper paramHelper = new ParameterHelper();
```

```
        System.out.println("Read the ssm_only_policy.json file");
        String ssmOnlyPolicy = readFileAsString(ssmJSON);

        System.out.println("Resetting parameters to starting values for demo.");
        paramHelper.reset();

        System.out.println(
                """
                        This part of the demonstration shows how to toggle
different parts of the system
                        to create situations where the web service fails, and
shows how using a resilient
                        architecture can keep the web service running in spite
of these failures.

                        At the start, the load balancer endpoint returns
recommendations and reports that all targets are healthy.
                       """);
        demoChoices(loadBalancer);

        System.out.println(
                """
                        The web service running on the EC2 instances gets
recommendations by querying a DynamoDB table.
                        The table name is contained in a Systems Manager
parameter named self.param_helper.table.
                        To simulate a failure of the recommendation service,
let's set this parameter to name a non-existent table.
                       """);
        paramHelper.put(paramHelper.tableName, "this-is-not-a-table");

        System.out.println(
                """
                        \nNow, sending a GET request to the load balancer
endpoint returns a failure code. But, the service reports as
                        healthy to the load balancer because shallow health
checks don't check for failure of the recommendation service.
                       """);
        demoChoices(loadBalancer);

        System.out.println(
                """
                       Instead of failing when the recommendation service fails,
the web service can return a static response.
```

```
                        While this is not a perfect solution, it presents the
customer with a somewhat better experience than failure.
                        """);
        paramHelper.put(paramHelper.failureResponse, "static");

        System.out.println("""
                Now, sending a GET request to the load balancer endpoint returns
a static response.
                The service still reports as healthy because health checks are
still shallow.
                """);
        demoChoices(loadBalancer);

        System.out.println("Let's reinstate the recommendation service.");
        paramHelper.put(paramHelper.tableName, paramHelper.dyntable);

        System.out.println("""
                Let's also substitute bad credentials for one of the instances in
the target group so that it can't
                access the DynamoDB recommendation table. We will get an instance
id value.
                """);

        LaunchTemplateCreator templateCreator = new LaunchTemplateCreator();
        AutoScaler autoScaler = new AutoScaler();

        // Create a new instance profile based on badCredsProfileName.
        templateCreator.createInstanceProfile(policyFile, policyName,
badCredsProfileName, roleName);
        String badInstanceId = autoScaler.getBadInstance(autoScalingGroupName);
        System.out.println("The bad instance id values used for this demo is " +
badInstanceId);

        String profileAssociationId =
autoScaler.getInstanceProfile(badInstanceId);
        System.out.println("The association Id value is " +
profileAssociationId);
        System.out.println("Replacing the profile for instance " + badInstanceId
                + " with a profile that contains bad credentials");
        autoScaler.replaceInstanceProfile(badInstanceId, badCredsProfileName,
profileAssociationId);

        System.out.println(
                """
```

```
                        Now, sending a GET request to the load balancer endpoint
returns either a recommendation or a static response,
                        depending on which instance is selected by the load
balancer.
                        """);

        demoChoices(loadBalancer);

        System.out.println("""
                Let's implement a deep health check. For this demo, a deep health
check tests whether
                the web service can access the DynamoDB table that it depends on
for recommendations. Note that
                the deep health check is only for ELB routing and not for Auto
Scaling instance health.
                This kind of deep health check is not recommended for Auto
Scaling instance health, because it
                risks accidental termination of all instances in the Auto Scaling
group when a dependent service fails.
                """);

        System.out.println("""
                By implementing deep health checks, the load balancer can detect
when one of the instances is failing
                and take that instance out of rotation.
                """);

        paramHelper.put(paramHelper.healthCheck, "deep");

        System.out.println("""
                Now, checking target health indicates that the instance with bad
credentials
                is unhealthy. Note that it might take a minute or two for the
load balancer to detect the unhealthy
                instance. Sending a GET request to the load balancer endpoint
always returns a recommendation, because
                the load balancer takes unhealthy instances out of its rotation.
                """);

        demoChoices(loadBalancer);

        System.out.println(
                """
```

```
                        Because the instances in this demo are controlled by an
auto scaler, the simplest way to fix an unhealthy
                        instance is to terminate it and let the auto scaler start
a new instance to replace it.
                        """);
        autoScaler.terminateInstance(badInstanceId);

        System.out.println("""
                Even while the instance is terminating and the new instance is
starting, sending a GET
                request to the web service continues to get a successful
recommendation response because
                the load balancer routes requests to the healthy instances. After
the replacement instance
                starts and reports as healthy, it is included in the load
balancing rotation.
                Note that terminating and replacing an instance typically takes
several minutes, during which time you
                can see the changing health check status until the new instance
is running and healthy.
                """);

        demoChoices(loadBalancer);
        System.out.println(
                "If the recommendation service fails now, deep health checks mean
all instances report as unhealthy.");
        paramHelper.put(paramHelper.tableName, "this-is-not-a-table");

        demoChoices(loadBalancer);
        paramHelper.reset();
    }

    public static void demoChoices(LoadBalancer loadBalancer) throws IOException,
InterruptedException {
        String[] actions = {
                "Send a GET request to the load balancer endpoint.",
                "Check the health of load balancer targets.",
                "Go to the next part of the demo."
        };
        Scanner scanner = new Scanner(System.in);

        while (true) {
            System.out.println("-".repeat(88));
```

```
            System.out.println("See the current state of the service by selecting
one of the following choices:");
            for (int i = 0; i < actions.length; i++) {
                System.out.println(i + ": " + actions[i]);
            }

            try {
                System.out.print("\nWhich action would you like to take? ");
                int choice = scanner.nextInt();
                System.out.println("-".repeat(88));

                switch (choice) {
                    case 0 -> {
                        System.out.println("Request:\n");
                        System.out.println("GET http://" +
loadBalancer.getEndpoint(lbName));
                        CloseableHttpClient httpClient =
HttpClients.createDefault();

                        // Create an HTTP GET request to the ELB.
                        HttpGet httpGet = new HttpGet("http://" +
loadBalancer.getEndpoint(lbName));

                        // Execute the request and get the response.
                        HttpResponse response = httpClient.execute(httpGet);
                        int statusCode =
response.getStatusLine().getStatusCode();
                        System.out.println("HTTP Status Code: " + statusCode);

                        // Display the JSON response
                        BufferedReader reader = new BufferedReader(
                                new
InputStreamReader(response.getEntity().getContent()));
                        StringBuilder jsonResponse = new StringBuilder();
                        String line;
                        while ((line = reader.readLine()) != null) {
                            jsonResponse.append(line);
                        }
                        reader.close();

                        // Print the formatted JSON response.
                        System.out.println("Full Response:\n");
                        System.out.println(jsonResponse.toString());
```

```
                        // Close the HTTP client.
                        httpClient.close();

                    }
                    case 1 -> {
                        System.out.println("\nChecking the health of load
 balancer targets:\n");
                        List<TargetHealthDescription> health =
 loadBalancer.checkTargetHealth(targetGroupName);
                        for (TargetHealthDescription target : health) {
                            System.out.printf("\tTarget %s on port %d is %s%n",
 target.target().id(),
                                    target.target().port(),
 target.targetHealth().stateAsString());
                        }
                        System.out.println("""
                                Note that it can take a minute or two for the
 health check to update
                                after changes are made.
                                """);
                    }
                    case 2 -> {
                        System.out.println("\nOkay, let's move on.");
                        System.out.println("-".repeat(88));
                        return; // Exit the method when choice is 2
                    }
                    default -> System.out.println("You must choose a value
 between 0-2. Please select again.");
                }

            } catch (java.util.InputMismatchException e) {
                System.out.println("Invalid input. Please select again.");
                scanner.nextLine(); // Clear the input buffer.
            }
        }
    }

    public static String readFileAsString(String filePath) throws IOException {
        byte[] bytes = Files.readAllBytes(Paths.get(filePath));
        return new String(bytes);
    }
}
```

Buat kelas yang membungkus Auto Scaling dan tindakan AmazonEC2.

```
public class AutoScaler {

    private static Ec2Client ec2Client;
    private static AutoScalingClient autoScalingClient;
    private static IamClient iamClient;

    private static SsmClient ssmClient;

    private IamClient getIAMClient() {
        if (iamClient == null) {
            iamClient = IamClient.builder()
                    .region(Region.US_EAST_1)
                    .build();
        }
        return iamClient;
    }

    private SsmClient getSSMClient() {
        if (ssmClient == null) {
            ssmClient = SsmClient.builder()
                    .region(Region.US_EAST_1)
                    .build();
        }
        return ssmClient;
    }

    private Ec2Client getEc2Client() {
        if (ec2Client == null) {
            ec2Client = Ec2Client.builder()
                    .region(Region.US_EAST_1)
                    .build();
        }
        return ec2Client;
    }

    private AutoScalingClient getAutoScalingClient() {
        if (autoScalingClient == null) {
            autoScalingClient = AutoScalingClient.builder()
                    .region(Region.US_EAST_1)
                    .build();
        }
        return autoScalingClient;
```

```
   }

   /**
    * Terminates and instances in an EC2 Auto Scaling group. After an instance
is
    * terminated, it can no longer be accessed.
    */
   public void terminateInstance(String instanceId) {
       TerminateInstanceInAutoScalingGroupRequest terminateInstanceIRequest =
TerminateInstanceInAutoScalingGroupRequest
               .builder()
               .instanceId(instanceId)
               .shouldDecrementDesiredCapacity(false)
               .build();


getAutoScalingClient().terminateInstanceInAutoScalingGroup(terminateInstanceIRequest);
       System.out.format("Terminated instance %s.", instanceId);
   }

   /**
    * Replaces the profile associated with a running instance. After the profile
is
    * replaced, the instance is rebooted to ensure that it uses the new profile.
    * When
    * the instance is ready, Systems Manager is used to restart the Python web
    * server.
    */
   public void replaceInstanceProfile(String instanceId, String
newInstanceProfileName, String profileAssociationId)
           throws InterruptedException {
       // Create an IAM instance profile specification.
       software.amazon.awssdk.services.ec2.model.IamInstanceProfileSpecification
iamInstanceProfile =
software.amazon.awssdk.services.ec2.model.IamInstanceProfileSpecification
               .builder()
               .name(newInstanceProfileName) // Make sure
'newInstanceProfileName' is a valid IAM Instance Profile
                                             // name.
               .build();

       // Replace the IAM instance profile association for the EC2 instance.
       ReplaceIamInstanceProfileAssociationRequest replaceRequest =
ReplaceIamInstanceProfileAssociationRequest
```

```
                .builder()
                .iamInstanceProfile(iamInstanceProfile)
                .associationId(profileAssociationId) // Make sure
'profileAssociationId' is a valid association ID.
                .build();

        try {
            getEc2Client().replaceIamInstanceProfileAssociation(replaceRequest);
            // Handle the response as needed.
        } catch (Ec2Exception e) {
            // Handle exceptions, log, or report the error.
            System.err.println("Error: " + e.getMessage());
        }
        System.out.format("Replaced instance profile for association %s with
profile %s.", profileAssociationId,
                newInstanceProfileName);
        TimeUnit.SECONDS.sleep(15);
        boolean instReady = false;
        int tries = 0;

        // Reboot after 60 seconds
        while (!instReady) {
            if (tries % 6 == 0) {
                getEc2Client().rebootInstances(RebootInstancesRequest.builder()
                        .instanceIds(instanceId)
                        .build());
                System.out.println("Rebooting instance " + instanceId + " and
waiting for it to be ready.");
            }
            tries++;
            try {
                TimeUnit.SECONDS.sleep(10);
            } catch (InterruptedException e) {
                e.printStackTrace();
            }

            DescribeInstanceInformationResponse informationResponse =
getSSMClient().describeInstanceInformation();
            List<InstanceInformation> instanceInformationList =
informationResponse.instanceInformationList();
            for (InstanceInformation info : instanceInformationList) {
                if (info.instanceId().equals(instanceId)) {
                    instReady = true;
                    break;
```

```
                }
            }
        }

        SendCommandRequest sendCommandRequest = SendCommandRequest.builder()
                .instanceIds(instanceId)
                .documentName("AWS-RunShellScript")
                .parameters(Collections.singletonMap("commands",
                        Collections.singletonList("cd / && sudo python3 server.py
80")))
                .build();

        getSSMClient().sendCommand(sendCommandRequest);
        System.out.println("Restarted the Python web server on instance " +
instanceId + ".");
    }

    public void openInboundPort(String secGroupId, String port, String ipAddress)
{
        AuthorizeSecurityGroupIngressRequest ingressRequest =
AuthorizeSecurityGroupIngressRequest.builder()
                .groupName(secGroupId)
                .cidrIp(ipAddress)
                .fromPort(Integer.parseInt(port))
                .build();

        getEc2Client().authorizeSecurityGroupIngress(ingressRequest);
        System.out.format("Authorized ingress to %s on port %s from %s.",
secGroupId, port, ipAddress);
    }

    /**
     * Detaches a role from an instance profile, detaches policies from the role,
     * and deletes all the resources.
     */
    public void deleteInstanceProfile(String roleName, String profileName) {
        try {
            software.amazon.awssdk.services.iam.model.GetInstanceProfileRequest
getInstanceProfileRequest =
software.amazon.awssdk.services.iam.model.GetInstanceProfileRequest
                    .builder()
                    .instanceProfileName(profileName)
                    .build();
```

```
            GetInstanceProfileResponse response =
getIAMClient().getInstanceProfile(getInstanceProfileRequest);
            String name = response.instanceProfile().instanceProfileName();
            System.out.println(name);

            RemoveRoleFromInstanceProfileRequest profileRequest =
RemoveRoleFromInstanceProfileRequest.builder()
                    .instanceProfileName(profileName)
                    .roleName(roleName)
                    .build();

            getIAMClient().removeRoleFromInstanceProfile(profileRequest);
            DeleteInstanceProfileRequest deleteInstanceProfileRequest =
DeleteInstanceProfileRequest.builder()
                    .instanceProfileName(profileName)
                    .build();

            getIAMClient().deleteInstanceProfile(deleteInstanceProfileRequest);
            System.out.println("Deleted instance profile " + profileName);

            DeleteRoleRequest deleteRoleRequest = DeleteRoleRequest.builder()
                    .roleName(roleName)
                    .build();

            // List attached role policies.
            ListAttachedRolePoliciesResponse rolesResponse = getIAMClient()
                    .listAttachedRolePolicies(role -> role.roleName(roleName));
            List<AttachedPolicy> attachedPolicies =
rolesResponse.attachedPolicies();
            for (AttachedPolicy attachedPolicy : attachedPolicies) {
                DetachRolePolicyRequest request =
DetachRolePolicyRequest.builder()
                        .roleName(roleName)
                        .policyArn(attachedPolicy.policyArn())
                        .build();

                getIAMClient().detachRolePolicy(request);
                System.out.println("Detached and deleted policy " +
attachedPolicy.policyName());
            }

            getIAMClient().deleteRole(deleteRoleRequest);
            System.out.println("Instance profile and role deleted.");
```

```
        } catch (IamException e) {
            System.err.println(e.getMessage());
            System.exit(1);
        }
    }

    public void deleteTemplate(String templateName) {
        getEc2Client().deleteLaunchTemplate(name ->
name.launchTemplateName(templateName));
        System.out.format(templateName + " was deleted.");
    }

    public void deleteAutoScaleGroup(String groupName) {
        DeleteAutoScalingGroupRequest deleteAutoScalingGroupRequest =
DeleteAutoScalingGroupRequest.builder()
                .autoScalingGroupName(groupName)
                .forceDelete(true)
                .build();


getAutoScalingClient().deleteAutoScalingGroup(deleteAutoScalingGroupRequest);
        System.out.println(groupName + " was deleted.");
    }

    /*
     * Verify the default security group of the specified VPC allows ingress from
     * this
     * computer. This can be done by allowing ingress from this computer's IP
     * address. In some situations, such as connecting from a corporate network,
you
     * must instead specify a prefix list ID. You can also temporarily open the
port
     * to
     * any IP address while running this example. If you do, be sure to remove
     * public
     * access when you're done.
     *
     */
    public GroupInfo verifyInboundPort(String VPC, int port, String ipAddress) {
        boolean portIsOpen = false;
        GroupInfo groupInfo = new GroupInfo();
        try {
            Filter filter = Filter.builder()
                    .name("group-name")
```

```
                    .values("default")
                    .build();

            Filter filter1 = Filter.builder()
                    .name("vpc-id")
                    .values(VPC)
                    .build();

            DescribeSecurityGroupsRequest securityGroupsRequest =
DescribeSecurityGroupsRequest.builder()
                    .filters(filter, filter1)
                    .build();

            DescribeSecurityGroupsResponse securityGroupsResponse =
getEc2Client()
                    .describeSecurityGroups(securityGroupsRequest);
            String securityGroup =
securityGroupsResponse.securityGroups().get(0).groupName();
            groupInfo.setGroupName(securityGroup);

            for (SecurityGroup secGroup :
securityGroupsResponse.securityGroups()) {
                System.out.println("Found security group: " +
secGroup.groupId());

                for (IpPermission ipPermission : secGroup.ipPermissions()) {
                    if (ipPermission.fromPort() == port) {
                        System.out.println("Found inbound rule: " +
ipPermission);
                        for (IpRange ipRange : ipPermission.ipRanges()) {
                            String cidrIp = ipRange.cidrIp();
                            if (cidrIp.startsWith(ipAddress) ||
cidrIp.equals("0.0.0.0/0")) {
                                System.out.println(cidrIp + " is applicable");
                                portIsOpen = true;
                            }
                        }

                        if (!ipPermission.prefixListIds().isEmpty()) {
                            System.out.println("Prefix lList is applicable");
                            portIsOpen = true;
                        }

                        if (!portIsOpen) {
```

```
                            System.out
                                    .println("The inbound rule does not appear to
be open to either this computer's IP,"
                                            + " all IP addresses (0.0.0.0/0), or
to a prefix list ID.");
                        } else {
                            break;
                        }
                    }
                }
            }

        } catch (AutoScalingException e) {
            System.err.println(e.awsErrorDetails().errorMessage());
        }

        groupInfo.setPortOpen(portIsOpen);
        return groupInfo;
    }

    /*
     * Attaches an Elastic Load Balancing (ELB) target group to this EC2 Auto
     * Scaling group.
     * The target group specifies how the load balancer forward requests to the
     * instances
     * in the group.
     */
    public void attachLoadBalancerTargetGroup(String asGroupName, String
targetGroupARN) {
        try {
            AttachLoadBalancerTargetGroupsRequest targetGroupsRequest =
AttachLoadBalancerTargetGroupsRequest.builder()
                    .autoScalingGroupName(asGroupName)
                    .targetGroupARNs(targetGroupARN)
                    .build();


getAutoScalingClient().attachLoadBalancerTargetGroups(targetGroupsRequest);
            System.out.println("Attached load balancer to " + asGroupName);

        } catch (AutoScalingException e) {
            System.err.println(e.awsErrorDetails().errorMessage());
            System.exit(1);
        }
```

```
   }

   // Creates an EC2 Auto Scaling group with the specified size.
   public String[] createGroup(int groupSize, String templateName, String
autoScalingGroupName) {

       // Get availability zones.

software.amazon.awssdk.services.ec2.model.DescribeAvailabilityZonesRequest
zonesRequest =
software.amazon.awssdk.services.ec2.model.DescribeAvailabilityZonesRequest
               .builder()
               .build();

       DescribeAvailabilityZonesResponse zonesResponse =
getEc2Client().describeAvailabilityZones(zonesRequest);
       List<String> availabilityZoneNames =
zonesResponse.availabilityZones().stream()

.map(software.amazon.awssdk.services.ec2.model.AvailabilityZone::zoneName)
               .collect(Collectors.toList());

       String availabilityZones = String.join(",", availabilityZoneNames);
       LaunchTemplateSpecification specification =
LaunchTemplateSpecification.builder()
               .launchTemplateName(templateName)
               .version("$Default")
               .build();

       String[] zones = availabilityZones.split(",");
       CreateAutoScalingGroupRequest groupRequest =
CreateAutoScalingGroupRequest.builder()
               .launchTemplate(specification)
               .availabilityZones(zones)
               .maxSize(groupSize)
               .minSize(groupSize)
               .autoScalingGroupName(autoScalingGroupName)
               .build();

       try {
           getAutoScalingClient().createAutoScalingGroup(groupRequest);

       } catch (AutoScalingException e) {
           System.err.println(e.awsErrorDetails().errorMessage());
```

```
            System.exit(1);
        }
        System.out.println("Created an EC2 Auto Scaling group named " +
autoScalingGroupName);
        return zones;
    }

    public String getDefaultVPC() {
        // Define the filter.
        Filter defaultFilter = Filter.builder()
                .name("is-default")
                .values("true")
                .build();

        software.amazon.awssdk.services.ec2.model.DescribeVpcsRequest request =
software.amazon.awssdk.services.ec2.model.DescribeVpcsRequest
                .builder()
                .filters(defaultFilter)
                .build();

        DescribeVpcsResponse response = getEc2Client().describeVpcs(request);
        return response.vpcs().get(0).vpcId();
    }

    // Gets the default subnets in a VPC for a specified list of Availability
Zones.
    public List<Subnet> getSubnets(String vpcId, String[] availabilityZones) {
        List<Subnet> subnets = null;
        Filter vpcFilter = Filter.builder()
                .name("vpc-id")
                .values(vpcId)
                .build();

        Filter azFilter = Filter.builder()
                .name("availability-zone")
                .values(availabilityZones)
                .build();

        Filter defaultForAZ = Filter.builder()
                .name("default-for-az")
                .values("true")
                .build();

        DescribeSubnetsRequest request = DescribeSubnetsRequest.builder()
```

```
                .filters(vpcFilter, azFilter, defaultForAZ)
                .build();

        DescribeSubnetsResponse response =
getEc2Client().describeSubnets(request);
        subnets = response.subnets();
        return subnets;
    }

    // Gets data about the instances in the EC2 Auto Scaling group.
    public String getBadInstance(String groupName) {
        DescribeAutoScalingGroupsRequest request =
DescribeAutoScalingGroupsRequest.builder()
                .autoScalingGroupNames(groupName)
                .build();

        DescribeAutoScalingGroupsResponse response =
getAutoScalingClient().describeAutoScalingGroups(request);
        AutoScalingGroup autoScalingGroup = response.autoScalingGroups().get(0);
        List<String> instanceIds = autoScalingGroup.instances().stream()
                .map(instance -> instance.instanceId())
                .collect(Collectors.toList());

        String[] instanceIdArray = instanceIds.toArray(new String[0]);
        for (String instanceId : instanceIdArray) {
            System.out.println("Instance ID: " + instanceId);
            return instanceId;
        }
        return "";
    }

    // Gets data about the profile associated with an instance.
    public String getInstanceProfile(String instanceId) {
        Filter filter = Filter.builder()
                .name("instance-id")
                .values(instanceId)
                .build();

        DescribeIamInstanceProfileAssociationsRequest associationsRequest =
DescribeIamInstanceProfileAssociationsRequest
                .builder()
                .filters(filter)
                .build();
```

```
        DescribeIamInstanceProfileAssociationsResponse response = getEc2Client()
                .describeIamInstanceProfileAssociations(associationsRequest);
        return response.iamInstanceProfileAssociations().get(0).associationId();
    }

    public void deleteRolesPolicies(String policyName, String roleName, String
 InstanceProfile) {
        ListPoliciesRequest listPoliciesRequest =
 ListPoliciesRequest.builder().build();
        ListPoliciesResponse listPoliciesResponse =
 getIAMClient().listPolicies(listPoliciesRequest);
        for (Policy policy : listPoliciesResponse.policies()) {
            if (policy.policyName().equals(policyName)) {
                // List the entities (users, groups, roles) that are attached to
 the policy.

 software.amazon.awssdk.services.iam.model.ListEntitiesForPolicyRequest
 listEntitiesRequest =
 software.amazon.awssdk.services.iam.model.ListEntitiesForPolicyRequest
                        .builder()
                        .policyArn(policy.arn())
                        .build();
                ListEntitiesForPolicyResponse listEntitiesResponse = iamClient
                        .listEntitiesForPolicy(listEntitiesRequest);
                if (!listEntitiesResponse.policyGroups().isEmpty() || !
listEntitiesResponse.policyUsers().isEmpty()
                        || !listEntitiesResponse.policyRoles().isEmpty()) {
                    // Detach the policy from any entities it is attached to.
                    DetachRolePolicyRequest detachPolicyRequest =
 DetachRolePolicyRequest.builder()
                            .policyArn(policy.arn())
                            .roleName(roleName) // Specify the name of the IAM
 role
                            .build();

                    getIAMClient().detachRolePolicy(detachPolicyRequest);
                    System.out.println("Policy detached from entities.");
                }

                // Now, you can delete the policy.
                DeletePolicyRequest deletePolicyRequest =
 DeletePolicyRequest.builder()
                        .policyArn(policy.arn())
                        .build();
```

```
                getIAMClient().deletePolicy(deletePolicyRequest);
                System.out.println("Policy deleted successfully.");
                break;
            }
        }

        // List the roles associated with the instance profile
        ListInstanceProfilesForRoleRequest listRolesRequest =
 ListInstanceProfilesForRoleRequest.builder()
                .roleName(roleName)
                .build();

        // Detach the roles from the instance profile
        ListInstanceProfilesForRoleResponse listRolesResponse =
 iamClient.listInstanceProfilesForRole(listRolesRequest);
        for (software.amazon.awssdk.services.iam.model.InstanceProfile profile :
 listRolesResponse.instanceProfiles()) {
            RemoveRoleFromInstanceProfileRequest removeRoleRequest =
 RemoveRoleFromInstanceProfileRequest.builder()
                    .instanceProfileName(InstanceProfile)
                    .roleName(roleName) // Remove the extra dot here
                    .build();

            getIAMClient().removeRoleFromInstanceProfile(removeRoleRequest);
            System.out.println("Role " + roleName + " removed from instance
 profile " + InstanceProfile);
        }

        // Delete the instance profile after removing all roles
        DeleteInstanceProfileRequest deleteInstanceProfileRequest =
 DeleteInstanceProfileRequest.builder()
                .instanceProfileName(InstanceProfile)
                .build();

        getIAMClient().deleteInstanceProfile(r ->
 r.instanceProfileName(InstanceProfile));
        System.out.println(InstanceProfile + " Deleted");
        System.out.println("All roles and policies are deleted.");
    }
}
```

Membuat kelas yang menggabungkan tindakan Penyeimbangan Beban Elastis.

```
public class LoadBalancer {
    public ElasticLoadBalancingV2Client elasticLoadBalancingV2Client;

    public ElasticLoadBalancingV2Client getLoadBalancerClient() {
        if (elasticLoadBalancingV2Client == null) {
            elasticLoadBalancingV2Client = ElasticLoadBalancingV2Client.builder()
                    .region(Region.US_EAST_1)
                    .build();
        }

        return elasticLoadBalancingV2Client;
    }

    // Checks the health of the instances in the target group.
    public List<TargetHealthDescription> checkTargetHealth(String
 targetGroupName) {
        DescribeTargetGroupsRequest targetGroupsRequest =
 DescribeTargetGroupsRequest.builder()
                .names(targetGroupName)
                .build();

        DescribeTargetGroupsResponse tgResponse =
 getLoadBalancerClient().describeTargetGroups(targetGroupsRequest);

        DescribeTargetHealthRequest healthRequest =
 DescribeTargetHealthRequest.builder()

 .targetGroupArn(tgResponse.targetGroups().get(0).targetGroupArn())
                .build();

        DescribeTargetHealthResponse healthResponse =
 getLoadBalancerClient().describeTargetHealth(healthRequest);
        return healthResponse.targetHealthDescriptions();
    }

    // Gets the HTTP endpoint of the load balancer.
    public String getEndpoint(String lbName) {
        DescribeLoadBalancersResponse res = getLoadBalancerClient()
                .describeLoadBalancers(describe -> describe.names(lbName));
        return res.loadBalancers().get(0).dnsName();
    }
```

```
   // Deletes a load balancer.
   public void deleteLoadBalancer(String lbName) {
       try {
           // Use a waiter to delete the Load Balancer.
           DescribeLoadBalancersResponse res = getLoadBalancerClient()
                   .describeLoadBalancers(describe -> describe.names(lbName));
           ElasticLoadBalancingV2Waiter loadBalancerWaiter =
getLoadBalancerClient().waiter();
           DescribeLoadBalancersRequest request =
DescribeLoadBalancersRequest.builder()

.loadBalancerArns(res.loadBalancers().get(0).loadBalancerArn())
                   .build();

           getLoadBalancerClient().deleteLoadBalancer(
                   builder ->
builder.loadBalancerArn(res.loadBalancers().get(0).loadBalancerArn()));
           WaiterResponse<DescribeLoadBalancersResponse> waiterResponse =
loadBalancerWaiter
                   .waitUntilLoadBalancersDeleted(request);
           waiterResponse.matched().response().ifPresent(System.out::println);

       } catch (ElasticLoadBalancingV2Exception e) {
           System.err.println(e.awsErrorDetails().errorMessage());
       }
       System.out.println(lbName + " was deleted.");
   }

   // Deletes the target group.
   public void deleteTargetGroup(String targetGroupName) {
       try {
           DescribeTargetGroupsResponse res = getLoadBalancerClient()
                   .describeTargetGroups(describe ->
describe.names(targetGroupName));
           getLoadBalancerClient()
                   .deleteTargetGroup(builder ->
builder.targetGroupArn(res.targetGroups().get(0).targetGroupArn()));
       } catch (ElasticLoadBalancingV2Exception e) {
           System.err.println(e.awsErrorDetails().errorMessage());
       }
       System.out.println(targetGroupName + " was deleted.");
   }
```

```
   // Verify this computer can successfully send a GET request to the load
balancer
   // endpoint.
   public boolean verifyLoadBalancerEndpoint(String elbDnsName) throws
IOException, InterruptedException {
       boolean success = false;
       int retries = 3;
       CloseableHttpClient httpClient = HttpClients.createDefault();

       // Create an HTTP GET request to the ELB.
       HttpGet httpGet = new HttpGet("http://" + elbDnsName);
       try {
           while ((!success) && (retries > 0)) {
               // Execute the request and get the response.
               HttpResponse response = httpClient.execute(httpGet);
               int statusCode = response.getStatusLine().getStatusCode();
               System.out.println("HTTP Status Code: " + statusCode);
               if (statusCode == 200) {
                   success = true;
               } else {
                   retries--;
                   System.out.println("Got connection error from load balancer
endpoint, retrying...");
                   TimeUnit.SECONDS.sleep(15);
               }
           }

       } catch (org.apache.http.conn.HttpHostConnectException e) {
           System.out.println(e.getMessage());
       }

       System.out.println("Status.." + success);
       return success;
   }

   /*
    * Creates an Elastic Load Balancing target group. The target group specifies
    * how
    * the load balancer forward requests to instances in the group and how
instance
    * health is checked.
    */
   public String createTargetGroup(String protocol, int port, String vpcId,
String targetGroupName) {
```

```
        CreateTargetGroupRequest targetGroupRequest =
CreateTargetGroupRequest.builder()
                .healthCheckPath("/healthcheck")
                .healthCheckTimeoutSeconds(5)
                .port(port)
                .vpcId(vpcId)
                .name(targetGroupName)
                .protocol(protocol)
                .build();

        CreateTargetGroupResponse targetGroupResponse =
getLoadBalancerClient().createTargetGroup(targetGroupRequest);
        String targetGroupArn =
targetGroupResponse.targetGroups().get(0).targetGroupArn();
        String targetGroup =
targetGroupResponse.targetGroups().get(0).targetGroupName();
        System.out.println("The " + targetGroup + " was created with ARN" +
targetGroupArn);
        return targetGroupArn;
    }

    /*
     * Creates an Elastic Load Balancing load balancer that uses the specified
     * subnets
     * and forwards requests to the specified target group.
     */
    public String createLoadBalancer(List<Subnet> subnetIds, String
targetGroupARN, String lbName, int port,
            String protocol) {
        try {
            List<String> subnetIdStrings = subnetIds.stream()
                    .map(Subnet::subnetId)
                    .collect(Collectors.toList());

            CreateLoadBalancerRequest balancerRequest =
CreateLoadBalancerRequest.builder()
                    .subnets(subnetIdStrings)
                    .name(lbName)
                    .scheme("internet-facing")
                    .build();

            // Create and wait for the load balancer to become available.
            CreateLoadBalancerResponse lsResponse =
getLoadBalancerClient().createLoadBalancer(balancerRequest);
```

```
            String lbARN = lsResponse.loadBalancers().get(0).loadBalancerArn();

            ElasticLoadBalancingV2Waiter loadBalancerWaiter =
getLoadBalancerClient().waiter();
            DescribeLoadBalancersRequest request =
DescribeLoadBalancersRequest.builder()
                    .loadBalancerArns(lbARN)
                    .build();

            System.out.println("Waiting for Load Balancer " + lbName + " to
become available.");
            WaiterResponse<DescribeLoadBalancersResponse> waiterResponse =
loadBalancerWaiter
                    .waitUntilLoadBalancerAvailable(request);
            waiterResponse.matched().response().ifPresent(System.out::println);
            System.out.println("Load Balancer " + lbName + " is available.");

            // Get the DNS name (endpoint) of the load balancer.
            String lbDNSName = lsResponse.loadBalancers().get(0).dnsName();
            System.out.println("*** Load Balancer DNS Name: " + lbDNSName);

            // Create a listener for the load balance.
            Action action = Action.builder()
                    .targetGroupArn(targetGroupARN)
                    .type("forward")
                    .build();

            CreateListenerRequest listenerRequest =
CreateListenerRequest.builder()

.loadBalancerArn(lsResponse.loadBalancers().get(0).loadBalancerArn())
                    .defaultActions(action)
                    .port(port)
                    .protocol(protocol)
                    .defaultActions(action)
                    .build();

            getLoadBalancerClient().createListener(listenerRequest);
            System.out.println("Created listener to forward traffic from load
balancer " + lbName + " to target group "
                    + targetGroupARN);

            // Return the load balancer DNS name.
            return lbDNSName;
```

```
        } catch (ElasticLoadBalancingV2Exception e) {
            e.printStackTrace();
        }
        return "";
    }
}
```

Membuat kelas yang menggunakan DynamoDB untuk menyimulasikan layanan yang direkomendasikan.

```
public class Database {

    private static DynamoDbClient dynamoDbClient;

    public static DynamoDbClient getDynamoDbClient() {
        if (dynamoDbClient == null) {
            dynamoDbClient = DynamoDbClient.builder()
                    .region(Region.US_EAST_1)
                    .build();
        }
        return dynamoDbClient;
    }

    // Checks to see if the Amazon DynamoDB table exists.
    private boolean doesTableExist(String tableName) {
        try {
            // Describe the table and catch any exceptions.
            DescribeTableRequest describeTableRequest =
 DescribeTableRequest.builder()
                    .tableName(tableName)
                    .build();

            getDynamoDbClient().describeTable(describeTableRequest);
            System.out.println("Table '" + tableName + "' exists.");
            return true;

        } catch (ResourceNotFoundException e) {
            System.out.println("Table '" + tableName + "' does not exist.");
        } catch (DynamoDbException e) {
            System.err.println("Error checking table existence: " +
 e.getMessage());
```

```
        }
        return false;
    }

    /*
     * Creates a DynamoDB table to use a recommendation service. The table has a
     * hash key named 'MediaType' that defines the type of media recommended,
such
     * as
     * Book or Movie, and a range key named 'ItemId' that, combined with the
     * MediaType,
     * forms a unique identifier for the recommended item.
     */
    public void createTable(String tableName, String fileName) throws IOException
{
        // First check to see if the table exists.
        boolean doesExist = doesTableExist(tableName);
        if (!doesExist) {
            DynamoDbWaiter dbWaiter = getDynamoDbClient().waiter();
            CreateTableRequest createTableRequest = CreateTableRequest.builder()
                    .tableName(tableName)
                    .attributeDefinitions(
                            AttributeDefinition.builder()
                                    .attributeName("MediaType")
                                    .attributeType(ScalarAttributeType.S)
                                    .build(),
                            AttributeDefinition.builder()
                                    .attributeName("ItemId")
                                    .attributeType(ScalarAttributeType.N)
                                    .build())
                    .keySchema(
                            KeySchemaElement.builder()
                                    .attributeName("MediaType")
                                    .keyType(KeyType.HASH)
                                    .build(),
                            KeySchemaElement.builder()
                                    .attributeName("ItemId")
                                    .keyType(KeyType.RANGE)
                                    .build())
                    .provisionedThroughput(
                            ProvisionedThroughput.builder()
                                    .readCapacityUnits(5L)
                                    .writeCapacityUnits(5L)
                                    .build())
```

```
                    .build();

            getDynamoDbClient().createTable(createTableRequest);
            System.out.println("Creating table " + tableName + "...");

            // Wait until the Amazon DynamoDB table is created.
            DescribeTableRequest tableRequest = DescribeTableRequest.builder()
                    .tableName(tableName)
                    .build();

            WaiterResponse<DescribeTableResponse> waiterResponse =
dbWaiter.waitUntilTableExists(tableRequest);
            waiterResponse.matched().response().ifPresent(System.out::println);
            System.out.println("Table " + tableName + " created.");

            // Add records to the table.
            populateTable(fileName, tableName);
        }
    }

    public void deleteTable(String tableName) {
        getDynamoDbClient().deleteTable(table -> table.tableName(tableName));
        System.out.println("Table " + tableName + " deleted.");
    }

    // Populates the table with data located in a JSON file using the DynamoDB
    // enhanced client.
    public void populateTable(String fileName, String tableName) throws
IOException {
        DynamoDbEnhancedClient enhancedClient = DynamoDbEnhancedClient.builder()
                .dynamoDbClient(getDynamoDbClient())
                .build();
        ObjectMapper objectMapper = new ObjectMapper();
        File jsonFile = new File(fileName);
        JsonNode rootNode = objectMapper.readTree(jsonFile);

        DynamoDbTable<Recommendation> mappedTable =
enhancedClient.table(tableName,
                TableSchema.fromBean(Recommendation.class));
        for (JsonNode currentNode : rootNode) {
            String mediaType = currentNode.path("MediaType").path("S").asText();
            int itemId = currentNode.path("ItemId").path("N").asInt();
            String title = currentNode.path("Title").path("S").asText();
            String creator = currentNode.path("Creator").path("S").asText();
```

```
            // Create a Recommendation object and set its properties.
            Recommendation rec = new Recommendation();
            rec.setMediaType(mediaType);
            rec.setItemId(itemId);
            rec.setTitle(title);
            rec.setCreator(creator);

            // Put the item into the DynamoDB table.
            mappedTable.putItem(rec); // Add the Recommendation to the list.
        }
        System.out.println("Added all records to the " + tableName);
    }
}
```

Membuat kelas yang mengabungkan tindakan Systems Manager.

```
public class ParameterHelper {

    String tableName = "doc-example-resilient-architecture-table";
    String dyntable = "doc-example-recommendation-service";
    String failureResponse = "doc-example-resilient-architecture-failure-
response";
    String healthCheck = "doc-example-resilient-architecture-health-check";

    public void reset() {
        put(dyntable, tableName);
        put(failureResponse, "none");
        put(healthCheck, "shallow");
    }

    public void put(String name, String value) {
        SsmClient ssmClient = SsmClient.builder()
                .region(Region.US_EAST_1)
                .build();

        PutParameterRequest parameterRequest = PutParameterRequest.builder()
                .name(name)
                .value(value)
                .overwrite(true)
                .type("String")
                .build();
```

```
        ssmClient.putParameter(parameterRequest);
        System.out.printf("Setting demo parameter %s to '%s'.", name, value);
    }
}
```

- Untuk API detailnya, lihat topik berikut di AWS SDK for Java 2.x APIReferensi.
  - AttachLoadBalancerTargetGroups
  - CreateAutoScalingGroup
  - CreateInstanceProfile
  - CreateLaunchTemplate
  - CreateListener
  - CreateLoadBalancer
  - CreateTargetGroup
  - DeleteAutoScalingGroup
  - DeleteInstanceProfile
  - DeleteLaunchTemplate
  - DeleteLoadBalancer
  - DeleteTargetGroup
  - DescribeAutoScalingGroups
  - DescribeAvailabilityZones
  - DescribeIamInstanceProfileAssociations
  - DescribeInstances
  - DescribeLoadBalancers
  - DescribeSubnets
  - DescribeTargetGroups
  - DescribeTargetHealth
  - DescribeVpcs
  - RebootInstances
  - ReplaceIamInstanceProfileAssociation
  - TerminateInstanceInAutoScalingGroup
  - UpdateAutoScalingGroup

JavaScript

SDKuntuk JavaScript (v3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

Menjalankan skenario interaktif di prompt perintah.

```
#!/usr/bin/env node
// Copyright Amazon.com, Inc. or its affiliates. All Rights Reserved.
// SPDX-License-Identifier: Apache-2.0

import {
  Scenario,
  parseScenarioArgs,
} from "@aws-doc-sdk-examples/lib/scenario/index.js";

/**
 * The workflow steps are split into three stages:
 *   - deploy
 *   - demo
 *   - destroy
 *
 * Each of these stages has a corresponding file prefixed with steps-*.
 */
import { deploySteps } from "./steps-deploy.js";
import { demoSteps } from "./steps-demo.js";
import { destroySteps } from "./steps-destroy.js";

/**
 * The context is passed to every scenario. Scenario steps
 * will modify the context.
 */
const context = {};

/**
 * Three Scenarios are created for the workflow. A Scenario is an orchestration
 class
 * that simplifies running a series of steps.
```

```
 */
export const scenarios = {
  // Deploys all resources necessary for the workflow.
  deploy: new Scenario("Resilient Workflow - Deploy", deploySteps, context),
  // Demonstrates how a fragile web service can be made more resilient.
  demo: new Scenario("Resilient Workflow - Demo", demoSteps, context),
  // Destroys the resources created for the workflow.
  destroy: new Scenario("Resilient Workflow - Destroy", destroySteps, context),
};

// Call function if run directly
import { fileURLToPath } from "node:url";

if (process.argv[1] === fileURLToPath(import.meta.url)) {
  parseScenarioArgs(scenarios, {
    name: "Resilient Workflow",
    synopsis:
      "node index.js --scenario <deploy | demo | destroy> [-h|--help] [-y|--yes]
 [-v|--verbose]",
    description: "Deploy and interact with scalable EC2 instances.",
  });
}
```

Menyusun langkah-langkah untuk men-deploy semua sumber daya.

```
import { join } from "node:path";
import { readFileSync, writeFileSync } from "node:fs";
import axios from "axios";

import {
  BatchWriteItemCommand,
  CreateTableCommand,
  DynamoDBClient,
  waitUntilTableExists,
} from "@aws-sdk/client-dynamodb";
import {
  EC2Client,
  CreateKeyPairCommand,
  CreateLaunchTemplateCommand,
  DescribeAvailabilityZonesCommand,
  DescribeVpcsCommand,
  DescribeSubnetsCommand,
```

```
  DescribeSecurityGroupsCommand,
  AuthorizeSecurityGroupIngressCommand,
} from "@aws-sdk/client-ec2";
import {
  IAMClient,
  CreatePolicyCommand,
  CreateRoleCommand,
  CreateInstanceProfileCommand,
  AddRoleToInstanceProfileCommand,
  AttachRolePolicyCommand,
  waitUntilInstanceProfileExists,
} from "@aws-sdk/client-iam";
import { SSMClient, GetParameterCommand } from "@aws-sdk/client-ssm";
import {
  CreateAutoScalingGroupCommand,
  AutoScalingClient,
  AttachLoadBalancerTargetGroupsCommand,
} from "@aws-sdk/client-auto-scaling";
import {
  CreateListenerCommand,
  CreateLoadBalancerCommand,
  CreateTargetGroupCommand,
  ElasticLoadBalancingV2Client,
  waitUntilLoadBalancerAvailable,
} from "@aws-sdk/client-elastic-load-balancing-v2";

import {
  ScenarioOutput,
  ScenarioInput,
  ScenarioAction,
} from "@aws-doc-sdk-examples/lib/scenario/index.js";
import { saveState } from "@aws-doc-sdk-examples/lib/scenario/steps-common.js";
import { retry } from "@aws-doc-sdk-examples/lib/utils/util-timers.js";

import { MESSAGES, NAMES, RESOURCES_PATH, ROOT } from "./constants.js";
import { initParamsSteps } from "./steps-reset-params.js";

/**
 * @type {import('@aws-doc-sdk-examples/lib/scenario.js').Step[]}
 */
export const deploySteps = [
  new ScenarioOutput("introduction", MESSAGES.introduction, { header: true }),
  new ScenarioInput("confirmDeployment", MESSAGES.confirmDeployment, {
    type: "confirm",
```

```
  }),
  new ScenarioAction(
    "handleConfirmDeployment",
    (c) => c.confirmDeployment === false && process.exit(),
  ),
  new ScenarioOutput(
    "creatingTable",
    MESSAGES.creatingTable.replace("${TABLE_NAME}", NAMES.tableName),
  ),
  new ScenarioAction("createTable", async () => {
    const client = new DynamoDBClient({});
    await client.send(
      new CreateTableCommand({
        TableName: NAMES.tableName,
        ProvisionedThroughput: {
          ReadCapacityUnits: 5,
          WriteCapacityUnits: 5,
        },
        AttributeDefinitions: [
          {
            AttributeName: "MediaType",
            AttributeType: "S",
          },
          {
            AttributeName: "ItemId",
            AttributeType: "N",
          },
        ],
        KeySchema: [
          {
            AttributeName: "MediaType",
            KeyType: "HASH",
          },
          {
            AttributeName: "ItemId",
            KeyType: "RANGE",
          },
        ],
      }),
    );
    await waitUntilTableExists({ client }, { TableName: NAMES.tableName });
  }),
  new ScenarioOutput(
    "createdTable",
```

```
    MESSAGES.createdTable.replace("${TABLE_NAME}", NAMES.tableName),
  ),
  new ScenarioOutput(
    "populatingTable",
    MESSAGES.populatingTable.replace("${TABLE_NAME}", NAMES.tableName),
  ),
  new ScenarioAction("populateTable", () => {
    const client = new DynamoDBClient({});
    /**
     * @type {{ default: import("@aws-sdk/client-dynamodb").PutRequest['Item']
[] }}
     */
    const recommendations = JSON.parse(
      readFileSync(join(RESOURCES_PATH, "recommendations.json")),
    );

    return client.send(
      new BatchWriteItemCommand({
        RequestItems: {
          [NAMES.tableName]: recommendations.map((item) => ({
            PutRequest: { Item: item },
          })),
        },
      }),
    );
  }),
  new ScenarioOutput(
    "populatedTable",
    MESSAGES.populatedTable.replace("${TABLE_NAME}", NAMES.tableName),
  ),
  new ScenarioOutput(
    "creatingKeyPair",
    MESSAGES.creatingKeyPair.replace("${KEY_PAIR_NAME}", NAMES.keyPairName),
  ),
  new ScenarioAction("createKeyPair", async () => {
    const client = new EC2Client({});
    const { KeyMaterial } = await client.send(
      new CreateKeyPairCommand({
        KeyName: NAMES.keyPairName,
      }),
    );

    writeFileSync(`${NAMES.keyPairName}.pem`, KeyMaterial, { mode: 0o600 });
  }),
```

```
  new ScenarioOutput(
    "createdKeyPair",
    MESSAGES.createdKeyPair.replace("${KEY_PAIR_NAME}", NAMES.keyPairName),
  ),
  new ScenarioOutput(
    "creatingInstancePolicy",
    MESSAGES.creatingInstancePolicy.replace(
      "${INSTANCE_POLICY_NAME}",
      NAMES.instancePolicyName,
    ),
  ),
  new ScenarioAction("createInstancePolicy", async (state) => {
    const client = new IAMClient({});
    const {
      Policy: { Arn },
    } = await client.send(
      new CreatePolicyCommand({
        PolicyName: NAMES.instancePolicyName,
        PolicyDocument: readFileSync(
          join(RESOURCES_PATH, "instance_policy.json"),
        ),
      }),
    );
    state.instancePolicyArn = Arn;
  }),
  new ScenarioOutput("createdInstancePolicy", (state) =>
    MESSAGES.createdInstancePolicy
      .replace("${INSTANCE_POLICY_NAME}", NAMES.instancePolicyName)
      .replace("${INSTANCE_POLICY_ARN}", state.instancePolicyArn),
  ),
  new ScenarioOutput(
    "creatingInstanceRole",
    MESSAGES.creatingInstanceRole.replace(
      "${INSTANCE_ROLE_NAME}",
      NAMES.instanceRoleName,
    ),
  ),
  new ScenarioAction("createInstanceRole", () => {
    const client = new IAMClient({});
    return client.send(
      new CreateRoleCommand({
        RoleName: NAMES.instanceRoleName,
        AssumeRolePolicyDocument: readFileSync(
          join(ROOT, "assume-role-policy.json"),
```

```
      ),
    }),
  );
}),
new ScenarioOutput(
  "createdInstanceRole",
  MESSAGES.createdInstanceRole.replace(
    "${INSTANCE_ROLE_NAME}",
    NAMES.instanceRoleName,
  ),
),
new ScenarioOutput(
  "attachingPolicyToRole",
  MESSAGES.attachingPolicyToRole
    .replace("${INSTANCE_ROLE_NAME}", NAMES.instanceRoleName)
    .replace("${INSTANCE_POLICY_NAME}", NAMES.instancePolicyName),
),
new ScenarioAction("attachPolicyToRole", async (state) => {
  const client = new IAMClient({});
  await client.send(
    new AttachRolePolicyCommand({
      RoleName: NAMES.instanceRoleName,
      PolicyArn: state.instancePolicyArn,
    }),
  );
}),
new ScenarioOutput(
  "attachedPolicyToRole",
  MESSAGES.attachedPolicyToRole
    .replace("${INSTANCE_POLICY_NAME}", NAMES.instancePolicyName)
    .replace("${INSTANCE_ROLE_NAME}", NAMES.instanceRoleName),
),
new ScenarioOutput(
  "creatingInstanceProfile",
  MESSAGES.creatingInstanceProfile.replace(
    "${INSTANCE_PROFILE_NAME}",
    NAMES.instanceProfileName,
  ),
),
new ScenarioAction("createInstanceProfile", async (state) => {
  const client = new IAMClient({});
  const {
    InstanceProfile: { Arn },
  } = await client.send(
```

```
      new CreateInstanceProfileCommand({
        InstanceProfileName: NAMES.instanceProfileName,
      }),
    );
    state.instanceProfileArn = Arn;

    await waitUntilInstanceProfileExists(
      { client },
      { InstanceProfileName: NAMES.instanceProfileName },
    );
  }),
  new ScenarioOutput("createdInstanceProfile", (state) =>
    MESSAGES.createdInstanceProfile
      .replace("${INSTANCE_PROFILE_NAME}", NAMES.instanceProfileName)
      .replace("${INSTANCE_PROFILE_ARN}", state.instanceProfileArn),
  ),
  new ScenarioOutput(
    "addingRoleToInstanceProfile",
    MESSAGES.addingRoleToInstanceProfile
      .replace("${INSTANCE_PROFILE_NAME}", NAMES.instanceProfileName)
      .replace("${INSTANCE_ROLE_NAME}", NAMES.instanceRoleName),
  ),
  new ScenarioAction("addRoleToInstanceProfile", () => {
    const client = new IAMClient({});
    return client.send(
      new AddRoleToInstanceProfileCommand({
        RoleName: NAMES.instanceRoleName,
        InstanceProfileName: NAMES.instanceProfileName,
      }),
    );
  }),
  new ScenarioOutput(
    "addedRoleToInstanceProfile",
    MESSAGES.addedRoleToInstanceProfile
      .replace("${INSTANCE_PROFILE_NAME}", NAMES.instanceProfileName)
      .replace("${INSTANCE_ROLE_NAME}", NAMES.instanceRoleName),
  ),
  ...initParamsSteps,
  new ScenarioOutput("creatingLaunchTemplate", MESSAGES.creatingLaunchTemplate),
  new ScenarioAction("createLaunchTemplate", async () => {
    const ssmClient = new SSMClient({});
    const { Parameter } = await ssmClient.send(
      new GetParameterCommand({
        Name: "/aws/service/ami-amazon-linux-latest/amzn2-ami-hvm-x86_64-gp2",
```

```
      }),
    );
    const ec2Client = new EC2Client({});
    await ec2Client.send(
      new CreateLaunchTemplateCommand({
        LaunchTemplateName: NAMES.launchTemplateName,
        LaunchTemplateData: {
          InstanceType: "t3.micro",
          ImageId: Parameter.Value,
          IamInstanceProfile: { Name: NAMES.instanceProfileName },
          UserData: readFileSync(
            join(RESOURCES_PATH, "server_startup_script.sh"),
          ).toString("base64"),
          KeyName: NAMES.keyPairName,
        },
      }),
    );
  }),
  new ScenarioOutput(
    "createdLaunchTemplate",
    MESSAGES.createdLaunchTemplate.replace(
      "${LAUNCH_TEMPLATE_NAME}",
      NAMES.launchTemplateName,
    ),
  ),
  new ScenarioOutput(
    "creatingAutoScalingGroup",
    MESSAGES.creatingAutoScalingGroup.replace(
      "${AUTO_SCALING_GROUP_NAME}",
      NAMES.autoScalingGroupName,
    ),
  ),
  new ScenarioAction("createAutoScalingGroup", async (state) => {
    const ec2Client = new EC2Client({});
    const { AvailabilityZones } = await ec2Client.send(
      new DescribeAvailabilityZonesCommand({}),
    );
    state.availabilityZoneNames = AvailabilityZones.map((az) => az.ZoneName);
    const autoScalingClient = new AutoScalingClient({});
    await retry({ intervalInMs: 1000, maxRetries: 30 }, () =>
      autoScalingClient.send(
        new CreateAutoScalingGroupCommand({
          AvailabilityZones: state.availabilityZoneNames,
          AutoScalingGroupName: NAMES.autoScalingGroupName,
```

```
        LaunchTemplate: {
          LaunchTemplateName: NAMES.launchTemplateName,
          Version: "$Default",
        },
        MinSize: 3,
        MaxSize: 3,
      }),
    ),
  );
}),
new ScenarioOutput(
  "createdAutoScalingGroup",
  /**
   * @param {{ availabilityZoneNames: string[] }} state
   */
  (state) =>
    MESSAGES.createdAutoScalingGroup
      .replace("${AUTO_SCALING_GROUP_NAME}", NAMES.autoScalingGroupName)
      .replace(
        "${AVAILABILITY_ZONE_NAMES}",
        state.availabilityZoneNames.join(", "),
      ),
),
new ScenarioInput("confirmContinue", MESSAGES.confirmContinue, {
  type: "confirm",
}),
new ScenarioOutput("loadBalancer", MESSAGES.loadBalancer),
new ScenarioOutput("gettingVpc", MESSAGES.gettingVpc),
new ScenarioAction("getVpc", async (state) => {
  const client = new EC2Client({});
  const { Vpcs } = await client.send(
    new DescribeVpcsCommand({
      Filters: [{ Name: "is-default", Values: ["true"] }],
    }),
  );
  state.defaultVpc = Vpcs[0].VpcId;
}),
new ScenarioOutput("gotVpc", (state) =>
  MESSAGES.gotVpc.replace("${VPC_ID}", state.defaultVpc),
),
new ScenarioOutput("gettingSubnets", MESSAGES.gettingSubnets),
new ScenarioAction("getSubnets", async (state) => {
  const client = new EC2Client({});
  const { Subnets } = await client.send(
```

```
      new DescribeSubnetsCommand({
        Filters: [
          { Name: "vpc-id", Values: [state.defaultVpc] },
          { Name: "availability-zone", Values: state.availabilityZoneNames },
          { Name: "default-for-az", Values: ["true"] },
        ],
      }),
    );
    state.subnets = Subnets.map((subnet) => subnet.SubnetId);
  }),
  new ScenarioOutput(
    "gotSubnets",
    /**
     * @param {{ subnets: string[] }} state
     */
    (state) =>
      MESSAGES.gotSubnets.replace("${SUBNETS}", state.subnets.join(", ")),
  ),
  new ScenarioOutput(
    "creatingLoadBalancerTargetGroup",
    MESSAGES.creatingLoadBalancerTargetGroup.replace(
      "${TARGET_GROUP_NAME}",
      NAMES.loadBalancerTargetGroupName,
    ),
  ),
  new ScenarioAction("createLoadBalancerTargetGroup", async (state) => {
    const client = new ElasticLoadBalancingV2Client({});
    const { TargetGroups } = await client.send(
      new CreateTargetGroupCommand({
        Name: NAMES.loadBalancerTargetGroupName,
        Protocol: "HTTP",
        Port: 80,
        HealthCheckPath: "/healthcheck",
        HealthCheckIntervalSeconds: 10,
        HealthCheckTimeoutSeconds: 5,
        HealthyThresholdCount: 2,
        UnhealthyThresholdCount: 2,
        VpcId: state.defaultVpc,
      }),
    );
    const targetGroup = TargetGroups[0];
    state.targetGroupArn = targetGroup.TargetGroupArn;
    state.targetGroupProtocol = targetGroup.Protocol;
    state.targetGroupPort = targetGroup.Port;
```

```
  }),
  new ScenarioOutput(
    "createdLoadBalancerTargetGroup",
    MESSAGES.createdLoadBalancerTargetGroup.replace(
      "${TARGET_GROUP_NAME}",
      NAMES.loadBalancerTargetGroupName,
    ),
  ),
  new ScenarioOutput(
    "creatingLoadBalancer",
    MESSAGES.creatingLoadBalancer.replace("${LB_NAME}", NAMES.loadBalancerName),
  ),
  new ScenarioAction("createLoadBalancer", async (state) => {
    const client = new ElasticLoadBalancingV2Client({});
    const { LoadBalancers } = await client.send(
      new CreateLoadBalancerCommand({
        Name: NAMES.loadBalancerName,
        Subnets: state.subnets,
      }),
    );
    state.loadBalancerDns = LoadBalancers[0].DNSName;
    state.loadBalancerArn = LoadBalancers[0].LoadBalancerArn;
    await waitUntilLoadBalancerAvailable(
      { client },
      { Names: [NAMES.loadBalancerName] },
    );
  }),
  new ScenarioOutput("createdLoadBalancer", (state) =>
    MESSAGES.createdLoadBalancer
      .replace("${LB_NAME}", NAMES.loadBalancerName)
      .replace("${DNS_NAME}", state.loadBalancerDns),
  ),
  new ScenarioOutput(
    "creatingListener",
    MESSAGES.creatingLoadBalancerListener
      .replace("${LB_NAME}", NAMES.loadBalancerName)
      .replace("${TARGET_GROUP_NAME}", NAMES.loadBalancerTargetGroupName),
  ),
  new ScenarioAction("createListener", async (state) => {
    const client = new ElasticLoadBalancingV2Client({});
    const { Listeners } = await client.send(
      new CreateListenerCommand({
        LoadBalancerArn: state.loadBalancerArn,
        Protocol: state.targetGroupProtocol,
```

```
        Port: state.targetGroupPort,
        DefaultActions: [
          { Type: "forward", TargetGroupArn: state.targetGroupArn },
        ],
      }),
    );
    const listener = Listeners[0];
    state.loadBalancerListenerArn = listener.ListenerArn;
  }),
  new ScenarioOutput("createdListener", (state) =>
    MESSAGES.createdLoadBalancerListener.replace(
      "${LB_LISTENER_ARN}",
      state.loadBalancerListenerArn,
    ),
  ),
  new ScenarioOutput(
    "attachingLoadBalancerTargetGroup",
    MESSAGES.attachingLoadBalancerTargetGroup
      .replace("${TARGET_GROUP_NAME}", NAMES.loadBalancerTargetGroupName)
      .replace("${AUTO_SCALING_GROUP_NAME}", NAMES.autoScalingGroupName),
  ),
  new ScenarioAction("attachLoadBalancerTargetGroup", async (state) => {
    const client = new AutoScalingClient({});
    await client.send(
      new AttachLoadBalancerTargetGroupsCommand({
        AutoScalingGroupName: NAMES.autoScalingGroupName,
        TargetGroupARNs: [state.targetGroupArn],
      }),
    );
  }),
  new ScenarioOutput(
    "attachedLoadBalancerTargetGroup",
    MESSAGES.attachedLoadBalancerTargetGroup,
  ),
  new ScenarioOutput("verifyingInboundPort", MESSAGES.verifyingInboundPort),
  new ScenarioAction(
    "verifyInboundPort",
    /**
     *
     * @param {{ defaultSecurityGroup: import('@aws-sdk/client-
ec2').SecurityGroup}} state
     */
    async (state) => {
      const client = new EC2Client({});
```

```
      const { SecurityGroups } = await client.send(
        new DescribeSecurityGroupsCommand({
          Filters: [{ Name: "group-name", Values: ["default"] }],
        }),
      );
      if (!SecurityGroups) {
        state.verifyInboundPortError = new Error(MESSAGES.noSecurityGroups);
      }
      state.defaultSecurityGroup = SecurityGroups[0];

      /**
       * @type {string}
       */
      const ipResponse = (await axios.get("http://checkip.amazonaws.com")).data;
      state.myIp = ipResponse.trim();
      const myIpRules = state.defaultSecurityGroup.IpPermissions.filter(
        ({ IpRanges }) =>
          IpRanges.some(
            ({ CidrIp }) =>
              CidrIp.startsWith(state.myIp) || CidrIp === "0.0.0.0/0",
          ),
      )
        .filter(({ IpProtocol }) => IpProtocol === "tcp")
        .filter(({ FromPort }) => FromPort === 80);

      state.myIpRules = myIpRules;
    },
  ),
  new ScenarioOutput(
    "verifiedInboundPort",
    /**
     * @param {{ myIpRules: any[] }} state
     */
    (state) => {
      if (state.myIpRules.length > 0) {
        return MESSAGES.foundIpRules.replace(
          "${IP_RULES}",
          JSON.stringify(state.myIpRules, null, 2),
        );
      }
      return MESSAGES.noIpRules;
    },
  ),
  new ScenarioInput(
```

```
    "shouldAddInboundRule",
    /**
     * @param {{ myIpRules: any[] }} state
     */
    (state) => {
      if (state.myIpRules.length > 0) {
        return false;
      }
      return MESSAGES.noIpRules;
    },
    { type: "confirm" },
  ),
  new ScenarioAction(
    "addInboundRule",
    /**
     * @param {{ defaultSecurityGroup: import('@aws-sdk/client-
ec2').SecurityGroup }} state
     */
    async (state) => {
      if (!state.shouldAddInboundRule) {
        return;
      }

      const client = new EC2Client({});
      await client.send(
        new AuthorizeSecurityGroupIngressCommand({
          GroupId: state.defaultSecurityGroup.GroupId,
          CidrIp: `${state.myIp}/32`,
          FromPort: 80,
          ToPort: 80,
          IpProtocol: "tcp",
        }),
      );
    },
  ),
  new ScenarioOutput("addedInboundRule", (state) => {
    if (state.shouldAddInboundRule) {
      return MESSAGES.addedInboundRule.replace("${IP_ADDRESS}", state.myIp);
    }
    return false;
  }),
  new ScenarioOutput("verifyingEndpoint", (state) =>
    MESSAGES.verifyingEndpoint.replace("${DNS_NAME}", state.loadBalancerDns),
  ),
```

```
  new ScenarioAction("verifyEndpoint", async (state) => {
    try {
      const response = await retry({ intervalInMs: 2000, maxRetries: 30 }, () =>
        axios.get(`http://${state.loadBalancerDns}`),
      );
      state.endpointResponse = JSON.stringify(response.data, null, 2);
    } catch (e) {
      state.verifyEndpointError = e;
    }
  }),
  new ScenarioOutput("verifiedEndpoint", (state) => {
    if (state.verifyEndpointError) {
      console.error(state.verifyEndpointError);
    } else {
      return MESSAGES.verifiedEndpoint.replace(
        "${ENDPOINT_RESPONSE}",
        state.endpointResponse,
      );
    }
  }),
  saveState,
];
```

Menyusun langkah-langkah untuk menjalankan demo.

```
import { readFileSync } from "node:fs";
import { join } from "node:path";

import axios from "axios";

import {
  DescribeTargetGroupsCommand,
  DescribeTargetHealthCommand,
  ElasticLoadBalancingV2Client,
} from "@aws-sdk/client-elastic-load-balancing-v2";
import {
  DescribeInstanceInformationCommand,
  PutParameterCommand,
  SSMClient,
  SendCommandCommand,
} from "@aws-sdk/client-ssm";
import {
```

```
  IAMClient,
  CreatePolicyCommand,
  CreateRoleCommand,
  AttachRolePolicyCommand,
  CreateInstanceProfileCommand,
  AddRoleToInstanceProfileCommand,
  waitUntilInstanceProfileExists,
} from "@aws-sdk/client-iam";
import {
  AutoScalingClient,
  DescribeAutoScalingGroupsCommand,
  TerminateInstanceInAutoScalingGroupCommand,
} from "@aws-sdk/client-auto-scaling";
import {
  DescribeIamInstanceProfileAssociationsCommand,
  EC2Client,
  RebootInstancesCommand,
  ReplaceIamInstanceProfileAssociationCommand,
} from "@aws-sdk/client-ec2";

import {
  ScenarioAction,
  ScenarioInput,
  ScenarioOutput,
} from "@aws-doc-sdk-examples/lib/scenario/scenario.js";
import { retry } from "@aws-doc-sdk-examples/lib/utils/util-timers.js";

import { MESSAGES, NAMES, RESOURCES_PATH } from "./constants.js";
import { findLoadBalancer } from "./shared.js";

const getRecommendation = new ScenarioAction(
  "getRecommendation",
  async (state) => {
    const loadBalancer = await findLoadBalancer(NAMES.loadBalancerName);
    if (loadBalancer) {
      state.loadBalancerDnsName = loadBalancer.DNSName;
      try {
        state.recommendation = (
          await axios.get(`http://${state.loadBalancerDnsName}`)
        ).data;
      } catch (e) {
        state.recommendation = e instanceof Error ? e.message : e;
      }
    } else {
```

```
      throw new Error(MESSAGES.demoFindLoadBalancerError);
    }
  },
);

const getRecommendationResult = new ScenarioOutput(
  "getRecommendationResult",
  (state) =>
    `Recommendation:\n${JSON.stringify(state.recommendation, null, 2)}`,
  { preformatted: true },
);

const getHealthCheck = new ScenarioAction("getHealthCheck", async (state) => {
  const client = new ElasticLoadBalancingV2Client({});
  const { TargetGroups } = await client.send(
    new DescribeTargetGroupsCommand({
      Names: [NAMES.loadBalancerTargetGroupName],
    }),
  );

  const { TargetHealthDescriptions } = await client.send(
    new DescribeTargetHealthCommand({
      TargetGroupArn: TargetGroups[0].TargetGroupArn,
    }),
  );
  state.targetHealthDescriptions = TargetHealthDescriptions;
});

const getHealthCheckResult = new ScenarioOutput(
  "getHealthCheckResult",
  /**
   * @param {{ targetHealthDescriptions: import('@aws-sdk/client-elastic-load-
balancing-v2').TargetHealthDescription[]}} state
   */
  (state) => {
    const status = state.targetHealthDescriptions
      .map((th) => `${th.Target.Id}: ${th.TargetHealth.State}`)
      .join("\n");
    return `Health check:\n${status}`;
  },
  { preformatted: true },
);

const loadBalancerLoop = new ScenarioAction(
```

```
  "loadBalancerLoop",
  getRecommendation.action,
  {
    whileConfig: {
      whileFn: ({ loadBalancerCheck }) => loadBalancerCheck,
      input: new ScenarioInput(
        "loadBalancerCheck",
        MESSAGES.demoLoadBalancerCheck,
        {
          type: "confirm",
        },
      ),
      output: getRecommendationResult,
    },
  },
);

const healthCheckLoop = new ScenarioAction(
  "healthCheckLoop",
  getHealthCheck.action,
  {
    whileConfig: {
      whileFn: ({ healthCheck }) => healthCheck,
      input: new ScenarioInput("healthCheck", MESSAGES.demoHealthCheck, {
        type: "confirm",
      }),
      output: getHealthCheckResult,
    },
  },
);

const statusSteps = [
  getRecommendation,
  getRecommendationResult,
  getHealthCheck,
  getHealthCheckResult,
];

/**
 * @type {import('@aws-doc-sdk-examples/lib/scenario.js').Step[]}
 */
export const demoSteps = [
  new ScenarioOutput("header", MESSAGES.demoHeader, { header: true }),
  new ScenarioOutput("sanityCheck", MESSAGES.demoSanityCheck),
```

```
  ...statusSteps,
  new ScenarioInput(
    "brokenDependencyConfirmation",
    MESSAGES.demoBrokenDependencyConfirmation,
    { type: "confirm" },
  ),
  new ScenarioAction("brokenDependency", async (state) => {
    if (!state.brokenDependencyConfirmation) {
      process.exit();
    } else {
      const client = new SSMClient({});
      state.badTableName = `fake-table-${Date.now()}`;
      await client.send(
        new PutParameterCommand({
          Name: NAMES.ssmTableNameKey,
          Value: state.badTableName,
          Overwrite: true,
          Type: "String",
        }),
      );
    }
  }),
  new ScenarioOutput("testBrokenDependency", (state) =>
    MESSAGES.demoTestBrokenDependency.replace(
      "${TABLE_NAME}",
      state.badTableName,
    ),
  ),
  ...statusSteps,
  new ScenarioInput(
    "staticResponseConfirmation",
    MESSAGES.demoStaticResponseConfirmation,
    { type: "confirm" },
  ),
  new ScenarioAction("staticResponse", async (state) => {
    if (!state.staticResponseConfirmation) {
      process.exit();
    } else {
      const client = new SSMClient({});
      await client.send(
        new PutParameterCommand({
          Name: NAMES.ssmFailureResponseKey,
          Value: "static",
          Overwrite: true,
```

```
          Type: "String",
        }),
      );
    }
  }),
  new ScenarioOutput("testStaticResponse", MESSAGES.demoTestStaticResponse),
  ...statusSteps,
  new ScenarioInput(
    "badCredentialsConfirmation",
    MESSAGES.demoBadCredentialsConfirmation,
    { type: "confirm" },
  ),
  new ScenarioAction("badCredentialsExit", (state) => {
    if (!state.badCredentialsConfirmation) {
      process.exit();
    }
  }),
  new ScenarioAction("fixDynamoDBName", async () => {
    const client = new SSMClient({});
    await client.send(
      new PutParameterCommand({
        Name: NAMES.ssmTableNameKey,
        Value: NAMES.tableName,
        Overwrite: true,
        Type: "String",
      }),
    );
  }),
  new ScenarioAction(
    "badCredentials",
    /**
     * @param {{ targetInstance: import('@aws-sdk/client-auto-
scaling').Instance }} state
     */
    async (state) => {
      await createSsmOnlyInstanceProfile();
      const autoScalingClient = new AutoScalingClient({});
      const { AutoScalingGroups } = await autoScalingClient.send(
        new DescribeAutoScalingGroupsCommand({
          AutoScalingGroupNames: [NAMES.autoScalingGroupName],
        }),
      );
      state.targetInstance = AutoScalingGroups[0].Instances[0];
      const ec2Client = new EC2Client({});
```

```
      const { IamInstanceProfileAssociations } = await ec2Client.send(
        new DescribeIamInstanceProfileAssociationsCommand({
          Filters: [
            { Name: "instance-id", Values: [state.targetInstance.InstanceId] },
          ],
        }),
      );
      state.instanceProfileAssociationId =
        IamInstanceProfileAssociations[0].AssociationId;
      await retry({ intervalInMs: 1000, maxRetries: 30 }, () =>
        ec2Client.send(
          new ReplaceIamInstanceProfileAssociationCommand({
            AssociationId: state.instanceProfileAssociationId,
            IamInstanceProfile: { Name: NAMES.ssmOnlyInstanceProfileName },
          }),
        ),
      );

      await ec2Client.send(
        new RebootInstancesCommand({
          InstanceIds: [state.targetInstance.InstanceId],
        }),
      );

      const ssmClient = new SSMClient({});
      await retry({ intervalInMs: 20000, maxRetries: 15 }, async () => {
        const { InstanceInformationList } = await ssmClient.send(
          new DescribeInstanceInformationCommand({}),
        );

        const instance = InstanceInformationList.find(
          (info) => info.InstanceId === state.targetInstance.InstanceId,
        );

        if (!instance) {
          throw new Error("Instance not found.");
        }
      });

      await ssmClient.send(
        new SendCommandCommand({
          InstanceIds: [state.targetInstance.InstanceId],
          DocumentName: "AWS-RunShellScript",
          Parameters: { commands: ["cd / && sudo python3 server.py 80"] },
```

```
        }),
      );
    },
  ),
  new ScenarioOutput(
    "testBadCredentials",
    /**
     * @param {{ targetInstance: import('@aws-sdk/client-
ssm').InstanceInformation}} state
     */
    (state) =>
      MESSAGES.demoTestBadCredentials.replace(
        "${INSTANCE_ID}",
        state.targetInstance.InstanceId,
      ),
  ),
  loadBalancerLoop,
  new ScenarioInput(
    "deepHealthCheckConfirmation",
    MESSAGES.demoDeepHealthCheckConfirmation,
    { type: "confirm" },
  ),
  new ScenarioAction("deepHealthCheckExit", (state) => {
    if (!state.deepHealthCheckConfirmation) {
      process.exit();
    }
  }),
  new ScenarioAction("deepHealthCheck", async () => {
    const client = new SSMClient({});
    await client.send(
      new PutParameterCommand({
        Name: NAMES.ssmHealthCheckKey,
        Value: "deep",
        Overwrite: true,
        Type: "String",
      }),
    );
  }),
  new ScenarioOutput("testDeepHealthCheck", MESSAGES.demoTestDeepHealthCheck),
  healthCheckLoop,
  loadBalancerLoop,
  new ScenarioInput(
    "killInstanceConfirmation",
    /**
```

```
     * @param {{ targetInstance: import('@aws-sdk/client-
ssm').InstanceInformation }} state
     */
    (state) =>
      MESSAGES.demoKillInstanceConfirmation.replace(
        "${INSTANCE_ID}",
        state.targetInstance.InstanceId,
      ),
    { type: "confirm" },
  ),
  new ScenarioAction("killInstanceExit", (state) => {
    if (!state.killInstanceConfirmation) {
      process.exit();
    }
  }),
  new ScenarioAction(
    "killInstance",
    /**
     * @param {{ targetInstance: import('@aws-sdk/client-
ssm').InstanceInformation }} state
     */
    async (state) => {
      const client = new AutoScalingClient({});
      await client.send(
        new TerminateInstanceInAutoScalingGroupCommand({
          InstanceId: state.targetInstance.InstanceId,
          ShouldDecrementDesiredCapacity: false,
        }),
      );
    },
  ),
  new ScenarioOutput("testKillInstance", MESSAGES.demoTestKillInstance),
  healthCheckLoop,
  loadBalancerLoop,
  new ScenarioInput("failOpenConfirmation", MESSAGES.demoFailOpenConfirmation, {
    type: "confirm",
  }),
  new ScenarioAction("failOpenExit", (state) => {
    if (!state.failOpenConfirmation) {
      process.exit();
    }
  }),
  new ScenarioAction("failOpen", () => {
    const client = new SSMClient({});
```

```
    return client.send(
      new PutParameterCommand({
        Name: NAMES.ssmTableNameKey,
        Value: `fake-table-${Date.now()}`,
        Overwrite: true,
        Type: "String",
      }),
    );
  }),
  new ScenarioOutput("testFailOpen", MESSAGES.demoFailOpenTest),
  healthCheckLoop,
  loadBalancerLoop,
  new ScenarioInput(
    "resetTableConfirmation",
    MESSAGES.demoResetTableConfirmation,
    { type: "confirm" },
  ),
  new ScenarioAction("resetTableExit", (state) => {
    if (!state.resetTableConfirmation) {
      process.exit();
    }
  }),
  new ScenarioAction("resetTable", async () => {
    const client = new SSMClient({});
    await client.send(
      new PutParameterCommand({
        Name: NAMES.ssmTableNameKey,
        Value: NAMES.tableName,
        Overwrite: true,
        Type: "String",
      }),
    );
  }),
  new ScenarioOutput("testResetTable", MESSAGES.demoTestResetTable),
  healthCheckLoop,
  loadBalancerLoop,
];

async function createSsmOnlyInstanceProfile() {
  const iamClient = new IAMClient({});
  const { Policy } = await iamClient.send(
    new CreatePolicyCommand({
      PolicyName: NAMES.ssmOnlyPolicyName,
      PolicyDocument: readFileSync(
```

```
      join(RESOURCES_PATH, "ssm_only_policy.json"),
    ),
  }),
);
await iamClient.send(
  new CreateRoleCommand({
    RoleName: NAMES.ssmOnlyRoleName,
    AssumeRolePolicyDocument: JSON.stringify({
      Version: "2012-10-17",
      Statement: [
        {
          Effect: "Allow",
          Principal: { Service: "ec2.amazonaws.com" },
          Action: "sts:AssumeRole",
        },
      ],
    }),
  }),
);
await iamClient.send(
  new AttachRolePolicyCommand({
    RoleName: NAMES.ssmOnlyRoleName,
    PolicyArn: Policy.Arn,
  }),
);
await iamClient.send(
  new AttachRolePolicyCommand({
    RoleName: NAMES.ssmOnlyRoleName,
    PolicyArn: "arn:aws:iam::aws:policy/AmazonSSMManagedInstanceCore",
  }),
);
const { InstanceProfile } = await iamClient.send(
  new CreateInstanceProfileCommand({
    InstanceProfileName: NAMES.ssmOnlyInstanceProfileName,
  }),
);
await waitUntilInstanceProfileExists(
  { client: iamClient },
  { InstanceProfileName: NAMES.ssmOnlyInstanceProfileName },
);
await iamClient.send(
  new AddRoleToInstanceProfileCommand({
    InstanceProfileName: NAMES.ssmOnlyInstanceProfileName,
    RoleName: NAMES.ssmOnlyRoleName,
```

```
    }),
  );

  return InstanceProfile;
}
```

Menyusun langkah-langkah untuk menghancurkan semua sumber daya.

```
import { unlinkSync } from "node:fs";

import { DynamoDBClient, DeleteTableCommand } from "@aws-sdk/client-dynamodb";
import {
  EC2Client,
  DeleteKeyPairCommand,
  DeleteLaunchTemplateCommand,
  RevokeSecurityGroupIngressCommand,
} from "@aws-sdk/client-ec2";
import {
  IAMClient,
  DeleteInstanceProfileCommand,
  RemoveRoleFromInstanceProfileCommand,
  DeletePolicyCommand,
  DeleteRoleCommand,
  DetachRolePolicyCommand,
  paginateListPolicies,
} from "@aws-sdk/client-iam";
import {
  AutoScalingClient,
  DeleteAutoScalingGroupCommand,
  TerminateInstanceInAutoScalingGroupCommand,
  UpdateAutoScalingGroupCommand,
  paginateDescribeAutoScalingGroups,
} from "@aws-sdk/client-auto-scaling";
import {
  DeleteLoadBalancerCommand,
  DeleteTargetGroupCommand,
  DescribeTargetGroupsCommand,
  ElasticLoadBalancingV2Client,
} from "@aws-sdk/client-elastic-load-balancing-v2";

import {
  ScenarioOutput,
```

```
  ScenarioInput,
  ScenarioAction,
} from "@aws-doc-sdk-examples/lib/scenario/index.js";
import { loadState } from "@aws-doc-sdk-examples/lib/scenario/steps-common.js";
import { retry } from "@aws-doc-sdk-examples/lib/utils/util-timers.js";

import { MESSAGES, NAMES } from "./constants.js";
import { findLoadBalancer } from "./shared.js";

/**
 * @type {import('@aws-doc-sdk-examples/lib/scenario.js').Step[]}
 */
export const destroySteps = [
  loadState,
  new ScenarioInput("destroy", MESSAGES.destroy, { type: "confirm" }),
  new ScenarioAction(
    "abort",
    (state) => state.destroy === false && process.exit(),
  ),
  new ScenarioAction("deleteTable", async (c) => {
    try {
      const client = new DynamoDBClient({});
      await client.send(new DeleteTableCommand({ TableName: NAMES.tableName }));
    } catch (e) {
      c.deleteTableError = e;
    }
  }),
  new ScenarioOutput("deleteTableResult", (state) => {
    if (state.deleteTableError) {
      console.error(state.deleteTableError);
      return MESSAGES.deleteTableError.replace(
        "${TABLE_NAME}",
        NAMES.tableName,
      );
    }
    return MESSAGES.deletedTable.replace("${TABLE_NAME}", NAMES.tableName);
  }),
  new ScenarioAction("deleteKeyPair", async (state) => {
    try {
      const client = new EC2Client({});
      await client.send(
        new DeleteKeyPairCommand({ KeyName: NAMES.keyPairName }),
      );
      unlinkSync(`${NAMES.keyPairName}.pem`);
```

```
    } catch (e) {
      state.deleteKeyPairError = e;
    }
  }),
  new ScenarioOutput("deleteKeyPairResult", (state) => {
    if (state.deleteKeyPairError) {
      console.error(state.deleteKeyPairError);
      return MESSAGES.deleteKeyPairError.replace(
        "${KEY_PAIR_NAME}",
        NAMES.keyPairName,
      );
    }
    return MESSAGES.deletedKeyPair.replace(
      "${KEY_PAIR_NAME}",
      NAMES.keyPairName,
    );
  }),
  new ScenarioAction("detachPolicyFromRole", async (state) => {
    try {
      const client = new IAMClient({});
      const policy = await findPolicy(NAMES.instancePolicyName);

      if (!policy) {
        state.detachPolicyFromRoleError = new Error(
          `Policy ${NAMES.instancePolicyName} not found.`,
        );
      } else {
        await client.send(
          new DetachRolePolicyCommand({
            RoleName: NAMES.instanceRoleName,
            PolicyArn: policy.Arn,
          }),
        );
      }
    } catch (e) {
      state.detachPolicyFromRoleError = e;
    }
  }),
  new ScenarioOutput("detachedPolicyFromRole", (state) => {
    if (state.detachPolicyFromRoleError) {
      console.error(state.detachPolicyFromRoleError);
      return MESSAGES.detachPolicyFromRoleError
        .replace("${INSTANCE_POLICY_NAME}", NAMES.instancePolicyName)
        .replace("${INSTANCE_ROLE_NAME}", NAMES.instanceRoleName);
```

```
    }
    return MESSAGES.detachedPolicyFromRole
      .replace("${INSTANCE_POLICY_NAME}", NAMES.instancePolicyName)
      .replace("${INSTANCE_ROLE_NAME}", NAMES.instanceRoleName);
  }),
  new ScenarioAction("deleteInstancePolicy", async (state) => {
    const client = new IAMClient({});
    const policy = await findPolicy(NAMES.instancePolicyName);

    if (!policy) {
      state.deletePolicyError = new Error(
        `Policy ${NAMES.instancePolicyName} not found.`,
      );
    } else {
      return client.send(
        new DeletePolicyCommand({
          PolicyArn: policy.Arn,
        }),
      );
    }
  }),
  new ScenarioOutput("deletePolicyResult", (state) => {
    if (state.deletePolicyError) {
      console.error(state.deletePolicyError);
      return MESSAGES.deletePolicyError.replace(
        "${INSTANCE_POLICY_NAME}",
        NAMES.instancePolicyName,
      );
    }
    return MESSAGES.deletedPolicy.replace(
      "${INSTANCE_POLICY_NAME}",
      NAMES.instancePolicyName,
    );
  }),
  new ScenarioAction("removeRoleFromInstanceProfile", async (state) => {
    try {
      const client = new IAMClient({});
      await client.send(
        new RemoveRoleFromInstanceProfileCommand({
          RoleName: NAMES.instanceRoleName,
          InstanceProfileName: NAMES.instanceProfileName,
        }),
      );
    } catch (e) {
```

```
      state.removeRoleFromInstanceProfileError = e;
    }
  }),
  new ScenarioOutput("removeRoleFromInstanceProfileResult", (state) => {
    if (state.removeRoleFromInstanceProfile) {
      console.error(state.removeRoleFromInstanceProfileError);
      return MESSAGES.removeRoleFromInstanceProfileError
        .replace("${INSTANCE_PROFILE_NAME}", NAMES.instanceProfileName)
        .replace("${INSTANCE_ROLE_NAME}", NAMES.instanceRoleName);
    }
    return MESSAGES.removedRoleFromInstanceProfile
      .replace("${INSTANCE_PROFILE_NAME}", NAMES.instanceProfileName)
      .replace("${INSTANCE_ROLE_NAME}", NAMES.instanceRoleName);
  }),
  new ScenarioAction("deleteInstanceRole", async (state) => {
    try {
      const client = new IAMClient({});
      await client.send(
        new DeleteRoleCommand({
          RoleName: NAMES.instanceRoleName,
        }),
      );
    } catch (e) {
      state.deleteInstanceRoleError = e;
    }
  }),
  new ScenarioOutput("deleteInstanceRoleResult", (state) => {
    if (state.deleteInstanceRoleError) {
      console.error(state.deleteInstanceRoleError);
      return MESSAGES.deleteInstanceRoleError.replace(
        "${INSTANCE_ROLE_NAME}",
        NAMES.instanceRoleName,
      );
    }
    return MESSAGES.deletedInstanceRole.replace(
      "${INSTANCE_ROLE_NAME}",
      NAMES.instanceRoleName,
    );
  }),
  new ScenarioAction("deleteInstanceProfile", async (state) => {
    try {
      const client = new IAMClient({});
      await client.send(
        new DeleteInstanceProfileCommand({
```

```
          InstanceProfileName: NAMES.instanceProfileName,
        }),
      );
    } catch (e) {
      state.deleteInstanceProfileError = e;
    }
  }),
  new ScenarioOutput("deleteInstanceProfileResult", (state) => {
    if (state.deleteInstanceProfileError) {
      console.error(state.deleteInstanceProfileError);
      return MESSAGES.deleteInstanceProfileError.replace(
        "${INSTANCE_PROFILE_NAME}",
        NAMES.instanceProfileName,
      );
    }
    return MESSAGES.deletedInstanceProfile.replace(
      "${INSTANCE_PROFILE_NAME}",
      NAMES.instanceProfileName,
    );
  }),
  new ScenarioAction("deleteAutoScalingGroup", async (state) => {
    try {
      await terminateGroupInstances(NAMES.autoScalingGroupName);
      await retry({ intervalInMs: 60000, maxRetries: 60 }, async () => {
        await deleteAutoScalingGroup(NAMES.autoScalingGroupName);
      });
    } catch (e) {
      state.deleteAutoScalingGroupError = e;
    }
  }),
  new ScenarioOutput("deleteAutoScalingGroupResult", (state) => {
    if (state.deleteAutoScalingGroupError) {
      console.error(state.deleteAutoScalingGroupError);
      return MESSAGES.deleteAutoScalingGroupError.replace(
        "${AUTO_SCALING_GROUP_NAME}",
        NAMES.autoScalingGroupName,
      );
    }
    return MESSAGES.deletedAutoScalingGroup.replace(
      "${AUTO_SCALING_GROUP_NAME}",
      NAMES.autoScalingGroupName,
    );
  }),
  new ScenarioAction("deleteLaunchTemplate", async (state) => {
```

```
    const client = new EC2Client({});
    try {
      await client.send(
        new DeleteLaunchTemplateCommand({
          LaunchTemplateName: NAMES.launchTemplateName,
        }),
      );
    } catch (e) {
      state.deleteLaunchTemplateError = e;
    }
  }),
  new ScenarioOutput("deleteLaunchTemplateResult", (state) => {
    if (state.deleteLaunchTemplateError) {
      console.error(state.deleteLaunchTemplateError);
      return MESSAGES.deleteLaunchTemplateError.replace(
        "${LAUNCH_TEMPLATE_NAME}",
        NAMES.launchTemplateName,
      );
    }
    return MESSAGES.deletedLaunchTemplate.replace(
      "${LAUNCH_TEMPLATE_NAME}",
      NAMES.launchTemplateName,
    );
  }),
  new ScenarioAction("deleteLoadBalancer", async (state) => {
    try {
      const client = new ElasticLoadBalancingV2Client({});
      const loadBalancer = await findLoadBalancer(NAMES.loadBalancerName);
      await client.send(
        new DeleteLoadBalancerCommand({
          LoadBalancerArn: loadBalancer.LoadBalancerArn,
        }),
      );
      await retry({ intervalInMs: 1000, maxRetries: 60 }, async () => {
        const lb = await findLoadBalancer(NAMES.loadBalancerName);
        if (lb) {
          throw new Error("Load balancer still exists.");
        }
      });
    } catch (e) {
      state.deleteLoadBalancerError = e;
    }
  }),
  new ScenarioOutput("deleteLoadBalancerResult", (state) => {
```

```
    if (state.deleteLoadBalancerError) {
      console.error(state.deleteLoadBalancerError);
      return MESSAGES.deleteLoadBalancerError.replace(
        "${LB_NAME}",
        NAMES.loadBalancerName,
      );
    }
    return MESSAGES.deletedLoadBalancer.replace(
      "${LB_NAME}",
      NAMES.loadBalancerName,
    );
  }),
  new ScenarioAction("deleteLoadBalancerTargetGroup", async (state) => {
    const client = new ElasticLoadBalancingV2Client({});
    try {
      const { TargetGroups } = await client.send(
        new DescribeTargetGroupsCommand({
          Names: [NAMES.loadBalancerTargetGroupName],
        }),
      );

      await retry({ intervalInMs: 1000, maxRetries: 30 }, () =>
        client.send(
          new DeleteTargetGroupCommand({
            TargetGroupArn: TargetGroups[0].TargetGroupArn,
          }),
        ),
      );
    } catch (e) {
      state.deleteLoadBalancerTargetGroupError = e;
    }
  }),
  new ScenarioOutput("deleteLoadBalancerTargetGroupResult", (state) => {
    if (state.deleteLoadBalancerTargetGroupError) {
      console.error(state.deleteLoadBalancerTargetGroupError);
      return MESSAGES.deleteLoadBalancerTargetGroupError.replace(
        "${TARGET_GROUP_NAME}",
        NAMES.loadBalancerTargetGroupName,
      );
    }
    return MESSAGES.deletedLoadBalancerTargetGroup.replace(
      "${TARGET_GROUP_NAME}",
      NAMES.loadBalancerTargetGroupName,
    );
```

```
  }),
  new ScenarioAction("detachSsmOnlyRoleFromProfile", async (state) => {
    try {
      const client = new IAMClient({});
      await client.send(
        new RemoveRoleFromInstanceProfileCommand({
          InstanceProfileName: NAMES.ssmOnlyInstanceProfileName,
          RoleName: NAMES.ssmOnlyRoleName,
        }),
      );
    } catch (e) {
      state.detachSsmOnlyRoleFromProfileError = e;
    }
  }),
  new ScenarioOutput("detachSsmOnlyRoleFromProfileResult", (state) => {
    if (state.detachSsmOnlyRoleFromProfileError) {
      console.error(state.detachSsmOnlyRoleFromProfileError);
      return MESSAGES.detachSsmOnlyRoleFromProfileError
        .replace("${ROLE_NAME}", NAMES.ssmOnlyRoleName)
        .replace("${PROFILE_NAME}", NAMES.ssmOnlyInstanceProfileName);
    }
    return MESSAGES.detachedSsmOnlyRoleFromProfile
      .replace("${ROLE_NAME}", NAMES.ssmOnlyRoleName)
      .replace("${PROFILE_NAME}", NAMES.ssmOnlyInstanceProfileName);
  }),
  new ScenarioAction("detachSsmOnlyCustomRolePolicy", async (state) => {
    try {
      const iamClient = new IAMClient({});
      const ssmOnlyPolicy = await findPolicy(NAMES.ssmOnlyPolicyName);
      await iamClient.send(
        new DetachRolePolicyCommand({
          RoleName: NAMES.ssmOnlyRoleName,
          PolicyArn: ssmOnlyPolicy.Arn,
        }),
      );
    } catch (e) {
      state.detachSsmOnlyCustomRolePolicyError = e;
    }
  }),
  new ScenarioOutput("detachSsmOnlyCustomRolePolicyResult", (state) => {
    if (state.detachSsmOnlyCustomRolePolicyError) {
      console.error(state.detachSsmOnlyCustomRolePolicyError);
      return MESSAGES.detachSsmOnlyCustomRolePolicyError
        .replace("${ROLE_NAME}", NAMES.ssmOnlyRoleName)
```

```
        .replace("${POLICY_NAME}", NAMES.ssmOnlyPolicyName);
    }
    return MESSAGES.detachedSsmOnlyCustomRolePolicy
      .replace("${ROLE_NAME}", NAMES.ssmOnlyRoleName)
      .replace("${POLICY_NAME}", NAMES.ssmOnlyPolicyName);
  }),
  new ScenarioAction("detachSsmOnlyAWSRolePolicy", async (state) => {
    try {
      const iamClient = new IAMClient({});
      await iamClient.send(
        new DetachRolePolicyCommand({
          RoleName: NAMES.ssmOnlyRoleName,
          PolicyArn: "arn:aws:iam::aws:policy/AmazonSSMManagedInstanceCore",
        }),
      );
    } catch (e) {
      state.detachSsmOnlyAWSRolePolicyError = e;
    }
  }),
  new ScenarioOutput("detachSsmOnlyAWSRolePolicyResult", (state) => {
    if (state.detachSsmOnlyAWSRolePolicyError) {
      console.error(state.detachSsmOnlyAWSRolePolicyError);
      return MESSAGES.detachSsmOnlyAWSRolePolicyError
        .replace("${ROLE_NAME}", NAMES.ssmOnlyRoleName)
        .replace("${POLICY_NAME}", "AmazonSSMManagedInstanceCore");
    }
    return MESSAGES.detachedSsmOnlyAWSRolePolicy
      .replace("${ROLE_NAME}", NAMES.ssmOnlyRoleName)
      .replace("${POLICY_NAME}", "AmazonSSMManagedInstanceCore");
  }),
  new ScenarioAction("deleteSsmOnlyInstanceProfile", async (state) => {
    try {
      const iamClient = new IAMClient({});
      await iamClient.send(
        new DeleteInstanceProfileCommand({
          InstanceProfileName: NAMES.ssmOnlyInstanceProfileName,
        }),
      );
    } catch (e) {
      state.deleteSsmOnlyInstanceProfileError = e;
    }
  }),
  new ScenarioOutput("deleteSsmOnlyInstanceProfileResult", (state) => {
    if (state.deleteSsmOnlyInstanceProfileError) {
```

```
      console.error(state.deleteSsmOnlyInstanceProfileError);
      return MESSAGES.deleteSsmOnlyInstanceProfileError.replace(
        "${INSTANCE_PROFILE_NAME}",
        NAMES.ssmOnlyInstanceProfileName,
      );
    }
    return MESSAGES.deletedSsmOnlyInstanceProfile.replace(
      "${INSTANCE_PROFILE_NAME}",
      NAMES.ssmOnlyInstanceProfileName,
    );
  }),
  new ScenarioAction("deleteSsmOnlyPolicy", async (state) => {
    try {
      const iamClient = new IAMClient({});
      const ssmOnlyPolicy = await findPolicy(NAMES.ssmOnlyPolicyName);
      await iamClient.send(
        new DeletePolicyCommand({
          PolicyArn: ssmOnlyPolicy.Arn,
        }),
      );
    } catch (e) {
      state.deleteSsmOnlyPolicyError = e;
    }
  }),
  new ScenarioOutput("deleteSsmOnlyPolicyResult", (state) => {
    if (state.deleteSsmOnlyPolicyError) {
      console.error(state.deleteSsmOnlyPolicyError);
      return MESSAGES.deleteSsmOnlyPolicyError.replace(
        "${POLICY_NAME}",
        NAMES.ssmOnlyPolicyName,
      );
    }
    return MESSAGES.deletedSsmOnlyPolicy.replace(
      "${POLICY_NAME}",
      NAMES.ssmOnlyPolicyName,
    );
  }),
  new ScenarioAction("deleteSsmOnlyRole", async (state) => {
    try {
      const iamClient = new IAMClient({});
      await iamClient.send(
        new DeleteRoleCommand({
          RoleName: NAMES.ssmOnlyRoleName,
        }),
```

```
      );
    } catch (e) {
      state.deleteSsmOnlyRoleError = e;
    }
  }),
  new ScenarioOutput("deleteSsmOnlyRoleResult", (state) => {
    if (state.deleteSsmOnlyRoleError) {
      console.error(state.deleteSsmOnlyRoleError);
      return MESSAGES.deleteSsmOnlyRoleError.replace(
        "${ROLE_NAME}",
        NAMES.ssmOnlyRoleName,
      );
    }
    return MESSAGES.deletedSsmOnlyRole.replace(
      "${ROLE_NAME}",
      NAMES.ssmOnlyRoleName,
    );
  }),
  new ScenarioAction(
    "revokeSecurityGroupIngress",
    async (
      /** @type {{ myIp: string, defaultSecurityGroup: { GroupId: string } }} */
state,
    ) => {
      const ec2Client = new EC2Client({});

      try {
        await ec2Client.send(
          new RevokeSecurityGroupIngressCommand({
            GroupId: state.defaultSecurityGroup.GroupId,
            CidrIp: `${state.myIp}/32`,
            FromPort: 80,
            ToPort: 80,
            IpProtocol: "tcp",
          }),
        );
      } catch (e) {
        state.revokeSecurityGroupIngressError = e;
      }
    },
  ),
  new ScenarioOutput("revokeSecurityGroupIngressResult", (state) => {
    if (state.revokeSecurityGroupIngressError) {
      console.error(state.revokeSecurityGroupIngressError);
```

```
      return MESSAGES.revokeSecurityGroupIngressError.replace(
        "${IP}",
        state.myIp,
      );
    }
    return MESSAGES.revokedSecurityGroupIngress.replace("${IP}", state.myIp);
  }),
];

/**
 * @param {string} policyName
 */
async function findPolicy(policyName) {
  const client = new IAMClient({});
  const paginatedPolicies = paginateListPolicies({ client }, {});
  for await (const page of paginatedPolicies) {
    const policy = page.Policies.find((p) => p.PolicyName === policyName);
    if (policy) {
      return policy;
    }
  }
}

/**
 * @param {string} groupName
 */
async function deleteAutoScalingGroup(groupName) {
  const client = new AutoScalingClient({});
  try {
    await client.send(
      new DeleteAutoScalingGroupCommand({
        AutoScalingGroupName: groupName,
      }),
    );
  } catch (err) {
    if (!(err instanceof Error)) {
      throw err;
    }
    console.log(err.name);
    throw err;
  }
}

/**
```

```
 * @param {string} groupName
 */
async function terminateGroupInstances(groupName) {
  const autoScalingClient = new AutoScalingClient({});
  const group = await findAutoScalingGroup(groupName);
  await autoScalingClient.send(
    new UpdateAutoScalingGroupCommand({
      AutoScalingGroupName: group.AutoScalingGroupName,
      MinSize: 0,
    }),
  );
  for (const i of group.Instances) {
    await retry({ intervalInMs: 1000, maxRetries: 30 }, () =>
      autoScalingClient.send(
        new TerminateInstanceInAutoScalingGroupCommand({
          InstanceId: i.InstanceId,
          ShouldDecrementDesiredCapacity: true,
        }),
      ),
    );
  }
}

async function findAutoScalingGroup(groupName) {
  const client = new AutoScalingClient({});
  const paginatedGroups = paginateDescribeAutoScalingGroups({ client }, {});
  for await (const page of paginatedGroups) {
    const group = page.AutoScalingGroups.find(
      (g) => g.AutoScalingGroupName === groupName,
    );
    if (group) {
      return group;
    }
  }
  throw new Error(`Auto scaling group ${groupName} not found.`);
}
```

- Untuk API detailnya, lihat topik berikut di AWS SDK for JavaScript APIReferensi.
  - AttachLoadBalancerTargetGroups
  - CreateAutoScalingGroup
  - CreateInstanceProfile

- CreateLaunchTemplate
- CreateListener
- CreateLoadBalancer
- CreateTargetGroup
- DeleteAutoScalingGroup
- DeleteInstanceProfile
- DeleteLaunchTemplate
- DeleteLoadBalancer
- DeleteTargetGroup
- DescribeAutoScalingGroups
- DescribeAvailabilityZones
- DescribeIamInstanceProfileAssociations
- DescribeInstances
- DescribeLoadBalancers
- DescribeSubnets
- DescribeTargetGroups
- DescribeTargetHealth
- DescribeVpcs
- RebootInstances
- ReplaceIamInstanceProfileAssociation
- TerminateInstanceInAutoScalingGroup
- UpdateAutoScalingGroup

Python

SDKuntuk Python (Boto3)

> **Note**
>
> Ada lebih banyak tentang GitHub. Temukan contoh lengkapnya dan pelajari cara pengaturan dan menjalankannya di Repositori Contoh Kode AWS.

Menjalankan skenario interaktif di prompt perintah.

```
class Runner:
    """
    Manages the deployment, demonstration, and destruction of resources for the
 resilient service.
    """

    def __init__(
        self,
        resource_path: str,
        recommendation: RecommendationService,
        autoscaler: AutoScalingWrapper,
        loadbalancer: ElasticLoadBalancerWrapper,
        param_helper: ParameterHelper,
    ):
        """
        Initializes the Runner class with the necessary parameters.

        :param resource_path: The path to resource files used by this example,
 such as IAM policies and instance scripts.
        :param recommendation: An instance of the RecommendationService class.
        :param autoscaler: An instance of the AutoScaler class.
        :param loadbalancer: An instance of the LoadBalancer class.
        :param param_helper: An instance of the ParameterHelper class.
        """
        self.resource_path = resource_path
        self.recommendation = recommendation
        self.autoscaler = autoscaler
        self.loadbalancer = loadbalancer
        self.param_helper = param_helper
        self.protocol = "HTTP"
        self.port = 80
        self.ssh_port = 22

        prefix = "doc-example-resilience"
        self.target_group_name = f"{prefix}-tg"
        self.load_balancer_name = f"{prefix}-lb"

    def deploy(self) -> None:
        """
        Deploys the resources required for the resilient service, including the
 DynamoDB table,
        EC2 instances, Auto Scaling group, and load balancer.
```

```
        """
        recommendations_path = f"{self.resource_path}/recommendations.json"
        startup_script = f"{self.resource_path}/server_startup_script.sh"
        instance_policy = f"{self.resource_path}/instance_policy.json"

        logging.info("Starting deployment of resources for the resilient
service.")

        logging.info(
            "Creating and populating DynamoDB table '%s'.",
            self.recommendation.table_name,
        )
        self.recommendation.create()
        self.recommendation.populate(recommendations_path)

        logging.info(
            "Creating an EC2 launch template with the startup script '%s'.",
            startup_script,
        )
        self.autoscaler.create_template(startup_script, instance_policy)

        logging.info(
            "Creating an EC2 Auto Scaling group across multiple Availability
Zones."
        )
        zones = self.autoscaler.create_autoscaling_group(3)

        logging.info("Creating variables that control the flow of the demo.")
        self.param_helper.reset()

        logging.info("Creating Elastic Load Balancing target group and load
balancer.")

        vpc = self.autoscaler.get_default_vpc()
        subnets = self.autoscaler.get_subnets(vpc["VpcId"], zones)
        target_group = self.loadbalancer.create_target_group(
            self.target_group_name, self.protocol, self.port, vpc["VpcId"]
        )
        self.loadbalancer.create_load_balancer(
            self.load_balancer_name, [subnet["SubnetId"] for subnet in subnets]
        )
        self.loadbalancer.create_listener(self.load_balancer_name, target_group)

        self.autoscaler.attach_load_balancer_target_group(target_group)
```

```
        logging.info("Verifying access to the load balancer endpoint.")
        endpoint = self.loadbalancer.get_endpoint(self.load_balancer_name)
        lb_success = self.loadbalancer.verify_load_balancer_endpoint(endpoint)
        current_ip_address = requests.get("http://
checkip.amazonaws.com").text.strip()

        if not lb_success:
            logging.warning(
                "Couldn't connect to the load balancer. Verifying that the port
 is open..."
            )
            sec_group, port_is_open = self.autoscaler.verify_inbound_port(
                vpc, self.port, current_ip_address
            )
            sec_group, ssh_port_is_open = self.autoscaler.verify_inbound_port(
                vpc, self.ssh_port, current_ip_address
            )
            if not port_is_open:
                logging.warning(
                    "The default security group for your VPC must allow access
 from this computer."
                )
                if q.ask(
                    f"Do you want to add a rule to security group
 {sec_group['GroupId']} to allow\n"
                    f"inbound traffic on port {self.port} from your computer's IP
 address of {current_ip_address}? (y/n) ",
                    q.is_yesno,
                ):
                    self.autoscaler.open_inbound_port(
                        sec_group["GroupId"], self.port, current_ip_address
                    )
            if not ssh_port_is_open:
                if q.ask(
                    f"Do you want to add a rule to security group
 {sec_group['GroupId']} to allow\n"
                    f"inbound SSH traffic on port {self.ssh_port} for debugging
 from your computer's IP address of {current_ip_address}? (y/n) ",
                    q.is_yesno,
                ):
                    self.autoscaler.open_inbound_port(
                        sec_group["GroupId"], self.ssh_port, current_ip_address
                    )
```

```
            lb_success =
self.loadbalancer.verify_load_balancer_endpoint(endpoint)

        if lb_success:
            logging.info(
                "Load balancer is ready. Access it at: http://%s",
current_ip_address
            )
        else:
            logging.error(
                "Couldn't get a successful response from the load balancer
endpoint. Please verify your VPC and security group settings."
            )

    def demo_choices(self) -> None:
        """
        Presents choices for interacting with the deployed service, such as
sending requests to
        the load balancer or checking the health of the targets.
        """
        actions = [
            "Send a GET request to the load balancer endpoint.",
            "Check the health of load balancer targets.",
            "Go to the next part of the demo.",
        ]
        choice = 0
        while choice != 2:
            logging.info("Choose an action to interact with the service.")
            choice = q.choose("Which action would you like to take? ", actions)
            if choice == 0:
                logging.info("Sending a GET request to the load balancer
endpoint.")
                endpoint =
self.loadbalancer.get_endpoint(self.load_balancer_name)
                logging.info("GET http://%s", endpoint)
                response = requests.get(f"http://{endpoint}")
                logging.info("Response: %s", response.status_code)
                if response.headers.get("content-type") == "application/json":
                    pp(response.json())
            elif choice == 1:
                logging.info("Checking the health of load balancer targets.")
                health =
self.loadbalancer.check_target_health(self.target_group_name)
                for target in health:
```

```
                    state = target["TargetHealth"]["State"]
                    logging.info(
                        "Target %s on port %d is %s",
                        target["Target"]["Id"],
                        target["Target"]["Port"],
                        state,
                    )
                    if state != "healthy":
                        logging.warning(
                            "%s: %s",
                            target["TargetHealth"]["Reason"],
                            target["TargetHealth"]["Description"],
                        )
                logging.info(
                    "Note that it can take a minute or two for the health check
to update."
                )
            elif choice == 2:
                logging.info("Proceeding to the next part of the demo.")

    def demo(self) -> None:
        """
        Runs the demonstration, showing how the service responds to different
failure scenarios
        and how a resilient architecture can keep the service running.
        """
        ssm_only_policy = f"{self.resource_path}/ssm_only_policy.json"

        logging.info("Resetting parameters to starting values for the demo.")
        self.param_helper.reset()

        logging.info(
            "Starting demonstration of the service's resilience under various
failure conditions."
        )
        self.demo_choices()

        logging.info(
            "Simulating failure by changing the Systems Manager parameter to a
non-existent table."
        )
        self.param_helper.put(self.param_helper.table, "this-is-not-a-table")
        logging.info("Sending GET requests will now return failure codes.")
        self.demo_choices()
```

```
        logging.info("Switching to static response mode to mitigate failure.")
        self.param_helper.put(self.param_helper.failure_response, "static")
        logging.info("Sending GET requests will now return static responses.")
        self.demo_choices()

        logging.info("Restoring normal operation of the recommendation service.")
        self.param_helper.put(self.param_helper.table,
self.recommendation.table_name)

        logging.info(
            "Introducing a failure by assigning bad credentials to one of the
instances."
        )
        self.autoscaler.create_instance_profile(
            ssm_only_policy,
            self.autoscaler.bad_creds_policy_name,
            self.autoscaler.bad_creds_role_name,
            self.autoscaler.bad_creds_profile_name,
            ["AmazonSSMManagedInstanceCore"],
        )
        instances = self.autoscaler.get_instances()
        bad_instance_id = instances[0]
        instance_profile = self.autoscaler.get_instance_profile(bad_instance_id)
        logging.info(
            "Replacing instance profile with bad credentials for instance %s.",
            bad_instance_id,
        )
        self.autoscaler.replace_instance_profile(
            bad_instance_id,
            self.autoscaler.bad_creds_profile_name,
            instance_profile["AssociationId"],
        )
        logging.info(
            "Sending GET requests may return either a valid recommendation or a
static response."
        )
        self.demo_choices()

        logging.info("Implementing deep health checks to detect unhealthy
instances.")
        self.param_helper.put(self.param_helper.health_check, "deep")
        logging.info("Checking the health of the load balancer targets.")
        self.demo_choices()
```

```
        logging.info(
            "Terminating the unhealthy instance to let the auto scaler replace
it."
        )
        self.autoscaler.terminate_instance(bad_instance_id)
        logging.info("The service remains resilient during instance
replacement.")
        self.demo_choices()

        logging.info("Simulating a complete failure of the recommendation
service.")
        self.param_helper.put(self.param_helper.table, "this-is-not-a-table")
        logging.info(
            "All instances will report as unhealthy, but the service will still
return static responses."
        )
        self.demo_choices()
        self.param_helper.reset()

    def destroy(self, automation=False) -> None:
        """
        Destroys all resources created for the demo, including the load balancer,
Auto Scaling group,
        EC2 instances, and DynamoDB table.
        """
        logging.info(
            "This concludes the demo. Preparing to clean up all AWS resources
created during the demo."
        )
        if automation:
            cleanup = True
        else:
            cleanup = q.ask(
                "Do you want to clean up all demo resources? (y/n) ", q.is_yesno
            )

        if cleanup:
            logging.info("Deleting load balancer and related resources.")
            self.loadbalancer.delete_load_balancer(self.load_balancer_name)
            self.loadbalancer.delete_target_group(self.target_group_name)
            self.autoscaler.delete_autoscaling_group(self.autoscaler.group_name)
            self.autoscaler.delete_key_pair()
            self.autoscaler.delete_template()
```

```
            self.autoscaler.delete_instance_profile(
                self.autoscaler.bad_creds_profile_name,
                self.autoscaler.bad_creds_role_name,
            )
            logging.info("Deleting DynamoDB table and other resources.")
            self.recommendation.destroy()
        else:
            logging.warning(
                "Resources have not been deleted. Ensure you clean them up
 manually to avoid unexpected charges."
            )


def main() -> None:
    """
    Main function to parse arguments and run the appropriate actions for the
 demo.
    """
    parser = argparse.ArgumentParser()
    parser.add_argument(
        "--action",
        required=True,
        choices=["all", "deploy", "demo", "destroy"],
        help="The action to take for the demo. When 'all' is specified, resources
 are\n"
        "deployed, the demo is run, and resources are destroyed.",
    )
    parser.add_argument(
        "--resource_path",
        default="../../../workflows/resilient_service/resources",
        help="The path to resource files used by this example, such as IAM
 policies and\n"
        "instance scripts.",
    )
    args = parser.parse_args()

    logging.info("Starting the Resilient Service demo.")

    prefix = "doc-example-resilience"

    # Service Clients
    ddb_client = boto3.client("dynamodb")
    elb_client = boto3.client("elbv2")
    autoscaling_client = boto3.client("autoscaling")
```

```
    ec2_client = boto3.client("ec2")
    ssm_client = boto3.client("ssm")
    iam_client = boto3.client("iam")

    # Wrapper instantiations
    recommendation = RecommendationService(
        "doc-example-recommendation-service", ddb_client
    )
    autoscaling_wrapper = AutoScalingWrapper(
        prefix,
        "t3.micro",
        "/aws/service/ami-amazon-linux-latest/amzn2-ami-hvm-x86_64-gp2",
        autoscaling_client,
        ec2_client,
        ssm_client,
        iam_client,
    )
    elb_wrapper = ElasticLoadBalancerWrapper(elb_client)
    param_helper = ParameterHelper(recommendation.table_name, ssm_client)

    # Demo invocation
    runner = Runner(
        args.resource_path,
        recommendation,
        autoscaling_wrapper,
        elb_wrapper,
        param_helper,
    )
    actions = [args.action] if args.action != "all" else ["deploy", "demo",
 "destroy"]
    for action in actions:
        if action == "deploy":
            runner.deploy()
        elif action == "demo":
            runner.demo()
        elif action == "destroy":
            runner.destroy()

    logging.info("Demo completed successfully.")


if __name__ == "__main__":
    logging.basicConfig(level=logging.INFO, format="%(levelname)s: %(message)s")
    main()
```

Buat kelas yang membungkus Auto Scaling dan tindakan AmazonEC2.

```
class AutoScalingWrapper:
    """
    Encapsulates Amazon EC2 Auto Scaling and EC2 management actions.
    """

    def __init__(
        self,
        resource_prefix: str,
        inst_type: str,
        ami_param: str,
        autoscaling_client: boto3.client,
        ec2_client: boto3.client,
        ssm_client: boto3.client,
        iam_client: boto3.client,
    ):
        """
        Initializes the AutoScaler class with the necessary parameters.

        :param resource_prefix: The prefix for naming AWS resources that are
 created by this class.
        :param inst_type: The type of EC2 instance to create, such as t3.micro.
        :param ami_param: The Systems Manager parameter used to look up the AMI
 that is created.
        :param autoscaling_client: A Boto3 EC2 Auto Scaling client.
        :param ec2_client: A Boto3 EC2 client.
        :param ssm_client: A Boto3 Systems Manager client.
        :param iam_client: A Boto3 IAM client.
        """
        self.inst_type = inst_type
        self.ami_param = ami_param
        self.autoscaling_client = autoscaling_client
        self.ec2_client = ec2_client
        self.ssm_client = ssm_client
        self.iam_client = iam_client
        sts_client = boto3.client("sts")
        self.account_id = sts_client.get_caller_identity()["Account"]

        self.key_pair_name = f"{resource_prefix}-key-pair"
        self.launch_template_name = f"{resource_prefix}-template-"
```

```
        self.group_name = f"{resource_prefix}-group"

        # Happy path
        self.instance_policy_name = f"{resource_prefix}-pol"
        self.instance_role_name = f"{resource_prefix}-role"
        self.instance_profile_name = f"{resource_prefix}-prof"

        # Failure mode
        self.bad_creds_policy_name = f"{resource_prefix}-bc-pol"
        self.bad_creds_role_name = f"{resource_prefix}-bc-role"
        self.bad_creds_profile_name = f"{resource_prefix}-bc-prof"


    def create_policy(self, policy_file: str, policy_name: str) -> str:
        """
        Creates a new IAM policy or retrieves the ARN of an existing policy.

        :param policy_file: The path to a JSON file that contains the policy
 definition.
        :param policy_name: The name to give the created policy.
        :return: The ARN of the created or existing policy.
        """
        with open(policy_file) as file:
            policy_doc = file.read()

        try:
            response = self.iam_client.create_policy(
                PolicyName=policy_name, PolicyDocument=policy_doc
            )
            policy_arn = response["Policy"]["Arn"]
            log.info(f"Policy '{policy_name}' created successfully. ARN:
 {policy_arn}")
            return policy_arn

        except ClientError as err:
            if err.response["Error"]["Code"] == "EntityAlreadyExists":
                # If the policy already exists, get its ARN
                response = self.iam_client.get_policy(
                    PolicyArn=f"arn:aws:iam::{self.account_id}:policy/
{policy_name}"
                )
                policy_arn = response["Policy"]["Arn"]
                log.info(f"Policy '{policy_name}' already exists. ARN:
 {policy_arn}")
```

```
                return policy_arn
            log.error(f"Full error:\n\t{err}")

    def create_role(self, role_name: str, assume_role_doc: dict) -> str:
        """
        Creates a new IAM role or retrieves the ARN of an existing role.

        :param role_name: The name to give the created role.
        :param assume_role_doc: The assume role policy document that specifies
 which
                                entities can assume the role.
        :return: The ARN of the created or existing role.
        """
        try:
            response = self.iam_client.create_role(
                RoleName=role_name,
 AssumeRolePolicyDocument=json.dumps(assume_role_doc)
            )
            role_arn = response["Role"]["Arn"]
            log.info(f"Role '{role_name}' created successfully. ARN: {role_arn}")
            return role_arn

        except ClientError as err:
            if err.response["Error"]["Code"] == "EntityAlreadyExists":
                # If the role already exists, get its ARN
                response = self.iam_client.get_role(RoleName=role_name)
                role_arn = response["Role"]["Arn"]
                log.info(f"Role '{role_name}' already exists. ARN: {role_arn}")
                return role_arn
            log.error(f"Full error:\n\t{err}")

    def attach_policy(
        self,
        role_name: str,
        policy_arn: str,
        aws_managed_policies: Tuple[str, ...] = (),
    ) -> None:
        """
        Attaches an IAM policy to a role and optionally attaches additional AWS-
managed policies.

        :param role_name: The name of the role to attach the policy to.
        :param policy_arn: The ARN of the policy to attach.
```

```
        :param aws_managed_policies: A tuple of AWS-managed policy names to
attach to the role.
        """
        try:
            self.iam_client.attach_role_policy(RoleName=role_name,
PolicyArn=policy_arn)
            for aws_policy in aws_managed_policies:
                self.iam_client.attach_role_policy(
                    RoleName=role_name,
                    PolicyArn=f"arn:aws:iam::aws:policy/{aws_policy}",
                )
            log.info(f"Attached policy {policy_arn} to role {role_name}.")
        except ClientError as err:
            log.error(f"Failed to attach policy {policy_arn} to role
{role_name}.")
            log.error(f"Full error:\n\t{err}")

    def create_instance_profile(
        self,
        policy_file: str,
        policy_name: str,
        role_name: str,
        profile_name: str,
        aws_managed_policies: Tuple[str, ...] = (),
    ) -> str:
        """
        Creates a policy, role, and profile that is associated with instances
created by
        this class. An instance's associated profile defines a role that is
assumed by the
        instance. The role has attached policies that specify the AWS permissions
granted to
        clients that run on the instance.

        :param policy_file: The name of a JSON file that contains the policy
definition to
                            create and attach to the role.
        :param policy_name: The name to give the created policy.
        :param role_name: The name to give the created role.
        :param profile_name: The name to the created profile.
        :param aws_managed_policies: Additional AWS-managed policies that are
attached to
                                     the role, such as
AmazonSSMManagedInstanceCore to grant
```

```
                                    use of Systems Manager to send commands to
the instance.
        :return: The ARN of the profile that is created.
        """
        assume_role_doc = {
            "Version": "2012-10-17",
            "Statement": [
                {
                    "Effect": "Allow",
                    "Principal": {"Service": "ec2.amazonaws.com"},
                    "Action": "sts:AssumeRole",
                }
            ],
        }
        policy_arn = self.create_policy(policy_file, policy_name)
        self.create_role(role_name, assume_role_doc)
        self.attach_policy(role_name, policy_arn, aws_managed_policies)

        try:
            profile_response = self.iam_client.create_instance_profile(
                InstanceProfileName=profile_name
            )
            waiter = self.iam_client.get_waiter("instance_profile_exists")
            waiter.wait(InstanceProfileName=profile_name)
            time.sleep(10)  # wait a little longer
            profile_arn = profile_response["InstanceProfile"]["Arn"]
            self.iam_client.add_role_to_instance_profile(
                InstanceProfileName=profile_name, RoleName=role_name
            )
            log.info("Created profile %s and added role %s.", profile_name,
role_name)
        except ClientError as err:
            if err.response["Error"]["Code"] == "EntityAlreadyExists":
                prof_response = self.iam_client.get_instance_profile(
                    InstanceProfileName=profile_name
                )
                profile_arn = prof_response["InstanceProfile"]["Arn"]
                log.info(
                    "Instance profile %s already exists, nothing to do.",
profile_name
                )
            log.error(f"Full error:\n\t{err}")
        return profile_arn
```

```
   def get_instance_profile(self, instance_id: str) -> Dict[str, Any]:
       """
       Gets data about the profile associated with an instance.

       :param instance_id: The ID of the instance to look up.
       :return: The profile data.
       """
       try:
           response =
self.ec2_client.describe_iam_instance_profile_associations(
               Filters=[{"Name": "instance-id", "Values": [instance_id]}]
           )
           if not response["IamInstanceProfileAssociations"]:
               log.info(f"No instance profile found for instance
{instance_id}.")
           profile_data = response["IamInstanceProfileAssociations"][0]
           log.info(f"Retrieved instance profile for instance {instance_id}.")
           return profile_data
       except ClientError as err:
           log.error(
               f"Failed to retrieve instance profile for instance
{instance_id}."
           )
           error_code = err.response["Error"]["Code"]
           if error_code == "InvalidInstanceID.NotFound":
               log.error(f"The instance ID '{instance_id}' does not exist.")
           log.error(f"Full error:\n\t{err}")


   def replace_instance_profile(
       self,
       instance_id: str,
       new_instance_profile_name: str,
       profile_association_id: str,
   ) -> None:
       """
       Replaces the profile associated with a running instance. After the
profile is
       replaced, the instance is rebooted to ensure that it uses the new
profile. When
       the instance is ready, Systems Manager is used to restart the Python web
server.
```

```
        :param instance_id: The ID of the instance to restart.
        :param new_instance_profile_name: The name of the new profile to
associate with
                                          the specified instance.
        :param profile_association_id: The ID of the existing profile association
for the
                                       instance.
        """
        try:
            self.ec2_client.replace_iam_instance_profile_association(
                IamInstanceProfile={"Name": new_instance_profile_name},
                AssociationId=profile_association_id,
            )
            log.info(
                "Replaced instance profile for association %s with profile %s.",
                profile_association_id,
                new_instance_profile_name,
            )
            time.sleep(5)

            self.ec2_client.reboot_instances(InstanceIds=[instance_id])
            log.info("Rebooting instance %s.", instance_id)
            waiter = self.ec2_client.get_waiter("instance_running")
            log.info("Waiting for instance %s to be running.", instance_id)
            waiter.wait(InstanceIds=[instance_id])
            log.info("Instance %s is now running.", instance_id)

            self.ssm_client.send_command(
                InstanceIds=[instance_id],
                DocumentName="AWS-RunShellScript",
                Parameters={"commands": ["cd / && sudo python3 server.py 80"]},
            )
            log.info(f"Restarted the Python web server on instance
'{instance_id}'.")
        except ClientError as err:
            log.error("Failed to replace instance profile.")
            error_code = err.response["Error"]["Code"]
            if error_code == "InvalidAssociationID.NotFound":
                log.error(
                    f"Association ID '{profile_association_id}' does not exist."
                    "Please check the association ID and try again."
                )
            if error_code == "InvalidInstanceId":
                log.error(
```

```
                    f"The specified instance ID '{instance_id}' does not exist or
is not available for SSM. "
                    f"Please verify the instance ID and try again."
                )
            log.error(f"Full error:\n\t{err}")


    def delete_instance_profile(self, profile_name: str, role_name: str) -> None:
        """
        Detaches a role from an instance profile, detaches policies from the
role,
        and deletes all the resources.

        :param profile_name: The name of the profile to delete.
        :param role_name: The name of the role to delete.
        """
        try:
            self.iam_client.remove_role_from_instance_profile(
                InstanceProfileName=profile_name, RoleName=role_name
            )

self.iam_client.delete_instance_profile(InstanceProfileName=profile_name)
            log.info("Deleted instance profile %s.", profile_name)
            attached_policies = self.iam_client.list_attached_role_policies(
                RoleName=role_name
            )
            for pol in attached_policies["AttachedPolicies"]:
                self.iam_client.detach_role_policy(
                    RoleName=role_name, PolicyArn=pol["PolicyArn"]
                )
                if not pol["PolicyArn"].startswith("arn:aws:iam::aws"):
                    self.iam_client.delete_policy(PolicyArn=pol["PolicyArn"])
                log.info("Detached and deleted policy %s.", pol["PolicyName"])
            self.iam_client.delete_role(RoleName=role_name)
            log.info("Deleted role %s.", role_name)
        except ClientError as err:
            log.error(
                f"Couldn't delete instance profile {profile_name} or detach "
                f"policies and delete role {role_name}: {err}"
            )
            if err.response["Error"]["Code"] == "NoSuchEntity":
                log.info(
                    "Instance profile %s doesn't exist, nothing to do.",
profile_name
```

```
                )


    def create_key_pair(self, key_pair_name: str) -> None:
        """
        Creates a new key pair.

        :param key_pair_name: The name of the key pair to create.
        """
        try:
            response = self.ec2_client.create_key_pair(KeyName=key_pair_name)
            with open(f"{key_pair_name}.pem", "w") as file:
                file.write(response["KeyMaterial"])
            chmod(f"{key_pair_name}.pem", 0o600)
            log.info("Created key pair %s.", key_pair_name)
        except ClientError as err:
            error_code = err.response["Error"]["Code"]
            log.error(f"Failed to create key pair {key_pair_name}.")
            if error_code == "InvalidKeyPair.Duplicate":
                log.error(f"A key pair with the name '{key_pair_name}' already
exists.")
            log.error(f"Full error:\n\t{err}")


    def delete_key_pair(self) -> None:
        """
        Deletes a key pair.
        """
        try:
            self.ec2_client.delete_key_pair(KeyName=self.key_pair_name)
            remove(f"{self.key_pair_name}.pem")
            log.info("Deleted key pair %s.", self.key_pair_name)
        except ClientError as err:
            log.error(f"Couldn't delete key pair '{self.key_pair_name}'.")
            log.error(f"Full error:\n\t{err}")
        except FileNotFoundError as err:
            log.info("Key pair %s doesn't exist, nothing to do.",
self.key_pair_name)
            log.error(f"Full error:\n\t{err}")


    def create_template(
        self, server_startup_script_file: str, instance_policy_file: str
    ) -> Dict[str, Any]:
```

```
        """
        Creates an Amazon EC2 launch template to use with Amazon EC2 Auto
Scaling. The
        launch template specifies a Bash script in its user data field that runs
after
        the instance is started. This script installs Python packages and starts
a
        Python web server on the instance.

        :param server_startup_script_file: The path to a Bash script file that is
run
                                           when an instance starts.
        :param instance_policy_file: The path to a file that defines a
permissions policy
                                     to create and attach to the instance
profile.
        :return: Information about the newly created template.
        """
        template = {}
        try:
            # Create key pair and instance profile
            self.create_key_pair(self.key_pair_name)
            self.create_instance_profile(
                instance_policy_file,
                self.instance_policy_name,
                self.instance_role_name,
                self.instance_profile_name,
            )

            # Read the startup script
            with open(server_startup_script_file) as file:
                start_server_script = file.read()

            # Get the latest AMI ID
            ami_latest = self.ssm_client.get_parameter(Name=self.ami_param)
            ami_id = ami_latest["Parameter"]["Value"]

            # Create the launch template
            lt_response = self.ec2_client.create_launch_template(
                LaunchTemplateName=self.launch_template_name,
                LaunchTemplateData={
                    "InstanceType": self.inst_type,
                    "ImageId": ami_id,
                    "IamInstanceProfile": {"Name": self.instance_profile_name},
```

```
                    "UserData": base64.b64encode(
                        start_server_script.encode(encoding="utf-8")
                    ).decode(encoding="utf-8"),
                    "KeyName": self.key_pair_name,
                },
            )
            template = lt_response["LaunchTemplate"]
            log.info(
                f"Created launch template {self.launch_template_name} for AMI
{ami_id} on {self.inst_type}."
            )
        except ClientError as err:
            log.error(f"Failed to create launch template
{self.launch_template_name}.")
            error_code = err.response["Error"]["Code"]
            if error_code == "InvalidLaunchTemplateName.AlreadyExistsException":
                log.info(
                    f"Launch template {self.launch_template_name} already exists,
nothing to do."
                )
            log.error(f"Full error:\n\t{err}")
        return template


    def delete_template(self):
        """
        Deletes a launch template.
        """
        try:
            self.ec2_client.delete_launch_template(
                LaunchTemplateName=self.launch_template_name
            )
            self.delete_instance_profile(
                self.instance_profile_name, self.instance_role_name
            )
            log.info("Launch template %s deleted.", self.launch_template_name)
        except ClientError as err:
            if (
                err.response["Error"]["Code"]
                == "InvalidLaunchTemplateName.NotFoundException"
            ):
                log.info(
                    "Launch template %s does not exist, nothing to do.",
                    self.launch_template_name,
```

```
                )
            log.error(f"Full error:\n\t{err}")


    def get_availability_zones(self) -> List[str]:
        """
        Gets a list of Availability Zones in the AWS Region of the Amazon EC2
client.

        :return: The list of Availability Zones for the client Region.
        """
        try:
            response = self.ec2_client.describe_availability_zones()
            zones = [zone["ZoneName"] for zone in response["AvailabilityZones"]]
            log.info(f"Retrieved {len(zones)} availability zones: {zones}.")
        except ClientError as err:
            log.error("Failed to retrieve availability zones.")
            log.error(f"Full error:\n\t{err}")
        else:
            return zones


    def create_autoscaling_group(self, group_size: int) -> List[str]:
        """
        Creates an EC2 Auto Scaling group with the specified size.

        :param group_size: The number of instances to set for the minimum and
maximum in
                           the group.
        :return: The list of Availability Zones specified for the group.
        """
        try:
            zones = self.get_availability_zones()
            self.autoscaling_client.create_auto_scaling_group(
                AutoScalingGroupName=self.group_name,
                AvailabilityZones=zones,
                LaunchTemplate={
                    "LaunchTemplateName": self.launch_template_name,
                    "Version": "$Default",
                },
                MinSize=group_size,
                MaxSize=group_size,
            )
            log.info(
```

```
                f"Created EC2 Auto Scaling group {self.group_name} with
availability zones {zones}."
            )
        except ClientError as err:
            error_code = err.response["Error"]["Code"]
            if error_code == "AlreadyExists":
                log.info(
                    f"EC2 Auto Scaling group {self.group_name} already exists,
nothing to do."
                )
            else:
                log.error(f"Failed to create EC2 Auto Scaling group
{self.group_name}.")
                log.error(f"Full error:\n\t{err}")
        else:
            return zones


    def get_instances(self) -> List[str]:
        """
        Gets data about the instances in the EC2 Auto Scaling group.

        :return: A list of instance IDs in the Auto Scaling group.
        """
        try:
            as_response = self.autoscaling_client.describe_auto_scaling_groups(
                AutoScalingGroupNames=[self.group_name]
            )
            instance_ids = [
                i["InstanceId"]
                for i in as_response["AutoScalingGroups"][0]["Instances"]
            ]
            log.info(
                f"Retrieved {len(instance_ids)} instances for Auto Scaling group
{self.group_name}."
            )
        except ClientError as err:
            error_code = err.response["Error"]["Code"]
            log.error(
                f"Failed to retrieve instances for Auto Scaling group
{self.group_name}."
            )
            if error_code == "ResourceNotFound":
```

```
                log.error(f"The Auto Scaling group '{self.group_name}' does not
exist.")
            log.error(f"Full error:\n\t{err}")
        else:
            return instance_ids


    def terminate_instance(self, instance_id: str, decrementsetting=False) ->
None:
        """
        Terminates an instance in an EC2 Auto Scaling group. After an instance is
        terminated, it can no longer be accessed.

        :param instance_id: The ID of the instance to terminate.
        :param decrementsetting: If True, do not replace terminated instances.
        """
        try:
            self.autoscaling_client.terminate_instance_in_auto_scaling_group(
                InstanceId=instance_id,
                ShouldDecrementDesiredCapacity=decrementsetting,
            )
            log.info("Terminated instance %s.", instance_id)

            # Adding a waiter to ensure the instance is terminated
            waiter = self.ec2_client.get_waiter("instance_terminated")
            log.info("Waiting for instance %s to be terminated...", instance_id)
            waiter.wait(InstanceIds=[instance_id])
            log.info(
                f"Instance '{instance_id}' has been terminated and will be
replaced."
            )

        except ClientError as err:
            error_code = err.response["Error"]["Code"]
            log.error(f"Failed to terminate instance '{instance_id}'.")
            if error_code == "ScalingActivityInProgressFault":
                log.error(
                    "Scaling activity is currently in progress. "
                    "Wait for the scaling activity to complete before attempting
to terminate the instance again."
                )
            elif error_code == "ResourceContentionFault":
                log.error(
                    "The request failed due to a resource contention issue. "
```

```
                    "Ensure that no conflicting operations are being performed on
the resource."
                )
            log.error(f"Full error:\n\t{err}")

    def attach_load_balancer_target_group(
        self, lb_target_group: Dict[str, Any]
    ) -> None:
        """
        Attaches an Elastic Load Balancing (ELB) target group to this EC2 Auto
Scaling group.
        The target group specifies how the load balancer forwards requests to the
instances
        in the group.

        :param lb_target_group: Data about the ELB target group to attach.
        """
        try:
            self.autoscaling_client.attach_load_balancer_target_groups(
                AutoScalingGroupName=self.group_name,
                TargetGroupARNs=[lb_target_group["TargetGroupArn"]],
            )
            log.info(
                "Attached load balancer target group %s to auto scaling group
%s.",
                lb_target_group["TargetGroupName"],
                self.group_name,
            )
        except ClientError as err:
            error_code = err.response["Error"]["Code"]
            log.error(
                f"Failed to attach load balancer target group
'{lb_target_group['TargetGroupName']}'."
            )
            if error_code == "ResourceContentionFault":
                log.error(
                    "The request failed due to a resource contention issue. "
                    "Ensure that no conflicting operations are being performed on
the resource."
                )
            elif error_code == "ServiceLinkedRoleFailure":
                log.error(
                    "The operation failed because the service-linked role is not
ready or does not exist. "
```

```
                    "Check that the service-linked role exists and is correctly
 configured."
                )
            log.error(f"Full error:\n\t{err}")


    def delete_autoscaling_group(self, group_name: str) -> None:
        """
        Terminates all instances in the group, then deletes the EC2 Auto Scaling
 group.

        :param group_name: The name of the group to delete.
        """
        try:
            response = self.autoscaling_client.describe_auto_scaling_groups(
                AutoScalingGroupNames=[group_name]
            )
            groups = response.get("AutoScalingGroups", [])
            if len(groups) > 0:
                self.autoscaling_client.update_auto_scaling_group(
                    AutoScalingGroupName=group_name, MinSize=0
                )
                instance_ids = [inst["InstanceId"] for inst in groups[0]
["Instances"]]
                for inst_id in instance_ids:
                    self.terminate_instance(inst_id)

                # Wait for all instances to be terminated
                if instance_ids:
                    waiter = self.ec2_client.get_waiter("instance_terminated")
                    log.info("Waiting for all instances to be terminated...")
                    waiter.wait(InstanceIds=instance_ids)
                    log.info("All instances have been terminated.")
            else:
                log.info(f"No groups found named '{group_name}'! Nothing to do.")
        except ClientError as err:
            error_code = err.response["Error"]["Code"]
            log.error(f"Failed to delete Auto Scaling group '{group_name}'.")
            if error_code == "ScalingActivityInProgressFault":
                log.error(
                    "Scaling activity is currently in progress. "
                    "Wait for the scaling activity to complete before attempting
 to delete the group again."
                )
```

```
            elif error_code == "ResourceContentionFault":
                log.error(
                    "The request failed due to a resource contention issue. "
                    "Ensure that no conflicting operations are being performed on
 the group."
                )
            log.error(f"Full error:\n\t{err}")


    def get_default_vpc(self) -> Dict[str, Any]:
        """
        Gets the default VPC for the account.

        :return: Data about the default VPC.
        """
        try:
            response = self.ec2_client.describe_vpcs(
                Filters=[{"Name": "is-default", "Values": ["true"]}]
            )
        except ClientError as err:
            error_code = err.response["Error"]["Code"]
            log.error("Failed to retrieve the default VPC.")
            if error_code == "UnauthorizedOperation":
                log.error(
                    "You do not have the necessary permissions to describe VPCs.
 "
                    "Ensure that your AWS IAM user or role has the correct
 permissions."
                )
            elif error_code == "InvalidParameterValue":
                log.error(
                    "One or more parameters are invalid. Check the request
 parameters."
                )

            log.error(f"Full error:\n\t{err}")
        else:
            if "Vpcs" in response and response["Vpcs"]:
                log.info(f"Retrieved default VPC: {response['Vpcs'][0]
['VpcId']}")
                return response["Vpcs"][0]
            else:
                pass
```

```
   def verify_inbound_port(
       self, vpc: Dict[str, Any], port: int, ip_address: str
   ) -> Tuple[Dict[str, Any], bool]:
       """
       Verify the default security group of the specified VPC allows ingress
from this
       computer. This can be done by allowing ingress from this computer's IP
       address. In some situations, such as connecting from a corporate network,
you
       must instead specify a prefix list ID. You can also temporarily open the
port to
       any IP address while running this example. If you do, be sure to remove
public
       access when you're done.

       :param vpc: The VPC used by this example.
       :param port: The port to verify.
       :param ip_address: This computer's IP address.
       :return: The default security group of the specified VPC, and a value
that indicates
                whether the specified port is open.
       """
       try:
           response = self.ec2_client.describe_security_groups(
               Filters=[
                   {"Name": "group-name", "Values": ["default"]},
                   {"Name": "vpc-id", "Values": [vpc["VpcId"]]},
               ]
           )
           sec_group = response["SecurityGroups"][0]
           port_is_open = False
           log.info(f"Found default security group {sec_group['GroupId']}.")

           for ip_perm in sec_group["IpPermissions"]:
               if ip_perm.get("FromPort", 0) == port:
                   log.info(f"Found inbound rule: {ip_perm}")
                   for ip_range in ip_perm["IpRanges"]:
                       cidr = ip_range.get("CidrIp", "")
                       if cidr.startswith(ip_address) or cidr == "0.0.0.0/0":
                           port_is_open = True
                   if ip_perm["PrefixListIds"]:
                       port_is_open = True
                   if not port_is_open:
```

```
                    log.info(
                        f"The inbound rule does not appear to be open to
either this computer's IP "
                        f"address of {ip_address}, to all IP addresses
(0.0.0.0/0), or to a prefix list ID."
                    )
                else:
                    break
        except ClientError as err:
            error_code = err.response["Error"]["Code"]
            log.error(
                f"Failed to verify inbound rule for port {port} for VPC
{vpc['VpcId']}."
            )
            if error_code == "InvalidVpcID.NotFound":
                log.error(
                    f"The specified VPC ID '{vpc['VpcId']}' does not exist.
Please check the VPC ID."
                )
            log.error(f"Full error:\n\t{err}")
        else:
            return sec_group, port_is_open


    def open_inbound_port(self, sec_group_id: str, port: int, ip_address: str) ->
None:
        """
        Add an ingress rule to the specified security group that allows access on
the
        specified port from the specified IP address.

        :param sec_group_id: The ID of the security group to modify.
        :param port: The port to open.
        :param ip_address: The IP address that is granted access.
        """
        try:
            self.ec2_client.authorize_security_group_ingress(
                GroupId=sec_group_id,
                CidrIp=f"{ip_address}/32",
                FromPort=port,
                ToPort=port,
                IpProtocol="tcp",
            )
            log.info(
```

```
                "Authorized ingress to %s on port %s from %s.",
                sec_group_id,
                port,
                ip_address,
            )
        except ClientError as err:
            error_code = err.response["Error"]["Code"]
            log.error(
                f"Failed to authorize ingress to security group '{sec_group_id}'
on port {port} from {ip_address}."
            )
            if error_code == "InvalidGroupId.Malformed":
                log.error(
                    "The security group ID is malformed. "
                    "Please verify that the security group ID is correct."
                )
            elif error_code == "InvalidPermission.Duplicate":
                log.error(
                    "The specified rule already exists in the security group. "
                    "Check the existing rules for this security group."
                )
            log.error(f"Full error:\n\t{err}")


    def get_subnets(self, vpc_id: str, zones: List[str] = None) -> List[Dict[str,
Any]]:
        """
        Gets the default subnets in a VPC for a specified list of Availability
Zones.

        :param vpc_id: The ID of the VPC to look up.
        :param zones: The list of Availability Zones to look up.
        :return: The list of subnets found.
        """
        # Ensure that 'zones' is a list, even if None is passed
        if zones is None:
            zones = []
        try:
            paginator = self.ec2_client.get_paginator("describe_subnets")
            page_iterator = paginator.paginate(
                Filters=[
                    {"Name": "vpc-id", "Values": [vpc_id]},
                    {"Name": "availability-zone", "Values": zones},
                    {"Name": "default-for-az", "Values": ["true"]},
```

```
                ]
            )

            subnets = []
            for page in page_iterator:
                subnets.extend(page["Subnets"])

            log.info("Found %s subnets for the specified zones.", len(subnets))
            return subnets
        except ClientError as err:
            log.error(
                f"Failed to retrieve subnets for VPC '{vpc_id}' in zones
 {zones}."
            )
            error_code = err.response["Error"]["Code"]
            if error_code == "InvalidVpcID.NotFound":
                log.error(
                    "The specified VPC ID does not exist. "
                    "Please check the VPC ID and try again."
                )
            # Add more error-specific handling as needed
            log.error(f"Full error:\n\t{err}")
```

Membuat kelas yang menggabungkan tindakan Penyeimbangan Beban Elastis.

```
class ElasticLoadBalancerWrapper:
    """Encapsulates Elastic Load Balancing (ELB) actions."""

    def __init__(self, elb_client: boto3.client):
        """
        Initializes the LoadBalancer class with the necessary parameters.
        """
        self.elb_client = elb_client


    def create_target_group(
        self, target_group_name: str, protocol: str, port: int, vpc_id: str
    ) -> Dict[str, Any]:
        """
```

```
        Creates an Elastic Load Balancing target group. The target group
specifies how
        the load balancer forwards requests to instances in the group and how
instance
        health is checked.

        To speed up this demo, the health check is configured with shortened
times and
        lower thresholds. In production, you might want to decrease the
sensitivity of
        your health checks to avoid unwanted failures.

        :param target_group_name: The name of the target group to create.
        :param protocol: The protocol to use to forward requests, such as 'HTTP'.
        :param port: The port to use to forward requests, such as 80.
        :param vpc_id: The ID of the VPC in which the load balancer exists.
        :return: Data about the newly created target group.
        """
        try:
            response = self.elb_client.create_target_group(
                Name=target_group_name,
                Protocol=protocol,
                Port=port,
                HealthCheckPath="/healthcheck",
                HealthCheckIntervalSeconds=10,
                HealthCheckTimeoutSeconds=5,
                HealthyThresholdCount=2,
                UnhealthyThresholdCount=2,
                VpcId=vpc_id,
            )
            target_group = response["TargetGroups"][0]
            log.info(f"Created load balancing target group
'{target_group_name}'.")
            return target_group
        except ClientError as err:
            log.error(
                f"Couldn't create load balancing target group
'{target_group_name}'."
            )
            error_code = err.response["Error"]["Code"]

            if error_code == "DuplicateTargetGroupName":
                log.error(
                    f"Target group name {target_group_name} already exists. "
```

```
                    "Check if the target group already exists."
                    "Consider using a different name or deleting the existing
target group if appropriate."
                )
            elif error_code == "TooManyTargetGroups":
                log.error(
                    "Too many target groups exist in the account. "
                    "Consider deleting unused target groups to create space for
new ones."
                )
            log.error(f"Full error:\n\t{err}")


    def delete_target_group(self, target_group_name) -> None:
        """
        Deletes the target group.
        """
        try:
            # Describe the target group to get its ARN
            response =
self.elb_client.describe_target_groups(Names=[target_group_name])
            tg_arn = response["TargetGroups"][0]["TargetGroupArn"]

            # Delete the target group
            self.elb_client.delete_target_group(TargetGroupArn=tg_arn)
            log.info("Deleted load balancing target group %s.",
target_group_name)

            # Use a custom waiter to wait until the target group is no longer
available
            self.wait_for_target_group_deletion(self.elb_client, tg_arn)
            log.info("Target group %s successfully deleted.", target_group_name)

        except ClientError as err:
            error_code = err.response["Error"]["Code"]
            log.error(f"Failed to delete target group '{target_group_name}'.")
            if error_code == "TargetGroupNotFound":
                log.error(
                    "Load balancer target group either already deleted or never
existed. "
                    "Verify the name and check that the resource exists in the
AWS Console."
                )
            elif error_code == "ResourceInUseException":
```

```
                log.error(
                    "Target group still in use by another resource. "
                    "Ensure that the target group is no longer associated with
any load balancers or resources.",
                )
            log.error(f"Full error:\n\t{err}")

    def wait_for_target_group_deletion(
        self, elb_client, target_group_arn, max_attempts=10, delay=30
    ):
        for attempt in range(max_attempts):
            try:

elb_client.describe_target_groups(TargetGroupArns=[target_group_arn])
                print(
                    f"Attempt {attempt + 1}: Target group {target_group_arn}
still exists."
                )
            except ClientError as e:
                if e.response["Error"]["Code"] == "TargetGroupNotFound":
                    print(
                        f"Target group {target_group_arn} has been successfully
deleted."
                    )
                    return
                else:
                    raise
            time.sleep(delay)
        raise TimeoutError(
            f"Target group {target_group_arn} was not deleted after {max_attempts
* delay} seconds."
        )


    def create_load_balancer(
        self,
        load_balancer_name: str,
        subnet_ids: List[str],
    ) -> Dict[str, Any]:
        """
        Creates an Elastic Load Balancing load balancer that uses the specified
subnets
        and forwards requests to the specified target group.
```

```
        :param load_balancer_name: The name of the load balancer to create.
        :param subnet_ids: A list of subnets to associate with the load balancer.
        :return: Data about the newly created load balancer.
        """
        try:
            response = self.elb_client.create_load_balancer(
                Name=load_balancer_name, Subnets=subnet_ids
            )
            load_balancer = response["LoadBalancers"][0]
            log.info(f"Created load balancer '{load_balancer_name}'.")

            waiter = self.elb_client.get_waiter("load_balancer_available")
            log.info(
                f"Waiting for load balancer '{load_balancer_name}' to be
available..."
            )
            waiter.wait(Names=[load_balancer_name])
            log.info(f"Load balancer '{load_balancer_name}' is now available!")

        except ClientError as err:
            error_code = err.response["Error"]["Code"]
            log.error(
                f"Failed to create load balancer '{load_balancer_name}'. Error
code: {error_code}, Message: {err.response['Error']['Message']}"
            )

            if error_code == "DuplicateLoadBalancerNameException":
                log.error(
                    f"A load balancer with the name '{load_balancer_name}'
already exists. "
                    "Load balancer names must be unique within the AWS region. "
                    "Please choose a different name and try again."
                )
            if error_code == "TooManyLoadBalancersException":
                log.error(
                    "The maximum number of load balancers has been reached in
this account and region. "
                    "You can delete unused load balancers or request an increase
in the service quota from AWS Support."
                )
            log.error(f"Full error:\n\t{err}")
        else:
            return load_balancer
```

```
   def create_listener(
       self,
       load_balancer_name: str,
       target_group: Dict[str, Any],
   ) -> Dict[str, Any]:
       """
       Creates a listener for the specified load balancer that forwards requests
to the
       specified target group.

       :param load_balancer_name: The name of the load balancer to create a
listener for.
       :param target_group: An existing target group that is added as a listener
to the
                            load balancer.
       :return: Data about the newly created listener.
       """
       try:
           # Retrieve the load balancer ARN
           load_balancer_response = self.elb_client.describe_load_balancers(
               Names=[load_balancer_name]
           )
           load_balancer_arn = load_balancer_response["LoadBalancers"][0][
               "LoadBalancerArn"
           ]

           # Create the listener
           response = self.elb_client.create_listener(
               LoadBalancerArn=load_balancer_arn,
               Protocol=target_group["Protocol"],
               Port=target_group["Port"],
               DefaultActions=[
                   {
                       "Type": "forward",
                       "TargetGroupArn": target_group["TargetGroupArn"],
                   }
               ],
           )
           log.info(
               f"Created listener to forward traffic from load balancer
'{load_balancer_name}' to target group '{target_group['TargetGroupName']}'."
           )
           return response["Listeners"][0]
```

```
        except ClientError as err:
            error_code = err.response["Error"]["Code"]
            log.error(
                f"Failed to add a listener on '{load_balancer_name}' for target
group '{target_group['TargetGroupName']}'."
            )

            if error_code == "ListenerNotFoundException":
                log.error(
                    f"The listener could not be found for the load balancer
'{load_balancer_name}'. "
                    "Please check the load balancer name and target group
configuration."
                )
            if error_code == "InvalidConfigurationRequestException":
                log.error(
                    f"The configuration provided for the listener on load
balancer '{load_balancer_name}' is invalid. "
                    "Please review the provided protocol, port, and target group
settings."
                )
            log.error(f"Full error:\n\t{err}")


    def delete_load_balancer(self, load_balancer_name) -> None:
        """
        Deletes a load balancer.

        :param load_balancer_name: The name of the load balancer to delete.
        """
        try:
            response = self.elb_client.describe_load_balancers(
                Names=[load_balancer_name]
            )
            lb_arn = response["LoadBalancers"][0]["LoadBalancerArn"]
            self.elb_client.delete_load_balancer(LoadBalancerArn=lb_arn)
            log.info("Deleted load balancer %s.", load_balancer_name)
            waiter = self.elb_client.get_waiter("load_balancers_deleted")
            log.info("Waiting for load balancer to be deleted...")
            waiter.wait(Names=[load_balancer_name])
        except ClientError as err:
            error_code = err.response["Error"]["Code"]
            log.error(
```

```
                f"Couldn't delete load balancer '{load_balancer_name}'. Error
code: {error_code}, Message: {err.response['Error']['Message']}"
            )

            if error_code == "LoadBalancerNotFoundException":
                log.error(
                    f"The load balancer '{load_balancer_name}' does not exist. "
                    "Please check the name and try again."
                )
            log.error(f"Full error:\n\t{err}")


    def get_endpoint(self, load_balancer_name) -> str:
        """
        Gets the HTTP endpoint of the load balancer.

        :return: The endpoint.
        """
        try:
            response = self.elb_client.describe_load_balancers(
                Names=[load_balancer_name]
            )
            return response["LoadBalancers"][0]["DNSName"]
        except ClientError as err:
            log.error(
                f"Couldn't get the endpoint for load balancer
{load_balancer_name}"
            )
            error_code = err.response["Error"]["Code"]
            if error_code == "LoadBalancerNotFoundException":
                log.error(
                    "Verify load balancer name and ensure it exists in the AWS
console."
                )
            log.error(f"Full error:\n\t{err}")

    @staticmethod
    def verify_load_balancer_endpoint(endpoint) -> bool:
        """
        Verify this computer can successfully send a GET request to the load
balancer endpoint.

        :param endpoint: The endpoint to verify.
        :return: True if the GET request is successful, False otherwise.
```

```
        """
        retries = 3
        verified = False
        while not verified and retries > 0:
            try:
                lb_response = requests.get(f"http://{endpoint}")
                log.info(
                    "Got response %s from load balancer endpoint.",
                    lb_response.status_code,
                )
                if lb_response.status_code == 200:
                    verified = True
                else:
                    retries = 0
            except requests.exceptions.ConnectionError:
                log.info(
                    "Got connection error from load balancer endpoint,
retrying..."
                )
                retries -= 1
                time.sleep(10)
        return verified

    def check_target_health(self, target_group_name: str) -> List[Dict[str,
Any]]:
        """
        Checks the health of the instances in the target group.

        :return: The health status of the target group.
        """
        try:
            tg_response = self.elb_client.describe_target_groups(
                Names=[target_group_name]
            )
            health_response = self.elb_client.describe_target_health(
                TargetGroupArn=tg_response["TargetGroups"][0]["TargetGroupArn"]
            )
        except ClientError as err:
            log.error(f"Couldn't check health of {target_group_name} target(s).")
            error_code = err.response["Error"]["Code"]
            if error_code == "LoadBalancerNotFoundException":
                log.error(
                    "Load balancer associated with the target group was not
found. "
```

```
                    "Ensure the load balancer exists, is in the correct AWS
 region, and "
                    "that you have the necessary permissions to access it.",
                )
            elif error_code == "TargetGroupNotFoundException":
                log.error(
                    "Target group was not found. "
                    "Verify the target group name, check that it exists in the
 correct region, "
                    "and ensure it has not been deleted or created in a different
 account.",
                )
            log.error(f"Full error:\n\t{err}")
        else:
            return health_response["TargetHealthDescriptions"]
```

Membuat kelas yang menggunakan DynamoDB untuk menyimulasikan layanan yang direkomendasikan.

```
class RecommendationService:
    """
    Encapsulates a DynamoDB table to use as a service that recommends books,
 movies,
    and songs.
    """

    def __init__(self, table_name: str, dynamodb_client: boto3.client):
        """
        Initializes the RecommendationService class with the necessary
 parameters.

        :param table_name: The name of the DynamoDB recommendations table.
        :param dynamodb_client: A Boto3 DynamoDB client.
        """
        self.table_name = table_name
        self.dynamodb_client = dynamodb_client

    def create(self) -> Dict[str, Any]:
        """
```

```
        Creates a DynamoDB table to use as a recommendation service. The table
has a
        hash key named 'MediaType' that defines the type of media recommended,
such as
        Book or Movie, and a range key named 'ItemId' that, combined with the
MediaType,
        forms a unique identifier for the recommended item.

        :return: Data about the newly created table.
        :raises RecommendationServiceError: If the table creation fails.
        """
        try:
            response = self.dynamodb_client.create_table(
                TableName=self.table_name,
                AttributeDefinitions=[
                    {"AttributeName": "MediaType", "AttributeType": "S"},
                    {"AttributeName": "ItemId", "AttributeType": "N"},
                ],
                KeySchema=[
                    {"AttributeName": "MediaType", "KeyType": "HASH"},
                    {"AttributeName": "ItemId", "KeyType": "RANGE"},
                ],
                ProvisionedThroughput={"ReadCapacityUnits": 5,
"WriteCapacityUnits": 5},
            )
            log.info("Creating table %s...", self.table_name)
            waiter = self.dynamodb_client.get_waiter("table_exists")
            waiter.wait(TableName=self.table_name)
            log.info("Table %s created.", self.table_name)
        except ClientError as err:
            if err.response["Error"]["Code"] == "ResourceInUseException":
                log.info("Table %s exists, nothing to be done.", self.table_name)
            else:
                raise RecommendationServiceError(
                    self.table_name, f"ClientError when creating table: {err}."
                )
        else:
            return response

    def populate(self, data_file: str) -> None:
        """
        Populates the recommendations table from a JSON file.

        :param data_file: The path to the data file.
```

```
        :raises RecommendationServiceError: If the table population fails.
        """
        try:
            with open(data_file) as data:
                items = json.load(data)
            batch = [{"PutRequest": {"Item": item}} for item in items]
            self.dynamodb_client.batch_write_item(RequestItems={self.table_name:
batch})
            log.info(
                "Populated table %s with items from %s.", self.table_name,
data_file
            )
        except ClientError as err:
            raise RecommendationServiceError(
                self.table_name, f"Couldn't populate table from {data_file}:
{err}"
            )

    def destroy(self) -> None:
        """
        Deletes the recommendations table.

        :raises RecommendationServiceError: If the table deletion fails.
        """
        try:
            self.dynamodb_client.delete_table(TableName=self.table_name)
            log.info("Deleting table %s...", self.table_name)
            waiter = self.dynamodb_client.get_waiter("table_not_exists")
            waiter.wait(TableName=self.table_name)
            log.info("Table %s deleted.", self.table_name)
        except ClientError as err:
            if err.response["Error"]["Code"] == "ResourceNotFoundException":
                log.info("Table %s does not exist, nothing to do.",
self.table_name)
            else:
                raise RecommendationServiceError(
                    self.table_name, f"ClientError when deleting table: {err}."
                )
```

Membuat kelas yang mengabungkan tindakan Systems Manager.

```
class ParameterHelper:
    """
    Encapsulates Systems Manager parameters. This example uses these parameters
 to drive
    the demonstration of resilient architecture, such as failure of a dependency
 or
    how the service responds to a health check.
    """

    table: str = "doc-example-resilient-architecture-table"
    failure_response: str = "doc-example-resilient-architecture-failure-response"
    health_check: str = "doc-example-resilient-architecture-health-check"

    def __init__(self, table_name: str, ssm_client: boto3.client):
        """
        Initializes the ParameterHelper class with the necessary parameters.

        :param table_name: The name of the DynamoDB table that is used as a
 recommendation
                           service.
        :param ssm_client: A Boto3 Systems Manager client.
        """
        self.ssm_client = ssm_client
        self.table_name = table_name

    def reset(self) -> None:
        """
        Resets the Systems Manager parameters to starting values for the demo.
        These are the name of the DynamoDB recommendation table, no response when
 a
        dependency fails, and shallow health checks.
        """
        self.put(self.table, self.table_name)
        self.put(self.failure_response, "none")
        self.put(self.health_check, "shallow")

    def put(self, name: str, value: str) -> None:
        """
        Sets the value of a named Systems Manager parameter.

        :param name: The name of the parameter.
        :param value: The new value of the parameter.
        :raises ParameterHelperError: If the parameter value cannot be set.
```

```
        """
        try:
            self.ssm_client.put_parameter(
                Name=name, Value=value, Overwrite=True, Type="String"
            )
            log.info("Setting parameter %s to '%s'.", name, value)
        except ClientError as err:
            error_code = err.response["Error"]["Code"]
            log.error(f"Failed to set parameter {name}.")
            if error_code == "ParameterLimitExceeded":
                log.error(
                    "The parameter limit has been exceeded. "
                    "Consider deleting unused parameters or request a limit
increase."
                )
            elif error_code == "ParameterAlreadyExists":
                log.error(
                    "The parameter already exists and overwrite is set to False.
"
                    "Use Overwrite=True to update the parameter."
                )
            log.error(f"Full error:\n\t{err}")
```

- Untuk API detailnya, lihat topik berikut AWS SDKuntuk Referensi Python (Boto3). API
  - AttachLoadBalancerTargetGroups
  - CreateAutoScalingGroup
  - CreateInstanceProfile
  - CreateLaunchTemplate
  - CreateListener
  - CreateLoadBalancer
  - CreateTargetGroup
  - DeleteAutoScalingGroup
  - DeleteInstanceProfile
  - DeleteLaunchTemplate
  - DeleteLoadBalancer

- DeleteTargetGroup
- DescribeAutoScalingGroups
- DescribeAvailabilityZones
- DescribeIamInstanceProfileAssociations
- DescribeInstances
- DescribeLoadBalancers
- DescribeSubnets
- DescribeTargetGroups
- DescribeTargetHealth
- DescribeVpcs
- RebootInstances
- ReplaceIamInstanceProfileAssociation
- TerminateInstanceInAutoScalingGroup
- UpdateAutoScalingGroup

Untuk daftar lengkap panduan AWS SDK pengembang dan contoh kode, lihatMembuat EC2 sumber daya Amazon menggunakan AWS SDK. Topik ini juga mencakup informasi tentang memulai dan detail tentang SDK versi sebelumnya.

# Pantau EC2 API permintaan Amazon menggunakan Amazon CloudWatch

Anda dapat memantau EC2 API permintaan Amazon menggunakan Amazon CloudWatch, yang mengumpulkan data mentah dan memprosesnya menjadi metrik yang dapat dibaca, mendekati waktu nyata. Metrik ini menyediakan cara sederhana untuk melacak penggunaan dan hasil EC2 API operasi Amazon dari waktu ke waktu. Informasi ini memberi Anda perspektif yang lebih baik tentang kinerja aplikasi web Anda, dan memungkinkan Anda mengidentifikasi dan mendiagnosis berbagai masalah. Anda juga dapat menyetel alarm yang mengawasi ambang batas tertentu, dan mengirim pemberitahuan atau mengambil tindakan tertentu saat ambang batas tersebut terpenuhi.

Untuk informasi selengkapnya CloudWatch, lihat Panduan CloudWatch Pengguna Amazon.

> **Important**
>
> EC2APIMetrik Amazon adalah fitur opt-in. Anda harus meminta akses ke fitur ini. Untuk informasi selengkapnya, lihat the section called “Aktifkan EC2 API metrik Amazon”.

Daftar Isi


- Aktifkan EC2 API metrik Amazon
- EC2APIMetrik dan dimensi Amazon
- Retensi data metrik
- Permintaan pemantauan yang dibuat atas nama Anda
- Penagihan
- Bekerja dengan Amazon CloudWatch


## Aktifkan EC2 API metrik Amazon

Gunakan prosedur berikut untuk meminta akses ke fitur ini untuk Anda Akun AWS.

Untuk meminta akses ke fitur ini

1. AWS Support Pusat Terbuka.
2. Pilih Buat kasus.

3. Pilih Akun dan penagihan.
4. Untuk Layanan, pilih Info Umum dan Memulai.
5. Untuk Kategori, pilih Menggunakan AWS & Layanan.
6. Pilih Langkah selanjutnya: Informasi tambahan.
7. Untuk Subjek, masukkan**`Request access to Amazon EC2 API metrics`**.
8. Untuk Deskripsi, masukkan **`Please grant my account access to Amazon EC2 API metrics. Related page: https://docs.aws.amazon.com/AWSEC2/latest/APIReference/monitor.html`**. Juga termasuk Wilayah di mana Anda memerlukan akses.
9. Pilih Langkah selanjutnya: Selesaikan sekarang atau hubungi kami.
10. Pada tab Hubungi kami, pilih bahasa kontak pilihan Anda dan metode kontak.
11. Pilih Kirim.

# EC2APIMetrik dan dimensi Amazon

## Metrik

EC2APIMetrik Amazon terkandung dalam `AWS/EC2/API` namespace. Tabel berikut mencantumkan metrik yang tersedia untuk EC2 API permintaan Amazon.

| Metrik | Deskripsi |
| --- | --- |
| `ClientErrors` | Jumlah API permintaan gagal yang disebabkan oleh kesalahan klien.<br><br>Kesalahan ini biasanya disebabkan oleh sesuatu yang dilakukan klien, seperti menentukan parameter yang salah atau tidak valid dalam permintaan, atau menggunakan tindakan atau sumber daya atas nama pengguna yang tidak memiliki izin untuk menggunak an tindakan atau sumber daya.<br><br>Unit: Jumlah |
| `RequestLimitExceeded` | Berapa kali tingkat permintaan maksimum yang diizinkan oleh Amazon EC2 APIs telah terlampaui untuk akun Anda. |

| Metrik | Deskripsi |
| --- | --- |
| | EC2APIPermintaan Amazon dibatasi untuk membantu menjaga kinerja layanan. Jika permintaa n Anda telah dibatasi, Anda mendapatkan kesalahan. `Client.RequestLimitExceeded`<br><br>Unit: Jumlah |
| `ServerErrors` | Jumlah API permintaan gagal yang disebabkan oleh kesalahan server internal.<br><br>Kesalahan ini biasanya disebabkan oleh kesalahan AWS sisi server, pengecualian, atau kegagalan.<br><br>Unit: Jumlah |
| `SuccessfulCalls` | Jumlah API permintaan yang berhasil.<br><br>Unit: Jumlah |

## Dimensi

Data EC2 metrik Amazon dapat difilter di semua EC2 API tindakan. Untuk informasi selengkapnya tentang dimensi, lihat CloudWatch Konsep Amazon.

# Retensi data metrik

EC2APIMetrik Amazon dikirim ke CloudWatch interval 1 menit. CloudWatch mempertahankan data metrik sebagai berikut:

- Titik data dengan periode 60 detik (1 menit) tersedia selama 15 hari.
- Titik data dengan jangka waktu 300 detik (5 menit) tersedia selama 63 hari.
- Poin data dengan jangka waktu 3600 detik (1 jam) tersedia selama 455 hari (15 bulan).

# Permintaan pemantauan yang dibuat atas nama Anda

APIPermintaan yang dibuat oleh AWS layanan atas nama Anda, seperti permintaan yang dibuat oleh peran terkait layanan, tidak diperhitungkan dalam batas API pembatasan Anda dan permintaan tersebut tidak mengirimkan metrik ke Amazon untuk akun Anda. CloudWatch Permintaan ini tidak dapat dipantau menggunakan CloudWatch.

APIPermintaan yang dibuat atas nama Anda oleh penyedia layanan pihak ketiga dihitung terhadap batas API pembatasan Anda dan mereka mengirim metrik ke Amazon CloudWatch untuk akun Anda. Permintaan ini dapat dipantau menggunakan CloudWatch.

# Penagihan

CloudWatch Harga dan biaya standar berlaku. Tidak ada biaya tambahan yang dikenakan untuk menggunakan EC2 API metrik Amazon. Untuk informasi selengkapnya, lihat CloudWatch Harga Amazon.

# Bekerja dengan Amazon CloudWatch

Daftar Isi


- Melihat CloudWatch metrik
- Membuat CloudWatch alarm


## Melihat CloudWatch metrik

Gunakan prosedur berikut untuk melihat EC2 API metrik Amazon.

Prasyarat

Anda harus mengaktifkan akses ke EC2 API metrik Amazon untuk akun Anda. Untuk informasi selengkapnya, lihat the section called “Aktifkan EC2 API metrik Amazon”.

Untuk melihat EC2 API metrik Amazon menggunakan konsol

1. Buka CloudWatch konsol di https://console.aws.amazon.com/cloudwatch/.
2. Di panel navigasi, pilih Metrik, Semua metrik.
3. Pada tab Browse, pilih namespace EC2/APImetrik.

4. Untuk melihat metrik, pilih dimensi metrik.

Untuk melihat EC2 API metrik Amazon menggunakan baris perintah

Gunakan salah satu perintah berikut:

- daftar-metrik ()AWS CLI

```
aws cloudwatch list-metrics --namespace "AWS/EC2/API"
```

- Dapatkan- CWMetricList (AWS Tools for Windows PowerShell)

```
Get-CWMetricList -Namespace "AWS/EC2/API"
```

## Membuat CloudWatch alarm

Anda dapat membuat CloudWatch alarm yang mengirimkan SNS pesan Amazon saat alarm berubah status. Alarm mengawasi metrik tunggal selama periode waktu yang Anda tentukan. Ini mengirimkan pemberitahuan ke SNS topik berdasarkan nilai metrik relatif terhadap ambang batas tertentu selama sejumlah periode waktu.

Misalnya, Anda dapat membuat alarm yang memantau jumlah DescribeInstances API permintaan yang gagal karena kesalahan sisi server. Alarm berikut mengirimkan pemberitahuan email ketika jumlah kegagalan DescribeInstances API permintaan mencapai ambang 10 kesalahan sisi server selama periode 5 menit.

Prasyarat

Anda harus mengaktifkan akses ke EC2 API metrik Amazon untuk akun Anda. Untuk informasi selengkapnya, lihat the section called “Aktifkan EC2 API metrik Amazon”.

Untuk membuat alarm untuk kesalahan server EC2 DescribeInstances API permintaan Amazon

1. Buka CloudWatch konsol di https://console.aws.amazon.com/cloudwatch/.
2. Pada panel navigasi, pilih Alarm, Semua alarm.
3. Pilih Buat alarm.
4. Pilih Pilih metrik, dan tentukan yang berikut ini:
    a. Pilih EC2/API.

b. Pilih Metrik Per-Tindakan.

c. Pilih kotak centang di sebelah DescribeInstancesyang ada di baris yang sama dengan nama ServerErrorsmetrik.

d. Pilih Pilih Metrik.

5. Halaman Tentukan metrik dan ketentuan ditampilkan, di sana ditampilkan grafik dan informasi lain tentang metrik dan statistik yang Anda pilih.

   a. Di bawah Metrik, tentukan yang berikut ini:

      i. Untuk Statistik pilih Jumlah.

      ii. Untuk Periode, verifikasi bahwa 5 menit dipilih.

   b. Pada Ketentuan, tentukan hal-hal berikut:

      i. Untuk Jenis ambang batas, pilih Statis.

      ii. Untuk Kapan pun ServerErrors ada, pilih Greater/Equal >=.

      iii. Untuk dari... , masukkan 10.

   c. Pilih Berikutnya.

6. Halaman Konfigurasi tindakan muncul.

   • Di bawah Pemberitahuan, tentukan yang berikut ini:

      i. Untuk pemicu status Alam, pilih In alarm.

      ii. Untuk Pilih SNS topik, pilih Pilih SNS topik yang ada atau Buat topik baru, dan lengkapi bidang yang diperlukan untuk pemberitahuan.

      iii. Pilih Berikutnya.

7. Halaman Tambahkan nama dan deskripsi muncul.

   a. Untuk nama Alarm, masukkan nama untuk alarm Anda. Nama harus berisi hanya ASCII karakter.

   b. Untuk deskripsi Alarm, masukkan deskripsi opsional untuk alarm Anda.

   c. Pilih Berikutnya.

8. Halaman Pratinjau dan buat muncul. Verifikasi bahwa informasinya benar, lalu pilih Buat alarm.

Untuk informasi selengkapnya, lihat Menggunakan CloudWatch alarm Amazon di Panduan CloudWatch Pengguna Amazon.

Terjemahan disediakan oleh mesin penerjemah. Jika konten terjemahan yang diberikan bertentangan dengan versi bahasa Inggris aslinya, utamakan versi bahasa Inggris.