User Guide

AWS CodeBuild



API Version 2016-10-06

Copyright © 2024 Amazon Web Services, Inc. and/or its affiliates. All rights reserved.

AWS CodeBuild: User Guide

Copyright © 2024 Amazon Web Services, Inc. and/or its affiliates. All rights reserved.

Amazon's trademarks and trade dress may not be used in connection with any product or service that is not Amazon's, in any manner that is likely to cause confusion among customers, or in any manner that disparages or discredits Amazon. All other trademarks not owned by Amazon are the property of their respective owners, who may or may not be affiliated with, connected to, or sponsored by Amazon.

Table of Contents

What is AWS CodeBuild?	
Pricing for CodeBuild	
•	
How do I get started with CodeBuild?	
Concepts	
How CodeBuild works	
Next steps	
Getting started	
Getting started using the console	
Step 1: Create the source code	
Step 2: Create the buildspec file	
Step 3: Create two S3 buckets	
Step 4: Upload the source code and the buildspec file	
Step 5: Create the build project	
Step 6: Run the build	
Step 7: View summarized build information	
Step 8: View detailed build information	17
Step 9: Get the build output artifact	18
Step 10: Delete the S3 buckets	19
Wrapping up	20
Getting started using the AWS CLI	20
Step 1: Create the source code	21
Step 2: Create the buildspec file	24
Step 3: Create two S3 buckets	26
Step 4: Upload the source code and the buildspec file	27
Step 5: Create the build project	28
Step 6: Run the build	32
Step 7: View summarized build information	34
Step 8: View detailed build information	36
Step 9: Get the build output artifact	39
Step 10: Delete the S3 buckets	40
Wrapping up	40
Use case-based samples	41

	Cross-service samples	42
	Amazon ECR sample	43
	Amazon EFS sample	49
	AWS CodePipeline samples	55
	AWS Config sample	66
	Build notifications sample	68
	Build badges sample	83
	Create a build project with build badges	83
	Access AWS CodeBuild build badges	86
	Publish CodeBuild build badges	87
	CodeBuild badge statuses	87
	Test report sample	87
	Run the test report sample	88
	Docker samples for CodeBuild	95
	Docker in custom image sample	
	'Publish Docker image to Amazon ECR' sample	
	Private registry with AWS Secrets Manager sample	106
	Host build output in an S3 bucket	109
	Multiple inputs and outputs sample	112
	Create a build project with multiple inputs and outputs	113
	Create a project without a source	116
	Runtime versions in buildspec file sample	116
	Update the runtime version in the buildspec file	117
	Specify two runtimes	121
	Source version sample	125
	Specify a GitHub repository version with a commit ID	127
	Specify a GitHub repository version with a reference and commit ID	128
	Third-party source repository samples	129
	Run the Bitbucket sample	130
	Run the GitHub Enterprise Server sample	135
	Run the GitHub pull request and webhook filter sample	143
	Set artifact names at build time	147
Rı	un Windows samples	150
	Run the Windows samples	
	Directory structure	151
	F# and the .NET Framework	151

Visual Basic and the .NET Framework	152
Files	152
F# and the .NET Framework	152
Visual Basic and the .NET Framework	157
Plan a build	171
Buildspec reference	174
Buildspec file name and storage location	174
Buildspec syntax	175
version	178
run-as	178
env	178
proxy	183
phases	
reports	187
artifacts	189
cache	195
Buildspec example	196
Buildspec versions	199
Batch buildspec reference	200
batch	200
batch/build-graph	201
<pre>batch/build-list</pre>	203
<pre>batch/build-matrix</pre>	205
Build environment reference	208
Docker images provided by CodeBuild	209
Obtain the list of current Docker images	209
EC2 compute images	210
Lambda compute images	211
Deprecated CodeBuild images	215
Available runtimes	216
Runtime versions	229
Build environment compute modes and types	233
About compute modes	233
About environment types	234
Shells and commands in build environments	242
Environment variables in build environments	243

Background tasks in build environments	249
Build projects	250
Create a build project	250
Prerequisites	251
Create a build project (console)	251
Create a build project (AWS CLI)	271
Create a build project (AWS SDKs)	291
Create a build project (AWS CloudFormation)	291
Create a notification rule	291
Change build project settings	294
Change a build project's settings (console)	294
Change a build project's settings (AWS CLI)	316
Change a build project's settings (AWS SDKs)	317
Multiple access tokens	318
Step 1: Create a Secrets Manager secret or a CodeConnections connection	318
Step 2: Grant CodeBuild project IAM role access to Secrets Manager secrets	319
Step 3: Configure Secrets Manager or CodeConnections tokens	321
Additional setup options	325
Delete build projects	328
Delete a build project (console)	328
Delete a build project (AWS CLI)	329
Delete a build project (AWS SDKs)	329
Get public build project URLs	329
Share build projects	331
Share a project	331
Related services	334
Access shared projects	334
Unshare a shared project	335
Identify a shared project	335
Shared project permissions	335
Tag build projects	336
Add a tag to a project	337
View tags for a project	338
Edit tags for a project	339
Remove a tag from a project	340
Use runners	341

GitHub Actions	. 341
GitLab runners	. 357
Use webhooks	. 368
Best practices for using webhooks	. 368
Bitbucket webhook events	. 369
GitHub global and organization webhooks	. 383
GitHub manual webhooks	. 389
GitHub webhook events	. 391
GitLab group webhooks	. 407
GitLab webhook events	. 412
View build project details	. 427
View a build project's details (console)	. 427
View a build project's details (AWS CLI)	. 428
View a build project's details (AWS SDKs)	430
View build project names	. 430
View a list of build project names (console)	431
View a list of build project names (AWS CLI)	. 431
View a list of build project names (AWS SDKs)	. 432
Builds	. 433
Run builds manually	. 434
Run a build locally	. 434
Run a build (console)	. 438
Run a build (AWS CLI)	. 439
Run a batch build (AWS CLI)	. 445
Start running builds automatically (AWS CLI)	. 447
Stop running builds automatically (AWS CLI)	. 448
Run a build (AWS SDKs)	448
Run builds on Lambda compute	. 449
Which tools and runtimes will be included in the curated runtime environment docker	
images which run on AWS Lambda?	
What if the curated image doesn't include the tools I need?	. 449
Which regions support AWS Lambda compute in CodeBuild?	. 450
Limitations of AWS Lambda compute	
Deploy a Lambda function using AWS SAM with CodeBuild Lambda Java	. 451
Create a single page React app with CodeBuild Lambda Node.js	
Update a Lambda function configuration with CodeBuild Lambda Python	. 458

Run builds on reserved capacity fleets	462
Create a reserved capacity fleet	463
Best practices	464
Can I share a reserved capacity fleet across multiple CodeBuild projects?	464
Which regions support reserved capacity fleets?	465
How do I configure a reserved capacity macOS fleet?	465
Limitations of reserved capacity fleets	466
Reserved capacity fleet properties	467
Reserved capacity samples	472
Run batch builds	474
Security role	474
Batch build types	475
Batch report mode	477
More information	478
Cache builds	478
Amazon S3 caching	479
Local caching	479
Specify a local cache	480
Delete builds	483
Delete builds (AWS CLI)	483
Delete builds (AWS SDKs)	484
Retry builds	484
Retry a build (console)	484
Retry a build (AWS CLI)	485
Retry a build (AWS SDKs)	486
Stop builds	486
Stop a build (console)	486
Stop a build (AWS CLI)	487
Stop a build (AWS SDKs)	487
Stop batch builds	487
Stop a batch build (console)	488
Stop a batch build (AWS CLI)	488
Stop a batch build (AWS SDKs)	489
Trigger builds automatically	
Create build triggers	489
Edit build triggers	493

View build details	496
View build details (console)	496
View build details (AWS CLI)	497
View build details (AWS SDKs)	497
Build phase transitions	497
View build IDs	498
View a list of build IDs (console)	498
View a list of build IDs (AWS CLI)	499
View a list of batch build IDs (AWS CLI)	500
View a list of build IDs (AWS SDKs)	501
View build IDs for a build project	501
View a list of build IDs for a build project (console)	502
View a list of build IDs for a build project (AWS CLI)	502
View a list of batch build IDs for a build project (AWS CLI)	503
View a list of build IDs for a build project (AWS SDKs)	505
View builds in Session Manager	505
Prerequisites	505
Pause the build	508
Start the build	508
Connect to the build container	509
Resume the build	510
Test reports	511
Create test reports	512
Create code coverage reports	513
	513
Create a code coverage report	514
Discover reports automatically	515
Configure report auto-discover using the console	516
Configure report auto-discover using project environment variables	517
Report groups	517
Create a report group	518
Report group naming	523
Share report groups	524
Specify test files	530
Specify test commands	530
Tag a report group	531

Update a report group	537
Test frameworks	540
Set up Jasmine	540
Set up Jest	542
Set up pytest	544
Set up RSpec	545
View test reports	546
View test reports for a build	546
View test reports for a report group	547
View test reports in your AWS account	547
Test report permissions	547
IAM role for test reports	547
Permissions for test reporting operations	549
Test reporting permissions examples	550
Test report statuses	550
VPC support	552
Use cases	552
Best practices for VPCs	553
Limitations of VPCs	553
Allow Amazon VPC access in your CodeBuild projects	554
Troubleshoot your VPC setup	555
Use VPC endpoints	555
Before you create VPC endpoints	556
Create VPC endpoints for CodeBuild	556
Create a VPC endpoint policy for CodeBuild	557
Use a proxy server	558
Set up components required to run CodeBuild in a proxy server	559
Run CodeBuild in an explicit proxy server	561
Run CodeBuild in a transparent proxy server	565
Run a package manager and other tools in a proxy server	567
AWS CloudFormation VPC template	569
Logging and monitoring	576
Log CodeBuild API calls	
About AWS CodeBuild information in CloudTrail	576
About AWS CodeBuild log file entries	577
Monitor builds	

CloudWatch metrics	580
CloudWatch resource utilization metrics	583
CloudWatch dimensions	585
CloudWatch alarms	585
View CodeBuild metrics	585
View CodeBuild resource utilization metrics	588
Create CodeBuild alarms in CloudWatch	592
Security	593
Data protection	593
Data encryption	595
Key management	596
Traffic privacy	596
Identity and access management	596
Overview of managing access	597
Using identity-based policies	601
AWS CodeBuild permissions reference	633
Using tags to control access to AWS CodeBuild resources	640
Viewing resources in the console	644
Compliance validation	645
Resilience	646
Infrastructure security	646
Source provider access	647
Create and store a token in a Secrets Manager secret	647
GitHub and GitHub Enterprise Server access	650
Bitbucket access	658
GitLab access	666
Cross-service confused deputy prevention	672
Advanced topics	674
Allow users to interact with CodeBuild	674
Allow CodeBuild to interact with other AWS services	681
Encrypt build outputs	689
Interact with CodeBuild using the AWS CLI	691
Command line reference	692
AWS SDKs and tools reference	693
Supported AWS SDKs and tools for AWS CodeBuild	693
Working with AWS SDKs	694

Specify the CodeBuild endpoint	695
Specify the AWS CodeBuild endpoint (AWS CLI)	696
Specify the AWS CodeBuild endpoint (AWS SDK)	696
Use CodeBuild with CodePipeline	698
Prerequisites	700
Create a pipeline (console)	701
Create a pipeline (AWS CLI)	706
Add a build action	710
Add a test action	714
Use CodeBuild with Codecov	717
Integrate Codecov into a build project	718
Use CodeBuild with Jenkins	721
Set up Jenkins	721
Install the plugin	722
Use the plugin	722
Use CodeBuild with serverless apps	724
Related resources	724
Third party notices	724
1) base Docker image—windowsservercore	725
2) windows-base Docker image—choco	726
3) windows-base Docker image—gitversion 2.16.2	726
4) windows-base Docker image—microsoft-build-toolsversion 15.0.26320.2	727
5) windows-base Docker image—nuget.commandlineversion 4.5.1	730
7) windows-base Docker image—netfx-4.6.2-devpack	731
8) windows-base Docker image—visualfsharptools, v 4.0	732
9) windows-base Docker image—netfx-pcl-reference-assemblies-4.6	733
10) windows-base Docker image—visualcppbuildtools v 14.0.25420.1	736
11) windows-base Docker image—microsoft-windows-netfx3-ondemand-package.cab .	740
12) windows-base Docker image—dotnet-sdk	741
Code examples	742
Basics	742
Actions	743
Troubleshooting	
Apache Maven builds reference artifacts from the wrong repository	
Build commands run as root by default	761
Builds might fail when file names have non-U.S. English characters	762

Builds might fail when getting parameters from Amazon EC2 Parameter Store	762
Cannot access branch filter in the CodeBuild console	764
Cannot view build success or failure	764
Build status not reported to source provider	764
Cannot find and select the base image of the Windows Server Core 2019 platform	765
Earlier commands in buildspec files are not recognized by later commands	765
Error: "Access denied" when attempting to download cache	766
Error: "BUILD_CONTAINER_UNABLE_TO_PULL_IMAGE" when using a custom build image	ge 766
Error: "Build container found dead before completing the build. build container died be	cause
it was out of memory, or the Docker image is not supported. ErrorCode: 500"	767
Error: "Cannot connect to the Docker daemon" when running a build	768
Error: "CodeBuild is not authorized to perform: sts:AssumeRole" when creating or upda	ting a
build project	769
Error: "Error calling GetBucketAcl: Either the bucket owner has changed or the service r	ole no
longer has permission to called s3:GetBucketAcl"	770
Error: "Failed to upload artifacts: Invalid arn" when running a build	770
Error: "Git clone failed: Unable to access 'your-repository-URL': SSL certificate pro	oblem:
Self signed certificate"	770
Error: "The bucket you are attempting to access must be addressed using the specified	
endpoint" when running a build	771
Error: "This build image requires selecting at least one runtime version."	771
Error: "QUEUED: INSUFFICIENT_SUBNET" when a build in a build queue fails	772
Error: "Unable to download cache: RequestError: Send request failed caused by: x509: F	ailed
to load system roots and no roots provided"	773
Error: "Unable to download certificate from S3. AccessDenied"	773
Error: "Unable to locate credentials"	774
RequestError timeout error when running CodeBuild in a proxy server	775
The bourne shell (sh) must exist in build images	
Warning: "Skipping install of runtimes. runtime version selection is not supported by th	is
build image" when running a build	777
Error: "Unable to verify JobWorker identity"	777
Build failed to start	
Accessing GitHub metadata in locally cached builds	778
AccessDenied: The bucket owner for the report group does not match the owner of the	S3
bucket	778
Quotas	779

Service quotas	
Other limits	
Build projects	
Builds	
Compute fleets	
Reports	
Tags	
Document history	
Earlier updates	807

What is AWS CodeBuild?

AWS CodeBuild is a fully managed build service in the cloud. CodeBuild compiles your source code, runs unit tests, and produces artifacts that are ready to deploy. CodeBuild eliminates the need to provision, manage, and scale your own build servers. It provides prepackaged build environments for popular programming languages and build tools such as Apache Maven, Gradle, and more. You can also customize build environments in CodeBuild to use your own build tools. CodeBuild scales automatically to meet peak build requests.

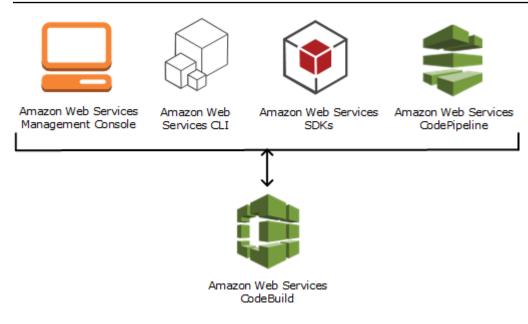
CodeBuild provides these benefits:

- **Fully managed** CodeBuild eliminates the need to set up, patch, update, and manage your own build servers.
- **On demand** CodeBuild scales on demand to meet your build needs. You pay only for the number of build minutes you consume.
- **Out of the box** CodeBuild provides preconfigured build environments for the most popular programming languages. All you need to do is point to your build script to start your first build.

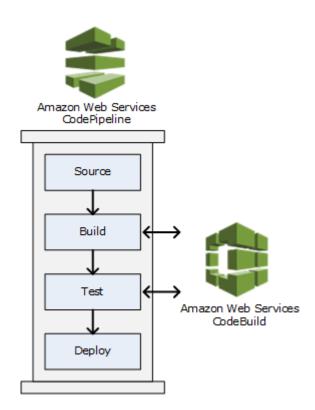
For more information, see <u>AWS CodeBuild</u>.

How to run CodeBuild

You can use the AWS CodeBuild or AWS CodePipeline console to run CodeBuild. You can also automate the running of CodeBuild by using the AWS Command Line Interface (AWS CLI) or the AWS SDKs.



As the following diagram shows, you can add CodeBuild as a build or test action to the build or test stage of a pipeline in AWS CodePipeline. AWS CodePipeline is a continuous delivery service that you can use to model, visualize, and automate the steps required to release your code. This includes building your code. A *pipeline* is a workflow construct that describes how code changes go through a release process.



To use CodePipeline to create a pipeline and then add a CodeBuild build or test action, see <u>Use</u> <u>CodeBuild with CodePipeline</u>. For more information about CodePipeline, see the <u>AWS CodePipeline</u> User Guide.

The CodeBuild console also provides a way to quickly search for your resources, such as repositories, build projects, deployment applications, and pipelines. Choose **Go to resource** or press the / key, and then enter the name of the resource. Any matches appear in the list. Searches are case insensitive. You only see resources that you have permissions to view. For more information, see <u>Viewing resources in the console</u>.

Pricing for CodeBuild

For information, see <u>CodeBuild pricing</u>.

How do I get started with CodeBuild?

We recommend that you complete the following steps:

- 1. **Learn** more about CodeBuild by reading the information in <u>Concepts</u>.
- 2. **Experiment** with CodeBuild in an example scenario by following the instructions in <u>Getting</u> started using the console.
- 3. **Use** CodeBuild in your own scenarios by following the instructions in <u>Plan a build</u>.

AWS CodeBuild concepts

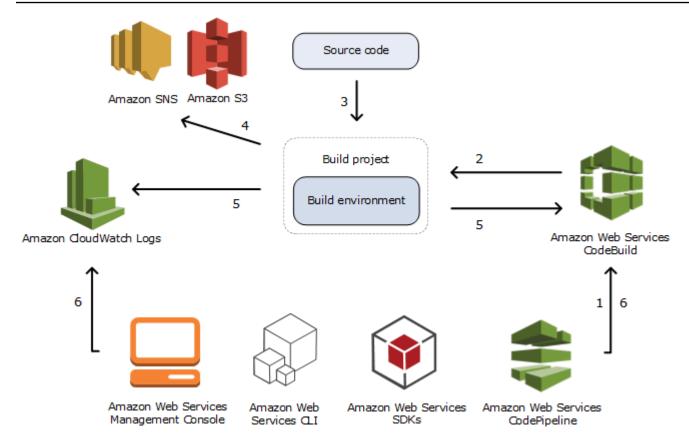
The following concepts are important for understanding how CodeBuild works.

Topics

- How CodeBuild works
- Next steps

How CodeBuild works

The following diagram shows what happens when you run a build with CodeBuild:



- 1. As input, you must provide CodeBuild with a build project. A *build project* includes information about how to run a build, including where to get the source code, which build environment to use, which build commands to run, and where to store the build output. A *build environment* represents a combination of operating system, programming language runtime, and tools that CodeBuild uses to run a build. For more information, see:
 - Create a build project
 - Build environment reference
- 2. CodeBuild uses the build project to create the build environment.
- 3. CodeBuild downloads the source code into the build environment and then uses the build specification (buildspec), as defined in the build project or included directly in the source code. A *buildspec* is a collection of build commands and related settings, in YAML format, that CodeBuild uses to run a build. For more information, see the <u>Buildspec reference</u>.
- 4. If there is any build output, the build environment uploads its output to an S3 bucket. The build environment can also perform tasks that you specify in the buildspec (for example, sending build notifications to an Amazon SNS topic). For an example, see <u>Build notifications</u> <u>sample</u>.

- 5. While the build is running, the build environment sends information to CodeBuild and Amazon CloudWatch Logs.
- 6. While the build is running, you can use the AWS CodeBuild console, AWS CLI, or AWS SDKs to get summarized build information from CodeBuild and detailed build information from Amazon CloudWatch Logs. If you use AWS CodePipeline to run builds, you can get limited build information from CodePipeline.

Next steps

Now that you know more about AWS CodeBuild, we recommend these next steps:

- 1. **Experiment** with CodeBuild in an example scenario by following the instructions in <u>Getting</u> started using the console.
- 2. Use CodeBuild in your own scenarios by following the instructions in Plan a build.

Getting started with CodeBuild

In the following tutorials, you use AWS CodeBuild to build a collection of sample source code input files into a deployable version of the source code.

Both tutorials have the same input and results, but one uses the AWS CodeBuild console and the other uses the AWS CLI.

A Important

We do not recommend that you use your AWS root account to complete this tutorial.

Topics

- Getting started with AWS CodeBuild using the console
- Getting started with AWS CodeBuild using the AWS CLI

Getting started with AWS CodeBuild using the console

In this tutorial, you use AWS CodeBuild to build a collection of sample source code input files (*build input artifacts* or *build input*) into a deployable version of the source code (*build output artifact* or *build output*). Specifically, you instruct CodeBuild to use Apache Maven, a common build tool, to build a set of Java class files into a Java Archive (JAR) file. You do not need to be familiar with Apache Maven or Java to complete this tutorial.

You can work with CodeBuild through the CodeBuild console, AWS CodePipeline, the AWS CLI, or the AWS SDKs. This tutorial demonstrates how to use the CodeBuild console. For information about using CodePipeline, see Use CodeBuild with CodePipeline.

🔥 Important

The steps in this tutorial require you to create resources (for example, an S3 bucket) that might result in charges to your AWS account. These include possible charges for CodeBuild and for AWS resources and actions related to Amazon S3, AWS KMS, and CloudWatch Logs. For more information, see <u>AWS CodeBuild pricing</u>, <u>Amazon S3 pricing</u>, <u>AWS Key</u> Management Service pricing, and Amazon CloudWatch pricing.

Topics

User Guide

- Step 1: Create the source code
- Step 2: Create the buildspec file
- Step 3: Create two S3 buckets
- Step 4: Upload the source code and the buildspec file
- Step 5: Create the build project
- Step 6: Run the build
- Step 7: View summarized build information
- Step 8: View detailed build information
- Step 9: Get the build output artifact
- Step 10: Delete the S3 buckets
- Wrapping up

Step 1: Create the source code

(Part of: Getting started with AWS CodeBuild using the console)

In this step, you create the source code that you want CodeBuild to build to the output bucket. This source code consists of two Java class files and an Apache Maven Project Object Model (POM) file.

1. In an empty directory on your local computer or instance, create this directory structure.

2. Using a text editor of your choice, create this file, name it MessageUtil.java, and then save it in the src/main/java directory.

```
public class MessageUtil {
  private String message;
  public MessageUtil(String message) {
    this.message = message;
```

```
}
public String printMessage() {
   System.out.println(message);
   return message;
}
public String salutationMessage() {
   message = "Hi!" + message;
   System.out.println(message);
   return message;
}
```

This class file creates as output the string of characters passed into it. The MessageUtil constructor sets the string of characters. The printMessage method creates the output. The salutationMessage method outputs Hi! followed by the string of characters.

 Create this file, name it TestMessageUtil.java, and then save it in the /src/test/java directory.

```
import org.junit.Test;
import org.junit.Ignore;
import static org.junit.Assert.assertEquals;
public class TestMessageUtil {
 String message = "Robert";
 MessageUtil messageUtil = new MessageUtil(message);
 @Test
  public void testPrintMessage() {
    System.out.println("Inside testPrintMessage()");
   assertEquals(message,messageUtil.printMessage());
 }
 @Test
  public void testSalutationMessage() {
    System.out.println("Inside testSalutationMessage()");
   message = "Hi!" + "Robert";
    assertEquals(message,messageUtil.salutationMessage());
  }
```

User Guide

}

This class file sets the message variable in the MessageUtil class to Robert. It then tests to see if the message variable was successfully set by checking whether the strings Robert and Hi!Robert appear in the output.

4. Create this file, name it pom.xml, and then save it in the root (top level) directory.

```
<project xmlns="http://maven.apache.org/POM/4.0.0"</pre>
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 http://maven.apache.org/
maven-v4_0_0.xsd">
  <modelVersion>4.0.0</modelVersion>
  <groupId>org.example</groupId>
  <artifactId>messageUtil</artifactId>
  <version>1.0</version>
  <packaging>jar</packaging>
  <name>Message Utility Java Sample App</name>
  <dependencies>
    <dependency>
      <groupId>junit</groupId>
      <artifactId>junit</artifactId>
      <version>4.11</version>
      <scope>test</scope>
    </dependency>
  </dependencies>
  <build>
    <plugins>
      <plugin>
        <groupId>org.apache.maven.plugins</groupId>
        <artifactId>maven-compiler-plugin</artifactId>
        <version>3.8.0</version>
      </plugin>
    </plugins>
  </build>
</project>
```

Apache Maven uses the instructions in this file to convert the MessageUtil.java and TestMessageUtil.java files into a file named messageUtil-1.0.jar and then run the specified tests.

At this point, your directory structure should look like this.

Step 2: Create the buildspec file

(Previous step: Step 1: Create the source code)

In this step, you create a build specification (build spec) file. A *buildspec* is a collection of build commands and related settings, in YAML format, that CodeBuild uses to run a build. Without a build spec, CodeBuild cannot successfully convert your build input into build output or locate the build output artifact in the build environment to upload to your output bucket.

Create this file, name it buildspec.yml, and then save it in the root (top level) directory.

```
version: 0.2
phases:
  install:
    runtime-versions:
      java: corretto11
  pre_build:
    commands:
      - echo Nothing to do in the pre_build phase...
  build:
    commands:
      - echo Build started on `date`
      - mvn install
  post_build:
    commands:
      - echo Build completed on `date`
artifacts:
  files:
    - target/messageUtil-1.0.jar
```

<u> Important</u>

Because a build spec declaration must be valid YAML, the spacing in a build spec declaration is important. If the number of spaces in your build spec declaration does not match this one, the build might fail immediately. You can use a YAML validator to test whether your build spec declaration is valid YAML.

🚺 Note

Instead of including a build spec file in your source code, you can declare build commands separately when you create a build project. This is helpful if you want to build your source code with different build commands without updating your source code's repository each time. For more information, see <u>Buildspec syntax</u>.

In this build spec declaration:

- version represents the version of the build spec standard being used. This build spec declaration uses the latest version, 0.2.
- phases represents the build phases during which you can instruct CodeBuild to run commands. These build phases are listed here as install, pre_build, build, and post_build. You cannot change the spelling of these build phase names, and you cannot create more build phase names.

In this example, during the build phase, CodeBuild runs the mvn install command. This command instructs Apache Maven to compile, test, and package the compiled Java class files into a build output artifact. For completeness, a few echo commands are placed in each build phase in this example. When you view detailed build information later in this tutorial, the output of these echo commands can help you better understand how CodeBuild runs commands and in which order. (Although all build phases are included in this example, you are not required to include a build phase if you do not plan to run any commands during that phase.) For each build phase, CodeBuild runs each specified command, one at a time, in the order listed, from beginning to end.

 artifacts represents the set of build output artifacts that CodeBuild uploads to the output bucket. files represents the files to include in the build output. CodeBuild uploads the single messageUtil-1.0.jar file found in the target relative directory in the build environment. The file name messageUtil-1.0.jar and the directory name target are based on the way Apache Maven creates and stores build output artifacts for this example only. In your own builds, these file names and directories are different.

For more information, see the Buildspec reference.

At this point, your directory structure should look like this.

Step 3: Create two S3 buckets

(Previous step: Step 2: Create the buildspec file)

Although you can use a single bucket for this tutorial, two buckets makes it easier to see where the build input is coming from and where the build output is going.

- One of these buckets (the *input bucket*) stores the build input. In this tutorial, the name of this
 input bucket is codebuild-*region-ID-account-ID*-input-bucket, where *region-ID* is
 the AWS Region of the bucket and *account-ID* is your AWS account ID.
- The other bucket (the *output bucket*) stores the build output. In this tutorial, the name of this output bucket is codebuild-*region-ID-account-ID*-output-bucket.

If you chose different names for these buckets, be sure to use them throughout this tutorial.

These two buckets must be in the same AWS Region as your builds. For example, if you instruct CodeBuild to run a build in the US East (Ohio) Region, these buckets must also be in the US East (Ohio) Region.

For more information, see <u>Creating a Bucket</u> in the Amazon Simple Storage Service User Guide.

🚯 Note

Although CodeBuild also supports build input stored in CodeCommit, GitHub, and Bitbucket repositories, this tutorial does not show you how to use them. For more information, see Plan a build.

Step 4: Upload the source code and the buildspec file

(Previous step: Step 3: Create two S3 buckets)

In this step, you add the source code and build spec file to the input bucket.

Using your operating system's zip utility, create a file named MessageUtil.zip that includes MessageUtil.java, TestMessageUtil.java, pom.xml, and buildspec.yml.

The MessageUtil.zip file's directory structure must look like this.

```
MessageUtil.zip

|-- pom.xml

|-- buildspec.yml

`-- src

|-- main

| `-- java

| `-- MessageUtil.java

`-- test

`-- java

`-- TestMessageUtil.java
```

<u> Important</u>

Do not include the (root directory name) directory, only the directories and files in the (root directory name) directory.

Upload the MessageUtil.zip file to the input bucket named codebuild-*region-ID-account-ID*-input-bucket.

User Guide

🔥 Important

For CodeCommit, GitHub, and Bitbucket repositories, by convention, you must store a build spec file named buildspec.yml in the root (top level) of each repository or include the build spec declaration as part of the build project definition. Do not create a ZIP file that contains the repository's source code and build spec file.

For build input stored in S3 buckets only, you must create a ZIP file that contains the source code and, by convention, a build spec file named buildspec.yml at the root (top level) or include the build spec declaration as part of the build project definition.

If you want to use a different name for your build spec file, or you want to reference a build spec in a location other than the root, you can specify a build spec override as part of the build project definition. For more information, see <u>Buildspec file name and storage location</u>.

Step 5: Create the build project

(Previous step: Step 4: Upload the source code and the buildspec file)

In this step, you create a build project that AWS CodeBuild uses to run the build. A *build project* includes information about how to run a build, including where to get the source code, which build environment to use, which build commands to run, and where to store the build output. A *build environment* represents a combination of operating system, programming language runtime, and tools that CodeBuild uses to run a build. The build environment is expressed as a Docker image. For more information, see <u>Docker overview</u> on the Docker Docs website.

For this build environment, you instruct CodeBuild to use a Docker image that contains a version of the Java Development Kit (JDK) and Apache Maven.

To create the build project

- 1. Sign in to the AWS Management Console and open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/home.
- 2. Use the AWS region selector to choose an AWS Region where CodeBuild is supported. For more information, see <u>AWS CodeBuild endpoints and quotas</u> in the *Amazon Web Services General Reference.*
- 3. If a CodeBuild information page is displayed, choose **Create build project**. Otherwise, on the navigation pane, expand **Build**, choose **Build projects**, and then choose **Create build project**.

4. On the **Create build project** page, in **Project configuration**, for **Project name**, enter a name for this build project (in this example, codebuild-demo-project). Build project names must be unique across each AWS account. If you use a different name, be sure to use it throughout this tutorial.

🚯 Note

On the **Create build project** page, you might see an error message similar to the following: **You are not authorized to perform this operation.** This is most likely because you signed in to the AWS Management Console as an user who does not have permissions to create a build project.. To fix this, sign out of the AWS Management Console, and then sign back in with credentials belonging to one of the following IAM entities:

- An administrator user in your AWS account. For more information, see <u>Creating your</u> first AWS account root user and group in the *user Guide*.
- An user in your AWS account with the AWSCodeBuildAdminAccess, AmazonS3ReadOnlyAccess, and IAMFullAccess managed policies attached to that user or to an IAM group that the user belongs to. If you do not have an user or group in your AWS account with these permissions, and you cannot add these permissions to your user or group, contact your AWS account administrator for assistance. For more information, see <u>AWS managed (predefined) policies for AWS</u> CodeBuild.

Both options include administrator permissions that allow you to create a build project so you can complete this tutorial. We recommend that you always use the minimum permissions required to accomplish your task. For more information, see AWS CodeBuild permissions reference.

- 5. In **Source**, for **Source provider**, choose **Amazon S3**.
- 6. For **Bucket**, choose **codebuild-***region-ID-account-ID***-input-bucket**.
- 7. For **S3 object key**, enter **MessageUtil.zip**.
- 8. In Environment, for Environment image, leave Managed image selected.
- 9. For **Operating system**, choose **Amazon Linux 2**.
- 10. For **Runtime(s)**, choose **Standard**.

- 11. For Image, choose aws/codebuild/amazonlinux2-x86_64-standard:4.0.
- 12. In Service role, leave New service role selected, and leave Role name unchanged.
- 13. For **Buildspec**, leave **Use a buildspec file** selected.
- 14. In Artifacts, for Type, choose Amazon S3.
- 15. For **Bucket name**, choose **codebuild-***region-ID-account-ID***-output-bucket**.
- 16. Leave **Name** and **Path** blank.
- 17. Choose Create build project.

Step 6: Run the build

(Previous step: Step 5: Create the build project)

In this step, you instruct AWS CodeBuild to run the build with the settings in the build project.

To run the build

- 1. Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.
- 2. In the navigation pane, choose **Build projects**.
- 3. In the list of build projects, choose **codebuild-demo-project**, and then choose **Start build**. The build starts immediately.

Step 7: View summarized build information

(Previous step: Step 6: Run the build)

In this step, you view summarized information about the status of your build.

To view summarized build information

- If the codebuild-demo-project:<build-ID> page is not displayed, in the navigation bar, choose Build history. Next, in the list of build projects, for Project, choose the Build run link for codebuild-demo-project. There should be only one matching link. (If you have completed this tutorial before, choose the link with the most recent value in the Completed column.)
- 2. On the **Build status** page, in **Phase details**, the following build phases should be displayed, with **Succeeded** in the **Status** column:

- SUBMITTED
- QUEUED
- PROVISIONING
- DOWNLOAD_SOURCE
- INSTALL
- PRE_BUILD
- BUILD
- POST_BUILD
- UPLOAD_ARTIFACTS
- FINALIZING
- COMPLETED

In Build Status, Succeeded should be displayed.

If you see In Progress instead, choose the refresh button.

3. Next to each build phase, the **Duration** value indicates how long the build phase lasted. The **End time** value indicates when that build phase ended.

Step 8: View detailed build information

(Previous step: Step 7: View summarized build information)

In this step, you view detailed information about your build in CloudWatch Logs.

Note

To protect sensitive information, the following are hidden in CodeBuild logs:

- AWS access key IDs. For more information, see <u>Managing Access Keys for IAM Users</u> in the *AWS Identity and Access Management User Guide*.
- Strings specified using the Parameter Store. For more information, see <u>Systems Manager</u> <u>Parameter Store</u> and <u>Systems Manager Parameter Store Console Walkthrough</u> in the *Amazon EC2 Systems Manager User Guide*.

 Strings specified using AWS Secrets Manager. For more information, see <u>Key</u> <u>management</u>.

To view detailed build information

- 1. With the build details page still displayed from the previous step, the last 10,000 lines of the build log are displayed in **Build logs**. To see the entire build log in CloudWatch Logs, choose the **View entire log** link.
- 2. In the CloudWatch Logs log stream, you can browse the log events. By default, only the last set of log events is displayed. To see earlier log events, scroll to the beginning of the list.
- 3. In this tutorial, most of the log events contain verbose information about CodeBuild downloading and installing build dependency files into its build environment, which you probably don't care about. You can use the **Filter events** box to reduce the information displayed. For example, if you enter "[INF0]" in **Filter events**, only those events that contain [INF0] are displayed. For more information, see <u>Filter and pattern syntax</u> in the *Amazon CloudWatch User Guide*.

Step 9: Get the build output artifact

(Previous step: Step 8: View detailed build information)

In this step, you get the messageUtil-1.0.jar file that CodeBuild built and uploaded to the output bucket.

You can use the CodeBuild console or the Amazon S3 console to complete this step.

To get the build output artifact (AWS CodeBuild console)

1. With the CodeBuild console still open and the build details page still displayed from the previous step, choose the **Build details** tab and scroll down to the **Artifacts** section.

i Note

If the build details page is not displayed, in the navigation bar, choose **Build history**, and then choose the **Build run** link.

2. The link to the Amazon S3 folder is under the **Artifacts upload location**. This link opens the folder in Amazon S3 where you find the messageUtil-1.0.jar build output artifact file.

To get the build output artifact (Amazon S3 console)

- 1. Open the Amazon S3 console at https://console.aws.amazon.com/s3/.
- 2. Open codebuild-*region-ID*-account-ID-output-bucket.
- 3. Open the codebuild-demo-project folder.
- 4. Open the target folder, where you find the messageUtil-1.0.jar build output artifact file.

Step 10: Delete the S3 buckets

(Previous step: Step 9: Get the build output artifact)

To prevent ongoing charges to your AWS account, you can delete the input and output buckets used in this tutorial. For instructions, see <u>Deleting or Emptying a Bucket</u> in the *Amazon Simple Storage Service User Guide*.

If you are using the IAM user or an administrator IAM user to delete these buckets, the user must have more access permissions. Add the following statement between the markers (*### BEGIN ADDING STATEMENT HERE ###* and *### END ADDING STATEMENTS HERE ###*) to an existing access policy for the user.

The ellipses (...) in this statement are used for brevity. Do not remove any statements in the existing access policy. Do not enter these ellipses into the policy.

```
{
    "Version": "2012-10-17",
    "Id": "...",
    "Statement": [
    ### BEGIN ADDING STATEMENT HERE ###
    {
        "Effect": "Allow",
        "Action": [
            "s3:DeleteBucket",
            "s3:DeleteObject"
        ],
        "Resource": "*"
```

```
}
### END ADDING STATEMENT HERE ###
]
}
```

Wrapping up

In this tutorial, you used AWS CodeBuild to build a set of Java class files into a JAR file. You then viewed the build's results.

You can now try using CodeBuild in your own scenarios. Follow the instructions in <u>Plan a build</u>. If you don't feel ready yet, you might want to try building some of the samples. For more information, see <u>Use case-based samples for CodeBuild</u>.

Getting started with AWS CodeBuild using the AWS CLI

In this tutorial, you use AWS CodeBuild to build a collection of sample source code input files (called *build input artifacts* or *build input*) into a deployable version of the source code (called *build output artifact* or *build output*). Specifically, you instruct CodeBuild to use Apache Maven, a common build tool, to build a set of Java class files into a Java Archive (JAR) file. You do not need to be familiar with Apache Maven or Java to complete this tutorial.

You can work with CodeBuild through the CodeBuild console, AWS CodePipeline, the AWS CLI, or the AWS SDKs. This tutorial demonstrates how to use CodeBuild with the AWS CLI. For information about using CodePipeline, see <u>Use CodeBuild with CodePipeline</u>.

A Important

The steps in this tutorial require you to create resources (for example, an S3 bucket) that might result in charges to your AWS account. These include possible charges for CodeBuild and for AWS resources and actions related to Amazon S3, AWS KMS, and CloudWatch Logs. For more information, see <u>CodeBuild pricing</u>, <u>Amazon S3 pricing</u>, <u>AWS Key Management</u> <u>Service pricing</u>, and <u>Amazon CloudWatch pricing</u>.

Topics

- <u>Step 1: Create the source code</u>
- Step 2: Create the buildspec file

- Step 3: Create two S3 buckets
- Step 4: Upload the source code and the buildspec file
- Step 5: Create the build project
- Step 6: Run the build
- Step 7: View summarized build information
- Step 8: View detailed build information
- Step 9: Get the build output artifact
- Step 10: Delete the S3 buckets
- Wrapping up

Step 1: Create the source code

(Part of: Getting started with AWS CodeBuild using the AWS CLI)

In this step, you create the source code that you want CodeBuild to build to the output bucket. This source code consists of two Java class files and an Apache Maven Project Object Model (POM) file.

1. In an empty directory on your local computer or instance, create this directory structure.

2. Using a text editor of your choice, create this file, name it MessageUtil.java, and then save it in the src/main/java directory.

```
public class MessageUtil {
  private String message;
  public MessageUtil(String message) {
    this.message = message;
  }
  public String printMessage() {
    System.out.println(message);
  }
```

```
return message;
}
public String salutationMessage() {
   message = "Hi!" + message;
   System.out.println(message);
   return message;
  }
}
```

This class file creates as output the string of characters passed into it. The MessageUtil constructor sets the string of characters. The printMessage method creates the output. The salutationMessage method outputs Hi! followed by the string of characters.

3. Create this file, name it TestMessageUtil.java, and then save it in the /src/test/java directory.

```
import org.junit.Test;
import org.junit.Ignore;
import static org.junit.Assert.assertEquals;
public class TestMessageUtil {
 String message = "Robert";
 MessageUtil messageUtil = new MessageUtil(message);
 @Test
 public void testPrintMessage() {
   System.out.println("Inside testPrintMessage()");
    assertEquals(message,messageUtil.printMessage());
 }
 @Test
 public void testSalutationMessage() {
    System.out.println("Inside testSalutationMessage()");
   message = "Hi!" + "Robert";
   assertEquals(message,messageUtil.salutationMessage());
 }
}
```

This class file sets the message variable in the MessageUtil class to Robert. It then tests to see if the message variable was successfully set by checking whether the strings Robert and Hi!Robert appear in the output.

4. Create this file, name it pom.xml, and then save it in the root (top level) directory.

```
<project xmlns="http://maven.apache.org/POM/4.0.0"</pre>
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 http://maven.apache.org/
maven-v4_0_0.xsd">
  <modelVersion>4.0.0</modelVersion>
  <groupId>org.example</groupId>
  <artifactId>messageUtil</artifactId>
  <version>1.0</version>
  <packaging>jar</packaging>
  <name>Message Utility Java Sample App</name>
  <dependencies>
    <dependency>
      <groupId>junit</groupId>
      <artifactId>junit</artifactId>
      <version>4.11</version>
      <scope>test</scope>
    </dependency>
  </dependencies>
  <build>
    <plugins>
      <plugin>
        <groupId>org.apache.maven.plugins</groupId>
        <artifactId>maven-compiler-plugin</artifactId>
        <version>3.8.0</version>
      </plugin>
    </plugins>
  </build>
</project>
```

Apache Maven uses the instructions in this file to convert the MessageUtil.java and TestMessageUtil.java files into a file named messageUtil-1.0.jar and then run the specified tests.

At this point, your directory structure should look like this.

```
User Guide
```

```
(root directory name)
  |-- pom.xml
  `-- src
        |-- main
        |   `-- java
        |    `-- MessageUtil.java
        `-- test
        `-- java
        `-- TestMessageUtil.java
```

Step 2: Create the buildspec file

(Previous step: Step 1: Create the source code)

In this step, you create a build specification (build spec) file. A *buildspec* is a collection of build commands and related settings, in YAML format, that CodeBuild uses to run a build. Without a build spec, CodeBuild cannot successfully convert your build input into build output or locate the build output artifact in the build environment to upload to your output bucket.

Create this file, name it buildspec.yml, and then save it in the root (top level) directory.

```
version: 0.2
phases:
  install:
    runtime-versions:
      java: corretto11
  pre_build:
    commands:
      - echo Nothing to do in the pre_build phase...
  build:
    commands:
      - echo Build started on `date`
      - mvn install
  post_build:
    commands:
      - echo Build completed on `date`
artifacts:
  files:
    - target/messageUtil-1.0.jar
```

<u> Important</u>

Because a build spec declaration must be valid YAML, the spacing in a build spec declaration is important. If the number of spaces in your build spec declaration does not match this one, the build might fail immediately. You can use a YAML validator to test whether your build spec declaration is valid YAML.

🚺 Note

Instead of including a build spec file in your source code, you can declare build commands separately when you create a build project. This is helpful if you want to build your source code with different build commands without updating your source code's repository each time. For more information, see <u>Buildspec syntax</u>.

In this build spec declaration:

- version represents the version of the build spec standard being used. This build spec declaration uses the latest version, 0.2.
- phases represents the build phases during which you can instruct CodeBuild to run commands. These build phases are listed here as install, pre_build, build, and post_build. You cannot change the spelling of these build phase names, and you cannot create more build phase names.

In this example, during the build phase, CodeBuild runs the mvn install command. This command instructs Apache Maven to compile, test, and package the compiled Java class files into a build output artifact. For completeness, a few echo commands are placed in each build phase in this example. When you view detailed build information later in this tutorial, the output of these echo commands can help you better understand how CodeBuild runs commands and in which order. (Although all build phases are included in this example, you are not required to include a build phase if you do not plan to run any commands during that phase.) For each build phase, CodeBuild runs each specified command, one at a time, in the order listed, from beginning to end.

 artifacts represents the set of build output artifacts that CodeBuild uploads to the output bucket. files represents the files to include in the build output. CodeBuild uploads the single messageUtil-1.0.jar file found in the target relative directory in the build environment. The file name messageUtil-1.0.jar and the directory name target are based on the way Apache Maven creates and stores build output artifacts for this example only. In your own builds, these file names and directories are different.

For more information, see the Buildspec reference.

At this point, your directory structure should look like this.

Step 3: Create two S3 buckets

(Previous step: Step 2: Create the buildspec file)

Although you can use a single bucket for this tutorial, two buckets makes it easier to see where the build input is coming from and where the build output is going.

- One of these buckets (the *input bucket*) stores the build input. In this tutorial, the name of this
 input bucket is codebuild-*region-ID-account-ID*-input-bucket, where *region-ID* is
 the AWS Region of the bucket and *account-ID* is your AWS account ID.
- The other bucket (the *output bucket*) stores the build output. In this tutorial, the name of this output bucket is codebuild-*region-ID-account-ID*-output-bucket.

If you chose different names for these buckets, be sure to use them throughout this tutorial.

These two buckets must be in the same AWS Region as your builds. For example, if you instruct CodeBuild to run a build in the US East (Ohio) Region, these buckets must also be in the US East (Ohio) Region.

For more information, see <u>Creating a Bucket</u> in the Amazon Simple Storage Service User Guide.

🚯 Note

Although CodeBuild also supports build input stored in CodeCommit, GitHub, and Bitbucket repositories, this tutorial does not show you how to use them. For more information, see Plan a build.

Step 4: Upload the source code and the buildspec file

(Previous step: Step 3: Create two S3 buckets)

In this step, you add the source code and build spec file to the input bucket.

Using your operating system's zip utility, create a file named MessageUtil.zip that includes MessageUtil.java, TestMessageUtil.java, pom.xml, and buildspec.yml.

The MessageUtil.zip file's directory structure must look like this.

```
MessageUtil.zip

|-- pom.xml

|-- buildspec.yml

`-- src

|-- main

| `-- java

| `-- MessageUtil.java

`-- test

`-- java

`-- TestMessageUtil.java
```

<u> Important</u>

Do not include the (root directory name) directory, only the directories and files in the (root directory name) directory.

Upload the MessageUtil.zip file to the input bucket named codebuild-*region-ID-account-ID*-input-bucket.

For build input stored in S3 buckets only, you must create a ZIP file that contains the source code and, by convention, a build spec file named buildspec.yml at the root (top level) or include the build spec declaration as part of the build project definition.

If you want to use a different name for your build spec file, or you want to reference a build spec in a location other than the root, you can specify a build spec override as part of the build project definition. For more information, see <u>Buildspec file name and storage location</u>.

Step 5: Create the build project

(Previous step: Step 4: Upload the source code and the buildspec file)

In this step, you create a build project that AWS CodeBuild uses to run the build. A *build project* includes information about how to run a build, including where to get the source code, which build environment to use, which build commands to run, and where to store the build output. A *build environment* represents a combination of operating system, programming language runtime, and tools that CodeBuild uses to run a build. The build environment is expressed as a Docker image. For more information, see <u>Docker overview</u> on the Docker Docs website.

For this build environment, you instruct CodeBuild to use a Docker image that contains a version of the Java Development Kit (JDK) and Apache Maven.

To create the build project

1. Use the AWS CLI to run the **create-project** command:

aws codebuild create-project --generate-cli-skeleton

JSON-formatted data appears in the output. Copy the data to a file named createproject.json in a location on the local computer or instance where the AWS CLI is installed. If you choose to use a different file name, be sure to use it throughout this tutorial. Modify the copied data to follow this format, and then save your results:

```
{
  "name": "codebuild-demo-project",
  "source": {
    "type": "S3",
    "location": "codebuild-region-ID-account-ID-input-bucket/MessageUtil.zip"
  },
  "artifacts": {
    "type": "S3",
    "location": "codebuild-region-ID-account-ID-output-bucket"
  },
  "environment": {
    "type": "LINUX_CONTAINER",
    "image": "aws/codebuild/standard:5.0",
    "computeType": "BUILD GENERAL1 SMALL"
 },
  "serviceRole": "serviceIAMRole"
}
```

Replace *serviceIAMRole* with the Amazon Resource Name (ARN) of a CodeBuild service role (for example, arn:aws:iam::*account-ID*:role/*role-name*). To create one, see <u>Allow</u> CodeBuild to interact with other AWS services.

In this data:

- name represents a required identifier for this build project (in this example, codebuilddemo-project). Build project names must be unique across all build projects in your account.
- For source, type is a required value that represents the source code's repository type (in this example, S3 for an Amazon S3 bucket).
- For source, location represents the path to the source code (in this example, the input bucket name followed by the ZIP file name).
- For artifacts, type is a required value that represents the build output artifact's repository type (in this example, S3 for an Amazon S3 bucket).
- For artifacts, location represents the name of the output bucket you created or identified earlier (in this example, codebuild-*region-ID-account-ID*-outputbucket).

- For environment, type is a required value that represents the type of build environment (in this example, LINUX_CONTAINER).
- For environment, image is a required value that represents the Docker image name and tag combination this build project uses, as specified by the Docker image repository type (in this example, aws/codebuild/standard:5.0 for a Docker image in the CodeBuild Docker images repository). aws/codebuild/standard is the name of the Docker image. 5.0 is the tag of the Docker image.

To find more Docker images you can use in your scenarios, see the <u>Build environment</u> reference.

• For environment, computeType is a required value that represents the computing resources CodeBuild uses (in this example, BUILD_GENERAL1_SMALL).

i Note

Other available values in the original JSON-formatted data, such as description, buildspec, auth (including type and resource), path, namespaceType, name (for artifacts), packaging, environmentVariables (including name and value), timeoutInMinutes, encryptionKey, and tags (including key and value) are optional. They are not used in this tutorial, so they are not shown here. For more information, see <u>Create a build project (AWS CLI)</u>.

2. Switch to the directory that contains the file you just saved, and then run the **create-project** command again.

```
aws codebuild create-project --cli-input-json file://create-project.json
```

If successful, data similar to this appears in the output.

```
{
    "project": {
        "name": "codebuild-demo-project",
        "serviceRole": "serviceIAMRole",
        "tags": [],
        "artifacts": {
            "packaging": "NONE",
            "type": "S3",
        "type": "S3",
        "serviceTamentary (serviceTamentary (servic
```

```
"location": "codebuild-region-ID-account-ID-output-bucket",
      "name": "message-util.zip"
    },
    "lastModified": 1472661575.244,
    "timeoutInMinutes": 60,
    "created": 1472661575.244,
    "environment": {
      "computeType": "BUILD_GENERAL1_SMALL",
      "image": "aws/codebuild/standard:5.0",
      "type": "LINUX_CONTAINER",
      "environmentVariables": []
    },
    "source": {
      "type": "S3",
      "location": "codebuild-region-ID-account-ID-input-bucket/MessageUtil.zip"
    },
    "encryptionKey": "arn:aws:kms:region-ID:account-ID:alias/aws/s3",
    "arn": "arn:aws:codebuild:region-ID:account-ID:project/codebuild-demo-project"
 }
}
```

- project represents information about this build project.
 - tags represents any tags that were declared.
 - packaging represents how the build output artifact is stored in the output bucket. NONE means that a folder is created in the output bucket. The build output artifact is stored in that folder.
 - lastModified represents the time, in Unix time format, when information about the build project was last changed.
 - timeoutInMinutes represents the number of minutes after which CodeBuild stops the build if the build has not been completed. (The default is 60 minutes.)
 - created represents the time, in Unix time format, when the build project was created.
 - environmentVariables represents any environment variables that were declared and are available for CodeBuild to use during the build.
 - encryptionKey represents the ARN of the customer managed key that CodeBuild used to encrypt the build output artifact.
 - arn represents the ARN of the build project.

🚯 Note

After you run the **create-project** command, an error message similar to the following might be output: **User:** *user-ARN* is not authorized to perform: codebuild:CreateProject. This is most likely because you configured the AWS CLI with the credentials of an user who does not have sufficient permissions to use CodeBuild to create build projects. To fix this, configure the AWS CLI with credentials belonging to one of the following IAM entities:

- An administrator user in your AWS account. For more information, see <u>Creating your first</u> <u>AWS account root user and group</u> in the *user Guide*.
- An user in your AWS account with the AWSCodeBuildAdminAccess, AmazonS3ReadOnlyAccess, and IAMFullAccess managed policies attached to that user or to an IAM group that the user belongs to. If you do not have an user or group in your AWS account with these permissions, and you cannot add these permissions to your user or group, contact your AWS account administrator for assistance. For more information, see AWS managed (predefined) policies for AWS CodeBuild.

Step 6: Run the build

(Previous step: Step 5: Create the build project)

In this step, you instruct AWS CodeBuild to run the build with the settings in the build project.

To run the build

1. Use the AWS CLI to run the **start-build** command:

```
aws codebuild start-build --project-name project-name
```

Replace *project-name* with your build project name from the previous step (for example, codebuild-demo-project).

2. If successful, data similar to the following appears in the output:

```
{
    "build": {
        "buildComplete": false,
        "initiator": "user-name",
        "artifacts": {
```

```
"location": "arn:aws:s3:::codebuild-region-ID-account-ID-output-bucket/
message-util.zip"
    },
    "projectName": "codebuild-demo-project",
    "timeoutInMinutes": 60,
    "buildStatus": "IN_PROGRESS",
    "environment": {
      "computeType": "BUILD_GENERAL1_SMALL",
      "image": "aws/codebuild/standard:5.0",
      "type": "LINUX_CONTAINER",
      "environmentVariables": []
    },
    "source": {
      "type": "S3",
      "location": "codebuild-region-ID-account-ID-input-bucket/MessageUtil.zip"
    },
    "currentPhase": "SUBMITTED",
    "startTime": 1472848787.882,
    "id": "codebuild-demo-project:0cfbb6ec-3db9-4e8c-992b-1ab28EXAMPLE",
    "arn": "arn:aws:codebuild:region-ID:account-ID:build/codebuild-demo-
project:0cfbb6ec-3db9-4e8c-992b-1ab28EXAMPLE"
  }
}
```

• build represents information about this build.

- buildComplete represents whether the build was completed (true). Otherwise, false.
- initiator represents the entity that started the build.
- artifacts represents information about the build output, including its location.
- projectName represents the name of the build project.
- buildStatus represents the current build status when the **start-build** command was run.
- currentPhase represents the current build phase when the **start-build** command was run.
- startTime represents the time, in Unix time format, when the build process started.
- id represents the ID of the build.
- arn represents the ARN of the build.

Make a note of the id value. You need it in the next step.

Step 7: View summarized build information

(Previous step: Step 6: Run the build)

In this step, you view summarized information about the status of your build.

To view summarized build information

• Use the AWS CLI to run the **batch-get-builds** command.

```
aws codebuild batch-get-builds --ids id
```

Replace *id* with the *id* value that appeared in the output of the previous step.

If successful, data similar to this appears in the output.

```
{
  "buildsNotFound": [],
  "builds": [
    {
      "buildComplete": true,
      "phases": [
        {
          "phaseStatus": "SUCCEEDED",
          "endTime": 1472848788.525,
          "phaseType": "SUBMITTED",
          "durationInSeconds": 0,
          "startTime": 1472848787.882
        },
        ... The full list of build phases has been omitted for brevity ...
          "phaseType": "COMPLETED",
          "startTime": 1472848878.079
        }
      ],
      "logs": {
        "groupName": "/aws/codebuild/codebuild-demo-project",
        "deepLink": "https://console.aws.amazon.com/cloudwatch/home?region=region-
ID#logEvent:group=/aws/codebuild/codebuild-demo-project;stream=38ca1c4a-e9ca-4dbc-
bef1-d52bfEXAMPLE",
        "streamName": "38ca1c4a-e9ca-4dbc-bef1-d52bfEXAMPLE"
      },
      "artifacts": {
```

```
"md5sum": "MD5-hash",
        "location": "arn:aws:s3:::codebuild-region-ID-account-ID-output-bucket/
message-util.zip",
        "sha256sum": "SHA-256-hash"
      },
      "projectName": "codebuild-demo-project",
      "timeoutInMinutes": 60,
      "initiator": "user-name",
      "buildStatus": "SUCCEEDED",
      "environment": {
        "computeType": "BUILD_GENERAL1_SMALL",
        "image": "aws/codebuild/standard:5.0",
        "type": "LINUX_CONTAINER",
        "environmentVariables": []
      },
      "source": {
        "type": "S3",
        "location": "codebuild-region-ID-account-ID-input-bucket/MessageUtil.zip"
      },
      "currentPhase": "COMPLETED",
      "startTime": 1472848787.882,
      "endTime": 1472848878.079,
      "id": "codebuild-demo-project:38ca1c4a-e9ca-4dbc-bef1-d52bfEXAMPLE",
      "arn": "arn:aws:codebuild:region-ID:account-ID:build/codebuild-demo-
project:38ca1c4a-e9ca-4dbc-bef1-d52bfEXAMPLE"
    }
  ]
}
```

- buildsNotFound represents the build IDs for any builds where information is not available.
 In this example, it should be empty.
- builds represents information about each build where information is available. In this example, information about only one build appears in the output.
 - phases represents the set of build phases CodeBuild runs during the build process. Information about each build phase is listed separately as startTime, endTime, and durationInSeconds (when the build phase started and ended, expressed in Unix time format, and how long it lasted, in seconds), and phaseType such as (SUBMITTED, PROVISIONING, DOWNLOAD_SOURCE, INSTALL, PRE_BUILD, BUILD, POST_BUILD, UPLOAD_ARTIFACTS, FINALIZING, or COMPLETED) and phaseStatus (such as SUCCEEDED, FAILED, FAULT, TIMED_OUT, IN_PROGRESS, or STOPPED). The first time you run the batch-get-builds command, there might not be many (or any) phases. After

subsequent runs of the **batch-get-builds** command with the same build ID, more build phases should appear in the output.

- logs represents information in Amazon CloudWatch Logs about the build's logs.
- md5sum and sha256sum represent MD5 and SHA-256 hashes of the build's output artifact. These appear in the output only if the build project's packaging value is set to ZIP. (You did not set this value in this tutorial.) You can use these hashes along with a checksum tool to confirm file integrity and authenticity.

i Note

You can also use the Amazon S3 console to view these hashes. Select the box next to the build output artifact, choose **Actions**, and then choose **Properties**. In the **Properties** pane, expand **Metadata**, and view the values for **x-amz-metacodebuild-content-md5** and **x-amz-meta-codebuild-content-sha256**. (In the Amazon S3 console, the build output artifact's **ETag** value should not be interpreted to be either the MD5 or SHA-256 hash.) If you use the AWS SDKs to get these hashes, the values are named codebuildcontent-md5 and codebuild-content-sha256.

• endTime represents the time, in Unix time format, when the build process ended.

i Note

Amazon S3 metadata has a CodeBuild header named x-amz-meta-codebuildbuildarn which contains the buildArn of the CodeBuild build that publishes artifacts to Amazon S3. The buildArn is added to allow source tracking for notifications and to reference which build the artifact is generated from.

Step 8: View detailed build information

(Previous step: Step 7: View summarized build information)

In this step, you view detailed information about your build in CloudWatch Logs.

(i) Note

To protect sensitive information, the following are hidden in CodeBuild logs:

- AWS access key IDs. For more information, see <u>Managing Access Keys for IAM Users</u> in the *AWS Identity and Access Management User Guide*.
- Strings specified using the Parameter Store. For more information, see <u>Systems Manager</u> <u>Parameter Store</u> and <u>Systems Manager Parameter Store Console Walkthrough</u> in the *Amazon EC2 Systems Manager User Guide*.
- Strings specified using AWS Secrets Manager. For more information, see <u>Key</u> <u>management</u>.

To view detailed build information

- Use your web browser to go to the deepLink location that appeared in the output in the previous step (for example, https://console.aws.amazon.com/cloudwatch/ home?region=region-ID#logEvent:group=/aws/codebuild/codebuild-demoproject;stream=38ca1c4a-e9ca-4dbc-bef1-d52bfEXAMPLE).
- 2. In the CloudWatch Logs log stream, you can browse the log events. By default, only the last set of log events is displayed. To see earlier log events, scroll to the beginning of the list.
- 3. In this tutorial, most of the log events contain verbose information about CodeBuild downloading and installing build dependency files into its build environment, which you probably don't care about. You can use the **Filter events** box to reduce the information displayed. For example, if you enter "[INF0]" in **Filter events**, only those events that contain [INF0] are displayed. For more information, see <u>Filter and pattern syntax</u> in the *Amazon CloudWatch User Guide*.

These portions of a CloudWatch Logs log stream pertain to this tutorial.

```
...
[Container] 2016/04/15 17:49:42 Entering phase PRE_BUILD
[Container] 2016/04/15 17:49:42 Running command echo Entering pre_build phase...
[Container] 2016/04/15 17:49:42 Entering pre_build phase...
[Container] 2016/04/15 17:49:42 Phase complete: PRE_BUILD Success: true
[Container] 2016/04/15 17:49:42 Entering phase BUILD
[Container] 2016/04/15 17:49:42 Running command echo Entering build phase...
```

```
[Container] 2016/04/15 17:49:42 Entering build phase...
[Container] 2016/04/15 17:49:42 Running command mvn install
[Container] 2016/04/15 17:49:44 [INFO] Scanning for projects...
[Container] 2016/04/15 17:49:44 [INF0]
[Container] 2016/04/15 17:49:44 [INF0]
[Container] 2016/04/15 17:49:44 [INFO] Building Message Utility Java Sample App 1.0
[Container] 2016/04/15 17:49:44 [INF0]
[Container] 2016/04/15 17:49:55
  _____
[Container] 2016/04/15 17:49:55 T E S T S
[Container] 2016/04/15 17:49:55
 [Container] 2016/04/15 17:49:55 Running TestMessageUtil
[Container] 2016/04/15 17:49:55 Inside testSalutationMessage()
[Container] 2016/04/15 17:49:55 Hi!Robert
[Container] 2016/04/15 17:49:55 Inside testPrintMessage()
[Container] 2016/04/15 17:49:55 Robert
[Container] 2016/04/15 17:49:55 Tests run: 2, Failures: 0, Errors: 0, Skipped: 0, Time
elapsed: 0.018 sec
[Container] 2016/04/15 17:49:55
[Container] 2016/04/15 17:49:55 Results :
[Container] 2016/04/15 17:49:55
[Container] 2016/04/15 17:49:55 Tests run: 2, Failures: 0, Errors: 0, Skipped: 0
. . .
[Container] 2016/04/15 17:49:56 [INF0]
_____
[Container] 2016/04/15 17:49:56 [INFO] BUILD SUCCESS
[Container] 2016/04/15 17:49:56 [INF0]
_____
[Container] 2016/04/15 17:49:56 [INFO] Total time: 11.845 s
[Container] 2016/04/15 17:49:56 [INF0] Finished at: 2016-04-15T17:49:56+00:00
[Container] 2016/04/15 17:49:56 [INFO] Final Memory: 18M/216M
[Container] 2016/04/15 17:49:56 [INF0]
_____
[Container] 2016/04/15 17:49:56 Phase complete: BUILD Success: true
[Container] 2016/04/15 17:49:56 Entering phase POST_BUILD
[Container] 2016/04/15 17:49:56 Running command echo Entering post_build phase...
[Container] 2016/04/15 17:49:56 Entering post_build phase...
[Container] 2016/04/15 17:49:56 Phase complete: POST_BUILD Success: true
[Container] 2016/04/15 17:49:57 Preparing to copy artifacts
[Container] 2016/04/15 17:49:57 Assembling file list
```

AWS CodeBuild

```
[Container] 2016/04/15 17:49:57 Expanding target/messageUtil-1.0.jar
[Container] 2016/04/15 17:49:57 Found target/messageUtil-1.0.jar
[Container] 2016/04/15 17:49:57 Creating zip artifact
```

In this example, CodeBuild successfully completed the pre-build, build, and post-build build phases. It ran the unit tests and successfully built the messageUtil-1.0.jar file.

Step 9: Get the build output artifact

(Previous step: Step 8: View detailed build information)

In this step, you get the messageUtil-1.0.jar file that CodeBuild built and uploaded to the output bucket.

You can use the CodeBuild console or the Amazon S3 console to complete this step.

To get the build output artifact (AWS CodeBuild console)

1. With the CodeBuild console still open and the build details page still displayed from the previous step, choose the **Build details** tab and scroll down to the **Artifacts** section.

🚯 Note

If the build details page is not displayed, in the navigation bar, choose **Build history**, and then choose the **Build run** link.

2. The link to the Amazon S3 folder is under the **Artifacts upload location**. This link opens the folder in Amazon S3 where you find the messageUtil-1.0.jar build output artifact file.

To get the build output artifact (Amazon S3 console)

- 1. Open the Amazon S3 console at <u>https://console.aws.amazon.com/s3/</u>.
- 2. Open codebuild-*region-ID-account-ID*-output-bucket.
- 3. Open the codebuild-demo-project folder.
- Open the target folder, where you find the messageUtil-1.0.jar build output artifact file.

Step 10: Delete the S3 buckets

```
(Previous step: Step 9: Get the build output artifact)
```

To prevent ongoing charges to your AWS account, you can delete the input and output buckets used in this tutorial. For instructions, see <u>Deleting or Emptying a Bucket</u> in the *Amazon Simple Storage Service User Guide*.

If you are using the IAM user or an administrator IAM user to delete these buckets, the user must have more access permissions. Add the following statement between the markers (*### BEGIN ADDING STATEMENT HERE ###* and *### END ADDING STATEMENTS HERE ###*) to an existing access policy for the user.

The ellipses (...) in this statement are used for brevity. Do not remove any statements in the existing access policy. Do not enter these ellipses into the policy.

```
{
  "Version": "2012-10-17",
  "Id": "...",
  "Statement": [
    ### BEGIN ADDING STATEMENT HERE ###
    {
      "Effect": "Allow",
      "Action": [
        "s3:DeleteBucket",
        "s3:DeleteObject"
      ],
      "Resource": "*"
    }
    ### END ADDING STATEMENT HERE ###
  ]
}
```

Wrapping up

In this tutorial, you used AWS CodeBuild to build a set of Java class files into a JAR file. You then viewed the build's results.

You can now try using CodeBuild in your own scenarios. Follow the instructions in <u>Plan a build</u>. If you don't feel ready yet, you might want to try building some of the samples. For more information, see <u>Use case-based samples for CodeBuild</u>.

Use case-based samples for CodeBuild

You can use these use case-based samples to experiment with AWS CodeBuild:

Cross-service samples

A list of cross-service samples to experiment with AWS CodeBuild.

Build badges sample

Shows how to set up CodeBuild with build badges.

Test report sample

Uses the AWS CLI to create, run, and view the results of a test report.

Docker samples for CodeBuild

Shows how to use custom Docker images, publish Docker images to a repository in Amazon ECR, and use Docker images in a private registry.

Host build output in an S3 bucket

Shows how to create a static website in an S3 bucket using unencrypted build artifacts.

Multiple inputs and outputs sample

Shows how to use multiple input sources and multiple output artifacts in a build project.

Runtime versions in buildspec file sample

Shows how to specify runtimes and their versions in the buildspec file.

Source version sample

Shows how to use a specific version of your source in a CodeBuild build project.

Third-party source repository samples for CodeBuild

Shows how to create BitBucket, GitHub Enterprise Server, and GitHub pull requests with webhooks using CodeBuild.

Set artifact names at build time using semantic versioning

Shows how to use semantic versioning to create an artifact name at build time.

Cross-service samples for CodeBuild

You can use these cross-service samples to experiment with AWS CodeBuild:

Amazon ECR sample

Uses a Docker image in an Amazon ECR repository to use Apache Maven to produce a single JAR file. The sample instructions will show you how to create and push a Docker image to Amazon ECR, create a Go project, build the project, run the project, and set up permissions to allow CodeBuild to connect to Amazon ECR.

Amazon EFS sample

Shows how to configure a buildspec file so that a CodeBuild project mounts and builds on an Amazon EFS file system. The sample instructions will show you how to create a Amazon VPC, create file system in the Amazon VPC, create and build a project that uses the Amazon VPC, and then review the generated project file and variables.

AWS CodePipeline samples

Shows how to use AWS CodePipeline to create a build with batch builds as well as multiple input sources and multiple output artifacts. Included in this section are example JSON files that show pipeline structures that create batch builds with separate artifacts, and combined artifacts. An additonal JSON sample is provided that show the pipeline structure with multiple input sources and multiple output artifacts.

AWS Config sample

Shows how to set up AWS Config. Lists which CodeBuild resources are tracked and describes how to look up CodeBuild projects in AWS Config. The sample instructions will show you the prerequisites for integrating with AWS Config, the steps to set up AWS Config, and the steps to look up CodeBuild projects and data in AWS Config.

Build notifications sample

Uses Apache Maven to produce a single JAR file. Sends a build notification to subscribers of an Amazon SNS topic. The sample instructions show you how to set up permissions so that CodeBuild can communicate with Amazon SNS and CloudWatch, how to create and identify CodeBuild topics in Amazon SNS, how to subscribe recipients to the topic, and how to set up rules in CloudWatch.

Amazon ECR sample for CodeBuild

This sample uses a Docker image in an Amazon Elastic Container Registry (Amazon ECR) image repository to build a sample Go project.

🔥 Important

Running this sample might result in charges to your AWS account. These include possible charges for AWS CodeBuild and for AWS resources and actions related to Amazon S3, AWS KMS, CloudWatch Logs, and Amazon ECR. For more information, see <u>CodeBuild pricing</u>, <u>Amazon S3 pricing</u>, <u>AWS Key Management Service pricing</u>, <u>Amazon CloudWatch pricing</u>, and Amazon Elastic Container Registry pricing.

Topics

• Run the Amazon ECR sample

Run the Amazon ECR sample

Use the following instructions to run the Amazon ECR sample for CodeBuild.

To run this sample

- To create and push the Docker image to your image repository in Amazon ECR, complete the steps in the <u>Run the 'Publish Docker image to Amazon ECR' sample</u> section of the <u>'Publish</u> Docker image to Amazon ECR' sample.
- 2. Create a Go project:
 - a. Create the files as described in the <u>Go project structure</u> and <u>Go project files</u> sections of this topic, and then upload them to an S3 input bucket or an AWS CodeCommit, GitHub, or Bitbucket repository.

🛕 Important

Do not upload (root directory name), just the files inside of (root directory name).

If you are using an S3 input bucket, be sure to create a ZIP file that contains the files, and then upload it to the input bucket. Do not add (*root directory name*) to the ZIP file, just the files inside of (*root directory name*).

b. Create a build project, run the build, and view related build information.

If you use the AWS CLI to create the build project, the JSON-formatted input to the create-project command might look similar to this. (Replace the placeholders with your own values.)

```
{
  "name": "sample-go-project",
  "source": {
    "type": "S3",
    "location": "codebuild-region-ID-account-ID-input-bucket/GoSample.zip"
  },
  "artifacts": {
    "type": "S3",
    "location": "codebuild-region-ID-account-ID-output-bucket",
    "packaging": "ZIP",
    "name": "GoOutputArtifact.zip"
  },
  "environment": {
    "type": "LINUX_CONTAINER",
    "image": "aws/codebuild/standard:5.0",
    "computeType": "BUILD_GENERAL1_SMALL"
  },
  "serviceRole": "arn:aws:iam::account-ID:role/role-name",
  "encryptionKey": "arn:aws:kms:region-ID:account-ID:key/key-ID"
}
```

- c. To get the build output artifact, open your S3 output bucket.
- d. Download the *GoOutputArtifact*.zip file to your local computer or instance, and then extract the contents of the file. In the extracted contents, get the hello file.
- 3. If one of the following is true, you must add permissions to your image repository in Amazon ECR so that AWS CodeBuild can pull its Docker image into the build environment.
 - Your project uses CodeBuild credentials to pull Amazon ECR images. This is denoted by a value of CODEBUILD in the imagePullCredentialsType attribute of your ProjectEnvironment.

- Your project uses a cross-account Amazon ECR image. In this case, your project must use its service role to pull Amazon ECR images. To enable this behavior, set the imagePullCredentialsType attribute of your ProjectEnvironment to SERVICE_ROLE.
- 1. Open the Amazon ECR console at https://console.aws.amazon.com/ecr/.
- 2. In the list of repository names, choose the name of the repository you created or selected.
- 3. From the navigation pane, choose **Permissions**, choose **Edit**, and then choose **Add statement**.
- 4. For **Statement name**, enter an identifier (for example, **CodeBuildAccess**).
- 5. For **Effect**, leave **Allow** selected. This indicates that you want to allow access to another AWS account.
- 6. For **Principal**, do one of the following:
 - If your project uses CodeBuild credentials to pull an Amazon ECR image, in **Service** principal, enter codebuild.amazonaws.com.
 - If your project uses a cross-account Amazon ECR image, for AWS account IDs, enter IDs of the AWS accounts that you want to give access.
- 7. Skip the **All IAM entities** list.
- 8. For Action, select the pull-only actions: ecr:GetDownloadUrlForLayer, ecr:BatchGetImage, and ecr:BatchCheckLayerAvailability.
- 9. For **Conditions**, add the following:

```
{
    "StringEquals":{
        "aws:SourceAccount":"<AWS-account-ID>",
        "aws:SourceArn":"arn:aws:codebuild:<region>:<AWS-account-
ID>:project/<project-name>"
    }
}
```

10Choose Save.

This policy is displayed in **Permissions**. The principal is what you entered for **Principal** in step 3 of this procedure:

• If your project uses CodeBuild credentials to pull an Amazon ECR image,

```
Amazon ECR sample build.amazonaws.com" appears under Service principals.
```

• If your project uses a cross-account Amazon ECR image, the ID of the AWS account that you want to give access appears under **AWS Account IDs**.

The following sample policy uses both CodeBuild credentials and a cross-account Amazon ECR image.

```
{
   "Version":"2012-10-17",
   "Statement":
      {
         "Sid": "CodeBuildAccessPrincipal",
         "Effect":"Allow",
         "Principal":{
            "Service": "codebuild.amazonaws.com"
         },
         "Action":[
            "ecr:GetDownloadUrlForLayer",
            "ecr:BatchGetImage",
            "ecr:BatchCheckLayerAvailability"
         ],
         "Condition":{
            "StringEquals":{
               "aws:SourceArn":"arn:aws:codebuild:<region>:<aws-account-
id>:project/<project-name>",
               "aws:SourceAccount":"<aws-account-id>"
            }
         }
      },
      {
         "Sid": "CodeBuildAccessCrossAccount",
         "Effect":"Allow",
         "Principal":{
            "AWS":"arn:aws:iam::<<u>AWS-account-ID</u>>:root"
         },
         "Action":[
            "ecr:GetDownloadUrlForLayer",
            "ecr:BatchGetImage",
            "ecr:BatchCheckLayerAvailability"
         ]
      }
   ]
}
```

• If your projects use CodeBuild credentials and you would like your CodeBuild projects to have open access to the Amazon ECR repository, you can omit the Condition keys and add the following sample policy.

```
{
  "Version":"2012-10-17",
  "Statement":[
    {
      "Sid": "CodeBuildAccessPrincipal",
      "Effect":"Allow",
      "Principal":{
        "Service":"codebuild.amazonaws.com"
      },
      "Action":[
        "ecr:GetDownloadUrlForLayer",
        "ecr:BatchGetImage",
        "ecr:BatchCheckLayerAvailability"
      ]
    },
    {
      "Sid": "CodeBuildAccessCrossAccount",
      "Effect":"Allow",
      "Principal":{
        "AWS":"arn:aws:iam::<<u>AWS-account-ID</u>>:root"
      },
      "Action":[
        "ecr:GetDownloadUrlForLayer",
        "ecr:BatchGetImage",
        "ecr:BatchCheckLayerAvailability"
      ]
    }
  ]
}
```

4. Create a build project, run the build, and view build information.

If you use the AWS CLI to create the build project, the JSON-formatted input to the createproject command might look similar to this. (Replace the placeholders with your own values.)

```
{
    "name": "amazon-ecr-sample-project",
```

```
"source": {
    "type": "S3",
    "location": "codebuild-region-ID-account-ID-input-bucket/GoSample.zip"
  },
  "artifacts": {
    "type": "S3",
    "location": "codebuild-region-ID-account-ID-output-bucket",
    "packaging": "ZIP",
    "name": "GoOutputArtifact.zip"
 },
  "environment": {
    "type": "LINUX_CONTAINER",
    "image": "account-ID.dkr.ecr.region-ID.amazonaws.com/your-Amazon-ECR-repo-
name:tag",
    "computeType": "BUILD_GENERAL1_SMALL"
 },
 "serviceRole": "arn:aws:iam::account-ID:role/role-name",
  "encryptionKey": "arn:aws:kms:region-ID:account-ID:key/key-ID"
}
```

- 5. To get the build output artifact, open your S3 output bucket.
- Download the GoOutputArtifact.zip file to your local computer or instance, and then extract the contents of the GoOutputArtifact.zip file. In the extracted contents, get the hello file.

Go project structure

This sample assumes this directory structure.

```
(root directory name)
### buildspec.yml
### hello.go
```

Go project files

This sample uses these files.

```
buildspec.yml(in (root directory name))
```

version: 0.2

phases:

```
install:
runtime-versions:
golang: 1.13
build:
commands:
        - echo Build started on `date`
        - echo Compiling the Go code
        - go build hello.go
post_build:
        commands:
        - echo Build completed on `date`
artifacts:
files:
        - hello
```

hello.go(in (root directory name))

```
package main
import "fmt"
func main() {
  fmt.Println("hello world")
  fmt.Println("1+1 =", 1+1)
  fmt.Println("7.0/3.0 =", 7.0/3.0)
  fmt.Println(true && false)
  fmt.Println(true || false)
  fmt.Println(!true)
}
```

Amazon Elastic File System sample for AWS CodeBuild

You might want to create your AWS CodeBuild builds on Amazon Elastic File System, a scalable, shared file service for Amazon EC2 instances. The storage capacity with Amazon EFS is elastic, so it grows or shrinks as files are added and removed. It has a simple web services interface that you can use to create and configure file systems. It also manages all of the file storage infrastructure for you, so you do not need to worry about deploying, patching, or maintaining file system configurations. For more information, see <u>What is Amazon Elastic File System?</u> in the *Amazon Elastic File System User Guide*.

This sample shows you how to configure a CodeBuild project so that it mounts and then builds a Java application to an Amazon EFS file system. Before you begin, you must have a Java application

ready to build that is uploaded to an S3 input bucket or an AWS CodeCommit, GitHub, GitHub Enterprise Server, or Bitbucket repository.

Data in transit for your file system is encrypted. To encrypt data in transit using a different image, see Encrypting data in transit.

Topics

- Use AWS CodeBuild with Amazon Elastic File System
- Troubleshoot the Amazon EFS integration

Use AWS CodeBuild with Amazon Elastic File System

The sample covers the four high-level steps required to use Amazon EFS with AWS CodeBuild. They are:

- 1. Create a virtual private cloud (VPC) in your AWS account.
- 2. Create a file system that uses this VPC.
- 3. Create and build a CodeBuild project that uses the VPC. The CodeBuild project uses the following to identify the file system:
 - A unique file system identifier. You choose the identifier when you specify the file system in your build project.
 - The file system ID. The ID is displayed when you view your file system in the Amazon EFS console.
 - A mount point. This is a directory in your Docker container that mounts the file system.
 - Mount options. These include details about how to mount the file system.
- 4. Review the build project to ensure that the correct project files and variables were generated.

🚺 Note

A file system created in Amazon EFS is supported on Linux platforms only.

Topics

• Step 1: Create a VPC using AWS CloudFormation

- Step 2: Create an Amazon Elastic File System file system with your VPC
- Step 3: Create a CodeBuild project to use with Amazon EFS
- Step 4: Review the build project

Step 1: Create a VPC using AWS CloudFormation

Create your VPC with an AWS CloudFormation template.

1. Follow the instructions in <u>AWS CloudFormation VPC template</u> to use AWS CloudFormation to create a VPC.

🚯 Note

The VPC created by this AWS CloudFormation template has two private subnets and two public subnets. You must only use private subnets when you use AWS CodeBuild to mount the file system you created in Amazon EFS. If you use one of the public subnets, the build fails.

- 2. Sign in to the AWS Management Console and open the Amazon VPC console at https://console.aws.amazon.com/vpc/.
- 3. Choose the VPC you created with AWS CloudFormation.
- 4. On the **Description** tab, make a note of the name of your VPC and its ID. Both are required when you create your AWS CodeBuild project later in this sample.

Step 2: Create an Amazon Elastic File System file system with your VPC

Create a simple Amazon EFS file system for this sample using the VPC you created earlier.

- 1. Sign in to the AWS Management Console and open the Amazon EFS console at https://console.aws.amazon.com/efs/.
- 2. Choose Create file system.
- 3. From **VPC**, choose the VPC name you noted earlier in this sample.
- 4. Leave the Availability Zones associated with your subnets selected.
- 5. Choose **Next Step**.
- 6. In **Add tags**, for the default **Name** key, in **Value**, enter the name of your Amazon EFS file system.

- 7. Keep **Bursting** and **General Purpose** selected as your default performance and throughput modes, and then choose **Next Step**.
- 8. For **Configure client access**, choose **Next Step**.
- 9. Choose **Create File System**.
- (Optional) We recommend adding a policy to your Amazon EFS file system that enforces encryption of data in transit. In the Amazon EFS console, choose File system policy, choose Edit, select the box labeled Enforce in-transit encryption for all clients, and then choose Save.

Step 3: Create a CodeBuild project to use with Amazon EFS

Create a AWS CodeBuild project that uses the VPC you created earlier in this sample. When the build is run, it mounts the Amazon EFS file system created earlier. Next, it stores the .jar file created by your Java application in your file system's mount point directory.

- 1. Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.
- 2. From the navigation pane, choose **Build projects**, and then choose **Create build project**.
- 3. In **Project name**, enter a name for your project.
- 4. From **Source provider**, choose the repository that contains the Java application you want to build.
- 5. Enter information, such as a repository URL, that CodeBuild uses to locate your application. The options are different for each source provider. For more information, see <u>Choose source</u> provider.
- 6. From **Environment image**, choose **Managed image**.
- 7. From **Operating system**, choose **Amazon Linux 2**.
- 8. From **Runtime(s)**, choose **Standard**.
- 9. From Image, choose aws/codebuild/amazonlinux2-x86_64-standard:4.0.
- 10. From **Environment type**, choose **Linux**.
- 11. Under **Service role**, choose **New service role**. In **Role name**, enter a name for the role CodeBuild creates for you.
- 12. Expand Additional configuration.
- 13. Select Enable this flag if you want to build Docker images or want your builds to get elevated privileges.

🚯 Note

By default, Docker daemon is enabled for non-VPC builds. If you would like to use Docker containers for VPC builds, see <u>Runtime Privilege and Linux Capabilities</u> on the Docker Docs website and enable privileged mode. Also, Windows does not support privileged mode.

- 14. From **VPC**, choose the VPC ID.
- 15. From **Subnets**, choose one or more of the private subnets associated with your VPC. You must use private subnets in a build that mounts an Amazon EFS file system. If you use a public subnet, the build fails.
- 16. From **Security Groups**, choose the default security group.
- 17. In **File systems**, enter the following information:
 - For Identifier, enter a unique file system identifier. It must be fewer than 129 characters and contain only alphanumeric characters and underscores. CodeBuild uses this identifier to create an environment variable that identifies the elastic file system. The environment variable format is CODEBUILD_<file_system_identifier> in capital letters. For example, if you enter my_efs, the environment variable is CODEBUILD_MY_EFS.
 - For **ID**, choose the file system ID.
 - (Optional) Enter a directory in the file system. CodeBuild mounts this directory. If you leave
 Directory path blank, CodeBuild mounts the entire file system. The path is relative to the
 root of the file system.
 - For **Mount point**, enter the absolute path of the directory in your build container where the file system is mounted. If this directory does not exist, CodeBuild creates it during the build.
 - (Optional) Enter mount options. If you leave **Mount options** blank, CodeBuild uses its default mount options:

```
nfsvers=4.1
rsize=1048576
wsize=1048576
hard
timeo=600
retrans=2
```

For more information, see <u>Recommended NFS Mount Options</u> in the *Amazon Elastic File System User Guide*.

- 18. For Build specification, choose Insert build commands, and then choose Switch to editor.
- 19. Enter the following build spec commands into the editor. Replace

<file_system_identifier> with the identifier you entered in step 17. Use capital letters (for example, CODEBUILD_MY_EFS).

```
version: 0.2
phases:
    install:
    runtime-versions:
        java: corretto11
    build:
        commands:
            - mvn compile -Dgpg.skip=true -Dmaven.repo.local=
$CODEBUILD_<file_system_identifier>
```

- 20. Use the default values for all other settings, and then choose **Create build project**. When your build is complete, the console page for your project is displayed.
- 21. Choose **Start build**.

Step 4: Review the build project

After your AWS CodeBuild project is built:

- You have a .jar file created by your Java application that is built to your Amazon EFS file system under your mount point directory.
- An environment variable that identifies your file system is created using the file system identifier you entered when you created the project.

For more information, see <u>Mounting file systems</u> in the Amazon Elastic File System User Guide.

Troubleshoot the Amazon EFS integration

The following are errors you might encounter when setting up Amazon EFS with CodeBuild.

Topics

Amazon EFS sample

- CLIENT_ERROR: mounting '127.0.0.1:/' failed. permission denied
- CLIENT_ERROR: mounting '127.0.0.1:/' failed. connection reset by peer
- VPC_CLIENT_ERROR: Unexpected EC2 error: UnauthorizedOperation

CLIENT_ERROR: mounting '127.0.0.1:/' failed. permission denied

IAM authorization is not supported for mounting Amazon EFS with CodeBuild. If you are using a custom Amazon EFS file system policy, you will need to grant read and write access to all IAM principals. For example:

```
"Principal": {
    "AWS": "*"
}
```

CLIENT_ERROR: mounting '127.0.0.1:/' failed. connection reset by peer

There are two possible causes for this error:

- The CodeBuild VPC subnet is in a different availability zone than the Amazon EFS mount target.
 You can resolve this by adding a VPC subnet in the same availability zone as the Amazon EFS mount target.
- The security group does not have permissions to communicate with Amazon EFS. You can resolve this by adding an inbound rule to allow all traffic from either the VPC (add the primary CIDR block for your VPC), or the security group itself.

VPC_CLIENT_ERROR: Unexpected EC2 error: UnauthorizedOperation

This error occurs when all of the subnets in your VPC configuration for the CodeBuild project are public subnets. You must have at least one private subnet in the VPC to ensure network connectivity.

AWS CodePipeline samples for CodeBuild

This section describes sample integrations between CodePipeline and CodeBuild.

Sample	Description
Samples of CodePipeline/CodeBuild integrati ons and batch builds	These samples demonstrate how to use AWS CodePipeline to create a build project that uses batch builds.
Sample of a CodePipeline/CodeBuild integrati on with multiple input sources and output artifacts	This sample demonstrates how to use AWS CodePipeline to create a build project that uses multiple input sources to create multiple output artifacts.

Samples of CodePipeline/CodeBuild integrations and batch builds

AWS CodeBuild supports batch builds. The following samples demonstrate how to use AWS CodePipeline to create a build project that uses batch builds.

You can use a JSON-formatted file that defines the structure of your pipeline, and then use it with the AWS CLI to create the pipeline. For more information, see <u>AWS CodePipeline Pipeline structure</u> reference in the AWS CodePipeline User Guide.

Batch build with individual artifacts

Use the following JSON file as an example of a pipeline structure that creates a batch build with separate artifacts. To enable batch builds in CodePipeline, set the BatchEnabled parameter of the configuration object to true.

```
{
    "pipeline": {
        "roleArn": "arn:aws:iam::account-id:role/my-AWS-CodePipeline-service-role-name",
        "stages": [
        {
            "name": "Source",
            "actions": [
            {
                "inputArtifacts": [],
                "name": "Source1",
                "actionTypeId": {
                "category": "Source",
                "owner": "AWS",
                "version": "1",
                "stages": [],
                "version": "1",
                "stages": [],
                "stages": [],
                "stages": [],
                "name": "Source1",
                "actionTypeId": {
                "category": "Source",
                "owner": "AWS",
                "version": "1",
                "stages": [],
                "stages": [],
               "stages": [],
                "stages": [],
                "stages": [],
                "stages": [],
                "stages": [],
                "stages": [],
                "stages": [],
                "stages": [],
                "stages": [],
                "stages": [],
                "stages": [],
                "stages": [],
                "stages": [],
                "stages": [],
                "stages": [],
                "stages": [],
                "stages": [],
               "stages": [],
                "stages": [],
                "stages": [],
               "stages": [],
                "stages": [],
                "stages": [],
                "stages": [],
                "stages": [],
                "stages": [],
                "stages": [],
                "stages": [],
                "stages": [],
                "stages": [],
                "stages": [],
                "stages": [],
                "stages": [],
                "stages": [],
```

```
"provider": "S3"
      },
      "outputArtifacts": [
        {
          "name": "source1"
        }
      ],
      "configuration": {
        "S3Bucket": "<my-input-bucket-name>",
        "S3ObjectKey": "my-source-code-file-name.zip"
      },
      "runOrder": 1
    },
    {
      "inputArtifacts": [],
      "name": "Source2",
      "actionTypeId": {
        "category": "Source",
        "owner": "AWS",
        "version": "1",
        "provider": "S3"
      },
      "outputArtifacts": [
        {
          "name": "source2"
        }
      ],
      "configuration": {
        "S3Bucket": "<my-other-input-bucket-name>",
        "S3ObjectKey": "my-other-source-code-file-name.zip"
      },
      "runOrder": 1
    }
 ]
},
{
  "name": "Build",
  "actions": [
    {
      "inputArtifacts": [
        {
          "name": "source1"
        },
        {
```

```
}
          ],
          "name": "Build",
          "actionTypeId": {
            "category": "Build",
            "owner": "AWS",
            "version": "1",
            "provider": "CodeBuild"
          },
          "outputArtifacts": [
            {
              "name": "build1"
            },
            {
              "name": "build1_artifact1"
            },
            {
              "name": "build1_artifact2"
            },
            {
              "name": "build2_artifact1"
            },
            {
              "name": "build2_artifact2"
            }
          ],
          "configuration": {
            "ProjectName": "my-build-project-name",
            "PrimarySource": "source1",
            "BatchEnabled": "true"
          },
          "runOrder": 1
        }
      ]
    }
 ],
  "artifactStore": {
    "type": "S3",
    "location": "<AWS-CodePipeline-internal-bucket-name>"
  },
  "name": "my-pipeline-name",
  "version": 1
}
```

"name": "source2"

}

The following is an example of a CodeBuild buildspec file that will work with this pipeline configuration.

```
version: 0.2
batch:
  build-list:
    - identifier: build1
      env:
        compute-type: BUILD_GENERAL1_SMALL
    - identifier: build2
      env:
        compute-type: BUILD_GENERAL1_MEDIUM
phases:
  build:
    commands:
      - echo 'file' > output_file
artifacts:
 files:
    - output_file
  secondary-artifacts:
    artifact1:
      files:
        - output_file
    artifact2:
      files:
        - output_file
```

The names of the output artifacts specified in the pipeline's JSON file must match the identifier of the builds and artifacts defined in your buildspec file. The syntax is *buildIdentifier* for the primary artifacts, and *buildIdentifier_artifactIdentifier* for the secondary artifacts.

For example, for output artifact name build1, CodeBuild will upload the primary artifact of build1 to the location of build1. For output name build1_artifact1, CodeBuild will upload the secondary artifact artifact1 of build1 to the location of build1_artifact1, and so on. If only one output location is specified, the name should be *buildIdentifier* only.

After you create the JSON file, you can create your pipeline. Use the AWS CLI to run the **createpipeline** command and pass the file to the --cli-input-json parameter. For more information, see Create a pipeline (CLI) in the AWS CodePipeline User Guide.

Batch build with combined artifacts

Use the following JSON file as an example of a pipeline structure that creates a batch build with combined artifacts. To enable batch builds in CodePipeline, set the BatchEnabled parameter of the configuration object to true. To combine the build artifacts into the same location, set the CombineArtifacts parameter of the configuration object to true.

```
{
 "pipeline": {
  "roleArn": "arn:aws:iam::account-id:role/my-AWS-CodePipeline-service-role-name",
  "stages": [
    {
      "name": "Source",
      "actions": [
        {
          "inputArtifacts": [],
          "name": "Source1",
          "actionTypeId": {
            "category": "Source",
            "owner": "AWS",
            "version": "1",
            "provider": "S3"
          },
          "outputArtifacts": [
            {
              "name": "source1"
            }
          ],
          "configuration": {
            "S3Bucket": "<my-input-bucket-name>",
            "S3ObjectKey": "my-source-code-file-name.zip"
          },
          "runOrder": 1
        },
        {
          "inputArtifacts": [],
          "name": "Source2",
          "actionTypeId": {
            "category": "Source",
```

```
"owner": "AWS",
        "version": "1",
        "provider": "S3"
      },
      "outputArtifacts": [
        {
          "name": "source2"
        }
      ],
      "configuration": {
        "S3Bucket": "<my-other-input-bucket-name>",
        "S3ObjectKey": "my-other-source-code-file-name.zip"
      },
      "runOrder": 1
    }
  ]
},
{
  "name": "Build",
  "actions": [
    {
      "inputArtifacts": [
        {
          "name": "source1"
        },
        {
          "name": "source2"
        }
      ],
      "name": "Build",
      "actionTypeId": {
        "category": "Build",
        "owner": "AWS",
        "version": "1",
        "provider": "CodeBuild"
      },
      "outputArtifacts": [
        {
          "name": "output1 "
        }
      ],
      "configuration": {
        "ProjectName": "my-build-project-name",
        "PrimarySource": "source1",
```

```
"BatchEnabled": "true",
             "CombineArtifacts": "true"
          },
          "runOrder": 1
        }
      ]
    }
  ],
  "artifactStore": {
    "type": "S3",
    "location": "<AWS-CodePipeline-internal-bucket-name>"
 },
  "name": "my-pipeline-name",
  "version": 1
}
}
```

The following is an example of a CodeBuild buildspec file that will work with this pipeline configuration.

```
version: 0.2
batch:
  build-list:
    - identifier: build1
      env:
        compute-type: BUILD_GENERAL1_SMALL
    - identifier: build2
      env:
        compute-type: BUILD_GENERAL1_MEDIUM
phases:
  build:
    commands:
      - echo 'file' > output_file
artifacts:
  files:
    - output_file
```

If combined artifacts is enabled for the batch build, there is only one output allowed. CodeBuild will combine the primary artifacts of all the builds into one single ZIP file.

After you create the JSON file, you can create your pipeline. Use the AWS CLI to run the **createpipeline** command and pass the file to the --cli-input-json parameter. For more information, see Create a pipeline (CLI) in the AWS CodePipeline User Guide.

Sample of a CodePipeline/CodeBuild integration with multiple input sources and output artifacts

An AWS CodeBuild project can take more than one input source. It can also create more than one output artifact. This sample demonstrates how to use AWS CodePipeline to create a build project that uses multiple input sources to create multiple output artifacts. For more information, see <u>Multiple input sources and output artifacts sample</u>.

You can use a JSON-formatted file that defines the structure of your pipeline, and then use it with the AWS CLI to create the pipeline. Use the following JSON file as an example of a pipeline structure that creates a build with more than one input source and more than one output artifact. Later in this sample you see how this file specifies the multiple inputs and outputs. For more information, see <u>CodePipeline pipeline structure reference</u> in the *AWS CodePipeline User Guide*.

```
{
 "pipeline": {
  "roleArn": "arn:aws:iam::account-id:role/my-AWS-CodePipeline-service-role-name",
  "stages": [
    {
      "name": "Source",
      "actions": [
        {
          "inputArtifacts": [],
          "name": "Source1",
          "actionTypeId": {
            "category": "Source",
            "owner": "AWS",
            "version": "1",
            "provider": "S3"
          },
          "outputArtifacts": [
            {
              "name": "source1"
            }
          ],
          "configuration": {
            "S3Bucket": "my-input-bucket-name",
            "S3ObjectKey": "my-source-code-file-name.zip"
```

```
},
      "runOrder": 1
    },
    {
      "inputArtifacts": [],
      "name": "Source2",
      "actionTypeId": {
        "category": "Source",
        "owner": "AWS",
        "version": "1",
        "provider": "S3"
      },
      "outputArtifacts": [
        {
          "name": "source2"
        }
      ],
      "configuration": {
        "S3Bucket": "my-other-input-bucket-name",
        "S3ObjectKey": "my-other-source-code-file-name.zip"
      },
      "runOrder": 1
    }
  ]
},
{
  "name": "Build",
  "actions": [
    {
      "inputArtifacts": [
        {
          "name": "source1"
        },
        {
          "name": "source2"
        }
      ],
      "name": "Build",
      "actionTypeId": {
        "category": "Build",
        "owner": "AWS",
        "version": "1",
        "provider": "AWS CodeBuild"
      },
```

```
"outputArtifacts": [
            {
               "name": "artifact1"
            },
            {
               "name": "artifact2"
            }
          ],
          "configuration": {
            "ProjectName": "my-build-project-name",
            "PrimarySource": "source1"
          },
          "runOrder": 1
        }
      ]
    }
  ],
  "artifactStore": {
    "type": "S3",
    "location": "AWS-CodePipeline-internal-bucket-name"
  },
  "name": "my-pipeline-name",
  "version": 1
 }
}
```

In this JSON file:

- One of your input sources must be designated the PrimarySource. This source is the directory where CodeBuild looks for and runs your buildspec file. The keyword PrimarySource is used to specify the primary source in the configuration section of the CodeBuild stage in the JSON file.
- Each input source is installed in its own directory. This directory is stored in the built-in environment variable \$CODEBUILD_SRC_DIR for the primary source and \$CODEBUILD_SRC_DIR_yourInputArtifactName for all other sources. For the pipeline in this sample, the two input source directories are \$CODEBUILD_SRC_DIR and \$CODEBUILD_SRC_DIR_source2. For more information, see Environment variables in build environments.

 The names of the output artifacts specified in the pipeline's JSON file must match the names of the secondary artifacts defined in your buildspec file. This pipeline uses the following buildspec file. For more information, see Buildspec syntax.

```
version: 0.2
phases:
  build:
    commands:
      - touch source1_file
      - cd $CODEBUILD_SRC_DIR_source2
      - touch source2_file
artifacts:
  files:
    _ '**/*'
  secondary-artifacts:
    artifact1:
      base-directory: $CODEBUILD_SRC_DIR
      files:
        - source1_file
    artifact2:
      base-directory: $CODEBUILD_SRC_DIR_source2
      files:

    source2_file
```

After you create the JSON file, you can create your pipeline. Use the AWS CLI to run the **createpipeline** command and pass the file to the --cli-input-json parameter. For more information, see <u>Create a pipeline (CLI)</u> in the AWS CodePipeline User Guide.

AWS Config sample with CodeBuild

AWS Config provides an inventory of your AWS resources and a history of configuration changes to these resources. AWS Config now supports AWS CodeBuild as an AWS resource, which means the service can track your CodeBuild projects. For more information about AWS Config, see <u>What is</u> AWS Config? in the AWS Config Developer Guide.

You can see the following information about CodeBuild resources on the **Resource Inventory** page in the AWS Config console:

• A timeline of your CodeBuild configuration changes.

- Configuration details for each CodeBuild project.
- Relationships with other AWS resources.
- A list of changes to your CodeBuild projects.

Topics

- Use CodeBuild with AWS Config
- Step 3: View AWS CodeBuild data in the AWS Config console

Use CodeBuild with AWS Config

The procedures in this topic show you how to set up AWS Config and look up CodeBuild projects.

Topics

- Prerequisites
- <u>Step 1: Set up AWS Config</u>
- Step 2: Look up AWS CodeBuild projects

Prerequisites

Create your AWS CodeBuild project. For instructions, see Create a build project.

Step 1: Set up AWS Config

- Setting up AWS Config (console)
- Setting up AWS Config (AWS CLI)

i Note

After you complete setup, it might take up to 10 minutes before you can see AWS CodeBuild projects in the AWS Config console.

Step 2: Look up AWS CodeBuild projects

 Sign in to the AWS Management Console and open the AWS Config console at <u>https://</u> console.aws.amazon.com/config.

User Guide

- 2. On the **Resource inventory** page, select **AWS CodeBuild Project** under **Resource type**. Scroll down and select the **CodeBuild project** check box.
- 3. Choose Look up.
- 4. After the list of CodeBuild projects is added, choose the CodeBuild project name link in the **Config timeline** column.

Step 3: View AWS CodeBuild data in the AWS Config console

When you look up resources on the **Resource inventory** page, you can choose the AWS Config timeline to view details about your CodeBuild project. The details page for a resource provides information about the configuration, relationships, and number of changes made to that resource.

The blocks at the top of the page are collectively called the timeline. The timeline shows the date and time that the recording was made.

For more information, see <u>Viewing configuration details in the AWS Config console</u> in the AWS *Config Developer Guide*.

Build notifications sample for CodeBuild

Amazon CloudWatch Events has built-in support for AWS CodeBuild. CloudWatch Events is a stream of system events describing changes in your AWS resources. With CloudWatch Events, you write declarative rules to associate events of interest with automated actions to be taken. This sample uses Amazon CloudWatch Events and Amazon Simple Notification Service (Amazon SNS) to send build notifications to subscribers whenever builds succeed, fail, go from one build phase to another, or any combination of these events.

🔥 Important

Running this sample might result in charges to your AWS account. These include possible charges for CodeBuild and for AWS resources and actions related to Amazon CloudWatch and Amazon SNS. For more information, see <u>CodeBuild pricing</u>, <u>Amazon CloudWatch</u> pricing, and <u>Amazon SNS pricing</u>.

Topics

- Run the build notifications sample
- Build notifications input format reference

User Guide

Run the build notifications sample

Use the following procedure to run the build notifications sample.

To run this sample

1. If you already have a topic set up and subscribed to in Amazon SNS that you want to use for this sample, skip ahead to step 4. Otherwise, if you are using an IAM user instead of an AWS root account or an administrator user to work with Amazon SNS, add the following statement (between ### BEGIN ADDING STATEMENT HERE ### and ### END ADDING STATEMENT HERE ###) to the user (or IAM group the user is associated with). Using an AWS root account is not recommended. This statement enables viewing, creating, subscribing, and testing the sending of notifications to topics in Amazon SNS. Ellipses (...) are used for brevity and to help you locate where to add the statement. Do not remove any statements, and do not type these ellipses into the existing policy.

```
{
  "Statement": [
    ### BEGIN ADDING STATEMENT HERE ###
    {
      "Action": [
        "sns:CreateTopic",
        "sns:GetTopicAttributes",
        "sns:List*",
        "sns:Publish",
        "sns:SetTopicAttributes",
        "sns:Subscribe"
      ],
      "Resource": "*",
      "Effect": "Allow"
    },
    ### END ADDING STATEMENT HERE ###
    . . .
  ],
  "Version": "2012-10-17"
}
```

Note

The IAM entity that modifies this policy must have permission in IAM to modify policies.

For more information, see <u>Editing customer managed policies</u> or the "To edit or delete an inline policy for a group, user, or role" section in <u>Working with inline policies</u> (console) in the *IAM User Guide*.

2. Create or identify a topic in Amazon SNS. AWS CodeBuild uses CloudWatch Events to send build notifications to this topic through Amazon SNS.

To create a topic:

- 1. Open the Amazon SNS console at https://console.aws.amazon.com/sns.
- 2. Choose **Create topic**.
- In Create new topic, for Topic name, enter a name for the topic (for example, CodeBuildDemoTopic). (If you choose a different name, substitute it throughout this sample.)
- 4. Choose **Create topic**.
- 5. On the **Topic details: CodeBuildDemoTopic** page, copy the **Topic ARN** value. You need this value for the next step.

Topic details: CodeBuildDemoTopic		
Publish to topic	Other topic actions -	
Topic ARN	arn:aws:sns:us-east-1: CodeBuildDemoTopic	
Topic owner	1020-0031-0021	
Region	us-east-1	
Display name		

For more information, see Create a topic in the Amazon SNS Developer Guide.

3. Subscribe one or more recipients to the topic to receive email notifications.

To subscribe a recipient to a topic:

1. With the Amazon SNS console open from the previous step, in the navigation pane, choose **Subscriptions**, and then choose **Create subscription**.

- 2. In **Create subscription**, for **Topic ARN**, paste the topic ARN you copied from the previous step.
- 3. For **Protocol**, choose **Email**.
- 4. For **Endpoint**, enter the recipient's full email address.

Create subscription		
Topic ARN	arn:aws:sns:us-east-1:::CodeBuildDemoTopic	
Protocol	Email	
Endpoint	mary@example.com	
	Cancel Create subs	cription

5. Choose Create Subscription.

6. Amazon SNS sends a subscription confirmation email to the recipient. To begin receiving email notifications, the recipient must choose the **Confirm subscription** link in the subscription confirmation email. After the recipient clicks the link, if successfully subscribed, Amazon SNS displays a confirmation message in the recipient's web browser.

For more information, see <u>Subscribe to a topic</u> in the Amazon SNS Developer Guide.

4. If you are using an user instead of an AWS root account or an administrator user to work with CloudWatch Events, add the following statement (between *### BEGIN ADDING STATEMENT HERE ###* and *### END ADDING STATEMENT HERE ###*) to the user (or IAM group the user is associated with). Using an AWS root account is not recommended. This statement is used to allow the user to work with CloudWatch Events. Ellipses (...) are used for brevity and to help you locate where to add the statement. Do not remove any statements, and do not type these ellipses into the existing policy.

```
{
   "Statement": [
    ### BEGIN ADDING STATEMENT HERE ###
    {
```

```
"Action": [
    "events:*",
    "iam:PassRole"
  ],
   "Resource": "*",
    "Effect": "Allow"
  },
  ### END ADDING STATEMENT HERE ###
  ...
],
"Version": "2012-10-17"
```

🚯 Note

}

The IAM entity that modifies this policy must have permission in IAM to modify policies.

For more information, see <u>Editing customer managed policies</u> or the "To edit or delete an inline policy for a group, user, or role" section in <u>Working with inline policies</u> (console) in the *IAM User Guide*.

- 5. Create a rule in CloudWatch Events. To do this, open the CloudWatch console, at https://console.aws.amazon.com/cloudwatch.
- 6. In the navigation pane, under **Events**, choose **Rules**, and then choose **Create rule**.
- 7. On the **Step 1: Create rule page**, **Event Pattern** and **Build event pattern to match events by service** should already be selected.
- 8. For Service Name, choose CodeBuild. For Event Type, All Events should already be selected.
- 9. The following code should be displayed in **Event Pattern Preview**:

```
{
   "source": [
     "aws.codebuild"
  ]
}
```

10. Choose **Edit** and replace the code in **Event Pattern Preview** with one of the following two rule patterns.

This first rule pattern triggers an event when a build starts or completes for the specified build projects in AWS CodeBuild.

```
{
  "source": [
    "aws.codebuild"
  ],
  "detail-type": [
    "CodeBuild Build State Change"
  ],
  "detail": {
    "build-status": [
      "IN_PROGRESS",
      "SUCCEEDED",
      "FAILED",
      "STOPPED"
    ],
    "project-name": [
      "my-demo-project-1",
      "my-demo-project-2"
    ]
  }
}
```

In the preceding rule, make the following code changes as needed.

- To trigger an event when a build starts or completes, either leave all of the values as shown in the build-status array, or remove the build-status array altogether.
- To trigger an event only when a build completes, remove IN_PROGRESS from the buildstatus array.
- To trigger an event only when a build starts, remove all of the values except IN_PROGRESS from the build-status array.
- To trigger events for all build projects, remove the project-name array altogether.
- To trigger events only for individual build projects, specify the name of each build project in the project-name array.

This second rule pattern triggers an event whenever a build moves from one build phase to another for the specified build projects in AWS CodeBuild.

```
{
  "source": [
    "aws.codebuild"
  ],
  "detail-type": [
    "CodeBuild Build Phase Change"
  ],
  "detail": {
    "completed-phase": [
      "SUBMITTED",
      "PROVISIONING",
      "DOWNLOAD_SOURCE",
      "INSTALL",
      "PRE_BUILD",
      "BUILD",
      "POST_BUILD",
      "UPLOAD_ARTIFACTS",
      "FINALIZING"
    ],
    "completed-phase-status": [
      "TIMED_OUT",
      "STOPPED",
      "FAILED",
      "SUCCEEDED",
      "FAULT",
      "CLIENT_ERROR"
    ],
    "project-name": [
      "my-demo-project-1",
      "my-demo-project-2"
    ]
  }
}
```

In the preceding rule, make the following code changes as needed.

- To trigger an event for every build phase change (which might send up to nine notifications for each build), either leave all of the values as shown in the completed-phase array, or remove the completed-phase array altogether.
- To trigger events only for individual build phase changes, remove the name of each build phase in the completed-phase array that you do not want to trigger an event for.

- To trigger an event for every build phase status change, either leave all of the values as shown in the completed-phase-status array, or remove the completed-phase-status array altogether.
- To trigger events only for individual build phase status changes, remove the name of each build phase status in the completed-phase-status array that you do not want to trigger an event for.
- To trigger events for all build projects, remove the project-name array.
- To trigger events for individual build projects, specify the name of each build project in the project-name array.

For more information about event patterns, see <u>Event Patterns</u> in the Amazon EventBridge User Guide.

For more information about filtering with event patterns, see <u>Content-based Filtering with</u> <u>Event Patterns</u> in the Amazon EventBridge User Guide.

i Note

If you want to trigger events for both build state changes and build phase changes, you must create two separate rules: one for build state changes and another for build phase changes. If you try to combine both rules into a single rule, the combined rule might produce unexpected results or stop working altogether.

When you have finished replacing the code, choose **Save**.

- 11. For Targets, choose Add target.
- 12. In the list of targets, choose **SNS topic**.
- 13. For **Topic**, choose the topic you identified or created earlier.
- 14. Expand **Configure input**, and then choose **Input Transformer**.
- 15. In the **Input Path** box, enter one of the following input paths.

For a rule with a detail-type value of CodeBuild Build State Change, enter the following.

```
{"build-id":"$.detail.build-id","project-name":"$.detail.project-name","build-
status":"$.detail.build-status"}
```

For a rule with a detail-type value of CodeBuild Build Phase Change, enter the following.

```
{"build-id":"$.detail.build-id","project-name":"$.detail.project-name","completed-
phase":"$.detail.completed-phase","completed-phase-status":"$.detail.completed-
phase-status"}
```

To get other types of information, see the **Build notifications input format reference**.

16. In the Input Template box, enter one of the following input templates.

For a rule with a detail-type value of CodeBuild Build State Change, enter the following.

```
"Build '<build-id>' for build project '<project-name>' has reached the build status of '<build-status>'."
```

For a rule with a detail-type value of CodeBuild Build Phase Change, enter the following.

"Build '<build-id>' for build project '<project-name>' has completed the build phase of '<completed-phase>' with a status of '<completed-phase-status>'."

- 17. Choose **Configure details**.
- On the Step 2: Configure rule details page, enter a name and an optional description. For State, leave Enabled selected.
- 19. Choose Create rule.
- 20. Create build projects, run the builds, and view build information.
- 21. Confirm that CodeBuild is now successfully sending build notifications. For example, check to see if the build notification emails are now in your inbox.

To change a rule's behavior, in the CloudWatch console, choose the rule you want to change, choose **Actions**, and then choose **Edit**. Make changes to the rule, choose **Configure details**, and then choose **Update rule**.

To stop using a rule to send build notifications, in the CloudWatch console, choose the rule you want to stop using, choose **Actions**, and then choose **Disable**.

To delete a rule altogether, in the CloudWatch console, choose the rule you want to delete, choose **Actions**, and then choose **Delete**.

Build notifications input format reference

CloudWatch delivers notifications in JSON format.

Build state change notifications use the following format:

```
{
  "version": "0",
  "id": "c030038d-8c4d-6141-9545-00ff7b7153EX",
  "detail-type": "CodeBuild Build State Change",
  "source": "aws.codebuild",
  "account": "123456789012",
  "time": "2017-09-01T16:14:28Z",
  "region": "us-west-2",
  "resources":[
    "arn:aws:codebuild:us-west-2:123456789012:build/my-sample-project:8745a7a9-
c340-456a-9166-edf953571bEX"
  ],
  "detail":{
    "build-status": "SUCCEEDED",
    "project-name": "my-sample-project",
    "build-id": "arn:aws:codebuild:us-west-2:123456789012:build/my-sample-
project:8745a7a9-c340-456a-9166-edf953571bEX",
    "additional-information": {
      "artifact": {
        "md5sum": "da9c44c8a9a3cd4b443126e823168fEX",
        "sha256sum":
 "6ccc2ae1df9d155ba83c597051611c42d60e09c6329dcb14a312cecc0a8e39EX",
        "location": "arn:aws:s3:::codebuild-123456789012-output-bucket/my-output-
artifact.zip"
      },
      "environment": {
        "image": "aws/codebuild/standard:5.0",
        "privileged-mode": false,
        "compute-type": "BUILD_GENERAL1_SMALL",
        "type": "LINUX_CONTAINER",
        "environment-variables": []
      },
```

```
"timeout-in-minutes": 60,
      "build-complete": true,
      "initiator": "MyCodeBuildDemoUser",
      "build-start-time": "Sep 1, 2017 4:12:29 PM",
      "source": {
        "location": "codebuild-123456789012-input-bucket/my-input-artifact.zip",
        "type": "S3"
      },
      "logs": {
        "group-name": "/aws/codebuild/my-sample-project",
        "stream-name": "8745a7a9-c340-456a-9166-edf953571bEX",
        "deep-link": "https://console.aws.amazon.com/cloudwatch/home?region=us-
west-2#logEvent:group=/aws/codebuild/my-sample-project;stream=8745a7a9-c340-456a-9166-
edf953571bEX"
      },
      "phases": [
        {
          "phase-context": [],
          "start-time": "Sep 1, 2017 4:12:29 PM",
          "end-time": "Sep 1, 2017 4:12:29 PM",
          "duration-in-seconds": 0,
          "phase-type": "SUBMITTED",
          "phase-status": "SUCCEEDED"
        },
        {
          "phase-context": [],
          "start-time": "Sep 1, 2017 4:12:29 PM",
          "end-time": "Sep 1, 2017 4:13:05 PM",
          "duration-in-seconds": 36,
          "phase-type": "PROVISIONING",
          "phase-status": "SUCCEEDED"
        },
        {
          "phase-context": [],
          "start-time": "Sep 1, 2017 4:13:05 PM",
          "end-time": "Sep 1, 2017 4:13:10 PM",
          "duration-in-seconds": 4,
          "phase-type": "DOWNLOAD_SOURCE",
          "phase-status": "SUCCEEDED"
        },
        {
          "phase-context": [],
          "start-time": "Sep 1, 2017 4:13:10 PM",
          "end-time": "Sep 1, 2017 4:13:10 PM",
```

```
"duration-in-seconds": 0,
  "phase-type": "INSTALL",
  "phase-status": "SUCCEEDED"
},
{
  "phase-context": [],
  "start-time": "Sep 1, 2017 4:13:10 PM",
  "end-time": "Sep 1, 2017 4:13:10 PM",
  "duration-in-seconds": 0,
  "phase-type": "PRE_BUILD",
  "phase-status": "SUCCEEDED"
},
{
  "phase-context": [],
  "start-time": "Sep 1, 2017 4:13:10 PM",
  "end-time": "Sep 1, 2017 4:14:21 PM",
  "duration-in-seconds": 70,
  "phase-type": "BUILD",
  "phase-status": "SUCCEEDED"
},
{
  "phase-context": [],
  "start-time": "Sep 1, 2017 4:14:21 PM",
  "end-time": "Sep 1, 2017 4:14:21 PM",
  "duration-in-seconds": 0,
  "phase-type": "POST_BUILD",
  "phase-status": "SUCCEEDED"
},
{
  "phase-context": [],
  "start-time": "Sep 1, 2017 4:14:21 PM",
  "end-time": "Sep 1, 2017 4:14:21 PM",
  "duration-in-seconds": 0,
  "phase-type": "UPLOAD_ARTIFACTS",
  "phase-status": "SUCCEEDED"
},
 {
  "phase-context": [],
  "start-time": "Sep 1, 2017 4:14:21 PM",
  "end-time": "Sep 1, 2017 4:14:26 PM",
  "duration-in-seconds": 4,
  "phase-type": "FINALIZING",
  "phase-status": "SUCCEEDED"
},
```

```
{
    "start-time": "Sep 1, 2017 4:14:26 PM",
    "phase-type": "COMPLETED"
    }
    ]
    },
    "current-phase": "COMPLETED",
    "current-phase-context": "[]",
    "version": "1"
    }
}
```

Build phase change notifications use the following format:

```
{
  "version": "0",
  "id": "43ddc2bd-af76-9ca5-2dc7-b695e15adeEX",
  "detail-type": "CodeBuild Build Phase Change",
  "source": "aws.codebuild",
  "account": "123456789012",
  "time": "2017-09-01T16:14:21Z",
  "region": "us-west-2",
  "resources":[
    "arn:aws:codebuild:us-west-2:123456789012:build/my-sample-project:8745a7a9-
c340-456a-9166-edf953571bEX"
  ],
  "detail":{
    "completed-phase": "COMPLETED",
    "project-name": "my-sample-project",
    "build-id": "arn:aws:codebuild:us-west-2:123456789012:build/my-sample-
project:8745a7a9-c340-456a-9166-edf953571bEX",
    "completed-phase-context": "[]",
    "additional-information": {
      "artifact": {
        "md5sum": "da9c44c8a9a3cd4b443126e823168fEX",
        "sha256sum":
 "6ccc2ae1df9d155ba83c597051611c42d60e09c6329dcb14a312cecc0a8e39EX",
        "location": "arn:aws:s3:::codebuild-123456789012-output-bucket/my-output-
artifact.zip"
      },
      "environment": {
        "image": "aws/codebuild/standard:5.0",
        "privileged-mode": false,
```

```
"compute-type": "BUILD_GENERAL1_SMALL",
        "type": "LINUX_CONTAINER",
        "environment-variables": []
      },
      "timeout-in-minutes": 60,
      "build-complete": true,
      "initiator": "MyCodeBuildDemoUser",
      "build-start-time": "Sep 1, 2017 4:12:29 PM",
      "source": {
        "location": "codebuild-123456789012-input-bucket/my-input-artifact.zip",
        "type": "S3"
      },
      "logs": {
        "group-name": "/aws/codebuild/my-sample-project",
        "stream-name": "8745a7a9-c340-456a-9166-edf953571bEX",
        "deep-link": "https://console.aws.amazon.com/cloudwatch/home?region=us-
west-2#logEvent:group=/aws/codebuild/my-sample-project;stream=8745a7a9-c340-456a-9166-
edf953571bEX"
      },
      "phases": [
        {
          "phase-context": [],
          "start-time": "Sep 1, 2017 4:12:29 PM",
          "end-time": "Sep 1, 2017 4:12:29 PM",
          "duration-in-seconds": 0,
          "phase-type": "SUBMITTED",
          "phase-status": "SUCCEEDED"
        },
        {
          "phase-context": [],
          "start-time": "Sep 1, 2017 4:12:29 PM",
          "end-time": "Sep 1, 2017 4:13:05 PM",
          "duration-in-seconds": 36,
          "phase-type": "PROVISIONING",
          "phase-status": "SUCCEEDED"
        },
        {
          "phase-context": [],
          "start-time": "Sep 1, 2017 4:13:05 PM",
          "end-time": "Sep 1, 2017 4:13:10 PM",
          "duration-in-seconds": 4,
          "phase-type": "DOWNLOAD_SOURCE",
          "phase-status": "SUCCEEDED"
        },
```

```
{
  "phase-context": [],
  "start-time": "Sep 1, 2017 4:13:10 PM",
  "end-time": "Sep 1, 2017 4:13:10 PM",
  "duration-in-seconds": 0,
  "phase-type": "INSTALL",
  "phase-status": "SUCCEEDED"
},
{
  "phase-context": [],
  "start-time": "Sep 1, 2017 4:13:10 PM",
  "end-time": "Sep 1, 2017 4:13:10 PM",
  "duration-in-seconds": 0,
  "phase-type": "PRE_BUILD",
  "phase-status": "SUCCEEDED"
},
{
  "phase-context": [],
  "start-time": "Sep 1, 2017 4:13:10 PM",
  "end-time": "Sep 1, 2017 4:14:21 PM",
  "duration-in-seconds": 70,
  "phase-type": "BUILD",
  "phase-status": "SUCCEEDED"
},
{
  "phase-context": [],
  "start-time": "Sep 1, 2017 4:14:21 PM",
  "end-time": "Sep 1, 2017 4:14:21 PM",
  "duration-in-seconds": 0,
  "phase-type": "POST_BUILD",
  "phase-status": "SUCCEEDED"
},
{
  "phase-context": [],
  "start-time": "Sep 1, 2017 4:14:21 PM",
  "end-time": "Sep 1, 2017 4:14:21 PM",
  "duration-in-seconds": 0,
  "phase-type": "UPLOAD_ARTIFACTS",
  "phase-status": "SUCCEEDED"
},
{
  "phase-context": [],
  "start-time": "Sep 1, 2017 4:14:21 PM",
  "end-time": "Sep 1, 2017 4:14:26 PM",
```

```
"duration-in-seconds": 4,
          "phase-type": "FINALIZING",
          "phase-status": "SUCCEEDED"
        },
        {
          "start-time": "Sep 1, 2017 4:14:26 PM",
          "phase-type": "COMPLETED"
        }
      ]
    },
    "completed-phase-status": "SUCCEEDED",
    "completed-phase-duration-seconds": 4,
    "version": "1",
    "completed-phase-start": "Sep 1, 2017 4:14:21 PM",
    "completed-phase-end": "Sep 1, 2017 4:14:26 PM"
  }
}
```

Build badges sample with CodeBuild

AWS CodeBuild now supports the use of build badges, which provide an embeddable, dynamically generated image (*badge*) that displays the status of the latest build for a project. This image is accessible through a publicly available URL generated for your CodeBuild project. This allows anyone to view the status of a CodeBuild project. Build badges do not contain any security information, so they do not require authentication.

Topics

- Create a build project with build badges
- <u>Access AWS CodeBuild build badges</u>
- Publish CodeBuild build badges
- <u>CodeBuild badge statuses</u>

Create a build project with build badges

Use the following one of the following procedures to create a build project with build badges enabled. You can use AWS CLI or the AWS Management Console.

To create a build project with build badges enabled (AWS CLI)

 For information about creating a build project, see <u>Create a build project (AWS CLI)</u>. To include build badges with your AWS CodeBuild project, you must specify <u>badgeEnabled</u> with a value of true.

To create a build project with build badges enabled (console)

- Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.
- 2. If a CodeBuild information page is displayed, choose **Create build project**. Otherwise, on the navigation pane, expand **Build**, choose **Build projects**, and then choose **Create build project**.
- 3. In **Project name**, enter a name for this build project. Build project names must be unique across each AWS account. You can also include an optional description of the build project to help other users understand what this project is used for.
- 4. In **Source**, for **Source provider**, choose the source code provider type, and then do one of the following:

Note

CodeBuild does not support build badges with the Amazon S3 source provider. Because AWS CodePipeline uses Amazon S3 for artifact transfers, build badges are not supported for build projects that are part of a pipeline created in CodePipeline.

- If you chose **CodeCommit**, then for **Repository**, choose the name of the repository. Select **Enable build badge** to make your project's build status visible and embeddable.
- If you chose GitHub, follow the instructions to connect (or reconnect) with GitHub. On the GitHub Authorize application page, for Organization access, choose Request access next to each repository you want AWS CodeBuild to be able to access. After you choose Authorize application, back in the AWS CodeBuild console, for Repository, choose the name of the repository that contains the source code. Select Enable build badge to make your project's build status visible and embeddable.
- If you chose Bitbucket, follow the instructions to connect (or reconnect) with Bitbucket. On the Bitbucket Confirm access to your account page, for Organization access, choose Grant access. After you choose Grant access, back in the AWS CodeBuild console, for Repository,

choose the name of the repository that contains the source code. Select **Enable build badge** to make your project's build status visible and embeddable.

<u> Important</u>

Updating your project source might affect the accuracy of the project's build badges.

5. In **Environment**:

For **Environment image**, do one of the following:

- To use a Docker image managed by AWS CodeBuild, choose Managed image, and then make selections from Operating system, Runtime(s), Image, and Image version. Make a selection from Environment type if it is available.
- To use another Docker image, choose Custom image. For Environment type, choose ARM, Linux, Linux GPU, or Windows. If you choose Other registry, for External registry URL, enter the name and tag of the Docker image in Docker Hub, using the format *docker repository/docker image name*. If you choose Amazon ECR, use Amazon ECR repository and Amazon ECR image to choose the Docker image in your AWS account.
- To use a private Docker image, choose Custom image. For Environment type, choose ARM, Linux, Linux GPU, or Windows. For Image registry, choose Other registry, and then enter the ARN of the credentials for your private Docker image. The credentials must be created by Secrets Manager. For more information, see <u>What Is AWS Secrets Manager?</u> in the AWS Secrets Manager User Guide.
- 6. In **Service role**, do one of the following:
 - If you do not have a CodeBuild service role, choose **New service role**. In **Role name**, enter a name for the new role.
 - If you have a CodeBuild service role, choose **Existing service role**. In **Role ARN**, choose the service role.

1 Note

When you use the console to create or update a build project, you can create a CodeBuild service role at the same time. By default, the role works with that build project only. If you use the console to associate this service role with another build project, the role is updated to work with the other build project. A service role can work with up to 10 build projects.

- 7. In **Buildspec**, do one of the following:
 - Choose Use a buildspec file to use the buildspec.yml file in the source code root directory.
 - Choose Insert build commands to use the console to insert build commands.

For more information, see the Buildspec reference.

8. In Artifacts, for Type, do one of the following:

- If you do not want to create build output artifacts, choose No artifacts.
- To store the build output in an S3 bucket, choose Amazon S3, and then do the following:
 - If you want to use your project name for the build output ZIP file or folder, leave Name blank. Otherwise, enter the name. By default, the artifact name is the project name. If you want to use a different name, enter it in the artifacts name box. If you want to output a ZIP file, include the zip extension.
 - For **Bucket name**, choose the name of the output bucket.
 - If you chose Insert build commands earlier in this procedure, for Output files, enter the locations of the files from the build that you want to put into the build output ZIP file or folder. For multiple locations, separate each location with a comma (for example, appspec.yml, target/my-app.jar). For more information, see the description of files in Buildspec syntax.
- 9. Expand Additional configuration and choose options as appropriate.
- 10. Choose **Create build project**. On the **Review** page, choose **Start build** to run the build.

Access AWS CodeBuild build badges

You can use AWS CodeBuild console or the AWS CLI to access build badges.

In the CodeBuild console, in the list of build projects, in the Name column, choose the link that corresponds to the build project. On the Build project: project-name page, in Configuration, choose Copy badge URL. For more information, see View a build project's details (console).

 In the AWS CLI, run the batch-get-projects command. The build badge URL is included in the project environment details section of the output. For more information, see <u>View a build</u> project's details (AWS CLI).

The build badge request URL is generated with a common default branch, but you can specify any branch in your source repository that you have used to run a build. For example:

https://codebuild.us-east-1.amazon.com/badges?uuid=...&branch=<branch>

You can also specify a tag from your source repository by substituting the branch parameter with the tag parameter in the badge URL. For example:

https://codebuild.us-east-1.amazon.com/badges?uuid=...&tag=<tag>

Publish CodeBuild build badges

You can display the status of the latest build in a markdown file using your build badge URL in a markdown image. This is useful to display the status of the most recent build in the readme.md file in your source repository (for example, GitHub or CodeCommit). For example:

![](<build badge URL>)

CodeBuild badge statuses

The CodeBuild build badge can have one of the following statuses.

- **PASSING** The most recent build on the given branch passed.
- FAILING The most recent build on the given branch timed out, failed, faulted, or was stopped.
- IN_PROGRESS The most recent build on the given branch is in progress.
- **UNKNOWN** The project has not yet run a build for the given branch or at all. Also, the build badges feature might have been disabled.

'Test report using the AWS CLI' sample

Tests that you specify in your buildspec file are run during your build. This sample shows you how to use the AWS CLI to incorporate tests into builds in CodeBuild. You can use JUnit to create unit

tests, or you can use another tool to create configuration tests. You can then evaluate the test results to fix issues or optimize your application.

You can use the CodeBuild API or the AWS CodeBuild console to access the test results. This sample shows you how to configure your report so its test results are exported to an S3 bucket.

Topics

• Run the test report sample

Run the test report sample

Use the following steps to run the trest report sample.

Topics

- Prerequisites
- Step 1: Create a report group
- Step 2: Configure a project with a report group
- Step 3: Run and view results of a report

Prerequisites

• Create your test cases. This sample is written with the assumption that you have test cases to include in your sample test report. You specify the location of your test files in the buildspec file.

The following test report file formats are supported:

- Cucumber JSON (.json)
- JUnit XML (.xml)
- NUnit XML (.xml)
- NUnit3 XML (.xml)
- TestNG XML (.xml)
- Visual Studio TRX (.trx)
- Visual Studio TRX XML (.xml)

Create your test cases with any test framework that can create report files in one of these formats (for example, Surefire JUnit plugin, TestNG, or Cucumber).

- Create an S3 bucket and make a note of its name. For more information, see <u>How do I create an</u> S3 bucket? in the Amazon S3 User Guide.
- Create an IAM role and make a note of its ARN. You need the ARN when you create your build project.
- If your role does not have the following permissions, add them.

```
{
    "Effect": "Allow",
    "Resource": [
        "*"
    ],
    "Action": [
        "codebuild:CreateReportGroup",
        "codebuild:CreateReport",
        "codebuild:UpdateReport",
        "codebuild:BatchPutTestCases"
    ]
}
```

For more information, see Permissions for test reporting operations.

Step 1: Create a report group

- 1. Create a file named CreateReportGroupInput.json.
- 2. Create a folder in your S3 bucket where your test results are exported.
- Copy the following into CreateReportGroupInput.json. For <<u>bucket-name</u>>, use the name of the S3 bucket. For <<u>path-to-folder</u>>, enter the path to the folder in your S3 bucket.

```
{
    "name": "<report-name>",
    "type": "TEST",
    "exportConfig": {
        "exportConfigType": "S3",
        "s3Destination": {
            "bucket": "<bucket-name>",
            "path": "<path-to-folder>",
            "packaging": "NONE"
        }
```

}

}

4. Run the following command in the directory that contains CreateReportGroupInput.json.

```
aws codebuild create-report-group --cli-input-json file://
CreateReportGroupInput.json
```

The output looks like the following. Make a note of the ARN for the reportGroup. You use it when you create a project that uses this report group.

```
{
  "reportGroup": {
    "arn": "arn:aws:codebuild:us-west-2:123456789012:report-group/<report-name>",
    "name": "<report-name>",
    "type": "TEST",
    "exportConfig": {
      "exportConfigType": "S3",
      "s3Destination": {
        "bucket": "<s3-bucket-name>",
        "path": "<folder-path>",
        "packaging": "NONE",
        "encryptionKey": "arn:aws:kms:us-west-2:123456789012:alias/aws/s3"
     }
    },
    "created": 1570837165.885,
    "lastModified": 1570837165.885
 }
}
```

Step 2: Configure a project with a report group

To run a report, you first create a CodeBuild build project that is configured with your report group. Test cases specified for your report group are run when you run a build.

- 1. Create a buildspec file named buildspec.yml.
- 2. Use the following YAML as a template for your buildspec.yml file. Be sure to include the commands that run your tests. In the reports section, specify the files that contain the results of your test cases. These files store the test results you can access with CodeBuild. They

expire 30 days after they are created. These files are different from the raw test case result files you export to an S3 bucket.

```
version: 0.2
phases:
install:
    runtime-versions:
        java: openjdk8
build:
    commands:
        echo Running tests
        echo Running tests
        - echo Running to run your tests>

reports:
        report-name-or-arn>: #test file information
    files:
            - '<test-result-files>'
        base-directory: '<optional-base-directory>'
        discard-paths: false #do not remove file paths from test result files
```

Note

Instead of the ARN of an existing report group, you can also specify a name for a report group that has not been created. If you specify a name instead of an ARN, CodeBuild creates a report group when it runs a build. Its name contains your project name and the name you specify in the buildspec file, in this format: project-name-report-group-name. For more information, see <u>Create test reports</u> and <u>Report group naming</u>.

- 3. Create a file named project.json. This file contains input for the create-project command.
- 4. Copy the following JSON into project.json. For source, enter the type and location of the repository that contains your source files. For serviceRole, specify the ARN of the role you are using.

```
{
    "name": "test-report-project",
    "description": "sample-test-report-project",
    "source": {
        "type": "CODECOMMIT|CODEPIPELINE|GITHUB|S3|BITBUCKET|GITHUB_ENTERPRISE|
NO_SOURCE",
```

```
"location": "<your-source-url>"
 },
  "artifacts": {
    "type": "NO_ARTIFACTS"
 },
  "cache": {
    "type": "NO_CACHE"
 },
  "environment": {
    "type": "LINUX_CONTAINER",
    "image": "aws/codebuild/standard:5.0",
    "computeType": "small"
 },
  "serviceRole": "arn:aws:iam::<your-aws-account-id>:role/service-role/<your-role-
name>"
}
```

5. Run the following command in the directory that contains project.json. This creates a project named test-project.

aws codebuild create-project --cli-input-json file://project.json

Step 3: Run and view results of a report

In this section, you run a build of the project you created earlier. During the build process, CodeBuild creates a report with the results of the test cases. The report is contained in the report group you specified.

1. To start a build, run the following command. test-report-project is the name of the build project created above. Make a note of the build ID that appears in the output.

aws codebuild start-build --project-name test-report-project

 Run the following command to get information about your build, including the ARN of your report. For <build-id>, specify your build ID. Make a note of the report ARN in the reportArns property of the output.

```
aws codebuild batch-get-builds --ids <build-id>
```

3. Run the following command to get details about your report. For <*report-arn*>, specify your report ARN.

```
aws codebuild batch-get-reports --report-arns <report-arn>
```

The output looks like the following. This sample output shows how many of the tests were successful, failed, skipped, resulted in an error, or return an unknown status.

```
{
  "reports": [
    {
      "status": "FAILED",
      "reportGroupArn": "<report-group-arn>",
      "name": "<report-group-name>",
      "created": 1573324770.154,
      "exportConfig": {
        "exportConfigType": "S3",
        "s3Destination": {
          "bucket": "<amzn-s3-demo-bucket>",
          "path": "<path-to-your-report-results>",
          "packaging": "NONE",
          "encryptionKey": "<encryption-key>"
        }
      },
      "expired": 1575916770.0,
      "truncated": false,
      "executionId": "arn:aws:codebuild:us-west-2:123456789012:build/<name-of-
build-project>:2c254862-ddf6-4831-a53f-6839a73829c1",
      "type": "TEST",
      "arn": "<report-arn>",
      "testSummary": {
        "durationInNanoSeconds": 6657770,
        "total": 11,
        "statusCounts": {
          "FAILED": 3,
          "SKIPPED": 7,
          "ERROR": 0,
          "SUCCEEDED": 1,
          "UNKNOWN": 0
        }
      }
    }
```

```
],
"reportsNotFound": []
}
```

4. Run the following command to list information about test cases for your report. For <<u>report</u>arn>, specify the ARN of your report. For the optional --filter parameter, you can specify one status result (SUCCEEDED, FAILED, SKIPPED, ERROR, or UNKNOWN).

```
aws codebuild describe-test-cases \
    --report-arn <report-arn> \
    --filter status=SUCCEEDED|FAILED|SKIPPED|ERROR|UNKNOWN
```

The output looks like the following.

```
{
  "testCases": [
    {
      "status": "FAILED",
      "name": "Test case 1",
      "expired": 1575916770.0,
      "reportArn": "<report-arn>",
      "prefix": "Cucumber tests for agent",
      "message": "A test message",
      "durationInNanoSeconds": 1540540,
      "testRawDataPath": "<path-to-output-report-files>"
    },
    {
      "status": "SUCCEEDED",
      "name": "Test case 2",
      "expired": 1575916770.0,
      "reportArn": "<report-arn>",
      "prefix": "Cucumber tests for agent",
      "message": "A test message",
      "durationInNanoSeconds": 1540540,
      "testRawDataPath": "<path-to-output-report-files>"
    }
 ]
}
```

Docker samples for CodeBuild

This section describes sample integrations between Docker and AWS CodeBuild.

Sample	Description
Docker in custom image sample for CodeBuild	This sample builds and runs a Docker image by using CodeBuild and a custom Docker build image (docker:dind in Docker Hub).
'Publish Docker image to an Amazon ECR image repository' sample for CodeBuild	This sample produces as build output a Docker image and then pushes the Docker image to an Amazon Elastic Container Registry (Amazon ECR) image repository.
Private registry with AWS Secrets Manager sample for CodeBuild	This sample shows you how to use a Docker image that is stored in a private registry as your CodeBuild runtime environment.

Docker in custom image sample for CodeBuild

The following sample builds and runs a Docker image by using AWS CodeBuild and a custom Docker build image (docker:dind in Docker Hub).

To learn how to build a Docker image by using a build image provided by CodeBuild with Docker support instead, see our 'Publish Docker image to Amazon ECR' sample.

<u> Important</u>

Running this sample might result in charges to your AWS account. These include possible charges for CodeBuild and for AWS resources and actions related to Amazon S3, AWS KMS, and CloudWatch Logs. For more information, see <u>CodeBuild pricing</u>, <u>Amazon S3 pricing</u>, <u>AWS Key Management Service pricing</u>, and <u>Amazon CloudWatch pricing</u>.

Topics

• Run the Docker in custom image sample

Run the Docker in custom image sample

Use the following procedure to run the Docker in custom image sample. For more information about this sample, see Docker in custom image sample for CodeBuild.

To run the Docker in custom image sample

1. Create the files as described in the <u>Directory structure</u> and <u>Files</u> sections of this topic, and then upload them to an S3 input bucket or an AWS CodeCommit, GitHub, or Bitbucket repository.

🔥 Important

Do not upload (*root directory name*), just the files inside of (*root directory name*).

If you are using an S3 input bucket, be sure to create a ZIP file that contains the files, and then upload it to the input bucket. Do not add (*root directory name*) to the ZIP file, just the files inside of (*root directory name*).

2. Create a build project, run the build, and view related build information.

If you use the AWS CLI to create the build project, the JSON-formatted input to the createproject command might look similar to this. (Replace the placeholders with your own values.)

```
{
  "name": "sample-docker-custom-image-project",
  "source": {
    "type": "S3",
    "location": "codebuild-region-ID-account-ID-input-
bucket/DockerCustomImageSample.zip"
  },
  "artifacts": {
    "type": "NO_ARTIFACTS"
  },
  "environment": {
    "type": "LINUX_CONTAINER",
    "image": "docker:dind",
    "computeType": "BUILD_GENERAL1_SMALL",
    "privilegedMode": false
  },
  "serviceRole": "arn:aws:iam::account-ID:role/role-name",
```

}

"encryptionKey": "arn:aws:kms:region-ID:account-ID:key/key-ID"

(i) Note

By default, Docker daemon is enabled for non-VPC builds. If you would like to use Docker containers for VPC builds, see <u>Runtime Privilege and Linux Capabilities</u> on the Docker Docs website and enable privileged mode. Also, Windows does not support privileged mode.

3. To see the build results, look in the build's log for the string Hello, World!. For more information, see View build details.

Directory structure

This sample assumes this directory structure.

```
(root directory name)
### buildspec.yml
### Dockerfile
```

Files

The base image of the operating system used in this sample is Ubuntu. The sample uses these files.

```
buildspec.yml(in (root directory name))
```

```
version: 0.2
phases:
    pre_build:
        commands:
            - docker build -t helloworld .
    build:
        commands:
            - docker images
            - docker run helloworld echo "Hello, World!"
```

```
Dockerfile(in (root directory name))
```

FROM maven:3.3.9-jdk-8

RUN echo "Hello World"

'Publish Docker image to an Amazon ECR image repository' sample for CodeBuild

This sample produces as build output a Docker image and then pushes the Docker image to an Amazon Elastic Container Registry (Amazon ECR) image repository. You can adapt this sample to push the Docker image to Docker Hub. For more information, see <u>Adapt the 'Publish Docker image</u> to Amazon ECR' sample to push to Docker Hub.

To learn how to build a Docker image by using a custom Docker build image (docker:dind in Docker Hub), see our <u>Docker in custom image sample</u>.

This sample was tested referencing golang:1.12.

This sample uses the new multi-stage Docker builds feature, which produces a Docker image as build output. It then pushes the Docker image to an Amazon ECR image repository. Multi-stage Docker image builds help to reduce the size of the final Docker image. For more information, see Use multi-stage builds with Docker.

🔥 Important

Running this sample might result in charges to your AWS account. These include possible charges for AWS CodeBuild and for AWS resources and actions related to Amazon S3, AWS KMS, CloudWatch Logs, and Amazon ECR. For more information, see <u>CodeBuild pricing</u>, <u>Amazon S3 pricing</u>, <u>AWS Key Management Service pricing</u>, <u>Amazon CloudWatch pricing</u>, and <u>Amazon Elastic Container Registry pricing</u>.

Topics

- Run the 'Publish Docker image to Amazon ECR' sample
- Adapt the 'Publish Docker image to Amazon ECR' sample to push to Docker Hub

Run the 'Publish Docker image to Amazon ECR' sample

Use the following procedure to run the sample that publishes a Docker image to Amazon ECR. For more infomration about this sample, see <u>'Publish Docker image to an Amazon ECR image</u> repository' sample for CodeBuild.

To run this sample

 If you already have an image repository in Amazon ECR you want to use, skip to step 3. Otherwise, if you are using an user instead of an AWS root account or an administrator user to work with Amazon ECR, add this statement (between ### BEGIN ADDING STATEMENT HERE ### and ### END ADDING STATEMENT HERE ###) to the user (or IAM group the user is associated with). Using an AWS root account is not recommended. This statement allows the creation of Amazon ECR repositories for storing Docker images. Ellipses (...) are used for brevity and to help you locate where to add the statement. Do not remove any statements, and do not type these ellipses into the policy. For more information, see <u>Working with inline</u> policies using the AWS Management Console in the user Guide.

```
{
    "Statement": [
    ### BEGIN ADDING STATEMENT HERE ###
    {
        "Action": [
           "ecr:CreateRepository"
     ],
        "Resource": "*",
        "Effect": "Allow"
    },
    ### END ADDING STATEMENT HERE ###
    ...
],
    "Version": "2012-10-17"
}
```

1 Note

The IAM entity that modifies this policy must have permission in IAM to modify policies.

- 2. Create an image repository in Amazon ECR. Be sure to create the repository in the same AWS Region where you create your build environment and run your build. For more information, see <u>Creating a repository</u> in the *Amazon ECR User Guide*. This repository's name must match the repository name you specify later in this procedure, represented by the IMAGE_REPO_NAME environment variable. Ensure that the Amazon ECR repository policy grants image push access for your CodeBuild service IAM role.
- 3. Add this statement (between ### BEGIN ADDING STATEMENT HERE ### and ### END ADDING STATEMENT HERE ###) to the policy you attached to your AWS CodeBuild service role. This statement allows CodeBuild to upload Docker images to Amazon ECR repositories. Ellipses (...) are used for brevity and to help you locate where to add the statement. Do not remove any statements, and do not type these ellipses into the policy.

```
{
  "Statement": [
    ### BEGIN ADDING STATEMENT HERE ###
    {
      "Action": [
        "ecr:BatchCheckLayerAvailability",
        "ecr:CompleteLayerUpload",
        "ecr:GetAuthorizationToken",
        "ecr:InitiateLayerUpload",
        "ecr:PutImage",
        "ecr:UploadLayerPart"
      ],
      "Resource": "*",
      "Effect": "Allow"
    },
    ### END ADDING STATEMENT HERE ###
    . . .
  ],
  "Version": "2012-10-17"
}
```

🚯 Note

The IAM entity that modifies this policy must have permission in IAM to modify policies.

 Create the files as described in the <u>Directory structure</u> and <u>Files</u> sections of this topic, and then upload them to an S3 input bucket or an AWS CodeCommit, GitHub, or Bitbucket repository. For more information, see <u>Image definitions file reference</u> in the AWS CodePipeline User Guide.

<u> Important</u>

Do not upload (root directory name), just the files inside of (root directory name).

If you are using an S3 input bucket, be sure to create a ZIP file that contains the files, and then upload it to the input bucket. Do not add (*root directory name*) to the ZIP file, just the files inside of (*root directory name*).

5. Create a build project, run the build, and view build information.

If you use the console to create your project:

- a. For **Operating system**, choose **Ubuntu**.
- b. For **Runtime**, choose **Standard**.
- c. For Image, choose aws/codebuild/standard:5.0.
- d. Add the following environment variables:
 - AWS_DEFAULT_REGION with a value of *region-ID*
 - AWS_ACCOUNT_ID with a value of account-ID
 - IMAGE_TAG with a value of Latest
 - IMAGE_REPO_NAME with a value of *Amazon-ECR-repo-name*

If you use the AWS CLI to create the build project, the JSON-formatted input to the createproject command might look similar to this. (Replace the placeholders with your own values.)

```
{
    "name": "sample-docker-project",
    "source": {
        "type": "S3",
        "location": "codebuild-region-ID-account-ID-input-bucket/DockerSample.zip"
    },
    "artifacts": {
        "type": "NO_ARTIFACTS"
    }
}
```

```
},
  "environment": {
    "type": "LINUX_CONTAINER",
    "image": "aws/codebuild/standard:5.0",
    "computeType": "BUILD_GENERAL1_SMALL",
    "environmentVariables": [
      {
        "name": "AWS_DEFAULT_REGION",
        "value": "region-ID"
      },
      {
        "name": "AWS_ACCOUNT_ID",
        "value": "account-ID"
      },
      {
        "name": "IMAGE_REPO_NAME",
        "value": "Amazon-ECR-repo-name"
      },
      {
        "name": "IMAGE_TAG",
        "value": "latest"
      }
    ],
 },
  "serviceRole": "arn:aws:iam::account-ID:role/role-name",
  "encryptionKey": "arn:aws:kms:region-ID:account-ID:key/key-ID"
}
```

6. Confirm that CodeBuild successfully pushed the Docker image to the repository:

- 1. Open the Amazon ECR console at https://console.aws.amazon.com/ecr/.
- 2. Choose the repository name. The image should be listed in the **Image tag** column.

Directory structure

This sample assumes this directory structure.

```
(root directory name)
### buildspec.yml
### Dockerfile
```

Files

This sample uses these files.

```
buildspec.yml(in (root directory name))
```

```
version: 0.2
phases:
  pre_build:
    commands:
      - echo Logging in to Amazon ECR...
      - aws ecr get-login-password --region $AWS_DEFAULT_REGION | docker login --
username AWS --password-stdin $AWS_ACCOUNT_ID.dkr.ecr.$AWS_DEFAULT_REGION.amazonaws.com
  build:
    commands:
      - echo Build started on `date`
      - echo Building the Docker image...
      - docker build -t $IMAGE_REPO_NAME:$IMAGE_TAG .
      docker tag $IMAGE_REPO_NAME:$IMAGE_TAG $AWS_ACCOUNT_ID.dkr.ecr.
$AWS_DEFAULT_REGION.amazonaws.com/$IMAGE_REP0_NAME:$IMAGE_TAG
  post_build:
    commands:
      - echo Build completed on `date`
      - echo Pushing the Docker image...
      - docker push $AWS_ACCOUNT_ID.dkr.ecr.$AWS_DEFAULT_REGION.amazonaws.com/
$IMAGE_REPO_NAME:$IMAGE_TAG
```

Dockerfile(in (root directory name))

```
FROM golang:1.12-alpine AS build
#Install git
RUN apk add --no-cache git
#Get the hello world package from a GitHub repository
RUN go get github.com/golang/example/hello
WORKDIR /go/src/github.com/golang/example/hello
# Build the project and send the output to /bin/HelloWorld
RUN go build -o /bin/HelloWorld
FROM golang:1.12-alpine
#Copy the build's output binary from the previous build container
COPY --from=build /bin/HelloWorld /bin/HelloWorld
ENTRYPOINT ["/bin/HelloWorld"]
```

1 Note

CodeBuild overrides the ENTRYPOINT for custom Docker images.

Adapt the 'Publish Docker image to Amazon ECR' sample to push to Docker Hub

To adapt the 'Publish Docker image to Amazon ECR' sample so that the Docker image is pushed to Docker Hub instead of Amazon ECR, edit the sample's code. For more information about the sample, see <u>'Publish Docker image to an Amazon ECR image repository' sample for CodeBuild</u> and Run the 'Publish Docker image to Amazon ECR' sample.

Note

If you are using a version of Docker earlier than 17.06, remove the --no-include-email option.

1. Replace these Amazon ECR-specific lines of code in the buildspec.yml file:

```
pre_build:
    commands:
      - echo Logging in to Amazon ECR...
      - aws ecr get-login-password --region $AWS_DEFAULT_REGION |
docker login --username AWS --password-stdin $AWS_ACCOUNT_ID.dkr.ecr.
$AWS_DEFAULT_REGION.amazonaws.com
  build:
    commands:
      - echo Build started on `date`
      - echo Building the Docker image...
      - docker build -t $IMAGE_REPO_NAME:$IMAGE_TAG .
      - docker tag $IMAGE_REPO_NAME:$IMAGE_TAG $AWS_ACCOUNT_ID.dkr.ecr.
$AWS_DEFAULT_REGION.amazonaws.com/$IMAGE_REPO_NAME:$IMAGE_TAG
  post_build:
    commands:
      - echo Build completed on `date`
      - echo Pushing the Docker image...
      - docker push $AWS_ACCOUNT_ID.dkr.ecr.$AWS_DEFAULT_REGION.amazonaws.com/
$IMAGE_REPO_NAME:$IMAGE_TAG
```

•••

With these Docker Hub-specific lines of code:

```
. . .
 pre build:
   commands:
      - echo Logging in to Docker Hub...
     # Type the command to log in to your Docker Hub account here.
 build:
   commands:
      - echo Build started on `date`
     - echo Building the Docker image...
     - docker build -t $IMAGE_REPO_NAME:$IMAGE_TAG .
      - docker tag $IMAGE_REPO_NAME:$IMAGE_TAG $IMAGE_REPO_NAME:$IMAGE_TAG
 post_build:
   commands:
      - echo Build completed on `date`
     - echo Pushing the Docker image...
     - docker push $IMAGE_REPO_NAME:$IMAGE_TAG
. . .
```

2. Upload the edited code to an S3 input bucket or an AWS CodeCommit, GitHub, or Bitbucket repository.

🔥 Important

Do not upload (root directory name), just the files inside of (root directory name).

If you are using an S3 input bucket, be sure to create a ZIP file that contains the files, and then upload it to the input bucket. Do not add (*root directory name*) to the ZIP file, just the files inside of (*root directory name*).

3. Replace these lines of code from the JSON-formatted input to the create-project command:

```
...
"environmentVariables": [
    {
        "name": "AWS_DEFAULT_REGION",
        "value": "region-ID"
```

```
},
{
    "name": "AWS_ACCOUNT_ID",
    "value": "account-ID"
    },
    {
        "name": "IMAGE_REPO_NAME",
        "value": "Amazon-ECR-repo-name"
    },
    {
        "name": "IMAGE_TAG",
        "value": "latest"
    }
]
```

With these lines of code:

```
...
"environmentVariables": [
    {
        "name": "IMAGE_REPO_NAME",
        "value": "your-Docker-Hub-repo-name"
    },
    {
        "name": "IMAGE_TAG",
        "value": "latest"
    }
]
....
```

- 4. Create a build environment, run the build, and view related build information.
- Confirm that AWS CodeBuild successfully pushed the Docker image to the repository. Sign in to Docker Hub, go to the repository, and choose the Tags tab. The latest tag should contain a very recent Last Updated value.

Private registry with AWS Secrets Manager sample for CodeBuild

This sample shows you how to use a Docker image that is stored in a private registry as your AWS CodeBuild runtime environment. The credentials for the private registry are stored in AWS Secrets Manager. Any private registry works with CodeBuild. This sample uses Docker Hub.

Private registry with AWS Secrets Manager sample

🚯 Note

Secrets are visible to actions and are not masked when written to a file.

Topics

- Private registry sample requirements
- Create a CodeBuild project with a private registry

Private registry sample requirements

To use a private registry with AWS CodeBuild, you must have the following:

• A Secrets Manager secret that stores your Docker Hub credentials. The credentials are used to access your private repository.

Note

You will be charged for secrets that you create.

- A private repository or account.
- A CodeBuild service role IAM policy that grants access to your Secrets Manager secret.

Follow these steps to create these resources and then create a CodeBuild build project using the Docker images stored in your private registry.

Create a CodeBuild project with a private registry

 For information about how to create a free private repository, see <u>Repositories on Docker Hub</u>. You can also run the following commands in a terminal to pull an image, get its ID, and push it to a new repository.

```
docker pull amazonlinux
docker images amazonlinux --format {{.ID}}
docker tag image-id your-username/repository-name:tag
docker login
docker push your-username/repository-name
```

- 2. Follow the steps in <u>Create an AWS Secrets Manager secret</u> in the AWS Secrets Manager User *Guide*.
 - a. In step 3, in **Choose secret type**, choose **Other type of secret**.
 - b. In **Key/value pairs**, create one key-value pair for your Docker Hub user name and one key-value pair for your Docker Hub password.
 - c. Continue following the steps in Create an AWS Secrets Manager secret.
 - d. In step 5, on the **Configure automatic rotation** page, turn it off because the keys correspond to your Docker Hub credentials.
 - e. Finish following the steps in <u>Create an AWS Secrets Manager secret</u>.

For more information, see <u>What is AWS Secrets Manager?</u>

3. When you create an AWS CodeBuild project in the console, CodeBuild attaches the required permission for you. If you use an AWS KMS key other than DefaultEncryptionKey, you must add it to the service role. For more information, see <u>Modifying a role (console)</u> in the *IAM User Guide*.

For your service role to work with Secrets Manager, it must have, at a minimum, the secretsmanager:GetSecretValue permission.

✓ KMS (1 action)			Clone	Remove
Service	KMS			
Actions	Write Decrypt			
Resources	Specific All resources			
	key 📎	arn:aws:kms: <region>:<account>:key/<your-key> EDIT Add ARN to restrict access</your-key></account></region>	0	Any
Request conditions	Specify request conditions	(optional)		

4. To use the console to create a project with an environment stored in a private registry, do the following while you create a project. For information, see <u>Create a build project (console)</u>.

🚯 Note

If your private registry is in your VPC, it must have public internet access. CodeBuild cannot pull an image from a private IP address in a VPC.

- a. In **Environment image**, choose **Custom image**.
- b. For Environment type, choose Linux or Windows.
- c. For **Image registry**, choose **Other registry**.
- d. In **External registry URL**, enter the image location and in **Registry credential optional** enter the ARN or name of your Secrets Manager credentials.

🚯 Note

If your credentials do not exist in your current Region, then you must use the ARN. You cannot use the credential name if the credentials exist in a different Region.

Create a static website with build output hosted in an S3 bucket

You can disable the encryption of artifacts in a build. You might want to do this so that you can publish artifacts to a location that is configured to host a website. (You cannot publish encrypted artifacts.) This sample shows how you can use webhooks to trigger a build and publish its artifacts to an S3 bucket that is configured to be a website.

- 1. Follow the instructions in <u>Setting up a static website</u> to configure an S3 bucket to function like a website.
- 2. Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ https://console.aws.amazon.com/codesuite/codebuild/
- 3. If a CodeBuild information page is displayed, choose **Create build project**. Otherwise, on the navigation pane, expand **Build**, choose **Build projects**, and then choose **Create build project**.
- 4. In **Project name**, enter a name for this build project. Build project names must be unique across each AWS account. You can also include an optional description of the build project to help other users understand what this project is used for.

5. In **Source**, for **Source provider**, choose **GitHub**. Follow the instructions to connect (or reconnect) with GitHub, and then choose **Authorize**.

For **Webhook**, select **Rebuild every time a code change is pushed to this repository**. You can select this check box only if you chose **Use a repository in my account**.

Source	Add source
Source 1 - Primary	
Source provider	
GitHub	▼
Repository	
O Public repository	• Repository in my GitHub account
GitHub repository	
	▼ C
Disconnect GitHub account	
 Additional configuration Git clone depth 	
Git clone depth - optional	
1	▼
Build Status - optional	
Report build statuses to source provider when your bu	ilds start and finish
Webhook - optional	
Rebuild every time a code change is pushed to this rep	ository
Branch filter - optional	
Enter a regular expression	

6. In **Environment**:

For **Environment image**, do one of the following:

- To use a Docker image managed by AWS CodeBuild, choose Managed image, and then make selections from Operating system, Runtime(s), Image, and Image version. Make a selection from Environment type if it is available.
- To use another Docker image, choose Custom image. For Environment type, choose ARM, Linux, Linux GPU, or Windows. If you choose Other registry, for External registry URL, enter the name and tag of the Docker image in Docker Hub, using the format *docker repository/docker image name*. If you choose Amazon ECR, use Amazon ECR repository and Amazon ECR image to choose the Docker image in your AWS account.
- To use a private Docker image, choose Custom image. For Environment type, choose ARM, Linux, Linux GPU, or Windows. For Image registry, choose Other registry, and then enter the ARN of the credentials for your private Docker image. The credentials must be created by Secrets Manager. For more information, see <u>What Is AWS Secrets Manager?</u> in the AWS Secrets Manager User Guide.
- 7. In **Service role**, do one of the following:
 - If you do not have a CodeBuild service role, choose **New service role**. In **Role name**, enter a name for the new role.
 - If you have a CodeBuild service role, choose **Existing service role**. In **Role ARN**, choose the service role.

🚯 Note

When you use the console to create or update a build project, you can create a CodeBuild service role at the same time. By default, the role works with that build project only. If you use the console to associate this service role with another build project, the role is updated to work with the other build project. A service role can work with up to 10 build projects.

- 8. In **Buildspec**, do one of the following:
 - Choose **Use a buildspec file** to use the buildspec.yml file in the source code root directory.
 - Choose Insert build commands to use the console to insert build commands.

For more information, see the **Buildspec reference**.

9. In **Artifacts**, for **Type**, choose **Amazon S3** to store the build output in an S3 bucket.

- 11. If you chose Insert build commands in Environment, then for Output files, enter the locations of the files from the build that you want to put into the output bucket. If you have more than one location, use a comma to separate each location (for example, appspec.yml, target/my-app.jar). For more information, see <u>Artifacts reference-key in the buildspec file</u>.
- 12. Select **Disable artifacts encryption**.
- 13. Expand **Additional configuration** and choose options as appropriate.
- 14. Choose **Create build project**. On the build project page, in **Build history**, choose **Start build** to run the build.
- 15. (Optional) Follow the instructions in <u>Example: Speed up your website with Amazon CloudFront</u> in the *Amazon S3 Developer Guide*.

Multiple input sources and output artifacts sample

You can create an AWS CodeBuild build project with more than one input source and more than one set of output artifacts. This sample shows you how to set up a build project that:

- Uses multiple sources and repositories of varying types.
- Publishes build artifacts to multiple S3 buckets in a single build.

In the following sample, you create a build project and use it to run a build. The sample uses the build project's buildspec file to show you how to incorporate more than one source and create more than one set of artifacts.

To learn how to to create a pipeline that uses multiple source inputs to CodeBuild to create multiple output artifacts, see <u>Sample of a CodePipeline/CodeBuild integration with multiple input</u> sources and output artifacts.

Topics

- Create a build project with multiple inputs and outputs
- Create a build project without a source

Create a build project with multiple inputs and outputs

Use the following procedure to create a build project with multiple inputs and outputs.

To create a build project with multiple inputs and outputs

- 1. Upload your sources to one or more S3 buckets, CodeCommit, GitHub, GitHub Enterprise Server, or Bitbucket repositories.
- 2. Choose which source is the primary source. This is the source in which CodeBuild looks for and runs your buildspec file.
- 3. Create a build project. For more information, see Create a build project in AWS CodeBuild.
- 4. Create your build project, run the build, and get information about the build.
- 5. If you use the AWS CLI to create the build project, the JSON-formatted input to the createproject command might look similar to the following:

```
{
  "name": "sample-project",
  "source": {
    "type": "S3",
    "location": "<bucket/sample.zip>"
  },
  "secondarySources": [
    {
      "type": "CODECOMMIT",
      "location": "https://git-codecommit.us-west-2.amazonaws.com/v1/repos/repo",
      "sourceIdentifier": "source1"
    },
    {
      "type": "GITHUB",
      "location": "https://github.com/awslabs/aws-codebuild-jenkins-plugin",
      "sourceIdentifier": "source2"
    }
  ],
  "secondaryArtifacts": [ss
    {
      "type": "S3",
      "location": "<output-bucket>",
      "artifactIdentifier": "artifact1"
    },
    {
      "type": "S3",
```

```
"location": "<other-output-bucket>",
    "artifactIdentifier": "artifact2"
    }
],
"environment": {
    "type": "LINUX_CONTAINER",
    "image": "aws/codebuild/standard:5.0",
    "computeType": "BUILD_GENERAL1_SMALL"
    },
    "serviceRole": "arn:aws:iam::account-ID:role/role-name",
    "encryptionKey": "arn:aws:kms:region-ID:account-ID:key/key-ID"
}
```

Your primary source is defined under the source attribute. All other sources are called secondary sources and appear under secondarySources. All secondary sources are installed in their own directory. This directory is stored in the built-in environment variable CODEBUILD_SRC_DIR_*sourceIdentifer*. For more information, see <u>Environment variables in build environments</u>.

The secondaryArtifacts attribute contains a list of artifact definitions. These artifacts use the secondary-artifacts block of the buildspec file that is nested inside the artifacts block.

Secondary artifacts in the buildspec file have the same structure as artifacts and are separated by their artifact identifier.

Note

In the <u>CodeBuild API</u>, the artifactIdentifier on a secondary artifact is a required attribute in CreateProject and UpdateProject. It must be used to reference a secondary artifact.

Using the preceding JSON-formatted input, the buildspec file for the project might look like:

```
version: 0.2
phases:
    install:
        runtime-versions:
        java: openjdk11
```

```
build:
    commands:
      - cd $CODEBUILD_SRC_DIR_source1
      - touch file1
      - cd $CODEBUILD_SRC_DIR_source2
      - touch file2
artifacts:
  files:
    - '**.*'
  secondary-artifacts:
    artifact1:
      base-directory: $CODEBUILD_SRC_DIR_source1
      files:
        - file1
    artifact2:
      base-directory: $CODEBUILD_SRC_DIR_source2
      files:
        - file2
```

You can override the version of the primary source using the API with the sourceVersion attribute in StartBuild. To override one or more secondary source versions, use the secondarySourceVersionOverride attribute.

The JSON-formatted input to the the start-build command in the AWS CLI might look like:

```
{
    "projectName": "sample-project",
    "secondarySourcesVersionOverride": [
        {
            "sourceIdentifier": "source1",
            "sourceVersion": "codecommit-branch"
        },
        {
            "sourceIdentifier": "source2",
            "sourceVersion": "github-branch"
        },
     ]
}
```

Create a build project without a source

You can configure a CodeBuild project by choosing the **NO_SOURCE** source type when you configure your source. When your source type is **NO_SOURCE**, you cannot specify a buildspec file because your project does not have a source. Instead, you must specify a YAML-formatted buildspec string in the buildspec attribute of the JSON-formatted input to the create-project CLI command. It might look like this:

```
{
  "name": "project-name",
  "source": {
    "type": "NO_SOURCE",
    "buildspec": "version: 0.2\n\nphases:\n build:\n
                                                          commands:\n
                                                                            - command"
   },
  "environment": {
    "type": "LINUX_CONTAINER",
    "image": "aws/codebuild/standard:5.0",
    "computeType": "BUILD_GENERAL1_SMALL",
  },
  "serviceRole": "arn:aws:iam::account-ID:role/role-name",
  "encryptionKey": "arn:aws:kms:region-ID:account-ID:key/key-ID"
}
```

For more information, see Create a build project (AWS CLI).

Runtime versions in buildspec file sample for CodeBuild

If you use the Amazon Linux 2 (AL2) standard image version 1.0 or later, or the Ubuntu standard image version 2.0 or later, you can specify one or more runtimes in the runtime-versions section of your buildspec file. The following samples show how you can change your project runtime, specify more than one runtime, and specify a runtime that is dependent on another runtime. For information about supported runtimes, see <u>Docker images provided by CodeBuild</u>.

🚯 Note

If you use Docker in your build container, your build must run in privileged mode. For more information, see <u>Run AWS CodeBuild builds manually</u> and <u>Create a build project in AWS</u> <u>CodeBuild</u>.

Topics

- Update the runtime version in the buildspec file
- Specify two runtimes

Update the runtime version in the buildspec file

You can modify the runtime used by your project to a new version by updating the runtimeversions section of your buildspec file. The following examples show how to specify java versions 8 and 11.

• A runtime-versions section that specifies version 8 of Java:

```
phases:
    install:
        runtime-versions:
        java: corretto8
```

• A runtime-versions section that specifies version 11 of Java:

```
phases:
install:
runtime-versions:
java: corretto11
```

The following examples show how to specify different versions of Python using the Ubuntu standard image 5.0 or the Amazon Linux 2 standard image 3.0:

• A runtime-versions section that specifies Python version 3.7:

```
phases:
    install:
        runtime-versions:
        python: 3.7
```

• A runtime-versions section that specifies Python version 3.8:

```
phases:
    install:
        runtime-versions:
```

python: 3.8

This sample demonstrates a project that starts with the Java version 8 runtime, and then is updated to the Java version 10 runtime.

- 1. Download and install Maven. For information, see <u>Downloading Apache Maven</u> and <u>Installing</u> Apache Maven on the Apache Maven website.
- 2. Switch to an empty directory on your local computer or instance, and then run this Maven command.

```
mvn archetype:generate "-DgroupId=com.mycompany.app" "-DartifactId=R00T" "-
DarchetypeArtifactId=maven-archetype-webapp" "-DinteractiveMode=false"
```

If successful, this directory structure and files are created.

```
.
### ROOT
### pom.xml
### src
### main
### resources
### webapp
### WEB-INF
# ### web.xml
### index.jsp
```

3. Create a file named buildspec.yml with the following contents. Store the file in the *(root directory name)/my-web-app directory.*

```
version: 0.2
phases:
    install:
        runtime-versions:
            java: corretto8
    build:
            commands:
                 java -version
                       mvn package
artifacts:
```

```
files:
    - '**/*'
base-directory: 'target/my-web-app'
```

In the buildspec file:

- The runtime-versions section specifies that the project uses version 8 of the Java runtime.
- The java -version command displays the version of Java used by your project when it builds.

Your file structure should now look like this.

```
(root directory name)
### my-web-app
    ### src
    # ### main
    # ### resources
    # ### webapp
    # ### WEB-INF
    # ### web.xml
    # ### index.jsp
    ### buildspec.yml
    ### pom.xml
```

4. Upload the contents of the my-web-app directory to an S3 input bucket or a CodeCommit, GitHub, or Bitbucket repository.

🛕 Important

Do not upload (root directory name) or (root directory name)/my-webapp, just the directories and files in (root directory name)/my-web-app. If you are using an S3 input bucket, be sure to create a ZIP file that contains the directory structure and files, and then upload it to the input bucket. Do not add (root directory name) or (root directory name)/my-web-app to the ZIP file, just the directories and files in (root directory name)/my-web-app.

5. Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.

- Create a build project. For more information, see <u>Create a build project (console)</u> and <u>Run a</u> <u>build (console)</u>. Leave all settings at their default values, except for these settings.
 - For Environment:
 - For Environment image, choose Managed image.
 - For **Operating system**, choose **Amazon Linux 2**.
 - For Runtime(s), choose Standard.
 - For Image, choose aws/codebuild/amazonlinux2-x86_64-standard:4.0.
- 7. Choose Start build.
- 8. On **Build configuration**, accept the defaults, and then choose **Start build**.
- 9. After the build is complete, view the build output on the **Build logs** tab. You should see output similar to the following:

```
[Container] Date Time Phase is DOWNLOAD_SOURCE
[Container] Date Time CODEBUILD_SRC_DIR=/codebuild/output/src460614277/src
[Container] Date Time YAML location is /codebuild/output/src460614277/src/
buildspec.yml
[Container] Date Time Processing environment variables
[Container] Date Time Selecting 'java' runtime version 'corretto8' based on manual
selections...
[Container] Date Time Running command echo "Installing Java version 8 ..."
Installing Java version 8 ...
[Container] Date Time Running command export JAVA_HOME="$JAVA_8_HOME"
[Container] Date Time Running command export JRE_HOME="$JRE_8_HOME"
[Container] Date Time Running command export JDK_HOME="$JDK_8_HOME"
[Container] Date Time Running command for tool_path in "$JAVA_8_HOME"/bin/*
"$JRE_8_HOME"/bin/*;
```

10. Update the runtime-versions section with Java version 11:

```
install:
    runtime-versions:
        java: corretto11
```

11. After you save the change, run your build again and view the build output. You should see that the installed version of Java is 11. You should see output similar to the following:

[Container] Date Time Phase is DOWNLOAD_SOURCE [Container] Date Time CODEBUILD_SRC_DIR=/codebuild/output/src460614277/src [Container] Date Time YAML location is /codebuild/output/src460614277/src/ buildspec.yml [Container] Date Time Processing environment variables [Container] Date Time Selecting 'java' runtime version 'corretto11' based on manual selections... Installing Java version 11 ... [Container] Date Time Running command export JAVA_HOME="\$JAVA_11_HOME" [Container] Date Time Running command export JRE_HOME="\$JRE_11_HOME" [Container] Date Time Running command export JDK_HOME="\$JDK_11_HOME" [Container] Date Time Running command for tool_path in "\$JAVA_11_HOME"/bin/* "\$JRE_11_HOME"/bin/*;

Specify two runtimes

You can specify more than one runtime in the same CodeBuild build project. This sample project uses two source files: one that uses the Go runtime and one that uses the Node.js runtime.

- 1. Create a directory named my-source.
- 2. Inside the my-source directory, create a directory named golang-app.
- 3. Create a file named hello.go with the following contents. Store the file in the golang-app directory.

```
package main
import "fmt"
func main() {
  fmt.Println("hello world from golang")
  fmt.Println("1+1 =", 1+1)
  fmt.Println("7.0/3.0 =", 7.0/3.0)
  fmt.Println(true && false)
  fmt.Println(true && false)
  fmt.Println(true || false)
  fmt.Println(!true)
  fmt.Println("good bye from golang")
```

- 4. Inside the my-source directory, create a directory named nodejs-app. It should be at the same level as the golang-app directory.
- 5. Create a file named index.js with the following contents. Store the file in the nodejs-app directory.

```
console.log("hello world from nodejs");
console.log("1+1 =" + (1+1));
console.log("7.0/3.0 =" + 7.0/3.0);
console.log(true && false);
console.log(true || false);
console.log(!true);
console.log("good bye from nodejs");
```

6. Create a file named package.json with the following contents. Store the file in the nodejsapp directory.

```
{
    "name": "mycompany-app",
    "version": "1.0.0",
    "description": "",
    "main": "index.js",
    "scripts": {
        "test": "echo \"run some tests here\""
    },
    "author": "",
    "license": "ISC"
}
```

7. Create a file named buildspec.yml with the following contents. Store the file in the mysource directory, at the same level as the nodejs-app and golang-app directories. The runtime-versions section specifies the Node.js version 12 and Go version 1.13 runtimes.

```
version: 0.2
phases:
    install:
        runtime-versions:
        golang: 1.13
        nodejs: 12
    build:
```

8. Your file structure should now look like this.

```
my-source
### golang-app
# ### hello.go
### nodejs.app
# ### index.js
# ### package.json
### buildspec.yml
```

9. Upload the contents of the my-source directory to an S3 input bucket or a CodeCommit, GitHub, or Bitbucket repository.

🛕 Important

If you are using an S3 input bucket, be sure to create a ZIP file that contains the directory structure and files, and then upload it to the input bucket. Do not add my-source to the ZIP file, just the directories and files in my-source.

- 10. Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ https://console.aws.amazon.com/codesuite/codebuild/
- 11. Create a build project. For more information, see <u>Create a build project (console)</u> and <u>Run a</u> <u>build (console)</u>. Leave all settings at their default values, except for these settings.

- For Environment:
 - For Environment image, choose Managed image.
 - For Operating system, choose Amazon Linux 2.
 - For Runtime(s), choose Standard.
 - For Image, choose aws/codebuild/amazonlinux2-x86_64-standard:4.0.
- 12. Choose Create build project.
- 13. Choose **Start build**.
- 14. On Build configuration, accept the defaults, and then choose Start build.
- 15. After the build is complete, view the build output on the **Build logs** tab. You should see output similar to the following. It shows output from the Go and Node.js runtimes. It also shows output from the Go and Node.js applications.

```
[Container] Date Time Processing environment variables
[Container] Date Time Selecting 'golang' runtime version '1.13' based on manual
selections...
[Container] Date Time Selecting 'nodejs' runtime version '12' based on manual
selections...
[Container] Date Time Running command echo "Installing Go version 1.13 ..."
Installing Go version 1.13 ...
[Container] Date Time Running command echo "Installing Node.js version 12 ..."
Installing Node.js version 12 ...
[Container] Date Time Running command n $NODE_12_VERSION
   installed : v12.20.1 (with npm 6.14.10)
[Container] Date Time Moving to directory /codebuild/output/src819694850/src
[Container] Date Time Registering with agent
[Container] Date Time Phases found in YAML: 2
[Container] Date Time INSTALL: 0 commands
[Container] Date Time BUILD: 1 commands
[Container] Date Time Phase complete: DOWNLOAD_SOURCE State: SUCCEEDED
[Container] Date Time Phase context status code: Message:
[Container] Date Time Entering phase INSTALL
[Container] Date Time Phase complete: INSTALL State: SUCCEEDED
[Container] Date Time Phase context status code:
                                                  Message:
[Container] Date Time Entering phase PRE_BUILD
[Container] Date Time Phase complete: PRE_BUILD State: SUCCEEDED
[Container] Date Time Phase context status code: Message:
```

[Container] Date Time Entering phase BUILD [Container] Date Time Running command echo Building the Go code... Building the Go code... [Container] Date Time Running command cd \$CODEBUILD_SRC_DIR/golang-app [Container] Date Time Running command go build hello.go [Container] Date Time Running command echo Building the Node code... Building the Node code... [Container] Date Time Running command cd \$CODEBUILD_SRC_DIR/nodejs-app [Container] Date Time Running command npm run test > mycompany-app@1.0.0 test /codebuild/output/src924084119/src/nodejs-app > echo "run some tests here" run some tests here

Source version sample with AWS CodeBuild

This sample demonstrates how to specify a version of your source using a format other than a commit ID (also known as a commit SHA). You can specify the version of your source in the following ways:

- For an Amazon S3 source provider, use the version ID of the object that represents the build input ZIP file.
- For CodeCommit, Bitbucket, GitHub, and GitHub Enterprise Server, use one of the following:
 - Pull request as a pull request reference (for example, refs/pull/1/head).
 - Branch as a branch name.
 - Commit ID.
 - Tag.
 - Reference and a commit ID. The reference can be one of the following:
 - A tag (for example, refs/tags/mytagv1.0^{full-commit-SHA}).
 - A branch (for example, refs/heads/mydevbranch^{full-commit-SHA}).
 - A pull request (for example, refs/pull/1/head^{full-commit-SHA}).

- For GitLab and GitLab Self Managed, use one of the following:
 - Branch as a branch name.
 - Commit ID.
 - Tag.

i Note

You can specify the version of a pull request source only if your repository is GitHub or GitHub Enterprise Server.

If you use a reference and a commit ID to specify a version, the DOWNLOAD_SOURCE phase of your build is faster than if you provide the version only. This is because when you add a reference, CodeBuild does not need to download the entire repository to find the commit.

- You can specify a source version with only a commit ID, such as 12345678901234567890123467890123456789. If you do this, CodeBuild must download the entire repository to find the version.
- You can specify a source version with a reference and a commit ID in this format: refs/heads/branchname^{full-commit-SHA} (for example, refs/heads/ main^{12345678901234567890123467890123456789}). If you do this, CodeBuild downloads only the specified branch to find the version.

🚺 Note

To speed up the DOWNLOAD_SOURCE phase of your build, you can also to set **Git clone depth** to a low number. CodeBuild downloads fewer versions of your repository.

Topics

- Specify a GitHub repository version with a commit ID
- Specify a GitHub repository version with a reference and commit ID

Specify a GitHub repository version with a commit ID

You can specify a source version with only a commit ID, such as

12345678901234567890123467890123456789. If you do this, CodeBuild must download the entire repository to find the version.

To specify a GitHub repository version with a commit ID

- Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.
- Create a build project. For information, see <u>Create a build project (console)</u> and <u>Run a build</u> (console). Leave all settings at their default values, except for these settings:
 - In Source:
 - For **Source provider**, choose **GitHub**. If you are not connected to GitHub, follow the instructions to connect.
 - For **Repository**, choose **Public repository**.
 - For Repository URL, enter https://github.com/aws/aws-sdk-ruby.git.
 - In Environment:
 - For Environment image, choose Managed image.
 - For Operating system, choose Amazon Linux 2.
 - For Runtime(s), choose Standard.
 - For Image, choose aws/codebuild/amazonlinux2-x86_64-standard:4.0.
- 3. For Build specifications, choose Insert build commands, and then choose Switch to editor.
- 4. In **Build commands**, replace the placeholder text with the following:

```
version: 0.2
phases:
    install:
    runtime-versions:
        ruby: 2.6
build:
        commands:
            - echo $CODEBUILD_RESOLVED_SOURCE_VERSION
```

The runtime-versions section is required when you use the Ubuntu standard image 2.0. Here, the Ruby version 2.6 runtime is specified, but you can use any runtime. The echo command displays the version of the source code stored in the CODEBUILD_RESOLVED_SOURCE_VERSION environment variable.

- 5. On **Build configuration**, accept the defaults, and then choose **Start build**.
- 6. For **Source version**, enter **046e8b67481d53bdc86c3f6affdd5d1afae6d369**. This is the SHA of a commit in the https://github.com/aws/aws-sdk-ruby.git repository.
- 7. Choose **Start build**.
- 8. When the build is complete, you should see the following:
 - On the **Build logs** tab, which version of the project source was used. Here is an example.

[Container] Date Time Running command echo \$CODEBUILD_RESOLVED_SOURCE_VERSION 046e8b67481d53bdc86c3f6affdd5d1afae6d369

[Container] Date Time Phase complete: BUILD State: SUCCEEDED

- On the **Environment variables** tab, the **Resolved source version** matches the commit ID used to create the build.
- On the **Phase details** tab, the duration of the DOWNLOAD_SOURCE phase.

Specify a GitHub repository version with a reference and commit ID

You can specify a source version with a reference and a commit ID in this format: refs/heads/branchname^{full-commit-SHA} (for example, refs/heads/ main^{12345678901234567890123467890123456789}). If you do this, CodeBuild downloads only the specified branch to find the version.

To specify a GitHub repository version with a reference and commit ID.

- 1. Complete the steps in Specify a GitHub repository version with a commit ID.
- 2. From the left navigation pane, choose **Build projects**, and then choose the project you created earlier.
- 3. Choose **Start build**.

- 4. In Source version, enter refs/heads/ main^{046e8b67481d53bdc86c3f6affdd5d1afae6d369}. This is the same commit ID and a reference to a branch in the format refs/heads/branchname^{full-commit-SHA}.
- 5. Choose **Start build**.
- 6. When the build is complete, you should see the following:
 - On the **Build logs** tab, which version of the project source was used. Here is an example.

[Container] Date Time Running command echo \$CODEBUILD_RESOLVED_SOURCE_VERSION 046e8b67481d53bdc86c3f6affdd5d1afae6d369

[Container] Date Time Phase complete: BUILD State: SUCCEEDED

- On the Environment variables tab, the Resolved source version matches the commit ID used to create the build.
- On the **Phase details** tab, the duration of the DOWNLOAD_SOURCE phase should be shorter than the duration when you used only the commit ID to specify the version of your source.

Third-party source repository samples for CodeBuild

This section describes sample integrations between third-party source repositories and CodeBuild.

Sample	Description
BitBucket pull request and webhook filter sample – see <u>Run the 'Bitbucket pull request</u> and webhook filter' sample for CodeBuild	This sample shows you how to create a pull request using a Bitbucket repository. It also shows you how to use a Bitbucket webhook to trigger CodeBuild to create a build of a project.
GitHub Enterprise Server sample – see <u>Run</u> <u>the GitHub Enterprise Server sample for</u> <u>CodeBuild</u>	This sample shows you how to set up your CodeBuild projects when your GitHub Enterprise Server repository has a certifica te installed. It also shows how to enable webhooks so that CodeBuild rebuilds the source code every time a code change is

Sample	Description
	pushed to your GitHub Enterprise Server repository.
GitHub pull request and webhook filter sample – see <u>Run the GitHub pull request and</u> webhook filter sample for CodeBuild	This sample shows you how to create a pull request using a GitHub Enterprise Server repository. It also shows how to enable webhooks so that CodeBuild rebuilds the source code every time a code change is pushed to your GitHub Enterprise Server repository.

Run the 'Bitbucket pull request and webhook filter' sample for CodeBuild

AWS CodeBuild supports webhooks when the source repository is Bitbucket. This means that for a CodeBuild build project that has its source code stored in a Bitbucket repository, webhooks can be used to rebuild the source code every time a code change is pushed to the repository. For more information, see Bitbucket webhook events.

This sample shows you how to create a pull request using a Bitbucket repository. It also shows you how to use a Bitbucket webhook to trigger CodeBuild to create a build of a project.

i Note

When using webhooks, it is possible for a user to trigger an unexpected build. To mitigate this risk, see Best practices for using webhooks.

Topics

- Prerequisites
- Step 1: Create a build project with Bitbucket and enable webhooks
- Step 2: Trigger a build with a Bitbucket webhook

Prerequisites

To run this sample you must connect your AWS CodeBuild project with your Bitbucket account.

🚺 Note

CodeBuild has updated its permissions with Bitbucket. If you previously connected your project to Bitbucket and now receive a Bitbucket connection error, you must reconnect to grant CodeBuild permission to manage your webhooks.

Step 1: Create a build project with Bitbucket and enable webhooks

The following steps describe how to create an AWS CodeBuild project with Bitbucket as a source repository and enable webhooks.

- Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.
- 2. If a CodeBuild information page is displayed, choose **Create build project**. Otherwise, on the navigation pane, expand **Build**, choose **Build projects**, and then choose **Create build project**.
- 3. Choose **Create build project**.
- 4. In **Project configuration**:

Project name

Enter a name for this build project. Build project names must be unique across each AWS account. You can also include an optional description of the build project to help other users understand what this project is used for.

5. In **Source**:

Source provider

Choose **Bitbucket**. Follow the instructions to connect (or reconnect) with Bitbucket and then choose **Authorize**.

Repository

Choose Repository in my Bitbucket account.

If you have not previously connected to your Bitbucket account, enter your Bitbucket username and app password, and select **Save Bitbucket credentials**.

Bitbucket repository

Enter the URL for your Bitbucket repository.

6. In **Primary source webhook events**, select the following.

🚯 Note

The **Primary source webhook events** section is only visible if you chose **Repository in my Bitbucket account** in the previous step.

- 1. Select **Rebuild every time a code change is pushed to this repository** when you create your project.
- 2. From **Event type**, choose one or more events.
- 3. To filter when an event triggers a build, under **Start a build under these conditions**, add one or more optional filters.
- 4. To filter when an event is not triggered, under **Don't start a build under these conditions**, add one or more optional filters.
- 5. Choose **Add filter group** to add another filter group, if needed.

For more information about Bitbucket webhook event types and filters, see <u>Bitbucket webhook</u> events.

7. In **Environment**:

Environment image

Choose one of the following:

To use a Docker image managed by AWS CodeBuild:

Choose **Managed image**, and then make selections from **Operating system**, **Runtime(s)**, **Image**, and **Image version**. Make a selection from **Environment type** if it is available. To use another Docker image:

Choose **Custom image**. For **Environment type**, choose **ARM**, **Linux**, **Linux GPU**, or **Windows**. If you choose **Other registry**, for **External registry URL**, enter the name and tag of the Docker image in Docker Hub, using the format *docker repository/docker image name*. If you choose **Amazon ECR**, use **Amazon ECR repository** and **Amazon ECR image** to choose the Docker image in your AWS account.

To use a private Docker image:

Choose **Custom image**. For **Environment type**, choose **ARM**, **Linux**, **Linux GPU**, or **Windows**. For **Image registry**, choose **Other registry**, and then enter the ARN of the credentials for your private Docker image. The credentials must be created by Secrets Manager. For more information, see <u>What Is AWS Secrets Manager?</u> in the AWS Secrets Manager User Guide.

Service role

Choose one of the following:

- If you do not have a CodeBuild service role, choose **New service role**. In **Role name**, enter a name for the new role.
- If you have a CodeBuild service role, choose **Existing service role**. In **Role ARN**, choose the service role.

🚯 Note

When you use the console to create or update a build project, you can create a CodeBuild service role at the same time. By default, the role works with that build project only. If you use the console to associate this service role with another build project, the role is updated to work with the other build project. A service role can work with up to 10 build projects.

- 8. In **Buildspec**, do one of the following:
 - Choose **Use a buildspec file** to use the buildspec.yml file in the source code root directory.
 - Choose **Insert build commands** to use the console to insert build commands.

For more information, see the <u>Buildspec reference</u>.

9. In **Artifacts**:

Run the Bitbucket sample

Туре

Choose one of the following:

- If you do not want to create build output artifacts, choose No artifacts.
- To store the build output in an S3 bucket, choose **Amazon S3**, and then do the following:
 - If you want to use your project name for the build output ZIP file or folder, leave Name blank. Otherwise, enter the name. By default, the artifact name is the project name.
 If you want to use a different name, enter it in the artifacts name box. If you want to output a ZIP file, include the zip extension.
 - For **Bucket name**, choose the name of the output bucket.
 - If you chose **Insert build commands** earlier in this procedure, for **Output files**, enter the locations of the files from the build that you want to put into the build output ZIP file or folder. For multiple locations, separate each location with a comma (for example, appspec.yml, target/my-app.jar). For more information, see the description of files in Buildspec syntax.

Additional configuration

Expand Additional configuration and set options as appropriate.

10. Choose **Create build project**. On the **Review** page, choose **Start build** to run the build.

Step 2: Trigger a build with a Bitbucket webhook

For a project that uses Bitbucket webhooks, AWS CodeBuild creates a build when the Bitbucket repository detects a change in your source code.

- Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.
- 2. On the navigation pane, choose **Build projects**, and then choose a project associated with a Bitbucket repository with webhooks. For information about creating a Bitbucket webhook project, see <u>the section called "Step 1: Create a build project with Bitbucket and enable</u> webhooks".
- 3. Make some changes in the code in your project's Bitbucket repository.
- 4. Create a pull request on your Bitbucket repository. For more information, see <u>Making a pull</u> request.
- 5. On the Bitbucket webhooks page, choose **View request** to see a list of recent events.

6. Choose **View details** to see details about the response returned by CodeBuild. It might look something like this:

```
"response":"Webhook received and build started: https://us-
east-1.console.aws.amazon.com/codebuild/home..."
"statusCode":200
```

7. Navigate to the Bitbucket pull request page to see the status of the build.

Run the GitHub Enterprise Server sample for CodeBuild

AWS CodeBuild supports GitHub Enterprise Server as a source repository. This sample shows how to set up your CodeBuild projects when your GitHub Enterprise Server repository has a certificate installed. It also shows how to enable webhooks so that CodeBuild rebuilds the source code every time a code change is pushed to your GitHub Enterprise Server repository.

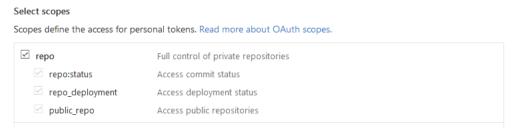
Topics

- Prerequisites
- Step 1: Create a build project with GitHub Enterprise Server and enable webhooks

Prerequisites

 Generate a personal access token for your CodeBuild project. We recommend that you create a GitHub Enterprise user and generate a personal access token for this user. Copy it to your clipboard so that it can be used when you create your CodeBuild project. For more information, see <u>Creating a personal access token for the command line</u> on the GitHub Help website.

When you create the personal access token, include the **repo** scope in the definition.



2. Download your certificate from GitHub Enterprise Server. CodeBuild uses the certificate to make a trusted SSL connection to the repository.

Linux/macOS clients:

From a terminal window, run the following command:

Replace the placeholders in the command with the following values:

HOST. The IP address of your GitHub Enterprise Server repository.

PORTNUMBER. The port number you are using to connect (for example, 443).

folder. The folder where you downloaded your certificate.

filename. The file name of your certificate file.

<u> Important</u>

Save the certificate as a .pem file.

Windows clients:

Use your browser to download your certificate from GitHub Enterprise Server. To see the site's certificate details, choose the padlock icon. For information about how to export the certificate, see your browser documentation.

A Important

Save the certificate as a .pem file.

3. Upload your certificate file to an S3 bucket. For information about how to create an S3 bucket, see <u>How do I create an S3 Bucket?</u> For information about how to upload objects to an S3 bucket, see How do I upload files and folders to a bucket?

🚯 Note

This bucket must be in the same AWS region as your builds. For example, if you instruct CodeBuild to run a build in the US East (Ohio) Region, the bucket must be in the US East (Ohio) Region.

Step 1: Create a build project with GitHub Enterprise Server and enable webhooks

- Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ https://console.aws.amazon.com/codesuite/codebuild/
- 2. If a CodeBuild information page is displayed, choose **Create build project**. Otherwise, on the navigation pane, expand **Build**, choose **Build projects**, and then choose **Create build project**.
- 3. In **Project name**, enter a name for this build project. Build project names must be unique across each AWS account. You can also include an optional description of the build project to help other users understand what this project is used for.
- 4. In Source, in Source provider, choose GitHub Enterprise.
 - For **Personal Access Token**, paste the token you copied to your clipboard and choose **Save Token**. In **Repository URL**, enter the URL for your GitHub Enterprise Server repository.

🚯 Note

You only need to enter and save the personal access token once. All future AWS CodeBuild projects use this token.

- In **Repository URL**, enter the path to your repository, including the name of the repository.
- Expand Additional configuration.
- Select **Rebuild every time a code change is pushed to this repository** to rebuild every time a code change is pushed to this repository.
- Select **Enable insecure SSL** to ignore SSL warnings while you connect to your GitHub Enterprise Server project repository.

Note

We recommend that you use **Enable insecure SSL** for testing only. It should not be used in a production environment.

Source	Add source
Source 1 - Primary	
ource provider	
GitHub Enterprise	
epository URL	
ttps:// <host-name>/<user-name>/<repository-name></repository-name></user-name></host-name>	
Disconnect GitHub Enterprise account	
 Additional configuration Git clone depth, Insecure SSL St clone depth - optional 	
1	
I • • • • •	
Vebhook - optional	
Vebhook - optional	
Vebhook - <i>optional</i> Rebuild every time a code change is pushed to this repository	
Vebhook - <i>optional</i> Rebuild every time a code change is pushed to this repository	
Vebhook - <i>optional</i> Rebuild every time a code change is pushed to this repository aranch filter - <i>optional</i>	

5. In **Environment**:

For **Environment image**, do one of the following:

- To use a Docker image managed by AWS CodeBuild, choose Managed image, and then make selections from Operating system, Runtime(s), Image, and Image version. Make a selection from Environment type if it is available.
- To use another Docker image, choose Custom image. For Environment type, choose ARM, Linux, Linux GPU, or Windows. If you choose Other registry, for External registry URL, enter the name and tag of the Docker image in Docker Hub, using the format *docker repository/docker image name*. If you choose Amazon ECR, use Amazon ECR repository and Amazon ECR image to choose the Docker image in your AWS account.
- To use a private Docker image, choose Custom image. For Environment type, choose ARM, Linux, Linux GPU, or Windows. For Image registry, choose Other registry, and then enter the ARN of the credentials for your private Docker image. The credentials must be created by Secrets Manager. For more information, see <u>What Is AWS Secrets Manager?</u> in the AWS Secrets Manager User Guide.
- 6. In **Service role**, do one of the following:
 - If you do not have a CodeBuild service role, choose **New service role**. In **Role name**, enter a name for the new role.
 - If you have a CodeBuild service role, choose **Existing service role**. In **Role ARN**, choose the service role.

🚺 Note

When you use the console to create or update a build project, you can create a CodeBuild service role at the same time. By default, the role works with that build project only. If you use the console to associate this service role with another build project, the role is updated to work with the other build project. A service role can work with up to 10 build projects.

7. Expand Additional configuration.

If you want CodeBuild to work with your VPC:

- For **VPC**, choose the VPC ID that CodeBuild uses.
- For VPC Subnets, choose the subnets that include resources that CodeBuild uses.

• For **VPC Security groups**, choose the security groups that CodeBuild uses to allow access to resources in the VPCs.

For more information, see Use AWS CodeBuild with Amazon Virtual Private Cloud.

- 8. In **Buildspec**, do one of the following:
 - Choose **Use a buildspec file** to use the buildspec.yml file in the source code root directory.
 - Choose Insert build commands to use the console to insert build commands.

For more information, see the **Buildspec reference**.

- 9. In **Artifacts**, for **Type**, do one of the following:
 - If you do not want to create build output artifacts, choose No artifacts.
 - To store the build output in an S3 bucket, choose Amazon S3, and then do the following:
 - If you want to use your project name for the build output ZIP file or folder, leave Name blank. Otherwise, enter the name. By default, the artifact name is the project name. If you want to use a different name, enter it in the artifacts name box. If you want to output a ZIP file, include the zip extension.
 - For **Bucket name**, choose the name of the output bucket.
 - If you chose **Insert build commands** earlier in this procedure, for **Output files**, enter the locations of the files from the build that you want to put into the build output ZIP file or folder. For multiple locations, separate each location with a comma (for example, appspec.yml, target/my-app.jar). For more information, see the description of files in Buildspec syntax.
- 10. For **Cache type**, choose one of the following:
 - If you do not want to use a cache, choose **No cache**.
 - If you want to use an Amazon S3 cache, choose Amazon S3, and then do the following:
 - For **Bucket**, choose the name of the S3 bucket where the cache is stored.
 - (Optional) For **Cache path prefix**, enter an Amazon S3 path prefix. The **Cache path prefix** value is similar to a directory name. It makes it possible for you to store the cache under the same directory in a bucket.

🔥 Important

Do not append a trailing slash (/) to the end of the path prefix.

• If you want to use a local cache, choose **Local**, and then choose one or more local cache modes.

🚯 Note

Docker layer cache mode is available for Linux only. If you choose it, your project must run in privileged mode.

Using a cache saves considerable build time because reusable pieces of the build environment are stored in the cache and used across builds. For information about specifying a cache in the buildspec file, see <u>Buildspec syntax</u>. For more information about caching, see <u>Cache builds to improve performance</u>.

- 11. Choose **Create build project**. On the build project page, choose **Start build**.
- 12. If you enabled webhooks in **Source**, a **Create webhook** dialog box is displayed with values for **Payload URL** and **Secret**.

🔥 Important

The **Create webhook** dialog box appears only once. Copy the payload URL and secret key. You need them when you add a webhook in GitHub Enterprise Server. If you need to generate a payload URL and secret key again, you must first delete the webhook from your GitHub Enterprise Server repository. In your CodeBuild project, clear the **Webhook** check box and then choose **Save**. You can then create or update a CodeBuild project with the **Webhook** check box selected. The **Create webhook** dialog box appears again.

- 13. In GitHub Enterprise Server, choose the repository where your CodeBuild project is stored.
- 14. Choose **Settings**, choose **Hooks & services**, and then choose **Add webhook**.
- 15. Enter the payload URL and secret key, accept the defaults for the other fields, and then choose **Add webhook**.

equests 0	🔲 Projects 🛛	🔳 Wiki	4- Pulse	<u>II</u> Graphs	Contemporation Settings	
Webhooks /	Add webhook					
	like to receive (JSO					also specify which data found in our developer
Payload URL	*					
Content type	2			2		
application	/json	\$				
Secret						
•••••	••••••	••••••	•••••	•••••		
🖰 By default, v	ve verify SSL certificate	s when deliveri	ng payloads.			Disable SSL verification
Which event	s would you like to	trigger this	webhook?			
Just the p	ush event.					
O Send me	everything.					
O Let me se	lect individual even	ts.				
Active We will del	iver event details when D ok	this hook is tri	ggered.			

16. Return to your CodeBuild project. Close the **Create webhook** dialog box and choose **Start build**.

Run the GitHub pull request and webhook filter sample for CodeBuild

AWS CodeBuild supports webhooks when the source repository is GitHub. This means that for a CodeBuild build project that has its source code stored in a GitHub repository, webhooks can be used to rebuild the source code every time a code change is pushed to the repository. For CodeBuild samples, see AWS CodeBuild Samples.

Note

When using webhooks, it is possible for a user to trigger an unexpected build. To mitigate this risk, see <u>Best practices for using webhooks</u>.

Topics

- Step 1: Create a build project with GitHub and enable webhooks
- Step 2: Verify that webhooks are enabled

Step 1: Create a build project with GitHub and enable webhooks

- 1. Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/home.
- 2. If a CodeBuild information page is displayed, choose **Create build project**. Otherwise, on the navigation pane, expand **Build**, choose **Build projects**, and then choose **Create build project**.
- 3. Choose Create build project.
- 4. In **Project configuration**:

Project name

Enter a name for this build project. Build project names must be unique across each AWS account. You can also include an optional description of the build project to help other users understand what this project is used for.

5. In **Source**:

Source provider

Choose **GitHub**. Follow the instructions to connect (or reconnect) with GitHub and then choose **Authorize**.

Repository

Choose **Repository in my GitHub account**.

GitHub repository

Enter the URL for your GitHub repository.

6. In **Primary source webhook events**, select the following.

Note

The **Primary source webhook events** section is only visible if you chose **Repository in my GitHub account** in the previous step.

- 1. Select **Rebuild every time a code change is pushed to this repository** when you create your project.
- 2. From **Event type**, choose one or more events.
- 3. To filter when an event triggers a build, under **Start a build under these conditions**, add one or more optional filters.
- 4. To filter when an event is not triggered, under **Don't start a build under these conditions**, add one or more optional filters.
- 5. Choose **Add filter group** to add another filter group, if needed.

For more information about GitHub webhook event types and filters, see <u>GitHub webhook</u> events.

7. In **Environment**:

Environment image

Choose one of the following:

To use a Docker image managed by AWS CodeBuild:

Choose **Managed image**, and then make selections from **Operating system**, **Runtime(s)**, **Image**, and **Image version**. Make a selection from **Environment type** if it is available. To use another Docker image:

Choose **Custom image**. For **Environment type**, choose **ARM**, **Linux**, **Linux GPU**, or **Windows**. If you choose **Other registry**, for **External registry URL**, enter the name and tag of the Docker image in Docker Hub, using the format *docker repository/docker image name*. If you choose **Amazon ECR**, use **Amazon ECR repository** and **Amazon ECR image** to choose the Docker image in your AWS account.

To use a private Docker image:

Choose **Custom image**. For **Environment type**, choose **ARM**, **Linux**, **Linux GPU**, or **Windows**. For **Image registry**, choose **Other registry**, and then enter the ARN of the credentials for your private Docker image. The credentials must be created by Secrets Manager. For more information, see <u>What Is AWS Secrets Manager?</u> in the AWS Secrets Manager User Guide.

Service role

Choose one of the following:

- If you do not have a CodeBuild service role, choose **New service role**. In **Role name**, enter a name for the new role.
- If you have a CodeBuild service role, choose **Existing service role**. In **Role ARN**, choose the service role.

🚯 Note

When you use the console to create or update a build project, you can create a CodeBuild service role at the same time. By default, the role works with that build project only. If you use the console to associate this service role with another build project, the role is updated to work with the other build project. A service role can work with up to 10 build projects.

- 8. In **Buildspec**, do one of the following:
 - Choose **Use a buildspec file** to use the buildspec.yml file in the source code root directory.
 - Choose **Insert build commands** to use the console to insert build commands.

For more information, see the <u>Buildspec reference</u>.

9. In Artifacts:

Туре

Choose one of the following:

- If you do not want to create build output artifacts, choose **No artifacts**.
- To store the build output in an S3 bucket, choose **Amazon S3**, and then do the following:
 - If you want to use your project name for the build output ZIP file or folder, leave Name blank. Otherwise, enter the name. By default, the artifact name is the project name.
 If you want to use a different name, enter it in the artifacts name box. If you want to output a ZIP file, include the zip extension.
 - For **Bucket name**, choose the name of the output bucket.
 - If you chose Insert build commands earlier in this procedure, for Output files, enter the locations of the files from the build that you want to put into the build output ZIP file or folder. For multiple locations, separate each location with a comma (for example, appspec.yml, target/my-app.jar). For more information, see the description of files in Buildspec syntax.

Additional configuration

Expand Additional configuration and set options as appropriate.

10. Choose **Create build project**. On the **Review** page, choose **Start build** to run the build.

Step 2: Verify that webhooks are enabled

- Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.
- 2. In the navigation pane, choose **Build projects**.
- 3. Do one of the following:
 - Choose the link for the build project with webhooks you want to verify, and then choose **Build details**.
 - Choose the button next to the build project with webhooks you want to verify, choose **View details**, and then choose the **Build details** tab.
- 4. In **Primary source webhook events**, choose the **Webhook** URL link.
- 5. In your GitHub repository, on the **Settings** page, under **Webhooks**, verify that **Pull Requests** and **Pushes** are selected.

 In your GitHub profile settings, under Personal settings, Applications, Authorized OAuth Apps, you should see that your application has been authorized to access the AWS Region you selected.

Set artifact names at build time using semantic versioning

This sample contains example buildspec files that demonstrate how to specify an artifact name that is created at build time. A name specified in a buildspec file can incorporate Shell commands and environment variables to make it unique. A name you specify in a buildspec file overrides a name you enter in the console when you create your project.

If you build multiple times, using an artifact name specified in the buildspec file can ensure your output artifact file names are unique. For example, you can use a date and timestamp that is inserted into an artifact name at build time.

If you want to override the artifact name you entered in the console with a name in the buildspec file, do the following:

- 1. Set your build project to override the artifact name with a name in the buildspec file.
 - If you use the console to create your build project, select **Enable semantic versioning**. For more information, see Create a build project (console).
 - If you use the AWS CLI, set the overrideArtifactName to true in the JSON-formatted file passed to create-project. For more information, see Create a build project (AWS CLI).
 - If you use the AWS CodeBuild API, set the overrideArtifactName flag on the ProjectArtifacts object when a project is created or updated or a build is started.
- 2. Specify a name in the buildspec file. Use the following sample buildspec files as a guide.

This Linux example shows you how to specify an artifact name that includes the date the build is created:

```
version: 0.2
phases:
    build:
        commands:
            - rspec HelloWorld_spec.rb
artifacts:
    files:
```

```
- '**/*'
name: myname-$(date +%Y-%m-%d)
```

This Linux example shows you how to specify an artifact name that uses a CodeBuild environment variable. For more information, see Environment variables in build environments.

```
version: 0.2
phases:
    build:
        commands:
            - rspec HelloWorld_spec.rb
artifacts:
    files:
            - '**/*'
    name: myname-$AWS_REGION
```

This Windows example shows you how to specify an artifact name that includes the date and time the build is created:

```
version: 0.2
env:
  variables:
   TEST_ENV_VARIABLE: myArtifactName
phases:
  build:
    commands:
        - cd samples/helloworld
        - dotnet restore
        - dotnet run
artifacts:
   files:
        _ '**/*'
   name: $Env:TEST_ENV_VARIABLE-$(Get-Date -UFormat "%Y%m%d-%H%M%S")
```

This Windows example shows you how to specify an artifact name that uses a variable declared in the buildspec file and a CodeBuild environment variable. For more information, see <u>Environment</u> variables in build environments.

version: 0.2 env: variables:

```
TEST_ENV_VARIABLE: myArtifactName
phases:
    build:
        commands:
            - cd samples/helloworld
            - dotnet restore
            - dotnet run
artifacts:
    files:
            - '**/*'
name: $Env:TEST_ENV_VARIABLE-$Env:AWS_REGION
```

For more information, see Build specification reference for CodeBuild.

Run Microsoft Windows samples for CodeBuild

These samples use an AWS CodeBuild build environment running Microsoft Windows Server 2019, the .NET Framework, and the .NET Core SDK to build runtime files out of code written in F# and Visual Basic.

🛕 Important

Running these samples might result in charges to your AWS account. These include possible charges for CodeBuild and for AWS resources and actions related to Amazon S3, AWS KMS, and CloudWatch Logs. For more information, see <u>CodeBuild pricing</u>, <u>Amazon S3 pricing</u>, <u>AWS Key Management Service pricing</u>, and <u>Amazon CloudWatch pricing</u>.

Run the Windows samples

Use the following procedure to run the Windows samples.

To run the Windows samples

1. Create the files as described in the <u>Directory structure</u> and <u>Files</u> sections of this topic, and then upload them to an S3 input bucket or a CodeCommit or GitHub repository.

🛕 Important

Do not upload (root directory name), just the files inside of (root directory name).

If you are using an S3 input bucket, be sure to create a ZIP file that contains the files, and then upload it to the input bucket. Do not add (*root directory name*) to the ZIP file, just the files inside of (*root directory name*).

2. Create a build project. The build project must use the mcr.microsoft.com/dotnet/ framework/sdk:4.8 image to build .NET Framework projects.

If you use the AWS CLI to create the build project, the JSON-formatted input to the createproject command might look similar to this. (Replace the placeholders with your own values.)

```
{
  "name": "sample-windows-build-project",
  "source": {
    "type": "S3",
    "location": "codebuild-region-ID-account-ID-input-bucket/windows-build-input-
artifact.zip"
  },
  "artifacts": {
    "type": "S3",
    "location": "codebuild-region-ID-account-ID-output-bucket",
    "packaging": "ZIP",
    "name": "windows-build-output-artifact.zip"
 },
  "environment": {
    "type": "WINDOWS_SERVER_2019_CONTAINER",
    "image": "mcr.microsoft.com/dotnet/framework/sdk:4.8",
    "computeType": "BUILD_GENERAL1_MEDIUM"
 },
  "serviceRole": "arn:aws:iam::account-ID:role/role-name",
  "encryptionKey": "arn:aws:kms:region-ID:account-ID:key/key-ID"
}
```

- 3. Run the build, and follow the steps in <u>Run builds manually</u>.
- 4. To get the build output artifact, in your S3 output bucket, download the *windows-build-output-artifact*. zip file to your local computer or instance. Extract the contents to get to the runtime and other files.
 - The runtime file for the F# sample using the .NET Framework, FSharpHelloWorld.exe, can be found in the FSharpHelloWorld\bin\Debug directory.
 - The runtime file for the Visual Basic sample using the .NET Framework, VBHelloWorld.exe, can be found in the VBHelloWorld\bin\Debug directory.

Directory structure

These samples assume the following directory structures.

F# and the .NET Framework

(root directory name)

```
### buildspec.yml
### FSharpHelloWorld.sln
### FSharpHelloWorld
    ### App.config
    ### AssemblyInfo.fs
    ### FSharpHelloWorld.fsproj
    ### Program.fs
```

Visual Basic and the .NET Framework

(root directory name)
buildspec.yml
VBHelloWorld.sln
VBHelloWorld
 ### App.config
 ### HelloWorld.vb
 ### VBHelloWorld.vbproj
 ### VBHelloWorld.vbproj
 ### Application.Designer.vb
 ### Application.myapp
 ### AssemblyInfo.vb
 ### Resources.Designer.vb
 ### Settings.Designer.vb
 ### Settings.settings

Files

These samples use the following files.

F# and the .NET Framework

```
buildspec.yml (in (root directory name)):
```

```
version: 0.2
env:
variables:
SOLUTION: .\FSharpHelloWorld.sln
PACKAGE_DIRECTORY: .\packages
DOTNET_FRAMEWORK: 4.8
```

phases:
build:
commands:
- '& nuget restore \$env:SOLUTION -PackagesDirectory \$env:PACKAGE_DIRECTORY'
- '& msbuild -p:FrameworkPathOverride="C:\Program Files (x86)\Reference
Assemblies\Microsoft\Framework\.NETFramework\v\$env:DOTNET_FRAMEWORK" \$env:SOLUTION'
artifacts:
files:
\FSharpHelloWorld\bin\Debug*

FSharpHelloWorld.sln(in (root directory name)):

```
Microsoft Visual Studio Solution File, Format Version 12.00
# Visual Studio 14
VisualStudioVersion = 14.0.25420.1
MinimumVisualStudioVersion = 10.0.40219.1
Project("{F2A71F9B-5D33-465A-A702-920D77279786}") = "FSharpHelloWorld",
 "FSharpHelloWorld\FSharpHelloWorld.fsproj", "{D60939B6-526D-43F4-9A89-577B2980DF62}"
EndProject
Global
  GlobalSection(SolutionConfigurationPlatforms) = preSolution
    Debug Any CPU = Debug Any CPU
    Release Any CPU = Release Any CPU
  EndGlobalSection
  GlobalSection(ProjectConfigurationPlatforms) = postSolution
    {D60939B6-526D-43F4-9A89-577B2980DF62}.Debug|Any CPU.ActiveCfg = Debug|Any CPU
    {D60939B6-526D-43F4-9A89-577B2980DF62}.Debug|Any CPU.Build.0 = Debug|Any CPU
    {D60939B6-526D-43F4-9A89-577B2980DF62}.Release Any CPU.ActiveCfg = Release Any CPU
    {D60939B6-526D-43F4-9A89-577B2980DF62}.Release Any CPU.Build.0 = Release Any CPU
  EndGlobalSection
  GlobalSection(SolutionProperties) = preSolution
    HideSolutionNode = FALSE
  EndGlobalSection
EndGlobal
```

App.config(in (root directory name)\FSharpHelloWorld):

```
<?xml version="1.0" encoding="utf-8" ?>
<configuration>
<startup>
<supportedRuntime version="v4.0" sku=".NETFramework,Version=v4.8" />
</startup>
```

```
User Guide
```

</configuration>

AssemblyInfo.fs(in (root directory name)\FSharpHelloWorld):

```
namespace FSharpHelloWorld.AssemblyInfo
open System.Reflection
open System.Runtime.CompilerServices
open System.Runtime.InteropServices
// General Information about an assembly is controlled through the following
// set of attributes. Change these attribute values to modify the information
// associated with an assembly.
[<assembly: AssemblyTitle("FSharpHelloWorld")>]
[<assembly: AssemblyDescription("")>]
[<assembly: AssemblyConfiguration("")>]
[<assembly: AssemblyCompany("")>]
[<assembly: AssemblyProduct("FSharpHelloWorld")>]
[<assembly: AssemblyCopyright("Copyright © 2017")>]
[<assembly: AssemblyTrademark("")>]
[<assembly: AssemblyCulture("")>]
// Setting ComVisible to false makes the types in this assembly not visible
// to COM components. If you need to access a type in this assembly from
// COM, set the ComVisible attribute to true on that type.
[<assembly: ComVisible(false)>]
// The following GUID is for the ID of the typelib if this project is exposed to COM
[<assembly: Guid("d60939b6-526d-43f4-9a89-577b2980df62")>]
// Version information for an assembly consists of the following four values:
11
// Major Version
// Minor Version
// Build Number
// Revision
11
// You can specify all the values or you can default the Build and Revision Numbers
// by using the '*' as shown below:
// [<assembly: AssemblyVersion("1.0.*")>]
[<assembly: AssemblyVersion("1.0.0.0")>]
[<assembly: AssemblyFileVersion("1.0.0.0")>]
```

do

()

FSharpHelloWorld.fsproj (in (root directory name)\FSharpHelloWorld):

```
<?xml version="1.0" encoding="utf-8"?>
<Project ToolsVersion="14.0" DefaultTargets="Build" xmlns="http://
schemas.microsoft.com/developer/msbuild/2003">
  <Import Project="$(MSBuildExtensionsPath)\</pre>
$(MSBuildToolsVersion)\Microsoft.Common.props"
 Condition="Exists('$(MSBuildExtensionsPath)\
$(MSBuildToolsVersion)\Microsoft.Common.props')" />
  <PropertyGroup>
    <Configuration Condition=" '$(Configuration)' == '' ">Debug</Configuration>
    <Platform Condition=" '$(Platform)' == '' ">AnyCPU</Platform>
    <SchemaVersion>2.0</SchemaVersion>
    <ProjectGuid>d60939b6-526d-43f4-9a89-577b2980df62</ProjectGuid>
    <OutputType>Exe</OutputType>
    <RootNamespace>FSharpHelloWorld</RootNamespace>
    <AssemblyName>FSharpHelloWorld</AssemblyName>
    <TargetFrameworkVersion>v4.8</TargetFrameworkVersion>
    <AutoGenerateBindingRedirects>true</AutoGenerateBindingRedirects>
    <TargetFSharpCoreVersion>4.4.0.0</TargetFSharpCoreVersion>
    <Name>FSharpHelloWorld</Name>
  </PropertyGroup>
  <PropertyGroup Condition=" '$(Configuration)|$(Platform)' == 'Debug|AnyCPU' ">
    <DebugSymbols>true</DebugSymbols>
    <DebugType>full</DebugType>
    <Optimize>false</Optimize>
    <Tailcalls>false</Tailcalls>
    <OutputPath>bin\Debug\</OutputPath>
    <DefineConstants>DEBUG;TRACE</DefineConstants>
    <WarningLevel>3</WarningLevel>
    <PlatformTarget>AnyCPU</PlatformTarget>
    <DocumentationFile>bin\Debug\FSharpHelloWorld.XML</DocumentationFile>
    <Prefer32Bit>true</Prefer32Bit>
  </PropertyGroup>
  <propertyGroup Condition=" '$(Configuration)|$(Platform)' == 'Release|AnyCPU' ">
    <DebugType>pdbonly</DebugType>
    <Optimize>true</Optimize>
    <Tailcalls>true</Tailcalls>
    <OutputPath>bin\Release\</OutputPath>
    <DefineConstants>TRACE</DefineConstants>
```

```
<WarningLevel>3</WarningLevel>
    <PlatformTarget>AnyCPU</PlatformTarget>
    <DocumentationFile>bin\Release\FSharpHelloWorld.XML</DocumentationFile>
    <Prefer32Bit>true</Prefer32Bit>
  </PropertyGroup>
  <ItemGroup>
    <Reference Include="mscorlib" />
    <Reference Include="FSharp.Core, Version=$(TargetFSharpCoreVersion),
 Culture=neutral, PublicKeyToken=b03f5f7f11d50a3a">
      <Private>True</Private>
    </Reference>
    <Reference Include="System" />
    <Reference Include="System.Core" />
    <Reference Include="System.Numerics" />
  </ItemGroup>
  <ItemGroup>
    <Compile Include="AssemblyInfo.fs" />
    <Compile Include="Program.fs" />
    <None Include="App.config" />
  </ItemGroup>
  <PropertyGroup>
    <MinimumVisualStudioVersion Condition="'$(MinimumVisualStudioVersion)' == ''">11</
MinimumVisualStudioVersion>
  </PropertyGroup>
  <Choose>
    <When Condition="'$(VisualStudioVersion)' == '11.0'">
      <propertyGroup Condition="Exists('$(MSBuildExtensionsPath32)\...\Microsoft SDKs\F#</pre>
\3.0\Framework\v4.0\Microsoft.FSharp.Targets')">
        <FSharpTargetsPath>$(MSBuildExtensionsPath32)\..\Microsoft SDKs\F#
\3.0\Framework\v4.0\Microsoft.FSharp.Targets</FSharpTargetsPath>
      </PropertyGroup>
    </When>
    <Otherwise>
      <propertyGroup Condition="Exists('$(MSBuildExtensionsPath32)\Microsoft</pre>
\VisualStudio\v$(VisualStudioVersion)\FSharp\Microsoft.FSharp.Targets')">
        <FSharpTargetsPath>$(MSBuildExtensionsPath32)\Microsoft\VisualStudio\v
$(VisualStudioVersion)\FSharp\Microsoft.FSharp.Targets</FSharpTargetsPath>
      </PropertyGroup>
    </Otherwise>
  </Choose>
  <Import Project="$(FSharpTargetsPath)" />
  <!-- To modify your build process, add your task inside one of the targets below and
 uncomment it.
```

Other similar extension points exist, see Microsoft.Common.targets.

```
<Target Name="BeforeBuild">
</Target>
<Target Name="AfterBuild">
</Target>
-->
</Project>
```

Program.fs (in (root directory name)\FSharpHelloWorld):

```
// Learn more about F# at http://fsharp.org
// See the 'F# Tutorial' project for more help.
[<EntryPoint>]
let main argv =
    printfn "Hello World"
    0 // return an integer exit code
```

Visual Basic and the .NET Framework

```
buildspec.yml(in (root directory name)):
```

```
version: 0.2
env:
  variables:
    SOLUTION: .\VBHelloWorld.sln
    PACKAGE_DIRECTORY: .\packages
    DOTNET_FRAMEWORK: 4.8
phases:
  build:
    commands:
      - '& "C:\ProgramData\chocolatey\bin\NuGet.exe" restore $env:SOLUTION -
PackagesDirectory $env:PACKAGE_DIRECTORY'
      - '& "C:\Program Files (x86)\MSBuild\14.0\Bin\MSBuild.exe" -
p:FrameworkPathOverride="C:\Program Files (x86)\Reference Assemblies\Microsoft
\Framework\.NETFramework\v$env:DOTNET_FRAMEWORK" $env:SOLUTION'
artifacts:
  files:
    - .\VBHelloWorld\bin\Debug\*
```

VBHelloWorld.sln(in (root directory name)):

```
AWS CodeBuild
```

```
User Guide
```

```
Microsoft Visual Studio Solution File, Format Version 12.00
# Visual Studio 14
VisualStudioVersion = 14.0.25420.1
MinimumVisualStudioVersion = 10.0.40219.1
Project("{F184B08F-C81C-45F6-A57F-5ABD9991F28F}") = "VBHelloWorld", "VBHelloWorld
\VBHelloWorld.vbproj", "{4DCEC446-7156-4FE6-8CCC-219E34DD409D}"
EndProject
Global
  GlobalSection(SolutionConfigurationPlatforms) = preSolution
    Debug Any CPU = Debug Any CPU
    Release Any CPU = Release Any CPU
  EndGlobalSection
  GlobalSection(ProjectConfigurationPlatforms) = postSolution
    {4DCEC446-7156-4FE6-8CCC-219E34DD409D}.Debug|Any CPU.ActiveCfg = Debug|Any CPU
    {4DCEC446-7156-4FE6-8CCC-219E34DD409D}.Debug|Any CPU.Build.0 = Debug|Any CPU
    {4DCEC446-7156-4FE6-8CCC-219E34DD409D}.Release Any CPU.ActiveCfg = Release Any CPU
    {4DCEC446-7156-4FE6-8CCC-219E34DD409D}.Release Any CPU.Build.0 = Release Any CPU
  EndGlobalSection
  GlobalSection(SolutionProperties) = preSolution
    HideSolutionNode = FALSE
  EndGlobalSection
EndGlobal
```

App.config(in (root directory name)\VBHelloWorld):

HelloWorld.vb(in (root directory name)\VBHelloWorld):

```
Module HelloWorld
Sub Main()
MsgBox("Hello World")
End Sub
```

End Module

VBHelloWorld.vbproj (in (root directory name)\VBHelloWorld):

```
<?xml version="1.0" encoding="utf-8"?>
<Project ToolsVersion="14.0" DefaultTargets="Build" xmlns="http://
schemas.microsoft.com/developer/msbuild/2003">
  <Import Project="$(MSBuildExtensionsPath)\</pre>
$(MSBuildToolsVersion)\Microsoft.Common.props"
 Condition="Exists('$(MSBuildExtensionsPath)\
$(MSBuildToolsVersion)\Microsoft.Common.props')" />
  <PropertyGroup>
    <Configuration Condition=" '$(Configuration)' == '' ">Debug</Configuration>
    <Platform Condition=" '$(Platform)' == '' ">AnyCPU</Platform>
    <ProjectGuid>{4DCEC446-7156-4FE6-8CCC-219E34DD409D}</ProjectGuid>
    <OutputType>Exe</OutputType>
    <StartupObject>VBHelloWorld.HelloWorld</StartupObject>
    <RootNamespace>VBHelloWorld</RootNamespace>
    <AssemblyName>VBHelloWorld</AssemblyName>
    <FileAlignment>512</FileAlignment>
    <MyType>Console</MyType>
    <TargetFrameworkVersion>v4.8</TargetFrameworkVersion>
    <AutoGenerateBindingRedirects>true</AutoGenerateBindingRedirects>
  </PropertyGroup>
  <PropertyGroup Condition=" '$(Configuration)|$(Platform)' == 'Debug|AnyCPU' ">
    <PlatformTarget>AnyCPU</PlatformTarget>
    <DebugSymbols>true</DebugSymbols>
    <DebugType>full</DebugType>
    <DefineDebug>true</DefineDebug>
    <DefineTrace>true</DefineTrace>
    <OutputPath>bin\Debug\</OutputPath>
    <DocumentationFile>VBHelloWorld.xml</DocumentationFile>
    <NoWarn>42016,41999,42017,42018,42019,42032,42036,42020,42021,42022</NoWarn>
  </PropertyGroup>
  <PropertyGroup Condition=" '$(Configuration)|$(Platform)' == 'Release|AnyCPU' ">
    <PlatformTarget>AnyCPU</PlatformTarget>
    <DebugType>pdbonly</DebugType>
    <DefineDebug>false</DefineDebug>
    <DefineTrace>true</DefineTrace>
    <Optimize>true</Optimize>
    <OutputPath>bin\Release\</OutputPath>
    <DocumentationFile>VBHelloWorld.xml</DocumentationFile>
    <NoWarn>42016,41999,42017,42018,42019,42032,42036,42020,42021,42022</NoWarn>
  </PropertyGroup>
  <PropertyGroup>
    <OptionExplicit>On</OptionExplicit>
```

```
</PropertyGroup>
<PropertyGroup>
  <OptionCompare>Binary</OptionCompare>
</PropertyGroup>
<PropertyGroup>
  <OptionStrict>Off</OptionStrict>
</PropertyGroup>
<PropertyGroup>
  <OptionInfer>On</OptionInfer>
</PropertyGroup>
<ItemGroup>
  <Reference Include="System" />
  <Reference Include="System.Data" />
  <Reference Include="System.Deployment" />
  <Reference Include="System.Xml" />
  <Reference Include="System.Core" />
  <Reference Include="System.Xml.Ling" />
  <Reference Include="System.Data.DataSetExtensions" />
  <Reference Include="System.Net.Http" />
</ItemGroup>
<ItemGroup>
  <Import Include="Microsoft.VisualBasic" />
  <Import Include="System" />
  <Import Include="System.Collections" />
  <Import Include="System.Collections.Generic" />
  <Import Include="System.Data" />
  <Import Include="System.Diagnostics" />
  <Import Include="System.Linq" />
  <Import Include="System.Xml.Ling" />
  <Import Include="System.Threading.Tasks" />
</ItemGroup>
<ItemGroup>
  <Compile Include="HelloWorld.vb" />
  <Compile Include="My Project\AssemblyInfo.vb" />
  <Compile Include="My Project\Application.Designer.vb">
    <AutoGen>True</AutoGen>
    <DependentUpon>Application.myapp</DependentUpon>
  </Compile>
  <Compile Include="My Project\Resources.Designer.vb">
    <AutoGen>True</AutoGen>
    <DesignTime>True</DesignTime>
    <DependentUpon>Resources.resx</DependentUpon>
  </Compile>
  <Compile Include="My Project\Settings.Designer.vb">
```

<autogen>True</autogen>
<dependentupon>Settings.settings</dependentupon>
<designtimesharedinput>True</designtimesharedinput>
<itemgroup></itemgroup>
<embeddedresource include="My Project\Resources.resx"></embeddedresource>
<generator>VbMyResourcesResXFileCodeGenerator</generator>
<lastgenoutput>Resources.Designer.vb</lastgenoutput>
<customtoolnamespace>My.Resources</customtoolnamespace>
<subtype>Designer</subtype>
<itemgroup></itemgroup>
<none include="My Project\Application.myapp"></none>
<generator>MyApplicationCodeGenerator</generator>
<lastgenoutput>Application.Designer.vb</lastgenoutput>
<none include="My Project\Settings.settings"></none>
<generator>SettingsSingleFileGenerator</generator>
<customtoolnamespace>My</customtoolnamespace>
<lastgenoutput>Settings.Designer.vb</lastgenoutput>
<none include="App.config"></none>
<import project="\$(MSBuildToolsPath)\Microsoft.VisualBasic.targets"></import>
To modify your build process, add your task inside one of the targets below and</td
uncomment it.
Other similar extension points exist, see Microsoft.Common.targets.
<target name="BeforeBuild"></target>
<target name="AfterBuild"></target>
>

Application.Designer.vb(in (root directory name)\VBHelloWorld\My Project):

```
' <auto-generated>
' This code was generated by a tool.
' Runtime Version:4.0.30319.42000
'
```

Option Explicit On

```
' Changes to this file may cause incorrect behavior and will be lost if
' the code is regenerated.
' </auto-generated>
'------
Option Strict On
```

Application.myapp(in (*root directory name*)\VBHelloWorld\My Project):

```
<?xml version="1.0" encoding="utf-8"?>
<MyApplicationData xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
<MySubMain>false</MySubMain>
<SingleInstance>false</SingleInstance>
<ShutdownMode>0</ShutdownMode>
<EnableVisualStyles>true</EnableVisualStyles>
<AuthenticationMode>0</AuthenticationMode>
<ApplicationType>2</ApplicationType>
<SaveMySettingsOnExit>true</SaveMySettingsOnExit>
</MyApplicationData>
```

AssemblyInfo.vb(in(*root directory name*)\VBHelloWorld\My Project):

```
Imports System
Imports System.Reflection
Imports System.Runtime.InteropServices
' General Information about an assembly is controlled through the following
' set of attributes. Change these attribute values to modify the information
' associated with an assembly.
' Review the values of the assembly attributes
<Assembly: AssemblyTitle("VBHelloWorld")>
<Assembly: AssemblyDescription("")>
<Assembly: AssemblyCompany("")>
<Assembly: AssemblyProduct("VBHelloWorld")>
<Assembly: AssemblyCopyright("Copyright © 2017")>
<Assembly: AssemblyCopyright("Copyright © 2017")>
<Assembly: AssemblyTrademark("")>
```

```
'The following GUID is for the ID of the typelib if this project is exposed to COM
<Assembly: Guid("137c362b-36ef-4c3e-84ab-f95082487a5a")>
' Version information for an assembly consists of the following four values:
' Major Version
' Minor Version
' Minor Version
' Build Number
' Revision
'
' You can specify all the values or you can default the Build and Revision Numbers
' by using the '*' as shown below:
' <Assembly: AssemblyVersion("1.0.0.0")>
<Assembly: AssemblyFileVersion("1.0.0.0")>
```

Resources.Designer.vb(in (root directory name)\VBHelloWorld\My Project):

```
'-----
                 ' <auto-generated>
   This code was generated by a tool.
۲
   Runtime Version: 4.0.30319.42000
۰.
  Changes to this file may cause incorrect behavior and will be lost if
  the code is regenerated.
' </auto-generated>
               Option Strict On
Option Explicit On
Namespace My.Resources
 'This class was auto-generated by the StronglyTypedResourceBuilder
 'class via a tool like ResGen or Visual Studio.
 'To add or remove a member, edit your .ResX file then rerun ResGen
 'with the /str option, or rebuild your VS project.
 '''<summary>
  ''' A strongly-typed resource class, for looking up localized strings, etc.
  '''</summary>
```

```
<Global.System.CodeDom.Compiler.GeneratedCodeAttribute("System.Resources.Tools.StronglyTypedRe
"4.0.0.0"), _
 Global.System.Diagnostics.DebuggerNonUserCodeAttribute(), _
 Global.System.Runtime.CompilerServices.CompilerGeneratedAttribute(), _
 Global.Microsoft.VisualBasic.HideModuleNameAttribute()> _
 Friend Module Resources
   Private resourceMan As Global.System.Resources.ResourceManager
   Private resourceCulture As Global.System.Globalization.CultureInfo
   '''<summary>
   ''' Returns the cached ResourceManager instance used by this class.
   '''</summary>
<Global.System.ComponentModel.EditorBrowsableAttribute(Global.System.ComponentModel.EditorBrow
   Friend ReadOnly Property ResourceManager() As
Global.System.Resources.ResourceManager
     Get
       If Object.ReferenceEquals(resourceMan, Nothing) Then
         Dim temp As Global.System.Resources.ResourceManager = New
Global.System.Resources.ResourceManager("VBHelloWorld.Resources",
GetType(Resources).Assembly)
         resourceMan = temp
       End If
       Return resourceMan
     End Get
   End Property
   '''<summary>
   ''' Overrides the current thread's CurrentUICulture property for all
   ...
       resource lookups using this strongly typed resource class.
   '''</summary>
<Global.System.ComponentModel.EditorBrowsableAttribute(Global.System.ComponentModel.EditorBrow
   Friend Property Culture() As Global.System.Globalization.CultureInfo
     Get
       Return resourceCulture
     End Get
     Set(ByVal value As Global.System.Globalization.CultureInfo)
       resourceCulture = value
```

End Set End Property End Module End Namespace

Resources.resx(in (root directory name)\VBHelloWorld\My Project):

```
<?xml version="1.0" encoding="utf-8"?>
<root>
 <!--
   Microsoft ResX Schema
   Version 2.0
   The primary goals of this format is to allow a simple XML format
    that is mostly human readable. The generation and parsing of the
    various data types are done through the TypeConverter classes
    associated with the data types.
   Example:
    ... ado.net/XML headers & schema ...
    <resheader name="resmimetype">text/microsoft-resx</resheader>
    <resheader name="version">2.0</resheader>
    <resheader name="reader">System.Resources.ResXResourceReader,
System.Windows.Forms, ...</resheader>
    <resheader name="writer">System.Resources.ResXResourceWriter,
System.Windows.Forms, ...</resheader>
    <data name="Name1"><value>this is my long string</value><comment>this is a
comment</comment></data>
    <data name="Color1" type="System.Drawing.Color, System.Drawing">Blue</data>
    <data name="Bitmap1" mimetype="application/x-microsoft.net.object.binary.base64">
      <value>[base64 mime encoded serialized .NET Framework object]</value>
    </data>
    <data name="Icon1" type="System.Drawing.Icon, System.Drawing"</pre>
mimetype="application/x-microsoft.net.object.bytearray.base64">
      <value>[base64 mime encoded string representing a byte array form of the .NET
Framework object]</value>
      <comment>This is a comment</comment>
    </data>
    There are any number of "resheader" rows that contain simple
    name/value pairs.
```

```
Each data row contains a name, and value. The row also contains a
   type or mimetype. Type corresponds to a .NET class that support
   text/value conversion through the TypeConverter architecture.
   Classes that don't support this are serialized and stored with the
  mimetype set.
  The mimetype is used for serialized objects, and tells the
   ResXResourceReader how to depersist the object. This is currently not
   extensible. For a given mimetype the value must be set accordingly:
  Note - application/x-microsoft.net.object.binary.base64 is the format
   that the ResXResourceWriter will generate, however the reader can
   read any of the formats listed below.
   mimetype: application/x-microsoft.net.object.binary.base64
   value
          : The object must be serialized with
           : System.Serialization.Formatters.Binary.BinaryFormatter
           : and then encoded with base64 encoding.
  mimetype: application/x-microsoft.net.object.soap.base64
   value
          : The object must be serialized with
           : System.Runtime.Serialization.Formatters.Soap.SoapFormatter
           : and then encoded with base64 encoding.
  mimetype: application/x-microsoft.net.object.bytearray.base64
   value : The object must be serialized into a byte array
           : using a System.ComponentModel.TypeConverter
           : and then encoded with base64 encoding.
 -->
<xsd:schema id="root" xmlns="" xmlns:xsd="http://www.w3.org/2001/XMLSchema"</pre>
xmlns:msdata="urn:schemas-microsoft-com:xml-msdata">
   <xsd:element name="root" msdata:IsDataSet="true">
     <re><xsd:complexType>
       <rsd:choice maxOccurs="unbounded">
         <xsd:element name="metadata">
           <re><xsd:complexType>
             <xsd:sequence>
               <rsd:element name="value" type="xsd:string" minOccurs="0" />
             </xsd:sequence>
             <rpre><xsd:attribute name="name" type="xsd:string" />
             <xsd:attribute name="type" type="xsd:string" />
             <xsd:attribute name="mimetype" type="xsd:string" />
           </xsd:complexType>
```

```
</xsd:element>
         <xsd:element name="assembly">
           <re><xsd:complexType>
             <xsd:attribute name="alias" type="xsd:string" />
             <rpre><xsd:attribute name="name" type="xsd:string" />
           </xsd:complexType>
         </xsd:element>
         <xsd:element name="data">
           <re><xsd:complexType>
             <xsd:sequence>
               <xsd:element name="value" type="xsd:string" minOccurs="0"</pre>
msdata:Ordinal="1" />
               <xsd:element name="comment" type="xsd:string" minOccurs="0"</pre>
msdata:Ordinal="2" />
             </xsd:sequence>
             <xsd:attribute name="name" type="xsd:string" msdata:Ordinal="1" />
             <xsd:attribute name="type" type="xsd:string" msdata:Ordinal="3" />
             <xsd:attribute name="mimetype" type="xsd:string" msdata:Ordinal="4" />
           </xsd:complexType>
         </xsd:element>
         <xsd:element name="resheader">
           <re><xsd:complexType>
             <xsd:sequence>
               <xsd:element name="value" type="xsd:string" minOccurs="0"</pre>
msdata:Ordinal="1" />
             </xsd:sequence>
             <xsd:attribute name="name" type="xsd:string" use="required" />
           </xsd:complexType>
         </xsd:element>
       </xsd:choice>
     </xsd:complexType>
   </xsd:element>
 </xsd:schema>
 <resheader name="resmimetype">
   <value>text/microsoft-resx</value>
 </resheader>
 <resheader name="version">
   <value>2.0</value>
 </resheader>
 <resheader name="reader">
   <value>System.Resources.ResXResourceReader, System.Windows.Forms, Version=2.0.0.0,
Culture=neutral, PublicKeyToken=b77a5c561934e089</value>
 </resheader>
 <resheader name="writer">
```

```
<value>System.Resources.ResXResourceWriter, System.Windows.Forms, Version=2.0.0.0,
Culture=neutral, PublicKeyToken=b77a5c561934e089</value>
    </resheader>
</root>
```

Settings.Designer.vb(in (*root directory name*)\VBHelloWorld\My Project):

```
1_____
' <auto-generated>
     This code was generated by a tool.
      Runtime Version: 4.0.30319.42000
      Changes to this file may cause incorrect behavior and will be lost if
      the code is regenerated.
' </auto-generated>
Option Strict On
Option Explicit On
Namespace My
  <Global.System.Runtime.CompilerServices.CompilerGeneratedAttribute(), _</pre>
 Global.System.CodeDom.Compiler.GeneratedCodeAttribute("Microsoft.VisualStudio.Editors.Settings
 "11.0.0.0"), _
 Global.System.ComponentModel.EditorBrowsableAttribute(Global.System.ComponentModel.EditorBrows
  Partial Friend NotInheritable Class MySettings
    Inherits Global.System.Configuration.ApplicationSettingsBase
    Private Shared defaultInstance As MySettings =
 CType(Global.System.Configuration.ApplicationSettingsBase.Synchronized(New
 MySettings), MySettings)
    #Region "My.Settings Auto-Save Functionality"
      #If _MyType = "WindowsForms" Then
        Private Shared addedHandler As Boolean
        Private Shared addedHandlerLockObject As New Object
```

```
<Global.System.Diagnostics.DebuggerNonUserCodeAttribute(),
 Global.System.ComponentModel.EditorBrowsableAttribute(Global.System.ComponentModel.EditorBrows
        Private Shared Sub AutoSaveSettings(ByVal sender As Global.System.Object, ByVal
 e As Global.System.EventArgs)
          If My.Application.SaveMySettingsOnExit Then
            My.Settings.Save()
          End If
        End Sub
      #End If
    #End Region
    Public Shared ReadOnly Property [Default]() As MySettings
      Get
        #If _MyType = "WindowsForms" Then
          If Not addedHandler Then
            SyncLock addedHandlerLockObject
              If Not addedHandler Then
                AddHandler My.Application.Shutdown, AddressOf AutoSaveSettings
                addedHandler = True
              End If
            End SyncLock
          End If
        #End If
        Return defaultInstance
      End Get
    End Property
  End Class
End Namespace
Namespace My
  <Global.Microsoft.VisualBasic.HideModuleNameAttribute(), _
  Global.System.Diagnostics.DebuggerNonUserCodeAttribute(), _
  Global.System.Runtime.CompilerServices.CompilerGeneratedAttribute()> _
  Friend Module MySettingsProperty
    <Global.System.ComponentModel.Design.HelpKeywordAttribute("My.Settings")> _
    Friend ReadOnly Property Settings() As Global.VBHelloWorld.My.MySettings
      Get
        Return Global.VBHelloWorld.My.MySettings.Default
      End Get
    End Property
```

End Module End Namespace

Settings.settings(in (root directory name)\VBHelloWorld\My Project):

```
<?xml version='1.0' encoding='utf-8'?>
<SettingsFile xmlns="http://schemas.microsoft.com/VisualStudio/2004/01/settings"
CurrentProfile="(Default)" UseMySettingsClassName="true">
<Profiles>
<Profiles>
</Profile Name="(Default)" />
</Profiles>
<Settings />
</SettingsFile>
```

Plan a build in AWS CodeBuild

Before you use AWS CodeBuild, you must answer these questions:

 Where is the source code stored? CodeBuild currently supports building from the following source code repository providers. The source code must contain a build specification (buildspec) file. A *buildspec* is a collection of build commands and related settings, in YAML format, that CodeBuild uses to run a build. You can declare a buildspec in a build project definition.

Repository provider	Required	Documentation
CodeCommit	Repository name. (Optional) Commit ID associated with the source code.	See these topics in the AWS CodeCommit User Guide: Create a CodeCommit repository Create a commit in CodeCommit
Amazon S3	Input bucket name. Object name corresponding to the build input ZIP file that contains the source code. (Optional) Version ID associated with the build input ZIP file.	See these topics in the Amazon S3 Getting Started Guide: Create a bucket Add an object to a bucket

Repository provider	Required	Documentation
GitHub	Repository name. (Optional) Commit ID associated with the source code.	See this topic on the GitHub Help website: Create a repo
Bitbucket	Repository name. (Optional) Commit ID associated with the source code.	See this topic on the Bitbucket Cloud documentation website: <u>Create a repository</u>

- 2. Which build commands do you need to run and in what order? By default, CodeBuild downloads the build input from the provider you specify and uploads the build output to the bucket you specify. You use the buildspec to instruct how to turn the downloaded build input into the expected build output. For more information, see the <u>Buildspec reference</u>.
- 3. Which runtimes and tools do you need to run the build? For example, are you building for Java, Ruby, Python, or Node.js? Does the build need Maven or Ant or a compiler for Java, Ruby, or Python? Does the build need Git, the AWS CLI, or other tools?

CodeBuild runs builds in build environments that use Docker images. These Docker images must be stored in a repository type supported by CodeBuild. These include the CodeBuild Docker image repository, Docker Hub, and Amazon Elastic Container Registry (Amazon ECR). For more information about the CodeBuild Docker image repository, see <u>Docker images provided by</u> <u>CodeBuild</u>.

- 4. Do you need AWS resources that aren't provided automatically by CodeBuild? If so, which security policies do those resources need? For example, you might need to modify the CodeBuild service role to allow CodeBuild to work with those resources.
- 5. **Do you want CodeBuild to work with your VPC?** If so, you need the VPC ID, the subnet IDs, and security group IDs for your VPC configuration. For more information, see <u>Use AWS CodeBuild</u> with Amazon Virtual Private Cloud.

After you have answered these questions, you should have the settings and resources you need to run a build successfully. To run your build, you can:

- Use the AWS CodeBuild console, AWS CLI, or AWS SDKs. For more information, see <u>Run builds</u> manually.
- Create or identify a pipeline in AWS CodePipeline, and then add a build or test action that instructs CodeBuild to automatically test your code, run your build, or both. For more information, see Use CodeBuild with CodePipeline.

Build specification reference for CodeBuild

This topic provides important reference information about build specification (buildspec) files. A *buildspec* is a collection of build commands and related settings, in YAML format, that CodeBuild uses to run a build. You can include a buildspec as part of the source code or you can define a buildspec when you create a build project. For information about how a build spec works, see <u>How</u> CodeBuild works.

Topics

- Buildspec file name and storage location
- Buildspec syntax
- Buildspec example
- Buildspec versions
- Batch build buildspec reference

Buildspec file name and storage location

If you include a buildspec as part of the source code, by default, the buildspec file must be named buildspec.yml and placed in the root of your source directory.

You can override the default buildspec file name and location. For example, you can:

- Use a different buildspec file for different builds in the same repository, such as buildspec_debug.yml and buildspec_release.yml.
- Store a buildspec file somewhere other than the root of your source directory, such as config/ buildspec.yml or in an S3 bucket. The S3 bucket must be in the same AWS Region as your build project. Specify the buildspec file using its ARN (for example, arn:aws:s3:::<mycodebuild-sample2>/buildspec.yml).

You can specify only one buildspec for a build project, regardless of the buildspec file's name.

To override the default buildspec file name, location, or both, do one of the following:

• Run the AWS CLI create-project or update-project command, setting the buildspec value to the path to the alternate buildspec file relative to the value of the built-in environment variable CODEBUILD_SRC_DIR. You can also do the equivalent with the create project

operation in the AWS SDKs. For more information, see <u>Create a build project</u> or <u>Change build</u> <u>project settings</u>.

- Run the AWS CLI start-build command, setting the buildspecOverride value to the path to the alternate buildspec file relative to the value of the built-in environment variable CODEBUILD_SRC_DIR. You can also do the equivalent with the start build operation in the AWS SDKs. For more information, see <u>Run builds manually</u>.
- In an AWS CloudFormation template, set the BuildSpec property of Source in a resource of type AWS::CodeBuild::Project to the path to the alternate buildspec file relative to the value of the built-in environment variable CODEBUILD_SRC_DIR. For more information, see the BuildSpec property in <u>AWS CodeBuild project source</u> in the AWS CloudFormation User Guide.

Buildspec syntax

Buildspec files must be expressed in <u>YAML</u> format.

If a command contains a character, or a string of characters, that is not supported by YAML, you must enclose the command in quotation marks (""). The following command is enclosed in quotation marks because a colon (:) followed by a space is not allowed in YAML. The quotation mark in the command is escaped (\").

```
"export PACKAGE_NAME=$(cat package.json | grep name | head -1 | awk -F: '{ print $2 }'
| sed 's/[\",]//g')"
```

The buildspec has the following syntax:

```
version: 0.2
run-as: Linux-user-name
env:
    shell: shell-tag
    variables:
        key: "value"
        key: "value"
```

```
- variable
  secrets-manager:
    key: secret-id:json-key:version-stage:version-id
  git-credential-helper: no | yes
proxy:
  upload-artifacts: no | yes
  logs: no | yes
batch:
 fast-fail: false | true
  # build-list:
  # build-matrix:
  # build-graph:
phases:
  install:
    run-as: Linux-user-name
    on-failure: ABORT | CONTINUE
    runtime-versions:
      runtime: version
      runtime: version
    commands:
      - command
      - command
    finally:
      - command
      - command
  pre_build:
    run-as: Linux-user-name
    on-failure: ABORT | CONTINUE
    commands:
      - command
      - command
    finally:
      - command
      - command
  build:
    run-as: Linux-user-name
    on-failure: ABORT | CONTINUE
    commands:
      - command
```

- command

```
finally:
```

- command
- command

```
post_build:
```

```
run-as: Linux-user-name
on-failure: ABORT | CONTINUE
commands:
```

- command
- command

```
finally:
```

- command
- command

```
reports:
```

```
report-group-name-or-arn:
    files:
      - location
      - location
    base-directory: location
    discard-paths: no | yes
    file-format: report-format
artifacts:
  files:
    - location
    - location
  name: artifact-name
  discard-paths: no | yes
  base-directory: location
  exclude-paths: excluded paths
  enable-symlinks: no | yes
  s3-prefix: prefix
  secondary-artifacts:
    artifactIdentifier:
      files:
        - location
        - location
      name: secondary-artifact-name
      discard-paths: no | yes
      base-directory: location
    artifactIdentifier:
      files:
        - location
```

```
- location
discard-paths: no | yes
base-directory: location
cache:
paths:
- path
- path
```

The buildspec contains the following:

version

Required mapping. Represents the buildspec version. We recommend that you use 0.2.

1 Note

Although version 0.1 is still supported, we recommend that you use version 0.2 whenever possible. For more information, see Buildspec versions.

run-as

Optional sequence. Available to Linux users only. Specifies a Linux user that runs commands in this buildspec file. run-as grants the specified user read and run permissions. When you specify run-as at the top of the buildspec file, it applies globally to all commands. If you don't want to specify a user for all buildspec file commands, you can specify one for commands in a phase by using run-as in one of the phases blocks. If run-as is not specified, then all commands run as the root user.

env

Optional sequence. Represents information for one or more custom environment variables.

🚺 Note

To protect sensitive information, the following are hidden in CodeBuild logs:

 AWS access key IDs. For more information, see <u>Managing Access Keys for IAM Users</u> in the AWS Identity and Access Management User Guide.

- Strings specified using the Parameter Store. For more information, see <u>Systems Manager</u> <u>Parameter Store</u> and <u>Systems Manager Parameter Store Console Walkthrough</u> in the *Amazon EC2 Systems Manager User Guide*.
- Strings specified using AWS Secrets Manager. For more information, see <u>Key</u> <u>management</u>.

env/shell

Optional sequence. Specifies the supported shell for Linux or Windows operating systems.

For Linux operating systems, supported shell tags are:

- bash
- /bin/sh

For Windows operating systems, supported shell tags are:

- powershell.exe
- cmd.exe

env/variables

Required if env is specified, and you want to define custom environment variables in plain text. Contains a mapping of key/value scalars, where each mapping represents a single custom environment variable in plain text. key is the name of the custom environment variable, and value is that variable's value.

🔥 Important

We strongly discourage the storing of sensitive values in environment variables. Environment variables can be displayed in plain text using tools such as the CodeBuild console and the AWS CLI. For sensitive values, we recommend that you use parameter-store or secrets-manager mapping instead, as described later in this section.

Any environment variables you set replace existing environment variables. For example, if the Docker image already contains an environment variable named MY_VAR with a value of my_value, and you set an environment variable named MY_VAR with a value of other_value, then my_value is replaced by other_value. Similarly, if the Docker

image already contains an environment variable named PATH with a value of /usr/ local/sbin:/usr/local/bin, and you set an environment variable named PATH with a value of \$PATH:/usr/share/ant/bin, then /usr/local/sbin:/usr/ local/bin is replaced by the literal value \$PATH:/usr/share/ant/bin. Do not set any environment variable with a name that starts with CODEBUILD_. This prefix is reserved for internal use.

If an environment variable with the same name is defined in multiple places, the value is determined as follows:

- The value in the start build operation call takes highest precedence. You can add or override environment variables when you create a build. For more information, see Run AWS CodeBuild builds manually.
- The value in the build project definition takes next precedence. You can add environment variables at the project level when you create or edit a project. For more information, see <u>Create a build project in AWS CodeBuild</u> and <u>Change build project</u> <u>settings in AWS CodeBuild</u>.
- The value in the buildspec declaration takes lowest precedence.

env/parameter-store

Required if env is specified, and you want to retrieve custom environment variables stored in Amazon EC2 Systems Manager Parameter Store. Contains a mapping of *key/value* scalars, where each mapping represents a single custom environment variable stored in Amazon EC2 Systems Manager Parameter Store. *key* is the name you use later in your build commands to refer to this custom environment variable, and *value* is the name of the custom environment variable stored in Amazon EC2 Systems Manager Parameter Store. To store sensitive values, see <u>Systems Manager Parameter Store</u> and <u>Walkthrough: Create and test a String parameter</u> (console) in the Amazon EC2 Systems Manager User Guide.

🔥 Important

To allow CodeBuild to retrieve custom environment variables stored in Amazon EC2 Systems Manager Parameter Store, you must add the ssm:GetParameters action to your CodeBuild service role. For more information, see <u>Allow CodeBuild to interact with</u> <u>other AWS services</u>.

Any environment variables you retrieve from Amazon EC2 Systems Manager Parameter Store replace existing environment variables. For example, if the Docker image already contains an environment variable named MY_VAR with a value of my_value, and you retrieve an environment variable named MY_VAR with a value of other_value, then my_value is replaced by other_value. Similarly, if the Docker image already contains an environment variable named PATH with a value of /usr/local/sbin:/ usr/local/bin, and you retrieve an environment variable named PATH with a value of \$PATH:/usr/share/ant/bin, then /usr/local/sbin:/usr/local/bin is replaced by the literal value \$PATH:/usr/share/ant/bin.

Do not store any environment variable with a name that starts with CODEBUILD_. This prefix is reserved for internal use.

If an environment variable with the same name is defined in multiple places, the value is determined as follows:

- The value in the start build operation call takes highest precedence. You can add or override environment variables when you create a build. For more information, see Run AWS CodeBuild builds manually.
- The value in the build project definition takes next precedence. You can add environment variables at the project level when you create or edit a project. For more information, see <u>Create a build project in AWS CodeBuild</u> and <u>Change build project</u> <u>settings in AWS CodeBuild</u>.
- The value in the buildspec declaration takes lowest precedence.

env/secrets-manager

Required if you want to retrieve custom environment variables stored in AWS Secrets Manager. Specify a Secrets Manager reference-key using the following pattern:

<key>:<secret-id>:<json-key>:<version-stage>:<version-id>

<key>

(Required) The local environment variable name. Use this name to access the variable during the build.

<secret-id>

(Required) The name or Amazon Resource Name (ARN) that serves as a unique identifier for the secret. To access a secret in your AWS account, simply specify the secret name. To access a secret in a different AWS account, specify the secret ARN.

<json-key>

(Optional) Specifies the key name of the Secrets Manager key-value pair whose value you want to retrieve. If you do not specify a json-key, CodeBuild retrieves the entire secret text.

<version-stage>

(Optional) Specifies the secret version that you want to retrieve by the staging label attached to the version. Staging labels are used to keep track of different versions during the rotation process. If you use version-stage, don't specify version-id. If you don't specify a version stage or version ID, the default is to retrieve the version with the version stage value of AWSCURRENT.

<version-id>

(Optional) Specifies the unique identifier of the version of the secret that you want to use. If you specify version-id, don't specify version-stage. If you don't specify a version stage or version ID, the default is to retrieve the version with the version stage value of AWSCURRENT.

In the following example, TestSecret is the name of the key-value pair stored in Secrets Manager. The key for TestSecret is MY_SECRET_VAR. You access the variable during the build using the LOCAL_SECRET_VAR name.

```
env:
    secrets-manager:
    LOCAL_SECRET_VAR: "TestSecret:MY_SECRET_VAR"
```

For more information, see <u>What is AWS Secrets Manager</u> in the AWS Secrets Manager User Guide.

env/exported-variables

Optional mapping. Used to list environment variables you want to export. Specify the name of each variable you want to export on a separate line under exported-variables. The variable you want to export must be available in your container during the build. The variable you export can be an environment variable.

Exported environment variables are used in conjunction with AWS CodePipeline to export environment variables from the current build stage to subsequent stages in the pipeline. For more information, see Working with variables in the AWS CodePipeline User Guide. During a build, the value of a variable is available starting with the install phase. It can be updated between the start of the install phase and the end of the post_build phase. After the post_build phase ends, the value of exported variables cannot change.

Note

The following cannot be exported:

- Amazon EC2 Systems Manager Parameter Store secrets specified in the build project.
- Secrets Manager secrets specified in the build project
- Environment variables that start with AWS_.

env/git-credential-helper

Optional mapping. Used to indicate if CodeBuild uses its Git credential helper to provide Git credentials. yes if it is used. Otherwise, no or not specified. For more information, see gitcredentials on the Git website.

Note

git-credential-helper is not supported for builds that are triggered by a webhook for a public Git repository.

proxy

Optional sequence. Used to represent settings if you run your build in an explicit proxy server. For more information, see Run CodeBuild in an explicit proxy server.

proxy/upload-artifacts

Optional mapping. Set to yes if you want your build in an explicit proxy server to upload artifacts. The default is no.

proxy/logs

Optional mapping. Set to yes for your build in a explicit proxy server to create CloudWatch logs. The default is no.

phases

Required sequence. Represents the commands CodeBuild runs during each phase of the build.

🚺 Note

In buildspec version 0.1, CodeBuild runs each command in a separate instance of the default shell in the build environment. This means that each command runs in isolation from all other commands. Therefore, by default, you cannot run a single command that relies on the state of any previous commands (for example, changing directories or setting environment variables). To get around this limitation, we recommend that you use version 0.2, which solves this issue. If you must use buildspec version 0.1, we recommend the approaches in <u>Shells and commands in build environments</u>.

phases/*/run-as

Optional sequence. Use in a build phase to specify a Linux user that runs its commands. If run-as is also specified globally for all commands at the top of the buildspec file, then the phase-level user takes precedence. For example, if globally run-as specifies User-1, and for the install phase only a run-as statement specifies User-2, then all commands in then buildspec file are run as User-1 *except* commands in the install phase, which are run as User-2.

phases/*/on-failure

Optional sequence. Specifies the action to take if a failure occurs during the phase. This can be one of the following values:

- ABORT Abort the build.
- CONTINUE Continue to the next phase.

If this property is not specified, the failure process follows the transition phases as shown in <u>Build phase transitions</u>.

phases/*/finally

Optional block. Commands specified in a finally block are run after commands in the commands block. The commands in a finally block are run even if a command in the commands block fails. For example, if the commands block contains three commands and

the first fails, CodeBuild skips the remaining two commands and runs any commands in the finally block. The phase is successful when all commands in the commands and the finally blocks run successfully. If any command in a phase fails, the phase fails.

The allowed build phase names are:

phases/install

Optional sequence. Represents the commands, if any, that CodeBuild runs during installation. We recommend that you use the install phase only for installing packages in the build environment. For example, you might use this phase to install a code testing framework such as Mocha or RSpec.

phases/install/runtime-versions

Optional sequence. A runtime version is supported with the Ubuntu standard image 5.0 or later and the Amazon Linux 2 standard image 4.0 or later. If specified, at least one runtime must be included in this section. Specify a runtime using a specific version, a major version followed by .x to specify that CodeBuild uses that major version with its latest minor version, or latest to use the most recent major and minor version (for example, ruby: 3.2, nodejs: 18.x, or java: latest). You can specify the runtime using a number or an environment variable. For example, if you use the Amazon Linux 2 standard image 4.0, then the following specifies that version 17 of Java, the latest minor version of python version 3, and a version contained in an environment variable of Ruby is installed. For more information, see <u>Docker images provided by CodeBuild</u>.

```
phases:
install:
    runtime-versions:
    java: corretto8
    python: 3.x
    ruby: "$MY_RUBY_VAR"
```

You can specify one or more runtimes in the runtime-versions section of your buildspec file. If your runtime is dependent upon another runtime, you can also specify its dependent runtime in the buildspec file. If you do not specify any runtimes in the buildspec file, CodeBuild chooses the default runtimes that are available in the image you use. If you specify one or more runtimes, CodeBuild uses only those runtimes. If a dependent runtime is not specified, CodeBuild attempts to choose the dependent runtime for you. If two specified runtimes conflict, the build fails. For example, android: 29 and java: openjdk11 conflict, so if both are specified, the build fails.

For more information about the available runtimes, see <u>Available runtimes</u>.

🚯 Note

If you specify a runtime-versions section and use an image other than Ubuntu Standard Image 2.0 or later, or the Amazon Linux 2 (AL2) standard image 1.0 or later, the build issues the warning, "Skipping install of runtimes. Runtime version selection is not supported by this build image."

phases/install/**commands**

Optional sequence. Contains a sequence of scalars, where each scalar represents a single command that CodeBuild runs during installation. CodeBuild runs each command, one at a time, in the order listed, from beginning to end.

phases/pre_build

Optional sequence. Represents the commands, if any, that CodeBuild runs before the build. For example, you might use this phase to sign in to Amazon ECR, or you might install npm dependencies.

phases/pre_build/commands

Required sequence if pre_build is specified. Contains a sequence of scalars, where each scalar represents a single command that CodeBuild runs before the build. CodeBuild runs each command, one at a time, in the order listed, from beginning to end.

phases/**build**

Optional sequence. Represents the commands, if any, that CodeBuild runs during the build. For example, you might use this phase to run Mocha, RSpec, or sbt.

phases/build/commands

Required if build is specified. Contains a sequence of scalars, where each scalar represents a single command that CodeBuild runs during the build. CodeBuild runs each command, one at a time, in the order listed, from beginning to end.

phases/post_build

Optional sequence. Represents the commands, if any, that CodeBuild runs after the build. For example, you might use Maven to package the build artifacts into a JAR or WAR file, or you might push a Docker image into Amazon ECR. Then you might send a build notification through Amazon SNS.

phases/post_build/commands

Required if post_build is specified. Contains a sequence of scalars, where each scalar represents a single command that CodeBuild runs after the build. CodeBuild runs each command, one at a time, in the order listed, from beginning to end.

reports

report-group-name-or-arn

Optional sequence. Specifies the report group that the reports are sent to. A project can have a maximum of five report groups. Specify the ARN of an existing report group, or the name of a new report group. If you specify a name, CodeBuild creates a report group using your project name and the name you specify in the format <project-name>-<report-group-name>. The report group name can also be set using an environment variable in the buildspec such as \$REPORT_GROUP_NAME. For more information, see <u>Report group naming</u>.

reports/<report-group>/files

Required sequence. Represents the locations that contain the raw data of test results generated by the report. Contains a sequence of scalars, with each scalar representing a separate location where CodeBuild can find test files, relative to the original build location or, if set, the base-directory. Locations can include the following:

- A single file (for example, my-test-report-file.json).
- A single file in a subdirectory (for example, *my-subdirectory*/my-test-report-file.json or *my-parent-subdirectory*/my-subdirectory/my-test-report-file.json).
- '**/*' represents all files recursively.
- my-subdirectory/* represents all files in a subdirectory named my-subdirectory.
- my-subdirectory/**/* represents all files recursively starting from a subdirectory named my-subdirectory.

reports/<report-group>/file-format

Optional mapping. Represents the report file format. If not specified, JUNITXML is used. This value is not case sensitive. Possible values are:

Test reports

CUCUMBERJSON

Cucumber JSON

JUNITXML

JUnit XML

NUNITXML

NUnit XML

NUNIT3XML

NUnit 3 XML

TESTNGXML

TestNG XML

VISUALSTUDIOTRX

Visual Studio TRX

Code coverage reports

CLOVERXML

Clover XML

COBERTURAXML

Cobertura XML

JACOCOXML

JaCoCo XML

SIMPLECOV

SimpleCov JSON

i Note

CodeBuild accepts JSON code coverage reports generated by <u>simplecov</u>, not <u>simplecov-json</u>.

reports/<report-group>/base-directory

Optional mapping. Represents one or more top-level directories, relative to the original build location, that CodeBuild uses to determine where to find the raw test files.

reports/<report-group>/discard-paths

Optional. Specifies if the report file directories are flattened in the output. If this is not specified, or contains no, report files are output with their directory structure intact. If this contains yes, all of the test files are placed in the same output directory. For example, if a path to a test result is com/myapp/mytests/TestResult.xml, specifying yes will place this file in /TestResult.xml.

artifacts

Optional sequence. Represents information about where CodeBuild can find the build output and how CodeBuild prepares it for uploading to the S3 output bucket. This sequence is not required if, for example, you are building and pushing a Docker image to Amazon ECR, or you are running unit tests on your source code, but not building it.

1 Note

Amazon S3 metadata has a CodeBuild header named x-amz-meta-codebuildbuildarn which contains the buildArn of the CodeBuild build that publishes artifacts to Amazon S3. The buildArn is added to allow source tracking for notifications and to reference which build the artifact is generated from.

artifacts/files

Required sequence. Represents the locations that contain the build output artifacts in the build environment. Contains a sequence of scalars, with each scalar representing a separate location

- A single file (for example, my-file.jar).
- A single file in a subdirectory (for example, my-subdirectory/my-file.jar or myparent-subdirectory/my-subdirectory/my-file.jar).
- '**/*' represents all files recursively.
- *my-subdirectory*/* represents all files in a subdirectory named *my-subdirectory*.
- my-subdirectory/**/* represents all files recursively starting from a subdirectory named my-subdirectory.

When you specify build output artifact locations, CodeBuild can locate the original build location in the build environment. You do not have to prepend your build artifact output locations with the path to the original build location or specify ./ or similar. If you want to know the path to this location, you can run a command such as echo \$CODEBUILD_SRC_DIR during a build. The location for each build environment might be slightly different.

artifacts/name

Optional name. Specifies a name for your build artifact. This name is used when one of the following is true.

- You use the CodeBuild API to create your builds and the overrideArtifactName flag is set on the ProjectArtifacts object when a project is updated, a project is created, or a build is started.
- You use the CodeBuild console to create your builds, a name is specified in the buildspec file, and you select **Enable semantic versioning** when you create or update a project. For more information, see <u>Create a build project (console)</u>.

You can specify a name in the buildspec file that is calculated at build time. The name specified in a buildspec file uses the Shell command language. For example, you can append a date and time to your artifact name so that it is always unique. Unique artifact names prevent artifacts from being overwritten. For more information, see Shell command language.

• This is an example of an artifact name appended with the date the artifact is created.

```
version: 0.2
phases:
    build:
        commands:
```

User Guide

```
- rspec HelloWorld_spec.rb
artifacts:
   files:
        - '**/*'
   name: myname-$(date +%Y-%m-%d)
```

• This is an example of an artifact name that uses a CodeBuild environment variable. For more information, see Environment variables in build environments.

```
version: 0.2
phases:
    build:
        commands:
            - rspec HelloWorld_spec.rb
artifacts:
    files:
            - '**/*'
    name: myname-$AWS_REGION
```

• This is an example of an artifact name that uses a CodeBuild environment variable with the artifact's creation date appended to it.

```
version: 0.2
phases:
    build:
        commands:
            - rspec HelloWorld_spec.rb
artifacts:
    files:
            - '**/*'
    name: $AWS_REGION-$(date +%Y-%m-%d)
```

You can add path information to the name so that the named artifacts are placed in directories based on the path in the name. In this example, build artifacts are placed in the output under builds/<build number>/my-artifacts.

```
version: 0.2
phases:
    build:
        commands:
            - rspec HelloWorld_spec.rb
artifacts:
```

```
files:
    - '**/*'
name: builds/$CODEBUILD_BUILD_NUMBER/my-artifacts
```

artifacts/discard-paths

Optional. Specifies if the build artifact directories are flattened in the output. If this is not specified, or contains no, build artifacts are output with their directory structure intact. If this contains yes, all of the build artifacts are placed in the same output directory. For example, if a path to a file in the build output artifact is com/mycompany/app/HelloWorld.java, specifying yes will place this file in /HelloWorld.java.

artifacts/base-directory

Optional mapping. Represents one or more top-level directories, relative to the original build location, that CodeBuild uses to determine which files and subdirectories to include in the build output artifact. Valid values include:

- A single top-level directory (for example, my-directory).
- 'my-directory*' represents all top-level directories with names starting with mydirectory.

Matching top-level directories are not included in the build output artifact, only their files and subdirectories.

You can use files and discard-paths to further restrict which files and subdirectories are included. For example, for the following directory structure:

```
### my-build-1
# ### my-file-1.txt
### my-build-2
### my-file-2.txt
### my-subdirectory
### my-file-3.txt
```

And for the following artifacts sequence:

```
artifacts:
    files:
        - '*/my-file-3.txt'
```

```
base-directory: my-build-2
```

The following subdirectory and file would be included in the build output artifact:

```
### my-subdirectory
    ### my-file-3.txt
```

While for the following artifacts sequence:

```
artifacts:
    files:
        - '**/*'
    base-directory: 'my-build*'
    discard-paths: yes
```

The following files would be included in the build output artifact:

```
### my-file-1.txt
### my-file-2.txt
### my-file-3.txt
```

artifacts/exclude-paths

Optional mapping. Represents one or more paths, relative to base-directory, that CodeBuild will exclude from the build artifacts. The asterisk (*) character matches zero or more characters of a name component without crossing folder boundaries. A double asterisk (**) matches zero or more characters of a name component across all directories.

Examples of exclude-paths include the following:

- To exclude a file from all directories: "**/file-name/**/*"
- To exclude all dot folders: "**/.*/**/*"
- To exclude all dot files: "**/.*"

artifacts/enable-symlinks

Optional. If the output type is ZIP, specifies if internal symbolic links are preserved in the ZIP file. If this contains yes, all internal symbolic links in the source will be preserved in the artifacts ZIP file.

artifacts/s3-prefix

Optional. Specifies a prefix used when the artifacts are output to an Amazon S3 bucket and the namespace type is BUILD_ID. When used, the output path in the bucket is <s3-prefix>/ <build-id>/<name>.zip.

artifacts/secondary-artifacts

Optional sequence. Represents one or more artifact definitions as a mapping between an artifact identifier and an artifact definition. Each artifact identifiers in this block must match an artifact defined in the secondaryArtifacts attribute of your project. Each separate definition has the same syntax as the artifacts block above.

Note

The <u>artifacts/files</u> sequence is always required, even when there are only secondary artifacts defined.

For example, if your project has the following structure:

```
{
  "name": "sample-project",
  "secondaryArtifacts": [
    {
      "type": "S3",
      "location": "<output-bucket1>",
      "artifactIdentifier": "artifact1",
      "name": "secondary-artifact-name-1"
    },
    {
      "type": "S3",
      "location": "<output-bucket2>",
      "artifactIdentifier": "artifact2",
      "name": "secondary-artifact-name-2"
    }
  ]
}
```

Then your buildspec looks like the following:

version: 0.2

```
phases:
build:
  commands:
    - echo Building...
artifacts:
  files:
    - '**/*'
  secondary-artifacts:
    artifact1:
      files:
        - directory/file1
      name: secondary-artifact-name-1
    artifact2:
      files:
        - directory/file2
      name: secondary-artifact-name-2
```

cache

Optional sequence. Represents information about where CodeBuild can prepare the files for uploading cache to an S3 cache bucket. This sequence is not required if the cache type of the project is No Cache.

cache/paths

Required sequence. Represents the locations of the cache. Contains a sequence of scalars, with each scalar representing a separate location where CodeBuild can find build output artifacts, relative to the original build location or, if set, the base directory. Locations can include the following:

- A single file (for example, my-file.jar).
- A single file in a subdirectory (for example, my-subdirectory/my-file.jar or myparent-subdirectory/my-subdirectory/my-file.jar).
- '**/*' represents all files recursively.
- *my-subdirectory*/* represents all files in a subdirectory named *my-subdirectory*.
- my-subdirectory/**/* represents all files recursively starting from a subdirectory named my-subdirectory.

<u> Important</u>

Because a buildspec declaration must be valid YAML, the spacing in a buildspec declaration is important. If the number of spaces in your buildspec declaration is invalid, builds might fail immediately. You can use a YAML validator to test whether your buildspec declarations are valid YAML.

If you use the AWS CLI, or the AWS SDKs to declare a buildspec when you create or update a build project, the buildspec must be a single string expressed in YAML format, along with required whitespace and newline escape characters. There is an example in the next section.

If you use the CodeBuild or AWS CodePipeline consoles instead of a buildspec.yml file, you can insert commands for the build phase only. Instead of using the preceding syntax, you list, in a single line, all of the commands that you want to run during the build phase. For multiple commands, separate each command by && (for example, mvn test && mvn package).

You can use the CodeBuild or CodePipeline consoles instead of a buildspec.yml file to specify the locations of the build output artifacts in the build environment. Instead of using the preceding syntax, you list, in a single line, all of the locations. For multiple locations, separate each location with a comma (for example, buildspec.yml, target/my-app.jar).

Buildspec example

Here is an example of a buildspec.yml file.

```
version: 0.2
env:
   variables:
    JAVA_HOME: "/usr/lib/jvm/java-8-openjdk-amd64"
   parameter-store:
    LOGIN_PASSWORD: /CodeBuild/dockerLoginPassword

phases:
   install:
    commands:
        - echo Entered the install phase...
        - apt-get update -y
```

```
- apt-get install -y maven
    finally:
      - echo This always runs even if the update or install command fails
  pre_build:
    commands:
      - echo Entered the pre_build phase...
      - docker login -u User -p $LOGIN_PASSWORD
    finally:
      - echo This always runs even if the login command fails
  build:
    commands:
      - echo Entered the build phase...
      - echo Build started on `date`
      - mvn install
    finally:
      - echo This always runs even if the install command fails
  post_build:
    commands:
      - echo Entered the post_build phase...
      - echo Build completed on `date`
reports:
  arn:aws:codebuild:your-region:your-aws-account-id:report-group/report-group-name-1:
    files:
      - "**/*"
    base-directory: 'target/tests/reports'
    discard-paths: no
  reportGroupCucumberJson:
    files:
      - 'cucumber/target/cucumber-tests.xml'
    discard-paths: yes
    file-format: CUCUMBERJSON # default is JUNITXML
artifacts:
  files:
    - target/messageUtil-1.0.jar
  discard-paths: yes
  secondary-artifacts:
    artifact1:
      files:
        - target/artifact-1.0.jar
      discard-paths: yes
    artifact2:
      files:
        - target/artifact-2.0.jar
```

```
discard-paths: yes
cache:
  paths:
    - '/root/.m2/**/*'
```

Here is an example of the preceding buildspec, expressed as a single string, for use with the AWS CLI, or the AWS SDKs.

```
"version: 0.2\n\nenv:\n variables:\n JAVA_HOME: \"/usr/lib/jvm/java-8-openjdk-
                                 LOGIN_PASSWORD: /CodeBuild/dockerLoginPassword\n
amd64\\"\n parameter-store:\n
phases:\n\n install:\n
                           commands:\n
                                            - echo Entered the install phase...\n
- apt-get update -y∖n
                           - apt-get install -y maven\n
                                                           finally:\n
                                                                           - echo This
always runs even if the update or install command fails \n pre_build:\n
                                                                            commands:
        - echo Entered the pre_build phase...\n
                                                    - docker login -u User -p
n/
                     finally:\n
                                     - echo This always runs even if the login command
$LOGIN PASSWORD\n
fails \n build:\n
                      commands:\n
                                       - echo Entered the build phase...\n
                                                                                - echo
Build started on `date`\n
                               - mvn install\n
                                                  finally:\n
                                                                  - echo This always
runs even if the install command fails\n post_build:\n
                                                           commands:\n
                                                                            - echo
Entered the post_build phase...\n
                                     - echo Build completed on `date`\n\n reports:
                                           - \"**/*\"\n
\n reportGroupJunitXml:\n
                             files:\n
                                                           base-directory: 'target/
tests/reports'\n
                   discard-paths: false\n reportGroupCucumberJson:\n
                                                                         files:\n
- 'cucumber/target/cucumber-tests.xml'\n
                                           file-format: CUCUMBERJSON\n\nartifacts:\n
             - target/messageUtil-1.0.jar\n discard-paths: yes\n secondary-artifacts:
files:\n
     artifact1:\n
                       files:\n
                                      - target/messageUtil-1.0.jar\n
\n
                                                                          discard-
paths: ves\n
               artifact2:\n
                                                - target/messageUtil-1.0.jar\n
                                 files:\n
discard-paths: yes\n cache:\n paths:\n
                                           - '/root/.m2/**/*'"
```

Here is an example of the commands in the build phase, for use with the CodeBuild or CodePipeline consoles.

echo Build started on `date` && mvn install

In these examples:

- A custom environment variable, in plain text, with the key of JAVA_HOME and the value of /usr/ lib/jvm/java-8-openjdk-amd64, is set.
- A custom environment variable named dockerLoginPassword you stored in Amazon EC2 Systems Manager Parameter Store is referenced later in build commands by using the key LOGIN_PASSWORD.

- You cannot change these build phase names. The commands that are run in this example are apt-get update -y and apt-get install -y maven (to install Apache Maven), mvn install (to compile, test, and package the source code into a build output artifact and to install the build output artifact in its internal repository), docker login (to sign in to Docker with the password that corresponds to the value of the custom environment variable dockerLoginPassword you set in Amazon EC2 Systems Manager Parameter Store), and several echo commands. The echo commands are included here to show how CodeBuild runs commands and the order in which it runs them.
- files represents the files to upload to the build output location. In this example, CodeBuild uploads the single file messageUtil-1.0.jar. The messageUtil-1.0.jar file can be found in the relative directory named target in the build environment. Because discard-paths: yes is specified, messageUtil-1.0.jar is uploaded directly (and not to an intermediate target directory). The file name messageUtil-1.0.jar and the relative directory name of target is based on the way Apache Maven creates and stores build output artifacts for this example only. In your own scenarios, these file names and directories will be different.
- reports represents two report groups that generate reports during the build:
 - arn:aws:codebuild:your-region:your-aws-account-id:report-group/reportgroup-name-1 specifies the ARN of a report group. Test results generated by the test framework are in the target/tests/reports directory. The file format is JunitXml and the path is not removed from the files that contain test results.
 - reportGroupCucumberJson specifies a new report group. If the name of the project is my-project, a report group with the name my-project-reportGroupCucumberJson is created when a build is run. Test results generated by the test framework are in cucumber/ target/cucumber-tests.xml. The test file format is CucumberJson and the path is removed from the files that contain test results.

Buildspec versions

The following table lists the buildspec versions and the changes between versions.

Version	Changes
0.2	 environment_variables has been renamed to env.

Version	Changes
	 plaintext has been renamed to variables . The type property for artifacts has been deprecated. In version 0.1, AWS CodeBuild runs each build command in a separate instance of the default shell in the build environme nt. In version 0.2, CodeBuild runs all build commands in the same instance of the default shell in the build environment.
0.1	This is the initial definition of the build specification format.

Batch build buildspec reference

This topic contains the buildspec reference for batch build properties.

batch

Optional mapping. The batch build settings for the project.

batch/fast-fail

Optional. Specifies the behavior of the batch build when one or more build tasks fail.

false

The default value. All running builds will complete.

true

All running builds will be stopped when one of the build tasks fails.

By default, all batch build tasks run with the build settings such as env and phases, specified in the buildspec file. You can override the default build settings by specifying different env values or a different buildspec file in the batch/<batch-type>/buildspec parameter.

The contents of the batch property varies based on the type of batch build being specified. The possible batch build types are:

- batch/build-graph
- batch/build-list
- <u>batch/build-matrix</u>

batch/build-graph

Defines a *build graph*. A build graph defines a set of tasks that have dependencies on other tasks in the batch. For more information, see <u>Build graph</u>.

This element contains an array of build tasks. Each build task contains the following properties.

identifier

Required. The identifier of the task.

buildspec

Optional. The path and file name of the buildspec file to use for this task. If this parameter is not specified, the current buildspec file is used.

debug-session

Optional. A Boolean value that indicates whether session debugging is enabled for this batch build. For more information about session debugging, see <u>View a running build in Session</u> <u>Manager</u>.

false

Session debugging is disabled.

true

Session debugging is enabled.

depend-on

Optional. An array of task identifiers that this task depends on. This task will not run until these tasks are completed.

env

Optional. The build environment overrides for the task. This can contain the following properties:

compute-type

The identifier of the compute type to use for the task. See **computeType** in <u>the section</u> called "Build environment compute modes and types" for possible values.

image

The identifier of the image to use for the task. See **Image identifier** in <u>the section called</u> <u>"Docker images provided by CodeBuild"</u> for possible values.

privileged-mode

A Boolean value that indicates whether to run the Docker daemon inside a Docker container. Set to true only if the build project is used to build Docker images. Otherwise, a build that attempts to interact with the Docker daemon fails. The default setting is false.

type

The identifier of the environment type to use for the task. See **Environment type** in <u>the</u> section called "Build environment compute modes and types" for possible values.

variables

The environment variables that will be present in the build environment. See <u>env/variables</u> for more information.

ignore-failure

Optional. A Boolean value that indicates if a failure of this build task can be ignored.

false

The default value. If this build task fails, the batch build will fail.

true

If this build task fails, the batch build can still succeed.

The following is an example of a build graph buildspec entry:

batch: fast-fail: false

```
build-graph:
  - identifier: build1
    env:
      variables:
        BUILD_ID: build1
    ignore-failure: false
  - identifier: build2
    buildspec: build2.yml
    env:
      variables:
        BUILD_ID: build2
    depend-on:
      - build1
  - identifier: build3
    env:
      variables:
        BUILD_ID: build3
    depend-on:
      - build2
```

batch/build-list

Defines a *build list*. A build list is used to define a number of tasks that run in parallel. For more information, see **Build list**.

This element contains an array of build tasks. Each build task contains the following properties.

identifier

Required. The identifier of the task.

buildspec

Optional. The path and file name of the buildspec file to use for this task. If this parameter is not specified, the current buildspec file is used.

debug-session

Optional. A Boolean value that indicates whether session debugging is enabled for this batch build. For more information about session debugging, see <u>View a running build in Session</u> <u>Manager</u>.

false

Session debugging is disabled.

true

Session debugging is enabled.

env

Optional. The build environment overrides for the task. This can contain the following properties:

compute-type

The identifier of the compute type to use for the task. See **computeType** in <u>the section</u> called "Build environment compute modes and types" for possible values.

image

The identifier of the image to use for the task. See **Image identifier** in <u>the section called</u> "Docker images provided by CodeBuild" for possible values.

privileged-mode

A Boolean value that indicates whether to run the Docker daemon inside a Docker container. Set to true only if the build project is used to build Docker images. Otherwise, a build that attempts to interact with the Docker daemon fails. The default setting is false.

type

The identifier of the environment type to use for the task. See **Environment type** in <u>the</u> section called "Build environment compute modes and types" for possible values.

variables

The environment variables that will be present in the build environment. See <u>env/variables</u> for more information.

ignore-failure

Optional. A Boolean value that indicates if a failure of this build task can be ignored.

false

The default value. If this build task fails, the batch build will fail.

true

If this build task fails, the batch build can still succeed.

The following is an example of a build list buildspec entry:

```
batch:
fast-fail: false
build-list:
    identifier: build1
    env:
      variables:
      BUILD_ID: build1
    ignore-failure: false
    identifier: build2
    buildspec: build2.yml
    env:
      variables:
      BUILD_ID: build2
    ignore-failure: true
```

batch/build-matrix

Defines a *build matrix*. A build matrix defines tasks with different configurations that run in parallel. CodeBuild creates a separate build for each possible configuration combination. For more information, see <u>Build matrix</u>.

static

The static properties apply to all build tasks.

ignore-failure

Optional. A Boolean value that indicates if a failure of this build task can be ignored.

false

The default value. If this build task fails, the batch build will fail.

true

If this build task fails, the batch build can still succeed.

env

Optional. The build environment overrides for all tasks.

privileged-mode

A Boolean value that indicates whether to run the Docker daemon inside a Docker container. Set to true only if the build project is used to build Docker images. Otherwise,

a build that attempts to interact with the Docker daemon fails. The default setting is false.

type

The identifier of the environment type to use for the task. See **Environment type** in <u>the</u> section called "Build environment compute modes and types" for possible values.

dynamic

The dynamic properties define the build matrix.

buildspec

Optional. An array that contains the path and file names of the buildspec files to use for these tasks. If this parameter is not specified, the current buildspec file is used.

env

Optional. The build environment overrides for these tasks.

compute-type

An array that contains the identifiers of the compute types to use for these tasks. See **computeType** in <u>the section called "Build environment compute modes and types"</u> for possible values.

image

An array that contains the identifiers of the images to use for these tasks. See **Image identifier** in <u>the section called "Docker images provided by CodeBuild"</u> for possible values.

variables

An array that contains the environment variables that will be present in the build environments for these tasks. See <u>env/variables</u> for more information.

The following is an example of a build matrix buildspec entry:

```
batch:
    build-matrix:
        static:
        ignore-failure: false
        dynamic:
```

```
buildspec:
    - matrix1.yml
    - matrix2.yml
env:
    variables:
    MY_VAR:
        - VALUE1
        - VALUE2
        - VALUE3
```

For more information, see **Build matrix**.

Build environment reference for AWS CodeBuild

When you call AWS CodeBuild to run a build, you must provide information about the build environment. A *build environment* represents a combination of operating system, programming language runtime, and tools that CodeBuild uses to run a build. For information about how a build environment works, see <u>How CodeBuild works</u>.

A build environment contains a Docker image. For information, see <u>the Docker glossary</u> on the Docker Docs website.

When you provide information to CodeBuild about the build environment, you specify the identifier of a Docker image in a supported repository type. These include the CodeBuild Docker image repository, publicly available images in Docker Hub, and Amazon Elastic Container Registry (Amazon ECR) repositories that your AWS account has permissions to access.

- We recommend that you use Docker images stored in the CodeBuild Docker image repository, because they are optimized for use with the service. For more information, see <u>Docker images</u> provided by CodeBuild.
- To get the identifier of a publicly available Docker image stored in Docker Hub, see <u>Searching for</u> <u>Repositories</u> on the Docker Docs website.
- To learn how to work with Docker images stored in Amazon ECR repositories in your AWS account, see <u>Amazon ECR sample</u>.

In addition to a Docker image identifier, you also specify a set of computing resources that the build environment uses. For more information, see <u>Build environment compute modes and types</u>.

Topics

- Docker images provided by CodeBuild
- Build environment compute modes and types
- Shells and commands in build environments
- Environment variables in build environments
- Background tasks in build environments

Docker images provided by CodeBuild

A *supported image* is the latest major version of an image available in CodeBuild and is updated with minor and patch version updates. CodeBuild optimizes the provisioning duration of builds with supported images by caching them in the machine's <u>Amazon Machine Images (AMI)</u>. If you want to benefit from caching and minimize the provisioning duration of your build, select **Always use the latest image for this runtime version** in the **Image version** section of the CodeBuild console instead of a more granular version, such as aws/codebuild/amazonlinux2-x86_64-standard:4.0-1.0.0

Topics

- Obtain the list of current Docker images
- EC2 compute images
- Lambda compute images
- Deprecated CodeBuild images
- Available runtimes
- <u>Runtime versions</u>

Obtain the list of current Docker images

CodeBuild frequently updates the list of Docker images to add the latest images and deprecate old images. To get the most current list, do one of the following:

- In the CodeBuild console, in the Create build project wizard or Edit Build Project page, for Environment image, choose Managed image. Choose from the Operating system, Runtime, and Runtime version drop-down lists. For more information, see Create a build project (console) or Change a build project's settings (console).
- For the AWS CLI, run the list-curated-environment-images command:

```
aws codebuild list-curated-environment-images
```

• For the AWS SDKs, call the ListCuratedEnvironmentImages operation for your target programming language. For more information, see the AWS SDKs and tools reference.

EC2 compute images

AWS CodeBuild supports the following Docker images that are available for EC2 compute in CodeBuild.

Note

The base image of the Windows Server Core 2019 platform is only available in the following regions:

- US East (N. Virginia)
- US East (Ohio)
- US West (Oregon)
- Europe (Ireland)

Platform	Image identifier	Definition
Amazon Linux 2	aws/codebuild/amaz onlinux2-x86_64-st andard:4.0	al2/standard/4.0
Amazon Linux 2023	aws/codebuild/amaz onlinux2-x86_64-st andard:5.0	al2/standard/5.0
Amazon Linux 2	aws/codebuild/amaz onlinux2-x86_64-st andard:corretto8	al2/standard/corretto8
Amazon Linux 2	aws/codebuild/amaz onlinux2-x86_64-st andard:corretto11	al2/standard/corretto11
Amazon Linux 2	aws/codebuild/amaz onlinux2-aarch64-s tandard:2.0	al2/aarch64/standard/2.0

AWS CodeBuild

Platform	Image identifier	Definition
Amazon Linux 2023	aws/codebuild/amaz onlinux2-aarch64-s tandard:3.0	al2/aarch64/standard/3.0
Ubuntu 20.04	aws/codebuild/stan dard:5.0	ubuntu/standard/5.0
Ubuntu 22.04	aws/codebuild/stan dard:6.0	ubuntu/standard/6.0
Ubuntu 22.04	aws/codebuild/stan dard:7.0	ubuntu/standard/7.0
Windows Server Core 2019	aws/codebuild/wind ows-base:2019-1.0	N/A
Windows Server Core 2019	aws/codebuild/wind ows-base:2019-2.0	N/A
Windows Server Core 2019	aws/codebuild/wind ows-base:2019-3.0	N/A
Windows Server Core 2022	aws/codebuild/wind ows-base:2022-1.0	N/A
macOS	aws/codebuild/macos- arm-base:14	N/A

Lambda compute images

AWS CodeBuild supports the following Docker images that are available for AWS Lambda compute in CodeBuild.

aarch64 Architecture

Platform	Image identifier	Definition
Amazon Linux 2	aws/codebuild/amaz onlinux-aarch64-la mbda-standard:dotn et6	<u>al-lambda/aarch64/dotnet6</u>
Amazon Linux 2023	aws/codebuild/amaz onlinux-aarch64-la mbda-standard:dotn et8	<u>al-lambda/aarch64/dotnet8</u>
Amazon Linux 2	aws/codebuild/amaz onlinux-aarch64-la mbda-standard:go1. 21	<u>al-lambda/aarch64/go1.21</u>
Amazon Linux 2	aws/codebuild/amaz onlinux-aarch64-la mbda-standard:corr etto11	<u>al-lambda/aarch64/corretto1</u> <u>1</u>
Amazon Linux 2	aws/codebuild/amaz onlinux-aarch64-la mbda-standard:corr etto17	<u>al-lambda/aarch64/corretto1</u> <u>7</u>
Amazon Linux 2023	aws/codebuild/amaz onlinux-aarch64-la mbda-standard:corr etto21	<u>al-lambda/aarch64/corretto2</u> <u>1</u>
Amazon Linux 2	aws/codebuild/amaz onlinux-aarch64-la mbda-standard:node js18	<u>al-lambda/aarch64/nodejs18</u>

AWS CodeBuild

Platform	Image identifier	Definition
Amazon Linux 2023	aws/codebuild/amaz onlinux-aarch64-la mbda-standard:node js20	<u>al-lambda/aarch64/nodejs20</u>
Amazon Linux 2	aws/codebuild/amaz onlinux-aarch64-la mbda-standard:pyth on3.11	<u>al-lambda/aarch64/</u> python3.11
Amazon Linux 2023	aws/codebuild/amaz onlinux-aarch64-la mbda-standard:pyth on3.12	<u>al-lambda/aarch64/</u> python3.12
Amazon Linux 2	aws/codebuild/amaz onlinux-aarch64-la mbda-standard:ruby 3.2	al-lambda/aarch64/ruby3.2

x86_64 Architecture

Platform	Image identifier	Definition
Amazon Linux 2	aws/codebuild/amaz onlinux-x86_64-lam bda-standard:dotne t6	<u>al-lambda/x86_64/dotnet6</u>
Amazon Linux 2023	aws/codebuild/amaz onlinux-x86_64-lam bda-standard:dotne t8	<u>al-lambda/x86_64/dotnet8</u>

AWS CodeBuild

Platform	Image identifier	Definition
Amazon Linux 2	aws/codebuild/amaz onlinux-x86_64-lam bda-standard:go1.21	al-lambda/x86_64/go1.21
Amazon Linux 2	aws/codebuild/amaz onlinux-x86_64-lam bda-standard:corre tto11	<u>al-lambda/x86_64/c</u> orretto11
Amazon Linux 2	aws/codebuild/amaz onlinux-x86_64-lam bda-standard:corre tto17	<u>al-lambda/x86_64/c</u> orretto17
Amazon Linux 2023	aws/codebuild/amaz onlinux-x86_64-lam bda-standard:corre tto21	<u>al-lambda/x86_64/c</u> orretto21
Amazon Linux 2	aws/codebuild/amaz onlinux-x86_64-lam bda-standard:nodej s18	<u>al-lambda/x86_64/nodejs18</u>
Amazon Linux 2023	aws/codebuild/amaz onlinux-x86_64-lam bda-standard:nodej s20	<u>al-lambda/x86_64/nodejs20</u>
Amazon Linux 2	aws/codebuild/amaz onlinux-x86_64-lam bda-standard:pytho n3.11	<u>al-lambda/x86_64/p</u> ython3.11

Platform	Image identifier	Definition
Amazon Linux 2023	aws/codebuild/amaz onlinux-x86_64-lam bda-standard:pytho n3.12	<u>al-lambda/x86_64/p</u> ython3.12
Amazon Linux 2	aws/codebuild/amaz onlinux-x86_64-lam bda-standard:ruby3 .2	al-lambda/x86_64/ruby3.2

Deprecated CodeBuild images

A *deprecated image* is an image that is no longer cached or updated by CodeBuild. A deprecated image no longer receives minor version updates or patch version updates, and because they are no longer updated, using them may not be secure. If your CodeBuild project is configured to use an older image version, the provisioning process will download this docker image and use it to create the containerized runtime environment, which can increase the provisioning duration and overall build duration.

CodeBuild has deprecated the following Docker images. You can still use these images, but they won't be cached on the build host and will result in higher provisioning times.

Platform	Image identifier	Definition	Deprecation date
Amazon Linux 2	aws/codebuild/ amazonlinux2- x86_64-st andard:3.0	al2/standard/3.0	May 9, 2023
Ubuntu 18.04	aws/codebuild/ standard:4.0	ubuntu/standard/4.0	March 31, 2023
Amazon Linux 2	aws/codebuild/ amazonlinux2-	al2/aarch64/standa rd/1.0	March 31, 2023

Platform	Image identifier	Definition	Deprecation date
	aarch64-s tandard:1.0		
Ubuntu 18.04	aws/codebuild/ standard:3.0	ubuntu/standard/3.0	June 30, 2022
Amazon Linux 2	aws/codebuild/ amazonlinux2- x86_64-st andard:2.0	al2/standard/2.0	June 30, 2022

Topics

- Available runtimes
- Runtime versions

Available runtimes

You can specify one or more runtimes in the runtime-versions section of your buildspec file. If your runtime is dependent upon another runtime, you can also specify its dependent runtime in the buildspec file. If you do not specify any runtimes in the buildspec file, CodeBuild chooses the default runtimes that are available in the image you use. If you specify one or more runtimes, CodeBuild uses only those runtimes. If a dependent runtime is not specified, CodeBuild attempts to choose the dependent runtime for you. For more information, see <u>Specify runtime versions in the</u> buildspec file.

Topics

- Linux image runtimes
- macOS image runtimes
- <u>Windows image runtimes</u>

Linux image runtimes

The following table contains the available runtimes and the standard Linux images that support them.

Ubuntu and Amazon Linux platform runtimes

Version	Images
3.1	Amazon Linux 2 AArch64 standard: 2.0
	Ubuntu standard:5.0
5.0	Ubuntu standard:5.0
6.0	Amazon Linux 2 x86_64 Lambda stand dotnet6
	Amazon Linux 2 AArch64 Lambda stan dotnet6
	Amazon Linux 2 x86_64 standard: 4.0
	Amazon Linux 2023 x86_64 standard: 5.0
	Amazon Linux 2023 AArch64 standard 3.0
	Ubuntu standard:6.0
	Ubuntu standard:7.0
8.0	Amazon Linux 2023 x86_64 standard: 5.0
	Amazon Linux 2023 AArch64 standard 3.0
	Ubuntu standard:7.0
1.12	Amazon Linux 2 AArch64 standard: 2.0
	3.1 5.0 6.0 8.0

Runtime name	Version	Images
	1.13	Amazon Linux 2 AArch64 standard 2.0
	1.14	Amazon Linux 2 AArch64 standard 2.0
	1.15	Ubuntu standard:5.0
	1.16	Ubuntu standard:5.0
	1.18	Amazon Linux 2 x86_64 standard: 4.0
		Ubuntu standard:6.0
	1.20	Amazon Linux 2023 x86_64 stand 5.0
		Amazon Linux 2023 AArch64 stan 3.0
		Ubuntu standard:7.0
	1.21	Amazon Linux 2 x86_64 Lambda s go1.21
		Amazon Linux 2 AArch64 Lambda go1.21
		Amazon Linux 2023 x86_64 stand 5.0
		Amazon Linux 2023 AArch64 stan 3.0
		Ubuntu standard:7.0

Runtime name	Version	Images
	1.22	Amazon Linux 2023 x86_64 standaı 5.0
		Ubuntu standard:7.0
java	corretto8	Amazon Linux 2 x86_64 standard: corretto8
		Amazon Linux 2023 x86_64 standa 5.0
		Amazon Linux 2 AArch64 standard: 2.0
		Ubuntu standard:5.0
		Ubuntu standard:7.0
	corretto11	Amazon Linux 2 x86_64 standard: corretto11
		Amazon Linux 2 x86_64 Lambda sta corretto11
		Amazon Linux 2023 x86_64 standa 5.0
		Amazon Linux 2 AArch64 Lambda s corretto11
		Amazon Linux 2 AArch64 standard: 2.0
		Ubuntu standard:5.0
		Ubuntu standard:7.0

Runtime name	Version	Images
	corretto17	Amazon Linux 2 x86_64 Lambda st corretto17
		Amazon Linux 2 AArch64 Lambda corretto17
		Amazon Linux 2 x86_64 standard: 4.0
		Amazon Linux 2023 x86_64 stand 5.0
		Amazon Linux 2023 AArch64 stand 3.0
		Ubuntu standard:6.0
		Ubuntu standard:7.0
	corretto21	Amazon Linux 2 x86_64 Lambda si corretto21
		Amazon Linux 2 AArch64 Lambda corretto21
		Amazon Linux 2023 x86_64 standa 5.0
		Amazon Linux 2023 AArch64 stan 3.0
		Ubuntu standard:7.0
nodejs	10	Amazon Linux 2 AArch64 standard 2.0

Runtime name	Version	Images
	12	Amazon Linux 2 AArch64 standard: 2.0
		Ubuntu standard:5.0
	14	Ubuntu standard:5.0
	16	Amazon Linux 2 x86_64 standard: 4.0
		Ubuntu standard:6.0
	18	Amazon Linux 2 x86_64 Lambda stand nodejs18
		Amazon Linux 2 AArch64 Lambda stan nodejs18
		Amazon Linux 2023 x86_64 standard: 5.0
		Amazon Linux 2023 AArch64 standard 3.0
		Ubuntu standard:7.0
	20	Amazon Linux 2 x86_64 Lambda stanc nodejs20
		Amazon Linux 2 AArch64 Lambda stan nodejs20
		Amazon Linux 2023 x86_64 standard: 5.0
		Amazon Linux 2023 AArch64 standard 3.0
		Ubuntu standard:7.0

AWS CodeBuild

Runtime name	Version	Images
php	7.3	Amazon Linux 2 AArch64 standarc 2.0
		Ubuntu standard:5.0
	7.4	Amazon Linux 2 AArch64 standarc 2.0
		Ubuntu standard:5.0
	8.0	Ubuntu standard:5.0
	8.1	Amazon Linux 2 x86_64 standard: 4.0
		Amazon Linux 2023 AArch64 stan 3.0
		Ubuntu standard:6.0
	8.2	Amazon Linux 2023 x86_64 stand 5.0
		Amazon Linux 2023 AArch64 stan 3.0
		Ubuntu standard:7.0
	8.3	Amazon Linux 2023 x86_64 stand 5.0
		Amazon Linux 2023 AArch64 stan 3.0
		Ubuntu standard:7.0

AWS CodeBuild

Runtime name	Version	Images
python	3.7	Amazon Linux 2 AArch64 standard 2.0
		Ubuntu standard:5.0
	3.8	Amazon Linux 2 AArch64 standarc 2.0
		Ubuntu standard:5.0
	3.9	Amazon Linux 2 x86_64 standard: 4.0
		Amazon Linux 2023 x86_64 stand 5.0
		Amazon Linux 2 AArch64 standarc 2.0
		Ubuntu standard:5.0
		Ubuntu standard:7.0
	3.10	Amazon Linux 2023 x86_64 stand 5.0
		Ubuntu standard:6.0
		Ubuntu standard:7.0

Runtime name	Version	Images
3.11		Amazon Linux 2 x86_64 Lambda s python3.11
		Amazon Linux 2 AArch64 Lambda python3.11
		Amazon Linux 2023 x86_64 stand 5.0
		Amazon Linux 2023 AArch64 stan 3.0
		Ubuntu standard:7.0
	3.12	Amazon Linux 2 x86_64 Lambda s python3.12
		Amazon Linux 2 AArch64 Lambda python3.12
		Amazon Linux 2023 x86_64 stand 5.0
		Amazon Linux 2023 AArch64 stan 3.0
		Ubuntu standard:7.0
uby	2.6	Amazon Linux 2 AArch64 standard 2.0
		Ubuntu standard:5.0
	2.7	Amazon Linux 2 AArch64 standard 2.0
		Ubuntu standard:5.0

Runtime name	Version	Images
	3.1	Amazon Linux 2 x86_64 standard: 4.0
		Amazon Linux 2023 x86_64 standard 5.0
		Ubuntu standard:6.0
		Ubuntu standard:7.0
	3.2	Amazon Linux 2 x86_64 Lambda star ruby3.2
		Amazon Linux 2 AArch64 Lambda sta ruby3.2
		Amazon Linux 2023 x86_64 standard 5.0
		Amazon Linux 2023 AArch64 standa 3.0
		Ubuntu standard:7.0
	3.3	Amazon Linux 2023 x86_64 standard 5.0
		Ubuntu standard:7.0

macOS image runtimes

▲ Important

The CodeBuild curated images for Mac builds contain macOS and Xcode pre-installed. By using the Xcode software, you acknowledge, understand, and consent to the <u>Xcode and</u> <u>Apple SDKs Agreement</u>. If you do not accept the terms and conditions of the agreement, do

not use the Xcode software. Instead, provide your own Amazon Machine Images (AMI). For more information, see How do I configure a reserved capacity macOS fleet?

The following table contains the available runtimes supported by macOS.

macOS platform runtimes

Runtime name	Version	Additional notes	
Xcode	15.4		
bash	3.2.57		
clang	15.0.0		
dotnet sdk	8.0.302		
gcc	11.4.0	Available by using the	
	12.3.0	gcc-11 alias	
	13.3.0	Available by using the gcc-12 alias	
	14.1.0	Available by using the gcc-13 alias	
		Available by using the gcc-14 alias	
gnu	11.4.0	Available by using the	
	12.3.0	gfortran-11 alias	
	13.3.0	Available by using the gfortran-12 alias	
	14.1.0	Available by using the gfortran-13 alias	
		Available by using the gfortran-14 alias	

Runtime name	Version	Additional notes
golang	1.22.4	
java	Corretto8	
	Corretto11	
	Corretto17	
	Corretto21	
kotlin	2.0.0	
mono	6.12.0.206	
nodejs	18.20.3	
	20.14.0	
	22.3.0	
perl	5.34.1	
php	8.1.29	
	8.2.20	
	8.3.8	
python	3.9.19	
	3.10.14	
	3.11.9	
	3.12.3	
ruby	3.1.6	
	3.2.4	
	3.3.2	

Runtime name	Version	Additional notes
rust	1.79.0	
swift	5.10.0.13	

Windows image runtimes

The base image of the Windows Server Core 2019 contains the following runtimes.

Windows platform runtimes

Runtime name	Windows Server Core 20 1.0 versions	Windows Server Core 20 2.0 versions	Windows Server Core 2019 sta 3.0 versions
dotnet	3.1	3.1	6.0
	5.0	6.0	7.0
		7.0	8.0
dotnet sdk	3.1	3.1	8.0
	5.0	6.0	
		7.0	
golang	1.14	1.18	1.21
gradle	6.7	7.6	8.5
java	Corretto11	Corretto11	Corretto21
		Corretto17	
maven	3.6	3.8	3.9
nodejs	14.15	16.19	20.11
php	7.4	8.1	8.3

Runtime name	Windows Server Core 20 1.0 versions	Windows Server Core 20 2.0 versions	Windows Server Core 2019 sta 3.0 versions
powershell	7.1	7.2	7.4
python	3.8	3.10	3.12
ruby	2.7	3.1	3.3

Runtime versions

When you specify a runtime in the <u>runtime-versions</u> section of your buildspec file, you can specify a specific version, a specific major version and the latest minor version, or the latest version. The following table lists the available runtimes and how to specify them. Not all runtime versions are available on all images. Runtime version selection is also not supported for the custom images. For more information, see <u>Available runtimes</u>. If you'd like to install and use a custom runtime version instead of the pre-installed runtime versions, see <u>Custom runtime versions</u>.

Ubuntu and Amazon Linux 2 platform runtime versions

Runtime name	Version	Specific version	Specific major and latest minor version	Latest version
android	28	android: 28	android: 28.x	android: latest
	29	android: 29	android: 29.x	
dotnet	3.1	dotnet: 3.1	dotnet: 3.x	dotnet: latest
	5.0	dotnet: 5.0	dotnet: 5.x	
	6.0	dotnet: 6.0	dotnet: 6.x	
	8.0	dotnet: 8.0	dotnet: 8.x	
golang	1.12	golang: 1.12	golang: 1.x	golang: latest
	1.13	golang: 1.13		

Runtime name	Version	Specific version	Specific major and latest minor version	Latest version
	1.14	golang: 1.14		
	1.15	golang: 1.15		
	1.16	golang: 1.16		
	1.18	golang: 1.18		
	1.20	golang: 1.20		
	1.21	golang: 1.21		
	1.22	golang: 1.22		
java	corretto8	java: corretto	java: corretto .x	java: latest
	corretto11	java: corretto 1	java: corretto 1.x	
	corretto17	java: corretto 7	java: corretto 7.x	
	corretto21	java: corretto 1	java: corretto 1.x	
nodejs	10	nodejs: 10	nodejs: 10.x	nodejs: latest
	12	nodejs: 12	nodejs: 12.x	
	14	nodejs: 14	nodejs: 14.x	
	16	nodejs: 16	nodejs: 16.x	
	18	nodejs: 18	nodejs: 18.x	
	20	nodejs: 20	nodejs: 20.x	

Runtime name	Version	Specific version	Specific major and latest minor version	Latest version
php	7.3	php: 7.3	php: 7.x	php: latest
	7.4	php: 7.4		
	8.0	php: 8.0	php: 8.x	
	8.1	php: 8.1		
	8.2	php: 8.2		
	8.3	php: 8.3		
python	3.7	python: 3.7	python: 3.x	python: latest
	3.8	python: 3.8		
	3.9	python: 3.9		
	3.10	python: 3.10		
	3.11	python: 3.11		
	3.12	python: 3.12		
ruby	2.6	ruby: 2.6	ruby: 2.x	ruby: latest
	2.7	ruby: 2.7		
	3.1	ruby: 3.1	ruby: 3.x	
	3.2	ruby: 3.2		
	3.3	ruby: 3.3		

You can use a build specification to install other components (for example, the AWS CLI, Apache Maven, Apache Ant, Mocha, RSpec, or similar) during the install build phase. For more information, see Buildspec example.

Custom runtime versions

Instead of using the pre-installed runtime versions in CodeBuild-managed images, you can install and use custom versions of your choice. The following table lists the available custom runtimes and how to specify them.

i Note

Custom runtime version selection is only supported for Ubuntu and Amazon Linux images.

Runtime name	Syntax	Example
dotnet	<major>.<minor>.<patch></patch></minor></major>	5.0.408
golang	<major>.<minor></minor></major>	1.19
	<major>.<minor>.<patch></patch></minor></major>	1.19.1
java	corretto <major></major>	corretto15
nodejs	<major></major>	14
	<major>.<minor></minor></major>	14.21
	<major>.<minor>.<patch></patch></minor></major>	14.21.3
php	<major>.<minor>.<patch></patch></minor></major>	8.0.30
python	<major></major>	3
	<major>.<minor></minor></major>	3.7
	<major>.<minor>.<patch></patch></minor></major>	3.7.16
ruby	<major>.<minor>.<patch></patch></minor></major>	3.0.6

Custom runtime versions

Custom runtime buildspec example

Here is an example of a buildspec that specifies custom runtime versions.

version: 0.2
phases:
 install:
 runtime-versions:
 java: corretto15
 php: 8.0.30
 ruby: 3.0.6
 golang: 1.19
 python: 3.7
 nodejs: 14
 dotnet: 5.0.408

Build environment compute modes and types

In CodeBuild, you can specify the compute and runtime environment image that CodeBuild uses to run your builds. *Compute* refers to the computing engine (the CPU, memory, and operating system) that is managed and maintained by CodeBuild. A *runtime environment image* is a container image that runs on top of your chosen compute platform, and includes extra tools that your build might need, such as the AWS CLI.

Topics

- <u>About compute modes</u>
- About environment types

About compute modes

CodeBuild offers the following compute modes:

- EC2
- AWS Lambda

EC2 offers optimized flexibility during your build and AWS Lambda offers optimized start-up speeds. AWS Lambda supports faster builds due to a lower start-up latency. AWS Lambda also

automatically scales, so builds aren't waiting in queue to run. For more information, see <u>Run builds</u> on AWS Lambda compute.

About environment types

AWS CodeBuild provides build environments with the following available memory, vCPUs, and disk space for EC2 compute mode:

Compute type	Environment computeTy pe value	Environment type value	Memory	vCPUs	Disk space
ARM Small ¹	BUILD_GEN ERAL1_SMA LL	ARM_CONTA INER	4 GB	2	64 GB
ARM Medium	BUILD_GEN ERAL1_MED IUM	ARM_CONTA INER	8 GB	4	128 GB
ARM Large ¹	BUILD_GEN ERAL1_LAR GE	ARM_CONTA INER	16 GB	8	128 GB
ARM XLarge ¹	BUILD_GEN ERAL1_XLA RGE	ARM_CONTA INER	64 GB	32	256 GB
ARM 2XLarge	BUILD_GEN ERAL1_2XL ARGE	ARM_CONTA INER	96 GB	48	824 GB
Linux Small ¹	BUILD_GEN ERAL1_SMA LL	LINUX_CON TAINER	3 GB	2	64 GB

AWS CodeBuild

Compute type	Environment computeTy pe value	Environment type value	Memory	vCPUs	Disk space
Linux Medium	BUILD_GEN ERAL1_MED IUM	LINUX_CON TAINER	7 GB	4	128 GB
Linux Large ¹	BUILD_GEN ERAL1_LAR GE	LINUX_CON TAINER	15 GB	8	128 GB
Linux XLarge	BUILD_GEN ERAL1_XLA RGE	LINUX_CON TAINER	70 GB	36	256 GB
Linux 2XLarge	BUILD_GEN ERAL1_2XL ARGE	LINUX_CON TAINER	145 GB	72	824 GB (SSD)
Linux GPU Sma	BUILD_GEN ERAL1_SMA LL	LINUX_GPU _CONTAINE R	16 GB	4	220 GB
Linux GPU Larg	BUILD_GEN ERAL1_LAR GE	LINUX_GPU _CONTAINE R	255 GB	32	50 GB
macOS Medium	BUILD_GEN ERAL1_MED IUM	MAC_ARM	24 GB	8	128 GB
macOS Large	BUILD_GEN ERAL1_LAR GE	MAC_ARM	32 GB	12	256 GB

Compute type	Environment computeTy pe value	Environment type value	Memory	vCPUs	Disk space
Windows Mediı 1	BUILD_GEN ERAL1_MED IUM	WINDOWS_S ERVER_201 9_CONTAIN ER	7 GB	4	128 GB
Windows Large	BUILD_GEN ERAL1_LAR GE	WINDOWS_S ERVER_201 9_CONTAIN ER	15 GB	8	128 GB

¹ The latest version of this image type is cached. If you specify a more specific version, then CodeBuild provisions that version instead of the cached version. This can result in longer build times. For example, to benefit from caching, specify aws/codebuild/amazonlinux2-x86_64-standard:5.0 instead of a more granular version, such as aws/codebuild/amazonlinux2-x86_64-standard:5.0-1.0.0.

AWS CodeBuild provides build environments with the following available memory and disk space for AWS Lambda compute mode:

Compute type	Environment computeType value	Environment type value	Memory	Disk space
ARM Lambda 1GB	BUILD_LAM BDA_1GB	ARM_LAMBD A_CONTAIN ER	1 GB	10 GB
ARM Lambda 2GB	BUILD_LAM BDA_2GB	ARM_LAMBD A_CONTAIN ER	2 GB	10 GB

AWS CodeBuild

Compute type	Environment computeType value	Environment type value	Memory	Disk space
ARM Lambda 4GB	BUILD_LAM BDA_4GB	ARM_LAMBD A_CONTAIN ER	4 GB	10 GB
ARM Lambda 8GB	BUILD_LAM BDA_8GB	ARM_LAMBD A_CONTAIN ER	8 GB	10 GB
ARM Lambda 10Gł	BUILD_LAM BDA_10GB	ARM_LAMBD A_CONTAIN ER	10 GB	10 GB
Linux Lambda 1GB	BUILD_LAM BDA_1GB	LINUX_LAM BDA_CONTA INER	1 GB	10 GB
Linux Lambda 2GB	BUILD_LAM BDA_2GB	LINUX_LAM BDA_CONTA INER	2 GB	10 GB
Linux Lambda 4GB	BUILD_LAM BDA_4GB	LINUX_LAM BDA_CONTA INER	4 GB	10 GB
Linux Lambda 8GB	BUILD_LAM BDA_8GB	LINUX_LAM BDA_CONTA INER	8 GB	10 GB
Linux Lambda 10G	BUILD_LAM BDA_10GB	LINUX_LAM BDA_CONTA INER	10 GB	10 GB

When using other environment types, it is recommended that you use a cached image to reduce build times.

The disk space listed for each build environment is available only in the directory specified by the CODEBUILD_SRC_DIR environment variable.

To choose a compute type:

- In the CodeBuild console, in the Create build project wizard or Edit Build Project page, in Environment expand Additional configuration, and then choose one of the options from Compute type. For more information, see Create a build project (console) or Change a build project's settings (console).
- For the AWS CLI, run the create-project or update-project command, specifying the computeType value of the environment object. For more information, see <u>Create a build</u> project (AWS CLI) or <u>Change a build project's settings (AWS CLI)</u>.
- For the AWS SDKs, call the equivalent of the CreateProject or UpdateProject operation for your target programming language, specifying the equivalent of computeType value of the environment object. For more information, see the AWS SDKs and tools reference.

Some environment and compute types have Region availability limitations:

- The compute type Linux GPU Small (LINUX_GPU_CONTAINER) is only available in these Regions:
 - US East (N. Virginia)
 - US West (Oregon)
 - Asia Pacific (Tokyo)
 - Canada (Central)
 - Europe (Frankfurt)
 - Europe (Ireland)
 - Europe (London)
- The compute type Linux GPU Large (LINUX_GPU_CONTAINER) is only available in these Regions:
 - US East (Ohio)
 - US East (N. Virginia)
 - US West (Oregon)
 - Asia Pacific (Seoul)
 - Asia Pacific (Singapore)
 - Asia Pacific (Sydney)
 - Asia Pacific (Tokyo)

- Canada (Central)
- China (Beijing)
- China (Ningxia)
- Europe (Frankfurt)
- Europe (Ireland)
- Europe (London)
- The environment type ARM_CONTAINER is only available in these Regions:
 - US East (Ohio)
 - US East (N. Virginia)
 - US West (N. California)
 - US West (Oregon)
 - Asia Pacific (Hong Kong)
 - Asia Pacific (Jakarta)
 - Asia Pacific (Hyderabad)
 - Asia Pacific (Mumbai)
 - Asia Pacific (Osaka)
 - Asia Pacific (Seoul)
 - Asia Pacific (Singapore)
 - Asia Pacific (Sydney)
 - Asia Pacific (Tokyo)
 - Canada (Central)
 - China (Beijing)
 - China (Ningxia)
 - Europe (Frankfurt)
 - Europe (Ireland)
 - Europe (London)
 - Europe (Milan)
 - Europe (Paris)
- Europe (Spain) About environment types

- Israel (Tel Aviv)
- Middle East (Bahrain)
- Middle East (UAE)
- South America (São Paulo)
- The compute type BUILD_GENERAL1_2XLARGE is only available in these Regions:
 - US East (Ohio)
 - US East (N. Virginia)
 - US West (N. California)
 - US West (Oregon)
 - Asia Pacific (Hyderabad)
 - Asia Pacific (Hong Kong)
 - Asia Pacific (Jakarta)
 - Asia Pacific (Melbourne)
 - Asia Pacific (Mumbai)
 - Asia Pacific (Seoul)
 - Asia Pacific (Singapore)
 - Asia Pacific (Sydney)
 - Asia Pacific (Tokyo)
 - Canada (Central)
 - China (Beijing)
 - China (Ningxia)
 - Europe (Frankfurt)
 - Europe (Ireland)
 - Europe (London)
 - Europe (Paris)
 - Europe (Spain)
 - Europe (Stockholm)
 - Europe (Zurich)
- Israel (Tel Aviv)
- About environment types
 - Middle East (Bahrain)

- Middle East (UAE)
- South America (São Paulo)
- The compute mode AWS Lambda (ARM_LAMBDA_CONTAINER and LINUX_LAMBDA_CONTAINER) is only available in these Regions:
 - US East (N. Virginia)
 - US East (Ohio)
 - US West (Oregon)
 - Asia Pacific (Mumbai)
 - Asia Pacific (Singapore)
 - Asia Pacific (Sydney)
 - Asia Pacific (Tokyo)
 - Europe (Frankfurt)
 - Europe (Ireland)
 - South America (São Paulo)
- The compute mode MAC_ARM is only available in these Regions:
 - US East (N. Virginia)
 - US East (Ohio)
 - US West (Oregon)
 - Asia Pacific (Sydney)
 - Europe (Frankfurt)

For the compute type BUILD_GENERAL1_2XLARGE, Docker images up to 100 GB uncompressed are supported.

(i) Note

For custom build environment images, CodeBuild supports Docker images up to 50 GB uncompressed in Linux and Windows, regardless of the compute type. To check your build image's size, use Docker to run the docker images *REPOSITORY*: *TAG* command.

You can use Amazon EFS to access more space in your build container. For more information, see <u>Amazon Elastic File System sample for AWS CodeBuild</u>. If you want to manipulate container disk space during a build, then the build must run in privileged mode.

🚯 Note

By default, Docker daemon is enabled for non-VPC builds. If you would like to use Docker containers for VPC builds, see <u>Runtime Privilege and Linux Capabilities</u> on the Docker Docs website and enable privileged mode. Also, Windows does not support privileged mode.

Shells and commands in build environments

You provide a set of commands for AWS CodeBuild to run in a build environment during the lifecycle of a build (for example, installing build dependencies and testing and compiling your source code). There are several ways to specify these commands:

- Create a build specification file and include it with your source code. In this file, specify the commands you want to run in each phase of the build lifecycle. For more information, see the <u>Build specification reference for CodeBuild</u>.
- Use the CodeBuild console to create a build project. In Insert build commands, for Build commands, enter the commands you want to run in the build phase. For more information, see Create a build project (console).
- Use the CodeBuild console to change the settings of a build project. In **Insert build commands**, for **Build commands**, enter the commands you want to run in the build phase. For more information, see <u>Change a build project's settings (console)</u>.
- Use the AWS CLI or AWS SDKs to create a build project or change the settings of a build project. Reference the source code that contains a buildspec file with your commands, or specify a single string that includes the contents of an equivalent buildspec file. For more information, see Create a build project or Change build project settings.
- Use the AWS CLI or AWS SDKs to start a build, specifying a buildspec file or a single string that includes the contents of an equivalent buildspec file. For more information, see the description for the buildspecOverride value in Run builds manually.

You can specify any Shell Command Language (sh) command. In buildspec version 0.1, CodeBuild runs each Shell command in a separate instance in the build environment. This means that each

command runs in isolation from all other commands. Therefore, by default, you cannot run a single command that relies on the state of any previous commands (for example, changing directories or setting environment variables). To get around this limitation, we recommend that you use version 0.2, which solves this issue. If you must use version 0.1, we recommend the following approaches:

- Include a shell script in your source code that contains the commands you want to run in a single instance of the default shell. For example, you could include a file named my-script.sh in your source code that contains commands such as cd MyDir; mkdir -p mySubDir; cd mySubDir; pwd;. Then, in your buildspec file, specify the command ./my-script.sh.
- In your buildspec file or on the Build commands setting for the build phase only, enter a single command that includes all of the commands you want to run in a single instance of the default shell (for example, cd MyDir && mkdir -p mySubDir && cd mySubDir && pwd).

If CodeBuild encounters an error, the error might be more difficult to troubleshoot compared to running a single command in its own instance of the default shell.

Commands that are run in a Windows Server Core image use the PowerShell shell.

Environment variables in build environments

AWS CodeBuild provides several environment variables that you can use in your build commands:

AWS_DEFAULT_REGION

The AWS Region where the build is running (for example, us-east-1). This environment variable is used primarily by the AWS CLI.

AWS_REGION

The AWS Region where the build is running (for example, us-east-1). This environment variable is used primarily by the AWS SDKs.

CODEBUILD_BATCH_BUILD_IDENTIFIER

The identifier of the build in a batch build. This is specified in the batch buildspec. For more information, see the section called "Batch buildspec reference".

Environment variables in build environments

CODEBUILD_BUILD_ARN

The Amazon Resource Name (ARN) of the build (for example, arn:aws:codebuild:*region-ID*:account-ID:build/codebuild-demo-project:b1e6661e-e4f2-4156-9ab9-82a19EXAMPLE).

CODEBUILD_BUILD_ID

The CodeBuild ID of the build (for example, codebuild-demo-project:b1e6661ee4f2-4156-9ab9-82a19EXAMPLE).

CODEBUILD_BUILD_IMAGE

The CodeBuild build image identifier (for example, aws/codebuild/standard:2.0). CODEBUILD_BUILD_NUMBER

The current build number for the project.

CODEBUILD_BUILD_SUCCEEDING

Whether the current build is succeeding. Set to 0 if the build is failing, or 1 if the build is succeeding.

CODEBUILD_INITIATOR

The entity that started the build. If CodePipeline started the build, this is the pipeline's name (for example, codepipeline/my-demo-pipeline). If an user started the build, this is the user's name (for example, MyUserName). If the Jenkins plugin for CodeBuild started the build, this is the string CodeBuild-Jenkins-Plugin.

CODEBUILD_KMS_KEY_ID

The identifier of the AWS KMS key that CodeBuild is using to encrypt the build output artifact (for example, arn:aws:kms:region-ID:account-ID:key/key-ID or alias/key-alias).

CODEBUILD_LOG_PATH

The log stream name in CloudWatch Logs for the build.

CODEBUILD_PUBLIC_BUILD_URL

The URL of the build results for this build on the public builds website. This variable is only set if the build project has public builds enabled. For more information, see <u>Get public build project</u> <u>URLs</u>.

CODEBUILD_RESOLVED_SOURCE_VERSION

The version identifier of a build's source code. The contents depends on the source code repository:

CodeCommit, GitHub, GitHub Enterprise Server, and Bitbucket

This variable contains the commit ID.

CodePipeline

This variable contains the source revision provided by CodePipeline.

If CodePipeline is not able to resolve the source revision, such as when the source is an Amazon S3 bucket that does not have versioning enabled, this environment variable is not set.

Amazon S3

This variable is not set.

When applicable, the CODEBUILD_RESOLVED_SOURCE_VERSION variable is only available after the DOWNLOAD_SOURCE phase.

CODEBUILD_SOURCE_REPO_URL

The URL to the input artifact or source code repository. For Amazon S3, this is s3:// followed by the bucket name and path to the input artifact. For CodeCommit and GitHub, this is the repository's clone URL. If a build originates from CodePipeline, this environment variable may be empty.

For secondary sources, the environment variable for the secondary source repository URL is CODEBUILD_SOURCE_REPO_URL_<*sourceIdentifier>*, where *sourceIdentifier>* is the source identifier you create.

CODEBUILD_SOURCE_VERSION

The value's format depends on the source repository.

- For Amazon S3, it is the version ID associated with the input artifact.
- For CodeCommit, it is the commit ID or branch name associated with the version of the source code to be built.
- For GitHub, GitHub Enterprise Server, and Bitbucket it is the commit ID, branch name, or tag name associated with the version of the source code to be built.

🚯 Note

For a GitHub or GitHub Enterprise Server build that is triggered by a webhook pull request event, it is pr/pull-request-number.

For secondary sources, the environment variable for the secondary source version is CODEBUILD_SOURCE_VERSION_<*sourceIdentifier>*, where <*sourceIdentifier>* is the source identifier you create. For more information, see <u>Multiple input sources and output artifacts sample</u>.

CODEBUILD_SRC_DIR

The directory path that CodeBuild uses for the build (for example, /tmp/src123456789/src).

For secondary sources, the environment variable for the secondary source directory path is CODEBUILD_SRC_DIR_<*sourceIdentifier>*, where <*sourceIdentifier>* is the source identifier you create. For more information, see <u>Multiple input sources and output artifacts</u> <u>sample</u>.

CODEBUILD_START_TIME

The start time of the build specified as a Unix timestamp in milliseconds.

CODEBUILD_WEBHOOK_ACTOR_ACCOUNT_ID

The account ID of the user that triggered the webhook event.

CODEBUILD_WEBHOOK_BASE_REF

The base reference name of the webhook event that triggers the current build. For a pull request, this is the branch reference.

CODEBUILD_WEBHOOK_EVENT

The webhook event that triggers the current build.

CODEBUILD_WEBHOOK_MERGE_COMMIT

The identifier of the merge commit used for the build. This variable is set when a Bitbucket pull request is merged with the squash strategy and the pull request branch is closed. In this case, the original pull request commit no longer exists, so this environment variable contains the identifier of the squashed merge commit.

CODEBUILD_WEBHOOK_PREV_COMMIT

The ID of the most recent commit before the webhook push event that triggers the current build.

CODEBUILD_WEBHOOK_HEAD_REF

The head reference name of the webhook event that triggers the current build. It can be a branch reference or a tag reference.

CODEBUILD_WEBHOOK_TRIGGER

Shows the webhook event that triggered the build. This variable is available only for builds triggered by a webhook. The value is parsed from the payload sent to CodeBuild by GitHub, GitHub Enterprise Server, or Bitbucket. The value's format depends on what type of event triggered the build.

- For builds triggered by a pull request, it is pr/pull-request-number.
- For builds triggered by creating a new branch or pushing a commit to a branch, it is branch/branch-name.
- For builds triggered by a pushing a tag to a repository, it is tag/tag-name.

HOME

This environment variable is always set to /root.

AWS CodeBuild also supports a set of environment variables for self-hosted runner builds. To learn more about CodeBuild self-hosted runner, see <u>Self-hosted GitHub Actions runners in AWS</u> CodeBuild.

CODEBUILD_RUNNER_OWNER

The owner of the repository that triggers the self-hosted runner build.

CODEBUILD_RUNNER_REPO

The name of the repository that triggers the self-hosted runner build.

CODEBUILD_RUNNER_REPO_DOMAIN

The domain of the repository that triggers the self-hosted runner build. Only specified GitHub Enterprise builds.

CODEBUILD_WEBHOOK_LABEL

The label used to configure build overrides and the self-hosted runner during the build.

CODEBUILD_WEBHOOK_RUN_ID

The run ID of the workflow associated with the build.

CODEBUILD_WEBHOOK_JOB_ID

The job ID of the job associated with the build.

CODEBUILD_WEBHOOK_WORKFLOW_NAME

The name of the workflow associated with the build if it exists in the webhook request payload. CODEBUILD_RUNNER_WITH_BUILDSPEC

If a buildspec override is configured in the self-hosted runner request labels, this is set to true.

You can also provide build environments with your own environment variables. For more information, see the following topics:

- Use CodeBuild with CodePipeline
- <u>Create a build project</u>
- Change build project settings
- Run builds manually
- Buildspec reference

To list all of the available environment variables in a build environment, you can run the printenv command (for Linux-based build environment) or "Get-ChildItem Env:" (for Windows-based build environments) during a build. Except for those previously listed, environment variables that start with CODEBUILD_ are for CodeBuild internal use. They should not be used in your build commands.

A Important

We strongly discourage the use of environment variables to store sensitive values, especially AWS access key IDs. Environment variables can be displayed in plain text using tools such as the CodeBuild console and the AWS CLI. We recommend you store sensitive values in the Amazon EC2 Systems Manager Parameter Store and then retrieve them from your buildspec. To store sensitive values, see <u>Systems</u> <u>Manager Parameter Store</u> and <u>Walkthrough: Create and test a String parameter (console)</u> in the *Amazon EC2 Systems Manager User Guide*. To retrieve them, see the parameter-store mapping in <u>Buildspec syntax</u>.

Background tasks in build environments

You can run background tasks in build environments. To do this, in your buildspec, use the nohup command to run a command as a task in the background, even if the build process exits the shell. Use the **disown** command to forcibly stop a running background task.

Examples:

L

• Start a background process and wait for it to complete later:

```
I
nohup sleep 30 & echo $! > pidfile
...
wait $(cat pidfile)
```

• Start a background process and do not wait for it to ever complete:

```
nohup sleep 30 & disown $!
```

• Start a background process and kill it later:

```
|
nohup sleep 30 & echo $! > pidfile
...
kill $(cat pidfile)
```

Build projects

A *build project* includes information about how to run a build, including where to get the source code, which build environment to use, which build commands to run, and where to store the build output.

You can perform these tasks when working with build projects:

Topics

- <u>Create a build project in AWS CodeBuild</u>
- Create a notification rule
- Change build project settings in AWS CodeBuild
- Multiple access tokens in CodeBuild
- Delete build projects in AWS CodeBuild
- Get public build project URLs
- Share build projects
- Tag build projects
- Use runners with AWS CodeBuild
- Use webhooks with AWS CodeBuild
- View a build project's details in AWS CodeBuild
- View build project names in AWS CodeBuild

Create a build project in AWS CodeBuild

You can use the AWS CodeBuild console, AWS CLI, or AWS SDKs to create a build project.

Topics

- Prerequisites
- Create a build project (console)
- Create a build project (AWS CLI)
- Create a build project (AWS SDKs)

Prerequisites

Before creating a build project, answer the questions in <u>Plan a build</u>.

Create a build project (console)

Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/home.

If a CodeBuild information page is displayed, choose **Create build project**. Otherwise, on the navigation pane, expand **Build**, choose **Build projects**, and then choose **Create build project**.

Choose Create build project.

Fill in the following sections. Once complete, choose **Create build project** at the bottom of the page.

Sections:

- Project configuration
- Source
- Environment
- Buildspec
- Batch configuration
- Artifacts
- Logs

Project configuration

Project name

Enter a name for this build project. Build project names must be unique across each AWS account.

Description

Enter an optional description of the build project to help other users understand what this project is used for.

Build badge

(Optional) Select **Enable build badge** to make your project's build status visible and embeddable. For more information, see Build badges sample.

Note

Build badge does not apply if your source provider is Amazon S3.

Enable concurrent build limit

(Optional) If you want to limit the number of concurrent builds for this project, perform the following steps:

- 1. Select Restrict number of concurrent builds this project can start.
- In Concurrent build limit, enter the maximum number of concurrent builds that are allowed for this project. This limit cannot be greater than the concurrent build limit set for the account. If you try to enter a number greater than the account limit, an error message is displayed.

New builds are only started if the current number of builds is less than or equal to this limit. If the current build count meets this limit, new builds are throttled and are not run.

Additional information

(Optional) For **Tags**, enter the name and value of any tags that you want supporting AWS services to use. Use **Add row** to add a tag. You can add up to 50 tags.

Source

Source provider

Choose the source code provider type. Use the following lists to make selections appropriate for your source provider:

Note

CodeBuild does not support Bitbucket Server.

Amazon S3

Bucket

Choose the name of the input bucket that contains the source code.

S3 object key or S3 folder

Enter the name of the ZIP file or the path to the folder that contains the source code. Enter a forward slash (/) to download everything in the S3 bucket.

Source version

Enter the version ID of the object that represents the build of your input file. For more information, seeSource version sample with AWS CodeBuild.

CodeCommit

Repository

Choose the repository you want to use.

Reference type

Choose **Branch**, **Git tag**, or **Commit ID** to specify the version of your source code. For more information, see Source version sample with AWS CodeBuild.

Note

We recommend that you choose Git branch names that don't look like commit IDs, such as 811dd1ba1aba14473856cee38308caed7190c0d or 5392f7. This helps you avoid Git checkout collisions with actual commits.

Git clone depth

Choose to create a shallow clone with a history truncated to the specified number of commits. If you want a full clone, choose **Full**.

Git submodules

Select **Use Git submodules** if you want to include Git submodules in your repository.

User Guide

Bitbucket

Credential

Choose **Default source credential** or **Custom source credential** and follow the instructions to manage the default source credential or customize the source credential.

Connection type

Choose **CodeConnections**, **OAuth**, **App password**, or **Personal access token** to connect to CodeBuild.

Connection

Select a Bitbucket connection or a Secrets Manager secret to connect through your specified connection type.

Repository

Choose **Repository in my Bitbucket account** or **Public repository** and enter the repository URL.

Source version

Enter a branch, commit ID, tag, or reference and a commit ID. For more information, see Source version sample with AWS CodeBuild

🚯 Note

We recommend that you choose Git branch names that don't look like commit IDs, such as 811dd1ba1aba14473856cee38308caed7190c0d or 5392f7. This helps you avoid Git checkout collisions with actual commits.

Git clone depth

Choose **Git clone depth** to create a shallow clone with a history truncated to the specified number of commits. If you want a full clone, choose **Full**.

Git submodules

Select **Use Git submodules** if you want to include Git submodules in your repository.

Build status

Select **Report build statuses to source provider when your builds start and finish** if you want the status of your build's start and completion reported to your source provider.

To be able to report the build status to the source provider, the user associated with the source provider must have write access to the repo. If the user does not have write access, the build status cannot be updated. For more information, see Source provider access.

For **Status context**, enter the value to be used for the name parameter in the Bitbucket commit status. For more information, see **build** in the Bitbucket API documentation.

For **Target URL**, enter the value to be used for the url parameter in the Bitbucket commit status. For more information, see build in the Bitbucket API documentation.

The status of a build triggered by a webhook is always reported to the source provider. To have the status of a build that is started from the console or an API call reported to the source provider, you must select this setting.

If your project's builds are triggered by a webhook, you must push a new commit to the repo for a change to this setting to take effect.

In **Primary source webhook events**, select **Rebuild every time a code change is pushed to this repository** if you want CodeBuild to build the source code every time a code change is pushed to this repository. For more information about webhooks and filter groups, see <u>Bitbucket</u> webhook events.

GitHub

Credential

Choose **Default source credential** or **Custom source credential** and follow the instructions to manage the default source credential or customize the source credential.

Connection type

Choose GitHub App, OAuth, or Personal access token to connect to CodeBuild.

Connection

Select a GitHub connection or a Secrets Manager secret to connect through your specified connection type.

Repository

Choose **Repository in my GitHub account**, **Public repository**, or **GitHub scoped webhook** and enter the repository URL.

Source version

Enter a branch, commit ID, tag, or reference and a commit ID. For more information, see Source version sample with AWS CodeBuild

i Note

We recommend that you choose Git branch names that don't look like commit IDs, such as 811dd1ba1aba14473856cee38308caed7190c0d or 5392f7. This helps you avoid Git checkout collisions with actual commits.

Git clone depth

Choose **Git clone depth** to create a shallow clone with a history truncated to the specified number of commits. If you want a full clone, choose **Full**.

Git submodules

Select **Use Git submodules** if you want to include Git submodules in your repository.

Build status

Select **Report build statuses to source provider when your builds start and finish** if you want the status of your build's start and completion reported to your source provider.

To be able to report the build status to the source provider, the user associated with the source provider must have write access to the repo. If the user does not have write access, the build status cannot be updated. For more information, see <u>Source provider access</u>.

For **Status context**, enter the value to be used for the context parameter in the GitHub commit status. For more information, see <u>Create a commit status</u> in the GitHub developer guide.

For **Target URL**, enter the value to be used for the target_url parameter in the GitHub commit status. For more information, see <u>Create a commit status</u> in the GitHub developer guide.

The status of a build triggered by a webhook is always reported to the source provider. To have the status of a build that is started from the console or an API call reported to the source provider, you must select this setting.

If your project's builds are triggered by a webhook, you must push a new commit to the repo for a change to this setting to take effect.

In **Primary source webhook events**, select **Rebuild every time a code change is pushed to this repository** if you want CodeBuild to build the source code every time a code change is pushed to this repository. For more information about webhooks and filter groups, see <u>GitHub webhook</u> <u>events</u>.

GitHub Enterprise Server

Credential

Choose **Default source credential** or **Custom source credential** and follow the instructions to manage the default source credential or customize the source credential.

Connection type

Choose CodeConnections or Personal access token to connect to CodeBuild.

Connection

Select a GitHub Enterprise connection or a Secrets Manager secret to connect through your specified connection type.

Repository

Choose **Repository in my GitHub Enterprise account** or **GitHub Enterprise scoped webhook** and enter the repository URL.

Source version

Enter a pull request, branch, commit ID, tag, or reference and a commit ID. For more information, see Source version sample with AWS CodeBuild.

Note

We recommend that you choose Git branch names that don't look like commit IDs, such as 811dd1ba1aba14473856cee38308caed7190c0d or 5392f7. This helps you avoid Git checkout collisions with actual commits.

Git clone depth

Choose **Git clone depth** to create a shallow clone with a history truncated to the specified number of commits. If you want a full clone, choose **Full**.

Git submodules

Select **Use Git submodules** if you want to include Git submodules in your repository.

Build status

Select **Report build statuses to source provider when your builds start and finish** if you want the status of your build's start and completion reported to your source provider.

To be able to report the build status to the source provider, the user associated with the source provider must have write access to the repo. If the user does not have write access, the build status cannot be updated. For more information, see <u>Source provider access</u>.

For **Status context**, enter the value to be used for the context parameter in the GitHub commit status. For more information, see <u>Create a commit status</u> in the GitHub developer guide.

For **Target URL**, enter the value to be used for the target_url parameter in the GitHub commit status. For more information, see <u>Create a commit status</u> in the GitHub developer guide.

The status of a build triggered by a webhook is always reported to the source provider. To have the status of a build that is started from the console or an API call reported to the source provider, you must select this setting.

If your project's builds are triggered by a webhook, you must push a new commit to the repo for a change to this setting to take effect.

Insecure SSL

Select **Enable insecure SSL** to ignore SSL warnings while connecting to your GitHub Enterprise project repository.

In **Primary source webhook events**, select **Rebuild every time a code change is pushed to this repository** if you want CodeBuild to build the source code every time a code change is pushed to this repository. For more information about webhooks and filter groups, see <u>GitHub webhook</u> <u>events</u>.

GitLab

Credential

Choose **Default source credential** or **Custom source credential** and follow the instructions to manage the default source credential or customize the source credential.

Connection type

CodeConnections is used to connect GitLab to CodeBuild.

Connection

Select a GitLab connection to connect through CodeConnections.

Repository

Choose the repository you want to use.

Source version

Enter a pull request ID, branch, commit ID, tag, or reference and a commit ID. For more information, see Source version sample with AWS CodeBuild.

Note

We recommend that you choose Git branch names that don't look like commit IDs, such as 811dd1ba1aba14473856cee38308caed7190c0d or 5392f7. This helps you avoid Git checkout collisions with actual commits.

Git clone depth

Choose **Git clone depth** to create a shallow clone with a history truncated to the specified number of commits. If you want a full clone, choose **Full**.

Build status

Select **Report build statuses to source provider when your builds start and finish** if you want the status of your build's start and completion reported to your source provider.

To be able to report the build status to the source provider, the user associated with the source provider must have write access to the repo. If the user does not have write access, the build status cannot be updated. For more information, see Source provider access.

GitLab Self Managed

Credential

Choose **Default source credential** or **Custom source credential** and follow the instructions to manage the default source credential or customize the source credential.

Connection type

CodeConnections is used to connect GitLab Self Managed to CodeBuild.

Connection

Select a GitLab Self Managed connection to connect through CodeConnections.

Repository

Choose the repository you want to use.

Source version

Enter a pull request ID, branch, commit ID, tag, or reference and a commit ID. For more information, see <u>Source version sample with AWS CodeBuild</u>.

Note

We recommend that you choose Git branch names that don't look like commit IDs, such as 811dd1ba1aba14473856cee38308caed7190c0d or 5392f7. This helps you avoid Git checkout collisions with actual commits.

Git clone depth

Choose **Git clone depth** to create a shallow clone with a history truncated to the specified number of commits. If you want a full clone, choose **Full**.

Build status

Select **Report build statuses to source provider when your builds start and finish** if you want the status of your build's start and completion reported to your source provider.

To be able to report the build status to the source provider, the user associated with the source provider must have write access to the repo. If the user does not have write access, the build status cannot be updated. For more information, see Source provider access.

Environment

Provisioning model

Do one of the following:

- To use on-demand fleets managed by AWS CodeBuild, choose **On-demand**. With on-demand fleets, CodeBuild provides compute for your builds. The machines are destroyed when the build finishes. On-demand fleets are fully managed, and includes automatic scaling capabilities to handle spikes in demand.
- To use reserved capacity fleets managed by AWS CodeBuild, choose **Reserved capacity**, and then select a **Fleet name**. With reserved capacity fleets, you configure a set of dedicated instances for your build environment. These machines remain idle, ready to process builds or tests immediately and reduces build durations. With reserved capacity fleets, your machines are always running and will continue to incur costs as long they're provisioned.

For information, see Run builds on reserved capacity fleets.

Environment image

Do one of the following:

- To use a Docker image managed by AWS CodeBuild, choose Managed image, and then make selections from Operating system, Runtime(s), Image, and Image version. Make a selection from Environment type if it is available.
- To use another Docker image, choose Custom image. For Environment type, choose ARM, Linux, Linux GPU, or Windows. If you choose Other registry, for External registry URL, enter the name and tag of the Docker image in Docker Hub, using the format *docker repository/docker image name*. If you choose Amazon ECR, use Amazon ECR repository and Amazon ECR image to choose the Docker image in your AWS account.
- To use a private Docker image, choose Custom image. For Environment type, choose ARM, Linux, Linux GPU, or Windows. For Image registry, choose Other registry, and then enter the ARN of the credentials for your private Docker image. The credentials must be created by Secrets Manager. For more information, see <u>What Is AWS Secrets Manager?</u> in the AWS Secrets Manager User Guide.

Note

CodeBuild overrides the ENTRYPOINT for custom Docker images.

Compute

Do one of the following:

- To use EC2 compute, choose **EC2**. EC2 compute offers optimized flexibility during action runs.
- To use Lambda compute, choose Lambda. Lambda compute offers optimized start-up speeds for your builds. Lambda supports faster builds due to a lower start-up latency. Lambda also automatically scales, so builds aren't waiting in queue to run. For information, see <u>Run builds</u> on AWS Lambda compute.

Service role

Do one of the following:

- If you do not have a CodeBuild service role, choose **New service role**. In **Role name**, enter a name for the new role.
- If you have a CodeBuild service role, choose **Existing service role**. In **Role ARN**, choose the service role.

i Note

When you use the console to create a build project, you can create a CodeBuild service role at the same time. By default, the role works with that build project only. If you use the console to associate this service role with another build project, the role is updated to work with the other build project. A service role can work with up to 10 build projects.

Additional configuration

Timeout

Specify a value, between 5 minutes and 36 hours, after which CodeBuild stops the build if it is not complete. If **hours** and **minutes** are left blank, the default value of 60 minutes is used.

Privileged

(Optional) Select **Enable this flag if you want to build Docker images or want your builds to get elevated privileges** only if you plan to use this build project to build Docker images. Otherwise, all associated builds that attempt to interact with the Docker daemon fail. You must also start the Docker daemon so that your builds can interact with it. One way to do this is to initialize the Docker daemon in the install phase of your build spec by running the following build commands. Do not run these commands if you chose a build environment image provided by CodeBuild with Docker support.

Note

By default, Docker daemon is enabled for non-VPC builds. If you would like to use Docker containers for VPC builds, see <u>Runtime Privilege and Linux Capabilities</u> on the Docker Docs website and enable privileged mode. Also, Windows does not support privileged mode.

```
- nohup /usr/local/bin/dockerd --host=unix:///var/run/docker.sock --
host=tcp://127.0.0.1:2375 --storage-driver=overlay2 &
- timeout 15 sh -c "until docker info; do echo .; sleep 1; done"
```

VPC

If you want CodeBuild to work with your VPC:

- For VPC, choose the VPC ID that CodeBuild uses.
- For VPC Subnets, choose the subnets that include resources that CodeBuild uses.
- For VPC Security groups, choose the security groups that CodeBuild uses to allow access to resources in the VPCs.

For more information, see Use AWS CodeBuild with Amazon Virtual Private Cloud.

Compute

Choose one of the available options.

Environment variables

Enter the name and value, and then choose the type of each environment variable for builds to use.

Note

CodeBuild sets the environment variable for your AWS Region automatically. You must set the following environment variables if you haven't added them to your buildspec.yml:

AWS_ACCOUNT_ID

- IMAGE_REPO_NAME
- IMAGE_TAG

Console and AWS CLI users can see environment variables. If you have no concerns about the visibility of your environment variable, set the **Name** and **Value** fields, and then set **Type** to **Plaintext**.

We recommend that you store an environment variable with a sensitive value, such as an AWS access key ID, an AWS secret access key, or a password as a parameter in Amazon EC2 Systems Manager Parameter Store or AWS Secrets Manager.

If you use Amazon EC2 Systems Manager Parameter Store, then for **Type**, choose **Parameter**. For **Name**, enter an identifier for CodeBuild to reference. For **Value**, enter the parameter's name as stored in Amazon EC2 Systems Manager Parameter Store. Using a parameter named /CodeBuild/dockerLoginPassword as an example, for **Type**, choose **Parameter**. For **Name**, enter LOGIN_PASSWORD. For **Value**, enter /CodeBuild/ dockerLoginPassword.

🔥 Important

If you use Amazon EC2 Systems Manager Parameter Store, we recommend that you store parameters with parameter names that start with /CodeBuild/ (for example, /CodeBuild/dockerLoginPassword). You can use the CodeBuild console to create a parameter in Amazon EC2 Systems Manager. Choose **Create parameter**, and then follow the instructions in the dialog box. (In that dialog box, for **KMS key**, you can specify the ARN of an AWS KMS key in your account. Amazon EC2 Systems Manager uses this key to encrypt the parameter's value during storage and decrypt it during retrieval.) If you use the CodeBuild console to create a parameter, the console starts the parameter name with /CodeBuild/ as it is being stored. For more information, see <u>Systems Manager Parameter Store</u> and <u>Systems Manager</u> <u>Parameter Store Console Walkthrough</u> in the *Amazon EC2 Systems Manager User Guide*.

If your build project refers to parameters stored in Amazon EC2 Systems Manager Parameter Store, the build project's service role must allow the ssm:GetParameters action. If you chose **New service role** earlier, CodeBuild includes this action in the default service role for your build project. However, if you chose **Existing service role**, you must include this action to your service role separately.

If your build project refers to parameters stored in Amazon EC2 Systems Manager Parameter Store with parameter names that do not start with /CodeBuild/, and you chose **New service role**, you must update that service role to allow access to parameter names that do not start with /CodeBuild/. This is because that service role allows access only to parameter names that start with /CodeBuild/. If you choose **New service role**, the service role includes permission to decrypt all parameters under the /CodeBuild/ namespace in the Amazon EC2 Systems Manager Parameter Store.

Environment variables you set replace existing environment variables. For example, if the Docker image already contains an environment variable named MY_VAR with a value of my_value, and you set an environment variable named MY_VAR with a value of other_value, then my_value is replaced by other_value. Similarly, if the Docker image already contains an environment variable named PATH with a value of /usr/local/sbin:/usr/local/bin, and you set an environment variable named PATH with a value of \$PATH:/usr/share/ant/bin, then /usr/local/sbin:/usr/local/bin is replaced by the literal value \$PATH:/usr/share/ant/bin.

Do not set any environment variable with a name that begins with CODEBUILD_. This prefix is reserved for internal use.

If an environment variable with the same name is defined in multiple places, the value is determined as follows:

- The value in the start build operation call takes highest precedence.
- The value in the build project definition takes next precedence.
- The value in the buildspec declaration takes lowest precedence.

If you use Secrets Manager, for **Type**, choose **Secrets Manager**. For **Name**, enter an identifier for CodeBuild to reference. For **Value**, enter a reference-key using the pattern *secret*-*id*:*json-key*:*version-stage*:*version-id*. For information, see <u>Secrets Manager</u> reference-key in the buildspec file.

🔥 Important

If you use Secrets Manager, we recommend that you store secrets with names that start with /CodeBuild/ (for example, /CodeBuild/dockerLoginPassword). For more information, see <u>What Is AWS Secrets Manager?</u> in the AWS Secrets Manager User Guide.

If your build project refers to secrets stored in Secrets Manager, the build project's service role must allow the secretsmanager:GetSecretValue action. If you chose **New service role** earlier, CodeBuild includes this action in the default service role for your build project. However, if you chose **Existing service role**, you must include this action to your service role separately.

If your build project refers to secrets stored in Secrets Manager with secret names that do not start with /CodeBuild/, and you chose **New service role**, you must update the service role to allow access to secret names that do not start with / CodeBuild/. This is because the service role allows access only to secret names that start with /CodeBuild/.

If you choose **New service role**, the service role includes permission to decrypt all secrets under the /CodeBuild/ namespace in the Secrets Manager.

Buildspec

Build specifications

Do one of the following:

- If your source code includes a buildspec file, choose Use a buildspec file. By default, CodeBuild looks for a file named buildspec.yml in the source code root directory. If your buildspec file uses a different name or location, enter its path from the source root in Buildspec name (for example, buildspec-two.yml or configuration/buildspec.yml. If the buildspec file is in an S3 bucket, it must be in the same AWS Region as your build project. Specify the buildspec file using its ARN (for example, arn:aws:s3:::<mycodebuild-sample2>/buildspec.yml).
- If your source code does not include a buildspec file, or if you want to run build commands different from the ones specified for the build phase in the buildspec.yml file in the source code's root directory, choose **Insert build commands**. For **Build commands**, enter the commands you want to run in the build phase. For multiple commands, separate each command by && (for example, mvn test && mvn package). To run commands in other

phases, or if you have a long list of commands for the build phase, add a buildspec.yml file to the source code root directory, add the commands to the file, and then choose **Use the buildspec.yml in the source code root directory**.

For more information, see the **Buildspec reference**.

Batch configuration

You can run a group of builds as a single operation. For more information, see <u>Run builds in</u> <u>batches</u>.

Define batch configuration

Select to allow batch builds in this project.

Batch service role

Provides the service role for batch builds.

Choose one of the following:

- If you do not have a batch service role, choose **New service role**. In **Service role**, enter a name for the new role.
- If you have a batch service role, choose **Existing service role**. In **Service role**, choose the service role.

Batch builds introduce a new security role in the batch configuration. This new role is required as CodeBuild must be able to call the StartBuild, StopBuild, and RetryBuild actions on your behalf to run builds as part of a batch. Customers should use a new role, and not the same role they use in their build, for two reasons:

- Giving the build role StartBuild, StopBuild, and RetryBuild permissions would allow a single build to start more builds via the buildspec.
- CodeBuild batch builds provide restrictions that restrict the number of builds and compute types that can be used for the builds in the batch. If the build role has these permissions, it is possible the builds themselves could bypass these restrictions.

Allowed compute type(s) for batch

Select the compute types allowed for the batch. Select all that apply.

Maximum builds allowed in batch

Enter the maximum number of builds allowed in the batch. If a batch exceeds this limit, the batch will fail.

Batch timeout

Enter the maximum amount of time for the batch build to complete.

Combine artifacts

Select **Combine all artifacts from batch into a single location** to have all of the artifacts from the batch combined into a single location.

Batch report mode

Select the desired build status report mode for batch builds.

Note

This field is only available when the project source is Bitbucket, GitHub, or GitHub Enterprise, and **Report build statuses to source provider when your builds start and finish** is selected under **Source**.

Aggregated builds

Select to have the statuses for all builds in the batch combined into a single status report.

Individual builds

Select to have the build statuses for all builds in the batch reported separately.

Artifacts

Туре

Do one of the following:

- If you do not want to create any build output artifacts, choose **No artifacts**. You might want to do this if you're only running build tests or you want to push a Docker image to an Amazon ECR repository.
- To store the build output in an S3 bucket, choose Amazon S3, and then do the following:

- If you want to use your project name for the build output ZIP file or folder, leave Name blank. Otherwise, enter the name. (If you want to output a ZIP file, and you want the ZIP file to have a file extension, be sure to include it after the ZIP file name.)
- Select **Enable semantic versioning** if you want a name specified in the buildspec file to override any name that is specified in the console. The name in a buildspec file is calculated at build time and uses the Shell command language. For example, you can append a date and time to your artifact name so that it is always unique. Unique artifact names prevent artifacts from being overwritten. For more information, see <u>Buildspec syntax</u>.
- For **Bucket name**, choose the name of the output bucket.
- If you chose **Insert build commands** earlier in this procedure, then for **Output files**, enter the locations of the files from the build that you want to put into the build output ZIP file or folder. For multiple locations, separate each location with a comma (for example, appspec.yml, target/my-app.jar). For more information, see the description of files in Buildspec syntax.
- If you do not want your build artifacts encrypted, select **Remove artifacts encryption**.

For each secondary set of artifacts you want:

- 1. For **Artifact identifier**, enter a value that is fewer than 128 characters and contains only alphanumeric characters and underscores.
- 2. Choose Add artifact.
- 3. Follow the previous steps to configure your secondary artifacts.
- 4. Choose **Save artifact**.

Additional configuration

Encryption key

(Optional) Do one of the following:

- To use the AWS managed key for Amazon S3 in your account to encrypt the build output artifacts, leave **Encryption key** blank. This is the default.
- To use a customer managed key to encrypt the build output artifacts, in Encryption key, enter the ARN of the KMS key. Use the format arn: aws:kms:region-ID:account-ID:key/key-ID.

Cache type

For **Cache type**, choose one of the following:

- If you do not want to use a cache, choose **No cache**.
- If you want to use an Amazon S3 cache, choose Amazon S3, and then do the following:
 - For **Bucket**, choose the name of the S3 bucket where the cache is stored.
 - (Optional) For Cache path prefix, enter an Amazon S3 path prefix. The Cache path prefix value is similar to a directory name. It makes it possible for you to store the cache under the same directory in a bucket.

<u> Important</u>

Do not append a trailing slash (/) to the end of the path prefix.

• If you want to use a local cache, choose **Local**, and then choose one or more local cache modes.

🚯 Note

Docker layer cache mode is available for Linux only. If you choose it, your project must run in privileged mode.

Using a cache saves considerable build time because reusable pieces of the build environment are stored in the cache and used across builds. For information about specifying a cache in the buildspec file, see <u>Buildspec syntax</u>. For more information about caching, see <u>Cache builds to improve performance</u>.

Logs

Choose the logs you want to create. You can create Amazon CloudWatch Logs, Amazon S3 logs, or both.

CloudWatch

If you want Amazon CloudWatch Logs logs:

CloudWatch logs

Select CloudWatch logs.

Group name

Enter the name of your Amazon CloudWatch Logs log group.

Stream name

Enter your Amazon CloudWatch Logs log stream name.

S3

If you want Amazon S3 logs:

S3 logs

Select S3 logs.

Bucket

Choose the name of the S3 bucket for your logs.

Path prefix

Enter the prefix for your logs.

Disable S3 log encryption

Select if you do not want your S3 logs encrypted.

Create a build project (AWS CLI)

For more information about using the AWS CLI with CodeBuild, see the Command line reference.

To create a CodeBuild build project using the AWS CLI, you create a JSON-formatted <u>Project</u> structure, fill in the structure, and call the <u>create-project</u> command to create the project.

Create the JSON file

Create a skeleton JSON file with the <u>create-project</u> command, using the --generate-cli-skeleton option:

aws codebuild create-project --generate-cli-skeleton > <json-file>

This creates a JSON file with the path and file name specified by *<json-file>*.

Fill in the JSON file

Modify the JSON data as follows and save your results.

```
{
  "name": "<project-name>",
  "description": "<description>",
  "source": {
    "type": "CODECOMMIT" | "CODEPIPELINE" | "GITHUB" | "GITHUB_ENTERPRISE" | "GITLAB" |
 "GITLAB_SELF_MANAGED" | "BITBUCKET" | "S3" | "NO_SOURCE",
    "location": "<source-location>",
    "gitCloneDepth": "<git-clone-depth>",
    "buildspec": "<buildspec>",
    "InsecureSsl": "<insecure-ssl>",
    "reportBuildStatus": "<report-build-status>",
    "buildStatusConfig": {
      "context": "<context>",
      "targetUrl": "<target-url>"
    },
    "gitSubmodulesConfig": {
      "fetchSubmodules": "<fetch-submodules>"
    },
    "auth": {
      "type": "<auth-type>",
      "resource": "<auth-resource>"
    },
    "sourceIdentifier": "<source-identifier>"
  },
  "secondarySources": [
    {
        "type": "CODECOMMIT" | "CODEPIPELINE" | "GITHUB" | "GITHUB_ENTERPRISE" |
 "GITLAB" | "GITLAB_SELF_MANAGED" | "BITBUCKET" | "S3" | "NO_SOURCE",
        "location": "<source-location>",
        "gitCloneDepth": "<git-clone-depth>",
        "buildspec": "<buildspec>",
        "InsecureSsl": "<insecure-ssl>",
        "reportBuildStatus": "<report-build-status>",
        "auth": {
          "type": "<auth-type>",
          "resource": "<auth-resource>"
        },
        "sourceIdentifier": "<source-identifier>"
    }
  ],
```

```
"secondarySourceVersions": [
  {
     "sourceIdentifier": "<secondary-source-identifier>",
     "sourceVersion": "<secondary-source-version>"
  }
٦,
 "sourceVersion": "<source-version>",
 "artifacts": {
   "type": "CODEPIPELINE" | "S3" | "NO_ARTIFACTS",
   "location": "<artifacts-location>",
   "path": "<artifacts-path>",
   "namespaceType": "<artifacts-namespacetype>",
   "name": "<artifacts-name>",
   "overrideArtifactName": "<override-artifact-name>",
   "packaging": "<artifacts-packaging>"
},
 "secondaryArtifacts": [
   {
     "type": "CODEPIPELINE" | "S3" | "NO_ARTIFACTS",
     "location": "<secondary-artifact-location>",
     "path": "<secondary-artifact-path>",
     "namespaceType": "<secondary-artifact-namespaceType>",
     "name": "<secondary-artifact-name>",
     "packaging": "<secondary-artifact-packaging>",
     "artifactIdentifier": "<secondary-artifact-identifier>"
  }
],
 "cache": {
  "type": "<cache-type>",
   "location": "<cache-location>",
   "mode": [
     "<cache-mode>"
  ]
},
 "environment": {
   "type": "LINUX_CONTAINER" | "LINUX_GPU_CONTAINER" | "ARM_CONTAINER" |
"WINDOWS_SERVER_2019_CONTAINER" | "WINDOWS_SERVER_2022_CONTAINER",
   "image": "<image>",
   "computeType": "BUILD_GENERAL1_SMALL" | "BUILD_GENERAL1_MEDIUM" |
"BUILD_GENERAL1_LARGE" | "BUILD_GENERAL1_2XLARGE",
   "certificate": "<certificate>",
   "environmentVariables": [
     {
```

```
"name": "<environmentVariable-name>",
```

```
"value": "<environmentVariable-value>",
      "type": "<environmentVariable-type>"
    }
  ],
  "registryCredential": [
    {
      "credential": "<credential-arn-or-name>",
      "credentialProvider": "<credential-provider>"
    }
  ],
  "imagePullCredentialsType": "CODEBUILD" | "SERVICE_ROLE",
  "privilegedMode": "<privileged-mode>"
},
"serviceRole": "<service-role>",
"timeoutInMinutes": <timeout>,
"queuedTimeoutInMinutes": <queued-timeout>,
"encryptionKey": "<encryption-key>",
"tags": [
  {
    "key": "<tag-key>",
    "value": "<tag-value>"
  }
],
"vpcConfig": {
  "securityGroupIds": [
       "<security-group-id>"
  ],
  "subnets": [
      "<subnet-id>"
  ],
  "vpcId": "<vpc-id>"
},
"badgeEnabled": "<badge-enabled>",
"logsConfig": {
  "cloudWatchLogs": {
    "status": "<cloudwatch-logs-status>",
    "groupName": "<group-name>",
    "streamName": "<stream-name>"
  },
  "s3Logs": {
    "status": "<s3-logs-status>",
    "location": "<s3-logs-location>",
    "encryptionDisabled": "<s3-logs-encryption-disabled>"
  }
```

```
},
  "fileSystemLocations": [
    {
      "type": "EFS",
      "location": "<EFS-DNS-name-1>:/<directory-path>",
      "mountPoint": "<mount-point>",
      "identifier": "<efs-identifier>",
      "mountOptions": "<efs-mount-options>"
    }
  ],
  "buildBatchConfig": {
    "serviceRole": "<batch-service-role>",
    "combineArtifacts": <combine-artifacts>,
    "restrictions": {
      "maximumBuildsAllowed": <max-builds>,
      "computeTypesAllowed": [
        "<compute-type>"
      ]
    },
    "timeoutInMins": <batch-timeout>,
    "batchReportMode": "REPORT_AGGREGATED_BATCH" | "REPORT_INDIVIDUAL_BUILDS"
  },
  "concurrentBuildLimit": <concurrent-build-limit>
}
```

Replace the following:

name

Required. The name for this build project. This name must be unique across all of the build projects in your AWS account.

description

Optional. The description for this build project.

source

Required. A <u>ProjectSource</u> object that contains information about this build project's source code settings. After you add a source object, you can add up to 12 more sources using the . These settings include the following:

source/**type**

Required. The type of repository that contains the source code to build. Valid values include:

- CODECOMMIT
- CODEPIPELINE
- GITHUB
- GITHUB_ENTERPRISE
- GITLAB
- GITLAB_SELF_MANAGED
- BITBUCKET
- S3
- NO_SOURCE

If you use NO_SOURCE, the buildspec cannot be a file because the project does not have a source. Instead, you must use the buildspec attribute to specify a YAML-formatted string for your buildspec. For more information, see <u>Create a build project without a source</u>.

source/location

Required unless you set <*source-type*> to CODEPIPELINE. The location of the source code for the specified repository type.

- For CodeCommit, the HTTPS clone URL to the repository that contains the source code and the buildspec file (for example, https://git-codecommit.<region-id>.amazonaws.com/v1/repos/<repo-name>).
- For Amazon S3, the build input bucket name, followed by the path and name of the ZIP file that contains the source code and the buildspec. For example:
 - For a ZIP file located at the root of the input bucket: <bucket-name>/<objectname>.zip.
 - For a ZIP file located in a subfolder in the input bucket: <bucket-name>/<subfolerpath>/<object-name>.zip.
- For GitHub, the HTTPS clone URL to the repository that contains the source code and the buildspec file. The URL must contain github.com. You must connect your AWS account to your GitHub account. To do this, use the CodeBuild console to create a build project.
 - Choose **Authorize application**. (After you have connected to your GitHub account, you do not need to finish creating the build project. You can close the CodeBuild console.)

- For GitHub Enterprise Server, the HTTP or HTTPS clone URL to the repository that contains the source code and the buildspec file. You must also connect your AWS account to your GitHub Enterprise Server account. To do this, use the CodeBuild console to create a build project.
 - 1. Create a personal access token in GitHub Enterprise Server.
 - 2. Copy this token to your clipboard so you can use it when you create your CodeBuild project. For more information, see <u>Creating a personal access token for the command line</u> on the GitHub Help website.
 - 3. When you use the console to create your CodeBuild project, in **Source**, for **Source provider**, choose **GitHub Enterprise**.
 - 4. For **Personal Access Token**, paste the token that was copied to your clipboard. Choose **Save Token**. Your CodeBuild account is now connected to your GitHub Enterprise Server account.
- For GitLab and GitLab self-managed, the HTTPS clone URL to the repository that contains the source code and the buildspec file. Note that if you use GitLab, the URL must contain gitlab.com. If you use GitLab self-managed, the URL does not need to contain gitlab.com. You must connect your AWS account to your GitLab or GitLab self-managed account. To do this, use the CodeBuild console to create a build project.
 - In the Developer Tools navigation pane, choose **Settings**, **Connections**, and then **Create connection**. On this page, create either a GitLab or GitLab self-managed connection, and then choose **Connect to GitLab**.
- For Bitbucket, the HTTPS clone URL to the repository that contains the source code and the buildspec file. The URL must contain bitbucket.org. You must also connect your AWS account to your Bitbucket account. To do this, use the CodeBuild console to create a build project.
 - When you use the console to connect (or reconnect) with Bitbucket, on the Bitbucket **Confirm access to your account** page, choose **Grant access**. (After you have connected to your Bitbucket account, you do not need to finish creating the build project. You can close the CodeBuild console.)
- For AWS CodePipeline, do not specify a location value for source. CodePipeline ignores this value because when you create a pipeline in CodePipeline, you specify the source code location in the Source stage of the pipeline.

Optional. The depth of history to download. Minimum value is 0. If this value is 0, greater than 25, or not provided, then the full history is downloaded with each build project. If your source type is Amazon S3, this value is not supported.

source/**buildspec**

Optional. The build specification definition or file to use. If this value is not provided or is set to an empty string, the source code must contain a buildspec.yml file in its root directory. If this value is set, it can be either an inline buildspec definition, the path to an alternate buildspec file relative to the root directory of your primary source, or the path to an S3 bucket. The bucket must be in the same AWS Region as the build project. Specify the buildspec file using its ARN (for example, arn:aws:s3:::<my-codebuild-sample2>/buildspec.yml). For more information, see <u>Buildspec file name and storage location</u>.

source/auth

Contains information about the authorization settings for CodeBuild to access the source code to be built.

source/auth/type

Required. The authorization type to use. Valid values are:

- OAUTH
- CODECONNECTIONS
- SECRETS_MANAGER

source/auth/resource

Optional. The resource value that applies to the specified authorization type. This can be the Secrets Manager ARN or the CodeConnections ARN.

source/reportBuildStatus

Specifies whether to send your source provider the status of a build's start and completion. If you set this with a source provider other than GitHub, GitHub Enterprise Server, or Bitbucket, an invalidInputException is thrown.

To be able to report the build status to the source provider, the user associated with the source provider must have write access to the repo. If the user does not have write access, the build status cannot be updated. For more information, see Source provider access.

source/buildStatusConfig

Contains information that defines how the CodeBuild build project reports the build status to the source provider. This option is only used when the source type is GITHUB, GITHUB_ENTERPRISE, or BITBUCKET.

source/buildStatusConfig/context

For Bitbucket sources, this parameter is used for the name parameter in the Bitbucket commit status. For GitHub sources, this parameter is used for the context parameter in the GitHub commit status.

For example, you can have the context contain the build number and the webhook trigger using the CodeBuild environment variables:

```
AWS CodeBuild sample-project Build #$CODEBUILD_BUILD_NUMBER -
$CODEBUILD_WEBHOOK_TRIGGER
```

This results in the context appearing like this for build #24 triggered by a webhook pull request event:

AWS CodeBuild sample-project Build #24 - pr/8

source/buildStatusConfig/targetUrl

For Bitbucket sources, this parameter is used for the url parameter in the Bitbucket commit status. For GitHub sources, this parameter is used for the target_url parameter in the GitHub commit status.

For example, you can set the targetUrl to https://aws.amazon.com/ codebuild/<path to build> and the commit status will link to this URL.

You can also include CodeBuild environment variables in the targetUrl to add additional information to the URL. For example, to add the build region to the URL, set the targetUrl to:

```
"targetUrl": "https://aws.amazon.com/codebuild/<path to build>?region=
$AWS_REGION"
```

If the build region is us-east-2, this will expand to:

https://aws.amazon.com/codebuild/<path to build>?region=us-east-2

source/gitSubmodulesConfig

Optional. Information about the Git submodules configuration. Used with CodeCommit, GitHub, GitHub Enterprise Server, and Bitbucket only.

source/gitSubmodulesConfig/fetchSubmodules

Set fetchSubmodules to true if you want to include the Git submodules in your repository. Git submodules that are included must be configured as HTTPS.

source/InsecureSsl

Optional. Used with GitHub Enterprise Server only. Set this value to true to ignore TLS warnings while connecting to your GitHub Enterprise Server project repository. The default value is false. InsecureSsl should be used for testing purposes only. It should not be used in a production environment.

source/sourceldentifier

A user-defined identifier for the project source. Optional for the primary source. Required for secondary sources.

secondarySources

Optional. An array of <u>ProjectSource</u> objects that contain information about the secondary sources for a build project. You can add up to 12 secondary sources. The secondarySources objects use the same properties used by the object. In a secondary source object, the sourceIdentifier is required.

secondarySourceVersions

Optional. An array of <u>ProjectSourceVersion</u> objects. If secondarySourceVersions is specified at the build level, then they take precedence over this.

sourceVersion

Optional. The version of the build input to be built for this project. If not specified, the latest version is used. If specified, it must be one of:

• For CodeCommit, the commit ID, branch, or Git tag to use.

- For GitHub, the commit ID, pull request ID, branch name, or tag name that corresponds to the version of the source code you want to build. If a pull request ID is specified, it must use the format pr/pull-request-ID (for example pr/25). If a branch name is specified, the branch's HEAD commit ID is used. If not specified, the default branch's HEAD commit ID is used.
- For GitLab, the commit ID, pull request ID, branch name, tag name, or reference and a commit ID. For more information, see Source version sample with AWS CodeBuild.
- For Bitbucket, the commit ID, branch name, or tag name that corresponds to the version of the source code you want to build. If a branch name is specified, the branch's HEAD commit ID is used. If not specified, the default branch's HEAD commit ID is used.
- For Amazon S3, the version ID of the object that represents the build input ZIP file to use.

If sourceVersion is specified at the build level, then that version takes precedence over this sourceVersion (at the project level). For more information, see <u>Source version sample with AWS</u> CodeBuild.

artifacts

Required. A <u>ProjectArtifacts</u> object that contains information about this build project's output artifact settings. After you add an artifacts object, you can add up to 12 more artifacts using the . These settings include the following:

artifacts/type

Required. The type of build output artifact. Valid values are:

- CODEPIPELINE
- NO_ARTIFACTS
- S3

artifacts/location

Only used with the S3 artifact type. Not used for other artifact types.

The name of the output bucket you created or identified in the prerequisites.

artifacts/path

Only used with the S3 artifact type. Not used for other artifact types.

The path in of the output bucket to place ZIP file or folder. If you do not specify a value for path, CodeBuild uses namespaceType (if specified) and name to determine the path and

name of the build output ZIP file or folder. For example, if you specify MyPath for path and MyArtifact.zip for name, the path and name would be MyPath/MyArtifact.zip.

artifacts/namespaceType

Only used with the S3 artifact type. Not used for other artifact types.

The namespace of the build output ZIP file or folder. Valid values include BUILD_ID and NONE. Use BUILD_ID to insert the build ID into the path of the build output ZIP file or folder. Otherwise, use NONE. If you do not specify a value for namespaceType, CodeBuild uses path (if specified) and name to determine the path and name of the build output ZIP file or folder. For example, if you specify MyPath for path, BUILD_ID for namespaceType, and MyArtifact.zip for name, the path and name would be MyPath/*build-ID*/MyArtifact.zip.

artifacts/name

Only used with the S3 artifact type. Not used for other artifact types.

The name of the build output ZIP file or folder inside of location. For example, if you specify MyPath for path and MyArtifact.zip for name, the path and name would be MyPath/MyArtifact.zip.

artifacts/overrideArtifactName

Only used with the S3 artifact type. Not used for other artifact types.

Optional. If set to true, the name specified in the artifacts block of the buildspec file overrides name. For more information, see Build specification reference for CodeBuild.

artifacts/packaging

Only used with the S3 artifact type. Not used for other artifact types.

Optional. Specifies how to package the artifacts. Allowed values are:

NONE

Create a folder that contains the build artifacts. This is the default value.

ZIP

Create a ZIP file that contains the build artifacts.

secondaryArtifacts

Optional. An array of <u>ProjectArtifacts</u> objects that contain information about the secondary artifacts settings for a build project. You can add up to 12 secondary artifacts. The secondaryArtifacts uses many of the same settings used by the object.

cache

Required. A <u>ProjectCache</u> object that contains information about this build project's cache settings. For more information, see <u>Cache builds</u>.

environment

Required. A <u>ProjectEnvironment</u> object that contains information about this project's build environment settings. These settings include:

environment/type

Required. The type of build environment. For more information, see <u>type</u> in the *CodeBuild API Reference*.

environment/image

Required. The Docker image identifier used by this build environment. Typically, this identifier is expressed as *image-name:tag*. For example, in the Docker repository that CodeBuild uses to manage its Docker images, this could be aws/codebuild/standard:5.0. In Docker Hub, maven:3.3.9-jdk-8. In Amazon ECR, *account-id*.dkr.ecr.*region-id*.amazonaws.com/*your-Amazon-ECR-repo-name:tag*. For more information, see <u>Docker images provided by CodeBuild</u>.

environment/computeType

Required. Specifies the compute resources used by this build environment. For more information, see computeType in the *CodeBuild API Reference*.

environment/certificate

Optional. The ARN of the Amazon S3 bucket, path prefix, and object key that contains the PEM-encoded certificate. The object key can be either just the .pem file or a .zip file containing the PEM-encoded certificate. For example, if your Amazon S3 bucket name is <my-bucket>, your path prefix is <cert>, and your object key name is <certificate.pem>, then acceptable formats for certificate are <my-bucket/cert/certificate.pem> or arn:aws:s3:::<my-bucket/cert/certificate.pem>.

environment/environmentVariables

Optional. An array of <u>EnvironmentVariable</u> objects that contains the environment variables you want to specify for this build environment. Each environment variable is expressed as an object that contains a name, value, and type of name, value, and type.

Console and AWS CLI users can see all environment variables. If you have no concerns about the visibility of your environment variable, set name and value, and set type to PLAINTEXT.

We recommend you store environment variables with sensitive values, such as an AWS access key ID, an AWS secret access key, or a password, as a parameter in Amazon EC2 Systems Manager Parameter Store or AWS Secrets Manager. For name, for that stored parameter, set an identifier for CodeBuild to reference.

If you use Amazon EC2 Systems Manager Parameter Store, for value, set the parameter's name as stored in the Parameter Store. Set type to PARAMETER_STORE. Using a parameter named /CodeBuild/dockerLoginPassword as an example, set name to LOGIN_PASSWORD. Set value to /CodeBuild/dockerLoginPassword. Set type to PARAMETER_STORE.

A Important

If you use Amazon EC2 Systems Manager Parameter Store, we recommend that you store parameters with parameter names that start with /CodeBuild/ (for example, / CodeBuild/dockerLoginPassword). You can use the CodeBuild console to create a parameter in Amazon EC2 Systems Manager. Choose **Create parameter**, and then follow the instructions in the dialog box. (In that dialog box, for **KMS key**, you can specify the ARN of an AWS KMS key in your account. Amazon EC2 Systems Manager uses this key to encrypt the parameter's value during storage and decrypt it during retrieval.) If you use the CodeBuild console to create a parameter, the console starts the parameter name with /CodeBuild/ as it is being stored. For more information, see <u>Systems Manager</u> <u>Parameter Store</u> and <u>Systems Manager User Guide</u>.

If your build project refers to parameters stored in Amazon EC2 Systems Manager Parameter Store, the build project's service role must allow the ssm:GetParameters action. If you chose **New service role** earlier, CodeBuild includes this action in the default service role for your build project. However, if you chose **Existing service role**, you must include this action to your service role separately.

If your build project refers to parameters stored in Amazon EC2 Systems Manager Parameter Store with parameter names that do not start with /CodeBuild/, and you chose **New service role**, you must update that service role to allow access to parameter names that do not start with /CodeBuild/. This is because that service role allows access only to parameter names that start with /CodeBuild/.

If you choose **New service role**, the service role includes permission to decrypt all parameters under the /CodeBuild/ namespace in the Amazon EC2 Systems Manager Parameter Store.

Environment variables you set replace existing environment variables. For example, if the Docker image already contains an environment variable named MY_VAR with a value of my_value, and you set an environment variable named MY_VAR with a value of other_value, then my_value is replaced by other_value. Similarly, if the Docker image already contains an environment variable named PATH with a value of /usr/local/sbin:/usr/local/bin, and you set an environment variable named PATH with a value of \$PATH:/usr/share/ant/bin, then /usr/local/sbin:/usr/local/bin is replaced by the literal value \$PATH:/usr/share/ant/bin. Do not set any environment variable with a name that begins with CODEBUILD_. This prefix is reserved for internal use.

If an environment variable with the same name is defined in multiple places, the value is determined as follows:

- The value in the start build operation call takes highest precedence.
- The value in the build project definition takes next precedence.
- The value in the buildspec declaration takes lowest precedence.

If you use Secrets Manager, for value, set the parameter's name as stored in Secrets Manager. Set type to SECRETS_MANAGER. Using a secret named /CodeBuild/ dockerLoginPassword as an example, set name to LOGIN_PASSWORD. Set value to / CodeBuild/dockerLoginPassword. Set type to SECRETS_MANAGER.

🔥 Important

If you use Secrets Manager, we recommend that you store secrets with names that start with /CodeBuild/ (for example, /CodeBuild/dockerLoginPassword). For more information, see <u>What Is AWS Secrets Manager</u>? in the AWS Secrets Manager User Guide. If your build project refers to secrets stored in Secrets Manager, the build project's service role must allow the secretsmanager:GetSecretValue action. If you chose **New service role** earlier, CodeBuild includes this action in the default service role for

your build project. However, if you chose **Existing service role**, you must include this action to your service role separately.

If your build project refers to secrets stored in Secrets Manager with secret names that do not start with /CodeBuild/, and you chose **New service role**, you must update the service role to allow access to secret names that do not start with /CodeBuild/. This is because the service role allows access only to secret names that start with / CodeBuild/.

If you choose **New service role**, the service role includes permission to decrypt all secrets under the /CodeBuild/ namespace in the Secrets Manager.

environment/registryCredential

Optional. A <u>RegistryCredential</u> object that specifies the credentials that provide access to a private Docker registry.

environment/registryCredential/credential

Specifies the ARN or name of credentials created using AWS Managed Services. You can use the name of the credentials only if they exist in your current Region.

environment/registryCredential/credentialProvider

The only valid value is SECRETS_MANAGER.

When this is set:

- imagePullCredentials must be set to SERVICE_ROLE.
- The image cannot be a curated image or an Amazon ECR image.

environment/imagePullCredentialsType

Optional. The type of credentials CodeBuild uses to pull images in your build. There are two valid values:

CODEBUILD

CODEBUILD specifies that CodeBuild uses its own credentials. You must edit your Amazon ECR repository policy to trust the CodeBuild service principal.

SERVICE_ROLE

Specifies that CodeBuild uses your build project's service role.

When you use a cross-account or private registry image, you must use SERVICE_ROLE credentials. When you use a CodeBuild curated image, you must use CODEBUILD credentials.

environment/privilegedMode

Set to true only if you plan to use this build project to build Docker images. Otherwise, all associated builds that attempt to interact with the Docker daemon fail. You must also start the Docker daemon so that your builds can interact with it. One way to do this is to initialize the Docker daemon in the install phase of your buildspec file by running the following build commands. Do not run these commands if you specified a build environment image provided by CodeBuild with Docker support.

Note

By default, Docker daemon is enabled for non-VPC builds. If you would like to use Docker containers for VPC builds, see <u>Runtime Privilege and Linux Capabilities</u> on the Docker Docs website and enable privileged mode. Also, Windows does not support privileged mode.

```
- nohup /usr/local/bin/dockerd --host=unix:///var/run/docker.sock --
host=tcp://127.0.0.1:2375 --storage-driver=overlay2 &
- timeout 15 sh -c "until docker info; do echo .; sleep 1; done"
```

serviceRole

Required. The ARN of the service role CodeBuild uses to interact with services on behalf of the user (for example, arn:aws:iam::account-id:role/role-name).

timeoutInMinutes

Optional. The number of minutes, between 5 to 2160 (36 hours), after which CodeBuild stops the build if it is not complete. If not specified, the default of 60 is used. To determine if and when CodeBuild stopped a build due to a timeout, run the batch-get-builds command. To determine if the build has stopped, look in the output for a buildStatus value of FAILED. To determine when the build timed out, look in the output for the endTime value associated with a phaseStatus value of TIMED_OUT.

queuedTimeoutInMinutes

Optional. The number of minutes, between 5 to 480 (8 hours), after which CodeBuild stops the build if it is is still queued. If not specified, the default of 60 is used.

encryptionKey

Optional. The alias or ARN of the AWS KMS key used by CodeBuild to encrypt the build output. If you specify an alias, use the format arn:aws:kms:*region-ID*:account-ID:key/key-ID or, if an alias exists, use the format alias/key-alias. If not specified, the AWS-managed KMS key for Amazon S3 is used.

tags

Optional. An array of Tag objects that provide the tags you want to associate with this build project. You can specify up to 50 tags. These tags can be used by any AWS service that supports CodeBuild build project tags. Each tag is expressed as an object with a key and a value.

vpcConfig

Optional. A <u>VpcConfig</u> object that contains information information about the VPC configuration for your project. For more information, see <u>Use AWS CodeBuild with Amazon Virtual Private Cloud</u>.

These properties include:

vpcld

Required. The VPC ID that CodeBuild uses. Run this command to get a list of all VPC IDs in your Region:

aws ec2 describe-vpcs --region <region-ID>

subnets

Required. An array of subnet IDs that include resources used by CodeBuild. Run this command to get these IDs:

```
aws ec2 describe-subnets --filters "Name=vpc-id,Values=<vpc-id>" --region <region-
ID>
```

securityGroupIds

Required. An array of security group IDs used by CodeBuild to allow access to resources in the VPC. Run this command to get these IDs:

```
aws ec2 describe-security-groups --filters "Name=vpc-id,Values=<vpc-id>" --<region-
ID>
```

badgeEnabled

Optional. Specifies whether to include build badges with your CodeBuild project. Set to true to enable build badges, or false otherwise. For more information, see <u>Build badges sample with</u> CodeBuild.

logsConfig

A LogsConfig object that contains information about where this build's logs are located.

logsConfig/cloudWatchLogs

A <u>CloudWatchLogsConfig</u> object that contains information about pushing logs to CloudWatch Logs.

logsConfig/s3Logs

An <u>S3LogsConfig</u> object that contains information about pushing logs to Amazon S3.

fileSystemLocations

Optional. An array of <u>ProjectFileSystemsLocation</u> objects that contains informationabout your Amazon EFS configuration.

buildBatchConfig

Optional. The buildBatchConfig object is a <u>ProjectBuildBatchConfig</u> structure that contains the batch build configuration information for the project.

buildBatchConfig/serviceRole

The service role ARN for the batch build project.

buildBatchConfig/combineArtifacts

A Boolean value that specifies whether to combine the build artifacts for the batch build into a single artifact location.

buildBatchConfig/restrictions/maximumBuildsAllowed

The maximum number of builds allowed.

buildBatchConfig/restrictions/computeTypesAllowed

An array of strings that specify the compute types that are allowed for the batch build. See Build environment compute types for these values.

buildBatchConfig/timeoutInMinutes

The maximum amount of time, in minutes, that the batch build must be completed in.

buildBatchConfig/batchReportMode

Specifies how build status reports are sent to the source provider for the batch build. Valid values include:

REPORT_AGGREGATED_BATCH

(Default) Aggregate all of the build statuses into a single status report.

```
REPORT_INDIVIDUAL_BUILDS
```

Send a separate status report for each individual build.

concurrentBuildLimit

The maximum number of concurrent builds that are allowed for this project.

New builds are only started if the current number of builds is less than or equal to this limit. If the current build count meets this limit, new builds are throttled and are not run.

Create the project

To create the project, run the **<u>create-project</u>** command again, passing your JSON file:

```
aws codebuild create-project --cli-input-json file://<json-file>
```

If successful, the JSON representation of a <u>Project</u> object appears in the console output. See the <u>CreateProject Response Syntax</u> for an example of this data. Except for the build project name, you can change any of the build project's settings later. For more information, see Change a build project's settings (AWS CLI).

To start running a build, see Run a build (AWS CLI).

If your source code is stored in a GitHub repository, and you want CodeBuild to rebuild the source code every time a code change is pushed to the repository, see <u>Start running builds automatically</u> (AWS CLI).

Create a build project (AWS SDKs)

For information about using AWS CodeBuild with the AWS SDKs, see the <u>AWS SDKs and tools</u> reference.

Create a build project (AWS CloudFormation)

For information about using AWS CodeBuild with AWS CloudFormation, see <u>the AWS</u> <u>CloudFormation template for CodeBuild</u> in the AWS CloudFormation User Guide.

Create a notification rule

You can use notification rules to notify users when important changes, such as build successes and failures, occur. Notification rules specify both the events and the Amazon SNS topic that is used to send notifications. For more information, see What are notifications?

You can use the console or the AWS CLI to create notification rules for AWS CodeBuild.

To create a notification rule (console)

- 1. Sign in to the AWS Management Console and open the CodeBuild console at https://console.aws.amazon.com/codebuild/.
- 2. Choose **Build**, choose **Build projects**, and then choose a build project where you want to add notifications.
- 3. On the build project page, choose **Notify**, and then choose **Create notification rule**. You can also go to the **Settings** page for the build project and choose **Create notification rule**.
- 4. In **Notification name**, enter a name for the rule.
- 5. In **Detail type**, choose **Basic** if you want only the information provided to Amazon EventBridge included in the notification. Choose **Full** if you want to include information provided to

Amazon EventBridge and information that might be supplied by the CodeBuild or the notification manager.

For more information, see Understanding Notification Contents and Security.

- 6. In **Events that trigger notifications**, select the events for which you want to send notifications. For more information, see Events for Notification Rules on Build Projects.
- 7. In **Targets**, do one of the following:
 - If you have already configured a resource to use with notifications, in Choose target type, choose either AWS Chatbot (Slack) or SNS topic. In Choose target, choose the name of the client (for a Slack client configured in AWS Chatbot) or the Amazon Resource Name (ARN) of the Amazon SNS topic (for Amazon SNS topics already configured with the policy required for notifications).
 - If you have not configured a resource to use with notifications, choose **Create target**, and then choose **SNS topic**. Provide a name for the topic after **codestar-notifications-**, and then choose **Create**.

Note

- If you create the Amazon SNS topic as part of creating the notification rule, the policy that allows the notifications feature to publish events to the topic is applied for you. Using a topic created for notification rules helps ensure that you subscribe only those users that you want to receive notifications about this resource.
- You cannot create an AWS Chatbot client as part of creating a notification rule. If you choose AWS Chatbot (Slack), you will see a button directing you to configure a client in AWS Chatbot. Choosing that option opens the AWS Chatbot console. For more information, see <u>Configure Integrations Between Notifications and AWS Chatbot</u>.
- If you want to use an existing Amazon SNS topic as a target, you must add the required policy for AWS CodeStar Notifications in addition to any other policies that might exist for that topic. For more information, see <u>Configure Amazon SNS Topics</u> for Notifications and <u>Understanding Notification Contents and Security</u>.
- 8. To finish creating the rule, choose **Submit**.
- 9. You must subscribe users to the Amazon SNS topic for the rule before they can receive notifications. For more information, see <u>Subscribe Users to Amazon SNS Topics That Are</u>

<u>Targets</u>. You can also set up integration between notifications and AWS Chatbot to send notifications to Amazon Chime chatrooms. For more information, see <u>Configure Integration</u> Between Notifications and AWS Chatbot.

To create a notification rule (AWS CLI)

1. At a terminal or command prompt, run the **create-notification rule** command to generate the JSON skeleton:

You can name the file anything you want. In this example, the file is named *rule.json*.

2. Open the JSON file in a plain-text editor and edit it to include the resource, event types, and target you want for the rule. The following example shows a notification rule named **MyNotificationRule** for a build project named **MyBuildProject** in an AWS acccount with the ID 123456789012. Notifications are sent with the full detail type to an Amazon SNS topic named codestar-notifications-MyNotificationTopic when builds are successful:

```
{
    "Name": "MyNotificationRule",
    "EventTypeIds": [
        "codebuild-project-build-state-succeeded"
    ],
    "Resource": "arn:aws:codebuild:us-east-2:123456789012:MyBuildProject",
    "Targets": [
        {
            "TargetType": "SNS",
            "TargetAddress": "arn:aws:sns:us-east-2:123456789012:codestar-
notifications-MyNotificationTopic"
        }
    ],
    "Status": "ENABLED",
    "DetailType": "FULL"
}
```

Save the file.

3. Using the file you just edited, at the terminal or command line, run the **create-notificationrule** command again to create the notification rule:

```
aws codestarnotifications create-notification-rule --cli-input-json
file://rule.json
```

4. If successful, the command returns the ARN of the notification rule, similar to the following:

```
{
    "Arn": "arn:aws:codestar-notifications:us-east-1:123456789012:notificationrule/
dc82df7a-EXAMPLE"
}
```

Change build project settings in AWS CodeBuild

You can use the AWS CodeBuild console, AWS CLI, or AWS SDKs to change a build project's settings.

If you add test reporting to a build project, make sure your IAM role has the permissions described in <u>Test report permissions</u>.

Topics

- Change a build project's settings (console)
- Change a build project's settings (AWS CLI)
- Change a build project's settings (AWS SDKs)

Change a build project's settings (console)

To change the settings for a build project, perform the following procedure:

- 1. Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.
- 2. In the navigation pane, choose **Build projects**.
- 3. Do one of the following:
 - Choose the link for the build project you want to change, and then choose **Build details**.
 - Choose the button next to the build project you want to change, choose **View details**, and then choose **Build details**.

You can modify the following sections:

Sections

User Guide

- Project configuration
- Source
- Environment
- Buildspec
- Batch configuration
- Artifacts
- Logs

Project configuration

In the **Project configuration** section, choose **Edit**. When your changes are complete, choose **Update configuration** to save the new configuration.

You can modify the following properties.

Description

Enter an optional description of the build project to help other users understand what this project is used for.

Build badge

Select **Enable build badge** to make your project's build status visible and embeddable. For more information, see <u>Build badges sample</u>.

🚯 Note

Build badge does not apply if your source provider is Amazon S3.

Enable concurrent build limit

If you want to limit the number of concurrent builds for this project, perform the following steps:

1. Select Restrict number of concurrent builds this project can start.

2. In **Concurrent build limit**, enter the maximum number of concurrent builds that are allowed for this project. This limit cannot be greater than the concurrent build limit set for the account. If you try to enter a number greater than the account limit, an error message is displayed.

New builds are only started if the current number of builds is less than or equal to this limit. If the current build count meets this limit, new builds are throttled and are not run.

Enable public build access

To make your project's build results available to the public, including users without access to an AWS account, select **Enable public build access** and confirm that you want to make the build results public. The following properties are used for public build projects:

Public build service role

Select **New service role** if you want to have CodeBuild create a new service role for you, or **Existing service role** if you want to use an existing service role.

The public build service role enables CodeBuild to read the CloudWatch Logs and download the Amazon S3 artifacts for the project's builds. This is required to make the project's build logs and artifacts available to the public.

Service role

Enter the name of the new service role or an existing service role.

To make your project's build results private, clear **Enable public build access**.

For more information, see Get public build project URLs.

🔥 Warning

The following should be kept in mind when making your project's build results public:

- All of a project's build results, logs, and artifacts, including builds that were run when the project was private, are available to the public.
- All build logs and artifacts are available to the public. Environment variables, source code, and other sensitive information may have been output to the build logs and artifacts. You must be careful about what information is output to the build logs. Some best practices are:

- Do not store sensitive values, especially AWS access key IDs and secret access keys, in environment variables. We recommend that you use an Amazon EC2 Systems Manager Parameter Store or AWS Secrets Manager to store sensitive values.
- Follow <u>Best practices for using webhooks</u> to limit which entities can trigger a build, and do not store the buildspec in the project itself, to ensure that your webhooks are as secure as possible.
- A malicious user can use public builds to distribute malicious artifacts. We recommend that project administrators review all pull requests to verify that the pull request is a legitimate change. We also recommend that you validate any artifacts with their checksums to make sure that the correct artifacts are being downloaded.

Additional information

For **Tags**, enter the name and value of any tags that you want supporting AWS services to use. Use **Add row** to add a tag. You can add up to 50 tags.

Source

In the **Source** section, choose **Edit**. When your changes are complete, choose **Update configuration** to save the new configuration.

You can modify the following properties:

Source provider

Choose the source code provider type. Use the following lists to make selections appropriate for your source provider:

Note

CodeBuild does not support Bitbucket Server.

Amazon S3

Bucket

Choose the name of the input bucket that contains the source code.

S3 object key or S3 folder

Enter the name of the ZIP file or the path to the folder that contains the source code. Enter a forward slash (/) to download everything in the S3 bucket.

Source version

Enter the version ID of the object that represents the build of your input file. For more information, see<u>Source version sample with AWS CodeBuild</u>.

CodeCommit

Repository

Choose the repository you want to use.

Reference type

Choose **Branch**, **Git tag**, or **Commit ID** to specify the version of your source code. For more information, see Source version sample with AWS CodeBuild.

Note

We recommend that you choose Git branch names that don't look like commit IDs, such as 811dd1ba1aba14473856cee38308caed7190c0d or 5392f7. This helps you avoid Git checkout collisions with actual commits.

Git clone depth

Choose to create a shallow clone with a history truncated to the specified number of commits. If you want a full clone, choose **Full**.

Git submodules

Select **Use Git submodules** if you want to include Git submodules in your repository.

Bitbucket

Credential

Choose **Default source credential** or **Custom source credential** and follow the instructions to manage the default source credential or customize the source credential.

Connection type

Choose **CodeConnections**, **OAuth**, **App password**, or **Personal access token** to connect to CodeBuild.

Connection

Select a Bitbucket connection or a Secrets Manager secret to connect through your specified connection type.

Repository

Choose **Repository in my Bitbucket account** or **Public repository** and enter the repository URL.

Source version

Enter a branch, commit ID, tag, or reference and a commit ID. For more information, see <u>Source version sample with AWS CodeBuild</u>

í) Note

We recommend that you choose Git branch names that don't look like commit IDs, such as 811dd1ba1aba14473856cee38308caed7190c0d or 5392f7. This helps you avoid Git checkout collisions with actual commits.

Git clone depth

Choose **Git clone depth** to create a shallow clone with a history truncated to the specified number of commits. If you want a full clone, choose **Full**.

Git submodules

Select Use Git submodules if you want to include Git submodules in your repository.

Build status

Select **Report build statuses to source provider when your builds start and finish** if you want the status of your build's start and completion reported to your source provider.

To be able to report the build status to the source provider, the user associated with the source provider must have write access to the repo. If the user does not have write access, the build status cannot be updated. For more information, see <u>Source provider access</u>.

For **Status context**, enter the value to be used for the name parameter in the Bitbucket commit status. For more information, see build in the Bitbucket API documentation.

For **Target URL**, enter the value to be used for the url parameter in the Bitbucket commit status. For more information, see build in the Bitbucket API documentation.

The status of a build triggered by a webhook is always reported to the source provider. To have the status of a build that is started from the console or an API call reported to the source provider, you must select this setting.

If your project's builds are triggered by a webhook, you must push a new commit to the repo for a change to this setting to take effect.

In **Primary source webhook events**, select **Rebuild every time a code change is pushed to this repository** if you want CodeBuild to build the source code every time a code change is pushed to this repository. For more information about webhooks and filter groups, see <u>Bitbucket</u> <u>webhook events</u>.

GitHub

Credential

Choose **Default source credential** or **Custom source credential** and follow the instructions to manage the default source credential or customize the source credential.

Connection type

Choose GitHub App, OAuth, or Personal access token to connect to CodeBuild.

Connection

Select a GitHub connection or a Secrets Manager secret to connect through your specified connection type.

Repository

Choose **Repository in my GitHub account**, **Public repository**, or **GitHub scoped webhook** and enter the repository URL.

Source version

Enter a branch, commit ID, tag, or reference and a commit ID. For more information, see Source version sample with AWS CodeBuild

🚯 Note

We recommend that you choose Git branch names that don't look like commit IDs, such as 811dd1ba1aba14473856cee38308caed7190c0d or 5392f7. This helps you avoid Git checkout collisions with actual commits.

Git clone depth

Choose **Git clone depth** to create a shallow clone with a history truncated to the specified number of commits. If you want a full clone, choose **Full**.

Git submodules

Select **Use Git submodules** if you want to include Git submodules in your repository.

Build status

Select **Report build statuses to source provider when your builds start and finish** if you want the status of your build's start and completion reported to your source provider.

To be able to report the build status to the source provider, the user associated with the source provider must have write access to the repo. If the user does not have write access, the build status cannot be updated. For more information, see <u>Source provider access</u>.

For **Status context**, enter the value to be used for the context parameter in the GitHub commit status. For more information, see <u>Create a commit status</u> in the GitHub developer guide.

For **Target URL**, enter the value to be used for the target_url parameter in the GitHub commit status. For more information, see <u>Create a commit status</u> in the GitHub developer guide.

The status of a build triggered by a webhook is always reported to the source provider. To have the status of a build that is started from the console or an API call reported to the source provider, you must select this setting.

If your project's builds are triggered by a webhook, you must push a new commit to the repo for a change to this setting to take effect.

In **Primary source webhook events**, select **Rebuild every time a code change is pushed to this repository** if you want CodeBuild to build the source code every time a code change is pushed to this repository. For more information about webhooks and filter groups, see <u>GitHub webhook</u> events.

GitHub Enterprise Server

Credential

Choose **Default source credential** or **Custom source credential** and follow the instructions to manage the default source credential or customize the source credential.

Connection type

Choose CodeConnections or Personal access token to connect to CodeBuild.

Connection

Select a GitHub Enterprise connection or a Secrets Manager secret to connect through your specified connection type.

Repository

Choose **Repository in my GitHub Enterprise account** or **GitHub Enterprise scoped webhook** and enter the repository URL.

Source version

Enter a pull request, branch, commit ID, tag, or reference and a commit ID. For more information, see <u>Source version sample with AWS CodeBuild</u>.

í) Note

We recommend that you choose Git branch names that don't look like commit IDs, such as 811dd1ba1aba14473856cee38308caed7190c0d or 5392f7. This helps you avoid Git checkout collisions with actual commits.

Git clone depth

Choose **Git clone depth** to create a shallow clone with a history truncated to the specified number of commits. If you want a full clone, choose **Full**.

Git submodules

Select **Use Git submodules** if you want to include Git submodules in your repository.

Build status

Select **Report build statuses to source provider when your builds start and finish** if you want the status of your build's start and completion reported to your source provider.

To be able to report the build status to the source provider, the user associated with the source provider must have write access to the repo. If the user does not have write access, the build status cannot be updated. For more information, see Source provider access.

For **Status context**, enter the value to be used for the context parameter in the GitHub commit status. For more information, see <u>Create a commit status</u> in the GitHub developer guide.

For **Target URL**, enter the value to be used for the target_url parameter in the GitHub commit status. For more information, see <u>Create a commit status</u> in the GitHub developer guide.

The status of a build triggered by a webhook is always reported to the source provider. To have the status of a build that is started from the console or an API call reported to the source provider, you must select this setting.

If your project's builds are triggered by a webhook, you must push a new commit to the repo for a change to this setting to take effect.

Insecure SSL

Select **Enable insecure SSL** to ignore SSL warnings while connecting to your GitHub Enterprise project repository.

In **Primary source webhook events**, select **Rebuild every time a code change is pushed to this repository** if you want CodeBuild to build the source code every time a code change is pushed to this repository. For more information about webhooks and filter groups, see <u>GitHub webhook</u> <u>events</u>.

GitLab

Credential

Choose **Default source credential** or **Custom source credential** and follow the instructions to manage the default source credential or customize the source credential.

Connection type

CodeConnections is used to connect GitLab to CodeBuild.

Connection

Select a GitLab connection to connect through CodeConnections.

Repository

Choose the repository you want to use.

Source version

Enter a pull request ID, branch, commit ID, tag, or reference and a commit ID. For more information, see Source version sample with AWS CodeBuild.

Note

We recommend that you choose Git branch names that don't look like commit IDs, such as 811dd1ba1aba14473856cee38308caed7190c0d or 5392f7. This helps you avoid Git checkout collisions with actual commits.

Git clone depth

Choose **Git clone depth** to create a shallow clone with a history truncated to the specified number of commits. If you want a full clone, choose **Full**.

Build status

Select **Report build statuses to source provider when your builds start and finish** if you want the status of your build's start and completion reported to your source provider.

To be able to report the build status to the source provider, the user associated with the source provider must have write access to the repo. If the user does not have write access, the build status cannot be updated. For more information, see <u>Source provider access</u>.

GitLab Self Managed

Credential

Choose **Default source credential** or **Custom source credential** and follow the instructions to manage the default source credential or customize the source credential.

Connection type

CodeConnections is used to connect GitLab Self Managed to CodeBuild.

Connection

Select a GitLab Self Managed connection to connect through CodeConnections.

Repository

Choose the repository you want to use.

Source version

Enter a pull request ID, branch, commit ID, tag, or reference and a commit ID. For more information, see Source version sample with AWS CodeBuild.

i Note

We recommend that you choose Git branch names that don't look like commit IDs, such as 811dd1ba1aba14473856cee38308caed7190c0d or 5392f7. This helps you avoid Git checkout collisions with actual commits.

Git clone depth

Choose **Git clone depth** to create a shallow clone with a history truncated to the specified number of commits. If you want a full clone, choose **Full**.

Build status

Select **Report build statuses to source provider when your builds start and finish** if you want the status of your build's start and completion reported to your source provider.

To be able to report the build status to the source provider, the user associated with the source provider must have write access to the repo. If the user does not have write access, the build status cannot be updated. For more information, see <u>Source provider access</u>.

Environment

In the **Environment** section, choose **Edit**. When your changes are complete, choose **Update configuration** to save the new configuration.

You can modify the following properties:

Provisioning model

To change the provisioning model, choose **Change provisioning model** and do one of the following:

- To use on-demand fleets managed by AWS CodeBuild, choose **On-demand**. With on-demand fleets, CodeBuild provides compute for your builds. The machines are destroyed when the build finishes. On-demand fleets are fully managed, and includes automatic scaling capabilities to handle spikes in demand.
- To use reserved capacity fleets managed by AWS CodeBuild, choose **Reserved capacity**, and then select a **Fleet name**. With reserved capacity fleets, you configure a set of dedicated instances for your build environment. These machines remain idle, ready to process builds or tests immediately and reduces build durations. With reserved capacity fleets, your machines are always running and will continue to incur costs as long they're provisioned.

For information, see Run builds on reserved capacity fleets.

Environment image

To change the build image, choose **Override image** and do one of the following:

- To use a Docker image managed by AWS CodeBuild, choose Managed image, and then make selections from Operating system, Runtime(s), Image, and Image version. Make a selection from Environment type if it is available.
- To use another Docker image, choose Custom image. For Environment type, choose ARM, Linux, Linux GPU, or Windows. If you choose Other registry, for External registry URL, enter the name and tag of the Docker image in Docker Hub, using the format *docker repository/docker image name*. If you choose Amazon ECR, use Amazon ECR repository and Amazon ECR image to choose the Docker image in your AWS account.
- To use a private Docker image, choose Custom image. For Environment type, choose ARM, Linux, Linux GPU, or Windows. For Image registry, choose Other registry, and then enter the ARN of the credentials for your private Docker image. The credentials must be created by Secrets Manager. For more information, see <u>What Is AWS Secrets Manager?</u> in the AWS Secrets Manager User Guide.

🚯 Note

CodeBuild overrides the ENTRYPOINT for custom Docker images.

Service role

Do one of the following:

- If you do not have a CodeBuild service role, choose **New service role**. In **Role name**, enter a name for the new role.
- If you have a CodeBuild service role, choose **Existing service role**. In **Role ARN**, choose the service role.

Note

When you use the console to create a build project, you can create a CodeBuild service role at the same time. By default, the role works with that build project only. If you use the console to associate this service role with another build project, the role is updated to work with the other build project. A service role can work with up to 10 build projects.

Additional configuration

Timeout

Specify a value, between 5 minutes and 36 hours, after which CodeBuild stops the build if it is not complete. If **hours** and **minutes** are left blank, the default value of 60 minutes is used.

Privileged

Select Enable this flag if you want to build Docker images or want your builds to get elevated privileges. only if you plan to use this build project to build Docker images. Otherwise, all associated builds that attempt to interact with the Docker daemon fail. You must also start the Docker daemon so that your builds can interact with it. One way to do this is to initialize the Docker daemon in the install phase of your build spec by running the following build commands. Do not run these commands if you chose a build environment image provided by CodeBuild with Docker support.

Note

By default, Docker daemon is enabled for non-VPC builds. If you would like to use Docker containers for VPC builds, see Runtime Privilege and Linux Capabilities on the

Docker Docs website and enable privileged mode. Also, Windows does not support privileged mode.

```
- nohup /usr/local/bin/dockerd --host=unix:///var/run/docker.sock --
host=tcp://127.0.0.1:2375 --storage-driver=overlay2 &
- timeout 15 sh -c "until docker info; do echo .; sleep 1; done"
```

VPC

If you want CodeBuild to work with your VPC:

- For **VPC**, choose the VPC ID that CodeBuild uses.
- For VPC Subnets, choose the subnets that include resources that CodeBuild uses.
- For VPC Security groups, choose the security groups that CodeBuild uses to allow access to resources in the VPCs.

For more information, see Use AWS CodeBuild with Amazon Virtual Private Cloud.

Compute

Choose one of the available options.

Environment variables

Enter the name and value, and then choose the type of each environment variable for builds to use.

Note

CodeBuild sets the environment variable for your AWS Region automatically. You must set the following environment variables if you haven't added them to your buildspec.yml:

- AWS_ACCOUNT_ID
- IMAGE_REPO_NAME
- IMAGE_TAG

Console and AWS CLI users can see environment variables. If you have no concerns about the visibility of your environment variable, set the **Name** and **Value** fields, and then set **Type** to **Plaintext**.

We recommend that you store an environment variable with a sensitive value, such as an AWS access key ID, an AWS secret access key, or a password as a parameter in Amazon EC2 Systems Manager Parameter Store or AWS Secrets Manager.

If you use Amazon EC2 Systems Manager Parameter Store, then for **Type**, choose **Parameter**. For **Name**, enter an identifier for CodeBuild to reference. For **Value**, enter the parameter's name as stored in Amazon EC2 Systems Manager Parameter Store. Using a parameter named /CodeBuild/dockerLoginPassword as an example, for **Type**, choose **Parameter**. For **Name**, enter LOGIN_PASSWORD. For **Value**, enter /CodeBuild/ dockerLoginPassword.

🛕 Important

If you use Amazon EC2 Systems Manager Parameter Store, we recommend that you store parameters with parameter names that start with /CodeBuild/ (for example, /CodeBuild/dockerLoginPassword). You can use the CodeBuild console to create a parameter in Amazon EC2 Systems Manager. Choose **Create parameter**, and then follow the instructions in the dialog box. (In that dialog box, for **KMS key**, you can specify the ARN of an AWS KMS key in your account. Amazon EC2 Systems Manager uses this key to encrypt the parameter's value during storage and decrypt it during retrieval.) If you use the CodeBuild console to create a parameter, the console starts the parameter name with /CodeBuild/ as it is being stored. For more information, see <u>Systems Manager Parameter Store</u> and <u>Systems Manager</u> <u>Parameter Store Console Walkthrough</u> in the *Amazon EC2 Systems Manager User Guide*.

If your build project refers to parameters stored in Amazon EC2 Systems Manager Parameter Store, the build project's service role must allow the ssm:GetParameters action. If you chose **New service role** earlier, CodeBuild includes this action in the default service role for your build project. However, if you chose **Existing service role**, you must include this action to your service role separately.

If your build project refers to parameters stored in Amazon EC2 Systems Manager Parameter Store with parameter names that do not start with /CodeBuild/, and you chose **New service role**, you must update that service role to allow access to parameter names that do not start with /CodeBuild/. This is because that service role allows access only to parameter names that start with /CodeBuild/.

If you choose **New service role**, the service role includes permission to decrypt all parameters under the /CodeBuild/ namespace in the Amazon EC2 Systems Manager Parameter Store.

Environment variables you set replace existing environment variables. For example, if the Docker image already contains an environment variable named MY_VAR with a value of my_value, and you set an environment variable named MY_VAR with a value of other_value, then my_value is replaced by other_value. Similarly, if the Docker image already contains an environment variable named PATH with a value of /usr/local/sbin:/usr/local/bin, and you set an environment variable named PATH with a value of \$PATH:/usr/share/ant/bin, then /usr/local/sbin:/usr/local/bin is replaced by the literal value \$PATH:/usr/share/ant/bin.

Do not set any environment variable with a name that begins with CODEBUILD_. This prefix is reserved for internal use.

If an environment variable with the same name is defined in multiple places, the value is determined as follows:

- The value in the start build operation call takes highest precedence.
- The value in the build project definition takes next precedence.
- The value in the buildspec declaration takes lowest precedence.

If you use Secrets Manager, for **Type**, choose **Secrets Manager**. For **Name**, enter an identifier for CodeBuild to reference. For **Value**, enter a reference-key using the pattern *secret*-*id*:*json-key*:*version-stage*:*version-id*. For information, see <u>Secrets Manager</u> reference-key in the buildspec file.

<u> Important</u>

If you use Secrets Manager, we recommend that you store secrets with names that start with /CodeBuild/ (for example, /CodeBuild/dockerLoginPassword). For more information, see <u>What Is AWS Secrets Manager?</u> in the AWS Secrets Manager User Guide.

If your build project refers to secrets stored in Secrets Manager, the build project's service role must allow the secretsmanager:GetSecretValue action. If you chose **New service role** earlier, CodeBuild includes this action in the default service

role for your build project. However, if you chose **Existing service role**, you must include this action to your service role separately.

If your build project refers to secrets stored in Secrets Manager with secret names that do not start with /CodeBuild/, and you chose **New service role**, you must update the service role to allow access to secret names that do not start with / CodeBuild/. This is because the service role allows access only to secret names that start with /CodeBuild/.

If you choose **New service role**, the service role includes permission to decrypt all secrets under the /CodeBuild/ namespace in the Secrets Manager.

Buildspec

In the **Buildspec** section, choose **Edit**. When your changes are complete, choose **Update configuration** to save the new configuration.

You can modify the following properties:

Build specifications

Do one of the following:

- If your source code includes a buildspec file, choose Use a buildspec file. By default, CodeBuild looks for a file named buildspec.yml in the source code root directory. If your buildspec file uses a different name or location, enter its path from the source root in Buildspec name (for example, buildspec-two.yml or configuration/buildspec.yml. If the buildspec file is in an S3 bucket, it must be in the same AWS Region as your build project. Specify the buildspec file using its ARN (for example, arn:aws:s3:::<mycodebuild-sample2>/buildspec.yml).
- If your source code does not include a buildspec file, or if you want to run build commands different from the ones specified for the build phase in the buildspec.yml file in the source code's root directory, choose Insert build commands. For Build commands, enter the commands you want to run in the build phase. For multiple commands, separate each command by && (for example, mvn test && mvn package). To run commands in other phases, or if you have a long list of commands for the build phase, add a buildspec.yml file to the source code root directory, add the commands to the file, and then choose Use the buildspec.yml in the source code root directory.

For more information, see the <u>Buildspec reference</u>.

Batch configuration

In the **Batch configuration** section, choose **Edit**. When your changes are complete, choose **Update configuration** to save the new configuration. For more information, see Run builds in batches.

You can modify the following properties:

Batch service role

Provides the service role for batch builds.

Choose one of the following:

- If you do not have a batch service role, choose **New service role**. In **Service role**, enter a name for the new role.
- If you have a batch service role, choose **Existing service role**. In **Service role**, choose the service role.

Batch builds introduce a new security role in the batch configuration. This new role is required as CodeBuild must be able to call the StartBuild, StopBuild, and RetryBuild actions on your behalf to run builds as part of a batch. Customers should use a new role, and not the same role they use in their build, for two reasons:

- Giving the build role StartBuild, StopBuild, and RetryBuild permissions would allow a single build to start more builds via the buildspec.
- CodeBuild batch builds provide restrictions that restrict the number of builds and compute types that can be used for the builds in the batch. If the build role has these permissions, it is possible the builds themselves could bypass these restrictions.

Allowed compute type(s) for batch

Select the compute types allowed for the batch. Select all that apply.

Maximum builds allowed in batch

Enter the maximum number of builds allowed in the batch. If a batch exceeds this limit, the batch will fail.

Batch timeout

Enter the maximum amount of time for the batch build to complete.

Combine artifacts

Select **Combine all artifacts from batch into a single location** to have all of the artifacts from the batch combined into a single location.

Batch report mode

Select the desired build status report mode for batch builds.

Note

This field is only available when the project source is Bitbucket, GitHub, or GitHub Enterprise, and **Report build statuses to source provider when your builds start and finish** is selected under **Source**.

Aggregated builds

Select to have the statuses for all builds in the batch combined into a single status report.

Individual builds

Select to have the build statuses for all builds in the batch reported separately.

Artifacts

In the **Artifacts** section, choose **Edit**. When your changes are complete, choose **Update configuration** to save the new configuration.

You can modify the following properties:

Туре

Do one of the following:

- If you do not want to create any build output artifacts, choose **No artifacts**. You might want to do this if you're only running build tests or you want to push a Docker image to an Amazon ECR repository.
- To store the build output in an S3 bucket, choose **Amazon S3**, and then do the following:
 - If you want to use your project name for the build output ZIP file or folder, leave **Name** blank. Otherwise, enter the name. (If you want to output a ZIP file, and you want the ZIP file to have a file extension, be sure to include it after the ZIP file name.)

- Select Enable semantic versioning if you want a name specified in the buildspec file to
 override any name that is specified in the console. The name in a buildspec file is calculated
 at build time and uses the Shell command language. For example, you can append a date
 and time to your artifact name so that it is always unique. Unique artifact names prevent
 artifacts from being overwritten. For more information, see <u>Buildspec syntax</u>.
- For **Bucket name**, choose the name of the output bucket.
- If you chose **Insert build commands** earlier in this procedure, then for **Output files**, enter the locations of the files from the build that you want to put into the build output ZIP file or folder. For multiple locations, separate each location with a comma (for example, appspec.yml, target/my-app.jar). For more information, see the description of files in <u>Buildspec syntax</u>.
- If you do not want your build artifacts encrypted, select **Remove artifacts encryption**.

For each secondary set of artifacts you want:

- 1. For **Artifact identifier**, enter a value that is fewer than 128 characters and contains only alphanumeric characters and underscores.
- 2. Choose Add artifact.
- 3. Follow the previous steps to configure your secondary artifacts.
- 4. Choose **Save artifact**.

Additional configuration

Encryption key

Do one of the following:

- To use the AWS managed key Amazon S3 in your account to encrypt the build output artifacts, leave **Encryption key** blank. This is the default.
- To use a customer managed key to encrypt the build output artifacts, in Encryption key, enter the ARN of the customer managed key. Use the format arn: aws:kms:region-ID:account-ID:key/key-ID.

Cache type

For **Cache type**, choose one of the following:

- If you do not want to use a cache, choose **No cache**.
- If you want to use an Amazon S3 cache, choose Amazon S3, and then do the following:

- For Bucket, choose the name of the S3 bucket where the cache is stored.
- (Optional) For Cache path prefix, enter an Amazon S3 path prefix. The Cache path prefix value is similar to a directory name. It makes it possible for you to store the cache under the same directory in a bucket.

🔥 Important

Do not append a trailing slash (/) to the end of the path prefix.

• If you want to use a local cache, choose **Local**, and then choose one or more local cache modes.

🚯 Note

Docker layer cache mode is available for Linux only. If you choose it, your project must run in privileged mode.

Using a cache saves considerable build time because reusable pieces of the build environment are stored in the cache and used across builds. For information about specifying a cache in the buildspec file, see <u>Buildspec syntax</u>. For more information about caching, see <u>Cache builds to improve performance</u>.

Logs

In the **Logs** section, choose **Edit**. When your changes are complete, choose **Update configuration** to save the new configuration.

You can modify the following properties:

Choose the logs you want to create. You can create Amazon CloudWatch Logs, Amazon S3 logs, or both.

CloudWatch

If you want Amazon CloudWatch Logs logs:

CloudWatch logs

Select CloudWatch logs.

Group name

Enter the name of your Amazon CloudWatch Logs log group.

Stream name

Enter your Amazon CloudWatch Logs log stream name.

S3

If you want Amazon S3 logs:

S3 logs

Select S3 logs.

Bucket

Choose the name of the S3 bucket for your logs.

Path prefix

Enter the prefix for your logs.

Disable S3 log encryption

Select if you do not want your S3 logs encrypted.

Change a build project's settings (AWS CLI)

For information about using the AWS CLI with AWS CodeBuild, see the Command line reference.

To update a CodeBuild project with the AWS CLI, you create a JSON file with the updated properties and pass that file to the <u>update-project</u> command. Any properties not contained in the update file remain unchanged.

In the update JSON file, only the name property and the modified properties are required. The name property identifies the project to modify. For any modified structures, the required parameters for those structures must also be included. For example, to modify the environment for the project, the environment/type and environment/computeType properties are required. Here is an example that updates the environment image:

```
"name": "<project-name>",
"environment": {
    "type": "LINUX_CONTAINER",
    "computeType": "BUILD_GENERAL1_SMALL",
    "image": "aws/codebuild/amazonlinux2-x86_64-standard:4.0"
}
```

If you need to obtain the current property values for a project, use the <u>batch-get-projects</u> command to obtain the current properties of the project you are modifying, and write the output to a file.

```
aws codebuild batch-get-projects --names "<project-name>" > project-info.json
```

The *project-info.json* file contains an array of projects, so it cannot be used directly to update a project. You can, however, copy the properties that you want to modify from the *project-info.json* file and paste them into your update file as a baseline for the properties you want to modify. For more information, see View a build project's details (AWS CLI).

Modify the update JSON file as described in <u>Create a build project (AWS CLI)</u>, and save your results. When you are finished modifying the update JSON file, run the <u>update-project</u> command, passing the update JSON file.

```
aws codebuild update-project --cli-input-json file://<update-project-file>
```

If successful, the updated project JSON appears in the output. If any required parameters are missing, an error message is displayed in the output that identifies the missing parameters. For example, this is the error message displayed if the environment/type parameter is missing:

```
aws codebuild update-project --cli-input-json file://update-project.json
Parameter validation failed:
Missing required parameter in environment: "type"
```

Change a build project's settings (AWS SDKs)

For information about using AWS CodeBuild with the AWS SDKs, see the <u>AWS SDKs and tools</u> <u>reference</u>.

Change a build project's settings (AWS SDKs)

Multiple access tokens in CodeBuild

CodeBuild supports sourcing access tokens to third party providers from your secrets in AWS Secrets Manager or through AWS CodeConnections connections. You can set your secret or connection as the default credential for interactions with a specified third party provider such as GitHub, GitHub Enterprise, or Bitbucket.

You can set your source credentials at three different levels:

- 1. Account level credentials for all projects: These are default credentials for all projects in an AWS account. They will be used on a project when no project or source level credentials are specified.
- 2. **Source level credentials for a specific repository:** This is when a Secrets Manager secret or CodeConnections connection is defined on a project source. These credentials will only be used for operations on the specified source repository. This allows you to set up multiple access tokens with different permission scopes in the same project, and not use the default account level credentials.
- 3. **Project level fallback credentials:** You can set a project level fallback credential by using NO_SOURCE as primary source type and define a secret or connection on it. This is can be used when you have multiple sources on a project, but want to use the same credentials for them, or when you don't want to use the default account level credentials for your project.

Topics

- <u>Step 1: Create a Secrets Manager secret or a CodeConnections connection</u>
- Step 2: Grant CodeBuild project IAM role access to Secrets Manager secrets
- Step 3: Configure Secrets Manager or CodeConnections tokens
- Additional setup options

Step 1: Create a Secrets Manager secret or a CodeConnections connection

Use the following instructions to create a Secrets Manager secret or a CodeConnections connection:

• Create and store a token in a Secrets Manager secret.

- Create a connection to GitHub
- <u>Create a connection to to GitHub Enterprise Server</u>
- Create a connection to Bitbucket

Step 2: Grant CodeBuild project IAM role access to Secrets Manager secrets

🚯 Note

Before you continue, you must have access to the token created in Secrets Manager or CodeConnections.

To grant CodeBuild project IAM role access to Secrets Manager or CodeConnections, you must add the following IAM policy.

To grant CodeBuild project IAM role access

- Create an IAM role for your CodeBuild project by following the instructions to <u>Allow CodeBuild</u> to interact with other AWS services for your CodeBuild project.
- 2. Do one of the following:
 - Add the following IAM policy to your CodeBuild project role to grant access to your secret.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
               "secretsmanager:GetSecretValue"
        ],
        "Resource": [
               "<secret-arn>"
        ]
        }
    ]
}
```

(Optional) If you're using AWS KMS customer managed keys to encrypt a Secrets Manager secret, you can add the following policy statement to grant access.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
                 "kms:Decrypt"
            ],
            "Resource": "<kms-key-arn>",
            "Condition": {
                 "StringEquals": {
                     "kms:EncryptionContext:SecretARN": "<secret-arn>"
                }
            }
        }
    ]
}
```

• Add the following IAM policy to your CodeBuild project role to grant access to your connection.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
               "codeconnections:GetConnectionToken",
               "codeconnections:GetConnection"
            ],
            "Resource": [
                <connection-arn>
            ]
        }
}
```

Step 3: Configure Secrets Manager or CodeConnections tokens

You can set your source credentials at three different levels with either Secrets Manager or CodeConnections tokens.

Configure Secrets Manager or CodeConnections tokens as account level credentials

You can configure a Secrets Manager secret or CodeConnections connection as an account level credential and use it in a project.

AWS Management Console

To configure a connection as an account level credential in the AWS Management Console

- 1. For **Source provider**, choose **Bitbucket**, **GitHub**, or **GitHub Enterprise**.
- 2. For **Credential**, do one of the following:
 - Choose Default source credential to use your account's default source credential to apply to all projects.
 - a. If you aren't connected to your source provider, choose **Manage default source** credential.
 - b. For **Credential type**, choose a credential type.
 - c. If you chose **CodeConnections**, choose to use an existing connection or create a new connection.

If you chose a different credential type, for **Service** choose which service you'd like to use to store your token and do the following:

- If you chose to use Secrets Manager, you can choose to use an existing secret connection or create a new secret and choose Save. For more information how to create a new secret, see <u>Create and store a token in a Secrets Manager</u> secret.
- If you chose to use **CodeBuild**, enter your token or your username and app password, and choose **Save**.
- Choose **Custom source credential** to use a custom source credential to override your account's default settings.
 - a. For **Credential type**, choose a credential type.

b. In **Connection**, choose to use an existing connection or create a new connection.

AWS CLI

To configure a connection as an account level credential in the AWS CLI

• Open a terminal (Linux, macOS, or Unix) or command prompt (Windows). Use the AWS CLI to run the **import-source-credentials** command.

Use the following command to configure a Secrets Manager secret:

```
aws codebuild import-source-credentials \
    --token "<secret-arn>" \
    --server-type <source-provider> \
    --auth-type SECRETS_MANAGER \
    --region <aws-region>
```

Use the following command to configure a CodeConnections connection:

```
aws codebuild import-source-credentials \
    --token "<connection-arn>" \
    --server-type <source-provider> \
    --auth-type CODECONNECTIONS \
    --region <aws-region>
```

This command allows you to import a token as the account level default source credentials. When you import a credential using the <u>ImportSourceCredentials</u> API, CodeBuild will use the token for all interactions with the source provider, such as webhooks, build status reporting and git clone operations unless a more specific set of credentials has been configured in the project.

You can now use the token in your build project and run it. For more information, see <u>Create a build</u> project in AWS CodeBuild and Run AWS CodeBuild builds manually.

Configure multiple tokens as source level credentials

To use Secrets Manager secrets or CodeConnections connections as source level credentials, directly reference the token in CodeBuild project, and start a build.

AWS Management Console

To configure multiple tokens as source level credentials in the AWS Management Console

- 1. For **Source provider**, choose **GitHub**.
- 2. For **Credential**, do one of the following:
 - Choose **Default source credential** to use your account's default source credential to apply to all projects.
 - a. If you aren't connected to GitHub, choose **Manage default source credential**.
 - b. For Credential type, choose GitHub App.
 - c. In **Connection**, choose to use an existing connection or create a new connection.
 - Choose **Custom source credential** to use a custom source credential to override your account's default settings.
 - a. For **Credential type**, choose **GitHub App**.
 - b. In **Connection**, choose to use an existing connection or create a new connection.
- 3. Choose **Add source** and repeat the process of choosing your source provider and credentials.

AWS CLI

To configure multiple tokens as source level credentials in the AWS CLI

• Open a terminal (Linux, macOS, or Unix) or command prompt (Windows). Use the AWS CLI to run the **create-project** command.

Use the following command:

Set a project level source credential fallback

To set up project level source credential fallback, use NO_SOURCE for your project's primary source and reference the token.

When using NO_SOURCE, a buildspec typically is provided within the source model as it is not directly configured to use an external source to fetch the <u>buildspec</u>. Commonly, a NO_SOURCE source will handle cloning all relevant repositories from within the buildspec. To ensure the configured credentials are available for those operations, you can enable the git-credential-helper option in the buildspec.

```
env:
    git-credential-helper: yes
```

During the build, CodeBuild will then read the AuthServer field from the configured token and use the token credentials for all git requests to that particular third party source provider.

Additional setup options

You can configure Secrets Manager account level credentials by using AWS CloudFormation templates. You can use the following AWS CloudFormation template to set an account level credential:

```
Parameters:
  GitHubToken:
    Type: String
    NoEcho: true
    Default: placeholder
Resources:
  CodeBuildAuthTokenSecret:
    Type: AWS::SecretsManager::Secret
    Properties:
      Description: CodeBuild auth token
      Name: codebuild-auth-token
      SecretString:
        !Join
          _ '''
          - - '{"ServerType":"GITHUB","AuthType":"PERSONAL_ACCESS_TOKEN","Token":"'
            - !Ref GitHubToken
            - '"}'
      Tags:
        - Key: codebuild:source:provider
          Value: github
        - Key: codebuild:source:type
          Value: personal_access_token
  CodeBuildSecretsManagerAccountCredential:
    Type: AWS::CodeBuild::SourceCredential
    Properties:
      ServerType: GITHUB
      AuthType: SECRETS_MANAGER
      Token: !Ref CodeBuildAuthTokenSecret
```

🚯 Note

If you're also creating a project in the same stack, use the AWS CloudFormation attribute DependsOn to ensure the AccountCredential is created before the project.

You can also configure Secrets Manager multiple source level credentials by using AWS CloudFormation templates. You can use the following AWS CloudFormation template to use multiple tokens to pull in multiple sources:

```
Parameters:
  GitHubTokenOne:
    Type: String
    NoEcho: true
    Default: placeholder
  GitHubTokenTwo:
    Type: String
    NoEcho: true
    Default: placeholder
Resources:
  CodeBuildSecretsManagerProject:
    Type: AWS::CodeBuild::Project
    Properties:
      Name: codebuild-multitoken-example
      ServiceRole: <service-role>
      Environment:
        Type: LINUX_CONTAINER
        ComputeType: BUILD_GENERAL1_SMALL
        Image: aws/codebuild/amazonlinux2-x86_64-standard:5.0
      Source:
        Type: GITHUB
        Location: <github-repository-one>
        Auth:
          Type: SECRETS_MANAGER
          Resource: !Ref CodeBuildAuthTokenSecretOne
      SecondarySources:
        - Type: GITHUB
          Location: <github-repository-two>
          Auth:
            Type: SECRETS_MANAGER
            Resource: !Ref CodeBuildAuthTokenSecretTwo
```

```
SourceIdentifier: secondary
    Artifacts:
      Type: NO_ARTIFACTS
    LogsConfig:
      CloudWatchLogs:
        Status: ENABLED
CodeBuildProjectIAMRoleSecretAccess:
  Type: AWS::IAM::RolePolicy
  Properties:
    RoleName: <role-name>
    PolicyName: CodeBuildProjectIAMRoleSecretAccessPolicy
    PolicyDocument:
      Version: '2012-10-17'
      Statement:
        - Effect: Allow
          Action:
            - secretsmanager:GetSecretValue
          Resource:
            - !Ref CodeBuildAuthTokenSecretOne
            - !Ref CodeBuildAuthTokenSecretTwo
CodeBuildAuthTokenSecretOne:
  Type: AWS::SecretsManager::Secret
  Properties:
    Description: CodeBuild auth token one
    Name: codebuild-auth-token-one
    SecretString:
      !Join
        _ _ _ _
        - - '{"ServerType":"GITHUB", "AuthType":"PERSONAL_ACCESS_TOKEN", "Token":"'
          - !Ref GitHubTokenOne
          - '"}'
    Tags:
      - Key: codebuild:source:provider
        Value: github
      - Key: codebuild:source:type
        Value: personal_access_token
CodeBuildAuthTokenSecretTwo:
  Type: AWS::SecretsManager::Secret
  Properties:
    Description: CodeBuild auth token two
    Name: codebuild-auth-token-two
    SecretString:
      !Join
          . .
```

- '{"ServerType":"GITHUB","AuthType":"PERSONAL_ACCESS_TOKEN","Token":"'

 !Ref GitHubTokenTwo
 '"}'

 Tags:

 Key: codebuild:source:provider
 Value: github
 Key: codebuild:source:type
 Value: personal_access_token

Delete build projects in AWS CodeBuild

You can use the CodeBuild console, AWS CLI, or AWS SDKs to delete a build project in CodeBuild. If you delete a project, its builds are not deleted.

<u> M</u>arning

You cannot delete a project that has builds and a resource policy. To delete a project with a resource policy and builds, you must first remove the resource policy and delete its builds.

Topics

- Delete a build project (console)
- Delete a build project (AWS CLI)
- Delete a build project (AWS SDKs)

Delete a build project (console)

- Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ https://console.aws.amazon.com/codesuite/codebuild/
- 2. In the navigation pane, choose **Build projects**.
- 3. Do one of the following:
 - Choose the radio button next to the build project you want to delete, and then choose Delete.
 - Choose the link for the build project you want to delete, and then choose **Delete**.

🚯 Note

By default, only the most recent 10 build projects are displayed. To view more build projects, choose a different value for **Projects per page** or use the back and forward arrows for viewing projects.

Delete a build project (AWS CLI)

1. Run the delete-project command:

aws codebuild delete-project --name name

Replace the following placeholder:

- name: Required string. The name of the build project to delete. To get a list of available build projects, run the list-projects command. For more information, see <u>View a list of build</u> project names (AWS CLI).
- 2. If successful, no data and no errors appear in the output.

For more information about using the AWS CLI with AWS CodeBuild, see the <u>Command line</u> reference.

Delete a build project (AWS SDKs)

For more information about using AWS CodeBuild with the AWS SDKs, see the <u>AWS SDKs and tools</u> reference.

Get public build project URLs

AWS CodeBuild allows you to make the build results, logs, and artifacts for your build projects available to the general public. This allows contributors to your source repositories to view the results and download the artifacts of a build, without requiring them to have access to an AWS account.

When you make your project's builds available to the public, all of a project's build results, logs, and artifacts, including builds that were run when the project was private, are made available to the public. Likewise, when you make a public build project private, the build results for that project are no longer available to the public.

For information about how to change the public visibility of your project's build results, see **Enable public build access**.

CodeBuild provides a URL for the public builds for your project that is unique to your project.

To obtain the public URL for your build project, use the following procedure.

To obtain the URL of a public build project

- Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ https://console.aws.amazon.com/codesuite/codebuild/
- 2. In the navigation pane, choose **Build projects**.
- 3. Choose the link for the build project you want to obtain the public URL for.
- 4. The public URL is displayed in the **Public project URL** field in the **Configuration** section. You can choose the link to open the URL, or copy the URL with the copy button.

<u> M</u>arning

The following should be kept in mind when making your project's build results public:

- All of a project's build results, logs, and artifacts, including builds that were run when the project was private, are available to the public.
- All build logs and artifacts are available to the public. Environment variables, source code, and other sensitive information may have been output to the build logs and artifacts. You must be careful about what information is output to the build logs. Some best practices are:
 - Do not store sensitive values, especially AWS access key IDs and secret access keys, in environment variables. We recommend that you use an Amazon EC2 Systems Manager Parameter Store or AWS Secrets Manager to store sensitive values.
 - Follow <u>Best practices for using webhooks</u> to limit which entities can trigger a build, and do not store the buildspec in the project itself, to ensure that your webhooks are as secure as possible.

• A malicious user can use public builds to distribute malicious artifacts. We recommend that project administrators review all pull requests to verify that the pull request is a legitimate change. We also recommend that you validate any artifacts with their checksums to make sure that the correct artifacts are being downloaded.

Share build projects

Project sharing allows project owners to share their AWS CodeBuild projects with other AWS accounts or users. In this model, the account that owns the project (owner) shares a project with other accounts (consumers). A consumer cannot edit or run a project.

Topics

- Share a project
- <u>Related services</u>
- <u>Access CodeBuild projects shared with you</u>
- Unshare a shared project
- Identify a shared project
- Shared project permissions

Share a project

The consumer can use both the AWS CLI and AWS CodeBuild console to view the project and builds you've shared. The consumer cannot edit or run the project.

You can add a project to an existing resource share or you can create one in the <u>AWS RAM console</u>.

🚯 Note

You cannot delete a project with builds that has been added to a resource share.

To share a project with organizational units or an entire organization, you must enable sharing with AWS Organizations. For more information, see <u>Enable sharing with AWS Organizations</u> in the AWS RAM User Guide.

You can use the AWS CodeBuild console, AWS RAM console, or the AWS CLI to share a project that you own.

Prerequisites for sharing projects

Before you start sharing a project, make sure your AWS account owns it. You cannot share a project that has been shared with you.

To share a project that you own (CodeBuild console)

- Open the AWS CodeBuild console at <u>https://console.aws.amazon.com/codesuite/codebuild/</u> home.
- 2. In the navigation pane, choose **Build projects**.

1 Note

By default, only the 10 most recent build projects are displayed. To view more build projects, choose the gear icon, and then choose a different value for **Projects per page** or use the back and forward arrows.

3. Choose the project you want to share, and then choose **Share**. For more information, see Create a resource share in the AWS RAM User Guide.

To share a project that you own (AWS RAM console)

See <u>Creating a resource share</u> in the AWS RAM User Guide.

To share a project that you own (AWS RAM command)

Use the create-resource-share command.

To share a project that you own (CodeBuild command)

Use the <u>put-resource-policy</u> command:

1. Create a file named policy.json and copy the following into it.

```
{
    "Version":"2012-10-17",
    "Statement":[{
        "Effect":"Allow",
```

```
"Principal":{
    "AWS":"<consumer-aws-account-id-or-user>"
    },
    "Action":[
        "codebuild:BatchGetProjects",
        "codebuild:BatchGetBuilds",
        "codebuild:ListBuildsForProject"],
        "Resource":"<arn-of-project-to-share>"
    }]
}
```

2. Update policy.json with the project ARN and identifiers to share it with. The following example grants read-only access to the root user for the AWS account identified by 123456789012.

```
{
  "Version":"2012-10-17",
  "Statement":[{
    "Effect":"Allow",
    "Principal":{
      "AWS": [
        "123456789012"
      1
    },
    "Action":[
      "codebuild:BatchGetProjects",
      "codebuild:BatchGetBuilds",
      "codebuild:ListBuildsForProject"],
    "Resource":"arn:aws:codebuild:us-west-2:123456789012:project/my-project"
 }]
}
```

3. Run the put-resource-policy command.

```
aws codebuild put-resource-policy --resource-arn <project-arn> --policy file://
policy.json
```

4. Get the AWS RAM resource share ARN.

```
aws ram list-resources --resource-owner SELF --resource-arns <project-arn>
```

This will return a response similar to this:

```
{
    "resources": [
        {
            "arn": "<project-arn>",
            "type": "<type>",
            "resourceShareArn": "<resource-share-arn>",
            "creationTime": "<creation-time>",
            "lastUpdatedTime": "<last-update-time>"
        }
    ]
}
```

From the response, copy the <<u>resource-share-arn</u>> value to use in the next step.

5. Run the AWS RAM promote-resource-share-created-from-policy command.

```
aws ram promote-resource-share-created-from-policy --resource-share-arn <resource-
share-arn>
```

Related services

Project sharing integrates with AWS Resource Access Manager (AWS RAM), a service that makes it possible for you to share your AWS resources with any AWS account or through AWS Organizations. With AWS RAM, you share resources by creating a *resource share* that specifies the resources and the consumers to share them with. Consumers can be individual AWS accounts, organizational units in AWS Organizations, or an entire organization in AWS Organizations.

For more information, see the <u>AWS RAM User Guide</u>.

Access CodeBuild projects shared with you

To access a shared project, a consumer's IAM role requires the BatchGetProjects permission. You can attach the following policy to their IAM role:

}

```
"codebuild:BatchGetProjects"
]
```

For more information, see Using identity-based policies for AWS CodeBuild.

Unshare a shared project

An unshared project, including its builds, can be accessed only by its owner. If you unshare a project, any AWS account or user you previously shared it with cannot access the project or its builds.

To unshare a shared project that you own, you must remove it from the resource share. You can use the AWS CodeBuild console, AWS RAM console, or AWS CLI to do this.

To unshare a shared project that you own (AWS RAM console)

See Updating a resource share in the AWS RAM User Guide.

To unshare a shared project that you own (AWS CLI)

Use the disassociate-resource-share command.

To unshare project that you own (CodeBuild command)

Run the <u>delete-resource-policy</u> command and specify the ARN of the project you want to unshare:

aws codebuild delete-resource-policy --resource-arn project-arn

Identify a shared project

Owners and consumers can use the AWS CLI to identify shared projects.

To identify projects shared with your AWS account or user (AWS CLI)

Use the <u>list-shared-projects</u> command to return the projects that are shared with you.

Shared project permissions

Permissions for owners

A project owner can edit the project and use it to run builds.

Permissions for consumers

A project consumer can view a project and its builds, but cannot edit a project or use it to run builds.

Tag build projects

A *tag* is a custom attribute label that you or AWS assigns to an AWS resource. Each AWS tag has two parts:

- A *tag key* (for example, CostCenter, Environment, Project, or Secret). Tag keys are case sensitive.
- An optional field known as a *tag value* (for example, 111122223333, Production, or a team name). Omitting the tag value is the same as using an empty string. Like tag keys, tag values are case sensitive.

Together these are known as key-value pairs. For information about the number of tags you can have on a project and restrictions on tag keys and values, see <u>Tags</u>.

Tags help you identify and organize your AWS resources. Many AWS services support tagging, so you can assign the same tag to resources from different services to indicate that the resources are related. For example, you can assign the same tag to a CodeBuild project that you assign to an S3 bucket. For more information about using tags, see <u>Tagging Best Practices</u>.

In CodeBuild, the primary resources are the project and the report group. You can use the CodeBuild console, the AWS CLI, CodeBuild APIs, or AWS SDKs to add, manage, and remove tags for a project. In addition to identifying, organizing, and tracking your project with tags, you can use tags in IAM policies to help control who can view and interact with your project. For examples of tag-based access policies, see Using tags to control access to AWS CodeBuild resources.

<u> Important</u>

When using the reserved capacity feature, data cached on fleet instances, including source files, Docker layers, and cached directories specified in the buildspec, can be accessible to other projects within the same account. This is by design and allows projects within the same account to share fleet instances.

Topics

- Add a tag to a project
- View tags for a project
- Edit tags for a project
- <u>Remove a tag from a project</u>

Add a tag to a project

Adding tags to a project can help you identify and organize your AWS resources and manage access to them. First, you add one or more tags (key-value pairs) to a project. Keep in mind that there are limits on the number of tags you can have on a project. There are restrictions on the characters you can use in the key and value fields. For more information, see <u>Tags</u>. After you have tags, you can create IAM policies to manage access to the project based on these tags. You can use the CodeBuild console or the AWS CLI to add tags to a project.

<u> Important</u>

When using the reserved capacity feature, data cached on fleet instances, including source files, Docker layers, and cached directories specified in the buildspec, can be accessible to other projects within the same account. This is by design and allows projects within the same account to share fleet instances.

For more information about adding tags to a project when you create it, see <u>Add a tag to a project</u> (console).

<u> Important</u>

Before you add a tag to a project, make sure to review any IAM policies that might use tags to control access to resources such as build projects. For examples of tag-based access policies, see Using tags to control access to AWS CodeBuild resources.

Topics

- Add a tag to a project (console)
- Add a tag to a project (AWS CLI)

Add a tag to a project (console)

You can use the CodeBuild console to add one or more tags to a CodeBuild project.

- 1. Open the CodeBuild console at https://console.aws.amazon.com/codebuild/.
- 2. In **Build projects**, choose the name of the project where you want to add tags.
- 3. In the navigation pane, choose **Settings**. Choose **Build project tags**.
- 4. If no tags have been added to the project, choose **Add tag**. Otherwise, choose **Edit**, and then choose **Add tag**.
- 5. In Key, enter a name for the tag. You can add an optional value for the tag in Value.
- 6. (Optional) To add another tag, choose **Add tag** again.
- 7. When you have finished adding tags, choose **Submit**.

Add a tag to a project (AWS CLI)

To add a tag to a project when you create it, see Create a build project (AWS CLI). In create-project.json, add your tags.

In these steps, we assume that you have already installed a recent version of the AWS CLI or updated to the current version. For more information, see <u>Installing the AWS Command Line</u> <u>Interface</u>.

If successful, this command returns nothing.

View tags for a project

Tags can help you identify and organize your AWS resources and manage access to them. For more information about using tags, see the <u>Tagging best practices</u> whitepaper. For examples of tag-based access policies, see Using tags to control access to AWS CodeBuild resources.

View tags for a project (console)

You can use the CodeBuild console to view the tags associated with a CodeBuild project.

- 1. Open the CodeBuild console at https://console.aws.amazon.com/codebuild/.
- 2. In **Build projects**, choose the name of the project where you want to view tags.
- 3. In the navigation pane, choose **Settings**. Choose **Build project tags**.

View tags for a project (AWS CLI)

To view tags for a build project, run the following command. Use the name of your project for the --names parameter.

```
aws codebuild batch-get-projects --names your-project-name
```

If successful, this command returns JSON-formatted information about your build project that includes something like the following:

```
{
    "tags": {
        "Status": "Secret",
        "Team": "JanesProject"
    }
}
```

If the project does not have tags, the tags section is empty:

"tags": []

Edit tags for a project

You can change the value for a tag associated with a project. You can also change the name of the key, which is equivalent to removing the current tag and adding a different one with the new name and the same value as the other key. Keep in mind that there are limits on the characters you can use in the key and value fields. For more information, see <u>Tags</u>.

🔥 Important

Editing tags for a project can impact access to that project. Before you edit the name (key) or value of a tag for a project, make sure to review any IAM policies that might use the key or value for a tag to control access to resources such as build projects. For examples of tagbased access policies, see <u>Using tags to control access to AWS CodeBuild resources</u>.

Edit a tag for a project (console)

You can use the CodeBuild console to edit the tags associated with a CodeBuild project.

- 1. Open the CodeBuild console at <u>https://console.aws.amazon.com/codebuild/</u>.
- 2. In **Build projects**, choose the name of the project where you want to edit tags.
- 3. In the navigation pane, choose **Settings**. Choose **Build project tags**.
- 4. Choose Edit.
- 5. Do one of the following:
 - To change the tag, enter a new name in **Key**. Changing the name of the tag is the equivalent of removing a tag and adding a new tag with the new key name.
 - To change the value of a tag, enter a new value. If you want to change the value to nothing, delete the current value and leave the field blank.
- 6. When you have finished editing tags, choose **Submit**.

Edit tags for a project (AWS CLI)

To add, change, or delete tags from a build project, see <u>Change a build project's settings (AWS CLI)</u>. Update the tags section in the JSON-formatted data you use to update the project.

Remove a tag from a project

You can remove one or more tags associated with a project. Removing a tag does not delete the tag from other AWS resources that are associated with that tag.

<u> Important</u>

Removing tags for a project can impact access to that project. Before you remove a tag from a project, make sure to review any IAM policies that might use the key or value for a tag to control access to resources such as build projects. For examples of tag-based access policies, see Using tags to control access to AWS CodeBuild resources.

Remove a tag from a project (console)

You can use the CodeBuild console to remove the association between a tag and a CodeBuild project.

- 1. Open the CodeBuild console at https://console.aws.amazon.com/codebuild/.
- 2. In **Build projects**, choose the name of the project where you want to remove tags.

- 3. In the navigation pane, choose **Settings**. Choose **Build project tags**.
- 4. Choose Edit.
- 5. Find the tag you want to remove, and then choose **Remove tag**.
- 6. When you have finished removing tags, choose **Submit**.

Remove a tag from a project (AWS CLI)

To delete one or more tags from a build project, see <u>Change a build project's settings (AWS CLI)</u>. Update the tags section in the JSON-formatted data with an updated list of tags that does not contain the ones you want to delete. If you want to delete all tags, update the tags section to:

"tags: []"

i Note

If you delete a CodeBuild build project, all tag associations are removed from the deleted build project. You do not have to remove tags before you delete a build project.

Use runners with AWS CodeBuild

AWS CodeBuild supports integration with GitHub Actions runners and self-managed GitLab runners.

Topics

- Self-hosted GitHub Actions runners in AWS CodeBuild
- Self-managed GitLab runners in AWS CodeBuild

Self-hosted GitHub Actions runners in AWS CodeBuild

You can configure your project to set up self-hosted GitHub Actions runners in CodeBuild containers to process your GitHub Actions workflow jobs. This can be done by setting up a webhook using your CodeBuild project, and updating your GitHub Actions workflow YAML to use self-hosted runners hosted on CodeBuild machines. For more information, see <u>About self-hosted</u> runners.

The high-level steps to configure a CodeBuild project to run GitHub Actions jobs are as follows:

- 1. If you haven't done so already, create a personal access token or connect with an OAuth app to connect your project to GitHub.
- 2. Navigate to the CodeBuild console and create a CodeBuild project with a webhook and set up your webhook filters.
- 3. Update your GitHub Actions workflow YAML in GitHub to configure your build environment.

For a more detailed procedure, see Tutorial: Configure a CodeBuild-hosted GitHub Actions runner.

This feature allows your GitHub Actions workflow jobs to get native integration with AWS, which provides security and convenience through features like IAM, AWS Secrets Manager integration, AWS CloudTrail, and Amazon VPC. You can access latest instance types, including ARM-based instances.

Topics

- About the CodeBuild-hosted GitHub Actions runner
- Tutorial: Configure a CodeBuild-hosted GitHub Actions runner
- Troubleshoot the webhook
- Label overrides supported with the CodeBuild-hosted GitHub Actions runner
- <u>Compute images supported with the CodeBuild-hosted GitHub Actions runner</u>

About the CodeBuild-hosted GitHub Actions runner

The following are some common questions about the CodeBuild-hosted GitHub Actions runner.

When should I include the image and instance overrides in the label?

You can include the image and instance overrides in the label in order to specify different build environment for each of your GitHub Actions workflow jobs. This can be done without the need to create multiple CodeBuild projects or webhooks. For example, this is useful when you need to use a matrix for your workflow jobs.

```
name: Hello World
on: [push]
jobs:
   Hello-World-Job:
    runs-on:
```

```
- codebuild-myProject-${{ github.run_id }}-${{ github.run_attempt }}
- image:${{ matrix.os }}
- instance-size:${{ matrix.size }}
strategy:
 matrix:
    include:
        - os: arm-3.0
        size: small
        - os: al2-5.0
        size: large
steps:
        - run: echo "Hello World!"
```

i Note

Quotation marks might be required if runs-on has multiple labels containing GitHub Actions context.

Can I use AWS CloudFormation for this feature?

Yes, you can include a filter group in your AWS CloudFormation template that specifies a GitHub Actions workflow job event filter in your project webhook.

```
Triggers:
Webhook: true
FilterGroups:
  - Type: EVENT
     Pattern: WORKFLOW_JOB_QUEUED
```

For more information, see Filter GitHub webhook events (AWS CloudFormation).

If you need help setting up project credentials in your AWS CloudFormation template, see AWS::CodeBuild::SourceCredential in the AWS CloudFormation User Guide for more information.

How can I mask secrets when using this feature?

By default, secrets that are printed in the log is not masked. If you would like to mask your secrets, you can use the following syntax: ::add-mask::value. The following is an example of how you can use this syntax in your YAML:

```
name: Secret Job
```

For more information, see <u>Masking a value in a log</u> on GitHub.

Can I receive GitHub Actions webhook events from multiple repositories within a single project?

CodeBuild supports organization and global level webhooks, which receive events from a specified organization or enterprise. For more information, see GitHub global and organization webhooks.

Which regions support using a CodeBuild-hosted GitHub Actions runner?

CodeBuild-hosted GitHub Actions runners are supported in all CodeBuild regions. For more information about AWS Regions where CodeBuild is available, see <u>AWS Services by Region</u>.

Which platforms support using a CodeBuild-hosted GitHub Actions runner?

CodeBuild-hosted GitHub Actions runners are supported on both Amazon EC2 and <u>AWS Lambda</u> compute. You can use the following platforms: Amazon Linux 2, Amazon Linux 2023, Ubuntu, and Windows Server Core 2019. For more information, see <u>EC2 compute images</u> and <u>Lambda compute images</u>.

Tutorial: Configure a CodeBuild-hosted GitHub Actions runner

This tutorial shows you how to configure your CodeBuild projects to run GitHub Actions jobs. For more information about using GitHub Actions with CodeBuild see <u>Self-hosted GitHub Actions</u> runners in AWS CodeBuild.

To complete this tutorial, you must first:

 Connect with a personal access token, a Secrets Manager secret, OAuth app, or GitHub App. If you'd like to connect with an OAuth app, you must use the CodeBuild console to do so. If you'd like to create a personal access token, you can either use the CodeBuild console or use the <u>ImportSourceCredentials API</u>. For more instructions, see <u>GitHub and GitHub Enterprise Server</u> access in CodeBuild.

- Connect CodeBuild to your GitHub account. To do so, you can do one of the following:
 - You can add GitHub as a source provider in the console. You can connect with either a personal access token, a Secrets Manager secret, OAuth app, or GitHub App. For instructions, see <u>GitHub</u> and GitHub Enterprise Server access in CodeBuild.
 - You can import your GitHub credentials via the <u>ImportSourceCredentials API</u>. This can only be done with a personal access token. If you connect using an OAuth app, you must connect using the console instead. For instructions, see <u>Connect GitHub with an access token (CLI)</u>.

Note

This only needs to be done if you haven't connected to GitHub for your account.

Step 1: Create a CodeBuild project with a webhook

In this step, you will create a CodeBuild project with a webhook and review it in the GitHub console. You can also choose GitHub Enterprise as your source provider. To learn more about creating a webhook within GitHub Enterprise, see <u>GitHub manual webhooks</u>.

To create a CodeBuild project with a webhook

- 1. Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.
- Create a build project. For information, see <u>Create a build project (console)</u> and <u>Run a build (console)</u>.
 - In Source:
 - For **Source provider**, choose **GitHub**.
 - For Repository, choose Repository in my GitHub account.
 - For **Repository URL**, enter **https://github.com/user-name/repository-name**.

i Note

By default, your project will only receive WORKFLOW_JOB_QUEUED events for a single repository. If you would like to receive events for all repositories within an organization or enterprise, see GitHub global and organization webhooks.

• In Primary source webhook events:

- For Webhook optional, select Rebuild every time a code change is pushed to this repository.
- For Event type, select WORKFLOW_JOB_QUEUED. Once this is enabled, builds will only be triggered by GitHub Actions workflow jobs events.

Solution is not a second state of the secon	
Filter group 1 Event type Add one or more webhook event filter groups to specify which events trigger a new build. If you do not then a new build is triggered every time a code change is pushed to your repository. WORKFLOW_JOB_QUEUED X Start a build under these conditions - optional	Remove filter group

- Don't start a build under these conditions optional
- In Environment:
 - Choose a supported Environment image and Compute. Note that you have the option to override the image and instance settings by using a label in your GitHub Actions workflow YAML. For more information, see Step 2: Update your GitHub Actions workflow YAML
- In **Buildspec**:
 - Note that your buildspec will be ignored unless buildspec-override:true is added as a label. Instead, CodeBuild will override it to use commands that will setup the self-hosted runner.
- 3. Continue with the default values and then choose **Create build project**.
- Open the GitHub console at https://github.com/user-name/repository-name/ settings/hooks to verify that a webhook has been created and is enabled to deliver Workflow jobs events.

Step 2: Update your GitHub Actions workflow YAML

In this step, you will update your GitHub Actions workflow YAML file in <u>GitHub</u> to configure your build environment and use GitHub Actions self-hosted runners in CodeBuild. For more information, see <u>Using labels with self-hosted runners</u> and <u>Label overrides supported with the CodeBuild-hosted</u> <u>GitHub Actions runner</u>.

Update your GitHub Actions workflow YAML

Navigate to <u>GitHub</u> and update the <u>runs-on</u> setting in your GitHub Actions workflow YAML to configure your build environment. To do so, you can do one of the following:

You can specify the project name and run ID, in which case the build will use your existing project configuration for the compute, image, image version, and instance size. The project name is needed to link the AWS-related settings of your GitHub Actions job to a specific CodeBuild project. By including the project name in the YAML, CodeBuild is allowed to invoke jobs with the correct project settings. By providing the run ID, CodeBuild will map your build to specific workflow runs and stop the build when the workflow run is cancelled. For more information, see <u>github context</u>.

runs-on: codebuild-<project-name>-\${{ github.run_id }}-\${{ github.run_attempt }}

Note

Make sure that your *<project-name>* matches the name of the project that you created in the previous step. If it doesn't match, CodeBuild will not process the webhook and the GitHub Actions workflow might hang.

The following is an example of a GitHub Actions workflow YAML:

```
name: Hello World
on: [push]
jobs:
    Hello-World-Job:
    runs-on:
        - codebuild-myProject-${{ github.run_id }}-${{ github.run_attempt }}
    steps:
        - run: echo "Hello World!"
```

• You can also override your image and compute type in the label. See <u>Compute images supported</u> <u>with the CodeBuild-hosted GitHub Actions runner</u> for a list of available images. The compute type and image in the label will override the environment settings on your project. To override your environment settings for an CodeBuild EC2 or Lambda compute build, use the following syntax:

runs-on:

- codebuild-<project-name>-\${{ github.run_id }}-\${{ github.run_attempt }}
- image:<environment-type>-<image-identifier>
- instance-size:<instance-size>

The following is an example of a GitHub Actions workflow YAML:

```
name: Hello World
on: [push]
jobs:
    Hello-World-Job:
    runs-on:
        codebuild-myProject-${{ github.run_id }}-${{ github.run_attempt }}
        image:arm-3.0
        instance-size:small
        steps:
            run: echo "Hello World!"
```

 You can override the fleet used for your build in the label. This will override the fleet settings configured on your project to use the specified fleet. For more information, see <u>Run builds on</u> <u>reserved capacity fleets</u>. To override your fleet settings for an Amazon EC2 compute build, use the following syntax:

```
runs-on:
    codebuild-<project-name>-${{ github.run_id }}-${{ github.run_attempt }}
    fleet:<fleet-name>
```

To override both the fleet and the image used for the build, use the following syntax:

runs-on:

- codebuild-<project-name>-\${{ github.run_id }}-\${{ github.run_attempt }}
- fleet:<fleet-name>
- image:<environment-type>-<image-identifier>

The following is an example of a GitHub Actions workflow YAML:

```
name: Hello World
on: [push]
jobs:
    Hello-World-Job:
    runs-on:
        - codebuild-myProject-${{ github.run_id }}-${{ github.run_attempt }}
        - image:arm-3.0
        - instance-size:small
        steps:
        - run: echo "Hello World!"
```

• Optionally, you can provide labels outside of those that CodeBuild supports. These labels will be ignored for the purpose of overriding attributes of the build, but will not fail the webhook request. For example, adding testLabel as a label will not prevent the build from running.

🚯 Note

If a dependency provided by GitHub-hosted runners is unavailable in the CodeBuild environment, you can install the dependency using GitHub Actions in your workflow run. For example, you can use the <u>setup-python</u> action to install Python for your build environment.

Run buildspec commands the INSTALL, PRE_BUILD, and POST_BUILD phases

By default, CodeBuild ignores any buildspec commands when running a self-hosted GitHub Actions build. To run buildspec commands during the build, buildspec-override:true can be added as a suffix to the label:

runs-on:

- codebuild-<project-name>-\${{ github.run_id }}-\${{ github.run_attempt }}
- buildspec-override:true

By using this command, CodeBuild will create a folder called actions-runner in the container's primary source folder. When the GitHub Actions runner starts during the BUILD phase, the runner will run in the actions-runner directory.

There are several limitations when using a buildspec override in a self-hosted GitHub Actions build:

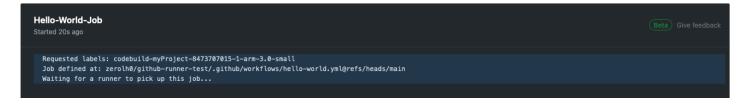
- CodeBuild will not run buildspec commands during the BUILD phase, as the self-hosted runner runs in the BUILD phase.
- CodeBuild will not download any primary or secondary sources during the DOWNLOAD_SOURCE phase. If you have a buildspec file configured, only that file will be downloaded from the project's primary source.
- If a build command fails in the PRE_BUILD or INSTALL phase, CodeBuild will not start the selfhosted runner and the GitHub Actions workflow job will need to be cancelled manually.
- CodeBuild fetches the runner token during the DOWNLOAD_SOURCE phase, which has an expiration time of one hour. If your PRE_BUILD or INSTALL phases exceed an hour, the runner token may expire before the GitHub self-hosted runner starts.

Step 3: Review your results

Whenever a GitHub Actions workflow run occurs, CodeBuild would receive the workflow job events through the webhook. For each job in the workflow, CodeBuild starts a build to run an ephemeral GitHub Actions runner. The runner is responsible for executing a single workflow job. Once the job is completed, the runner and the associated build process will be immediately terminated.

To view your workflow job logs, navigate to your repository in GitHub, choose **Actions**, choose your desired workflow, and then choose the specific **Job** that you'd like to review the logs for.

You can review the requested labels in the log while the job is waiting to be picked up by a self-hosted runner in CodeBuild.



Once the job is completed, you will be able to view the log of the job.

Hello-World-Job succeeded now in 4s	(Beta) Give feedback Q Searc	h logs
> 🥥 Set up job		0s
V 🥥 Run echo "Hello World!"		0s
1 → Run echo "Hello World!" 4 Hello World!		
> 🤡 Complete job		15

Troubleshoot the webhook

Issue: The webhook you set up in <u>Tutorial: Configure a CodeBuild-hosted GitHub Actions runner</u> isn't working or your workflow job is hanging on GitHub.

Possible cause: Your webhook **Workflow jobs** event might be failing to trigger a build. Review the **Response** logs to view the response or error message.

Recommended solution: To debug this error, use the following instructions.

- Open the GitHub console at https://github.com/user-name/repository-name/ settings/hooks to view your repository's webhook settings. On this page, you'll see a webhook that was created for your repository.
- 2. Choose **Edit** and confirm that the webhook is enabled to deliver **Workflow jobs** events.

Team adds Team added or modified on a repository.	Visibility changes Repository changes from private to public.
User stars a repository.	Wiki Wiki page updated.
Workflow jobs Workflow job queued, waiting, in progress, or completed on a repository.	 Workflow runs Workflow run requested or completed on a repository.
Active We will deliver event details when this hook is triggere	ed.
Update webhook Delete webhook	

- 3. Navigate to the **Recent Deliveries** tab, find the corresponding workflow_job.queued event, and expand the event.
- 4. Review the **labels** field in the **Payload** and make sure it's as expected.

5. Finally, review the **Response** tab, as this contains the response or error message returned from CodeBuild.

Settings	Recent Deliveries					
	13479-e1s4-12ee-8797-	MT+8/11/384	workflow_job.queued			2024-02-0116-02121
Request	Response 400			Redeliver	Ŀ	Completed in seconds.
Headers						

6. Alternatively, you can debug webhook failures using GitHub's APIs. You can view recent deliveries for a webhook using the List deliveries for a repository webhook API:

gh api 🔪	
-H "Accept: application/vnd.github+json" \	
-H "X-GitHub-Api-Version: 2022-11-28" \	
/repos/ <u>owner/repo</u> /hooks/ <u>hook-id</u> /deliveries	

After finding the webhook delivery you're looking to debug and noting the delivery ID, you can use the <u>Get a delivery for a repository webhook</u> API. CodeBuild's response to the webhook's delivery payload can be found in the response section:

```
gh api \
  -H "Accept: application/vnd.github+json" \
  -H "X-GitHub-Api-Version: 2022-11-28" \
  /repos/owner/repo/hooks/hook-id/deliveries/delivery-id
```

Label overrides supported with the CodeBuild-hosted GitHub Actions runner

In your GitHub Actions workflow YAML, you can provide a variety of label overrides that modify your self-hosted runner build. Any builds not recognized by CodeBuild will be ignored but will not fail your webhook request. For example, the following workflow YAML includes overrides for image, instance size, fleet, and the buillspec:

```
name: Hello World
on: [push]
jobs:
   Hello-World-Job:
```

```
runs-on:
    codebuild-myProject-${{ github.run_id }}-${{ github.run_attempt }}
    image:${{ matrix.os }}
    instance-size:${{ matrix.size }}
    fleet:myFleet
    buildspec-override:true
strategy:
    matrix:
    include:
        - os: arm-3.0
            size: small
        - os: al2-5.0
            size: large
steps:
    - run: echo "Hello World!"
```

codebuild-<project-name>-\${{github.run_id}}-\${{github.run_attempt}} (required)

- Example: codebuild-fake-project-\${{ github.run_id }}\${{ github.run_attempt }}
- Required for all GitHub Actions workflow YAMLs. <project name> should be equal to the name
 of the project for which the self-hosted runner webhook is configured.

image:<environment-type>-<image-identifier>

- Example: image:arm-3.0
- Overrides the image and environment type used when starting the self-hosted runner build. To learn about supported values, see <u>Compute images supported with the CodeBuild-hosted GitHub</u> <u>Actions runner</u>.

instance-size:<instance-size>

- Example: instance-size: medium
- Overrides the instance type used when starting the self-hosted runner build. To learn about supported values, see <u>Compute images supported with the CodeBuild-hosted GitHub Actions</u> <u>runner</u>.

fleet:<fleet-name>

- Example: fleet:myFleet
- Overrides the fleet settings configured on your project to use the specified fleet. For more information, see Run builds on reserved capacity fleets.

buildspec-override:<boolean>

- Example: buildspec-override:true
- Allows the build to run buildspec commands in the INSTALL, PRE_BUILD, and POST_BUILD phases if set to true.

Single label override (legacy)

CodeBuild allows you to provide multiple overrides in a single label using the following:

• To override your environment settings for an Amazon EC2/Lambda compute build, use the following syntax:

```
runs-on: codebuild-<project-name>-${{ github.run_id }}-
${{ github.run_attempt }}-<environment-type>-<image-identifier>-<instance-size>
```

• To override your fleet settings for Amazon EC2 compute build, use the following syntax:

```
runs-on: codebuild-<project-name>-${{ github.run_id }}-${{ github.run_attempt }}-
fleet-<fleet-name>
```

• To override both the fleet and the image used for the build, use the following syntax:

```
runs-on: codebuild-<project-name>-${{ github.run_id }}-
${{ github.run_attempt }}-image-<image-version>-fleet-<fleet-name>
```

 To run buildspec commands during the build, -with-buildspec can be added as a suffix to the label:

```
runs-on: codebuild-<project-name>-${{ github.run_id }}-
${{ github.run_attempt }}-<image-version>-<instance-size>-with-buildspec
```

• Optionally, you can provide an instance size override without overriding the image. For Amazon EC2 builds, you can exclude both environment type and image identifier. For Lambda builds, you can exclude the image identifier.

Compute images supported with the CodeBuild-hosted GitHub Actions runner

In the label you configured in <u>Tutorial: Configure a CodeBuild-hosted GitHub Actions runner</u>, you can override your Amazon EC2 environment settings by using the values in the first three columns. CodeBuild provides the following Amazon EC2 compute images. For more information about

Environment type	lmage identifier	Instance size	Platform	Resolved image	Definition
linux	4.0	small medium large xlarge	Amazon Linux 2	aws/codeb uild/amaz onlinux2- x86_64-st andard:4. Ø	<u>al2/stand</u> ard/4.0
linux	5.0	2xlarge gpu_small gpu_large	Amazon Linux 2	aws/codeb uild/amaz onlinux2- x86_64-st andard:5. Ø	<u>al2/stand</u> ard/5.0
arm	2.0	small medium large xlarge	Amazon Linux 2	aws/codeb uild/amaz onlinux2- aarch64-s tandard:2 .0	<u>al2/aarch64/</u> standard/2.0
arm	3.0	2xlarge	Amazon Linux 2	aws/codeb uild/amaz onlinux2- aarch64-s tandard:3 .0	al2/aarch64/ standard/3.0

Environment type	lmage identifier	Instance size	Platform	Resolved image	Definition
ubuntu	5.0	small medium	Ubuntu 20.04	aws/codeb uild/stan dard:5.0	<u>ubuntu/st</u> andard/5.0
ubuntu	6.0	large xlarge	Ubuntu 22.04	aws/codeb uild/stan dard:6.0	ubuntu/st andard/6.0
ubuntu	7.0	2xlarge gpu_small gpu_large	Ubuntu 22.04	aws/codeb uild/stan dard:7.0	ubuntu/st andard/7.0
windows	1.0	medium large	Windows Server Core 2019	aws/codeb uild/wind ows-base: 2019-1.0	N/A
windows	2.0		Windows Server Core 2019	aws/codeb uild/wind ows-base: 2019-2.0	N/A
windows	3.0		Windows Server Core 2019	aws/codeb uild/wind ows-base: 2019-3.0	N/A

In addition, you can override your Lambda environment settings by using the following values. For more information about CodeBuild Lambda compute, see <u>Run builds on AWS Lambda compute</u>. CodeBuild supports the following Lambda compute images:

Environment type	lmage identifier	Instance size
linux-lam bda	dotnet6	1GB
	go1.21	2GB
arm-lambd a	corretto1	4GB
	1	8GB
	corretto1 7	10GB
	corretto2 1	
	nodejs18	
	nodejs20	
	python3.1 1	
	python3.1 2	
	ruby3.2	

For more information, see <u>Build environment compute modes and types</u> and <u>Docker images</u> provided by CodeBuild.

Self-managed GitLab runners in AWS CodeBuild

GitLab provides two execution modes to run GitLab jobs in your CI/CD pipeline. One mode is GitLab-hosted runners, which are managed by GitLab and fully integrated with GitLab. The other mode is self-managed runners, which allows you to bring your own customized environment to run jobs in the GitLab CI/CD pipeline. For more information, see <u>Use self-managed runners</u>.

The high-level steps to configure a CodeBuild project to run GitLab CI/CD pipeline jobs are as follows:

- 1. If you haven't done so already, connect with an OAuth app to connect your project to GitLab.
- 2. Navigate to the CodeBuild console and create a CodeBuild project with a webhook and set up your webhook filters.
- 3. Update your GitLab CI/CD pipeline YAML in GitLab to configure your build environment.

For a more detailed procedure, see <u>Tutorial: Configure a CodeBuild-hosted GitLab runner</u>.

This feature allows your GitLab CI/CD pipeline jobs to get native integration with AWS, which provides security and convenience through features like IAM, AWS CloudTrail, and Amazon VPC. You can access latest instance types, including ARM-based instances.

Topics

- <u>About the CodeBuild-hosted GitLab runner</u>
- Tutorial: Configure a CodeBuild-hosted GitLab runner
- Compute images supported with the CodeBuild-hosted GitLab runner

About the CodeBuild-hosted GitLab runner

The following are some common questions about the CodeBuild-hosted GitLab runner.

Can I execute a job in docker executor for the self-managed runner? For example, I want to run a pipeline job on a specific image to maintain the same build environment in a separate and isolated container.

You can run the GitLab self-managed runner in CodeBuild with a specific image by <u>creating the</u> project with a custom image or overriding the image in your .gitlab-ci.yml file.

What executor does the self-managed runner in CodeBuild run with?

The self-managed runner in CodeBuild runs with the shell executor, where the build runs locally along with the GitLab runner that is running inside the docker container.

Can I provide buildspec commands along with the self-managed runner?

Yes, it is possible to add buildspec commands along with self-managed runner. You can provide the buildspec.yml file in your GitLab repository and use the buildspec-override:true tag in the **Tags** section of the job. For more information, see <u>Buildspec file name and storage location</u>.

Which regions support using a CodeBuild-hosted GitLab runner?

CodeBuild-hosted GitLab runners are supported in all CodeBuild regions. For more information about AWS Regions where CodeBuild is available, see <u>AWS Services by Region</u>.

Which platforms support using a CodeBuild-hosted GitLab runner?

CodeBuild-hosted GitLab runners are supported on both Amazon EC2 and <u>AWS Lambda</u> compute. You can use the following platforms: Amazon Linux 2, Amazon Linux 2023, Ubuntu, and Windows Server Core 2019. For more information, see <u>EC2 compute images</u> and <u>Lambda compute images</u>.

Tutorial: Configure a CodeBuild-hosted GitLab runner

This tutorial shows you how to configure your CodeBuild projects to run GitLab CI/CD pipeline jobs. For more information about using GitLab or GitLab Self Managed with CodeBuild, see <u>Self-managed GitLab runners in AWS CodeBuild</u>.

To complete this tutorial, you must first:

- Connect with a OAuth app by using CodeConnections. Note that when connecting with an OAuth app, you must use the CodeBuild console to do so. For more instructions, see <u>GitLab access in</u> <u>CodeBuild</u>.
- Connect CodeBuild to your GitLab account. To do so, you can add GitLab as a source provider in the console. For instructions, see GitLab access in CodeBuild.

Note

This only needs to be done if you haven't connected to GitLab for your account. With this feature, CodeBuild needs additional permissions. such as create_runner and manage_runner from the GitLab OAuth app. If there are existing CodeConnections for a particular GitLab account, then it doesn't automatically request for permission updates. To do so, you can go to the CodeConnections console and create a dummy connection to the same GitLab account to trigger the reauthorization to get the additional prmissions. With this, all the existing connections can use the runner feature. Once complete, you can delete the dummy connection.

Step 1: Create a CodeBuild project with a webhook

In this step, you will create a CodeBuild project with a webhook and review it in the GitLab console.

To create a CodeBuild project with a webhook

- Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ https://console.aws.amazon.com/codesuite/codebuild/
- 2. Create a build project. For information, see <u>Create a build project (console)</u> and <u>Run a build</u> (console).
 - In Source:
 - For Source provider, choose GitLab.
 - For **Credential**, choose one of the following:
 - Choose **Default source credential**. Default connection applies a default GitLab connection across all projects.
 - Choose **Custom source credential**. Custom connection applies a custom GitLab connection that overrides your account's default settings.

í) Note

If you have not already created a connection to your provider, you'll have to create a new GitLab connection. For instructions, see <u>Connect CodeBuild to GitLab</u>.

- For **Repository**, choose the name of your project in GitLab by specifying the project path with the namespace.
- In Primary source webhook events:
 - For Webhook optional, select Rebuild every time a code change is pushed to this repository.
 - For Event type, select WORKFLOW_JOB_QUEUED. Once this is enabled, builds will only be triggered by GitLab CI/CD pipeline jobs events.

(i) Note CodeBuild will only process GitLab CI/CD p filter groups containing the WORKFLOW_	
Filter group 1 Event type Add one or more webhook event filter groups to specify which events trigger a new build. If then a new build is triggered every time a code change is pushed to your repository.	Remove filter group you do not add a webhook event filter group,
 WORKFLOW_JOB_QUEUED X Start a build under these conditions - optional Don't start a build under these conditions - optional 	▼

- In Environment:
 - Choose a supported **Environment image** and **Compute**. Note that you have the option to override the image and instance settings by using a label in your GitLab CI/CD pipeline YAML. For more information, see Step 2: Create a .gitlab-ci.yml file in your repository.
- In **Buildspec**:
 - Note that your buildspec will be ignored unless buildspec-override:true is added as a label. Instead, CodeBuild will override it to use commands that will setup the self-managed runner.
- 3. Continue with the default values and then choose **Create build project**.
- 4. Open the GitLab console at https://gitlab.com/user-name/repository-name/-/ hooks to verify that a webhook has been created and is enabled to deliver **Workflow jobs** events.

Step 2: Create a .gitlab-ci.yml file in your repository

In this step, you will create a .gitlab-ci.yml file in <u>GitLab</u> to configure your build environment and use GitLab self-managed runners in CodeBuild. For more information, see <u>Use self-managed</u> runners.

Update your GitLab CI/CD pipeline YAML

Navigate to https://gitlab.com/user-name/project-name/-/tree/branch-name and create a .gitlab-ci.yml file in your repository. You can configure your build environment by doing one of the following:

 You can specify the CodeBuild project name, in which case the build will use your existing project configuration for the compute, image, image version, and instance size. The project name is needed to link the AWS-related settings of your GitLab job to a specific CodeBuild project. By including the project name in the YAML, CodeBuild is allowed to invoke jobs with the correct project settings.

tags:

- codebuild-<codebuild-project-name>-\$CI_PROJECT_ID-\$CI_PIPELINE_IID-\$CI_JOB_NAME

\$CI_PROJECT_ID-\$CI_PIPELINE_IID-\$CI_JOB_NAME is required to map the build to specific pipeline job runs and stop the build when the pipeline run is cancelled.

Note

Make sure that your *<project-name>* matches the name of the project that you created in CodeBuild. If it doesn't match, CodeBuild will not process the webhook and the GitLab CI/CD pipeline might hang.

The following is an example of a GitLab CI/CD pipeline YAML:

 You can also override your image and compute type in the tag. See <u>Compute images supported</u> <u>with the CodeBuild-hosted GitLab runner</u> for a list of available images. The compute type and image in the label will override the environment settings on your project. To override your environment settings for an Amazon EC2 compute build, use the following syntax:

tags:

- codebuild-<codebuild-project-name>-\$CI_PROJECT_ID-\$CI_PIPELINE_IID-\$CI_JOB_NAME
- image:<environment-type>-<image-identifier>
- instance-size:<instance-size>

The following is an example of a GitLab CI/CD pipeline YAML:

```
stages:
  - build
build-job:
  stage: build
  script:
    - echo "Hello World!"
  tags:
    - codebuild-myProject-$CI_PROJECT_ID-$CI_PIPELINE_IID-$CI_JOB_NAME
    - image:arm-3.0
    - instance-size:small
```

 You can override the fleet used for your build in the tag. This will override the fleet settings configured on your project to use the specified fleet. For more information, see <u>Run builds on</u> <u>reserved capacity fleets</u>. To override your fleet settings for an Amazon EC2 compute build, use the following syntax:

tags:

- codebuild-<codebuild-project-name>-\$CI_PROJECT_ID-\$CI_PIPELINE_IID-\$CI_JOB_NAME
- fleet:<fleet-name>

To override both the fleet and the image used for the build, use the following syntax:

tags:

- codebuild-<codebuild-project-name>-\$CI_PROJECT_ID-\$CI_PIPELINE_IID-\$CI_JOB_NAME
- fleet:<fleet-name>
- image:<environment-type>-<image-identifier>

The following is an example of a GitLab CI/CD pipeline YAML:

```
stages:
  - build
build-job:
  stage: build
  script:
    - echo "Hello World!"
  tags:
    - codebuild-myProject-$CI_PROJECT_ID-$CI_PIPELINE_IID-$CI_JOB_NAME
    - fleet:myFleet
    - image:arm-3.0
```

After you commit your changes to .gitlab-ci.yml, a GitLab pipeline will be triggered and the build-job will send a webhook notification that will start your build in CodeBuild.

Run buildspec commands the INSTALL, PRE_BUILD, and POST_BUILD phases

By default, CodeBuild ignores any buildspec commands when running a self-managed GitLab build. To run buildspec commands during the build, buildspec-override:true can be added as a suffix to tags:

```
tags:
```

- codebuild-<codebuild-project-name>-\$CI_PROJECT_ID-\$CI_PIPELINE_IID-\$CI_JOB_NAME
- buildspec-override:true

By using this command, CodeBuild will create a folder called gitlab-runner in the container's primary source folder. When the GitLab runner starts during the BUILD phase, the runner will run in the gitlab-runner directory.

There are several limitations when using a buildspec override in a self-managed GitLab build:

- CodeBuild will not run buildspec commands during the BUILD phase, as the self-managed runner runs in the BUILD phase.
- CodeBuild will not download any primary or secondary sources during the DOWNLOAD_SOURCE phase. If you have a buildspec file configured, only that file will be downloaded from the project's primary source.

- If a build command fails in the PRE_BUILD or INSTALL phase, CodeBuild will not start the selfmanaged runner and the GitLab CI/CD pipeline job will need to be cancelled manually.
- CodeBuild fetches the runner token during the DOWNLOAD_SOURCE phase, which has an expiration time of one hour. If your PRE_BUILD or INSTALL phases exceed an hour, the runner token may expire before the GitLab self-managed runner starts.

Step 3: Review your results

Whenever a GitLab CI/CD pipeline run occurs, CodeBuild would receive the CI/CD pipeline job events through the webhook. For each job in the CI/CD pipeline, CodeBuild starts a build to run an ephemeral GitLab runner. The runner is responsible for executing a single CI/CD pipeline job. Once the job is completed, the runner and the associated build process will be immediately terminated.

To view your CI/CD pipeline job logs, navigate to your repository in GitLab, choose **Build**, **Jobs**, and then choose the specific **Job** that you'd like to review the logs for.

You can review the requested labels in the log while the job is waiting to be picked up by a selfmanaged runner in CodeBuild.

Compute images supported with the CodeBuild-hosted GitLab runner

In the label you configured in <u>Tutorial: Configure a CodeBuild-hosted GitLab runner</u>, you can override your Amazon EC2 environment settings by using the values in the first three columns. CodeBuild provides the following Amazon EC2 compute images. For more information about

Environment type	lmage identifier	Instance size	Platform	Image	Definition
linux	4.0	small medium large xlarge	Amazon Linux 2	aws/codeb uild/amaz onlinux2- x86_64-st andard:4. Ø	<u>al2/stand</u> ard/4.0
linux	5.0	2xlarge gpu_small	Amazon Linux 2	aws/codeb uild/amaz onlinux2-	al2/stand ard/5.0

Environment type	lmage identifier	Instance size	Platform	lmage	Definition
		gpu_large		x86_64-st andard:5. 0	
arm	2.0	small medium large xlarge	Amazon Linux 2	aws/codeb uild/amaz onlinux2- aarch64-s tandard:2 .0	<u>al2/aarch64/</u> standard/2.0
arm	3.0	2xlarge	Amazon Linux 2	aws/codeb uild/amaz onlinux2- aarch64-s tandard:3 .0	al2/aarch64/ standard/3.0
ubuntu	5.0	small medium	Ubuntu 20.04	aws/codeb uild/stan dard:5.0	ubuntu/st andard/5.0
ubuntu	6.0	large xlarge	Ubuntu 22.04	aws/codeb uild/stan dard:6.0	ubuntu/st andard/6.0
ubuntu	7.0	2xlarge gpu_small gpu_large	Ubuntu 22.04	aws/codeb uild/stan dard:7.0	<u>ubuntu/st</u> andard/7.0
windows	1.0	medium large	Windows Server Core 2019	aws/codeb uild/wind ows-base: 2019-1.0	N/A

Environment type	lmage identifier	Instance size	Platform	lmage	Definition
windows	2.0		Windows Server Core 2019	aws/codeb uild/wind ows-base: 2019-2.0	N/A
windows	3.0		Windows Server Core 2019	aws/codeb uild/wind ows-base: 2019-3.0	N/A

In addition, you can override your Lambda environment settings by using the following values. For more information about CodeBuild Lambda compute, see <u>Run builds on AWS Lambda compute</u>. CodeBuild supports the following Lambda compute images:

Environment type	Runtime version	Instance size
linux-lam bda	dotnet6	1GB
	go1.21	2GB
arm-lambd a	corretto1 1	4GB
	1	8GB
	corretto1 7	10GB
	corretto2 1	
	nodejs18	
	nodejs20	

Environment type	Runtime version	Instance size	
	python3.1 1		
	python3.1 2		
	ruby3.2		

For more information, see <u>Build environment compute modes and types</u> and <u>Docker images</u> provided by CodeBuild.

Use webhooks with AWS CodeBuild

AWS CodeBuild supports webhook integration with GitHub, GitHub Enterprise Server, GitLab, GitLab Self Managed, and Bitbucket.

Topics

- Best practices for using webhooks with AWS CodeBuild
- Bitbucket webhook events
- GitHub global and organization webhooks
- GitHub manual webhooks
- GitHub webhook events
- GitLab group webhooks
- GitLab webhook events

Best practices for using webhooks with AWS CodeBuild

For projects that use public repositories to setup webhooks, we recommend the following options:

Setup ACTOR_ACCOUNT_ID filters

Add ACTOR_ACCOUNT_ID filters to your project's webhook filter groups to specify which users can trigger a build. Every webhook event delivered to CodeBuild comes with sender information

that specifies the actor's identifier. CodeBuild will filter the webhooks based on the regular expression pattern provided in the filters. You can specify the specific users that are allowed to trigger builds with this filter. For more information, see <u>GitHub webhook events</u> and <u>Bitbucket</u> webhook events.

Setup FILE_PATH filters

Add FILE_PATH filters to your project's webhook filter groups to include or exclude the files that can trigger a build when changed. For example, you can deny build requests for changes to the buildspec.yml file using a regular expression pattern such as ^buildspec.yml\$, along with the excludeMatchedPattern property. For more information, see <u>GitHub webhook</u> events and <u>Bitbucket webhook events</u>.

Scope down the permissions for your build IAM role

Builds triggered by a webhook use the IAM service role specified in the project. We recommend setting the permissions in the service role to the minimum set of permissions required to run the build. For example, in a test and deploy scenario, create one project for testing and another project for deployment. The testing project accepts webhook builds from the repository, but provides no write permissions to your resources. The deployment project provides write permissions to your resources, and the webhook filter is configured to only allow trusted users to trigger builds.

Use an inline or an Amazon S3 stored buildspec

If you define your buildspec inline within the project itself, or store the buildspec file in an Amazon S3 bucket, the buildspec file is only visible to the project owner. This prevents pull requests from making code changes to the buildspec file and triggering unwanted builds. For more information, see <u>ProjectSource.buildspec</u> in the *CodeBuild API Reference*.

Bitbucket webhook events

You can use webhook filter groups to specify which Bitbucket webhook events trigger a build. For example, you can specify that a build is only triggered for changes to specific branches.

You can create one or more webhook filter groups to specify which webhook events trigger a build. A build is triggered if any filter group evaluates to true, which occurs when all the filters in the group evaluate to true. When you create a filter group, you specify:

An event

For Bitbucket, you can choose one or more of the following events:

- PUSH
- PULL_REQUEST_CREATED
- PULL_REQUEST_UPDATED
- PULL_REQUEST_MERGED
- PULL_REQUEST_CLOSED

The webhook's event type is in its header in the X-Event-Key field. The following table shows how X-Event-Key header values map to the event types.

🚯 Note

You must enable the merged event in your Bitbucket webhook setting if you create a webhook filter group that uses the PULL_REQUEST_MERGED event type. You must also enable the declined event in your Bitbucket webhook setting if you create a webhook filter group that uses the PULL_REQUEST_CLOSED event type.

X-Event-Key Header value	Event type	
repo:push	PUSH	
pullrequest:created	PULL_REQUEST_CREATED	
pullrequest:updated	PULL_REQUEST_UPDATED	
pullrequest:fulfilled	PULL_REQUEST_MERGED	
pullrequest:rejected	PULL_REQUEST_CLOSED	

For PULL_REQUEST_MERGED, if a pull request is merged with the squash strategy and the pull request branch is closed, the original pull request commit no longer exists. In this case, the CODEBUILD_WEBHOOK_MERGE_COMMIT environment variable contains the identifier of the squashed merge commit.

One or more optional filters

Use a regular expression to specify a filter. For an event to trigger a build, every filter within the group associated with it must evaluate to true.

ACTOR_ACCOUNT_ID (ACTOR_ID in the console)

A webhook event triggers a build when a Bitbucket account ID matches the regular expression pattern. This value appears in the account_id property of the actor object in the webhook filter payload.

HEAD_REF

A webhook event triggers a build when the head reference matches the regular expression pattern (for example, refs/heads/branch-name and refs/tags/tag-name). A HEAD_REF filter evaluates the Git reference name for the branch or tag. The branch or tag name appears in the name field of the new object in the push object of the webhook payload. For pull request events, the branch name appears in the name field in the branch object of the source object in the webhook payload.

BASE_REF

A webhook event triggers a build when the base reference matches the regular expression pattern. A BASE_REF filter works with pull request events only (for example, refs/heads/branch-name). A BASE_REF filter evaluates the Git reference name for the branch. The branch name appears in the name field of the branch object in the destination object in the webhook payload.

FILE_PATH

A webhook triggers a build when the path of a changed file matches the regular expression pattern.

COMMIT_MESSAGE

A webhook triggers a build when the head commit message matches the regular expression pattern.

WORKFLOW_NAME

A webhook triggers a build when the workflow name matches the regular expression pattern.

🚯 Note

You can find the webhook payload in the webhook settings of your Bitbucket repository.

Topics

- Filter Bitbucket webhook events (console)
- Filter Bitbucket webhook events (SDK)
- Filter Bitbucket webhook events (AWS CloudFormation)

Filter Bitbucket webhook events (console)

To use the AWS Management Console to filter webhook events:

- 1. Select **Rebuild every time a code change is pushed to this repository** when you create your project.
- 2. From **Event type**, choose one or more events.
- 3. To filter when an event triggers a build, under **Start a build under these conditions**, add one or more optional filters.
- 4. To filter when an event is not triggered, under **Don't start a build under these conditions**, add one or more optional filters.
- 5. Choose **Add filter group** to add another filter group.

For more information, see <u>Create a build project (console)</u> and <u>WebhookFilter</u> in the AWS CodeBuild API Reference.

In this example, a webhook filter group triggers a build for pull requests only:

Filter group 1

Remove filter group

Event type

Add one or more webhook event filter groups to specify which events trigger a new build. If you do not add a webhook event filter group, then a new build is triggered every time a code change is pushed to your repository.

	•
PULL_REQUEST_CREATED \times	PULL_REQUEST_UPDATED \times
PULL_REQUEST_MERGED \times	PULL_REQUEST_CLOSED \times

- Start a build under these conditions optional
- Don't start a build under these conditions optional

Using an example of two filter groups, a build is triggered when one or both evaluate to true:

- The first filter group specifies pull requests that are created or updated on branches with Git reference names that match the regular expression <code>^refs/heads/main\$</code> and head references that match <code>^refs/heads/branch1!</code>.
- The second filter group specifies push requests on branches with Git reference names that match the regular expression *refs/heads/branch1*\$.

Webhook event filter group	01		
	nt filter groups to specify which ever ry time a code change is pushed to y		add a webhook event filter group,
		•	
PULL_REQUEST_CREATED	X PULL_REQUEST_UPDA	TED ×	
Start a build under the	se conditions		
ACTOR_ID - optional	HEAD_REF - optional	BASE_REF - optional	FILE_PATH - optional
	^refs/heads/branch1\$	^refs/heads/main\$	
COMMIT_MESSAGE - optional			
Don't start a build under the start a build under t	er these conditions		
Webhook event filter group	2		Remove filter group
	nt filter groups to specify which ever ry time a code change is pushed to y		add a webhook event filter group,
		•	
PUSH X			
Start a build under the	se conditions		
ACTOR_ID - optional	HEAD_REF - optional	BASE_REF - optional	FILE_PATH - optional
	^refs/heads/branch1\$		
COMMIT_MESSAGE - optional			
Don't start a build under	er these conditions		

In this example, a webhook filter group triggers a build for all requests except tag events.

Filter group 1	Remove filter group
	Kentove fitter group
Event type	
Add one or more webhook event filter groups to specify which events trigger a new build. If you do not add then a new build is triggered every time a code change is pushed to your repository.	d a webhook event filter group,
then a new build is triggered every time a code change is pushed to your repository.	
PUSH \times PULL_REQUEST_CREATED \times PULL_REQUEST_UPDATED \times	
PULL_REQUEST_MERGED \times PULL_REQUEST_CLOSED \times	
Start a build under these conditions - optional	
Don't start a build under these conditions - optional	Add filter
Filter 1	
Туре	
HEAD_REF 🔹	
Pattern	
^refs/tags/.*	

In this example, a webhook filter group triggers a build only when files with names that match the regular expression ^buildspec.* change.

Webhook event filter group 1

Event type

		•	
PUSH ×	assa conditions		
Start a built under tr			
ACTOR_ID - optional	HEAD_REF - optional	BASE_REF - optional	FILE_PATH - optional
			^buildspec.*
COMMIT_MESSAGE -			
optional			

Don't start a build under these conditions

In this example, a webhook filter group triggers a build only when files are changed in src or test folders.

Webhook event filter group 1

Event type

		•	
push \times			
Start a build under	these conditions		
ACTOR_ID - optional	HEAD_REF - optional	BASE_REF - optional	FILE_PATH - optional
			^src/.+ ^test/.+
COMMIT_MESSAGE - optional			

In this example, a webhook filter group triggers a build only when a change is made by a Bitbucket user who does not have an account ID that matches the regular expression actor-account-id.

(i) Note

For information about how to find your Bitbucket account ID, see https:// api.bitbucket.org/2.0/users/user-name, where user-name is your Bitbucket user name.

Filter group 1

Remove filter group

Event type

Add one or more webhook event filter groups to specify which events trigger a new build. If you do not add a webhook event filter group, then a new build is triggered every time a code change is pushed to your repository.

▼	
PUSH \times PULL_REQUEST_CREATED \times PULL_REQUEST_UPDATED \times	
PULL_REQUEST_MERGED \times PULL_REQUEST_CLOSED \times	
Start a build under these conditions - optional	Add filter
Filter 2	
Туре	
ACTOR_ACCOUNT_ID	
Pattern	
actor-account-id	

In this example, a webhook filter group triggers a build for a push event when the head commit message matches the regular expression \[CodeBuild\].

Webhoo	k event filter	aroup 1
11001100		group i

Event type

			,
push $ imes$			
Start a build under the start and start a build under the start a build und	hese conditions		
ACTOR_ID - optional	HEAD_REF - optional	BASE_REF - optional	FILE_PATH - optional
COMMIT_MESSAGE - optional			
\[CodeBuild\]			

Don't start a build under these conditions

Filter Bitbucket webhook events (SDK)

To use the AWS CodeBuild SDK to filter webhook events, use the filterGroups field in the request syntax of the CreateWebhook or UpdateWebhook API methods. For more information, see WebhookFilter in the CodeBuild API Reference.

To create a webhook filter that triggers a build for pull requests only, insert the following into the request syntax:

To create a webhook filter that triggers a build for specified branches only, use the pattern parameter to specify a regular expression to filter branch names. Using an example of two filter groups, a build is triggered when one or both evaluate to true:

AWS CodeBuild

- The first filter group specifies pull requests that are created or updated on branches with Git
 reference names that match the regular expression *^refs/heads/main\$* and head references
 that match *^refs/heads/myBranch\$*.
- The second filter group specifies push requests on branches with Git reference names that match the regular expression <code>^refs/heads/myBranch\$</code>.

```
"filterGroups": [
  Γ
    {
      "type": "EVENT",
      "pattern": "PULL_REQUEST_CREATED, PULL_REQUEST_UPDATED, PULL_REQUEST_CLOSED"
    },
    {
      "type": "HEAD_REF",
      "pattern": "^refs/heads/myBranch$"
    },
    {
      "type": "BASE_REF",
      "pattern": "^refs/heads/main$"
    }
  ],
  Γ
    {
      "type": "EVENT",
      "pattern": "PUSH"
    },
    {
      "type": "HEAD_REF",
      "pattern": "^refs/heads/myBranch$"
    }
  ]
]
```

You can use the excludeMatchedPattern parameter to specify which events do not trigger a build. In this example, a build is triggered for all requests except tag events.

```
"filterGroups": [
[
{
"type": "EVENT",
```

```
"pattern": "PUSH, PULL_REQUEST_CREATED, PULL_REQUEST_UPDATED,
PULL_REQUEST_MERGED, PULL_REQUEST_CLOSED"
        },
        {
            "type": "HEAD_REF",
            "pattern": "^refs/tags/.*",
            "excludeMatchedPattern": true
        }
      ]
]
```

You can create a filter that triggers a build only when a change is made by a Bitbucket user with account ID actor-account-id.

1 Note

For information about how to find your Bitbucket account ID, see https:// api.bitbucket.org/2.0/users/user-name, where user-name is your Bitbucket user name.

```
"filterGroups": [
 [
 {
    "type": "EVENT",
    "pattern": "PUSH, PULL_REQUEST_CREATED, PULL_REQUEST_UPDATED,
PULL_REQUEST_MERGED, PULL_REQUEST_CLOSED"
 },
 {
    "type": "ACTOR_ACCOUNT_ID",
    "pattern": "actor-account-id"
 }
]
```

You can create a filter that triggers a build only when files with names that match the regular expression in the pattern argument change. In this example, the filter group specifies that a build is triggered only when files with a name that matches the regular expression ^buildspec.* change.

```
"filterGroups": [
```

```
[
    {
        "type": "EVENT",
        "pattern": "PUSH"
    },
    {
        "type": "FILE_PATH",
        "pattern": "^buildspec.*"
    }
]
]
```

In this example, the filter group specifies that a build is triggered only when files are changed in src or test folders.

You can create a filter that triggers a build only when the head commit message matches the regular expression in the pattern argument. In this example, the filter group specifies that a build is triggered only when the head commit message of the push event matches the regular expression \[CodeBuild\].

```
"filterGroups": [
   [
      {
        "type": "EVENT",
        "pattern": "PUSH"
      },
      {
        "type": "COMMIT_MESSAGE",
        "pattern": "\[CodeBuild\]"
```

```
}
]
}
```

Filter Bitbucket webhook events (AWS CloudFormation)

To use an AWS CloudFormation template to filter webhook events, use the AWS CodeBuild project's FilterGroups property. The following YAML-formatted portion of an AWS CloudFormation template creates two filter groups. Together, they trigger a build when one or both evaluate to true:

- The first filter group specifies pull requests are created or updated on branches with Git reference names that match the regular expression ^refs/heads/main\$ by a Bitbucket user who does not have account ID 12345.
- The second filter group specifies push requests are created on branches with Git reference names that match the regular expression <code>^refs/heads/.*</code>.
- The third filter group specifies a push request with a head commit message matching the regular expression \[CodeBuild\].

```
CodeBuildProject:
  Type: AWS::CodeBuild::Project
  Properties:
    Name: MyProject
    ServiceRole: service-role
    Artifacts:
      Type: NO_ARTIFACTS
    Environment:
      Type: LINUX_CONTAINER
      ComputeType: BUILD_GENERAL1_SMALL
      Image: aws/codebuild/standard:5.0
    Source:
      Type: BITBUCKET
      Location: source-location
    Triggers:
      Webhook: true
      FilterGroups:
        - - Type: EVENT
            Pattern: PULL_REQUEST_CREATED, PULL_REQUEST_UPDATED
          - Type: BASE_REF
            Pattern: ^refs/heads/main$
```

-	ExcludeMatchedPattern: false Type: ACTOR_ACCOUNT_ID Pattern: 12345
	ExcludeMatchedPattern: true Type: EVENT Pattern: PUSH Type: HEAD_REF
	Pattern: ^refs/heads/.* Type: FILE_PATH Pattern: READ_ME ExcludeMatchedPattern: true
-	Type: EVENT Pattern: PUSH Type: COMMIT_MESSAGE Pattern: \[CodeBuild\] Type: FILE_PATH Pattern: ^src/.+ ^test/.+

GitHub global and organization webhooks

You can use CodeBuild GitHub global or organization webhooks to start builds on webhook events from any repository within a GitHub organization or enterprise. Global and organization webhooks work with any of the existing GitHub webhook event types, and can be configured by adding a scope configuration when creating a CodeBuild webhook. You can also use global and organization webhooks to <u>set up self-hosted GitHub Action runners within CodeBuild</u> in order to receive WORKFLOW_JOB_QUEUED events from multiple repositories within a single project.

Topics

- Set up a global or organization GitHub webhook
- Filter GitHub global or organization webhook events (console)
- Filter GitHub organization webhook events (AWS CloudFormation)

Set up a global or organization GitHub webhook

The high-level steps to set up a global or organization GitHub webhook are as follows. For more information about global and organization GitHub webhooks, see <u>GitHub global and organization</u> webhooks.

1. Set your project's source location to CODEBUILD_DEFAULT_WEBHOOK_SOURCE_LOCATION.

- In the webhook's scope configuration, set the scope to either GITHUB_ORGANIZATION or GITHUB_GLOBAL depending on whether it should be an organization or <u>global webhook</u>. For more information, see Types of webhooks.
- 3. Specify a name as part of the webhook's scope configuration. For organization webhooks, this is the organization name, and for global webhooks this is the enterprise name.

🚺 Note

If the project's source type is GITHUB_ENTERPRISE, you will also need to specify a domain as part of the webhook scope configuration.

- (Optional) If you would only like to receive webhook events for specific repositories within your organization or enterprise, you can specify REPOSITORY_NAME as a filter when creating the webhook.
- 5. If you are creating an organization webhook, ensure that CodeBuild has permissions to create organization level webhooks within GitHub. You can create a GitHub personal access token with organization webhook permissions, or use CodeBuild OAuth. For more information, see <u>GitHub</u> and <u>GitHub Enterprise Server access token</u>.

Note that organization webhooks work with any of the existing GitHub webhook event types.

6. If you are creating a global webhook, the webhook will need to be created manually. For more information about how to manually create a webhook within GitHub, see <u>GitHub manual</u> <u>webhooks</u>.

Note that global webhooks only support the WORKFLOW_JOB_QUEUED event type. For more information, see <u>Self-hosted GitHub Actions runners in AWS CodeBuild</u>.

Filter GitHub global or organization webhook events (console)

When creating a GitHub project through the console, select the following options to create a GitHub global or organization webhook within the project. For more information about global and organization GitHub webhooks, see GitHub global and organization webhooks.

- Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.
- 2. Create a build project. For information, see <u>Create a build project (console)</u> and <u>Run a build</u> (console).

- In Source:
 - For Source provider, choose GitHub or GitHub Enterprise.
 - For Repository, choose GitHub scoped webhook.

The GitHub repository will automatically be set to CODEBUILD_DEFAULT_WEBHOOK_SOURCE_LOCATION, which is the required source location for global and organization webhooks.

🚯 Note

If you are using organization webhooks, make sure that CodeBuild has permissions to create organization level webhooks within GitHub. If you're using an <u>existing</u> <u>OAuth connection</u>, you may need to regenerate the connection in order to grant CodeBuild this permission. Alternatively, you can create the webhook manually using the <u>CodeBuild manual webhooks feature</u>. Note that if you have an existing GitHub OAuth token and would like to add additional organization permissions, you can <u>revoke the OAuth token's permission</u> and reconnect the token through the CodeBuild console.

Source

Add source

Source 1 - Primary

Source provider	
GitHub	▼

Repository

 Repository in my GitHub account O Public repository

GitHub scoped webhook

GitHub repository

CODEBUILD_DEFAULT_WEBHOOK_SOURCE_LOCATION

Connection status

You are connected to GitHub using a personal access token.

Disconnect from GitHub

- In Primary source webhook events:
 - For **Scope type**, choose **Organization level** if you're creating an organization webhook or **Enterprise level** if you're creating a global webhook.
 - For **Name**, enter either the enterprise or organization name, depending on if the webhook is a global or organization webhook.

If the project's source type is GITHUB_ENTERPRISE, you also need to specify a domain as part of the webhook organization configuration. For example, if the URL of your organization is https://domain.com/orgs/org-name, then the domain is domain.com.

🚯 Note

This name cannot be changed after the webhook has been created. To change the name, you can delete and re-create the webhook. If you want to remove the webhook entirely, you can also update the project source location to a GitHub repository.

Primary source webhook events In	Add filter group	
Nebhook - optional Info 🔼		
Rebuild every time a code change is pushe	d to this repository	
scope type		
• Organization level	○ Enterprise level	
Organization name /our GitHub organization name.		
organization-name		
Build type		
• Single build Triggers single build	Batch build Triggers multiple builds	as single execution

.

(Optional) In Webhook event filter groups, you can specify which events you would like
to trigger a new build. You can also specify REPOSITORY_NAME as a filter to only trigger
builds on webhook events from specific repositories.

Webhook event filter groups

A build is triggered if any filter group evaluates to true, which occurs when all the filters in the group evaluate to true.

Filter group 1	Remove filter group
Event type - <i>optional</i> Add one or more webhook event filter groups to specify which events trigger a new build. If you do not add then a new build is triggered every time a code change is pushed to your repository.	a webhook event filter group,
WORKFLOW_JOB_QUEUED \times	
Start a build under these conditions - optional	Add filter
Filter 1	
Туре	
REPOSITORY_NAME	
Pattern	
repository-name	
Remove	

You can also set the event type to WORKFLOW_JOB_QUEUED to set up self-hosted GitHub Actions runners. For more information, see <u>Self-hosted GitHub Actions runners in AWS</u> CodeBuild.

3. Continue with the default values and then choose Create build project.

Filter GitHub organization webhook events (AWS CloudFormation)

To use an AWS CloudFormation template to filter organization webhook events, use the AWS CodeBuild project's ScopeConfiguration property. For more information about global and organization GitHub webhooks, see GitHub global and organization webhooks.

🚯 Note

Global webhooks and GitHub Enterprise webhooks are not supported by AWS CloudFormation.

The following YAML-formatted portion of an AWS CloudFormation template creates four filter groups. Together, they trigger a build when one or all evaluate to true:

- The first filter group specifies pull requests are created or updated on branches with Git reference names that match the regular expression ^refs/heads/main\$ by a GitHub user who does not have account ID 12345.
- The second filter group specifies push requests are created on files with names that match the regular expression READ_ME in branches with Git reference names that match the regular expression ^refs/heads/.*.
- The third filter group specifies a push request with a head commit message matching the regular expression \[CodeBuild\].
- The fourth filter group specifies a GitHub Actions workflow job request with a workflow name matching the regular expression \[CI-CodeBuild\].

```
CodeBuildProject:
 Type: AWS::CodeBuild::Project
 Properties:
    Name: MyProject
    ServiceRole: service-role
    Artifacts:
      Type: NO_ARTIFACTS
    Environment:
      Type: LINUX_CONTAINER
      ComputeType: BUILD_GENERAL1_SMALL
      Image: aws/codebuild/standard:5.0
    Source:
      Type: GITHUB
      Location: source-location
    Triggers:
     Webhook: true
      ScopeConfiguration:
        Name: organization-name
      FilterGroups:
```

Type: EVENT
Pattern: PULL_REQUEST_CREATED,PULL_REQUEST_UPDATED
- Type: BASE_REF
Pattern: ^refs/heads/main\$
ExcludeMatchedPattern: false
- Type: ACTOR_ACCOUNT_ID
Pattern: 12345
ExcludeMatchedPattern: true
Type: EVENT
Pattern: PUSH
- Type: HEAD_REF
Pattern: ^refs/heads/.*
- Type: FILE_PATH
Pattern: READ_ME
ExcludeMatchedPattern: true
Type: EVENT
Pattern: PUSH
- Type: COMMIT_MESSAGE
Pattern: \[CodeBuild\]
- Type: FILE_PATH
Pattern: ^src/.+ ^test/.+
Type: EVENT
Pattern: WORKFLOW_JOB_QUEUED
- Type: WORKFLOW_NAME
Pattern: \[CI-CodeBuild\]

GitHub manual webhooks

You can configure manual GitHub webhooks to prevent CodeBuild from automatically attempting to create a webhook within GitHub. CodeBuild returns a payload URL in as part of the call to create the webhook and can be used to manually create the webhook within GitHub. Even if CodeBuild is not allowlisted to create a webhook in your GitHub account, you can still manually create a webhook for your build project.

Use the following procedure to create a GitHub manual webhook.

To create a GitHub manual webhook

- Open the AWS CodeBuild console at <u>https://console.aws.amazon.com/codesuite/codebuild/</u> <u>home</u>.
- Create a build project. For information, see <u>Create a build project (console)</u> and <u>Run a build</u> (console).

- In Source:
 - For Source provider, choose GitHub.
 - For Repository, choose Repository in my GitHub account.
 - For **Repository URL**, enter **https://github.com/user-name/repository-name**.
- In Primary source webhook events:
 - For Webhook optional, choose Rebuild every time a code change is pushed to this repository.
 - Choose Additional configuration and for Manual creation optional, choose Manually create a webhook for this repository in GitHub console.

1 Note

Additional configuration is not available if you are using GitHub Enterprise as your source provider.

3. Continue with the default values and then choose **Create build project**. Take note of the **Payload URL** and **Secret** values as you will use these later.

Create webhook		×
You must create a webhook for your GitHub repository.		
Payload URL	Copy payload URL	
Secret	Copy secret 🗇	
		Close

- Open the GitHub console at https://github.com/user-name/repository-name/ settings/hooks and choose Add webhook.
 - For Payload URL, enter the Payload URL value you took note of earlier.
 - For **Content type**, choose **application/json**.
 - For **Secret**, enter the Secret value you took note of earlier.
 - Configure the individual events that will send a webhook payload to CodeBuild. For Which
 events would you like to trigger this webhook?, choose Let me select individual events,
 and then choose from the following events: Pushes, Pull requests, and Releases. If you want

to start builds for WORKFLOW_JOB_QUEUED events, choose **Workflow jobs**. To learn more about GitHub Actions runners, see <u>Self-hosted GitHub Actions runners in AWS CodeBuild</u>. To learn more about event types supported by CodeBuild, see <u>GitHub webhook events</u>.

5. Choose Add webhook.

Note

By default, all GitHub Enterprise webhooks need to be created manually. This process can be automated by programmatically calling CodeBuild's <u>CreateWebhook API</u> and using the returned output to call GitHub Enterprise's <u>repository webhook creation API</u>.

GitHub webhook events

You can use webhook filter groups to specify which GitHub webhook events trigger a build. For example, you can specify that a build is only triggered for changes to specific branches.

You can create one or more webhook filter groups to specify which webhook events trigger a build. A build is triggered if any filter group evaluates to true, which occurs when all the filters in the group evaluate to true. When you create a filter group, you specify:

An event

For GitHub, you can choose one or more of the following events: PUSH, PULL_REQUEST_CREATED, PULL_REQUEST_UPDATED, PULL_REQUEST_REOPENED, PULL_REQUEST_MERGED, PULL_REQUEST_CLOSED, RELEASED, PRERELEASED, and WORKFLOW_JOB_QUEUED. The webhook event type is in the X-GitHub-Event header in the webhook payload. In the X-GitHub-Event header, you might see pull_request or push. For a pull request event, the type is in the action field of the webhook event payload. The following table shows how X-GitHub-Event header values and webhook pull request payload action field values map to the available event types.

X-GitHub-Event Header value	Webhook event payload action value	Event type
pull_request	opened	PULL_REQUEST_CREATED

X-GitHub-Event Header value	Webhook event payload action value	Event type
pull_request	reopened	PULL_REQUEST_REOPE NED
pull_request	synchronize	PULL_REQUEST_UPDATED
pull_request	closed, and the merged field is true	PULL_REQUEST_MERGED
pull_request	closed, and the merged field is false	PULL_REQUEST_CLOSED
push	n/a	PUSH
release	released	RELEASED
release	prereleased	PRERELEASED
workflow_job	queued	WORKFLOW_JOB_QUEUED

🚯 Note

The PULL_REQUEST_REOPENED event type can be used with GitHub and GitHub Enterprise Server only. The RELEASED, PRERELEASED, and WORKFLOW_JOB_QUEUED event type can be used with GitHub only. For more information on WORKFLOW_JOB_QUEUED, see <u>Tutorial: Configure a CodeBuild-hosted</u> <u>GitHub Actions runner</u>.

One or more optional filters

Use a regular expression to specify a filter. For an event to trigger a build, every filter within the group associated with it must evaluate to true.

A webhook event triggers a build when a GitHub or GitHub Enterprise Server account ID matches the regular expression pattern. This value is found in the id property of the sender object in the webhook payload.

HEAD_REF

A webhook event triggers a build when the head reference matches the regular expression pattern (for example, refs/heads/branch-name or refs/tags/tag-name). For a push event, the reference name is found in the ref property in the webhook payload. For pull requests events, the branch name is found in the ref property of the head object in the webhook payload.

BASE_REF

A webhook event triggers a build when the base reference matches the regular expression pattern (for example, refs/heads/branch-name). A BASE_REF filter can be used with pull request events only. The branch name is found in the ref property of the base object in the webhook payload.

FILE_PATH

A webhook triggers a build when the path of a changed file matches the regular expressions pattern. A FILE_PATH filter can be used with GitHub push and pull request events and GitHub Enterprise Server push events. It cannot be used with GitHub Enterprise Server pull request events.

COMMIT_MESSAGE

A webhook triggers a build when the head commit message matches the regular expression pattern. A COMMIT_MESSAGE filter can be used with GitHub push and pull request events and GitHub Enterprise Server push events. It cannot be used with GitHub Enterprise Server pull request events.

TAG_NAME

A webhook triggers a build when the tag name of the release matches the regular expression pattern. A TAG_NAME filter can be used with GitHub released and prereleased request events.

RELEASE_NAME

A webhook triggers a build when the release name matches the regular expression pattern. A RELEASE_NAME filter can be used with GitHub released and prereleased request events.

REPOSITORY_NAME

A webhook triggers a build when the repository name matches the regular expression pattern. A REPOSITORY_NAME filter can only be used with GitHub global or organization webhooks.

WORKFLOW_NAME

A webhook triggers a build when the workflow name matches the regular expression pattern. A WORKFLOW_NAME filter can be used with GitHub Actions workflow job queued request events.

Note

You can find the webhook payload in the webhook settings of your GitHub repository.

Topics

- Filter GitHub webhook events (console)
- Filter GitHub webhook events (SDK)
- Filter GitHub webhook events (AWS CloudFormation)

Filter GitHub webhook events (console)

Use the following instructions to filter GitHub webhook events using the AWS Management Console. For more information about GitHub webhook events, see GitHub webhook events.

In **Primary source webhook events**, select the following. This section is only available when you chose **Repository in my GitHub account** for the source repository.

- 1. Select **Rebuild every time a code change is pushed to this repository** when you create your project.
- 2. From **Event type**, choose one or more events.

- 3. To filter when an event triggers a build, under **Start a build under these conditions**, add one or more optional filters.
- 4. To filter when an event is not triggered, under **Don't start a build under these conditions**, add one or more optional filters.
- 5. Choose **Add filter group** to add another filter group, if needed.

For more information, see <u>Create a build project (console)</u> and <u>WebhookFilter</u> in the AWS CodeBuild API Reference.

In this example, a webhook filter group triggers a build for pull requests only:

Filter group 1	Remove filter group
Event type Add one or more webhook event filter groups to specify which events trigger a new build. If you do not add then a new build is triggered every time a code change is pushed to your repository.	l a webhook event filter group,
•	
PULL_REQUEST_CREATED \times PULL_REQUEST_UPDATED \times	
PULL_REQUEST_REOPENED X PULL_REQUEST_MERGED X	
PULL_REQUEST_CLOSED X	
Start a build under these conditions - optional	
Don't start a build under these conditions - optional	

Using an example of two webhook filter groups, a build is triggered when one or both evaluate to true:

- The first filter group specifies pull requests that are created, updated, or reopened on branches with Git reference names that match the regular expression <code>^refs/heads/main\$</code> and head references that match <code>^refs/heads/branch1\$</code>.
- The second filter group specifies push requests on branches with Git reference names that match the regular expression <code>^refs/heads/branch1\$</code>.

Webhook event filter group 1				
Event type Add one or more a webhook event filter groups to specify which events trigger a new build. If you do not add a webhook event filter group, then a new build is triggered every time a code change is pushed to your repository.				
•				
PULL_REQUEST_CREATED X PULL_REQUEST_UPDATED X				
PULL_REQUEST_REOPENED X				
Start a build under these conditions				
ACTOR_ID - optional HEAD_REF - optional BASE_REF - optional	FILE_PATH - optional			
^refs/heads/branch1\$ ^refs/heads/main\$				
COMMIT_MESSAGE - optional				
Don't start a build under these conditions				
Webhook event filter group 2	Remove filter group			
Event type Add one or more a webhook event filter groups to specify which events trigger a new build. If you do not add a webhook event filter group, then a new build is triggered every time a code change is pushed to your repository.				
•				
PUSH X				
Start a build under these conditions				
ACTOR_ID - optional HEAD_REF - optional BASE_REF - optional	FILE_PATH - optional			
^refs/heads/branch1\$				
COMMIT_MESSAGE - optional				
Don't start a build under these conditions				

In this example, a webhook filter group triggers a build for all requests except tag events.

Filter group 1	Remove filter group
Event type Add one or more webhook event filter groups to specify which events trigger a new build. If you do not add then a new build is triggered every time a code change is pushed to your repository.	d a webhook event filter group,
•	
PUSH \times PULL_REQUEST_CREATED \times PULL_REQUEST_UPDATED \times	
PULL_REQUEST_REOPENED \times PULL_REQUEST_MERGED \times	
PULL_REQUEST_CLOSED \times	
Start a build under these conditions - optional	
Don't start a build under these conditions - optional	Add filter
Filter 1	
Туре	
HEAD_REF 🔹	
Pattern	
^refs/tags/.*	

In this example, a webhook filter group triggers a build only when files with names that match the regular expression ^buildspec.* change.

Webhook event filter group 1

Event type

		•	
push \times			
 Start a build under the 	hese conditions		
ACTOR_ID - optional	HEAD_REF - optional	BASE_REF - optional	FILE_PATH - optional
			^buildspec.*
COMMIT_MESSAGE -			
optional			

Don't start a build under these conditions

In this example, a webhook filter group triggers a build only when files are changed in src or test folders.

Webhook event filter group 1

Event type

push ×		•	
Start a build under to start a build under	these conditions		
CTOR_ID - optional	HEAD_REF - optional	BASE_REF - optional	FILE_PATH - optional
			^src/.+ ^test/.+
OMMIT_MESSAGE -			
otional	_		

In this example, a webhook filter group triggers a build only when a change is made by a specified GitHub or GitHub Enterprise Server user with an account ID that matches the regular expression actor-account-id.

Solution State	
For information about how to find your GitHub account ID, see https:/ users/user-name, where user-name is your GitHub user name.	/api.github.com/
Filter group 1	Remove filter group
Event type Add one or more webhook event filter groups to specify which events trigger a new build. If you do not add a then a new build is triggered every time a code change is pushed to your repository.	a webhook event filter group,
PUSH × PULL_REQUEST_CREATED × PULL_REQUEST_UPDATED × PULL_REQUEST_REOPENED × PULL_REQUEST_MERGED ×	
PULL_REQUEST_CLOSED ×	
Start a build under these conditions - optional	Add filter
Filter 2	
Туре	
ACTOR_ACCOUNT_ID	
Pattern	
actor-account-id	
Remove	

Don't start a build under these conditions - optional

In this example, a webhook filter group triggers a build for a push event when the head commit message matches the regular expression \[CodeBuild\].

Webhook event filter group 1

Event type

			7
push $ imes$			
 Start a build under the 	hese conditions		
ACTOR_ID - optional	HEAD_REF - optional	BASE_REF - optional	FILE_PATH - optional
COMMIT_MESSAGE - optional			
\[CodeBuild\]			

Don't start a build under these conditions

In this example, a webhook filter group triggers a build for GitHub Actions workflow job events only.

(i) Note
CodeBuild will only process GitHub Actions workflow jobs if a webhook has filter groups containing the WORKFLOW_JOB_QUEUED event filter.

Eilter group 1	Demons filter means
Filter group 1	Remove filter group
Event type Add one or more webhook event filter groups to specify which events trigger a new build. If you do not a then a new build is triggered every time a code change is pushed to your repository.	dd a webhook event filter group,
•	
WORKFLOW_JOB_QUEUED X	
Start a build under these conditions - optional	
Don't start a build under these conditions - optional	

In this example, a webhook filter group triggers a build for a workflow name that matches the regular expression CI-CodeBuild.

Filter group 1	Remov	e filter group
Event type Add one or more webhook event filter groups to specify which events trigger a new build. If you do not add then a new build is triggered every time a code change is pushed to your repository.	l a webhook (event filter group,
▼		
WORKFLOW_JOB_QUEUED X		
Start a build under these conditions - optional		Add filter
Filter 1		
Туре		
WORKFLOW_NAME		
Pattern		
CI-CodeBuild		
Remove		

Don't start a build under these conditions - optional

Filter GitHub webhook events (SDK)

To use the AWS CodeBuild SDK to filter webhook events, use the filterGroups field in the request syntax of the CreateWebhook or UpdateWebhook API methods. For more information, see <u>WebhookFilter</u> in the *CodeBuild API Reference*.

For more information about GitHub webhook events, see GitHub webhook events.

To create a webhook filter that triggers a build for pull requests only, insert the following into the request syntax:

]

]

To create a webhook filter that triggers a build for specified branches only, use the pattern parameter to specify a regular expression to filter branch names. Using an example of two filter groups, a build is triggered when one or both evaluate to true:

- The first filter group specifies pull requests that are created, updated, or reopened on branches with Git reference names that match the regular expression <code>^refs/heads/main\$</code> and head references that match <code>^refs/heads/myBranch\$</code>.
- The second filter group specifies push requests on branches with Git reference names that match the regular expression <code>^refs/heads/myBranch\$</code>.

```
"filterGroups": [
    Γ
        {
             "type": "EVENT",
            "pattern": "PULL_REQUEST_CREATED, PULL_REQUEST_UPDATED,
 PULL_REQUEST_REOPENED"
        },
        {
            "type": "HEAD_REF",
             "pattern": "^refs/heads/myBranch$"
        },
        {
            "type": "BASE_REF",
             "pattern": "^refs/heads/main$"
        }
    ],
    Ε
        {
            "type": "EVENT",
             "pattern": "PUSH"
        },
        {
            "type": "HEAD_REF",
             "pattern": "^refs/heads/myBranch$"
        }
    ]
]
```

You can use the excludeMatchedPattern parameter to specify which events do not trigger a build. For example, in this example a build is triggered for all requests except tag events.

```
"filterGroups": [
    [
        [
            "type": "EVENT",
            "pattern": "PUSH, PULL_REQUEST_CREATED, PULL_REQUEST_UPDATED,
PULL_REQUEST_REOPENED, PULL_REQUEST_MERGED, PULL_REQUEST_CLOSED"
        },
        {
            "type": "HEAD_REF",
            "pattern": "^refs/tags/.*",
            "excludeMatchedPattern": true
        }
    ]
]
```

You can create a filter that triggers a build only when files with names that match the regular expression in the pattern argument change. In this example, the filter group specifies that a build is triggered only when files with a name that matches the regular expression ^buildspec.* change.

In this example, the filter group specifies that a build is triggered only when files are changed in src or test folders.

```
"filterGroups": [
[
```

```
{
    "type": "EVENT",
    "pattern": "PUSH"
},
    {
        "type": "FILE_PATH",
        "pattern": "^src/.+|^test/.+"
    }
]
```

You can create a filter that triggers a build only when a change is made by a specified GitHub or GitHub Enterprise Server user with account ID actor-account-id.

Note

For information about how to find your GitHub account ID, see https://api.github.com/ users/user-name, where user-name is your GitHub user name.

You can create a filter that triggers a build only when the head commit message matches the regular expression in the pattern argument. In this example, the filter group specifies that a build is triggered only when the head commit message of the push event matches the regular expression \[CodeBuild\].

```
"filterGroups": [
```

```
[
    {
        "type": "EVENT",
        "pattern": "PUSH"
    },
    {
        "type": "COMMIT_MESSAGE",
        "pattern": "\[CodeBuild\]"
    }
]
```

To create a webhook filter that triggers a build for GitHub Actions workflow jobs only, insert the following into the request syntax:

Filter GitHub webhook events (AWS CloudFormation)

To use an AWS CloudFormation template to filter webhook events, use the AWS CodeBuild project's FilterGroups property.

For more information about GitHub webhook events, see GitHub webhook events.

The following YAML-formatted portion of an AWS CloudFormation template creates two filter groups. Together, they trigger a build when one or both evaluate to true:

- The first filter group specifies pull requests are created or updated on branches with Git reference names that match the regular expression ^refs/heads/main\$ by a GitHub user who does not have account ID 12345.
- The second filter group specifies push requests are created on files with names that match the regular expression READ_ME in branches with Git reference names that match the regular expression ^refs/heads/.*.

AWS CodeBuild

- The third filter group specifies a push request with a head commit message matching the regular expression \[CodeBuild\].
- The fourth filter group specifies a GitHub Actions workflow job request with a workflow name matching the regular expression \[CI-CodeBuild\].

```
CodeBuildProject:
  Type: AWS::CodeBuild::Project
  Properties:
    Name: MyProject
    ServiceRole: service-role
    Artifacts:
      Type: NO_ARTIFACTS
    Environment:
      Type: LINUX_CONTAINER
      ComputeType: BUILD_GENERAL1_SMALL
      Image: aws/codebuild/standard:5.0
    Source:
      Type: GITHUB
      Location: source-location
    Triggers:
      Webhook: true
      FilterGroups:
        - - Type: EVENT
            Pattern: PULL_REQUEST_CREATED, PULL_REQUEST_UPDATED
          - Type: BASE_REF
            Pattern: ^refs/heads/main$
            ExcludeMatchedPattern: false
          - Type: ACTOR_ACCOUNT_ID
            Pattern: 12345
            ExcludeMatchedPattern: true
        - - Type: EVENT
            Pattern: PUSH
          - Type: HEAD_REF
            Pattern: ^refs/heads/.*
          - Type: FILE_PATH
            Pattern: READ_ME
            ExcludeMatchedPattern: true
        - - Type: EVENT
            Pattern: PUSH
          - Type: COMMIT_MESSAGE
            Pattern: \[CodeBuild\]
          - Type: FILE_PATH
```

```
Pattern: ^src/.+|^test/.+
- - Type: EVENT
Pattern: WORKFLOW_JOB_QUEUED
- Type: WORKFLOW_NAME
Pattern: \[CI-CodeBuild\]
```

GitLab group webhooks

You can use CodeBuild GitLab group webhooks to start builds on webhook events from any repository within a GitLab group. Group webhooks work with any of the existing GitLab webhook event types, and can be configured by adding a scope configuration when creating a CodeBuild webhook. You can also use group webhooks to <u>set up self-hosted GitLab runners within CodeBuild</u> in order to receive WORKFLOW_JOB_QUEUED events from multiple repositories within a single project.

Topics

- Set up a group GitLab webhook
- Filter GitLab group webhook events (console)
- Filter GitLab group webhook events (AWS CloudFormation)

Set up a group GitLab webhook

The high-level steps to set up a group GitLab webhook are as follows. For more information about group GitLab webhooks, see <u>GitLab group webhooks</u>.

- 1. Set your project's source location to CODEBUILD_DEFAULT_WEBHOOK_SOURCE_LOCATION.
- 2. In the webhook's scope configuration, set the scope to GITLAB_GROUP.
- 3. Specify a name as part of the webhook's scope configuration. For group webhooks, this is the group name.

🚺 Note

If the project's source type is GITLAB_SELF_MANAGED, you will also need to specify a domain as part of the webhook scope configuration.

- (Optional) If you would only like to receive webhook events for specific repositories within your organization or enterprise, you can specify REPOSITORY_NAME as a filter when creating the webhook.
- 5. When creating a group webhook, ensure that CodeBuild has permissions to create group level webhooks within GitLab. To do so, you can use CodeBuild OAuth though CodeConnections. For more information, see GitLab access in CodeBuild.

Note that group webhooks work with any of the existing GitLab webhook event types.

Filter GitLab group webhook events (console)

When creating a GitLab project through the console, select the following options to create a GitLab group webhook within the project. For more information about group GitLab webhooks, see <u>GitLab</u> group webhooks.

- Open the AWS CodeBuild console at <u>https://console.aws.amazon.com/codesuite/codebuild/</u> home.
- 2. Create a build project. For information, see <u>Create a build project (console)</u> and <u>Run a build</u> (console).
 - In Source:
 - For **Source provider**, choose **GitLab** or **GitLab Self Managed**.
 - For Repository, choose GitLab scoped webhook.

The GitLab repository will automatically be set to CODEBUILD_DEFAULT_WEBHOOK_SOURCE_LOCATION, which is the required source location for group webhooks.

🚺 Note

When using group webhooks, make sure that CodeBuild has permissions to create group level webhooks within GitLab. If you're using an <u>existing OAuth connection</u>, you may need to regenerate the connection in order to grant CodeBuild this permission.

Source Add source Source 1 - Primary Source provider GitLab • Credential Default source credential Custom source credential Use your account's default source Use a custom source credential to credential to apply to all projects override your account's default settings Successfully connected through CodeConnections - open resource Manage default source credential Repository Repository in my GitLab account GitLab scoped webhook Repository CODEBUILD_DEFAULT_WEBHOOK_SOURCE_LOCATION

- In Primary source webhook events:
 - For **Group name**, enter the group name.

If the project's source type is GITLAB_SELF_MANAGED, you also need to specify a domain as part of the webhook group configuration. For example, if the URL of your group is **https://domain.com/group/group-name**, then the domain is **domain.com**.

1 Note

This name cannot be changed after the webhook has been created. To change the name, you can delete and re-create the webhook. If you want to remove the webhook entirely, you can also update the project source location to a GitLab repository. •

Event type - optional Add one or more webhook event filter groups to specify which events trigger a new build. If you do not add a webhook event filter g then a new build is triggered every time a code change is pushed to your repository. WORKFLOW_JOB_QUEUED X	Primary source webhook events Info		Add filter group
Group name Your Gittab group name. group-name Build type			
Your GitLab group name. group-name Build type • Single build Triggers single build • Additional configuration • Additional configuration • Additional configuration • Diftional) In Webhook event filter groups, you can specify which events you would • trigger a new build. You can also specify REPOSITORY_NAME as a filter to only trig uilds on webhook events from specific repositories. Webhook event filter groups Abuil is triggered if any filter group evaluates to true, which occurs when all the filters in the group evaluate to true. Filter group 1 Remove filter groups Add on or more webhook event filter groups to specify which events trigger a new build. If you do not add a webhook event filter group then a new build is triggered every time a code change is pushed to your repository. WORKFLOW_JOB_QUEUED × • Start a build under these conditions - optional Filter 1 Type REPOSITORY_NAME Pattern repository-name	Rebuild every time a code change is pushed to this reposition of the second	tory	
Build type Single build Triggers single build Build type Additional configuration Deptional) In Webhook event filter groups, you can specify which events you would trigger a new build. You can also specify REPOSITORY_NAME as a filter to only trig uilds on webhook events from specific repositories. Webhook event filter groups A build is triggered if any filter group evaluates to true, which occurs when all the filters in the group evaluate to true. Filter group 1 Remove filter group to trigger a new build is triggered every time a code change is pushed to your repository. WORKFLOW_JOB_QUEUED X Start a build under these conditions - optional Add fil Filter 1 Type REPOSITORY_NAME Pattern repository-name			
Single build Triggers single build Additional configuration Additional configuration Additional configuration Additional configuration Additional configuration Additional configuration Webhook event filter groups, you can specify which events you would of trigger a new build. You can also specify REPOSITORY_NAME as a filter to only trigger a new build. You can also specific repositories. Webhook event filter groups A build is triggered if any filter group evaluates to true, which occurs when all the filters in the group evaluate to true. Filter group 1 Remove filter group to specify which events trigger a new build. If you do not add a webhook event filter groups to specify which events trigger a new build. If you do not add a webhook event filter group then a new build is triggered every time a code change is pushed to your repository. WORKFLOW_JOB_QUEUED X Start a build under these conditions - optional Add filter 1 Type REPOSITORY_NAME Pattern repository-name	group-name		
Triggers single build Triggers multiple builds as single execution Additional configuration Optional) In Webhook event filter groups, you can specify which events you would a trigger a new build. You can also specify REPOSITORY_NAME as a filter to only trigging a new build. You can also specify repositories. Webhook event filter groups A build is triggered if any filter group evaluates to true, which occurs when all the filters in the group evaluate to true. Filter group 1 Remove filter group Event type - optional Add on or orner webhook event filter groups to specify which events trigger a new build. If you do not add a webhook event filter group the new build is triggered every time a code change is pushed to your repository. WORKFLOW_JOB_QUEUED X Vortical a build under these conditions - optional Filter 1 Type RePOSITORY_NAME Pattern repository-name Image: Start a build is triggered event filter start abuild is triggered build buil	Build type		
Optional) In Webhook event filter groups, you can specify which events you would be trigger a new build. You can also specify REPOSITORY_NAME as a filter to only triguids on webhook events from specific repositories. Webhook event filter groups A build is triggered if any filter group evaluates to true, which occurs when all the filters in the group evaluate to true. Filter group 1 Event type - optional Add one or more webhook event filter groups to specify which events trigger a new build. If you do not add a webhook event filter group then a new build is triggered every time a code change is pushed to your repository. WORKFLOW_JOB_QUEUED × * Start a build under these conditions - optional Filter 1 Type Pattern repository-name		0	s single execution
trigger a new build. You can also specify REPOSITORY_NAME as a filter to only triguilds on webhook events from specific repositories. Webhook event filter groups A build is triggered if any filter group evaluates to true, which occurs when all the filters in the group evaluate to true. Filter group 1 Remove filter group Add one or more webhook event filter groups to specify which events trigger a new build. If you do not add a webhook event filter group anew build is triggered every time a code change is pushed to your repository. WORKFLOW_JOB_QUEUED X Start a build under these conditions - optional Add filter 1 Type REPOSITORY_NAME Pattern repository-name	Additional configuration		
Webhook event filter groups A build is triggered if any filter group evaluates to true, which occurs when all the filters in the group evaluate to true. Filter group 1 Remove filter group Event type - optional Add one or more webhook event filter groups to specify which events trigger a new build. If you do not add a webhook event filter group then a new build is triggered every time a code change is pushed to your repository. WORKFLOW_JOB_QUEUED X Start a build under these conditions - optional Add filt Filter 1 Type REPOSITORY_NAME Pattern repository-name			
Webhook event filter groups A build is triggered if any filter group evaluates to true, which occurs when all the filters in the group evaluate to true. Filter group 1 Remove filter group Event type - optional Add one or more webhook event filter groups to specify which events trigger a new build. If you do not add a webhook event filter group then a new build is triggered every time a code change is pushed to your repository. WORKFLOW_JOB_QUEUED X Start a build under these conditions - optional Add filt Filter 1 Type Pattern repository-name			
Event type - optional Add one or more webhook event filter groups to specify which events trigger a new build. If you do not add a webhook event filter g then a new build is triggered every time a code change is pushed to your repository. WORKFLOW_JOB_QUEUED X Start a build under these conditions - optional Filter 1 Type REPOSITORY_NAME Pattern repository-name			
Add one or more webhook event filter groups to specify which events trigger a new build. If you do not add a webhook event filter g then a new build is triggered every time a code change is pushed to your repository. WORKFLOW_JOB_QUEUED × Start a build under these conditions - optional Filter 1 Type REPOSITORY_NAME Pattern repository-name	uilds on webhook events from specific repo Webhook event filter groups	ositories.	evaluate to true.
WORKFLOW_JOB_QUEUED × ▼ Start a build under these conditions - optional Filter 1 Type REPOSITORY_NAME Pattern repository-name	uilds on webhook events from specific repo Webhook event filter groups A build is triggered if any filter group evaluates to true, which occurs	ositories.	evaluate to true. Remove filter group
▼ Start a build under these conditions - optional Add fil Filter 1 Type REPOSITORY_NAME ▼ Pattern repository-name	uilds on webhook events from specific repo Webhook event filter groups A build is triggered if any filter group evaluates to true, which occurs Filter group 1 Event type - optional Add one or more webhook event filter groups to specify which even	s when all the filters in the group	Remove filter group
Filter 1 Type REPOSITORY_NAME Pattern repository-name	uilds on webhook events from specific repo Webhook event filter groups A build is triggered if any filter group evaluates to true, which occurs Filter group 1 Event type - optional Add one or more webhook event filter groups to specify which even	psitories. when all the filters in the group ts trigger a new build. If you do no your repository.	Remove filter group ot add a webhook event filter group
Type REPOSITORY_NAME Pattern repository-name	uilds on webhook events from specific reported Webhook event filter groups A build is triggered if any filter group evaluates to true, which occurs Filter group 1 Event type - optional Add one or more webhook event filter groups to specify which even then a new build is triggered every time a code change is pushed to	psitories. when all the filters in the group ts trigger a new build. If you do no your repository.	Remove filter group ot add a webhook event filter group
REPOSITORY_NAME Pattern repository-name	uilds on webhook events from specific reported webhook event filter groups Webhook event filter groups A build is triggered if any filter group evaluates to true, which occurs Filter group 1 Event type - optional Add one or more webhook event filter groups to specify which even then a new build is triggered every time a code change is pushed to WORKFLOW_JOB_QUEUED X	psitories. when all the filters in the group ts trigger a new build. If you do no your repository.	Remove filter group ot add a webhook event filter group
Pattern repository-name	uilds on webhook events from specific report Webhook event filter groups A build is triggered if any filter group evaluates to true, which occurs Filter group 1 Event type - optional Add one or more webhook event filter groups to specify which even then a new build is triggered every time a code change is pushed to WORKFLOW_JOB_QUEUED ★ Start a build under these conditions - optional	psitories. when all the filters in the group ts trigger a new build. If you do no your repository.	Remove filter group
repository-name	uilds on webhook events from specific report Webhook event filter groups A build is triggered if any filter group evaluates to true, which occurs Filter group 1 Event type - optional Add one or more webhook event filter groups to specify which event then a new build is triggered every time a code change is pushed to WORKFLOW_JOB_QUEUED X • Start a build under these conditions - optional	psitories. when all the filters in the group ts trigger a new build. If you do no your repository.	Remove filter group
	uilds on webhook events from specific report Webhook event filter groups A build is triggered if any filter group evaluates to true, which occurs Filter group 1 Event type - optional Add one or more webhook event filter groups to specify which even then a new build is triggered every time a code change is pushed to WORKFLOW_JOB_QUEUED × ▼ Start a build under these conditions - optional Filter 1 Type	estitories.	Remove filter group ot add a webhook event filter group Add filter
Pomovo	uilds on webhook events from specific report Webhook event filter groups A build is triggered if any filter group evaluates to true, which occurs Filter group 1 Event type - optional Add one or more webhook event filter groups to specify which event then a new build is triggered every time a code change is pushed to WORKFLOW_JOB_QUEUED X Start a build under these conditions - optional Filter 1 Type REPOSITORY_NAME	estitories.	Remove filter group ot add a webhook event filter group Add filter
Kelliove	uilds on webhook events from specific report Webhook event filter groups A build is triggered if any filter group evaluates to true, which occurs Filter group 1 Event type - optional Add one or more webhook event filter groups to specify which event then a new build is triggered every time a code change is pushed to WORKFLOW_JOB_QUEUED × ▼ Start a build under these conditions - optional Filter 1 Type REPOSITORY_NAME Pattern	estitories.	Remove filter group

You can also set the event type to WORKFLOW_JOB_QUEUED to set up self-hosted GitLab runners. For more information, see Self-managed GitLab runners in AWS CodeBuild.

3. Continue with the default values and then choose **Create build project**.

Filter GitLab group webhook events (AWS CloudFormation)

To use an AWS CloudFormation template to filter group webhook events, use the AWS CodeBuild project's ScopeConfiguration property. For more information about group GitLab webhooks, see <u>GitLab group webhooks</u>.

The following YAML-formatted portion of an AWS CloudFormation template creates four filter groups. Together, they trigger a build when one or all evaluate to true:

- The first filter group specifies pull requests are created or updated on branches with Git reference names that match the regular expression ^refs/heads/main\$ by a GitLab user who does not have account ID 12345.
- The second filter group specifies push requests are created on files with names that match the regular expression READ_ME in branches with Git reference names that match the regular expression ^refs/heads/.*.
- The third filter group specifies a push request with a head commit message matching the regular expression \[CodeBuild\].
- The fourth filter group specifies a GitLab CI/CD pipeline job request with a CI/CD pipeline name matching the regular expression \[CI-CodeBuild\].

```
CodeBuildProject:

Type: AWS::CodeBuild::Project

Properties:

Name: MyProject

ServiceRole: service-role

Artifacts:

Type: NO_ARTIFACTS

Environment:

Type: LINUX_CONTAINER

ComputeType: BUILD_GENERAL1_SMALL

Image: aws/codebuild/standard:5.0

Source:

Type: GITLAB
```

Location: source-location Triggers: Webhook: true ScopeConfiguration: Name: group-name FilterGroups: - Type: EVENT Pattern: PULL_REQUEST_CREATED,PULL_REQUEST_UPDATED - Type: BASE_REF Pattern: ^refs/heads/main\$ ExcludeMatchedPattern: false - Type: ACTOR_ACCOUNT_ID Pattern: 12345 ExcludeMatchedPattern: true - Type: EVENT Pattern: PUSH - Type: FILE_PATH Pattern: READ_ME ExcludeMatchedPattern: true - Type: FILE_PATH Pattern: PUSH - Type: COMMIT_MESSAGE Pattern: \[CodeBuild\] - Type: FILE_PATH Pattern: ^src/.+ ^test/.+ - Type: EVENT Pattern: WORKFLOW_JOB_QUEUED - Type: WORKFLOW_NAME Pattern: \[CI-CodeBuild\]		
<pre>Webhook: true ScopeConfiguration: Name: group-name FilterGroups: - Type: EVENT Pattern: PULL_REQUEST_CREATED,PULL_REQUEST_UPDATED - Type: BASE_REF Pattern: ^refs/heads/main\$ ExcludeMatchedPattern: false - Type: ACTOR_ACCOUNT_ID Pattern: 12345 ExcludeMatchedPattern: true - Type: EVENT Pattern: PUSH - Type: HEAD_REF Pattern: ^refs/heads/.* - Type: FILE_PATH Pattern: READ_ME ExcludeMatchedPattern: true - Type: EVENT Pattern: PUSH - Type: COMMIT_MESSAGE Pattern: \[CodeBuild\] - Type: FILE_PATH Pattern: \[CodeBuild\] - Type: FILE_PATH Pattern: ^src/.+ ^test/.+ - Type: EVENT Pattern: WORKFLOW_JOB_QUEUED - Type: WORKFLOW_NAME</pre>		
<pre>ScopeConfiguration: Name: group-name FilterGroups: - Type: EVENT Pattern: PULL_REQUEST_CREATED, PULL_REQUEST_UPDATED Type: BASE_REF Pattern: ^refs/heads/main\$ ExcludeMatchedPattern: false Type: ACTOR_ACCOUNT_ID Pattern: 12345 ExcludeMatchedPattern: true - Type: EVENT Pattern: PUSH Type: HEAD_REF Pattern: ^refs/heads/.* Type: FILE_PATH Pattern: READ_ME ExcludeMatchedPattern: true - Type: EVENT Pattern: PUSH Type: COMMIT_MESSAGE Pattern: \[CodeBuild\] Type: FILE_PATH Pattern: \[CodeBuild\] Type: FILE_PATH Pattern: ^src/.+ ^test/.+ - Type: EVENT Pattern: WORKFLOW_JOB_QUEUED Type: WORKFLOW_JOB_QUEUED Type: WORKFLOW_NAME</pre>	Triggers:	
<pre>Name: group-name FilterGroups: - Type: EVENT Pattern: PULL_REQUEST_CREATED, PULL_REQUEST_UPDATED Type: BASE_REF Pattern: ^refs/heads/main\$ ExcludeMatchedPattern: false Type: ACTOR_ACCOUNT_ID Pattern: 12345 ExcludeMatchedPattern: true Type: EVENT Pattern: PUSH Type: FILE_PATH Pattern: READ_ME ExcludeMatchedPattern: true Type: EVENT Pattern: PUSH Type: EVENT Pattern: PUSH Type: COMMIT_MESSAGE Pattern: \[CodeBuild\] Type: FILE_PATH Pattern: \[CodeBuild\] Type: WORKFLOW_JOB_QUEUED Type: WORKFLOW_NAME </pre>	Webhook: true	
<pre>FilterGroups: - Type: EVENT Pattern: PULL_REQUEST_CREATED, PULL_REQUEST_UPDATED - Type: BASE_REF Pattern: ^refs/heads/main\$ ExcludeMatchedPattern: false - Type: ACTOR_ACCOUNT_ID Pattern: 12345 ExcludeMatchedPattern: true - Type: EVENT Pattern: PUSH - Type: HEAD_REF Pattern: ^refs/heads/.* - Type: FILE_PATH Pattern: READ_ME ExcludeMatchedPattern: true - Type: EVENT Pattern: PUSH - Type: COMMIT_MESSAGE Pattern: \[CodeBuild\] - Type: FILE_PATH Pattern: \SCASAGE Pattern: ^src/.+[^test/.+ - Type: EVENT Pattern: WORKFLOW_JOB_QUEUED - Type: WORKFLOW_NAME</pre>	ScopeConfiguration:	
 Type: EVENT <pre>Pattern: PULL_REQUEST_CREATED, PULL_REQUEST_UPDATED</pre> Type: BASE_REF <pre>Pattern: ^refs/heads/main\$ ExcludeMatchedPattern: false</pre> <pre>Type: ACTOR_ACCOUNT_ID <pre>Pattern: 12345 ExcludeMatchedPattern: true</pre> <pre>Type: EVENT <pre>Pattern: PUSH</pre> <pre>Type: FILE_PATH <pre>Pattern: READ_ME ExcludeMatchedPattern: true</pre> <pre>Type: EVENT <pre>Pattern: PUSH</pre> <pre>Pattern: READ_ME ExcludeMatchedPattern: true</pre> <pre>Type: EVENT <pre>Pattern: PUSH</pre> <pre>Pattern: READ_ME ExcludeMatchedPattern: true</pre> <pre>Type: EVENT </pre> <pre>Pattern: PUSH</pre> <pre>Pattern: PUSH</pre> <pre>Pattern: PUSH</pre> <pre>Type: COMMIT_MESSAGE </pre> <pre>Pattern: \[CodeBuild\] </pre> <pre>Type: FILE_PATH </pre> <pre>Pattern: ^src/.+ ^test/.+</pre> </pre> <pre> Type: WORKFLOW_JOB_QUEUED </pre> <pre> Type: WORKFLOW_NAME </pre></pre></pre></pre></pre>	Name: group-name	
<pre>Pattern: PULL_REQUEST_CREATED, PULL_REQUEST_UPDATED - Type: BASE_REF Pattern: ^refs/heads/main\$ ExcludeMatchedPattern: false - Type: ACTOR_ACCOUNT_ID Pattern: 12345 ExcludeMatchedPattern: true - Type: EVENT Pattern: PUSH - Type: HEAD_REF Pattern: ^refs/heads/.* - Type: FILE_PATH Pattern: READ_ME ExcludeMatchedPattern: true - Type: EVENT Pattern: PUSH - Type: COMMIT_MESSAGE Pattern: \[CodeBuild\] - Type: FILE_PATH Pattern: ^src/.+ ^test/.+ - Type: EVENT Pattern: WORKFLOW_JOB_QUEUED - Type: WORKFLOW_NAME</pre>	FilterGroups:	
 Type: BASE_REF Pattern: ^refs/heads/main\$ ExcludeMatchedPattern: false Type: ACTOR_ACCOUNT_ID Pattern: 12345 ExcludeMatchedPattern: true Type: EVENT Pattern: PUSH Type: FILE_PATH Pattern: READ_ME ExcludeMatchedPattern: true Type: EVENT Pattern: PUSH Type: EVENT Pattern: PUSH Type: EVENT Pattern: PUSH Type: COMMIT_MESSAGE Pattern: \[CodeBuild\] Type: FILE_PATH Pattern: ^src/.+ ^test/.+ Type: EVENT Pattern: WORKFLOW_JOB_QUEUED Type: WORKFLOW_NAME 	Type: EVENT	
<pre>Pattern: ^refs/heads/main\$ ExcludeMatchedPattern: false Type: ACTOR_ACCOUNT_ID Pattern: 12345 ExcludeMatchedPattern: true Type: EVENT Pattern: PUSH Type: HEAD_REF Pattern: ^refs/heads/.* Type: FILE_PATH Pattern: READ_ME ExcludeMatchedPattern: true Type: EVENT Pattern: PUSH Type: COMMIT_MESSAGE Pattern: \[CodeBuild\] Type: FILE_PATH Pattern: ^src/.+ ^test/.+ Type: EVENT Pattern: WORKFLOW_JOB_QUEUED Type: WORKFLOW_NAME</pre>	Pattern: PULL_REQUEST_CREATED,PULL_REQUEST_UPDATED	
<pre>ExcludeMatchedPattern: false - Type: ACTOR_ACCOUNT_ID Pattern: 12345 ExcludeMatchedPattern: true - Type: EVENT Pattern: PUSH - Type: HEAD_REF Pattern: ^refs/heads/.* - Type: FILE_PATH Pattern: READ_ME ExcludeMatchedPattern: true - Type: EVENT Pattern: PUSH - Type: COMMIT_MESSAGE Pattern: \[CodeBuild\] - Type: FILE_PATH Pattern: ^src/.+ ^test/.+ - Type: EVENT Pattern: WORKFLOW_JOB_QUEUED - Type: WORKFLOW_NAME</pre>	- Type: BASE_REF	
 Type: ACTOR_ACCOUNT_ID Pattern: 12345 ExcludeMatchedPattern: true Type: EVENT Pattern: PUSH Type: HEAD_REF Pattern: ^refs/heads/.* Type: FILE_PATH Pattern: READ_ME ExcludeMatchedPattern: true Type: EVENT Pattern: PUSH Type: COMMIT_MESSAGE Pattern: \[CodeBuild\] Type: FILE_PATH Pattern: ^src/.+ ^test/.+ Type: EVENT Pattern: WORKFLOW_JOB_QUEUED Type: WORKFLOW_NAME 	Pattern: ^refs/heads/main\$	
<pre>Pattern: 12345 ExcludeMatchedPattern: true - Type: EVENT Pattern: PUSH - Type: HEAD_REF Pattern: ^refs/heads/.* - Type: FILE_PATH Pattern: READ_ME ExcludeMatchedPattern: true - Type: EVENT Pattern: PUSH - Type: COMMIT_MESSAGE Pattern: \[CodeBuild\] - Type: FILE_PATH Pattern: ^src/.+ ^test/.+ - Type: EVENT Pattern: WORKFLOW_JOB_QUEUED - Type: WORKFLOW_NAME</pre>	ExcludeMatchedPattern: false	
<pre>ExcludeMatchedPattern: true - Type: EVENT Pattern: PUSH - Type: HEAD_REF Pattern: ^refs/heads/.* - Type: FILE_PATH Pattern: READ_ME ExcludeMatchedPattern: true - Type: EVENT Pattern: PUSH - Type: COMMIT_MESSAGE Pattern: \[CodeBuild\] - Type: FILE_PATH Pattern: ^src/.+ ^test/.+ - Type: EVENT Pattern: WORKFLOW_JOB_QUEUED - Type: WORKFLOW_NAME</pre>	- Type: ACTOR_ACCOUNT_ID	
 Type: EVENT Pattern: PUSH Type: HEAD_REF Pattern: ^refs/heads/.* Type: FILE_PATH Pattern: READ_ME ExcludeMatchedPattern: true Type: EVENT Pattern: PUSH Type: COMMIT_MESSAGE Pattern: \[CodeBuild\] Type: FILE_PATH Pattern: ^src/.+ ^test/.+ Type: EVENT Pattern: WORKFLOW_JOB_QUEUED Type: WORKFLOW_NAME 	Pattern: 12345	
<pre>Pattern: PUSH - Type: HEAD_REF Pattern: ^refs/heads/.* - Type: FILE_PATH Pattern: READ_ME ExcludeMatchedPattern: true - Type: EVENT Pattern: PUSH - Type: COMMIT_MESSAGE Pattern: \[CodeBuild\] - Type: FILE_PATH Pattern: ^src/.+ ^test/.+ - Type: EVENT Pattern: WORKFLOW_JOB_QUEUED - Type: WORKFLOW_NAME</pre>	ExcludeMatchedPattern: true	
 Type: HEAD_REF Pattern: ^refs/heads/.* Type: FILE_PATH Pattern: READ_ME ExcludeMatchedPattern: true Type: EVENT Pattern: PUSH Type: COMMIT_MESSAGE Pattern: \[CodeBuild\] Type: FILE_PATH Pattern: ^src/.+ ^test/.+ Type: EVENT Pattern: WORKFLOW_JOB_QUEUED Type: WORKFLOW_NAME 	Type: EVENT	
<pre>Pattern: ^refs/heads/.* Type: FILE_PATH Pattern: READ_ME ExcludeMatchedPattern: true Type: EVENT Pattern: PUSH Type: COMMIT_MESSAGE Pattern: \[CodeBuild\] Type: FILE_PATH Pattern: ^src/.+ ^test/.+ Type: EVENT Pattern: WORKFLOW_JOB_QUEUED Type: WORKFLOW_NAME</pre>	Pattern: PUSH	
 Type: FILE_PATH <pre>Pattern: READ_ME ExcludeMatchedPattern: true</pre> Type: EVENT <pre>Pattern: PUSH Type: COMMIT_MESSAGE Pattern: \[CodeBuild\] Type: FILE_PATH Pattern: ^src/.+ ^test/.+</pre> Type: EVENT <pre>pattern: WORKFLOW_JOB_QUEUED Type: WORKFLOW_NAME </pre> 	- Type: HEAD_REF	
<pre>Pattern: READ_ME ExcludeMatchedPattern: true - Type: EVENT Pattern: PUSH - Type: COMMIT_MESSAGE Pattern: \[CodeBuild\] - Type: FILE_PATH Pattern: ^src/.+ ^test/.+ - Type: EVENT Pattern: WORKFLOW_JOB_QUEUED - Type: WORKFLOW_NAME</pre>	Pattern: ^refs/heads/.*	
<pre>ExcludeMatchedPattern: true ExcludeMatchedPattern: true Type: EVENT Pattern: PUSH Type: COMMIT_MESSAGE Pattern: \[CodeBuild\] Type: FILE_PATH Pattern: ^src/.+ ^test/.+ Type: EVENT Pattern: WORKFLOW_JOB_QUEUED Type: WORKFLOW_NAME</pre>	- Type: FILE_PATH	
 Type: EVENT Pattern: PUSH Type: COMMIT_MESSAGE Pattern: \[CodeBuild\] Type: FILE_PATH Pattern: ^src/.+ ^test/.+ Type: EVENT Pattern: WORKFLOW_JOB_QUEUED Type: WORKFLOW_NAME 	Pattern: READ_ME	
<pre>Pattern: PUSH - Type: COMMIT_MESSAGE Pattern: \[CodeBuild\] - Type: FILE_PATH Pattern: ^src/.+ ^test/.+ Type: EVENT Pattern: WORKFLOW_JOB_QUEUED - Type: WORKFLOW_NAME</pre>	ExcludeMatchedPattern: true	
 Type: COMMIT_MESSAGE Pattern: \[CodeBuild\] Type: FILE_PATH Pattern: ^src/.+ ^test/.+ Type: EVENT Pattern: WORKFLOW_JOB_QUEUED Type: WORKFLOW_NAME 	Type: EVENT	
<pre>Pattern: \[CodeBuild\] - Type: FILE_PATH Pattern: ^src/.+ ^test/.+ - Type: EVENT Pattern: WORKFLOW_JOB_QUEUED - Type: WORKFLOW_NAME</pre>	Pattern: PUSH	
 Type: FILE_PATH Pattern: ^src/.+ ^test/.+ Type: EVENT Pattern: WORKFLOW_JOB_QUEUED Type: WORKFLOW_NAME 	- Type: COMMIT_MESSAGE	
Pattern: ^src/.+ ^test/.+ Type: EVENT Pattern: WORKFLOW_JOB_QUEUED - Type: WORKFLOW_NAME	Pattern: \[CodeBuild\]	
 - Type: EVENT Pattern: WORKFLOW_JOB_QUEUED - Type: WORKFLOW_NAME 	- Type: FILE_PATH	
 - Type: EVENT Pattern: WORKFLOW_JOB_QUEUED - Type: WORKFLOW_NAME 	Pattern: ^src/.+ ^test/.+	
Pattern: WORKFLOW_JOB_QUEUED - Type: WORKFLOW_NAME		
- Type: WORKFLOW_NAME		

GitLab webhook events

You can use webhook filter groups to specify which GitLab webhook events trigger a build. For example, you can specify that a build is only triggered for changes to specific branches.

You can create one or more webhook filter groups to specify which webhook events trigger a build. A build is triggered if any filter group evaluates to true, which occurs when all the filters in the group evaluate to true. When you create a filter group, you specify:

An event

For GitLab, you can choose one or more of the following events: PUSH, PULL_REQUEST_CREATED, PULL_REQUEST_UPDATED, PULL_REQUEST_MERGED, PULL_REQUEST_REOPENED, PULL_REQUEST_CLOSED, RELEASED, and WORKFLOW_JOB_QUEUED.

The webhook's event type is in its header in the X-GitLab-Event field. The following table shows how X-GitLab-Event header values map to the event types. For the Merge Request Hook webhook event, the payload's object_attributes.action will contain additional information on merge request type.

X-GitLab-Event Header value	object_atttributes .action	Event type
Push Hook	N/A	PUSH
Merge Request Hook	open	PULL_REQUEST_CREATED
Merge Request Hook	update	PULL_REQUEST_UPDATED
Merge Request Hook	close, merge	PULL_REQUEST_MERGED
Merge Request Hook	reopen	PULL_REQUEST_REOPE NED
Merge Request Hook	close	PULL_REQUEST_CLOSED
Release Hook	create, update	RELEASED
Job Hook	N/A	WORKFLOW_JOB_QUEUED

For PULL_REQUEST_MERGED, if a pull request is merged with the squash strategy and the pull request branch is closed, the original pull request commit no longer exists. In this case, the CODEBUILD_WEBHOOK_MERGE_COMMIT environment variable contains the identifier of the squashed merge commit.

One or more optional filters

Use a regular expression to specify a filter. For an event to trigger a build, every filter within the group associated with it must evaluate to true.

ACTOR_ACCOUNT_ID (ACTOR_ID in the console)

A webhook event triggers a build when a GitLab account ID matches the regular expression pattern. This value appears in the account_id property of the actor object in the webhook filter payload.

HEAD_REF

A webhook event triggers a build when the head reference matches the regular expression pattern (for example, refs/heads/branch-name and refs/tags/tag-name). A HEAD_REF filter evaluates the Git reference name for the branch or tag. The branch or tag name appears in the name field of the new object in the push object of the webhook payload. For pull request events, the branch name appears in the name field in the branch object of the source object in the webhook payload.

BASE_REF

A webhook event triggers a build when the base reference matches the regular expression pattern. A BASE_REF filter works with pull request events only (for example, refs/heads/branch-name). A BASE_REF filter evaluates the Git reference name for the branch. The branch name appears in the name field of the branch object in the destination object in the webhook payload.

FILE_PATH

A webhook triggers a build when the path of a changed file matches the regular expression pattern.

COMMIT_MESSAGE

A webhook triggers a build when the head commit message matches the regular expression pattern.

WORKFLOW_NAME

A webhook triggers a build when the workflow name matches the regular expression pattern.

(i) Note

You can find the webhook payload in the webhook settings of your GitLab repository.

Topics

- Filter GitLab webhook events (console)
- Filter GitLab webhook events (SDK)
- Filter GitLab webhook events (AWS CloudFormation)

Filter GitLab webhook events (console)

Use the following instructions to use the AWS Management Console to filter webhook events. For more information about GitLab webhook events, see <u>GitLab webhook events</u>.

- 1. Select **Rebuild every time a code change is pushed to this repository** when you create your project.
- 2. From **Event type**, choose one or more events.
- 3. To filter when an event triggers a build, under **Start a build under these conditions**, add one or more optional filters.
- 4. To filter when an event is not triggered, under **Don't start a build under these conditions**, add one or more optional filters.
- 5. Choose **Add filter group** to add another filter group.

For more information, see <u>Create a build project (console)</u> and <u>WebhookFilter</u> in the AWS CodeBuild API Reference.

In this example, a webhook filter group triggers a build for pull requests only:

Filter group 1	Remove filter group
	Remove inter group
Event type	
Add one or more webhook event filter groups to specify which events trigger a new build. If you do not add then a new build is triggered every time a code change is pushed to your repository.	l a webhook event filter group,
•	
PULL_REQUEST_CREATED × PULL_REQUEST_UPDATED ×	
PULL_REQUEST_MERGED ×	
Start a build under these conditions - optional	

Using an example of two filter groups, a build is triggered when one or both evaluate to true:

Don't start a build under these conditions - optional

- The first filter group specifies pull requests that are created or updated on branches with Git reference names that match the regular expression <code>^refs/heads/main\$</code> and head references that match <code>^refs/heads/branch1!</code>.
- The second filter group specifies push requests on branches with Git reference names that match the regular expression ^refs/heads/branch1\$.

Webhook event filter groups

A build is triggered if any filter group evaluates to true, which occurs when all the filters in the group evaluate to true.

Filter group 1	Remove filter group
Event type Add one or more webhook event filter groups to specify which events trigger a new build. If you do not ad hen a new build is triggered every time a code change is pushed to your repository.	d a webhook event filter group,
•	
PULL_REQUEST_CREATED X PULL_REQUEST_UPDATED X	
Start a build under these conditions - optional	Add filter
Filter 1	
Гуре	
HEAD_REF	
Pattern	
^refs/heads/branch1\$	
Remove	
Filter 2	
Гуре	
BASE_REF	
Pattern	
^refs/heads/main	
Remove	
Don't start a build under these conditions - optional	
	F
Filter group 2	Remove filter group
Event type Add one or more webhook event filter groups to specify which events trigger a new build. If you do not add hen a new build is triggered every time a code change is pushed to your repository.	d a webhook event filter group,
PUSH X	
ab webhook events Start a build under these conditions - optional	

т.

In this example, a webhook filter group triggers a build for all requests except tag events.

Filter group 1	Remove filter group
Event type Add one or more webhook event filter groups to specify which events trigger a new build. If you do not add then a new build is triggered every time a code change is pushed to your repository.	l a webhook event filter group,
•	
PUSH X PULL_REQUEST_CREATED X PULL_REQUEST_UPDATED X	
PULL_REQUEST_MERGED ×	
Start a build under these conditions - optional	
Don't start a build under these conditions - optional	Add filter
Filter 1	
Туре	
HEAD_REF	
Pattern	
^refs/tags/.*	

In this example, a webhook filter group triggers a build only when files with names that match the regular expression ^buildspec.* change.

A build is triggered if any filter group evaluates to true, which occurs when all the filters in the group evaluate to true.

Filter group 1	Remove filter group
Event type Add one or more webhook event filter groups to specify which events trigger a new build. If you do not add then a new build is triggered every time a code change is pushed to your repository.	l a webhook event filter group,
PUSH X	
Start a build under these conditions - optional	Add filter
Filter 1	
Туре	
FILE_PATH	
Pattern	
^buildspec.*	
Remove	

Don't start a build under these conditions - optional

In this example, a webhook filter group triggers a build only when files are changed in src or test folders.

A build is triggered if any filter group evaluates to true, which occurs when all the filters in the group evaluate to true.

Filter group 1	Remove filter group
Event type	
Add one or more webhook event filter groups to specify which events trigger a new build. If you do not ad then a new build is triggered every time a code change is pushed to your repository.	d a webhook event filter group,
PUSH X	
Start a build under these conditions - optional	Add filter
Filter 1	
Туре	
FILE_PATH	
Pattern	
^src/.+ ^test/.+	
Remove	

Don't start a build under these conditions - optional

In this example, a webhook filter group triggers a build only when a change is made by a GitLab user who does not have an account ID that matches the regular expression actor-account-id.



For information about how to find your GitLab account ID, see https://api.github.com/ users/user-name, where user-name is your GitLab user name.

A build is triggered if any filter group evaluates to true, which occurs when all the filters in the group evaluate to true.

Filter group 1	Remove filter group
Event type Add one or more webhook event filter groups to specify which events trigger a new build. If you do not add then a new build is triggered every time a code change is pushed to your repository.	a webhook event filter group,
•	
PUSH X	
Start a build under these conditions - optional	Add filter
Filter 1	
Туре	
ACTOR_ACCOUNT_ID	
Pattern	
actor-account-id	
Remove	

Don't start a build under these conditions - optional

In this example, a webhook filter group triggers a build for a push event when the head commit message matches the regular expression \[CodeBuild\].

A build is triggered if any filter group evaluates to true, which occurs when all the filters in the group evaluate to true.

Filter group 1	Remove filter group
Event type Add one or more webhook event filter groups to specify which events trigger a new build. If you do not ad then a new build is triggered every time a code change is pushed to your repository.	dd a webhook event filter group,
PUSH X	
Start a build under these conditions - optional	Add filter
Filter 1	
Туре	
COMMIT_MESSAGE	
Pattern	
\[CodeBuild]\	
Remove	

Don't start a build under these conditions - optional

Filter GitLab webhook events (SDK)

To use the AWS CodeBuild SDK to filter webhook events, use the filterGroups field in the request syntax of the CreateWebhook or UpdateWebhook API methods. For more information, see WebhookFilter in the CodeBuild API Reference.

For more information about GitLab webhook events, see GitLab webhook events.

To create a webhook filter that triggers a build for pull requests only, insert the following into the request syntax:

```
"filterGroups": [
[
{
"type": "EVENT",
```

```
User Guide
```

```
"pattern": "PULL_REQUEST_CREATED, PULL_REQUEST_UPDATED, PULL_REQUEST_MERGED"
}
]
```

To create a webhook filter that triggers a build for specified branches only, use the pattern parameter to specify a regular expression to filter branch names. Using an example of two filter groups, a build is triggered when one or both evaluate to true:

- The first filter group specifies pull requests that are created or updated on branches with Git reference names that match the regular expression <code>^refs/heads/main\$</code> and head references that match <code>^refs/heads/myBranch\$</code>.
- The second filter group specifies push requests on branches with Git reference names that match the regular expression <code>^refs/heads/myBranch\$</code>.

```
"filterGroups": [
 Ε
    {
      "type": "EVENT",
      "pattern": "PULL_REQUEST_CREATED, PULL_REQUEST_UPDATED"
    },
    {
      "type": "HEAD_REF",
      "pattern": "^refs/heads/myBranch$"
    },
    {
      "type": "BASE_REF",
      "pattern": "^refs/heads/main$"
    }
 ],
 Ε
    {
      "type": "EVENT",
      "pattern": "PUSH"
    },
    {
      "type": "HEAD_REF",
      "pattern": "^refs/heads/myBranch$"
    }
  ٦
```

]

You can use the excludeMatchedPattern parameter to specify which events do not trigger a build. In this example, a build is triggered for all requests except tag events.

You can create a filter that triggers a build only when a change is made by a GitLab user with account ID actor-account-id.

i Note

For information about how to find your GitLab account ID, see https://api.github.com/ users/user-name, where user-name is your GitLab user name.

]

You can create a filter that triggers a build only when files with names that match the regular expression in the pattern argument change. In this example, the filter group specifies that a build is triggered only when files with a name that matches the regular expression ^buildspec.* change.

In this example, the filter group specifies that a build is triggered only when files are changed in src or test folders.

You can create a filter that triggers a build only when the head commit message matches the regular expression in the pattern argument. In this example, the filter group specifies that a build is triggered only when the head commit message of the push event matches the regular expression \[CodeBuild\].

Filter GitLab webhook events (AWS CloudFormation)

To use an AWS CloudFormation template to filter webhook events, use the AWS CodeBuild project's FilterGroups property. For more information about GitLab webhook events, see <u>GitLab</u> webhook events.

The following YAML-formatted portion of an AWS CloudFormation template creates two filter groups. Together, they trigger a build when one or both evaluate to true:

- The first filter group specifies pull requests are created or updated on branches with Git reference names that match the regular expression ^refs/heads/main\$ by a GitLab user who does not have account ID 12345.
- The second filter group specifies push requests are created on branches with Git reference names that match the regular expression <code>^refs/heads/.*</code>.
- The third filter group specifies a push request with a head commit message matching the regular expression \[CodeBuild\].

```
CodeBuildProject:

Type: AWS::CodeBuild::Project

Properties:

Name: MyProject

ServiceRole: service-role

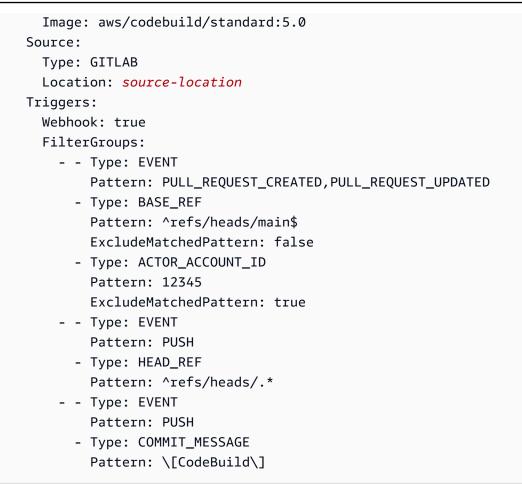
Artifacts:

Type: NO_ARTIFACTS

Environment:

Type: LINUX_CONTAINER

ComputeType: BUILD_GENERAL1_SMALL
```



View a build project's details in AWS CodeBuild

You can use the AWS CodeBuild console, AWS CLI, or AWS SDKs to view the details of a build project in CodeBuild.

Topics

- View a build project's details (console)
- View a build project's details (AWS CLI)
- View a build project's details (AWS SDKs)

View a build project's details (console)

- Open the AWS CodeBuild console at <u>https://console.aws.amazon.com/codesuite/codebuild/</u> home.
- 2. In the navigation pane, choose **Build projects**.

🚯 Note

By default, only the 10 most recent build projects are displayed. To view more build projects, choose the gear icon, and then choose a different value for **Projects per page** or use the back and forward arrows.

- 3. In the list of build projects, in the **Name** column, choose the link for the build project.
- 4. On the **Build project:** *project-name* page, choose **Build details**.

View a build project's details (AWS CLI)

Run the **batch-get-projects** command:

aws codebuild batch-get-projects --names names

In the preceding command, replace the following placeholder:

 names: Required string used to indicate one or more build project names to view details about. To specify more than one build project, separate each build project's name with a space. You can specify up to 100 build project names. To get a list of build projects, see <u>View a list of build</u> project names (AWS CLI).

For example, if you run this command:

```
aws codebuild batch-get-projects --names codebuild-demo-project codebuild-demo-project2
my-other-demo-project
```

A result similar to the following might appear in the output. Ellipses (...) are used to represent data omitted for brevity.

```
{
    "projectsNotFound": [
        "my-other-demo-project"
],
    "projects": [
        {
        ...
```

```
"name": codebuild-demo-project,
...
},
{
...
"name": codebuild-demo-project2",
...
}
]
```

In the preceding output, the projectsNotFound array lists any build project names that were specified, but not found. The projects array lists details for each build project where information was found. Build project details have been omitted from the preceding output for brevity. For more information, see the output of <u>Create a build project (AWS CLI)</u>.

The **batch-get-projects** command does not support filtering for certain property values, but you can write a script that enumerates the properties for a project. For example, the following Linux shell script enumerates the projects in the current region for the current account, and prints the image used by each project.

```
#!/usr/bin/sh
# This script enumerates all of the projects for the current account
# in the current region and prints out the image that each project is using.
imageName=""
function getImageName(){
  local environmentValues=(${1//$'\t'/ })
  imageName=${environmentValues[1]}
}
function processProjectInfo() {
  local projectInfo=$1
  while IFS=$'\t' read -r section value; do
    if [[ "$section" == *"ENVIRONMENT"* ]]; then
      getImageName "$value"
    fi
  done <<< "$projectInfo"</pre>
}
```

For more information about using the AWS CLI with AWS CodeBuild, see the <u>Command line</u> <u>reference</u>.

View a build project's details (AWS SDKs)

For more information about using AWS CodeBuild with the AWS SDKs, see the <u>AWS SDKs and tools</u> reference.

View build project names in AWS CodeBuild

You can use the AWS CodeBuild console, AWS CLI, or AWS SDKs to view a list of build projects in CodeBuild.

Topics

- View a list of build project names (console)
- View a list of build project names (AWS CLI)
- View a list of build project names (AWS SDKs)

View a list of build project names (console)

You can view a list of build projects in an AWS Region in the console. Information includes the name, source provider, repository, latest build status, and description, if any.

- Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.
- 2. In the navigation pane, choose **Build projects**.

i Note

By default, only the 10 most recent build projects are displayed. To view more build projects, choose the gear icon, and then choose a different value for **Projects per page** or use the back and forward arrows.

View a list of build project names (AWS CLI)

Run the **list-projects** command:

```
aws codebuild list-projects --sort-by sort-by --sort-order sort-order --next-token next-token
```

In the preceding command, replace the following placeholders:

- sort-by: Optional string used to indicate the criterion to be used to list build project names.
 Valid values include:
 - CREATED_TIME: List the build project names based on when each build project was created.
 - LAST_MODIFIED_TIME: List the build project names based on when information about each build project was last changed.
 - NAME: List the build project names based on each build project's name.
- sort-order: Optional string used to indicate the order in which to list build projects, based on sort-by. Valid values include ASCENDING and DESCENDING.
- next-token: Optional string. During a previous run, if there were more than 100 items in the list, only the first 100 items are returned, along with a unique string called *next token*. To get the next batch of items in the list, run this command again, adding the next token to the call. To get

all of the items in the list, keep running this command with each subsequent next token, until no more next tokens are returned.

For example, if you run this command:

```
aws codebuild list-projects --sort-by NAME --sort-order ASCENDING
```

A result similar to the following might appear in the output:

```
{
   "nextToken": "Ci33ACF6...The full token has been omitted for brevity...U+AkMx8=",
   "projects": [
      "codebuild-demo-project",
      "codebuild-demo-project2",
      ... The full list of build project names has been omitted for brevity ...
   "codebuild-demo-project99"
]
}
```

If you run this command again:

```
aws codebuild list-projects --sort-by NAME --sort-order ASCENDING --next-token
Ci33ACF6...The full token has been omitted for brevity...U+AkMx8=
```

A result similar to the following might appear in the output:

```
{
   "projects": [
    "codebuild-demo-project100",
    "codebuild-demo-project101",
    ... The full list of build project names has been omitted for brevity ...
    "codebuild-demo-project122"
]
}
```

View a list of build project names (AWS SDKs)

For more information about using AWS CodeBuild with the AWS SDKs, see the <u>AWS SDKs and tools</u> reference.

View a list of build project names (AWS SDKs)

User Guide

Builds in AWS CodeBuild

A *build* represents a set of actions performed by AWS CodeBuild to create output artifacts (for example, a JAR file) based on a set of input artifacts (for example, a collection of Java class files).

The following rules apply when you run multiple builds:

- When possible, builds run concurrently. The maximum number of concurrently running builds can vary. For more information, see <u>Quotas for AWS CodeBuild</u>.
- If the build project has a concurrent build limit set, builds return an error if the number of running builds reaches the concurrent build limit for the project. For more information, see Enable concurrent build limit.
- If the build project does not have a concurrent build limit set, builds are queued if the number of running builds reaches the concurrent build limit for the platform and compute type. The maximum number of builds in a queue is five times the concurrent build limit. For more information, see Quotas for AWS CodeBuild.

A build in a queue that does not start after the number of minutes specified in its time out value is removed from the queue. The default timeout value is eight hours. You can override the build queue timeout with a value between five minutes and eight hours when you run your build. For more information, see Run AWS CodeBuild builds manually.

It is not possible to predict the order in which queued builds start.

Note

You can access the history of a build for one year.

You can perform these tasks when working with builds:

Topics

- Run AWS CodeBuild builds manually
- Run builds on AWS Lambda compute
- <u>Run builds on reserved capacity fleets</u>
- <u>Run builds in batches</u>

- <u>Cache builds to improve performance</u>
- Delete builds in AWS CodeBuild
- <u>Retry builds in AWS CodeBuild</u>
- Stop builds in AWS CodeBuild
- Stop batch builds in AWS CodeBuild
- Trigger AWS CodeBuild builds automatically
- View build details in AWS CodeBuild
- View a list of build IDs in AWS CodeBuild
- View a list of build IDs for a build project in AWS CodeBuild
- View a running build in Session Manager

Run AWS CodeBuild builds manually

You can use the AWS CodeBuild console, AWS CLI, or AWS SDKs to run a build in CodeBuild.

Topics

- Run builds locally with the AWS CodeBuild agent
- Run a build (console)
- Run a build (AWS CLI)
- Run a batch build (AWS CLI)
- Start running builds automatically (AWS CLI)
- Stop running builds automatically (AWS CLI)
- Run a build (AWS SDKs)

Run builds locally with the AWS CodeBuild agent

You can use the AWS CodeBuild agent to run CodeBuild builds on a local machine. There are agents available for x86_64 and ARM platforms.

You can also subscribe to receive notifications when new versions of the agent are published.

Prerequisites

Before you begin, you need to do the following:

- Install Git on your local machine.
- Install and set up Docker on your local machine.

Set up the build image

You only need to set up the build image the first time you run the agent, or when the image has changed.

To set up the build image

 If you want to use a curated Amazon Linux 2 image, you can pull it from the CodeBuild public Amazon ECR repository at <u>https://gallery.ecr.aws/codebuild/amazonlinux2-x86_64-standard</u> with the following command:

\$ docker pull public.ecr.aws/codebuild/amazonlinux2-x86_64-standard:4.0

Alternatively, if you want to use another Linux image, perform the following steps:

a. Clone the CodeBuild image repo:

\$ git clone https://github.com/aws/aws-codebuild-docker-images.git

b. Change to the image directory. For this example, use the aws/codebuild/ standard:5.0 image:

\$ cd aws-codebuild-docker-images/ubuntu/standard/5.0

c. Build the image. This will take several minutes.

\$ docker build -t aws/codebuild/standard:5.0 .

2. Download the CodeBuild agent.

To download the x86_64 version of the agent, run the following command:

\$ docker pull public.ecr.aws/codebuild/local-builds:latest

To download the ARM version of the agent, run the following command:

\$ docker pull public.ecr.aws/codebuild/local-builds:aarch64

3. The CodeBuild agent is available from https://gallery.ecr.aws/codebuild/local-builds.

The Secure Hash Algorithm (SHA) signature for the x86_64 version of the agent is:

sha256:ccb19bdd7af94e4dc761e4c58c267e9455c28ec68d938086b4dc1cf8fe6b0940

The SHA signature for the ARM version of the agent is:

sha256:7d7b5d35d2ac4e062ae7ba8c662ffed15229a52d09bd0d664a7816c439679192

You can use the SHA to identify the version of the agent. To see the agent's SHA signature, run the following command and look for the SHA under RepoDigests:

\$ docker inspect public.ecr.aws/codebuild/local-builds:latest

Run the CodeBuild agent

To run the CodeBuild agent

- 1. Change to the directory that contains your build project source.
- 2. Download the codebuild_build.sh script:

```
$ curl -0 https://raw.githubusercontent.com/aws/aws-codebuild-docker-images/
master/local_builds/codebuild_build.sh
$ chmod +x codebuild_build.sh
```

3. Run the codebuild_build.sh script and specify your container image and the output directory.

To run an x86_64 build, run the following command:

\$./codebuild_build.sh -i <container-image> -a <output directory>

To run an ARM build, run the following command:

```
$ ./codebuild_build.sh -i <container-image> -a <output directory> -l
public.ecr.aws/codebuild/local-builds:aarch64
```

Replace <container-image> with the name of the container image, such as aws/ codebuild/standard:5.0 or public.ecr.aws/codebuild/amazonlinux2-x86_64standard:4.0.

The script launches the build image and runs the build on the project in the current directory. To specify the location of the build project, add the -s *solution solution solution*

Receive notifications for new CodeBuild agent versions

You can subscribe to Amazon SNS notifications so you will be notified when new versions of the AWS CodeBuild agent are released.

To subscribe to CodeBuild agent notifications

- 1. Open the Amazon SNS console at https://console.aws.amazon.com/sns/v3/home.
- In the navigation bar, if it's not already selected, change the AWS Region to US East (N. Virginia). You must select this AWS Region because the Amazon SNS notifications that you are subscribing to are created in this Region.
- 3. In the navigation pane, choose **Subscriptions**.
- 4. Choose **Create subscription**.
- 5. In **Create subscription**, do the following:
 - a. For **Topic ARN**, use the following Amazon Resource Name (ARN):

arn:aws:sns:us-east-1:850632864840:AWS-CodeBuild-Local-Agent-Updates

- b. For **Protocol**, choose **Email** or **SMS**.
- c. For **Endpoint**, choose where (email or SMS) to receive the notifications. Enter an email or address or phone number, including area code.
- d. Choose Create subscription.
- e. Choose **Email** to receive an email asking you to confirm your subscription. Follow the directions in the email to complete your subscription.

If you no longer want to receive these notifications, use the following procedure to unsubscribe.

To unsubscribe from CodeBuild agent notifications

- 1. Open the Amazon SNS console at https://console.aws.amazon.com/sns/v3/home.
- 2. In the navigation pane, choose **Subscriptions**.
- 3. Select the subscription and from **Actions**, choose **Delete subscriptions**. When you are prompted to confirm, choose **Delete**.

Run a build (console)

To use AWS CodePipeline to run a build with CodeBuild, skip these steps and follow the instructions in <u>Use CodeBuild with CodePipeline</u>.

- Open the AWS CodeBuild console at <u>https://console.aws.amazon.com/codesuite/codebuild/</u> home.
- 2. In the navigation pane, choose **Build projects**.
- 3. In the list of build projects, choose the build project.
- 4. You can run the build with the default build project settings, or override build settings for this build only.
 - a. If you want to run the build with the default build project settings, choose **Start build**. The build starts immediately.
 - b. If you want to override the default build project settings, choose **Start build with overrides**. In the **Start build** page, you can override the following:
 - Build configuration
 - Source
 - Environment variable overrides

If you need to select more advanced overrides, choose **Advanced build overrides**. In this page, you can override the following:

• Build configuration

- Source
- Environment
- Buildspec
- Artifacts
- Logs

When you have made your override selections, choose Start build.

For detailed information about this build, see View build details (console).

Run a build (AWS CLI)

1 Note

To use CodePipeline to run a build with AWS CodeBuild, skip these steps and follow the instructions in <u>Create a pipeline that uses CodeBuild (AWS CLI)</u>. For more information about using the AWS CLI with CodeBuild, see the <u>Command line</u> <u>reference</u>.

1. Run the start-build command in one of the following ways:

aws codebuild start-build --project-name <project-name>

Use this if you want to run a build that uses the latest version of the build input artifact and the build project's existing settings.

aws codebuild start-build --generate-cli-skeleton

Use this if you want to run a build with an earlier version of the build input artifact or if you want to override the settings for the build output artifacts, environment variables, buildspec, or default build timeout period.

 If you run the start-build command with the --project-name option, replace <projectname> with the name of the build project, and then skip to step 6 of this procedure. To get a list of build projects, see View build project names.

- 3. If you run the start-build command with the --idempotency-token option, a unique case-sensitive identifier or token, is included with the start-build request. The token is valid for 5 minutes after the request. If you repeat the start-build request with the same token, but change a parameter, CodeBuild returns a parameter mismatch error.
- 4. If you run the start-build command with the --generate-cli-skeleton option, JSON-formatted data appears in the output. Copy the data to a file (for example, startbuild.json) in a location on the local computer or instance where the AWS CLI is installed. Modify the copied data to match the following format, and save your results:

```
{
  "projectName": "projectName",
  "sourceVersion": "sourceVersion",
  "artifactsOverride": {
    "type": "type",
    "location": "location",
    "path": "path",
    "namespaceType": "namespaceType",
    "name": "artifactsOverride-name",
    "packaging": "packaging"
 },
  "buildspecOverride": "buildspecOverride",
  "cacheOverride": {
    "location": "cacheOverride-location",
    "type": "cacheOverride-type"
 },
  "certificateOverride": "certificateOverride",
  "computeTypeOverride": "computeTypeOverride",
  "environmentTypeOverride": "environmentTypeOverride",
  "environmentVariablesOverride": {
    "name": "environmentVariablesOverride-name",
    "value": "environmentVariablesValue",
    "type": "environmentVariablesOverride-type"
 },
  "gitCloneDepthOverride": "gitCloneDepthOverride",
  "imageOverride": "imageOverride",
  "idempotencyToken": "idempotencyToken",
  "insecureSslOverride": "insecureSslOverride",
  "privilegedModeOverride": "privilegedModeOverride",
  "queuedTimeoutInMinutesOverride": "queuedTimeoutInMinutesOverride",
  "reportBuildStatusOverride": "reportBuildStatusOverride",
  "timeoutInMinutesOverride": "timeoutInMinutesOverride",
  "sourceAuthOverride": "sourceAuthOverride",
```

```
"sourceLocationOverride": "sourceLocationOverride",
"serviceRoleOverride": "serviceRoleOverride",
"sourceTypeOverride": "sourceTypeOverride"
}
```

Replace the following placeholders:

- *projectName*: Required string. The name of the build project to use for this build.
- *sourceVersion*: Optional string. A version of the source code to be built, as follows:
 - For Amazon S3, the version ID that corresponds to the version of the input ZIP file you want to build. If *sourceVersion* is not specified, then the latest version is used.
 - For CodeCommit, the commit ID that corresponds to the version of the source code you
 want to build. If *sourceVersion* is not specified, the default branch's HEAD commit ID is
 used. (You cannot specify a tag name for *sourceVersion*, but you can specify the tag's
 commit ID.)
 - For GitHub, the commit ID, pull request ID, branch name, or tag name that corresponds to the version of the source code you want to build. If a pull request ID is specified, it must use the format pr/pull-request-ID (for example, pr/25). If a branch name is specified, the branch's HEAD commit ID is used. If sourceVersion is not specified, the default branch's HEAD commit ID is used.
 - For Bitbucket, the commit ID, branch name, or tag name that corresponds to the version of the source code you want to build. If a branch name is specified, the branch's HEAD commit ID is used. If *sourceVersion* is not specified, the default branch's HEAD commit ID is used.
- The following placeholders are for artifactsOverride.
 - *type*: Optional. The build output artifact type that overrides for this build the one defined in the build project.
 - *location*: Optional. The build output artifact location that overrides for this build the one defined in the build project.
 - *path*: Optional. The build output artifact path that overrides for this build the one defined in the build project.
 - *namespaceType*: Optional. The build output artifact path type that overrides for this build the one defined in the build project.
 - *name*: Optional. The build output artifact name that overrides for this build the one defined in the build project.

- *packaging*: Optional. The build output artifact packaging type that overrides for this build the one defined in the build project.
- buildspecOverride: Optional. A buildspec declaration that overrides for this build the one defined in the build project. If this value is set, it can be either an inline buildspec definition, the path to an alternate buildspec file relative to the value of the built-in CODEBUILD_SRC_DIR environment variable, or the path to an S3 bucket. The S3 bucket must be in the same AWS Region as the build project. Specify the buildspec file using its ARN (for example, arn:aws:s3:::<my-codebuild-sample2>/buildspec.yml). If this value is not provided or is set to an empty string, the source code must contain a buildspec.yml file in its root directory. For more information, see <u>Buildspec file name and storage location</u>.
- The following placeholders are for cacheOverride.
 - cacheOverride-location: Optional. The location of a ProjectCache object for this build that overrides the ProjectCache object specified in the build project. cacheOverride is optional and takes a ProjectCache object. location is required in a ProjectCache object.
 - cacheOverride-type: Optional. The type of a ProjectCache object for this build that overrides the ProjectCache object specified in the build project. cacheOverride is optional and takes a ProjectCache object. type is required in a ProjectCache object.
- *certificate0verride*: Optional. The name of a certificate for this build that overrides the one specified in the build project.
- environmentTypeOverride: Optional. A container type for this build that overrides the one specified in the build project. The current valid string is LINUX_CONTAINER.
- The following placeholders are for environmentVariablesOverride.
 - *environmentVariables0verride-name*: Optional. The name of an environment variable in the build project whose value you want to override for this build.
 - *environmentVariablesOverride-type*: Optional. The type of environment variable in the build project whose value you want to override for this build.
 - *environmentVariablesValue*: Optional. The value of the environment variable defined in the build project that you want to override for this build.
- *gitCloneDepthOverride*: Optional. The value of the **Git clone depth** in the build project whose value you want to override for this build. If your source type is Amazon S3, this value is not supported.

- *imageOverride*: Optional. The name of an image for this build that overrides the one specified in the build project.
- *idempotencyToken*: Optional. A string that serves as a token to specify that the build request is idempotent. You can choose any string that is 64 characters or less. The token is valid for 5 minutes after the start-build request. If you repeat the start-build request with the same token, but change a parameter, CodeBuild returns a parameter mismatch error.
- *insecureSsl0verride*: Optional boolean that specifies whether to override the insecure TLS setting specified in the build project. The insecure TLS setting determines whether to ignore TLS warnings while connecting to the project source code. This override applies only if the build's source is GitHub Enterprise Server.
- *privilegedModeOverride*: Optional boolean. If set to true, the build overrides privileged mode in the build project.
- *queuedTimeoutInMinutesOverride*: Optional integer that specifies the number of minutes a build is allowed to be queued before it times out. Its minimum value is five minutes and its maximum value is 480 minutes (eight hours).
- reportBuildStatusOverride: Optional boolean that specifies whether to send your source provider the status of a build's start and completion. If you set this with a source provider other than GitHub, GitHub Enterprise Server, or Bitbucket, an invalidInputException is thrown.
- sourceAuthOverride: Optional string. An authorization type for this build that overrides the one defined in the build project. This override applies only if the build project's source is Bitbucket or GitHub.
- *sourceLocationOverride*: Optional string. A location that overrides for this build the source location for the one defined in the build project.
- *serviceRoleOverride*: Optional string. The name of a service role for this build that overrides the one specified in the build project.
- sourceTypeOverride: Optional string. A source input type for this build that overrides the source input defined in the build project. Valid strings are NO_SOURCE, CODECOMMIT, CODEPIPELINE, GITHUB, S3, BITBUCKET, and GITHUB_ENTERPRISE.
- *timeoutInMinutesOverride*: Optional number. The number of build timeout minutes that overrides for this build the one defined in the build project.

We recommend that you store an environment variable with a sensitive value, such as an AWS access key ID, an AWS secret access key, or a password as a parameter in Amazon EC2

Systems Manager Parameter Store. CodeBuild can use a parameter stored in Amazon EC2 Systems Manager Parameter Store only if that parameter's name starts with /CodeBuild/ (for example, /CodeBuild/dockerLoginPassword). You can use the CodeBuild console to create a parameter in Amazon EC2 Systems Manager. Choose **Create a parameter**, and then follow the instructions. (In that dialog box, for **KMS key**, you can optionally specify the ARN of an AWS KMS key in your account. Amazon EC2 Systems Manager uses this key to encrypt the parameter's value during storage and decrypt during retrieval.) If you use the CodeBuild console to create a parameter, the console starts the parameter with /CodeBuild/ as it is being stored. However, if you use the Amazon EC2 Systems Manager Parameter Store console to create a parameter, you must start the parameter's name with /CodeBuild/, and you must set **Type** to **Secure String**. For more information, see <u>AWS Systems Manager parameter store</u> and <u>Walkthrough: Create and test a String parameter (console)</u> in the *Amazon EC2 Systems Manager User Guide*.

If your build project refers to parameters stored in Amazon EC2 Systems Manager Parameter Store, the build project's service role must allow the ssm:GetParameters action. If you chose **Create a new service role in your account** earlier, then CodeBuild includes this action in the default service role for your build project automatically. However, if you chose **Choose an existing service role from your account**, then you must include this action in your service role separately.

Environment variables you set replace existing environment variables. For example, if the Docker image already contains an environment variable named MY_VAR with a value of my_value, and you set an environment variable named MY_VAR with a value of other_value, then my_value is replaced by other_value. Similarly, if the Docker image already contains an environment variable named PATH with a value of /usr/local/sbin:/ usr/local/bin, and you set an environment variable named PATH with a value of \$PATH:/ usr/share/ant/bin, then /usr/local/sbin:/usr/local/bin is replaced by the literal value \$PATH:/usr/share/ant/bin.

Do not set any environment variable with a name that begins with CODEBUILD_. This prefix is reserved for internal use.

If an environment variable with the same name is defined in multiple places, the environment variable's value is determined as follows:

- The value in the start build operation call takes highest precedence.
- The value in the build project definition takes next precedence.

• The value in the buildspec file declaration takes lowest precedence.

For information about valid values for these placeholders, see <u>Create a build project (AWS CLI)</u>. For a list of the latest settings for a build project, see <u>View build project details</u>.

5. Switch to the directory that contains the file you just saved, and run the start-build command again.

```
aws codebuild start-build --cli-input-json file://start-build.json
```

6. If successful, data similar to that described in the <u>To run the build</u> procedure appears in the output.

To work with detailed information about this build, make a note of the id value in the output, and then see <u>View build details (AWS CLI)</u>.

Run a batch build (AWS CLI)

1. Run the start-build-batch command in one of the following ways:

aws codebuild start-build-batch --project-name <project-name>

Use this if you want to run a build that uses the latest version of the build input artifact and the build project's existing settings.

aws codebuild start-build-batch --generate-cli-skeleton > <json-file>

Use this if you want to run a build with an earlier version of the build input artifact or if you want to override the settings for the build output artifacts, environment variables, buildspec, or default build timeout period.

- If you run the start-build-batch command with the --project-name option, replace <project-name> with the name of the build project, and then skip to step 6 of this procedure. To get a list of build projects, see <u>View build project names</u>.
- 3. If you run the start-build-batch command with the --idempotency-token option, a unique case-sensitive identifier, or token, is included with the start-build-batch request. The token is valid for 5 minutes after the request. If you repeat the start-build-batch request with the same token, but change a parameter, CodeBuild returns a parameter mismatch error.

4. If you run the start-build-batch command with the --generate-cli-skeleton option, JSON-formatted data is output to the <json-file> file. This file is similar to the skelton produced by the start-build command, with the addition of the following object. For more information about the common objects, see <u>Run a build (AWS CLI)</u>.

Modify this file to add any build overrides, and save your results.

```
"buildBatchConfigOverride": {
    "combineArtifacts": combineArtifacts,
    "restrictions": {
        "computeTypesAllowed": [
            allowedComputeTypes
        ],
        "maximumBuildsAllowed": maximumBuildsAllowed
    },
    "serviceRole": "batchServiceRole",
    "timeoutInMins": batchTimeout
}
```

The buildBatchConfigOverride object is a <u>ProjectBuildBatchConfig</u> structure that contains the batch build configuration overides for this build.

combineArtifacts

A boolean that specifies if the build artifacts for the batch build should be combined into a single artifact location.

allowedComputeTypes

An array of strings that specify the compute types that are allowed for the batch build. See Build environment compute types for these values.

maximumBuildsAllowed

Specifies the maximum number of builds allowed.

batchServiceRole

Specifies the service role ARN for the batch build project.

batchTimeout

Specifies the maximum amount of time, in minutes, that the batch build must be

5. Switch to the directory that contains the file you just saved, and run the start-build-batch command again.

```
aws codebuild start-build-batch --cli-input-json file://start-build.json
```

6. If successful, the JSON representation of a <u>BuildBatch</u> object appears in the console output. See the <u>StartBuildBatch Response Syntax</u> for an example of this data.

Start running builds automatically (AWS CLI)

If your source code is stored in a GitHub or a GitHub Enterprise Server repository, you can use GitHub webhooks to have AWS CodeBuild rebuild your source code whenever a code change is pushed to the repository.

Run the **create-webhook** command as follows:

aws codebuild create-webhook --project-name <project-name>

<project-name> is the name of the build project that contains the source code to be rebuilt.

For GitHub, information similar to the following appears in the output:

```
{
    "webhook": {
        "url": "<url>"
    }
}
```

<url>< is the URL to the GitHub webhook.

For GitHub Enterprise Server, information similar to the following appears in the output:



User Guide

- 1. Copy the secret key and payload URL from the output. You need them to add a webhook in GitHub Enterprise Server.
- 2. In GitHub Enterprise Server, choose the repository where your CodeBuild project is stored. Choose **Settings**, choose **Hooks & services**, and then choose **Add webhook**.
- 3. Enter the payload URL and secret key, accept the defaults for the other fields, and then choose **Add webhook**.

Stop running builds automatically (AWS CLI)

If your source code is stored in a GitHub or a GitHub Enterprise Server repository, you can set up GitHub webhooks to have AWS CodeBuild rebuild your source code whenever a code change is pushed to the repository. For more information, see <u>Start running builds automatically (AWS CLI)</u>.

If you have enabled this behavior, you can turn it off by running the delete-webhook command as follows:

```
aws codebuild delete-webhook --project-name <project-name>
```

 where <project-name> is the name of the build project that contains the source code to be rebuilt.

If this command is successful, no information and no errors appear in the output.

Note

This deletes the webhook from your CodeBuild project only. You should also delete the webhook from your GitHub or GitHub Enterprise Server repository.

Run a build (AWS SDKs)

To use CodePipeline to run a build with AWS CodeBuild, skip these steps and follow the instructions in Use AWS CodeBuild with AWS CodePipeline to test code and run builds instead.

For information about using CodeBuild with the AWS SDKs, see the <u>AWS SDKs and tools reference</u>.

Run builds on AWS Lambda compute

AWS Lambda compute offers optimized start-up speeds for your builds. AWS Lambda supports faster builds due to a lower start-up latency. AWS Lambda also automatically scales, so builds aren't waiting in queue to run. However, there are some use-cases which AWS Lambda does not support, and if they impact you, use the EC2 compute. For more information, see <u>Limitations of AWS Lambda compute</u>.

Topics

- Which tools and runtimes will be included in the curated runtime environment docker images which run on AWS Lambda?
- What if the curated image doesn't include the tools I need?
- Which regions support AWS Lambda compute in CodeBuild?
- Limitations of AWS Lambda compute
- Deploy a Lambda function using AWS SAM with CodeBuild Lambda Java
- Create a single page React app with CodeBuild Lambda Node.js
- Update a Lambda function configuration with CodeBuild Lambda Python

Which tools and runtimes will be included in the curated runtime environment docker images which run on AWS Lambda?

AWS Lambda supports the following tools: AWS CLI v2, AWS SAM CLI, git, go, Java, Node.js, Python, pip, Ruby, and .NET.

What if the curated image doesn't include the tools I need?

If the curated image doesn't include the tools you need, you can provide a custom environment Docker image that includes the necessary tools.

Note that you require the following Amazon ECR permissions to use custom images for Lambda compute:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
```

Run builds on Lambda compute

```
"Effect": "Allow",
      "Action": [
        "ecr:GetAuthorizationToken"
      ],
      "Resource": "*"
    },
    {
      "Effect": "Allow",
      "Action": [
        "ecr:BatchCheckLayerAvailability",
        "ecr:GetDownloadUrlForLayer",
        "ecr:BatchGetImage"
      ],
      "Resource": "arn:aws:ecr:image-region:image-account-id:repository/image-repo"
    }
  ]
}
```

Also note that curl or wget must be installed in order to use custom images.

Which regions support AWS Lambda compute in CodeBuild?

In CodeBuild, AWS Lambda compute is supported in the following AWS Regions: US East (N. Virginia), US East (Ohio), US West (Oregon), Asia Pacific (Mumbai), Asia Pacific (Singapore), Asia Pacific (Sydney), Asia Pacific (Tokyo), Europe (Frankfurt), Europe (Ireland), and South America (São Paulo). For more information about AWS Regions where CodeBuild is available, see <u>AWS Services by Region</u>.

Limitations of AWS Lambda compute

There are some use-cases which AWS Lambda does not support, and if they impact you, use the EC2 compute:

- AWS Lambda doesn't support tools that require root permissions. For tools such as yum or rpm, use the EC2 compute type or other tools that don't require root permissions.
- AWS Lambda doesn't support Docker builds or runs.
- AWS Lambda doesn't support writing to files outside /tmp. The included package managers are configured to use the /tmp directory by default for downloading and referencing packages.
- AWS Lambda doesn't support the environment type LINUX_GPU_CONTAINER and isn't supported on Windows Server Core 2019.

- AWS Lambda doesn't support caching, batch builds, custom build timeouts, queue timeout, build badges, privileged mode, custom runtime environments, or runtimes longer than 15 minutes.
- AWS Lambda doesn't support VPC connectivity, a fixed range of CodeBuild source IP addresses, EFS, installing certificates, or SSH access with Session Manager.

Deploy a Lambda function using AWS SAM with CodeBuild Lambda Java

The AWS Serverless Application Model (AWS SAM) is an open-source framework for building serverless applications. For more information, see the <u>AWS Serverless Application Model repository</u> on GitHub. The following Java sample uses Gradle to build and test a AWS Lambda function. After which, the AWS SAM CLI is used to deploy the AWS CloudFormation template and deployment bundle. By using CodeBuild Lambda, the build, test, and deployment steps are all handled automatically, allowing for infrastructure to be quickly updated without manual intervention in a single build.

Set up your AWS SAM repository

Create an AWS SAM Hello World project using the AWS SAM CLI.

To create your AWS SAM Project

- 1. Follow the instructions in the AWS Serverless Application Model Developer Guide for <u>Installing</u> the AWS SAM CLI on your local machine.
- 2. Run sam init and select the following project configuration.

```
Which template source would you like to use?: 1 - AWS Quick Start Templates
Choose an AWS Quick Start application template: 1 - Hello World Example
Use the most popular runtime and package type? (Python and zip) [y/N]: N
Which runtime would you like to use?: 8 - java21
What package type would you like to use?: 1 - Zip
Which dependency manager would you like to use?: 1 - gradle
Would you like to enable X-Ray tracing on the function(s) in your application? [y/
N]: N
Would you like to enable monitoring using CloudWatch Application Insights? [y/N]: N
Would you like to set Structured Logging in JSON format on your Lambda functions?
[y/N]: N
Project name [sam-app]: <insert project name>
```

3. Upload the AWS SAM project folder to a supported source repository. For a list of supported source types, see ProjectSource.

Create a CodeBuild Lambda Java project

Create an AWS CodeBuild Lambda Java project and set up the IAM permissions needed for the build.

To create your CodeBuild Lambda Java project

- Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.
- 2. If a CodeBuild information page is displayed, choose **Create build project**. Otherwise, on the navigation pane, expand **Build**, choose **Build projects**, and then choose **Create build project**.
- 3. In **Project name**, enter a name for this build project. Build project names must be unique across each AWS account. You can also include an optional description of the build project to help other users understand what this project is used for.
- 4. In **Source**, select the source repository where your AWS SAM project is located.
- 5. In **Environment**:
 - For Compute, select Lambda.
 - For Runtime(s), select Java.
 - For Image, select aws/codebuild/amazonlinux-x86_64-lambda-standard:corretto21.
 - For **Service role**, leave **New service role** selected. Make a note of the **Role name**. This will be required when you update the project's IAM permissions later in this sample.
- 6. Choose **Create build project**.
- 7. Open the IAM console at https://console.aws.amazon.com/iam/.
- In the navigation pane, choose Roles and select the service role associated with your project.
 You can find your project role in CodeBuild by selecting your build project, choosing Edit,
 Environment, and then Service role.
- 9. Choose the **Trust relationships** tab, and then choose **Edit trust policy**.
- 10. Add the following inline policy to your IAM role. This will be used to deploy your AWS SAM infrastructure later on. For more information, see <u>Adding and removing IAM identity</u> permissions in the *IAM User Guide*.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
             "Sid": "",
             "Effect": "Allow",
             "Action": [
                 "cloudformation:*",
                 "lambda:*",
                 "iam:*",
                 "apigateway:*",
                 "s3:*"
             ],
             "Resource": [
                 "*"
             ٦
        }
    ]
}
```

Set up the project buildspec

In order to build, test, and deploy your Lambda function, CodeBuild reads and executes build commands from a buildspec.

To set up your project buildspec

- 1. In the CodeBuild console, select your build project, then choose Edit and Buildspec.
- 2. In Buildspec, choose Insert build commands and then Switch to editor.
- 3. Delete the pre-filled build commands and paste in the following buildspec.

```
version: 0.2
env:
variables:
GRADLE_DIR: "HelloWorldFunction"
phases:
build:
commands:
     - echo "Running unit tests..."
     - cd $GRADLE_DIR; gradle test; cd ..
```



4. Choose **Update buildspec**.

Deploy your AWS SAM Lambda infrastructure

Use CodeBuild Lambda to automatically deploy your Lambda infrastructure

To deploy your Lambda infrastructure

- 1. Choose **Start build**. This will automatically build, test, and deploy your AWS SAM application to AWS Lambda using AWS CloudFormation.
- 2. Once the build has finished, navigate to the AWS Lambda console and search for your new Lambda function under the AWS SAM project name.
- 3. Test your Lambda function by selecting API Gateway under the Function overview, then clicking the API endpoint URL. You should see a page open with the message "message": "hello world".

Clean up your infrastructure

To avoid further charges for resources you used during this tutorial, delete the resources created by your AWS SAM template and CodeBuild.

To clean up your infrastructure

- Navigate to the AWS CloudFormation console and select the aws-sam-cli-manageddefault.
- 2. In **Resources**, empty the deployment bucket SamCliSourceBucket.
- 3. Delete the aws-sam-cli-managed-default stack.
- 4. Delete the AWS CloudFormation stack associated with your AWS SAM project. This stack should have the same name as your AWS SAM project.
- 5. Navigate to the CloudWatch console and delete the CloudWatch log groups associated with your CodeBuild project.

6. Navigate to the CodeBuild console and delete your CodeBuild project by choosing **Delete build project**.

Create a single page React app with CodeBuild Lambda Node.js

<u>Create React App</u> is a way to create single-page React applications. The following Node.js sample uses Node.js to build the source artifacts from Create React App and returns the build artifacts.

Set up your source repository and artifacts bucket

Create a source repository for your project using yarn and Create React App.

To set up the source repository and artifacts bucket

- On your local machine, run yarn create react-app <app-name> to create a simple React app.
- 2. Upload the React app project folder to a supported source repository. For a list of supported source types, see <u>ProjectSource</u>.

Create a CodeBuild Lambda Node.js project

Create an AWS CodeBuild Lambda Node.js project.

To create your CodeBuild Lambda Node.js project

- Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ https://console.aws.amazon.com/codesuite/codebuild/
- 2. If a CodeBuild information page is displayed, choose **Create build project**. Otherwise, on the navigation pane, expand **Build**, choose **Build projects**, and then choose **Create build project**.
- 3. In **Project name**, enter a name for this build project. Build project names must be unique across each AWS account. You can also include an optional description of the build project to help other users understand what this project is used for.
- 4. In **Source**, select the source repository where your AWS SAM project is located.
- 5. In **Environment**:
 - For **Compute**, select **Lambda**.
 - For Runtime(s), select Node.js.

• For Image, select aws/codebuild/amazonlinux-x86_64-lambda-standard:nodejs20.

6. In Artifacts:

- For Type, select Amazon S3.
- For Bucket name, select the project artifacts bucket you created earlier.
- For Artifacts packaging, select Zip.
- 7. Choose Create build project.

Set up the project buildspec

In order to build your React app, CodeBuild reads and executes build commands from a buildspec file.

To set up your project buildspec

- 1. In the CodeBuild console, select your build project, then choose Edit and Buildspec.
- 2. In **Buildspec**, choose **Insert build commands** and then **Switch to editor**.
- 3. Delete the pre-filled build commands and paste in the following buildspec.

```
version: 0.2
phases:
 build:
    commands:
      - yarn
      - yarn add --dev jest-junit @babel/plugin-proposal-private-property-in-object
      - yarn run build
      - yarn run test -- --coverage --watchAll=false --testResultsProcessor="jest-
junit" --detectOpenHandles
artifacts:
  name: "build-output"
 files:
    - "**/*"
reports:
 test-report:
   files:
      - 'junit.xml'
    file-format: 'JUNITXML'
 coverage-report:
    files:
      - 'coverage/clover.xml'
```

```
file-format: 'CLOVERXML'
```

4. Choose **Update buildspec**.

Build and run your React app

Build the React app on CodeBuild Lambda, download the build artifacts, and run the React app locally.

To build and run your React app

- 1. Choose **Start build**.
- 2. Once the build has finished, navigate to your Amazon S3 project artifacts bucket and download the React app artifact.
- Unzip the React build artifact and run npm install -g serve && serve -s build in the project folder.
- 4. The serve command will serve the static site on a local port and print output to your terminal. You can visit the localhost URL under Local: in the terminal output to view your React app.

To learn more about how to handle deployment for a React based server, see <u>Create React App</u> <u>Deployment</u>.

Clean up your infrastructure

To avoid further charges for resources you used during this tutorial, delete the resources created for your CodeBuild project.

To clean up your infrastructure

- 1. Delete your project artifacts Amazon S3 bucket
- 2. Navigate to the CloudWatch console and delete the CloudWatch log groups associated with your CodeBuild project.
- Navigate to the CodeBuild console and delete your CodeBuild project by choosing Delete build project.

Update a Lambda function configuration with CodeBuild Lambda Python

The following Python sample uses <u>Boto3</u> and CodeBuild Lambda Python to update a Lambda function's configuration. This sample can be extended to manage other AWS resources programmatically. For more information, see <u>Boto3 documentation</u>.

Prerequisites

Create or find a Lambda function in your account.

This sample assumes that you have already created a Lambda function in your account and will use CodeBuild to update the Lambda function's environment variables. For more information on setting up a Lambda function through CodeBuild, see the <u>Deploy a Lambda function using AWS</u> <u>SAM with CodeBuild Lambda Java</u> sample or visit <u>AWS Lambda</u>.

Set up your source repository

Create a source repository to store your Boto3 python script.

To set up the source repository

 Copy the following python script to a new file called update_lambda_environment_variables.py.

```
}
}
}
if __name__ == "__main__":
region = environ['AWS_REGION']
client = boto3.client('lambda', region)
update_lambda_env_variable(client)
```

2. Upload the python file to a supported source repository. For a list of supported source types, see ProjectSource.

Create a CodeBuild Lambda Python project

Create a CodeBuild Lambda Python project.

To create your CodeBuild Lambda Java project

- Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.
- 2. If a CodeBuild information page is displayed, choose **Create build project**. Otherwise, on the navigation pane, expand **Build**, choose **Build projects**, and then choose **Create build project**.
- 3. In **Project name**, enter a name for this build project. Build project names must be unique across each AWS account. You can also include an optional description of the build project to help other users understand what this project is used for.
- 4. In **Source**, select the source repository where your AWS SAM project is located.
- 5. In **Environment**:
 - For Compute, select Lambda.
 - For Runtime(s), select Python.
 - For Image, select aws/codebuild/amazonlinux-x86_64-lambda-standard:python3.12.
 - For **Service role**, leave **New service role** selected. Make a note of the **Role name**. This will be required when you update the project's IAM permissions later in this sample.
- 6. Choose **Create build project**.
- 7. Open the IAM console at https://console.aws.amazon.com/iam/.

- In the navigation pane, choose Roles and select the service role associated with your project. You can find your project role in CodeBuild by selecting your build project, choosing Edit, Environment, and then Service role.
- 9. Choose the **Trust relationships** tab, and then choose **Edit trust policy**.
- 10. Add the following inline policy to your IAM role. This will be used to deploy your AWS SAM infrastructure later on. For more information, see <u>Adding and removing IAM identity</u> <u>permissions</u> in the *IAM User Guide*.

Set up the project buildspec

In order to update the Lambda function, the script reads environment variables from the buildspec to find the Lambda function's name, environment variable name, and environment variable value.

To set up your project buildspec

- 1. In the CodeBuild console, select your build project, then choose Edit and Buildspec.
- 2. In **Buildspec**, choose **Insert build commands** and then **Switch to editor**.
- 3. Delete the pre-filled build commands and paste in the following buildspec.

```
version: 0.2
env:
variables:
LAMBDA_FUNC_NAME: "<lambda-function-name>"
```

```
LAMBDA_ENV_VARIABLE: "FEATURE_ENABLED"

LAMBDA_ENV_VARIABLE_VALUE: "true"

phases:

install:

commands:

- pip3 install boto3

build:

commands:

- python3 update_lambda_environment_variables.py
```

4. Choose **Update buildspec**.

Update your Lambda configuration

Use CodeBuild Lambda Python to automatically update your Lambda function's configuration.

To update your Lambda function's configuration

- 1. Choose **Start build**.
- 2. Once the build has finished, navigate to your Lambda function.
- 3. Select **Configuration** and then **Environment** variables. You should see a new environment variable with key FEATURE_ENABLED and value true.

Clean up your infrastructure

To avoid further charges for resources you used during this tutorial, delete the resources created for your CodeBuild project.

To clean up your infrastructure

- 1. Navigate to the CloudWatch console and delete the CloudWatch log groups associated with your CodeBuild project.
- Navigate to the CodeBuild console and delete your CodeBuild project by choosing Delete build project.
- If you created a Lambda function for the purpose of this sample, choose Actions and Delete function to clean up your Lambda function.

Extensions

If you want to extend this sample to manage other AWS resources using AWS CodeBuild Lambda Python:

- Update the Python script to modify the new resources using Boto3.
- Update the IAM role associated with your CodeBuild project to have permissions for the new resources.
- Add any new environment variables associated with the new resources to your buildspec.

Run builds on reserved capacity fleets

CodeBuild offers the following compute fleets:

- On-demand fleets
- Reserved capacity fleets

With on-demand fleets, CodeBuild provides compute for your builds. The machines are destroyed when the build finishes. On-demand fleets are fully managed, and includes automatic scaling capabilities to handle spikes in demand.

🚯 Note

On-demand fleets do not support macOS or Windows Server 2022.

CodeBuild also offers reserved capacity fleets which contain instances powered by Amazon EC2 that are maintained by CodeBuild. With reserved capacity fleets, you configure a set of dedicated instances for your build environment. These machines remain idle, ready to process builds or tests immediately and reduces build durations. With reserved capacity fleets, your machines are always running and will continue to incur costs as long they're provisioned.

<u> Important</u>

Regardless of how long you run an instance for, reserved capacity fleets incur an initial charge per instance, after which there may be additional associated costs. For more information, see https://aws.amazon.com/codebuild/pricing/.

Topics

- Create a reserved capacity fleet
- Best practices
- Can I share a reserved capacity fleet across multiple CodeBuild projects?
- Which regions support reserved capacity fleets?
- How do I configure a reserved capacity macOS fleet?
- Limitations of reserved capacity fleets
- <u>Reserved capacity fleet properties</u>
- Reserved capacity samples with AWS CodeBuild

Create a reserved capacity fleet

Use the following instructions to create a reserved capacity fleet.

To create a reserved capacity fleet

- 1. Sign in to the AWS Management Console and open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/home.
- 2. In the navigation pane, choose **Compute fleets**, and then choose **Create Fleet**.
- 3. In the **Compute fleet name** text field, enter a name for your fleet.
- 4. From the **Operating system** drop-down menu, choose the operating system.
- 5. From the **Architecture** drop-down menu, choose the architecture.
- 6. In the **Compute** field, choose the compute machine type for your machine.
- 7. In the **Capacity** text field, enter the minimum number of instances in the fleet.
- 8. In the **Overflow behavior** field, choose the behavior when demand exceeds the fleet capacity. For more information about these options, see Reserved capacity fleet properties.
- 9. (Optional) In Additional configuration do the following:
 - From the VPC optional drop-down menu, select a VPC that your CodeBuild fleet will access.
 - From the **Subnets** drop-down menu, select the subnets that CodeBuild should use to set up your VPC configuration.
 - From the **Security groups** drop-down menu, select the security groups that CodeBuild should use to work with your VPC.

• In the Fleet Service Role field, choose an existing service role.

i Note

Make sure that your fleet role has the necessary permissions. For more information, see Allow a user to add a permission policy for a fleet service role.

- 10. Choose **Create compute fleet**.
- After the compute fleet is created, create a new CodeBuild project or edit an existing one.
 From Environment, choose Reserved capacity under Provisioning model, and then choose the specified fleet under Fleet name.

Best practices

When using reserved capacity fleets, we recommend that you follow these best practices.

- We recommend using source cache mode to help improve the build performance by caching the source.
- We recommend using Docker layer caching to help improve the build performance by caching existing Docker layers.

Can I share a reserved capacity fleet across multiple CodeBuild projects?

Yes, you can maximize the utilization of a fleet's capacity by using it across multiple projects.

<u> Important</u>

When using the reserved capacity feature, data cached on fleet instances, including source files, Docker layers, and cached directories specified in the buildspec, can be accessible to other projects within the same account. This is by design and allows projects within the same account to share fleet instances.

Which regions support reserved capacity fleets?

Reserved capacity Amazon Linux and Windows fleets are supported in the following AWS Regions: US East (N. Virginia), US East (Ohio), US West (Oregon), Asia Pacific (Mumbai), Asia Pacific (Singapore), Asia Pacific (Sydney), Asia Pacific (Tokyo), Europe (Frankfurt), Europe (Ireland), and South America (São Paulo). For more information about AWS Regions where CodeBuild is available, see <u>AWS Services by Region</u>.

Reserved capacity macOS Medium fleets are supported in the following AWS Regions: US East (N. Virginia), US East (Ohio), US West (Oregon), Asia Pacific (Sydney), and Europe (Frankfurt). Reserved capacity macOS Large fleets are supported in the following AWS Regions: US East (N. Virginia), US East (Ohio), US West (Oregon), and Asia Pacific (Sydney).

How do I configure a reserved capacity macOS fleet?

To configure a reserved capacity macOS fleet

- 1. Sign in to the AWS Management Console and open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/home.
- 2. In the navigation pane, choose **Compute fleets**, and then choose **Create Fleet**.
- 3. In the **Compute fleet name** text field, enter a name for your fleet.
- 4. From the **Operating system** drop-down menu, choose **macOS**.
- 5. In the **Compute** field, choose one of the following compute machine types: **Apple M2, 24 GB memory, 8 vCPUs** or **Apple M2, 32 GB memory, 12 vCPUs**.
- 6. In the **Capacity** text field, enter the minimum number of instances in the fleet.
- 7. (Optional) If you choose **Custom image** for your fleet, ensure that your Amazon Machine Images (AMI) has the following prerequisites:
 - The AMI Architecture is 64-bit Mac-Arm.
 - The AMI allows the CodeBuild service Organization ARN. For a list of Organization ARNs, see <u>Amazon Machine Images (AMI)</u>.
 - If the AMI is encrypted with a AWS KMS key, the AWS KMS key must also allow the CodeBuild service Organization ID. For a list of Organization IDs, see <u>Amazon Machine</u> <u>Images (AMI)</u>. For more information on AWS KMS keys, see <u>Allow organizations and OUs to</u> <u>use a KMS key</u> in the *Amazon EC2 User Guide*.
 - In the **Fleet service role** field, grant the following Amazon EC2 permissions:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": "ec2:DescribeImages",
            "Resource": "*"
        }
    ]
}
```

- 8. (Optional) To configure a VPC with your fleet, in Additional configuration do the following:
 - From the VPC optional drop-down menu, select a VPC that your CodeBuild fleet will access.
 - From the **Subnets** drop-down menu, select the subnets that CodeBuild should use to set up your VPC configuration.
 - From the **Security groups** drop-down menu, select the security groups that CodeBuild should use to work with your VPC.
 - In the Fleet service role field, choose an existing service role.

1 Note

Make sure that your fleet role has the necessary permissions. For more information, see Allow a user to add a permission policy for a fleet service role.

- Choose Create compute fleet and wait for the fleet instance to launch. Once launched the capacity will be n/n, where n is the capacity provided.
- After the compute fleet has launched, create a new CodeBuild project or edit an existing one. From Environment, choose Reserved capacity under Provisioning model, and then choose the specified fleet under Fleet name.

Limitations of reserved capacity fleets

There are some use-cases which reserved capacity fleets do not support, and if they impact you, use on-demand fleets instead:

• Reserved capacity fleets don't support batch builds, or build utilization metrics.

• Reserved capacity macOS fleets don't support debug session.

For more information on limits and quotas, see <u>Compute fleets</u>.

Reserved capacity fleet properties

A reserved capacity fleet contains the following properties. For more information about reserved capacity fleets, see <u>Run builds on reserved capacity fleets</u>.

Operating system

The operating system. The following operating systems are available:

- Amazon Linux
- macOS
- Windows Server 2019
- Windows Server 2022

Architecture

The processor architecture. The following architectures are available:

- x86_64
- Arm64

Compute

The compute machine type for each instance. The following machine types are available:

Compute type	Environme nt computeTy pe value	Environme nt type value	Memory	vCPUs	Disk space
ARM Small ¹	BUILD_GEN ERAL1_SMA LL	ARM_CONTA INER	4 GB	2	64 GB
ARM Medium ¹	BUILD_GEN ERAL1_MED IUM	ARM_CONTA INER	8 GB	4	128 GB

Compute type	Environme nt computeTy pe value	Environme nt type value	Memory	vCPUs	Disk space
ARM Large ¹	BUILD_GEN ERAL1_LAR GE	ARM_CONTA INER	16 GB	8	128 GB
ARM XLarge ¹	BUILD_GEN ERAL1_XLA RGE	ARM_CONTA INER	64 GB	32	256 GB
ARM 2XLarge ¹	BUILD_GEN ERAL1_2XL ARGE	ARM_CONTA INER	96 GB	48	824 GB
Linux Small ¹	BUILD_GEN ERAL1_SMA LL	LINUX_CON TAINER	3 GB	2	64 GB
Linux Medium ¹	BUILD_GEN ERAL1_MED IUM	LINUX_CON TAINER	7 GB	4	128 GB
Linux Large ¹	BUILD_GEN ERAL1_LAR GE	LINUX_CON TAINER	15 GB	8	128 GB
Linux XLarge	BUILD_GEN ERAL1_XLA RGE	LINUX_CON TAINER	70 GB	36	256 GB
Linux 2XLarge	BUILD_GEN ERAL1_2XL ARGE	LINUX_CON TAINER	145 GB	72	824 GB (SSD)

Compute type	Environme nt computeTy pe value	Environme nt type value	Memory	vCPUs	Disk space
Linux GPU Small	BUILD_GEN ERAL1_SMA LL	LINUX_GPU _CONTAINE R	16 GB	4	220 GB
Linux GPU Large	BUILD_GEN ERAL1_LAR GE	LINUX_GPU _CONTAINE R	255 GB	32	50 GB
macOS Medium	BUILD_GEN ERAL1_MED IUM	MAC_ARM	24 GB	8	128 GB
macOS Large	BUILD_GEN ERAL1_LAR GE	MAC_ARM	32 GB	12	256 GB
Windows Medium	BUILD_GEN ERAL1_MED IUM	WINDOWS_S ERVER_201 9_CONTAIN ER	7 GB	4	128 GB
Windows Medium	BUILD_GEN ERAL1_MED IUM	WINDOWS_S ERVER_202 2_CONTAIN ER	7 GB	4	128 GB
Windows Large	BUILD_GEN ERAL1_LAR GE	WINDOWS_S ERVER_201 9_CONTAIN ER	15 GB	8	128 GB

Compute type	Environme nt computeTy pe value	Environme nt type value	Memory	vCPUs	Disk space
Windows Large	BUILD_GEN ERAL1_LAR GE	WINDOWS_S ERVER_202 2_CONTAIN ER	15 GB	8	128 GB

Capacity

The initial number of machines allocated to the fleet, which defines the number of builds that can run in parallel.

Overflow behavior

Defines the behavior when the number of builds exceeds the fleet capacity.

On-demand

Overflow builds run on CodeBuild on-demand.

í) Note

If you choose to set your overflow behavior to on-demand while creating a VPCconnected fleet, make sure that you add the required VPC permissions to your project service role. For more information, see <u>Example policy statement to allow</u> CodeBuild access to AWS services required to create a VPC network interface.

<u> Important</u>

If you choose to set your overflow behavior to on-demand, note that overflow builds will be billed separately, similar to on-demand Amazon EC2. For more information, see https://aws.amazon.com/codebuild/pricing/.

Queue

Build runs are placed in a queue until a machine is available. This limits additional costs because no additional machines are allocated.

Amazon Machine Images (AMI)

The Amazon Machine Image (AMI) properties for your fleet. The following properties are supported by CodeBuild:

AWS Regions	Organization ARN	Organization ID
us-east-1	arn:aws:organizati ons::851725618577: organization/o-c6w cu152r1	o-c6wcu152r1
us-east-2	arn:aws:organizati ons::992382780434: organization/o-seu fr2suvq	o-seufr2suvq
us-west-2	arn:aws:organizati ons::381491982620: organization/o-041 2099a4r	o-0412o99a4r
ap-southeast-2	arn:aws:organizati ons::767398067170: organization/o-6cr t0f6bu4	o-6crt0f6bu4
eu-central-1	arn:aws:organizati ons::590183817084: organization/o-lb2 lne3te6	o-lb2lne3te6

Additional configuration

VPC - optional

The VPC that your CodeBuild fleet will access. For more information, see <u>Use AWS CodeBuild</u> with Amazon Virtual Private Cloud.

Subnets

The VPC subnets that CodeBuild uses to set up your VPC configuration. Note that reserved capacity fleets support only one subnet in a single Availablity Zone. Also, ensure that your subnets include a NAT gateway.

Security groups

The VPC security groups that CodeBuild uses with your VPC. Ensure that your security groups allow outbound connections.

Fleet Service Role

Defines the service role for your fleet from an existing service role in your account.

Reserved capacity samples with AWS CodeBuild

These samples can be used to experiment with reserved capacity fleets in CodeBuild.

Topics

• Caching with reserved capacity sample

Caching with reserved capacity sample

A cache can store reusable pieces of your build environment and use them across multiple builds. This sample demonstrated how to enable caching within your build project using reserved capacity. For more information, see Cache builds to improve performance.

You can start by specifying one or more cache modes in your project settings:

Cache: Type: LOCAL Modes: - LOCAL_CUSTOM_CACHE

- LOCAL_DOCKER_LAYER_CACHE
- LOCAL_SOURCE_CACHE

🚯 Note

Make sure to enable privileged mode in order to use Docker layer cache.

Your project buildspec settings should look like the following:

```
version: 0.2
      phases:
        build:
          commands:
            - echo testing local source cache
            - touch /codebuild/cache/workspace/foobar.txt
            - git checkout -b cached_branch
            - echo testing local docker layer cache
            - docker run alpine:3.14 2>&1 | grep 'Pulling from' || exit 1
            - echo testing local custom cache
            - touch foo
            - mkdir bar && ln -s foo bar/foo2
            - mkdir bar/bar && touch bar/bar/foo3 && touch bar/bar/foo4
            - "[ -f foo ] || exit 1"
            - "[ -L bar/foo2 ] || exit 1"
            - "[ -f bar/bar/foo3 ] || exit 1"
            - "[ -f bar/bar/foo4 ] || exit 1"
      cache:
        paths:
           - './foo'
           - './bar/**/*'
           - './bar/bar/foo3'
```

You can start by running a build with the new project to seed the cache. Once that's complete, you should start another build with an overriding buildspec, similar to the following:

Run builds in batches

You can use AWS CodeBuild to run concurrent and coordinated builds of a project with batch builds.

Topics

- Security role
- Batch build types
- Batch report mode
- More information

Security role

Batch builds introduce a new security role in the batch configuration. This new role is required as CodeBuild must be able to call the StartBuild, StopBuild, and RetryBuild actions on your behalf to run builds as part of a batch. Customers should use a new role, and not the same role they use in their build, for two reasons:

- Giving the build role StartBuild, StopBuild, and RetryBuild permissions would allow a single build to start more builds via the buildspec.
- CodeBuild batch builds provide restrictions that restrict the number of builds and compute types that can be used for the builds in the batch. If the build role has these permissions, it is possible the builds themselves could bypass these restrictions.

Batch build types

CodeBuild supports the following batch build types:

Batch build types

- Build graph
- Build list
- Build matrix

Build graph

A build graph defines a set of tasks that have dependencies on other tasks in the batch.

The following example defines a build graph that creates a dependency chain.

```
batch:
  fast-fail: false
  build-graph:
    - identifier: build1
      env:
        variables:
          BUILD_ID: build1
      ignore-failure: false
    - identifier: build2
      buildspec: build2.yml
      env:
        variables:
          BUILD_ID: build2
      depend-on:
        - build1
    - identifier: build3
      env:
        variables:
          BUILD_ID: build3
      depend-on:
        - build2
```

In this example:

• build1 runs first because it has no dependencies.

- build2 has a dependency on build1, so build2 runs after build1 completes.
- build3 has a dependency on build2, so build3 runs after build2 completes.

For more information about the build graph buildspec syntax, see <u>batch/build-graph</u>.

Build list

A build list defines a number of tasks that run in parallel.

The following example defines a build list. The build1 and build2 builds will run in parallel.

```
batch:
fast-fail: false
build-list:
    identifier: build1
    env:
      variables:
      BUILD_ID: build1
    ignore-failure: false
    identifier: build2
    buildspec: build2.yml
    env:
      variables:
      BUILD_ID: build2
    ignore-failure: true
```

For more information about the build list buildspec syntax, see <u>batch/build-list</u>.

Build matrix

A build matrix defines tasks with different configurations that run in parallel. CodeBuild creates a separate build for each possible configuration combination.

The following example shows a build matrix with two buildspec files and three values for an environment variable.

```
batch:
    build-matrix:
        static:
        ignore-failure: false
```

dynamic:
buildspec:
- matrix1.yml
- matrix2.yml
env:
variables:
MY_VAR:
- VALUE1
- VALUE2
- VALUE3

In this example, CodeBuild creates six builds:

- matrix1.yml with \$MY_VAR=VALUE1
- matrix1.yml with \$MY_VAR=VALUE2
- matrix1.yml with \$MY_VAR=VALUE3
- matrix2.yml with \$MY_VAR=VALUE1
- matrix2.yml with \$MY_VAR=VALUE2
- matrix2.yml with \$MY_VAR=VALUE3

Each build will have the following settings:

- ignore-failure set to false
- env/type set to LINUX_CONTAINER
- env/image set to aws/codebuild/amazonlinux2-x86_64-standard:4.0
- env/privileged-mode set to true

These builds run in parallel.

For more information about the build matrix buildspec syntax, see batch/build-matrix.

Batch report mode

If the source provider for your project is Bitbucket, GitHub, or GitHub Enterprise, and your project is configured to report build statuses to the source provider, you can select how you want your batch build statuses sent to the source provider. You can select to have the statuses sent as a single aggregate status report for the batch, or have the status of each build in the batch reported individually.

For more information, see the following topics:

- Batch configuration (create)
- Batch configuration (update)

More information

For more information, see the following topics:

- Batch build buildspec reference
- Batch configuration
- Run a batch build (AWS CLI)
- Stop batch builds in AWS CodeBuild

Cache builds to improve performance

You can save time when your project builds by using a cache. A cache can store reusable pieces of your build environment and use them across multiple builds. Your build project can use one of two types of caching: Amazon S3 or local. If you use a local cache, you must choose one or more of three cache modes: source cache, Docker layer cache, and custom cache.

Note

Docker layer cache mode is available for the Linux environment only. If you choose this mode, you must run your build in privileged mode. CodeBuild projects granted privileged mode grants its container access to all devices. For more information, see <u>Runtime privilege</u> and Linux capabilities on the Docker Docs website.

Topics

- Amazon S3 caching
- Local caching

Amazon S3 caching

Amazon S3 caching stores the cache in an Amazon S3 bucket that is available across multiple build hosts. This is a good option for small to intermediate sized build artifacts that are more expensive to build than to download. This is not the best option for large build artifacts because they can take a long time to transfer over your network, which can affect build performance. It also is not the best option if you use Docker layers.

Local caching

Local caching stores a cache locally on a build host that is available to that build host only. This is a good option for intermediate to large build artifacts because the cache is immediately available on the build host. This is not the best option if your builds are infrequent. This means that build performance is not impacted by network transfer time.

If you choose local caching, you must choose one or more of the following cache modes:

- Source cache mode caches Git metadata for primary and secondary sources. After the cache is created, subsequent builds pull only the change between commits. This mode is a good choice for projects with a clean working directory and a source that is a large Git repository. If you choose this option and your project does not use a Git repository (AWS CodeCommit, GitHub, GitHub Enterprise Server, or Bitbucket), the option is ignored.
- Docker layer cache mode caches existing Docker layers. This mode is a good choice for projects that build or pull large Docker images. It can prevent the performance issues caused by pulling large Docker images down from the network.

1 Note

- You can use a Docker layer cache in the Linux environment only.
- The privileged flag must be set so that your project has the required Docker permissions.

By default, Docker daemon is enabled for non-VPC builds. If you would like to use Docker containers for VPC builds, see <u>Runtime Privilege and Linux Capabilities</u> on the Docker Docs website and enable privileged mode. Also, Windows does not support privileged mode.

- You should consider the security implication before you use a Docker layer cache.
- Custom cache mode caches directories you specify in the buildspec file. This mode is a good choice if your build scenario is not suited to one of the other two local cache modes. If you use a custom cache:
 - Only directories can be specified for caching. You cannot specify individual files.
 - Symlinks are used to reference cached directories.
 - Cached directories are linked to your build before it downloads its project sources. Cached items overrides source items if they have the same name. Directories are specified using cache paths in the buildspec file. For more information, see <u>Buildspec syntax</u>.
 - Avoid directory names that are the same in the source and in the cache. Locally-cached directories may override, or delete the contents of, directories in the source repository that have the same name.

Note

Local caching is not supported with the LINUX_GPU_CONTAINER environment type and the BUILD_GENERAL1_2XLARGE compute type. For more information, see <u>Build</u> <u>environment compute modes and types</u>.

i Note

Local caching is not supported when you configure CodeBuild to work with a VPC. For more information on using VPCs with CodeBuild, see <u>Use AWS CodeBuild with Amazon Virtual</u> <u>Private Cloud</u>.

Specify a local cache

You can use the AWS CLI, console, SDK, or AWS CloudFormation to specify a local cache. For more information about local caching, see <u>Local caching</u>.

Topics

• Specify local caching (CLI)

- Specify local caching (console)
- Specify local caching (AWS CloudFormation)

Specify local caching (CLI)

You can use the the --cache parameter in the AWS CLI to specify each of the three local cache types.

• To specify a source cache:

--cache type=LOCAL,mode=[LOCAL_SOURCE_CACHE]

• To specify a Docker layer cache:

--cache type=LOCAL,mode=[LOCAL_DOCKER_LAYER_CACHE]

• To specify a custom cache:

--cache type=LOCAL,mode=[LOCAL_CUSTOM_CACHE]

For more information, see Create a build project (AWS CLI).

Specify local caching (console)

You specify a cache in the **Artifacts** section of the console. For **Cache type**, choose **Amazon S3** or **Local**. If you choose **Local**, choose one or more of the three local cache options.

Cache type	
Local 🗸	
Select one or more local cache options.	
Docker layer cache Caches existing Docker layers so they can be reused. Requires privileged mode.	
Caches .git metadata so subsequent builds only pull the change in commits.	
Custom cache Caches directories specified in the buildspec file.	

For more information, see Create a build project (console).

Specify local caching (AWS CloudFormation)

If you use AWS CloudFormation to specify a local cache, on the Cache property, for Type, specify LOCAL. The following sample YAML-formatted AWS CloudFormation code specifies all three local cache types. You can specify any combination of the types. If you use a Docker layer cache, under Environment, you must set PrivilegedMode to true and Type to LINUX_CONTAINER.

```
CodeBuildProject:
    Type: AWS::CodeBuild::Project
    Properties:
      Name: MyProject
      ServiceRole: <service-role>
      Artifacts:
        Type: S3
        Location: <bucket-name>
        Name: myArtifact
        EncryptionDisabled: true
        OverrideArtifactName: true
      Environment:
        Type: LINUX_CONTAINER
        ComputeType: BUILD_GENERAL1_SMALL
        Image: aws/codebuild/standard:5.0
        Certificate: <bucket/cert.zip>
        # PrivilegedMode must be true if you specify LOCAL_DOCKER_LAYER_CACHE
        PrivilegedMode: true
      Source:
        Type: GITHUB
        Location: <github-location>
        InsecureSsl: true
        GitCloneDepth: 1
        ReportBuildStatus: false
      TimeoutInMinutes: 10
      Cache:
        Type: LOCAL
        Modes: # You can specify one or more cache mode,
          - LOCAL_CUSTOM_CACHE

    LOCAL_DOCKER_LAYER_CACHE

    LOCAL_SOURCE_CACHE
```

🚯 Note

By default, Docker daemon is enabled for non-VPC builds. If you would like to use Docker containers for VPC builds, see <u>Runtime Privilege and Linux Capabilities</u> on the Docker Docs website and enable privileged mode. Also, Windows does not support privileged mode.

For more information, see Create a build project (AWS CloudFormation).

Delete builds in AWS CodeBuild

You can use the AWS CLI or the AWS SDKs to delete builds in AWS CodeBuild.

Topics

- Delete builds (AWS CLI)
- Delete builds (AWS SDKs)

Delete builds (AWS CLI)

Run the batch-delete-builds command:

```
aws codebuild batch-delete-builds --ids ids
```

In the preceding command, replace the following placeholder:

- *ids*: Required string. The IDs of the builds to delete. To specify multiple builds, separate each build ID with a space. To get a list of build IDs, see the following topics:
 - View a list of build IDs (AWS CLI)
 - View a list of build IDs for a build project (AWS CLI)

If successful, a buildsDeleted array appears in the output, containing the Amazon Resource Name (ARN) of each build that was successfully deleted. Information about builds that were not successfully deleted appears in output within a buildsNotDeleted array.

For example, if you run this command:

```
aws codebuild batch-delete-builds --ids my-demo-build-project:f8b888d2-5e1e-4032-8645-
b115195648EX my-other-demo-build-project:a18bc6ee-e499-4887-b36a-8c90349c7eEX
```

Information similar to the following appears in the output:

```
{
    "buildsNotDeleted": [
        {
          "id": "arn:aws:codebuild:us-west-2:123456789012:build/my-demo-build-
project:f8b888d2-5e1e-4032-8645-b115195648EX",
          "statusCode": "BUILD_IN_PROGRESS"
        }
    ],
    "buildsDeleted": [
        "arn:aws:codebuild:us-west-2:123456789012:build/my-other-demo-build-
project:a18bc6ee-e499-4887-b36a-8c90349c7eEX"
    ]
}
```

Delete builds (AWS SDKs)

For information about using AWS CodeBuild with the AWS SDKs, see the <u>AWS SDKs and tools</u> reference.

Retry builds in AWS CodeBuild

You can use the AWS CodeBuild console, AWS CLI, or AWS SDKs to retry either a single build or a batch build in AWS CodeBuild.

Topics

- Retry a build (console)
- Retry a build (AWS CLI)
- Retry a build (AWS SDKs)

Retry a build (console)

 Open the AWS CodeBuild console at <u>https://console.aws.amazon.com/codesuite/codebuild/</u> home.

- 2. Do one of the following:
 - If the *build-project-name:build-ID* page is displayed, choose Retry build.
 - In the navigation pane, choose **Build history**. In the list of builds, select the box for the build, and then choose **Retry build**.
 - In the navigation pane, choose **Build projects**. In the list of build projects, in the **Name** column, choose the link for the build project's name. In the list of builds, select the box for the build, and then choose **Retry build**.

🚺 Note

By default, only the most recent 100 builds or build projects are displayed. To view more builds or build projects, choose the gear icon, and then choose a different value for **Builds per page** or **Projects per page** or use the back and forward arrows.

Retry a build (AWS CLI)

• Run the **retry-build** command:

aws codebuild retry-build --id <build-id> --idempotency-token <idempotencyToken>

In the preceding command, replace the following placeholder:

- <build-id>: Required string. The ID of the build or batch build to retry. To get a list of build IDs, see the following topics:
 - View a list of build IDs (AWS CLI)
 - View a list of batch build IDs (AWS CLI)
 - View a list of build IDs for a build project (AWS CLI)
 - View a list of batch build IDs for a build project (AWS CLI)
- --idempotency-token: Optional. If you run the retry-build command with the option, a unique case-sensitive identifier, or token, is included with the retry-build request. The token is valid for 5 minutes after the request. If you repeat the retry-build request with the same token, but change a parameter, CodeBuild returns a parameter mismatch error.

Retry a build (AWS SDKs)

For more information about using AWS CodeBuild with the AWS SDKs, see the <u>AWS SDKs and tools</u> reference.

Stop builds in AWS CodeBuild

You can use the AWS CodeBuild console, AWS CLI, or AWS SDKs to stop a build in AWS CodeBuild.

Topics

- Stop a build (console)
- Stop a build (AWS CLI)
- Stop a build (AWS SDKs)

Stop a build (console)

- Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ https://console.aws.amazon.com/codesuite/codebuild/
- 2. Do one of the following:
 - If the *build-project-name:build-ID* page is displayed, choose **Stop build**.
 - In the navigation pane, choose **Build history**. In the list of builds, select the box for the build, and then choose **Stop build**.
 - In the navigation pane, choose **Build projects**. In the list of build projects, in the **Name** column, choose the link for the build project's name. In the list of builds, select the box for the build, and then choose **Stop build**.

🚺 Note

By default, only the most recent 100 builds or build projects are displayed. To view more builds or build projects, choose the gear icon, and then choose a different value for **Builds per page** or **Projects per page** or use the back and forward arrows. If AWS CodeBuild cannot successfully stop a build (for example, if the build process is

If AWS CodeBuild cannot successfully stop a build (for example, if the build process is already complete), the **Stop** button is disabled or might not appear.

Stop a build (AWS CLI)

Run the **stop-build** command:

aws codebuild stop-build --id id

In the preceding command, replace the following placeholder:

- *id*: Required string. The ID of the build to stop. To get a list of build IDs, see the following topics:
 - View a list of build IDs (AWS CLI)
 - View a list of build IDs for a build project (AWS CLI)

If AWS CodeBuild successfully stops the build, the buildStatus value in the build object in the output is STOPPED.

If CodeBuild cannot successfully stop the build (for example, if the build is already complete), the buildStatus value in the build object in the output is the final build status (for example, SUCCEEDED).

Stop a build (AWS SDKs)

For more information about using AWS CodeBuild with the AWS SDKs, see the <u>AWS SDKs and tools</u> reference.

Stop batch builds in AWS CodeBuild

You can use the AWS CodeBuild console, AWS CLI, or AWS SDKs to stop a batch build in AWS CodeBuild.

Topics

- Stop a batch build (console)
- Stop a batch build (AWS CLI)
- Stop a batch build (AWS SDKs)

User Guide

Stop a batch build (console)

- Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ https://console.aws.amazon.com/codesuite/codebuild/
- 2. Do one of the following:
 - If the *build-project-name:build-ID* page is displayed, choose **Stop build**.
 - In the navigation pane, choose **Build history**. In the list of builds, select the box for the build, and then choose **Stop build**.
 - In the navigation pane, choose **Build projects**. In the list of build projects, in the **Name** column, choose the link for the build project's name. In the list of builds, select the box for the build, and then choose **Stop build**.

🚯 Note

By default, only the most recent 100 builds or build projects are displayed. To view more builds or build projects, choose the gear icon, and then choose a different value for **Builds per page** or **Projects per page** or use the back and forward arrows. If AWS CodeBuild cannot successfully stop a batch build (for example, if the build process is already complete), the **Stop build** button is disabled.

Stop a batch build (AWS CLI)

• Run the stop-build-batch command:

```
aws codebuild stop-build-batch --id <batch-build-id>
```

In the preceding command, replace the following placeholder:

- <batch-build-id>: Required string. The identifier of the batch build to stop. To get a list
 of batch build identifiers, see the following topics:
 - View a list of batch build IDs (AWS CLI)
 - View a list of batch build IDs for a build project (AWS CLI)

If AWS CodeBuild successfully stops the batch build, the buildBatchStatus value in the buildBatch object in the output is STOPPED.

If CodeBuild cannot successfully stop the batch build (for example, if the batch build is already complete), the buildBatchStatus value in the buildBatch object in the output is the final build status (for example, SUCCEEDED).

Stop a batch build (AWS SDKs)

For more information about using AWS CodeBuild with the AWS SDKs, see the <u>AWS SDKs and tools</u> reference.

Trigger AWS CodeBuild builds automatically

You can create a trigger on a project to schedule a build once every hour, day, or week. You can also edit a trigger to use a custom rule with an Amazon CloudWatch cron expression. For example, using a cron expression, you can schedule a build at a specific time on every weekday. For information about creating and editing triggers, see <u>Create AWS CodeBuild triggers</u> and <u>Edit AWS CodeBuild</u> triggers.

Topics

- Create AWS CodeBuild triggers
- Edit AWS CodeBuild triggers

Create AWS CodeBuild triggers

You can create a trigger on a project to schedule a build once every hour, day, or week. You can also create a trigger using a custom rule with an Amazon CloudWatch cron expression. For example, using a cron expression, you can schedule a build at a specific time every weekday.

🚯 Note

It is not possible to start a batch build from a build trigger, an Amazon EventBridge event, or an AWS Step Functions task.

Topics

- Create AWS CodeBuild triggers (console)
- Create AWS CodeBuild triggers programmatically

Create AWS CodeBuild triggers (console)

Use the following procedure to create triggers using the AWS Management Console.

To create a trigger

- Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ https://console.aws.amazon.com/codesuite/codebuild/
- 2. In the navigation pane, choose **Build projects**.
- Choose the link for the build project to which you want to add a trigger, and then choose the Build triggers tab.

Note

By default, the 100 most recent build projects are displayed. To view more build projects, choose the gear icon, and then choose a different value for **Projects per page** or use the back and forward arrows.

- 4. Choose **Create trigger**.
- 5. Enter a name in **Trigger name**.
- 6. From the **Frequency** drop-down list, choose the frequency for your trigger. If you want to create a frequency using a cron expression, choose **Custom**.
- 7. Specify the parameters for the frequency of your trigger. You can enter the first few characters of your selections in the text box to filter drop-down menu items.

Note

Start hours and minutes are zero-based. The start minute is a number between zero and 59. The start hour is a number between zero and 23. For example, a daily trigger that starts every day at 12:15 P.M. has a start hour of 12 and a start minute of 15. A daily trigger that starts every day at midnight has a start hour of zero and a start

minute of zero. A daily trigger that starts every day at 11:59 P.M. has a start hour of 23 and a start minute of 59.

Frequency	Required Parameters	Details
Hourly	Start minute	Use the Start minute drop- down menu.
Daily	Start minute Start hour	Use the Start minute drop- down menu. Use the Start hour drop- down menu.
Weekly	Start minute Start hour Start day	Use the Start minute drop- down menu. Use the Start hour drop- down menu. Use the Start day drop- down menu.

Frequency	Required Parameters	Details
Custom	Cron expression	Enter a cron expression in Cron expression . A cron expression has six required fields that are separated by white space. The fields specify a start value for minute, hour, day of month, month, day of week, and year. You can use wildcards to specify a range, additiona l values, and more. For example, the cron expressio n 0 9 ? * MON-FRI * schedules a build every weekday at 9:00 A.M. For more information, see <u>Cron</u> <u>Expressions</u> in the Amazon <i>CloudWatch Events User</i> <i>Guide</i> .

8. Select **Enable this trigger**.

- 9. (Optional) Expand Advanced section. In Source version, type a version of your source.
 - For Amazon S3, enter the version ID that corresponds to the version of the input artifact you want to build. If **Source version** is left blank, the latest version is used.
 - For AWS CodeCommit, type a commit ID. If **Source version** is left blank, the default branch's HEAD commit ID is used.
 - For GitHub or GitHub Enterprise, type a commit ID, a pull request ID, a branch name, or a tag
 name that corresponds to the version of the source code you want to build. If you specify a
 pull request ID, it must use the format pr/pull-request-ID (for example, pr/25). If you
 specify a branch name, the branch's HEAD commit ID is used. If Source version is blank, the
 default branch's HEAD commit ID is used.
 - For Bitbucket, type a commit ID, a branch name, or a tag name that corresponds to the version of the source code you want to build. If you specify a branch name, the branch's

HEAD commit ID is used. If **Source version** is blank, the default branch's HEAD commit ID is used.

- (Optional) Specify a timeout between 5 minutes and 2160 minutes (36 hours). This value specifies how long AWS CodeBuild attempts a build before it stops. If Hours and Minutes are left blank, the default timeout value specified in the project is used.
- 11. Choose Create trigger.

Create AWS CodeBuild triggers programmatically

CodeBuild uses Amazon EventBridge rules for build triggers. You can use the EventBridge API to programmatically create build triggers for your CodeBuild projects. See <u>Amazon EventBridge API</u> Reference for more information.

Edit AWS CodeBuild triggers

You can edit a trigger on a project to schedule a build once every hour, day, or week. You can also edit a trigger to use a custom rule with an Amazon CloudWatch cron expression. For example, using a cron expression, you can schedule a build at a specific time on every weekday. For information about creating a trigger, see <u>Create AWS CodeBuild triggers</u>.

Topics

- Edit AWS CodeBuild triggers (console)
- Edit AWS CodeBuild triggers programmatically

Edit AWS CodeBuild triggers (console)

Use the following procedure to edit triggers using the AWS Management Console.

To edit a trigger

- Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.
- 2. In the navigation pane, choose **Build projects**.
- 3. Choose the link for the build project you want to change, and then choose the **Build triggers** tab.

🚯 Note

By default, the 100 most recent build projects are displayed. To view more build projects, choose the gear icon, and then choose a different value for **Projects per page** or use the back and forward arrows.

- 4. Choose the radio button next to the trigger you want to change, and then choose **Edit**.
- 5. From the **Frequency** drop-down list, choose the frequency for your trigger. If you want to create a frequency using a cron expression, choose **Custom**.
- 6. Specify the parameters for the frequency of your trigger. You can enter the first few characters of your selections in the text box to filter drop-down menu items.

🚯 Note

Start hours and minutes are zero-based. The start minute is a number between zero and 59. The start hour is a number between zero and 23. For example, a daily trigger that starts every day at 12:15 P.M. has a start hour of 12 and a start minute of 15. A daily trigger that starts every day at midnight has a start hour of zero and a start minute of zero. A daily trigger that starts every day at 11:59 P.M. has a start hour of 23 and a start minute of 59.

Frequency	Required Parameters	Details
Hourly	Start minute	Use the Start minute drop- down menu.
Daily	Start minute Start hour	Use the Start minute drop- down menu. Use the Start hour drop- down menu.
Weekly	Start minute Start hour	Use the Start minute drop- down menu.

Frequency	Required Parameters	Details
	Start day	Use the Start hour drop- down menu. Use the Start day drop- down menu.
Custom	Cron expression	Enter a cron expression in Cron expression . A cron expression has six required fields that are separated by white space. The fields specify a start value for minute, hour, day of month, month, day of week, and year. You can use wildcards to specify a range, additiona l values, and more. For example, the cron expressio n 0 9 ? * MON-FRI * schedules a build every weekday at 9:00 A.M. For more information, see <u>Cron</u> <u>Expressions</u> in the Amazon <i>CloudWatch Events User</i> <i>Guide</i> .

7. Select Enable this trigger.

i Note

You can use the Amazon CloudWatch console at https://console.aws.amazon.com/cloudwatch/ to edit source version, timeout, and other options that are not available in AWS CodeBuild.

Edit AWS CodeBuild triggers programmatically

CodeBuild uses Amazon EventBridge rules for build triggers. You can use the EventBridge API to programmatically edit the build triggers for your CodeBuild projects. See <u>Amazon EventBridge API</u> <u>Reference</u> for more information.

View build details in AWS CodeBuild

You can use the AWS CodeBuild console, AWS CLI, or AWS SDKs to view details about builds managed by CodeBuild.

Topics

- View build details (console)
- View build details (AWS CLI)
- View build details (AWS SDKs)
- Build phase transitions

View build details (console)

- 1. Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ https://console.aws.amazon.com/codesuite/codebuild/
- 2. Do one of the following:
 - In the navigation pane, choose **Build history**. In the list of builds, in the **Build run** column, choose the link for the build.
 - In the navigation pane, choose **Build projects**. In the list of build projects, in the **Name** column, choose the link for the name of the build project. Then, in the list of builds, in the **Build run** column, choose the link for the build.

1 Note

By default, only the 10 most recent builds or build projects are displayed. To view more builds or build projects, choose the gear icon, and then choose a different value for **Builds per page** or **Projects per page** or use the back and forward arrows.

View build details (AWS CLI)

For more information about using the AWS CLI with AWS CodeBuild, see the <u>Command line</u> <u>reference</u>.

Run the **batch-get-builds** command:

```
aws codebuild batch-get-builds --ids ids
```

Replace the following placeholder:

- ids: Required string. One or more build IDs to view details about. To specify more than one build ID, separate each build ID with a space. You can specify up to 100 build IDs. To get a list of build IDs, see the following topics:
 - View a list of build IDs (AWS CLI)
 - View a list of build IDs for a build project (AWS CLI)

For example, if you run this command:

```
aws codebuild batch-get-builds --ids codebuild-demo-project:e9c4f4df-3f43-41d2-
ab3a-60fe2EXAMPLE codebuild-demo-project:815e755f-bade-4a7e-80f0-efe51EXAMPLE my-other-
project:813bb6c6-891b-426a-9dd7-6d8a3EXAMPLE
```

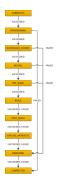
If the command is successful, data similar to that described in <u>To view summarized build</u> information appears in the output.

View build details (AWS SDKs)

For more information about using AWS CodeBuild with the AWS SDKs, see the <u>AWS SDKs and tools</u> reference.

Build phase transitions

Builds in AWS CodeBuild proceed in phases:



🔥 Important

The UPLOAD_ARTIFACTS phase is always attempted, even if the BUILD phase fails.

View a list of build IDs in AWS CodeBuild

You can use the AWS CodeBuild console, AWS CLI, or AWS SDKs to view a list of build IDs for builds managed by CodeBuild.

Topics

- View a list of build IDs (console)
- View a list of build IDs (AWS CLI)
- View a list of batch build IDs (AWS CLI)
- View a list of build IDs (AWS SDKs)

View a list of build IDs (console)

- 1. Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/home.
- 2. In the navigation pane, choose **Build history**.

1 Note

By default, only the 10 most recent builds are displayed. To view more builds, choose the gear icon, and then choose a different value for **Builds per page** or use the back and forward arrows.

View a list of build IDs (AWS CLI)

For more information about using the AWS CLI with CodeBuild, see the Command line reference.

Run the list-builds command:

```
aws codebuild list-builds --sort-order sort-order --next-token next-token
```

In the preceding command, replace the following placeholders:

- *sort-order*: Optional string used to indicate how to list the build IDs. Valid values include ASCENDING and DESCENDING.
- next-token: Optional string. During a previous run, if there were more than 100 items in the list, only the first 100 items are returned, along with a unique string called next token. To get the next batch of items in the list, run this command again, adding the next token to the call. To get all of the items in the list, keep running this command with each subsequent next token, until no more next tokens are returned.

For example, if you run this command:

aws codebuild list-builds --sort-order ASCENDING

A result similar to the following might appear in the output:

```
{
   "nextToken": "4AEA6u7J...The full token has been omitted for brevity...MzY2OA==",
   "ids": [
      "codebuild-demo-project:815e755f-bade-4a7e-80f0-efe51EXAMPLE"
      "codebuild-demo-project:84a7f3d1-d40e-4956-b4cf-7a9d4EXAMPLE"
      ... The full list of build IDs has been omitted for brevity ...
      "codebuild-demo-project:931d0b72-bf6f-4040-a472-5c707EXAMPLE"
   ]
}
```

If you run this command again:

```
aws codebuild list-builds --sort-order ASCENDING --next-token 4AEA6u7J...The full
token has been omitted for brevity...MzY20A==
```

A result similar to the following might appear in the output:

```
{
   "ids": [
   "codebuild-demo-project:49015049-21cf-4b50-9708-df115EXAMPLE",
   "codebuild-demo-project:543e7206-68a3-46d6-a4da-759abEXAMPLE",
   ... The full list of build IDs has been omitted for brevity ...
   "codebuild-demo-project:c282f198-4582-4b38-bdc0-26f96EXAMPLE"
  ]
}
```

View a list of batch build IDs (AWS CLI)

For more information about using the AWS CLI with CodeBuild, see the Command line reference.

• Run the list-build-batches command:

aws codebuild list-build-batches --sort-order sort-order --next-token next-token

In the preceding command, replace the following placeholders:

- *sort-order*: Optional string used to indicate how to list the batch build IDs. Valid values include ASCENDING and DESCENDING.
- next-token: Optional string. During a previous run, if there were more than 100 items in the list, only the first 100 items are returned, along with a unique string called next token. To get the next batch of items in the list, run this command again, adding the next token to the call. To get all of the items in the list, keep running this command with each subsequent next token, until no more next tokens are returned.

For example, if you run this command:

aws codebuild list-build-batches --sort-order ASCENDING

A result similar to the following might appear in the output:

"nextToken": "4AEA6u7J...The full token has been omitted for brevity...MzY20A==",

{

```
"ids": [
   "codebuild-demo-project:815e755f-bade-4a7e-80f0-efe51EXAMPLE"
   "codebuild-demo-project:84a7f3d1-d40e-4956-b4cf-7a9d4EXAMPLE"
   ... The full list of build IDs has been omitted for brevity ...
   "codebuild-demo-project:931d0b72-bf6f-4040-a472-5c707EXAMPLE"
]
}
```

If you run this command again:

```
aws codebuild list-build-batches --sort-order ASCENDING --next-token 4AEA6u7J...The
full token has been omitted for brevity...MzY20A==
```

A result similar to the following might appear in the output:

```
{
  "ids": [
    "codebuild-demo-project:49015049-21cf-4b50-9708-df115EXAMPLE",
    "codebuild-demo-project:543e7206-68a3-46d6-a4da-759abEXAMPLE",
    ... The full list of build IDs has been omitted for brevity ...
    "codebuild-demo-project:c282f198-4582-4b38-bdc0-26f96EXAMPLE"
  ]
}
```

View a list of build IDs (AWS SDKs)

For more information about using CodeBuild with the AWS SDKs, see the <u>AWS SDKs and tools</u> reference.

View a list of build IDs for a build project in AWS CodeBuild

You can use the AWS CodeBuild console, AWS CLI, or AWS SDKs to view a list of build IDs for a build project in CodeBuild.

Topics

- View a list of build IDs for a build project (console)
- View a list of build IDs for a build project (AWS CLI)
- View a list of batch build IDs for a build project (AWS CLI)

• View a list of build IDs for a build project (AWS SDKs)

View a list of build IDs for a build project (console)

- 1. Open the CodeBuild console at https://console.aws.amazon.com/codebuild/.
- 2. In the navigation pane, choose **Build projects**. In the list of build projects, in the **Name** column, choose the build project.

i Note

By default, only the most recent 100 builds or build projects are displayed. To view more builds or build projects, choose the gear icon, and then choose a different value for **Builds per page** or **Projects per page** or use the back and forward arrows.

View a list of build IDs for a build project (AWS CLI)

For more information about using the AWS CLI with AWS CodeBuild, see the <u>Command line</u> reference.

Run the list-builds-for-project command, as follows:

```
aws codebuild list-builds-for-project --project-name project-name --sort-order sort-
order --next-token next-token
```

In the preceding command, replace the following placeholders:

- project-name: Required string used to indicate the name of the build project to list builds IDs for. To get a list of build projects, see View a list of build project names (AWS CLI).
- sort-order: Optional string used to indicate how to list the build IDs. Valid values include ASCENDING and DESCENDING.
- next-token: Optional string. During a previous run, if there were more than 100 items in the list, only the first 100 items are returned, along with a unique string called *next token*. To get the next batch of items in the list, run this command again, adding the next token to the call. To get all of the items in the list, keep running this command with each subsequent next token that is returned, until no more next tokens are returned.

For example, if you run this command similar to this:

```
aws codebuild list-builds-for-project --project-name codebuild-demo-project --sort-
order ASCENDING
```

A result like the following might appear in the output:

```
{
    "nextToken": "4AEA6u7J...The full token has been omitted for brevity...MzY2OA==",
    "ids": [
        "codebuild-demo-project:9b175d16-66fd-4e71-93a0-50a08EXAMPLE"
        "codebuild-demo-project:a9d1bd09-18a2-456b-8a36-7d65aEXAMPLE"
        ... The full list of build IDs has been omitted for brevity ...
        "codebuild-demo-project:fe70d102-c04f-421a-9cfa-2dc15EXAMPLE"
    ]
}
```

If you run this command again:

```
aws codebuild list-builds-for-project --project-name codebuild-demo-project --
sort-order ASCENDING --next-token 4AEA6u7J...The full token has been omitted for
brevity...MzY20A==
```

You might see a result like the following in the output:

```
{
  "ids": [
   "codebuild-demo-project:98253670-7a8a-4546-b908-dc890EXAMPLE"
   "codebuild-demo-project:ad5405b2-1ab3-44df-ae2d-fba84EXAMPLE"
   ... The full list of build IDs has been omitted for brevity ...
   "codebuild-demo-project:f721a282-380f-4b08-850a-e0ac1EXAMPLE"
  ]
}
```

View a list of batch build IDs for a build project (AWS CLI)

For more information about using the AWS CLI with AWS CodeBuild, see the <u>Command line</u> reference.

Run the list-build-batches-for-project command, as follows:

```
aws codebuild list-build-batches-for-project --project-name project-name --sort-
order sort-order --next-token next-token
```

In the preceding command, replace the following placeholders:

- project-name: Required string used to indicate the name of the build project to list builds IDs for. To get a list of build projects, see <u>View a list of build project names (AWS CLI)</u>.
- sort-order: Optional string used to indicate how to list the build IDs. Valid values include ASCENDING and DESCENDING.
- next-token: Optional string. During a previous run, if there were more than 100 items in the list, only the first 100 items are returned, along with a unique string called *next token*. To get the next batch of items in the list, run this command again, adding the next token to the call. To get all of the items in the list, keep running this command with each subsequent next token that is returned, until no more next tokens are returned.

For example, if you run this command similar to this:

```
aws codebuild list-build-batches-for-project --project-name codebuild-demo-project --
sort-order ASCENDING
```

A result like the following might appear in the output:

```
{
   "nextToken": "4AEA6u7J...The full token has been omitted for brevity...MzY2OA==",
   "ids": [
    "codebuild-demo-project:9b175d16-66fd-4e71-93a0-50a08EXAMPLE"
    "codebuild-demo-project:a9d1bd09-18a2-456b-8a36-7d65aEXAMPLE"
    ... The full list of build IDs has been omitted for brevity ...
   "codebuild-demo-project:fe70d102-c04f-421a-9cfa-2dc15EXAMPLE"
  ]
}
```

If you run this command again:

```
aws codebuild list-build-batches-for-project --project-name codebuild-demo-project
    --sort-order ASCENDING --next-token 4AEA6u7J...The full token has been omitted for
    brevity...MzY20A==
```

You might see a result like the following in the output:

```
{
  "ids": [
    "codebuild-demo-project:98253670-7a8a-4546-b908-dc890EXAMPLE"
    "codebuild-demo-project:ad5405b2-1ab3-44df-ae2d-fba84EXAMPLE"
    ... The full list of build IDs has been omitted for brevity ...
    "codebuild-demo-project:f721a282-380f-4b08-850a-e0ac1EXAMPLE"
  ]
}
```

View a list of build IDs for a build project (AWS SDKs)

For more information about using AWS CodeBuild with the AWS SDKs, see the <u>AWS SDKs and tools</u> reference.

View a running build in Session Manager

In AWS CodeBuild, you can pause a running build and then use AWS Systems Manager Session Manager to connect to the build container and view the state of the container.

Note

This feature is not available in Windows environments.

Topics

- Prerequisites
- Pause the build
- Start the build
- Connect to the build container
- <u>Resume the build</u>

Prerequisites

To allow Session Manager to be used with the build session, you must enable session connection for the build. There are two prerequisites:

CodeBuild Linux standard curated images already have the SSM agent installed and the SSM agent ContainerMode enabled.

If you are using a custom image for your build, do the following:

- Install the SSM Agent. For more information, see <u>Manually install SSM Agent on EC2</u> <u>instances for Linux</u> in the AWS Systems Manager User Guide. The SSM Agent version must be 3.0.1295.0 or later.
- Copy the file <u>https://github.com/aws/aws-codebuild-docker-images/blob/master/ubuntu/</u> <u>standard/5.0/amazon-ssm-agent.json</u> to the /etc/amazon/ssm/ directory in your image. This enables Container Mode in the SSM agent.

1 Note

Custom images would require most updated SSM agent for this feature to work as expected.

• The CodeBuild service role must have the following SSM policy:

```
{
    "Effect": "Allow",
    "Action": [
        "ssmmessages:CreateControlChannel",
        "ssmmessages:OpenControlChannel",
        "ssmmessages:OpenDataChannel"
    ],
    "Resource": "*"
}
```

You can have the CodeBuild console automatically attach this policy to your service role when you start the build. Alternatively, you can attach this policy to your service role manually.

• If you have **Auditing and logging session activity** enabled in Systems Manager preferences, the CodeBuild service role must also have additional permissions. The permissions are different, depending on where the logs are stored.

CloudWatch Logs

If using CloudWatch Logs to store your logs, add the following permission to the CodeBuild service role:

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Effect": "Allow",
      "Action": "logs:DescribeLogGroups",
      "Resource": "arn:aws:logs:<region-id>:<account-id>:log-group:*:*"
    },
    {
      "Effect": "Allow",
      "Action": [
        "logs:CreateLogStream",
        "logs:PutLogEvents"
      ],
      "Resource": "arn:aws:logs:<region-id>:<account-id>:log-group:<log-group-
name>:*"
    }
  ]
}
```

Amazon S3

If using Amazon S3 to store your logs, add the following permission to the CodeBuild service role:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
         "Effect": "Allow",
         "Action": [
            "s3:GetEncryptionConfiguration",
            "s3:PutObject"
        ],
        "Resource": [
            "arn:aws:s3:::<bucket-name>",
            "arn:aws:s3:::<bucket-name>/*"
```

```
]
}
}
```

For more information, see <u>Auditing and logging session activity</u> in the AWS Systems Manager User Guide.

Pause the build

To pause the build, insert the **codebuild-breakpoint** command in any of the build phases in your buildspec file. The build will be paused at this point, which allows you to connect to the build container and view the container in its current state.

For example, add the following to the build phases in your buildspec file.

```
phases:
    pre_build:
        commands:
        - echo Entered the pre_build phase...
        - echo "Hello World" > /tmp/hello-world
        codebuild breekpeint
```

```
- codebuild-breakpoint
```

This code creates the /tmp/hello-world file and then pauses the build at this point.

Start the build

To allow Session Manager to be used with the build session, you must enable session connections for the build. To do this, when starting the build, follow these steps:

- 1. Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ https://console.aws.amazon.com/codesuite/codebuild/
- In the navigation pane, choose Build projects. Choose the build project, and then choose Start build with overrides.
- 3. Choose Advanced build overrides.
- 4. In the **Environment** section, choose the **Enable session connection** option. If this option is not selected, all of the **codebuild-breakpoint** and **codebuild-resume** commands are ignored.
- 5. Make any other desired changes, and choose **Start build**.

6. Monitor the build status in the console. When the session is available, the **AWS Session Manager** link appears in the **Build status** section.

Connect to the build container

You can connect to the build container in one of two ways:

CodeBuild console

In a web browser, open the **AWS Session Manager** link to connect to the build container. A terminal session opens that allows you to browse and control the build container.

AWS CLI

Note

Your local machine must have the Session Manager plugin installed for this procedure. For more information, see <u>Install the Session Manager Plugin for the AWS CLI</u> in the AWS Systems Manager User Guide.

 Call the **batch-get-builds** api with the build ID to get information about the build, including the session target identifier. The session target identifier property name varies depending on the output type of the aws command. This is why --output json is added to the command.

aws codebuild batch-get-builds --ids
 solution --region
 region --output json

- 2. Copy the sessionTarget property value. The sessionTarget property name can vary depending on the output type of the aws command. This is why --output json is added to the command in the previous step.
- 3. Use the following command to connect to the build container.

aws ssm start-session --target <sessionTarget> --region <region>

For this example, verify that the /tmp/hello-world file exists and contains the text Hello World.

Resume the build

After you finish examining the build container, issue the **codebuild-resume** command from the container shell.

\$ codebuild-resume

Test reports in AWS CodeBuild

You can create reports in CodeBuild that contain details about tests that are run during builds. You can create tests such as unit tests, configuration tests, and functional tests.

The following test report file formats are supported:

- Cucumber JSON (.json)
- JUnit XML (.xml)
- NUnit XML (.xml)
- NUnit3 XML (.xml)
- TestNG XML (.xml)
- Visual Studio TRX (.trx)
- Visual Studio TRX XML (.xml)

í) Note

The latest supported version of cucumber-js is 7.3.2.

Create your test cases with any test framework that can create report files in one of these formats (for example, Surefire JUnit plugin, TestNG, or Cucumber).

To create a test report, you add a report group name to the buildspec file of a build project with information about your test cases. When you run the build project, the test cases are run and a test report is created. A new test report is created in the report group each time the test cases run. You do not need to create a report group before you run your tests. If you specify a report group name, CodeBuild creates a report group for you when you run your reports. If you want to use a report group that already exists, you specify its ARN in the buildspec file.

You can use a test report to help troubleshoot a problem during a build run. If you have many test reports from multiple builds of a build project, you can use your test reports to view trends and test and failure rates to help you optimize builds.

A report expires 30 days after it was created. You cannot view an expired test report. If you want to keep test reports for more than 30 days, you can export your test results' raw data files to an

Amazon S3 bucket. Exported test files do not expire. Information about the S3 bucket is specified when you create the report group.

🚯 Note

The CodeBuild service role specified in the project is used for permissions to upload to the S3 bucket.

Topics

- Create test reports
- Create code coverage reports
- Auto-discover reports in CodeBuild
- <u>Report groups</u>
- Test frameworks
- View test reports
- Test report permissions
- Test report statuses

Create test reports

To create a test report, you run a build project that is configured with one to five report groups in its buildspec file. A test report is created during the run. It contains the results of the test cases that are specified for the report groups. A new test report is generated for each subsequent build that uses the same buildspec file.

To create a test report

- 1. Create a build project. For information, see <u>Create a build project in AWS CodeBuild</u>.
- 2. Configure the buildspec file of your project with test report informaton:
 - a. Add a reports: section and specify either the ARN of an existing report group, or the name of a report group.

If you specify an ARN, CodeBuild uses that report group.

If you specify a name, CodeBuild creates a report group for you using your project name, and the name you specified, in the format <project-name>-<report-group-name>. If the named report group already exists, CodeBuild uses that report group.

- b. Under the report group, specify the location of the files that contain the test results. If you use more than one report group, specify test result file locations for each one. A new test report is created each time your build project runs. For more information, see <u>Specify test files</u>.
- c. In the commands section of the build or post_build sequence, specify the commands that run the tests cases you specified for your report groups. For more information, see <u>Specify test commands</u>.

The following is an example of a buildspec reports section:

```
reports:
  php-reports:
    files:
        - "reports/php/*.xml"
    file-format: "JUNITXML"
    nunit-reports:
        files:
        - "reports/nunit/*.xml"
        file-format: "NUNITXML"
```

- 3. Run a build of the build project. For more information, see <u>Run AWS CodeBuild builds</u> <u>manually</u>.
- When the build is complete, choose the new build run from Build history on your project page. Choose Reports to view the test report. For more information, see <u>View test reports for</u> <u>a build</u>.

Create code coverage reports

CodeBuild allows you to generate code coverage reports for your tests. The following code coverage reports are provided:

Line coverage

Line coverage measures how many statements your tests cover. A statement is a single instruction, not including comments or conditionals.

```
line coverage = (total lines covered)/(total number of lines)
```

Branch coverage

Branch coverage measures how many branches your tests cover out of every possible branch of a control structure, such as an if or case statement.

branch coverage = (total branches covered)/(total number of branches)

The following code coverage report file formats are supported:

- JaCoCo XML
- SimpleCov JSON¹
- Clover XML
- Cobertura XML
- LCOV INFO

¹ CodeBuild accepts JSON code coverage reports generated by <u>simplecov</u>, not <u>simplecov-json</u>.

Create a code coverage report

To create a code coverage report, you run a build project that is configured with at least one code coverage report group in its buildspec file. CodeBuild will interpret the code coverage results and provide a code coverage report for the run. A new test report is generated for each subsequent build that uses the same buildspec file.

To create a test report

- 1. Create a build project. For information, see <u>Create a build project in AWS CodeBuild</u>.
- 2. Configure the buildspec file of your project with test report information:
 - a. Add a reports: section and specify the name for your report group. CodeBuild creates a report group for you using your project name and the name you specified in the format project-name-report-group-name-in-buildspec. If you already have a report

group you want to use, specify its ARN. If you use the name instead of the ARN, CodeBuild creates a new report group. For more information, see Reports syntax in the buildspec file.

b. Under the report group, specify the location of the files that contain the code coverage results. If you use more than one report group, specify result file locations for each report group. A new code coverage report is created each time your build project runs. For more information, see <u>Specify test files</u>.

This is an example that generates a code coverage report for a JaCoCo XML results file located in test-results/jacoco-coverage-report.xml.

```
reports:
    jacoco-report:
    files:
        - 'test-results/jacoco-coverage-report.xml'
    file-format: 'JACOCOXML'
```

- c. In the commands section of the build or post_build sequence, specify the commands that run the code coverage analysis. For more information, see Specify test commands.
- 3. Run a build of the build project. For more information, see <u>Run AWS CodeBuild builds</u> manually.
- 4. When the build is complete, choose the new build run from **Build history** on your project page. Choose **Reports** to view the code coverage report. For more information, see <u>View test</u> reports for a build.

Auto-discover reports in CodeBuild

With auto-discovery, CodeBuild searches through all your build files after the build phase has completed, searches for any supported report file types, and automatically creates new test and code coverage report groups and reports. For any discovered report types, CodeBuild creates new report groups with the following pattern:

```
<project-name>-<report-file-format>-AutoDiscovered
```

Note

If the discovered report files have the same format type, they will be placed in to the same report group or report.

Report auto-discover is configured by your project environment variables:

CODEBUILD_CONFIG_AUTO_DISCOVER

This variable determines whether report auto-discover is disabled during the build. By default, report auto-discover is enabled for all builds. To disable this feature, set CODEBUILD_CONFIG_AUTO_DISCOVER to false.

CODEBUILD_CONFIG_AUTO_DISCOVER_DIR

(Optional) This variable determines where CodeBuild searches for potential report files. Note that by default, CodeBuild searches in **/* by default.

These environment variables can be modified during the build phase. For example, if you only want to enable report auto-discover for builds on the main git branch, you can check the git branch during the build process and set CODEBUILD_CONFIG_AUTO_DISCOVER to false if the build is not on the main branch. Report auto-discover can be disabled using the console or using project environment variables.

Topics

- Configure report auto-discover using the console
- Configure report auto-discover using project environment variables

Configure report auto-discover using the console

Use the following procedure to configure report auto-discovery using the console.

To configure report auto-discover using the console

- 1. Create a build project or choose a build project to edit. For information, see <u>Create a build</u> project in AWS CodeBuild or Change build project settings in AWS CodeBuild.
- 2. In **Environment**, select **Additional configuration**.
- 3. To disable report auto-discover, in **Report auto-discover**, select **Disable report auto-discover**.
- 4. (Optional) In **Auto-discover directory optional**, enter a directory pattern for CodeBuild to search for supported report format files. Note that CodeBuild searches in **/* by default.

Configure report auto-discover using project environment variables

Use the following procedure to configure report auto-discovery using project environment variables.

To configure report auto-discover using project environment variables

- 1. Create a build project or choose a build project to edit. For information, see <u>Create a build</u> project in AWS CodeBuild or Change build project settings in AWS CodeBuild.
- 2. In **Environment variables**, do the following:
 - a. To disable report auto-discover, for **Name**, enter **CODEBUILD_CONFIG_AUTO_DISCOVER** and for **Value**, enter **false**. This disables report auto-discover.
 - b. (Optional) For Name, enter CODEBUILD_CONFIG_AUTO_DISCOVER_DIR and for Value, enter the directory where CodeBuild should search for supported report format files. For example, output/*xml searches for .xml files in the output directory

Report groups

A *report group* contains test reports and specifies shared settings. You use the buildspec file to specify the test cases to run and the commands to run them when it builds. For each report group configured in a build project, a run of the build project creates a test report. Multiple runs of a build project configured with a report group create multiple test reports in that report group, each with results of the same test cases specified for that report group.

The test cases are specified for a report group in the buildspec file of a build project. You can specify up to five report groups in one build project. When you run a build, all the test cases run. A new test report is created with the results of each test case specified for a report group. Each time you run a new build, the test cases run and a new test report is created with the new test results.

Report groups can be used in more than one build project. All test reports created with one report group share the same configuration, such as its export option and permissions, even if the test reports are created using different build projects. Test reports created with one report group in multiple build projects can contain the results from running different sets of test cases (one set of test cases for each build project). This is because you can specify different test case files for the report group in each project's buildspec file. You can also change the test case files for a report group in a build project by editing its buildspec file. Subsequent build runs create new test reports that contain the results of the test case files in the updated buildspec.

Topics

- <u>Create a report group</u>
- Report group naming
- Share report groups
- Specify test files
- Specify test commands
- Tag a report group in AWS CodeBuild
- Update a report group

Create a report group

You can use the CodeBuild console, the AWS CLI, or a buildspec file to create a report group. Your IAM role must have the permissions required to create a report group. For more information, see <u>Test report permissions</u>.

Topics

- Create a report group (buildspec)
- Create a report group (console)
- Create a report group (CLI)
- Create a report group (AWS CloudFormation)

Create a report group (buildspec)

A report group created using the buildspec does not export raw test result files. You can view your report group and specify export settings. For more information, see Update a report group.

To create a report group using a buildspec file

- 1. Choose a report group name that is not associated with a report group in your AWS account.
- 2. Configure the reports section of the buildspec file with this name. In this example, the report group name is new-report-group and the use test cases are created with the JUnit framework:

```
reports:
    new-report-group: #surefire junit reports
```

```
files:
    - '**/*'
base-directory: 'surefire/target/surefire-reports'
```

The report group name can also be specified by using environment variables in the buildspec:

```
version: 0.2
env:
   variables:
    REPORT_GROUP_NAME: "new-report-group"
phases:
   build:
      commands:
      - ...
reports:
   $REPORT_GROUP_NAME:
   files:
      - '**/*'
   base-directory: 'surefire/target/surefire-reports'
```

For more information, see Specify test files and Reports syntax in the buildspec file.

- 3. In the commands section, specify the command to run your tests. For more information, see Specify test commands .
- 4. Run the build. When the build is complete, a new report group is created with a name that uses the format project-name-report-group-name. For more information, see <u>Report</u> group naming.

Create a report group (console)

Use the following procedure to create a report group using the AWS Management Console.

To create a report group

- Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ https://console.aws.amazon.com/codesuite/codebuild/
- 2. In the navigation pane, choose **Report groups**.
- 3. Choose **Create report group**.

- 4. For **Report group name**, enter a name for your report group.
- 5. (Optional) For **Tags**, enter the name and value of any tags that you want supporting AWS services to use. Use **Add row** to add a tag. You can add up to 50 tags.
- 6. If you want to upload the raw data of your test report results to an Amazon S3 bucket:
 - a. Select **Export to Amazon S3**.
 - b. For **S3 bucket name**, enter the name of the S3 bucket.
 - c. (Optional) For **S3 bucket owner**, enter the AWS account identifier of the account that owns the S3 bucket. This allows report data to be exported to an Amazon S3 bucket that is owned by an account other than the account running the build.
 - d. For **Path prefix**, enter the path in your S3 bucket where you want to upload your test results.
 - e. Select **Compress test result data in a zip file** to compress your raw test result data files.
 - f. Expand **Additional configuration** to display encryption options. Choose one of the following:
 - **Default AWS managed key** to use a AWS managed key for Amazon S3. For more information, see <u>Customer managed CMKs</u> in the AWS Key Management Service User *Guide*. This is the default encryption option.
 - Choose a custom key to use a customer managed key that you create and configure.
 For AWS KMS encryption key, enter the ARN of your encryption key. Its format is arn:aws:kms:<region-id>: <aws-account-id>:key/<key-id>. For more information, see Creating KMS keys in the AWS Key Management Service User Guide.
 - **Disable artifact encryption** to disable encryption. You might choose this if you want to share your test results, or publish them to a static website. (A dynamic website can run code to decrypt test results.)

For more information about encryption of data at rest, see **Data encryption**.

🚯 Note

The CodeBuild service role specified in the project is used for permissions to upload to the S3 bucket.

7. Choose **Create report group**.

Create a report group (CLI)

Use the following procedure to create a report group using the AWS CLI.

To create a report group

- 1. Create a file named CreateReportGroup.json.
- 2. Depending on your requirements, copy one of the following JSON code snippets into CreateReportGroup.json:
 - Use the following JSON to specify that your test report group exports raw test result files to an Amazon S3 bucket.

```
{
  "name": "<report-name>",
  "type": "TEST",
  "exportConfig": {
    "exportConfigType": "S3",
    "s3Destination": {
      "bucket": "<bucket-name>",
      "bucketOwner": "<bucket-owner>",
      "path": "<path>",
      "packaging": "NONE | ZIP",
      "encryptionDisabled": "false",
      "encryptionKey": "<your-key>"
    },
    "tags": [
      {
        "key": "tag-key",
        "value": "tag-value"
      }
    ]
  }
}
```

- Replace <bucket-name> with your Amazon S3 bucket name and <path> with the path in your bucket to where you want to export the files.
- If you want to compress the exported files, for packaging, specify ZIP. Otherwise, specify NONE.
- bucketOwner is optional and is only required if the Amazon S3 bucket is owned by an account other than the account running the build.

- Use encryptionDisabled to specify whether to encrypt the exported files. If you encrypt the exported files, enter your customer managed key. For more information, see Update a report group.
- Use the following JSON to specify that your test report does not export raw test files:

```
{
    "name": "<report-name>",
    "type": "TEST",
    "exportConfig": {
        "exportConfigType": "NO_EXPORT"
    }
}
```

1 Note

The CodeBuild service role specified in the project is used for permissions to upload to the S3 bucket.

3. Run the following command:

```
aws codebuild create-report-group --cli-input-json file://
CreateReportGroupInput.json
```

Create a report group (AWS CloudFormation)

Use the following instructions to create a report group using the AWS CloudFormation template

To create a report group using the AWS CloudFormation template

You can use an AWS CloudFormation template file to create and provision a report group. For more information, see AWS CloudFormation User Guide.

The following AWS CloudFormation YAML template creates a report group that does not export raw test result files.

```
Resources:
CodeBuildReportGroup:
Type: AWS::CodeBuild::ReportGroup
Properties:
```

```
User Guide
```

```
Name: my-report-group-name
Type: TEST
ExportConfig:
   ExportConfigType: N0_EXPORT
```

The following AWS CloudFormation YAML template creates a report group that exports raw test result files to an Amazon S3 bucket.

```
Resources:

CodeBuildReportGroup:

Type: AWS::CodeBuild::ReportGroup

Properties:

Name: my-report-group-name

Type: TEST

ExportConfig:

ExportConfigType: S3

S3Destination:

Bucket: amzn-s3-demo-bucket

Path: path-to-folder-for-exported-files

Packaging: ZIP

EncryptionKey: my-KMS-encryption-key

EncryptionDisabled: false
```

🚯 Note

The CodeBuild service role specified in the project is used for permissions to upload to the S3 bucket.

Report group naming

When you use the AWS CLI or the AWS CodeBuild console to create a report group, you specify a name for the report group. If you use the buildspec to create a new report group, it is named using the format *project-name-report-group-name-specified-in-buildspec*. All reports created by running builds of that build project belong to the new report group that has the new name.

If you do not want CodeBuild to create a new report group, specify the ARN of the report group in a build project's buildspec file. You can specify a report group's ARN in multiple build projects. After each build project runs, the report group contains test reports created by each build project. For example, if you create one report group with the name my-report-group, and then use its name in two different build projects named my-project-1 and my-project-2 and create a build of both projects, two new report groups are created. The result is three report groups with the following names:

- my-report-group: Does not have any test reports.
- my-project-1-my-report-group: Contains reports with results of tests run by the build project named my-project-1.
- my-project-2-my-report-group: Contains reports with results of tests run by the build project named my-project-2.

If you use the ARN of the report group named my-report-group in both projects, and then run builds of each project, you still have one report group (my-report-group). That report group contains test reports with results of tests run by both build projects.

If you choose a report group name that doesn't belong to a report group in your AWS account, and then use that name for a report group in a buildspec file and run a build of its build project, a new report group is created. The format of name of the new report group is *project-name-new-group-name*. For example, if there is not a report group in your AWS account with the name new-report-group, and specify it in a build project called test-project, a build run creates a new report group with the name test-project-new-report-group.

Share report groups

Report group sharing allows multiple AWS accounts or users to view a report group, its unexpired reports, and the test results of its reports. In this model, the account that owns the report group (owner) shares a report group with other accounts (consumers). A consumer cannot edit a report group. A report expires 30 days after it is created.

Topics

- Share a report group
- Related services
- <u>Access report groups shared with you</u>
- Unshare a shared report group
- Identify a shared report group
- Shared report group permissions

Share a report group

When you share a report group, the consumer is granted read-only access to the report group and its reports. The consumer can use the AWS CLI to view the report group, its reports, and the test case results for each report. The consumer cannot:

- View a shared report group or its reports in the CodeBuild console.
- Edit a shared report group.
- Use the ARN of the shared report group in a project to run a report. A project build that specifies a shared report group fails.

You can use the CodeBuild console to add a report group to an existing resource share. If you want to add the report group to a new resource share, you must first create it in the <u>AWS RAM console</u>.

To share a report group with organizational units or an entire organization, you must enable sharing with AWS Organizations. For more information, see <u>Enable sharing with AWS Organizations</u> in the *AWS RAM User Guide*.

You can use the CodeBuild console, AWS RAM console, or AWS CLI to share report groups that you own.

Prerequisite

To share a report group, your AWS account must own it. You cannot share a report group that has been shared with you.

To share a report group that you own (CodeBuild console)

- Open the AWS CodeBuild console at <u>https://console.aws.amazon.com/codesuite/codebuild/</u> <u>home</u>.
- 2. In the navigation pane, choose **Report groups**.
- 3. Choose the project you want to share, and then choose **Share**. For more information, see <u>Create a resource share</u> in the AWS RAM User Guide.

To share report groups that you own (AWS RAM console)

See Creating a resource share in the AWS RAM User Guide.

To share report groups that you own (AWS RAM command)

Use the create-resource-share command.

To share a report group that you own (CodeBuild command)

Use the <u>put-resource-policy</u> command:

1. Create a file named policy.json and copy the following into it.

```
{
    "Version":"2012-10-17",
    "Statement":[{
        "Effect":"Allow",
        "Principal":{
        "AWS":"consumer-aws-account-id-or-user"
        },
        "Action":[
            "codebuild:BatchGetReportGroups",
            "codebuild:BatchGetReports",
            "codebuild:ListReportsForReportGroup",
            "codebuild:DescribeTestCases"],
        "Resource":"arn-of-report-group-to-share"
    }]
}
```

2. Update policy.json with the report group ARN and identifiers to share it with. The following example grants read-only access to the report group with the ARN arn:aws:codebuild:us-west-2:123456789012:report-group/my-report-group to Alice and the root user for the AWS account identified by 123456789012.

```
{
    "Version":"2012-10-17",
    "Statement":[{
        "Effect":"Allow",
        "Principal":{
            "AWS": [
              "arn:aws:iam::123456789012:user/Alice",
              "123456789012"
        ]
      },
      "Action":[
        "codebuild:BatchGetReportGroups",
```

```
"codebuild:BatchGetReports",
    "codebuild:ListReportsForReportGroup",
    "codebuild:DescribeTestCases"],
    "Resource":"arn:aws:codebuild:us-west-2:123456789012:report-group/my-report-
group"
    }]
}
```

3. Run the following command.

```
aws codebuild put-resource-policy --resource-arn report-group-arn --policy file://
policy.json
```

Related services

Report group sharing integrates with AWS Resource Access Manager (AWS RAM), a service that makes it possible for you to share your AWS resources with any AWS account or through AWS Organizations. With AWS RAM, you share resources that you own by creating a *resource share* that specifies the resources and the consumers to share them with. Consumers can be individual AWS accounts, organizational units in AWS Organizations, or an entire organization in AWS Organizations.

For more information, see the AWS RAM User Guide.

Access report groups shared with you

To access a shared report group, a consumer's IAM role requires the BatchGetReportGroups permission. You can attach the following policy to their IAM role:

```
{
    "Effect": "Allow",
    "Resource": [
        "*"
    ],
    "Action": [
        "codebuild:BatchGetReportGroups"
    ]
}
```

For more information, see Using identity-based policies for AWS CodeBuild.

Unshare a shared report group

An unshared report group, including its reports and their test case results, can be accessed only by its owner. If you unshare a report group, any AWS account or user you previously shared it with cannot access the report group, its reports, or the results of test cases in the reports.

To unshare a shared report group that you own, you must remove it from the resource share. You can use the AWS RAM console or AWS CLI to do this.

To unshare a shared report group that you own (AWS RAM console)

See Updating a resource share in the AWS RAM User Guide.

To unshare a shared report group that you own (AWS RAM command)

Use the disassociate-resource-share command.

To unshare report group that you own CodeBuild command)

Run the <u>delete-resource-policy</u> command and specify the ARN of the report group you want to unshare:

aws codebuild delete-resource-policy --resource-arn report-group-arn

Identify a shared report group

Owners and consumers can use the AWS CLI to identify shared report groups.

To identify and get information about a shared report group and its reports, use the following commands:

To see the ARNs of report groups shared with you, run <u>list-shared-report-groups</u>:

aws codebuild list-shared-report-groups

 To see the ARNs of the reports in a report group, run <u>list-reports-for-report-group</u> using the report group ARN:

aws codebuild list-reports-for-report-group --report-group-arn report-group-arn

 To see information about test cases in a report, run <u>describe-test-cases</u> using the report ARN: aws codebuild describe-test-cases --report-arn report-arn

The output looks like the following:

```
{
    "testCases": [
        {
            "status": "FAILED",
            "name": "Test case 1",
            "expired": 1575916770.0,
            "reportArn": "report-arn",
            "prefix": "Cucumber tests for agent",
            "message": "A test message",
            "durationInNanoSeconds": 1540540,
            "testRawDataPath": "path-to-output-report-files"
        },
        {
            "status": "SUCCEEDED",
            "name": "Test case 2",
            "expired": 1575916770.0,
            "reportArn": "report-arn",
            "prefix": "Cucumber tests for agent",
            "message": "A test message",
            "durationInNanoSeconds": 1540540,
            "testRawDataPath": "path-to-output-report-files"
        }
    ]
}
```

Shared report group permissions

Permissions for owners

A report group owner can edit the report group and specify it in a project to run reports.

Permissions for consumers

A report group consumer can view a report group, its reports, and the test case results for its reports. A consumer cannot edit a report group or its reports, and cannot use it to create reports.

Specify test files

You specify the test result files and their location for each report group in the reports section of your build project's buildspec file. For more information, see Reports syntax in the buildspec file.

The following is a sample reports section that specifies two report groups for a build project. One is specified with its ARN, the other with a name. The files section specifies the files that contain the test case results. The optional base-directory section specifies the directory where the test case files are located. The optional discard-paths section specifies whether paths to test result files uploaded to an Amazon S3 bucket are discarded.

```
reports:
    arn:aws:codebuild:your-region:your-aws-account-id:report-group/report-group-name-1:
    #surefire junit reports
    files:
        - '**/*'
    base-directory: 'surefire/target/surefire-reports'
    discard-paths: false
    sampleReportGroup: #Cucumber reports from json plugin
    files:
        - 'cucumber-json/target/cucumber-json-report.json'
    file-format: CUCUMBERJSON #Type of the report, defaults to JUNITXML
```

Specify test commands

You specify the commands that run your test cases in the commands section of your buildspec file. These commands run the test cases specified for your report groups in the reports section of your buildspec file. The following is a sample commands section that includes commands to run the tests in test files:

```
commands:
    echo Running tests for surefire junit
    mvn test -f surefire/pom.xml -fn
    echo
    echo Running tests for cucumber with json plugin
    mvn test -Dcucumber.options="--plugin json:target/cucumber-json-report.json" -f
    cucumber-json/pom.xml -fn
```

For more information, see **Buildspec syntax**.

Tag a report group in AWS CodeBuild

A *tag* is a custom attribute label that you or AWS assigns to an AWS resource. Each AWS tag has two parts:

- A *tag key* (for example, CostCenter, Environment, Project, or Secret). Tag keys are case sensitive.
- An optional field known as a *tag value* (for example, 111122223333, Production, or a team name). Omitting the tag value is the same as using an empty string. Like tag keys, tag values are case sensitive.

Together these are known as key-value pairs. For limits on the number of tags you can have on a report group and restrictions on tag keys and values, see <u>Tags</u>.

Tags help you identify and organize your AWS resources. Many AWS services support tagging, so you can assign the same tag to resources from different services to indicate that the resources are related. For example, you can assign the same tag to a CodeBuild report group that you assign to an Amazon S3 bucket. For more information about using tags, see the <u>Tagging best practices</u> whitepaper.

In CodeBuild, the primary resources are the report group and the project. You can use the CodeBuild console, the AWS CLI, CodeBuild APIs, or AWS SDKs to add, manage, and remove tags for a report group. In addition to identifying, organizing, and tracking your report group with tags, you can use tags in IAM policies to help control who can view and interact with your report group. For examples of tag-based access policies, see <u>Using tags to control access to AWS CodeBuild resources</u>.

Topics

- Add tags to a report group
- View tags for a report group
- Edit tags for a report group
- <u>Remove tags from a report group</u>

Add tags to a report group

Adding tags to a report group can help you identify and organize your AWS resources and manage access to them. First, you add one or more tags (key-value pairs) to a report group. Keep in mind

that there are limits on the number of tags you can have on a report group. There are restrictions on the characters you can use in the key and value fields. For more information, see <u>Tags</u>. After you have tags, you can create IAM policies to manage access to the report group based on these tags. You can use the CodeBuild console or the AWS CLI to add tags to a report group.

<u> Important</u>

Adding tags to a report group can impact access to that report group. Before you add a tag to a report group, make sure to review any IAM policies that might use tags to control access to resources such as report groups. For examples of tag-based access policies, see Using tags to control access to AWS CodeBuild resources.

For more information about adding tags to a report group when you create it, see <u>Create a report</u> group (console).

Topics

- Add a tag to a report group (console)
- Add a tag to a report group (AWS CLI)

Add a tag to a report group (console)

You can use the CodeBuild console to add one or more tags to a CodeBuild report group.

- 1. Open the CodeBuild console at https://console.aws.amazon.com/codebuild/.
- 2. In **Report groups**, choose the name of the report group where you want to add tags.
- 3. In the navigation pane, choose **Settings**.
- 4. If no tags have been added to the report group, choose **Add tag**. You can also choose **Edit**, and then choose **Add tag**.
- 5. In **Key**, enter a name for the tag. You can add an optional value for the tag in **Value**.
- 6. (Optional) To add another tag, choose **Add tag** again.
- 7. When you have finished adding tags, choose **Submit**.

Add a tag to a report group (AWS CLI)

To add a tag to a report group when you create it, see <u>Create a report group (CLI)</u>. In CreateReportGroup.json, add your tags.

To add tags to an existing report group, see <u>Update a report group (CLI)</u> and add your tags in UpdateReportGroupInput.json.

In these steps, we assume that you have already installed a recent version of the AWS CLI or updated to the current version. For more information, see <u>Installing the AWS Command Line</u> <u>Interface</u>.

View tags for a report group

Tags can help you identify and organize your AWS resources and manage access to them. For more information about using tags, see the <u>Tagging best practices</u> whitepaper. For examples of tagbased access policies, see <u>Deny or allow actions on report groups based on resource tags</u>.

View tags for a report group (console)

You can use the CodeBuild console to view the tags associated with a CodeBuild report group.

- 1. Open the CodeBuild console at https://console.aws.amazon.com/codebuild/.
- 2. In **Report groups**, choose the name of the report group where you want to view tags.
- 3. In the navigation pane, choose **Settings**.

View tags for a report group (AWS CLI)

Follow these steps to use the AWS CLI to view the AWS tags for a report group. If no tags have been added, the returned tags list is empty.

1. Use the console or the AWS CLI to locate the ARN of your report group. Make a note of it.

AWS CLI

Run the following command.

aws list-report-groups

This command returns JSON-formatted information similar to the following:

```
{
    "reportGroups": [
        "arn:aws:codebuild:region:123456789012:report-group/report-group-1",
        "arn:aws:codebuild:region:123456789012:report-group/report-group-2",
        "arn:aws:codebuild:region:123456789012:report-group/report-group-3"
    ]
}
```

A report group ARN ends with its name, which you can use to identify the ARN for your report group.

Console

- 1. Open the CodeBuild console at https://console.aws.amazon.com/codebuild/.
- 2. In **Report groups**, choose the name of your report group with the tags you want to view.
- 3. In **Configuration** locate your report group's ARN.
- 2. Run the following command. Use the ARN you made a note of for the --report-grouparns parameter.

```
aws codebuild batch-get-report-groups --report-group-arns
arn:aws:codebuild:region:123456789012:report-group/report-group-name
```

If successful, this command returns JSON-formatted information that contains a tags section similar to the following:

```
{
    ...
    "tags": {
        "Status": "Secret",
        "Project": "TestBuild"
    }
    ...
}
```

Edit tags for a report group

You can change the value for a tag associated with a report group. You can also change the name of the key, which is equivalent to removing the current tag and adding a different one with the new name and the same value as the other key. Keep in mind that there are restrictions on the characters you can use in the key and value fields. For more information, see Tags.

<u> Important</u>

Editing tags for a report group can impact access to that report group. Before you edit the name (key) or value of a tag for a report group, make sure to review any IAM policies that might use the key or value for a tag to control access to resources such as report groups. For examples of tag-based access policies, see <u>Deny or allow actions on report groups</u> based on resource tags.

Edit a tag for a report group (console)

You can use the CodeBuild console to edit the tags associated with a CodeBuild report group.

- 1. Open the CodeBuild console at https://console.aws.amazon.com/codebuild/.
- 2. In **Report groups**, choose the name of the report group where you want to edit tags.
- 3. In the navigation pane, choose **Settings**.
- 4. Choose Edit.
- 5. Do one of the following:
 - To change the tag, enter a new name in **Key**. Changing the name of the tag is the equivalent of removing a tag and adding a new tag with the new key name.
 - To change the value of a tag, enter a new value. If you want to change the value to nothing, delete the current value and leave the field blank.
- 6. When you have finished editing tags, choose **Submit**.

Edit tags for a report group (AWS CLI)

To add, change, or delete tags from a report group, see <u>Update a report group (CLI)</u>. Update the tags in UpdateReportGroupInput.json.

Remove tags from a report group

You can remove one or more tags associated with a report group. Removing a tag does not delete the tag from other AWS resources that are associated with that tag.

<u> Important</u>

Removing tags for a report group can impact access to that report group. Before you remove a tag from a report group, make sure to review any IAM policies that might use the key or value for a tag to control access to resources such as report groups. For examples of tag-based access policies, see Using tags to control access to AWS CodeBuild resources.

Remove a tag from a report group (console)

You can use the CodeBuild console to remove the association between a tag and a CodeBuild report group.

- 1. Open the CodeBuild console at https://console.aws.amazon.com/codebuild/.
- 2. In **Report groups**, choose the name of the report group where you want to remove tags.
- 3. In the navigation pane, choose **Settings**.
- 4. Choose **Edit**.
- 5. Find the tag you want to remove, and then choose **Remove tag**.
- 6. When you have finished removing tags, choose **Submit**.

Remove a tag from a report group (AWS CLI)

Follow these steps to use the AWS CLI to remove a tag from a CodeBuild report group. Removing a tag does not delete it, but simply removes the association between the tag and the report group.

(i) Note

If you delete a CodeBuild report group, all tag associations are removed from the deleted report group. You do not have to remove tags before you delete a report group.

To delete one or more tags from a report group, see <u>Edit tags for a report group (AWS CLI)</u>. Update the tags section in the JSON-formatted data with an updated list of tags that does not contain the ones you want to delete. If you want to delete all tags, update the tags section to:

"tags: []"

Update a report group

When you update a report group, you can specify information about whether to export the raw test result data to files in an Amazon S3 bucket. If you choose to export to an S3 bucket, you can specify the following for your report group:

- Whether the raw test results files are compressed in a ZIP file.
- Whether the raw test result files are encrypted. You can specify encryption with one of the following:
 - An AWS managed key for Amazon S3.
 - A customer managed key that you create and configure.

For more information, see <u>Data encryption</u>.

If you use the AWS CLI to update a report group, you can also update or add tags. For more information, see Tag a report group in AWS CodeBuild.

1 Note

The CodeBuild service role specified in the project is used for permissions to upload to the S3 bucket.

Topics

- Update a report group (console)
- Update a report group (CLI)

Update a report group (console)

Use the following procedure to update a report group using the AWS Management Console.

- Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ https://console.aws.amazon.com/codesuite/codebuild/
- 2. In the navigation pane, choose **Report groups**.
- 3. Choose the report group you want to update.
- 4. Choose Edit.
- 5. Select or clear **Backup to Amazon S3**. If you selected this option, specify your export settings:
 - a. For **S3 bucket name**, enter the name of the S3 bucket.
 - b. For **Path prefix**, enter the path in your S3 bucket where you want to upload your test results.
 - c. Select **Compress test result data in a zip file** to compress your raw test result data files.
 - d. Expand **Additional configuration** to display encryption options. Choose one of the following:
 - **Default AWS managed key** to use a AWS managed key for Amazon S3. For more information, see <u>Customer managed CMKs</u> in the AWS Key Management Service User *Guide*. This is the default encryption option.
 - Choose a custom key to use a customer managed key that you create and configure.
 For AWS KMS encryption key, enter the ARN of your encryption key. Its format is arn:aws:kms:<region-id>: <aws-account-id>:key/<key-id>. For more information, see Creating KMS keys in the AWS Key Management Service User Guide.
 - **Disable artifact encryption** to disable encryption. You might choose this if you want to share your test results, or publish them to a static website. (A dynamic website can run code to decrypt test results.)

Update a report group (CLI)

Use the following procedure to update a report group using the AWS CLI.

To update a report group

- 1. Create a file named UpdateReportGroupInput.json.
- 2. Copy the following into UpdateReportGroupInput.json:

API Version 2016-10-06 538

```
{
    "arn": "",
    "exportConfig": {
        "exportConfigType": "S3",
        "s3Destination": {
            "bucket": "bucket-name",
            "path": "path",
            "packaging": "NONE | ZIP",
            "encryptionDisabled": "false",
            "encryptionKey": "your-key"
         }
     },
     "tags": [
        {
            "key": "tag-key",
            "value": "tag-value"
        }
     ]
}
```

- 3. Enter the ARN of your report group in the arn line (for example, "arn":"arn:aws:codebuild:region:123456789012:report-group/report-group-1").
- 4. Update UpdateReportGroupInput.json with the updates you want to apply to your report group.
 - If you want to update your report group to export raw test result files to an S3 bucket, update the exportConfig section. Replace bucket-name with your S3 bucket name and path with the path in your S3 bucket that you want to export the files to. If you want to compress the exported files, for packaging, specify ZIP. Otherwise, specify NONE. Use encryptionDisabled to specify whether to encrypt the exported files. If you encrypt the exported files, enter your customer managed key.
 - If you want to update your report group so that it does not export raw test result files to an S3 bucket, update the exportConfig section with the following JSON:

```
{
    "exportConfig": {
        "exportConfigType": "NO_EXPORT"
    }
```

}

• If you want to update the report group's tags, update the tags section. You can change, add, or remove tags. If you want to remove all tags, update it with the following JSON:

"tags": []

5. Run the following command:

```
aws codebuild update-report-group \
--cli-input-json file://UpdateReportGroupInput.json
```

Test frameworks

The topics in this section demonstrate how to set up test reporting in AWS CodeBuild for various test frameworks.

Topics

- Set up test reporting with Jasmine
- Set up test reporting with Jest
- Set up test reporting with pytest
- Set up test reporting with RSpec

Set up test reporting with Jasmine

The following procedure demonstrates how to set up test reporting in AWS CodeBuild with the JasmineBDD testing framework.

The procedure requires the following prerequisites:

- You have an existing CodeBuild project.
- Your project is a Node.js project that is set up to use the Jasmine testing framework.

Add the <u>jasmine-reporters</u> package to the devDependencies section of your project's package.json file. This package has a collection of JavaScript reporter classes that can be used with Jasmine.

npm install --save-dev jasmine-reporters

If it's not already present, add the test script to your project's package.json file. The test script ensures that Jasmine is called when **npm test** is run.

```
{
   "scripts": {
     "test": "npx jasmine"
   }
}
```

CodeBuild supports the following Jasmine test reporters:

JUnitXmlReporter

Used to generate reports in the JunitXml format.

NUnitXmlReporter

Used to generate reports in the NunitXml format.

A Node.js project with Jasmine will, by default, have a spec sub-directory, which contains the Jasmine configuration and test scripts.

To configure Jasmine to generate reports in the JunitXML format, instantiate the JUnitXmlReporter reporter by adding the following code to your tests.

```
var reporters = require('jasmine-reporters');
var junitReporter = new reporters.JUnitXmlReporter({
   savePath: <test report directory>,
   filePrefix: <report filename>,
   consolidateAll: true
});
jasmine.getEnv().addReporter(junitReporter);
```

To configure Jasmine to generate reports in the NunitXML format, instantiate the NUnitXmlReporter reporter by adding the following code to your tests.

```
var reporters = require('jasmine-reporters');
```

```
var nunitReporter = new reporters.NUnitXmlReporter({
  savePath: <test report directory>,
  filePrefix: <report filename>,
  consolidateAll: true
});
```

jasmine.getEnv().addReporter(nunitReporter)

The test reports are exported to the file specified by <test report directory>/<report filename>.

In your buildspec.yml file, add/update the following sections.

If you are using the the NunitXml report format, change the file-format value to the following.

file-format: NUNITXML

Set up test reporting with Jest

The following procedure demonstrates how to set up test reporting in AWS CodeBuild with the <u>Jest</u> testing framework.

The procedure requires the following prerequisites:

- You have an existing CodeBuild project.
- Your project is a Node.js project that is set up to use the Jest testing framework.

Add the <u>jest-junit</u> package to the devDependencies section of your project's package.json file. CodeBuild uses this package to generate reports in the JunitXml format.

```
npm install --save-dev jest-junit
```

If it's not already present, add the test script to your project's package.json file. The test script ensures that Jest is called when **npm test** is run.

```
{
    "scripts": {
        "test": "jest"
    }
}
```

Configure Jest to use the JunitXml reporter by adding the following to your Jest configuration file. If your project does not have a Jest configuration file, create a file named jest.config.js in the root of your project and add the following. The test reports are exported to the file specified by <test report directory>/<report filename>.

```
module.exports = {
  reporters: [
    'default',
    [ 'jest-junit', {
      outputDirectory: <test report directory>,
      outputName: <report filename>,
    } ]
  ]
};
```

In your buildspec.yml file, add/update the following sections.

```
build:
    commands:
        - npm build
        - npm test
reports:
    jest_reports:
    files:
        - <report filename>
    file-format: JUNITXML
    base-directory: <test report directory>
```

Set up test reporting with pytest

The following procedure demonstrates how to set up test reporting in AWS CodeBuild with the pytest testing framework.

The procedure requires the following prerequisites:

- You have an existing CodeBuild project.
- Your project is a Python project that is set up to use the pytest testing framework.

Add the following entry to either the build or post_build phase of your buildspec.yml file. This code automatically discovers tests in the current directory and exports the test reports to the file specified by <test report directory>/<report filename>. The report uses the JunitXml format.

- python -m pytest --junitxml=<test report directory>/<report filename>

In your buildspec.yml file, add/update the following sections.

```
version: 0.2
phases:
    install:
    runtime-versions:
        python: 3.7
        commands:
            - pip3 install pytest
        build:
```

```
commands:
        - python -m pytest --junitxml=<test report directory>/<report filename>
reports:
    pytest_reports:
    files:
        - <report filename>
    base-directory: <test report directory>
    file-format: JUNITXML
```

Set up test reporting with RSpec

The following procedure demonstrates how to set up test reporting in AWS CodeBuild with the RSpec testing framework.

The procedure requires the following prerequisites:

- You have an existing CodeBuild project.
- Your project is a Ruby project that is set up to use the RSpec testing framework.

Add/update the following in your buildspec.yml file. This code runs the tests in the <test source directory> directory and exports the test reports to the file specified by <test report directory>/<report filename>. The report uses the JunitXml format.

```
version: 0.2
phases:
  install:
    runtime-versions:
      ruby: 2.6
  pre_build:
    commands:
      - gem install rspec
      - gem install rspec_junit_formatter
  build:
    commands:
      - rspec <test source directory>/* --format RspecJunitFormatter --out <test report
 directory>/<report filename>
reports:
    rspec_reports:
        files:
```

```
- <report filename>
base-directory: <test report directory>
file-format: JUNITXML
```

View test reports

You can view details about a test report, such as information about its test cases, pass and fail numbers, and how long it took for it to run. You can view test reports grouped by build run, report group, or your AWS account. Choose a test report in the console to see its details and results of its test cases.

You can see view test reports that are not expired. Test reports expire 30 days after they are created. You cannot view an expired report in CodeBuild.

Topics

- View test reports for a build
- View test reports for a report group
- View test reports in your AWS account

View test reports for a build

To view test reports for a build

- Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ home.
- 2. Locate the build you want to view. If you know the project that ran the build that created the test report:
 - 1. In the navigation pane, choose **Build projects**, and then choose the project with the build that ran the test report you want to view.
 - 2. Choose **Build history**, and then choose the build that ran created the reports you want to view.

You can also locate the build in the build history for your AWS account:

1. In the navigation pane, choose **Build history**, and then choose the build that created the test reports you want to view.

3. In the build page, choose **Reports**, and then choose a test report to see its details.

View test reports for a report group

To view test reports in a report group

- Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ https://console.aws.amazon.com/codesuite/codebuild/
- 2. In the navigation pane, choose **Report groups**.
- 3. Choose the report group that contains the test reports you want to view.
- 4. Choose a test report to see its details.

View test reports in your AWS account

To view test reports in your AWS account

- Open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/ https://console.aws.amazon.com/codesuite/codebuild/
- 2. In the navigation pane, choose **Report history**.
- 3. Choose a test report to see its details.

Test report permissions

This topic describes important information about permissions related to test reporting.

Topics

- IAM role for test reports
- Permissions for test reporting operations
- Test reporting permissions examples

IAM role for test reports

To run a test report, and to update a project to include test reports, your IAM role requires the following permissions. These permissions are included in the predefined AWS managed policies.

If you want to add test reporting to an existing build project, you must add these permissions yourself.

- CreateReportGroup
- CreateReport
- UpdateReport
- BatchPutTestCases

To run a code coverage report, your IAM role must also include the BatchPutCodeCoverages permission.

1 Note

BatchPutTestCases, CreateReport, UpdateReport, and BatchPutCodeCoverages are not public permissions. You cannot call a corresponding AWS CLI command or SDK method for these permissions.

To make sure you have these permissions, you can attach the following policy to your IAM role:

```
{
    "Effect": "Allow",
    "Resource": [
        "*"
    ],
    "Action": [
        "codebuild:CreateReportGroup",
        "codebuild:CreateReport",
        "codebuild:UpdateReport",
        "codebuild:BatchPutTestCases",
        "codebuild:BatchPutCodeCoverages"
    ]
}
```

We recommend that you restrict this policy to only those report groups you must use. The following restricts permissions to only the report groups with the two ARNs in the policy:

```
{
    "Effect": "Allow",
```

```
"Resource": [
    "arn:aws:codebuild:your-region:your-aws-account-id:report-group/report-group-
name-1",
    "arn:aws:codebuild:your-region:your-aws-account-id:report-group/report-group-
name-2"
    ],
    "Action": [
        "codebuild:CreateReportGroup",
        "codebuild:CreateReportGroup",
        "codebuild:UpdateReport",
        "codebuild:UpdateReport",
        "codebuild:BatchPutTestCases",
        "codebuild:BatchPutCodeCoverages"
    ]
}
```

The following restricts permissions to only report groups created by running builds of a project named my-project:

```
{
    "Effect": "Allow",
    "Resource": [
        "arn:aws:codebuild:your-region:your-aws-account-id:report-group/my-project-*"
    ],
    "Action": [
        "codebuild:CreateReportGroup",
        "codebuild:CreateReportT,
        "codebuild:UpdateReport",
        "codebuild:BatchPutTestCases",
        "codebuild:BatchPutCodeCoverages"
    ]
}
```

Note

The CodeBuild service role specified in the project is used for permissions to upload to the S3 bucket.

Permissions for test reporting operations

You can specify permissions for the following test reporting CodeBuild API operations:

- BatchGetReportGroups
- BatchGetReports
- CreateReportGroup
- DeleteReportGroup
- DeleteReport
- DescribeTestCases
- ListReportGroups
- ListReports
- ListReportsForReportGroup
- UpdateReportGroup

For more information, see AWS CodeBuild permissions reference.

Test reporting permissions examples

For information about sample policies related to test reporting, see the following:

- Allow a user to change a report group
- Allow a user to create a report group
- Allow a user to delete a report
- Allow a user to delete a report group
- Allow a user to get information about report groups
- Allow a user to get information about reports
- Allow a user to get a list of report groups
- Allow a user to get a list of reports
- Allow a user to get a list of reports for a report group
- Allow a user to get a list of test cases for a report

Test report statuses

The status of a test report can be one of the following:

• GENERATING: The run of the test cases is still in progress.

- DELETING: The test report is being deleted. When a test report is deleted, its test cases are also deleted. Raw test result data files exported to an S3 bucket are not deleted.
- INCOMPLETE: The test report was not completed. This status might be returned for one of the following reasons:
 - A problem with the configuration of the report group that specifies this report's test cases. For example, the path to the test cases under the report group in the buildspec file might be incorrect.
 - The IAM user that ran the build does not have permissions to run tests. For more information, see <u>Test report permissions</u>.
 - The build was not completed because of an error that is not related to the tests.
- SUCCEEDED: All test cases were successful.
- FAILED: Some of the test cases were not successful.

Each test case returns a status. The status for a test case can be one of the following:

- SUCCEEDED: The test case passed.
- FAILED: The test case failed.
- ERROR: The test case resulted in an unexpected error.
- SKIPPED: The test case did not run.
- UNKNOWN: The test case returned a status other than SUCCEEDED, FAILED, ERROR, or SKIPPED.

A test report can have a maximum of 500 test case results. If more than 500 test cases are run, CodeBuild prioritizes tests with the status FAILED and truncates the test case results.

Use AWS CodeBuild with Amazon Virtual Private Cloud

Typically, AWS CodeBuild cannot access resources in a VPC. To enable access, you must provide additional VPC-specific configuration information in your CodeBuild project configuration. This includes the VPC ID, the VPC subnet IDs, and the VPC security group IDs. VPC-enabled builds can then access resources inside your VPC. For more information about setting up a VPC in Amazon VPC, see the <u>Amazon VPC User Guide</u>.

Topics

- Use cases
- Best practices for VPCs
- Limitations of VPCs
- Allow Amazon VPC access in your CodeBuild projects
- <u>Troubleshoot your VPC setup</u>
- Use VPC endpoints
- Use AWS CodeBuild with a proxy server
- AWS CloudFormation VPC template

Use cases

VPC connectivity from AWS CodeBuild builds makes it possible to:

- Run integration tests from your build against data in an Amazon RDS database that's isolated on a private subnet.
- Query data in an Amazon ElastiCache cluster directly from tests.
- Interact with internal web services hosted on Amazon EC2, Amazon ECS, or services that use internal Elastic Load Balancing.
- Retrieve dependencies from self-hosted, internal artifact repositories, such as PyPI for Python, Maven for Java, and npm for Node.js.
- Access objects in an S3 bucket configured to allow access through an Amazon VPC endpoint only.
- Query external web services that require fixed IP addresses through the Elastic IP address of the NAT gateway or NAT instance associated with your subnet.

Your builds can access any resource that's hosted in your VPC.

Best practices for VPCs

Use this checklist when you set up a VPC to work with CodeBuild.

 Set up your VPC with public and private subnets, and a NAT gateway. The NAT gateway must reside in a public subnet. For more information, see <u>VPC with public and private subnets (NAT)</u> in the *Amazon VPC User Guide*.

▲ Important

You need a NAT gateway or NAT instance to use CodeBuild with your VPC so that CodeBuild can reach public endpoints (for example, to run CLI commands when running builds). You cannot use the internet gateway instead of a NAT gateway or a NAT instance because CodeBuild does not support assigning Elastic IP addresses to the network interfaces that it creates, and auto-assigning a public IP address is not supported by Amazon EC2 for any network interfaces created outside of Amazon EC2 instance launches.

- Include multiple Availability Zones with your VPC.
- Make sure that your security groups have no inbound (ingress) traffic allowed to your builds. CodeBuild does not have specific requirements for outbound traffic, but you must allow access to any Internet resources required for your build, such as GitHub or Amazon S3.

For more information, see <u>Security groups rules</u> in the Amazon VPC User Guide.

- Set up separate subnets for your builds.
- When you set up your CodeBuild projects to access your VPC, choose private subnets only.

For more information about setting up a VPC in Amazon VPC, see the Amazon VPC User Guide.

For more information about using AWS CloudFormation to configure a VPC to use the CodeBuild VPC feature, see the <u>AWS CloudFormation VPC template</u>.

Limitations of VPCs

• VPC connectivity from CodeBuild is not supported for shared VPCs.

Allow Amazon VPC access in your CodeBuild projects

Include these settings in your VPC configuration:

- For VPC ID, choose the VPC ID that CodeBuild uses.
- For **Subnets**, choose a private subnet with NAT translation that includes or has routes to the resources used by CodeBuild.
- For **Security Groups**, choose the security groups that CodeBuild uses to allow access to resources in the VPCs.

To use the console to create a build project, see <u>Create a build project (console)</u>. When you create or change your CodeBuild project, in **VPC**, choose your VPC ID, subnets, and security groups.

To use the AWS CLI to create a build project, see <u>Create a build project (AWS CLI)</u>. If you are using the AWS CLI with CodeBuild, the service role used by CodeBuild to interact with services on behalf of the IAM user must have a policy attached. For information, see <u>Allow CodeBuild access to AWS</u> services required to create a VPC network interface.

The *vpcConfig* object should include your *vpcId*, *securityGroupIds*, and *subnets*.

 vpcId: Required. The VPC ID that CodeBuild uses. Run this command to get a list of all Amazon VPC IDs in your Region:

aws ec2 describe-vpcs

 subnets: Required. The subnet IDs that include resources used by CodeBuild. Run this command obtain these IDs:

aws ec2 describe-subnets --filters "Name=vpc-id,Values=<vpc-id>" --region us-east-1

1 Note

Replace us-east-1 with your Region.

 securityGroupIds: Required. The security group IDs used by CodeBuild to allow access to resources in the VPCs. Run this command to obtain these IDs:

```
aws ec2 describe-security-groups --filters "Name=vpc-id,Values=<vpc-id>" --region us-
east-1
```

Note

Replace us-east-1 with your Region.

Troubleshoot your VPC setup

Use the information that appears in the error message to help you identify, diagnose, and address issues.

The following are some guidelines to assist you when troubleshooting a common CodeBuild VPC error: Build does not have internet connectivity. Please check subnet network configuration.

- 1. Make sure that your internet gateway is attached to VPC.
- 2. Make sure that the route table for your public subnet points to the internet gateway.
- 3. Make sure that your network ACLs allow traffic to flow.
- 4. Make sure that your security groups allow traffic to flow.
- 5. <u>Troubleshoot your NAT gateway</u>.
- 6. Make sure that the route table for private subnets points to the NAT gateway.
- Make sure that the service role used by CodeBuild to interact with services on behalf of the IAM user has the permissions in <u>this policy</u>. For more information, see <u>Allow CodeBuild to</u> interact with other AWS services.

If CodeBuild is missing permissions, you might receive an error that says, Unexpected EC2 error: UnauthorizedOperation. This error can occur if CodeBuild does not have the Amazon EC2 permissions required to work with a VPC.

Use VPC endpoints

You can improve the security of your builds by configuring AWS CodeBuild to use an interface VPC endpoint. Interface endpoints are powered by PrivateLink, a technology that you can use to

privately access Amazon EC2 and CodeBuild by using private IP addresses. PrivateLink restricts all network traffic between your managed instances, CodeBuild, and Amazon EC2 to the Amazon network. (Managed instances don't have access to the internet.) Also, you don't need an internet gateway, NAT device, or virtual private gateway. You are not required to configure PrivateLink, but it's recommended. For more information about PrivateLink and VPC endpoints, see <u>What is AWS</u> PrivateLink?.

Before you create VPC endpoints

Before you configure VPC endpoints for AWS CodeBuild, be aware of the following restrictions and limitations.

🚯 Note

Use a <u>NAT gateway</u> if you want to use CodeBuild with AWS services that do not support Amazon VPC PrivateLink connections.

- VPC endpoints support Amazon-provided DNS through Amazon Route 53 only. If you want to use your own DNS, you can use conditional DNS forwarding. For more information, see <u>DHCP</u> <u>option sets</u> in the Amazon VPC User Guide.
- VPC endpoints currently do not support cross-Region requests. Make sure that you create your endpoint in the same AWS Region as any S3 buckets that store your build input and output. You can use the Amazon S3 console or the <u>get-bucket-location</u> command to find the location of your bucket. Use a Region-specific Amazon S3 endpoint to access your bucket (for example, <<u>bucket-name>.s3-us-west-2.amazonaws.com</u>). For more information about Region-specific endpoints for Amazon S3, see <u>Amazon Simple Storage Service</u> in the *Amazon Web Services General Reference*. If you use the AWS CLI to make requests to Amazon S3, set your default Region to the same Region where your bucket was created, or use the --region parameter in your requests.

Create VPC endpoints for CodeBuild

Follow the instructions in <u>Creating an interface endpoint</u> to create the endpoint com.amazonaws.*region*.codebuild. This is a VPC endpoint for AWS CodeBuild.

Service Name	com.amazonaws.us-west-2.codebuild		
	Q Filter by attributes		
	Service Name	Owner	Туре
	ocom.amazonaws.us-west-2.cloudformation	amazon	Interface
	com.amazonaws.us-west-2.codebuild	amazon	Interface
	ocom.amazonaws.us-west-2.codebuild-fips	amazon	Interface
	ocom.amazonaws.us-west-2.dynamodb	amazon	Gateway
(com.amazonaws.us-west-2.ec2	amazon	Interface

region represents the region identifier for an AWS Region supported by CodeBuild, such as useast-2 for the US East (Ohio) Region. For a list of supported AWS Regions, see <u>CodeBuild</u> in the *AWS General Reference*. The endpoint is prepopulated with the Region you specified when you signed in to AWS. If you change your Region, the VPC endpoint is updated accordingly.

Create a VPC endpoint policy for CodeBuild

You can create a policy for Amazon VPC endpoints for AWS CodeBuild in which you can specify:

- The principal that can perform actions.
- The actions that can be performed.
- The resources that can have actions performed on them.

The following example policy specifies that all principals can only start and view builds for the project-name project.

```
"Effect": "Allow",
    "Resource": "arn:aws:codebuild:region-ID:account-ID:project/project-name",
    "Principal": "*"
    }
]
}
```

For more information, see <u>Controlling access to services with VPC endpoints</u> in the *Amazon VPC User Guide*.

Use AWS CodeBuild with a proxy server

You can use AWS CodeBuild with a proxy server to regulate HTTP and HTTPS traffic to and from the internet. To run CodeBuild with a proxy server, you install a proxy server in a public subnet and CodeBuild in a private subnet in a VPC.

There are two primary use cases for running CodeBuild in a proxy server:

- It eliminates the use of a NAT gateway or NAT instance in your VPC.
- It lets you specify the URLs that instances in the proxy server can access and the URLs to which the proxy server denies access.

You can use CodeBuild with two types of proxy servers. For both, the proxy server runs in a public subnet and CodeBuild runs in a private subnet.

- Explicit proxy: If you use an explicit proxy server, you must configure NO_PROXY, HTTP_PROXY, and HTTPS_PROXY environment variables in CodeBuild at the project level. For more information, see <u>Change build project settings in AWS CodeBuild</u> and <u>Create a build project in AWS CodeBuild</u>.
- **Transparent proxy**: If you use a transparent proxy server, no special configuration is required.

Topics

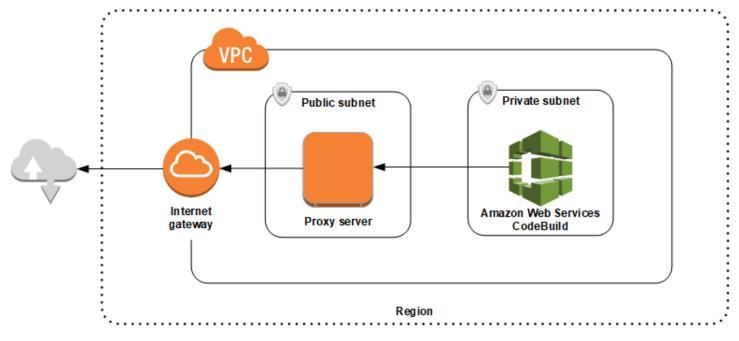
- Set up components required to run CodeBuild in a proxy server
- Run CodeBuild in an explicit proxy server
- <u>Run CodeBuild in a transparent proxy server</u>
- Run a package manager and other tools in a proxy server

Set up components required to run CodeBuild in a proxy server

You need these components to run AWS CodeBuild in a transparent or explicit proxy server:

- A VPC.
- One public subnet in your VPC for the proxy server.
- One private subnet in your VPC for CodeBuild.
- An internet gateway that allows communcation between the VPC and the internet.

The following diagram shows how the components interact.



Set up a VPC, subnets, and a network gateway

The following steps are required to run AWS CodeBuild in a transparent or explicit proxy server.

- 1. Create a VPC. For information, see Creating a VPC in the Amazon VPC User Guide.
- 2. Create two subnets in your VPC. One is a public subnet named Public Subnet in which your proxy server runs. The other is a private subnet named Private Subnet in which CodeBuild runs.

For information, see Creating a subnet in your VPC.

3. Create and attach an internet gateway to your VPC. For more information, see <u>Creating and</u> attaching an internet gateway.

- 4. Add a rule to the default route table that routes outgoing traffic from the VPC (0.0.0.0/0) to the internet gateway. For information, see Adding and removing routes from a route table.
- 5. Add a rule to the default security group of your VPC that allows ingress SSH traffic (TCP 22) from your VPC (0.0.0.0/0).
- 6. Follow the instructions in <u>Launching an instance using the launch instance wizard</u> in the *Amazon EC2 User Guide* to launch an Amazon Linux instance. When you run the wizard, choose the following options:
 - In Choose an Instance Type, choose an Amazon Linux Amazon Machine Image (AMI).
 - In **Subnet**, choose the public subnet you created earlier in this topic. If you used the suggested name, it is **Public Subnet**.
 - In Auto-assign Public IP, choose Enable.
 - On the Configure Security Group page, for Assign a security group, choose Select an existing security group. Next, choose the default security group.
 - After you choose Launch, choose an existing key pair or create one.

Choose the default settings for all other options.

- 7. After your EC2 instance is running, disable source/destination checks. For information, see Disabling Source/Destination checks in the *Amazon VPC User Guide*.
- 8. Create a route table in your VPC. Add a rule to the route table that routes traffic destined for the internet to your proxy server. Associate this route table with your private subnet. This is required so that outbound requests from instances in your private subnet, where CodeBuild runs, are always routed through the proxy server.

Install and configure a proxy server

There are many proxy servers from which to choose. An open-source proxy server, Squid, is used here to demonstrate how AWS CodeBuild runs in a proxy server. You can apply the same concepts to other proxy servers.

To install Squid, use a yum repo by running the following commands:

```
sudo yum update -y
sudo yum install -y squid
```

After you install Squid, edit its squid.conf file using the instructions later in this topic.

For HTTPS, the HTTP traffic is encapsulated in a Transport Layer Security (TLS) connection. Squid uses a feature called <u>SslPeekAndSplice</u> to retrieve the Server Name Indication (SNI) from the TLS initiation that contains the requested internet host. This is required so Squid does not need to unencrypt HTTPS traffic. To enable SslPeekAndSplice, Squid requires a certificate. Create this certificate using OpenSSL:

```
sudo mkdir /etc/squid/ssl
cd /etc/squid/ssl
sudo openssl genrsa -out squid.key 2048
sudo openssl req -new -key squid.key -out squid.csr -subj "/C=XX/ST=XX/L=squid/0=squid/
CN=squid"
sudo openssl x509 -req -days 3650 -in squid.csr -signkey squid.key -out squid.crt
sudo cat squid.key squid.crt | sudo tee squid.pem
```

🚯 Note

For HTTP, Squid does not require configuration. From all HTTP/1.1 request messages, it can retrieve the host header field, which specifies the internet host that is being requested.

Run CodeBuild in an explicit proxy server

To run AWS CodeBuild in an explicit proxy server, you must configure the proxy server to allow or deny traffic to and from external sites, and then configure the HTTP_PROXY and HTTPS_PROXY environment variables.

Topics

- <u>Configure Squid as an explicit proxy server</u>
- Create a CodeBuild project
- Explicit proxy server sample squid.conf file

Configure Squid as an explicit proxy server

To configure the Squid proxy server to be explicit, you must make the following modifications to its /etc/squid/squid.conf file:

• Remove the following default access control list (ACL) rules.

```
acl localnet src 10.0.0.0/8
acl localnet src 172.16.0.0/12
acl localnet src 192.168.0.0/16
acl localnet src fc00::/7
acl localnet src fe80::/10
```

Add the following in place of the default ACL rules you removed. The first line allows requests from your VPC. The next two lines grant your proxy server access to destination URLs that might be used by AWS CodeBuild. Edit the regular expression in the last line to specify S3 buckets or a CodeCommit repository in an AWS Region. For example:

- If your source is Amazon S3, use the command acl download_src dstdom_regex .*s3\.uswest-1\.amazonaws\.comto grant access to S3 buckets in the us-west-1 Region.
- If your source is AWS CodeCommit, use git-codecommit.<yourregion>.amazonaws.com to add an AWS Region to an allow list.

```
acl localnet src 10.1.0.0/16 #Only allow requests from within the VPC
acl allowed_sites dstdomain .github.com #Allows to download source from GitHub
acl allowed_sites dstdomain .bitbucket.com #Allows to download source from Bitbucket
acl download_src dstdom_regex .*\.amazonaws\.com #Allows to download source from
Amazon S3 or CodeCommit
```

• Replace http_access allow localnet with the following:

```
http_access allow localnet allowed_sites
http_access allow localnet download_src
```

- If you want your build to upload logs and artifacts, do one of the following:
 - Before the http_access deny all statement, insert the following statements. They
 allow CodeBuild to access CloudWatch and Amazon S3. Access to CloudWatch is required so
 that CodeBuild can create CloudWatch logs. Access to Amazon S3 is required for uploading
 artifacts and Amazon S3 caching.

```
https_port 3130 cert=/etc/squid/ssl/squid.pem ssl-bump intercept
acl SSL_port port 443
http_access allow SSL_port
acl allowed_https_sites ssl::server_name .amazonaws.com
acl step1 at_step SslBump1
acl step2 at_step SslBump2
```

```
acl step3 at_step SslBump3
ssl_bump peek step1 all
ssl_bump peek step2 allowed_https_sites
ssl_bump splice step3 allowed_https_sites
ssl_bump terminate step2 all
```

• After you save squid.conf, run the following command:

```
sudo iptables -t nat -A PREROUTING -p tcp --dport 443 -j REDIRECT --to-port 3130
sudo service squid restart
```

2. Add proxy to your buildspec file. For more information, see Buildspec syntax.

```
version: 0.2
proxy:
    upload-artifacts: yes
    logs: yes
phases:
    build:
        commands:
        - command
```

🚯 Note

If you receive a RequestError timeout error, see <u>RequestError timeout error when running</u> CodeBuild in a proxy server.

For more information, see Explicit proxy server sample squid.conf file later in this topic.

Create a CodeBuild project

To run AWS CodeBuild with your explicit proxy server, set its HTTP_PROXY and HTTPS_PROXY environment variables with the private IP address of the EC2 instance you created for your proxy server and port 3128 at the project level. The private IP address looks like http://your-ec2-private-ip-address:3128. For more information, see Create a build project in AWS CodeBuild and Change build project settings in AWS CodeBuild.

Use the following command to view the Squid proxy access log:

```
User Guide
```

```
sudo tail -f /var/log/squid/access.log
```

Explicit proxy server sample squid.conf file

The following is an example of a squid.conf file that is configured for an explicit proxy server.

```
acl localnet src 10.0.0/16 #Only allow requests from within the VPC
 # add all URLS to be whitelisted for download source and commands to be run in build
environment
 acl allowed_sites dstdomain .github.com
                                            #Allows to download source from github
 acl allowed_sites dstdomain .bitbucket.com #Allows to download source from bitbucket
 acl allowed_sites dstdomain ppa.launchpad.net #Allows to run apt-get in build
environment
 acl download_src dstdom_regex .*\.amazonaws\.com #Allows to download source from S3
or CodeCommit
 acl SSL_ports port 443
 acl Safe_ports port 80 # http
 acl Safe_ports port 21 # ftp
 acl Safe_ports port 443 # https
 acl Safe_ports port 70 # gopher
 acl Safe_ports port 210 # wais
 acl Safe_ports port 1025-65535 # unregistered ports
 acl Safe_ports port 280 # http-mgmt
 acl Safe_ports port 488 # gss-http
 acl Safe_ports port 591 # filemaker
 acl Safe_ports port 777 # multiling http
 acl CONNECT method CONNECT
 #
 # Recommended minimum Access Permission configuration:
 #
 # Deny requests to certain unsafe ports
 http_access deny !Safe_ports
 # Deny CONNECT to other than secure SSL ports
 http_access deny CONNECT !SSL_ports
 # Only allow cachemgr access from localhost
 http_access allow localhost manager
 http_access deny manager
 # We strongly recommend the following be uncommented to protect innocent
 # web applications running on the proxy server who think the only
 # one who can access services on "localhost" is a local user
 #http_access deny to_localhost
 # INSERT YOUR OWN RULE(S) HERE TO ALLOW ACCESS FROM YOUR CLIENTS
```

#

```
# Example rule allowing access from your local networks.
# Adapt localnet in the ACL section to list your (internal) IP networks
# from where browsing should be allowed
http_access allow localnet allowed_sites
http_access allow localnet download_src
http_access allow localhost
# Add this for CodeBuild to access CWL end point, caching and upload artifacts S3
bucket end point
https_port 3130 cert=/etc/squid/ssl/squid.pem ssl-bump intercept
acl SSL_port port 443
http_access allow SSL_port
acl allowed_https_sites ssl::server_name .amazonaws.com
acl step1 at_step SslBump1
acl step2 at_step SslBump2
acl step3 at_step SslBump3
ssl_bump peek step1 all
ssl_bump peek step2 allowed_https_sites
ssl_bump splice step3 allowed_https_sites
ssl_bump terminate step2 all
# And finally deny all other access to this proxy
http_access deny all
# Squid normally listens to port 3128
http_port 3128
# Uncomment and adjust the following to add a disk cache directory.
#cache_dir ufs /var/spool/squid 100 16 256
# Leave coredumps in the first cache dir
coredump_dir /var/spool/squid
#
# Add any of your own refresh_pattern entries above these.
#
refresh_pattern ^ftp: 1440 20% 10080
refresh_pattern ^gopher: 1440 0% 1440
refresh_pattern -i (/cgi-bin/|\?) 0 0% 0
refresh_pattern . 0 20% 4320
```

Run CodeBuild in a transparent proxy server

To run AWS CodeBuild in a transparent proxy server, you must configure the proxy server with access to the websites and domains it interacts with.

Topics

Configure Squid as a transparent proxy server

```
Run CodeBuild in a transparent proxy server
```

Create a CodeBuild project

Configure Squid as a transparent proxy server

To configure a proxy server to be transparent, you must grant it access to the domains and websites you want it to access. To run AWS CodeBuild with a transparent proxy server, you must grant it access to amazonaws.com. You must also grant access to other websites CodeBuild uses. These vary, depending on how you create your CodeBuild projects. Example websites are those for repositories such as GitHub, Bitbucket, Yum, and Maven. To grant Squid access to specific domains and websites, use a command similar to the following to update the squid.conf file. This sample command grants access to amazonaws.com, github.com, and bitbucket.com. You can edit this sample to grant access to other websites.

```
cat | sudo tee /etc/squid/squid.conf #EOF
visible_hostname squid
#Handling HTTP requests
http_port 3129 intercept
acl allowed_http_sites dstdomain .amazonaws.com
#acl allowed_http_sites dstdomain domain_name [uncomment this line to add another
 domain]
http_access allow allowed_http_sites
#Handling HTTPS requests
https_port 3130 cert=/etc/squid/ssl/squid.pem ssl-bump intercept
acl SSL_port port 443
http_access allow SSL_port
acl allowed_https_sites ssl::server_name .amazonaws.com
acl allowed_https_sites ssl::server_name .github.com
acl allowed_https_sites ssl::server_name .bitbucket.com
#acl allowed_https_sites ssl::server_name [uncomment this line to add another website]
acl step1 at_step SslBump1
acl step2 at_step SslBump2
acl step3 at_step SslBump3
ssl_bump peek step1 all
ssl_bump peek step2 allowed_https_sites
ssl_bump splice step3 allowed_https_sites
ssl_bump terminate step2 all
http_access deny all
EOF
```

Incoming requests from instances in the private subnet must redirect to the Squid ports. Squid listens on port 3129 for HTTP traffic (instead of 80) and 3130 for HTTPS traffic (instead of 443). Use the **iptables** command to route traffic:

sudo iptables -t nat -A PREROUTING -p tcp --dport 80 -j REDIRECT --to-port 3129
sudo iptables -t nat -A PREROUTING -p tcp --dport 443 -j REDIRECT --to-port 3130
sudo service iptables save
sudo service squid start

Create a CodeBuild project

After you configure your proxy server, you can use it with AWS CodeBuild in a private subnet without more configuration. Every HTTP and HTTPS request goes through the public proxy server. Use the following command to view the Squid proxy access log:

sudo tail -f /var/log/squid/access.log

Run a package manager and other tools in a proxy server

Use the following procedures to run a package manager and other tools in a proxy server.

To run a tool, such as a package manager, in a proxy server

- 1. Add the tool to the allow list in your proxy server by adding statements to your squid.conf file.
- 2. Add a line to your buildspec file that points to the private endpoint of your proxy server.

The following examples demonstrate how to do this for apt-get, curl, and maven. If you use a different tool, the same principles apply. Add it to an allow list in the squid.conf file and add a command to your buildspec file to make CodeBuild aware of your proxy server's endpoint.

To run apt-get in a proxy server

 Add the following statements to your squid.conf file to add apt-get to an allow list in your proxy server. The first three lines allow apt-get to run in the build environment.

acl allowed_sites dstdomain ppa.launchpad.net # Required for apt-get to run in the build environment

```
acl apt_get dstdom_regex .*\.launchpad.net # Required for CodeBuild to run apt-get
in the build environment
acl apt_get dstdom_regex .*\.ubuntu.com  # Required for CodeBuild to run apt-get
in the build environment
http_access allow localnet allowed_sites
http_access allow localnet apt_get
```

2. Add the following statement in your buildspec file so that apt-get commands look for the proxy configuration in /etc/apt/apt.conf.d/00proxy.

```
echo 'Acquire::http::Proxy "http://<private-ip-of-proxy-server>:3128";
Acquire::https::Proxy "http://<private-ip-of-proxy-server>:3128";
Acquire::ftp::Proxy "http://<private-ip-of-proxy-server>:3128";' > /etc/apt/
apt.conf.d/00proxy
```

To run curl in a proxy server

1. Add the following to your squid.conf file to add curl to an allow list in your build environment.

```
acl allowed_sites dstdomain ppa.launchpad.net # Required to run apt-get in the
build environment
acl allowed_sites dstdomain google.com # Required for access to a webiste. This
example uses www.google.com.
http_access allow localnet allowed_sites
http_access allow localnet apt_get
```

 Add the following statement in your buildspec file so curl uses the private proxy server to access the website you added to the squid.conf. In this example, the website is google.com.

curl -x <private-ip-of-proxy-server>:3128 https://www.google.com

To run maven in a proxy server

1. Add the following to your squid.conf file to add maven to an allow list in your build environment.

```
acl allowed_sites dstdomain ppa.launchpad.net # Required to run apt-get in the
build environment
acl maven dstdom_regex .*\.maven.org # Allows access to the maven repository in the
build environment
http_access allow localnet allowed_sites
http_access allow localnet maven
```

2. Add the following statement to your buildspec file.

```
maven clean install -DproxySet=true -DproxyHost=<private-ip-of-proxy-server> -
DproxyPort=3128
```

AWS CloudFormation VPC template

AWS CloudFormation enables you to create and provision AWS infrastructure deployments predictably and repeatedly, by using template files to create and delete a collection of resources together as a single unit (a *stack*). For more information, see the AWS CloudFormation User Guide.

The following is an AWS CloudFormation YAML template for configuring a VPC to use AWS CodeBuild. This file is also available in <u>samples.zip</u>.

```
Description: This template deploys a VPC, with a pair of public and private subnets
 spread
  across two Availability Zones. It deploys an internet gateway, with a default
  route on the public subnets. It deploys a pair of NAT gateways (one in each AZ),
  and default routes for them in the private subnets.
Parameters:
  EnvironmentName:
    Description: An environment name that is prefixed to resource names
    Type: String
  VpcCIDR:
    Description: Please enter the IP range (CIDR notation) for this VPC
   Type: String
    Default: 10.192.0.0/16
  PublicSubnet1CIDR:
    Description: Please enter the IP range (CIDR notation) for the public subnet in the
 first Availability Zone
```

```
Type: String
    Default: 10.192.10.0/24
  PublicSubnet2CIDR:
    Description: Please enter the IP range (CIDR notation) for the public subnet in the
 second Availability Zone
    Type: String
    Default: 10.192.11.0/24
  PrivateSubnet1CIDR:
    Description: Please enter the IP range (CIDR notation) for the private subnet in
 the first Availability Zone
    Type: String
    Default: 10.192.20.0/24
  PrivateSubnet2CIDR:
    Description: Please enter the IP range (CIDR notation) for the private subnet in
 the second Availability Zone
   Type: String
    Default: 10.192.21.0/24
Resources:
  VPC:
    Type: AWS::EC2::VPC
    Properties:
      CidrBlock: !Ref VpcCIDR
      EnableDnsSupport: true
      EnableDnsHostnames: true
      Tags:
        - Key: Name
          Value: !Ref EnvironmentName
  InternetGateway:
    Type: AWS::EC2::InternetGateway
    Properties:
      Tags:
        - Key: Name
          Value: !Ref EnvironmentName
  InternetGatewayAttachment:
    Type: AWS::EC2::VPCGatewayAttachment
    Properties:
      InternetGatewayId: !Ref InternetGateway
      VpcId: !Ref VPC
```

PublicSubnet1: Type: AWS::EC2::Subnet **Properties:** VpcId: !Ref VPC AvailabilityZone: !Select [0, !GetAZs ''] CidrBlock: !Ref PublicSubnet1CIDR MapPublicIpOnLaunch: true Tags: - Key: Name Value: !Sub \${EnvironmentName} Public Subnet (AZ1) PublicSubnet2: Type: AWS::EC2::Subnet **Properties:** VpcId: !Ref VPC AvailabilityZone: !Select [1, !GetAZs ''] CidrBlock: !Ref PublicSubnet2CIDR MapPublicIpOnLaunch: true Tags: - Key: Name Value: !Sub \${EnvironmentName} Public Subnet (AZ2) PrivateSubnet1: Type: AWS::EC2::Subnet **Properties:** VpcId: !Ref VPC AvailabilityZone: !Select [0, !GetAZs ''] CidrBlock: !Ref PrivateSubnet1CIDR MapPublicIpOnLaunch: false Tags: - Key: Name Value: !Sub \${EnvironmentName} Private Subnet (AZ1) PrivateSubnet2: Type: AWS::EC2::Subnet **Properties:** VpcId: !Ref VPC AvailabilityZone: !Select [1, !GetAZs ''] CidrBlock: !Ref PrivateSubnet2CIDR MapPublicIpOnLaunch: false Tags: - Key: Name Value: !Sub \${EnvironmentName} Private Subnet (AZ2)

```
NatGateway1EIP:
  Type: AWS::EC2::EIP
  DependsOn: InternetGatewayAttachment
  Properties:
    Domain: vpc
NatGateway2EIP:
  Type: AWS::EC2::EIP
  DependsOn: InternetGatewayAttachment
  Properties:
    Domain: vpc
NatGateway1:
  Type: AWS::EC2::NatGateway
  Properties:
    AllocationId: !GetAtt NatGateway1EIP.AllocationId
    SubnetId: !Ref PublicSubnet1
NatGateway2:
  Type: AWS::EC2::NatGateway
  Properties:
    AllocationId: !GetAtt NatGateway2EIP.AllocationId
    SubnetId: !Ref PublicSubnet2
PublicRouteTable:
  Type: AWS::EC2::RouteTable
  Properties:
    VpcId: !Ref VPC
   Tags:
      - Key: Name
        Value: !Sub ${EnvironmentName} Public Routes
DefaultPublicRoute:
  Type: AWS::EC2::Route
  DependsOn: InternetGatewayAttachment
  Properties:
    RouteTableId: !Ref PublicRouteTable
    DestinationCidrBlock: 0.0.0.0/0
    GatewayId: !Ref InternetGateway
PublicSubnet1RouteTableAssociation:
  Type: AWS::EC2::SubnetRouteTableAssociation
  Properties:
```

```
RouteTableId: !Ref PublicRouteTable
    SubnetId: !Ref PublicSubnet1
PublicSubnet2RouteTableAssociation:
  Type: AWS::EC2::SubnetRouteTableAssociation
  Properties:
    RouteTableId: !Ref PublicRouteTable
    SubnetId: !Ref PublicSubnet2
PrivateRouteTable1:
  Type: AWS::EC2::RouteTable
  Properties:
    VpcId: !Ref VPC
    Tags:
      - Key: Name
        Value: !Sub ${EnvironmentName} Private Routes (AZ1)
DefaultPrivateRoute1:
  Type: AWS::EC2::Route
  Properties:
    RouteTableId: !Ref PrivateRouteTable1
    DestinationCidrBlock: 0.0.0/0
    NatGatewayId: !Ref NatGateway1
PrivateSubnet1RouteTableAssociation:
  Type: AWS::EC2::SubnetRouteTableAssociation
  Properties:
    RouteTableId: !Ref PrivateRouteTable1
    SubnetId: !Ref PrivateSubnet1
PrivateRouteTable2:
  Type: AWS::EC2::RouteTable
  Properties:
    VpcId: !Ref VPC
    Tags:
      - Key: Name
        Value: !Sub ${EnvironmentName} Private Routes (AZ2)
DefaultPrivateRoute2:
  Type: AWS::EC2::Route
  Properties:
    RouteTableId: !Ref PrivateRouteTable2
    DestinationCidrBlock: 0.0.0.0/0
```

NatGatewayId: !Ref NatGateway2 PrivateSubnet2RouteTableAssociation: Type: AWS::EC2::SubnetRouteTableAssociation **Properties:** RouteTableId: !Ref PrivateRouteTable2 SubnetId: !Ref PrivateSubnet2 NoIngressSecurityGroup: Type: AWS::EC2::SecurityGroup **Properties:** GroupName: "no-ingress-sg" GroupDescription: "Security group with no ingress rule" VpcId: !Ref VPC Outputs: VPC: Description: A reference to the created VPC Value: !Ref VPC PublicSubnets: Description: A list of the public subnets Value: !Join [",", [!Ref PublicSubnet1, !Ref PublicSubnet2]] PrivateSubnets: Description: A list of the private subnets Value: !Join [",", [!Ref PrivateSubnet1, !Ref PrivateSubnet2]] PublicSubnet1: Description: A reference to the public subnet in the 1st Availability Zone Value: !Ref PublicSubnet1 PublicSubnet2: Description: A reference to the public subnet in the 2nd Availability Zone Value: !Ref PublicSubnet2 PrivateSubnet1: Description: A reference to the private subnet in the 1st Availability Zone Value: !Ref PrivateSubnet1 PrivateSubnet2: Description: A reference to the private subnet in the 2nd Availability Zone Value: !Ref PrivateSubnet2

NoIngressSecurityGroup: Description: Security group with no ingress rule Value: !Ref NoIngressSecurityGroup

Logging and monitoring in AWS CodeBuild

Logging and monitoring is an important part of maintaining the reliability, availability, and performance of AWS CodeBuild and your AWS solutions. You should collect monitoring data from all of the parts of your AWS solution so that you can more easily debug a multi-point failure, if one occurs. AWS provides the following tools for monitoring your CodeBuild resources and builds and for responding to potential incidents.

Topics

- Log AWS CodeBuild API calls with AWS CloudTrail
- Monitor CodeBuild builds with CloudWatch

Log AWS CodeBuild API calls with AWS CloudTrail

AWS CodeBuild is integrated with AWS CloudTrail, a service that provides a record of actions taken by a user, role, or an AWS service in CodeBuild. CloudTrail captures all API calls for CodeBuild as events, including calls from the CodeBuild console and from code calls to the CodeBuild APIs. If you create a trail, you can enable continuous delivery of CloudTrail events to an S3 bucket, including events for CodeBuild. If you don't configure a trail, you can still view the most recent events in the CloudTrail console in **Event history**. Using the information collected by CloudTrail, you can determine the request that was made to CodeBuild, the IP address from which the request was made, who made the request, when it was made, and additional details.

To learn more about CloudTrail, see the <u>AWS CloudTrail User Guide</u>.

Topics

- <u>About AWS CodeBuild information in CloudTrail</u>
- About AWS CodeBuild log file entries

About AWS CodeBuild information in CloudTrail

CloudTrail is enabled on your AWS account when you create the account. When activity occurs in CodeBuild, that activity is recorded in a CloudTrail event along with other AWS service events in **Event history**. You can view, search, and download recent events in your AWS account. For more information, see <u>Viewing events with CloudTrail event history</u> in the *AWS CloudTrail User Guide*.

For an ongoing record of events in your AWS account, including events for CodeBuild, create a trail. A trail enables CloudTrail to deliver log files to an S3 bucket. By default, when you create a trail in the console, the trail applies to all regions. The trail logs events from all regions in the AWS partition and delivers the log files to the S3 bucket that you specify. You can configure other AWS services to further analyze and act upon the event data collected in CloudTrail logs. For more information, see:

- Overview for creating a trail
- <u>CloudTrail supported services and integrations</u>
- Configuring Amazon SNS notifications for CloudTrail
- <u>Receiving CloudTrail log files from multiple regions</u> and <u>Receiving CloudTrail log files from</u> <u>multiple accounts</u>

All CodeBuild actions are logged by CloudTrail and are documented in the <u>CodeBuild API</u> <u>Reference</u>. For example, calls to the CreateProject (in the AWS CLI, create-project), StartBuild (in the AWS CLI, start-project), and UpdateProject (in the AWS CLI, updateproject) actions generate entries in the CloudTrail log files.

Every event or log entry contains information about who generated the request. The identity information helps you determine the following:

- Whether the request was made with root or user credentials.
- Whether the request was made with temporary security credentials for a role or federated user.
- Whether the request was made by another AWS service.

For more information, see the <u>CloudTrail userIdentity element</u>in the AWS CloudTrail User Guide.

About AWS CodeBuild log file entries

A trail is a configuration that enables delivery of events as log files to an S3 bucket that you specify. CloudTrail log files contain one or more log entries. An event represents a single request from any source and includes information about the requested action, the date and time of the action, request parameters, and so on. CloudTrail log files are not an ordered stack trace of the public API calls, so they do not appear in any specific order.

í) Note

To protect sensitive information, the following are hidden in CodeBuild logs:

- AWS access key IDs. For more information, see <u>Managing Access Keys for IAM Users</u> in the AWS Identity and Access Management User Guide.
- Strings specified using the Parameter Store. For more information, see <u>Systems Manager</u> <u>Parameter Store</u> and <u>Systems Manager Parameter Store Console Walkthrough</u> in the *Amazon EC2 Systems Manager User Guide*.
- Strings specified using AWS Secrets Manager. For more information, see <u>Key</u> <u>management</u>.

The following example shows a CloudTrail log entry that demonstrates creating a build project in CodeBuild.

```
{
  "eventVersion": "1.05",
  "userIdentity": {
    "type": "FederatedUser",
    "principalId": "account-ID:user-name",
    "arn": "arn:aws:sts::account-ID:federated-user/user-name",
    "accountId": "account-ID",
    "accessKeyId": "access-key-ID",
    "sessionContext": {
      "attributes": {
        "mfaAuthenticated": "false",
        "creationDate": "2016-09-06T17:59:10Z"
      },
      "sessionIssuer": {
        "type": "IAMUser",
        "principalId": "access-key-ID",
        "arn": "arn:aws:iam::account-ID:user/user-name",
        "accountId": "account-ID",
        "userName": "user-name"
      }
    }
 },
  "eventTime": "2016-09-06T17:59:11Z",
  "eventSource": "codebuild.amazonaws.com",
  "eventName": "CreateProject",
```

```
User Guide
```

```
"awsRegion": "region-ID",
  "sourceIPAddress": "127.0.0.1",
  "userAgent": "user-agent",
  "requestParameters": {
    "awsActId": "account-ID"
  },
  "responseElements": {
    "project": {
      "environment": {
        "image": "image-ID",
        "computeType": "BUILD_GENERAL1_SMALL",
        "type": "LINUX_CONTAINER",
        "environmentVariables": []
      },
      "name": "codebuild-demo-project",
      "description": "This is my demo project",
      "arn": "arn:aws:codebuild:region-ID:account-ID:project/codebuild-demo-
project:project-ID",
      "encryptionKey": "arn:aws:kms:region-ID:key-ID",
      "timeoutInMinutes": 10,
      "artifacts": {
        "location": "arn:aws:s3:::codebuild-region-ID-account-ID-output-bucket",
        "type": "S3",
        "packaging": "ZIP",
        "outputName": "MyOutputArtifact.zip"
      },
      "serviceRole": "arn:aws:iam::account-ID:role/CodeBuildServiceRole",
      "lastModified": "Sep 6, 2016 10:59:11 AM",
      "source": {
        "type": "GITHUB",
        "location": "https://github.com/my-repo.git"
      },
      "created": "Sep 6, 2016 10:59:11 AM"
    }
  },
  "requestID": "9d32b228-745b-11e6-98bb-23b67EXAMPLE",
  "eventID": "581f7dd1-8d2e-40b0-aeee-0dbf7EXAMPLE",
  "eventType": "AwsApiCall",
  "recipientAccountId": "account-ID"
}
```

Monitor CodeBuild builds with CloudWatch

You can use Amazon CloudWatch to watch your builds, report when something is wrong, and take automatic actions when appropriate. You can monitor your builds at two levels:

Project level

These metrics are for all builds in the specified project. To see metrics for a project, specify ProjectName for the dimension in CloudWatch.

AWS account level

These metrics are for all builds in an account. To see metrics at the AWS account level, do not enter a dimension in CloudWatch. Build resource utilization metrics are not available at the AWS account level.

CloudWatch metrics show the behavior of your builds over time. For example, you can monitor:

- How many builds were attempted in a build project or an AWS account over time.
- How many builds were successful in a build project or an AWS account over time.
- How many builds failed in a build project or an AWS account over time.
- How much time CodeBuild spent running builds in a build project or an AWS account over time.
- Build resource utilization for a build or an entire build project. Build resource utilization metrics include metrics such as CPU, memory, and storage utilization.

For more information, see View CodeBuild metrics.

CodeBuild CloudWatch metrics

The following metrics can be tracked per AWS account or build project. For more information about using CloudWatch with CodeBuild, see Monitor CodeBuild builds with CloudWatch.

BuildDuration

Measures the duration of the build's BUILD phase.

Units: Seconds

Valid CloudWatch statistics: Average (recommended), Maximum, Minimum

Builds

Measures the number of builds triggered.

Units: Count

Valid CloudWatch statistics: Sum

DownloadSourceDuration

Measures the duration of the build's DOWNLOAD_SOURCE phase.

Units: Seconds

Valid CloudWatch statistics: Average (recommended), Maximum, Minimum

Duration

Measures the duration of all builds over time.

Units: Seconds

Valid CloudWatch statistics: Average (recommended), Maximum, Minimum

FailedBuilds

Measures the number of builds that failed because of client error or a timeout.

Units: Count

Valid CloudWatch statistics: Sum

FinalizingDuration

Measures the duration of the build's FINALIZING phase.

Units: Seconds

Valid CloudWatch statistics: Average (recommended), Maximum, Minimum InstallDuration

Measures the duration of the build's INSTALL phase.

Units: Seconds

Valid CloudWatch statistics: Average (recommended), Maximum, Minimum PostBuildDuration

Measures the duration of the build's POST_BUILD phase

Units: Seconds

Valid CloudWatch statistics: Average (recommended), Maximum, Minimum

PreBuildDuration

Measures the duration of the build's PRE_BUILD phase.

Units: Seconds

Valid CloudWatch statistics: Average (recommended), Maximum, Minimum

ProvisioningDuration

Measures the duration of the build's PROVISIONING phase.

Units: Seconds

Valid CloudWatch statistics: Average (recommended), Maximum, Minimum

QueuedDuration

Measures the duration of the build's QUEUED phase.

Units: Seconds

Valid CloudWatch statistics: Average (recommended), Maximum, Minimum

SubmittedDuration

Measures the duration of the build's SUBMITTED phase.

Units: Seconds

Valid CloudWatch statistics: Average (recommended), Maximum, Minimum

SucceededBuilds

Measures the number of successful builds.

Units: Count

Valid CloudWatch statistics: Sum

UploadArtifactsDuration

Measures the duration of the build's UPLOAD_ARTIFACTS phase.

Units: Seconds

Valid CloudWatch statistics: Average (recommended), Maximum, Minimum

CodeBuild CloudWatch resource utilization metrics

Note

CodeBuild resource utilization metrics are only available in the following regions:

- Asia Pacific (Tokyo) Region
- Asia Pacific (Seoul) Region
- Asia Pacific (Mumbai) Region
- Asia Pacific (Singapore) Region
- Asia Pacific (Sydney) Region
- Canada (Central) Region
- Europe (Frankfurt) Region
- Europe (Ireland) Region
- Europe (London) Region
- Europe (Paris) Region
- South America (São Paulo) Region
- US East (N. Virginia) Region
- US East (Ohio) Region
- US West (N. California) Region
- US West (Oregon) Region

The following resource utilization metrics can be tracked. For more information about using CloudWatch with CodeBuild, see <u>Monitor CodeBuild builds with CloudWatch</u>.

CPUUtilized

The number of CPU units of allocated processing used by the build container.

Units: CPU units

Valid CloudWatch statistics: Average (recommended), Maximum, Minimum CPUUtilizedPercent

The percentage of allocated processing used by the build container.

Units: Percent

Valid CloudWatch statistics: Average (recommended), Maximum, Minimum MemoryUtilized

The number of megabytes of memory used by the build container.

Units: Megabytes

Valid CloudWatch statistics: Average (recommended), Maximum, Minimum MemoryUtilizedPercent

The percentage of allocated memory used by the build container.

Units: Percent

Valid CloudWatch statistics: Average (recommended), Maximum, Minimum StorageReadBytes

The storage read speed used by the build container.

Units: Bytes/second

Valid CloudWatch statistics: Average (recommended), Maximum, Minimum StorageWriteBytes

The storage write speed used by the build container.

Units: Bytes/second

Valid CloudWatch statistics: Average (recommended), Maximum, Minimum

CodeBuild CloudWatch dimensions

CodeBuild provides the following CloudWatch metric dimensions. If none of these are specified, the metrics are for the current AWS account.

BuildId, BuildNumber, ProjectName

Metrics are provided for a build identifier, build number, and project name.

ProjectName

Metrics are provided for a project name.

CodeBuild CloudWatch alarms

You can use the CloudWatch console to create alarms based on CodeBuild metrics so you can react if something goes wrong with your builds. The two metrics that are most useful with alarms are described in the following bullets. For more information about using CloudWatch with CodeBuild, see <u>Monitor CodeBuild builds with CloudWatch</u>.

- FailedBuild. You can create an alarm that is triggered when a certain number of failed builds are detected within a predetermined number of seconds. In CloudWatch, you specify the number of seconds and how many failed builds trigger an alarm.
- Duration. You can create an alarm that is triggered when a build takes longer than expected. You specify how many seconds must elapse after a build is started and before a build is completed before the alarm is triggered.

For information about how to create alarms for CodeBuild metrics, see <u>Monitor CodeBuild builds</u> <u>with CloudWatch alarms</u>. For more information about alarms, see <u>Creating Amazon CloudWatch</u> <u>alarms</u> in the *Amazon CloudWatch User Guide*.

View CodeBuild metrics

AWS CodeBuild monitors functions on your behalf and reports metrics through Amazon CloudWatch. These metrics include the number of total builds, failed builds, successful builds, and the duration of builds.

You can use the CodeBuild console or the CloudWatch console to monitor metrics for CodeBuild. The following procedures show you how to view metrics.

Topics

- View build metrics (CodeBuild console)
- View build metrics (Amazon CloudWatch console)

View build metrics (CodeBuild console)

Note

You can't customize the metrics or the graphs used to display them in the CodeBuild console. If you want to customize the display, use the Amazon CloudWatch console to view your build metrics.

Account-level metrics

To view AWS account-level metrics

- 1. Sign in to the AWS Management Console and open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/home.
- 2. In the navigation pane, choose **Account metrics**.

Project-level metrics

To view project-level metrics

- 1. Sign in to the AWS Management Console and open the AWS CodeBuild console at <u>https://</u> console.aws.amazon.com/codesuite/codebuild/home.
- 2. In the navigation pane, choose **Build projects**.
- 3. In the list of build projects, in the **Name** column, choose the project where you want to view metrics.
- 4. Choose the **Metrics** tab.

View build metrics (Amazon CloudWatch console)

You can customize the metrics and the graphs used to display them with the CloudWatch console.

Account-level metrics

To view account-level metrics

- 1. Sign in to the AWS Management Console and open the CloudWatch console at https://console.aws.amazon.com/cloudwatch/.
- 2. In the navigation pane, choose Metrics.
- 3. On the **All metrics** tab, choose **CodeBuild**.

Metrics		***		
Favorites	All metrics Graphed metrics Graph optic	ons Source		
O Add a dashboard	Q Search for any metric, dimension or resource id			
	155 Metrics			
	CodeBuild	Events	Lambda	
	44 Metrics	12 Metrics	14 Metrics	

- 4. Choose **Account Metrics**.
- Choose one or more projects and metrics. For each project, you can choose the SucceededBuilds, FailedBuilds, Builds, and Duration metrics. All selected project and metric combinations are displayed in the graph on the page.

Project-level metrics

To view project-level metrics

- 1. Sign in to the AWS Management Console and open the CloudWatch console at https://console.aws.amazon.com/cloudwatch/.
- 2. In the navigation pane, choose **Metrics**.
- 3. On the **All metrics** tab, choose **CodeBuild**.

Metrics		***			
Favorites	All metrics Graphed metrics Graph opti	ons Source			
O Add a dashboard					
	Q Search for any metric, dimension or resource id				
	155 Metrics				
	CodeBuild	Events	Lambda		
	44 Metrics	12 Metrics	14 Metrics		

4. Choose By Project.

- Choose one or more project and metric combinations. For each project, you can choose the SucceededBuilds, FailedBuilds, Builds, and Duration metrics. All selected project and metric combinations are displayed in the graph on the page.
- 6. (Optional) You can customize your metrics and graphs. For example, from the drop-down list in the **Statistic** column, you can choose a different statistic to display. Or from the drop-down menu in the **Period** column, you can choose a different time period to use to monitor the metrics.

For more information, see <u>Graph metrics</u> and <u>View available metrics</u> in the Amazon CloudWatch User Guide.

View CodeBuild resource utilization metrics

AWS CodeBuild monitors build resource utilization on your behalf and reports metrics through Amazon CloudWatch. These include metrics such as CPU, memory, and storage utilization.

1 Note

CodeBuild resource utilization metrics are only recorded for builds that run for more than one minute.

You can use the CodeBuild console or the CloudWatch console to monitor resource utilization metrics for CodeBuild.

i Note

CodeBuild resource utilization metrics are only available in the following regions:

- Asia Pacific (Tokyo) Region
- Asia Pacific (Seoul) Region
- Asia Pacific (Mumbai) Region
- Asia Pacific (Singapore) Region
- Asia Pacific (Sydney) Region
- Canada (Central) Region
- Europe (Frankfurt) Region

- Europe (Ireland) Region
- Europe (London) Region
- Europe (Paris) Region
- South America (São Paulo) Region
- US East (N. Virginia) Region
- US East (Ohio) Region
- US West (N. California) Region
- US West (Oregon) Region

The following procedures show you how to access your resource utilization metrics.

Topics

- <u>Access resource utilization metrics (CodeBuild console)</u>
- Access resource utilization metrics (Amazon CloudWatch console)

Access resource utilization metrics (CodeBuild console)

Note

You can't customize the metrics or the graphs used to display them in the CodeBuild console. If you want to customize the display, use the Amazon CloudWatch console to view your build metrics.

Project-level resource utilization metrics

To access project-level resource utilization metrics

- 1. Sign in to the AWS Management Console and open the AWS CodeBuild console at https://console.aws.amazon.com/codesuite/codebuild/home.
- 2. In the navigation pane, choose **Build projects**.
- 3. In the list of build projects, in the **Name** column, choose the project you want to view the utilization metrics for.

- 4. Choose the **Metrics** tab. The resource utilization metrics are displayed in the **Resource utilization metrics** section.
- 5. To view the project-level resource utilization metrics in the CloudWatch console, choose **View in CloudWatch** in the **Resource utilization metrics** section.

Build-level resource utilization metrics

To access build-level resource utilization metrics

- 1. Sign in to the AWS Management Console and open the AWS CodeBuild console at https://codebuild/home.
- 2. In the navigation pane, choose **Build history**.
- 3. In the list of builds, in the **Build run** column, choose the build you want to view the utilization metrics for.
- 4. Choose the **Resource utilization** tab.
- 5. To view the build-level resource utilization metrics in the CloudWatch console, choose **View in CloudWatch** in the **Resource utilization metrics** section.

Access resource utilization metrics (Amazon CloudWatch console)

The Amazon CloudWatch console can be used to access CodeBuild resource utilization metrics.

Project-level resource utilization metrics

To access project-level resource utilization metrics

- 1. Sign in to the AWS Management Console and open the CloudWatch console at https://console.aws.amazon.com/cloudwatch/.
- 2. In the navigation pane, choose Metrics.
- 3. On the All metrics tab, choose CodeBuild.

Metrics		***		
Favorites	All metrics Graphed metrics Graph optic	ons Source		
O Add a dashboard	Q Search for any metric, dimension or resource id			
	155 Metrics			
	CodeBuild	Events	Lambda	
	44 Metrics	12 Metrics	14 Metrics	

L

4. Choose **By Project**.

- 5. Choose one or more project and metric combinations to add to the graph. All selected project and metric combinations are displayed in the graph on the page.
- 6. (Optional) You can customize your metrics and graphs from the **Graphed metrics** tab. For example, from the drop-down list in the **Statistic** column, you can choose a different statistic to display. Or from the drop-down menu in the **Period** column, you can choose a different time period to use to monitor the metrics.

For more information, see <u>Graphing metrics</u> and <u>Viewing available metrics</u> in the Amazon CloudWatch User Guide.

Build-level resource utilization metrics

To access build-level resource utilization metrics

- 1. Sign in to the AWS Management Console and open the CloudWatch console at https://console.aws.amazon.com/cloudwatch/.
- 2. In the navigation pane, choose **Metrics**.
- 3. On the All metrics tab, choose CodeBuild.

Metrics						
Favorites	All metrics	Graphed metrics	Graph options	Source		
O Add a dashboard	Q Search fo	Q Search for any metric, dimension or resource id				
	155 Metrics					
	CodeBui	ld	E	Events		Lambda
	44 Metrics		1	2 Metrics		14 Metrics

- 4. Choose **BuildId**, **BuildNumber**, **ProjectName**.
- 5. Choose one or more build and metric combinations to add to the graph. All selected build and metric combinations are displayed in the graph on the page.
- 6. (Optional) You can customize your metrics and graphs from the **Graphed metrics** tab. For example, from the drop-down list in the **Statistic** column, you can choose a different statistic to display. Or from the drop-down menu in the **Period** column, you can choose a different time period to use to monitor the metrics.

For more information, see <u>Graphing metrics</u> and <u>Viewing available metrics</u> in the Amazon CloudWatch User Guide.

Monitor CodeBuild builds with CloudWatch alarms

You can create a CloudWatch alarm for your builds. An alarm watches a single metric over a period of time that you specify and performs one or more actions based on the value of the metric relative to a specified threshold over a number of time periods. Using native CloudWatch alarm functionality, you can specify any of the actions supported by CloudWatch when a threshold is exceeded. For example, you can specify that an Amazon SNS notification is sent when more than three builds in your account fail within fifteen minutes.

To create a CloudWatch alarm for a CodeBuild metric

- Sign in to the AWS Management Console and open the CloudWatch console at https://console.aws.amazon.com/cloudwatch/.
- 2. In the navigation pane, choose Alarms.
- 3. Choose Create Alarm.
- 4. Under **CloudWatch Metrics by Category**, choose **CodeBuild Metrics**. If you know you want only project-level metrics, choose **By Project**. If you know you want only account-level metrics, choose **Account Metrics**.
- 5. On **Create Alarm**, if it isn't already selected, choose **Select Metric**.
- Choose a metric for which you want to create an alarm. The options are By Project or Account Metrics.
- Choose Next or Define Alarm and then create your alarm. For more information, see <u>Creating</u> <u>Amazon CloudWatch alarms</u> in the *Amazon CloudWatch User Guide*. For more information about setting up Amazon SNS notifications when an alarm is triggered, see <u>Set up Amazon</u> <u>SNS notifications in the *Amazon SNS Developer Guide*.
 </u>
- 8. Choose Create Alarm.

Security in AWS CodeBuild

Cloud security at AWS is the highest priority. As an AWS customer, you benefit from a data center and network architecture that is built to meet the requirements of the most security-sensitive organizations.

Security and compliance is a shared responsibility between AWS and you. This shared model can help relieve your operational burden: AWS operates, manages, and controls the components from the host operating system and virtualization layer down to the physical security of the service facilities. You assume responsibility and management of the guest operating system (including updates and security patches) and other associated application software. You're also responsible for the configuration of the AWS provided security group firewall. Your responsibilities vary with the services you use, the integration of those services into your IT environment, and applicable laws and regulations. Therefore, you should carefully consider the services that your organization uses. For more information, see Shared responsibility model.

To learn how to secure your CodeBuild resources, see the following topics.

Topics

- Data protection in AWS CodeBuild
- Identity and access management in AWS CodeBuild
- Compliance validation for AWS CodeBuild
- <u>Resilience in AWS CodeBuild</u>
- Infrastructure security in AWS CodeBuild
- <u>Access your source provider in CodeBuild</u>
- <u>Cross-service confused deputy prevention</u>

Data protection in AWS CodeBuild

The AWS <u>shared responsibility model</u> applies to data protection in AWS CodeBuild. As described in this model, AWS is responsible for protecting the global infrastructure that runs all of the AWS Cloud. You are responsible for maintaining control over your content that is hosted on this infrastructure. You are also responsible for the security configuration and management tasks for the AWS services that you use. For more information about data privacy, see the Data Privacy FAQ. For information about data protection in Europe, see the <u>AWS Shared Responsibility Model and</u> <u>GDPR</u> blog post on the *AWS Security Blog*.

For data protection purposes, we recommend that you protect AWS account credentials and set up individual users with AWS IAM Identity Center or AWS Identity and Access Management (IAM). That way, each user is given only the permissions necessary to fulfill their job duties. We also recommend that you secure your data in the following ways:

- Use multi-factor authentication (MFA) with each account.
- Use SSL/TLS to communicate with AWS resources. We require TLS 1.2 and recommend TLS 1.3.
- Set up API and user activity logging with AWS CloudTrail. For information about using CloudTrail trails to capture AWS activities, see <u>Working with CloudTrail trails</u> in the AWS CloudTrail User Guide.
- Use AWS encryption solutions, along with all default security controls within AWS services.
- Use advanced managed security services such as Amazon Macie, which assists in discovering and securing sensitive data that is stored in Amazon S3.
- If you require FIPS 140-3 validated cryptographic modules when accessing AWS through a command line interface or an API, use a FIPS endpoint. For more information about the available FIPS endpoints, see Federal Information Processing Standard (FIPS) 140-3.

We strongly recommend that you never put confidential or sensitive information, such as your customers' email addresses, into tags or free-form text fields such as a **Name** field. This includes when you work with CodeBuild or other AWS services using the console, API, AWS CLI, or AWS SDKs. Any data that you enter into tags or free-form text fields used for names may be used for billing or diagnostic logs. If you provide a URL to an external server, we strongly recommend that you do not include credentials information in the URL to validate your request to that server.

To protect sensitive information, the following are hidden in CodeBuild logs:

- Strings specified using the Parameter Store in CodeBuild project environment variables or the buildspec env/parameter-store section. For more information, see <u>Systems Manager</u> <u>Parameter Store</u> and <u>Systems Manager Parameter Store console walkthrough</u> in the Amazon EC2 Systems Manager User Guide.
- Strings specified using AWS Secrets Manager in CodeBuild project environment variables or the buildspec env/secrets-manager section. For more information, see Key management.

For more information about data protection, see the <u>AWS shared responsibility model and GDPR</u> blog post on the *AWS Security Blog*.

Topics

- Data encryption
- Key management
- <u>Traffic privacy</u>

Data encryption

Encryption is an important part of CodeBuild security. Some encryption, such as for data in-transit, is provided by default and does not require you to do anything. Other encryption, such as for data at-rest, you can configure when you create your project or build.

- Encryption of data at-rest Build artifacts, such as a cache, logs, exported raw test report data files, and build results, are encrypted by default using AWS managed keys. If you do not want to use these KMS keys, you must create and configure a customer managed key. For more information <u>Creating KMS Keys</u> and <u>AWS Key Management Service concepts</u> in the AWS Key Management Service User Guide.
 - You can store the identifier of the AWS KMS key that CodeBuild uses to encrypt the build output artifact in the CODEBUILD_KMS_KEY_ID environment variable. For more information, see Environment variables in build environments
 - You can specify a customer managed key when you create a build project. For more information, see <u>Set the Encryption Key Using the Console</u> and <u>Set the encryption key using</u> <u>the CLI</u>.

The Amazon Elastic Block Store volumes of your build fleet are encrypted by default using AWS managed keys.

- Encryption of data in-transit All communication between customers and CodeBuild and between CodeBuild and its downstream dependencies is protected using TLS connections that are signed using the Signature Version 4 signing process. All CodeBuild endpoints use SHA-256 certificates that are managed by AWS Private Certificate Authority. For more information, see <u>Signature Version 4 signing process</u> and <u>What is ACM PCA</u>.
- **Build artifact encryption** The CodeBuild service role associated with the build project requires access to a KMS key in order to encrypt its build output artifacts. By default, CodeBuild uses an AWS managed key for Amazon S3 in your AWS account. If you do not want to use this AWS

managed key, you must create and configure a customer managed key. For more information, see Encrypt build outputs and Creating keys in the AWS KMS Developer Guide.

Key management

You can protect your content from unauthorized use through encryption. Store your encryption keys in AWS Secrets Manager, and then give the CodeBuild service role associated with the build project permission to obtain the encryption keys from your Secrets Manager account. For more information, see Encrypt build outputs using a customer managed key, Create a build project in AWS CodeBuild, Run AWS CodeBuild builds manually, and Tutorial: Storing and retrieving a secret.

Use the CODEBUILD_KMS_KEY_ID environment variable in a build command to obtain the AWS KMS key identifier. For more information, see <u>Environment variables in build environments</u>.

You can use Secrets Manager to protect credentials to a private registry that stores a Docker image used for your runtime environment. For more information, see <u>Private registry with AWS Secrets</u> <u>Manager sample for CodeBuild</u>.

Traffic privacy

You can improve the security of your builds by configuring CodeBuild to use an interface VPC endpoint. To do this, you do not need an internet gateway, NAT device, or virtual private gateway. It also is not required to configure PrivateLink, though it is recommended. For more information, see <u>Use VPC endpoints</u>. For more information about PrivateLink and VPC endpoints, see <u>AWS</u> <u>PrivateLink</u> and <u>Accessing AWS services through PrivateLink</u>.

Identity and access management in AWS CodeBuild

Access to AWS CodeBuild requires credentials. Those credentials must have permissions to access AWS resources, such as storing and retrieving build artifacts in S3 buckets and viewing Amazon CloudWatch Logs for builds. The following sections describe how you can use <u>AWS Identity and Access Management</u> (IAM) and CodeBuild to help secure access to your resources:

Overview of managing access permissions to your AWS CodeBuild

resources

Every AWS resource is owned by an AWS account, and permissions to create or access a resource are governed by permissions policies. An account administrator can attach permissions policies to IAM identities (that is, users, groups, and roles).

1 Note

An account administrator (or administrator user) is a user with administrator privileges. For more information, see <u>IAM Best Practices</u> in the *IAM User Guide*.

When you grant permissions, you decide who is getting the permissions, the resources they can access, and the actions that can be performed on those resources.

Topics

- AWS CodeBuild resources and operations
- Understanding resource ownership
- Managing access to resources
- Specifying policy elements: Actions, effects, and principals

AWS CodeBuild resources and operations

In AWS CodeBuild, the primary resource is a build project. In a policy, you use an Amazon Resource Name (ARN) to identify the resource the policy applies to. Builds are also resources and have ARNs associated with them. For more information, see <u>Amazon Resource Names (ARN) and AWS Service</u> <u>Namespaces</u> in the *Amazon Web Services General Reference*.

Resource type	ARN format	
Build project	arn:aws:codebuild: <i>project-name</i>	<pre>region-ID :account-ID :project/</pre>
Build	arn:aws:codebuild: <i>D</i> :build/ <i>build-ID</i>	region-ID :account-I

AWS CodeBuild

Resource type	ARN format
Report group	arn:aws:codebuild: <i>region-ID</i> : <i>account-ID</i> :report-g roup/ <i>report-group-name</i>
Report	<pre>arn:aws:codebuild: region-ID :account-I D :report/report-ID</pre>
Fleet	<pre>arn:aws:codebuild: region-ID :account-I D :fleet/fleet-ID</pre>
All CodeBuild resources	arn:aws:codebuild:*
All CodeBuild resources owned by the specified account in the specified AWS Region	arn:aws:codebuild: <i>region-ID</i> :account-ID :*

A Important

When using the reserved capacity feature, data cached on fleet instances, including source files, Docker layers, and cached directories specified in the buildspec, can be accessible to other projects within the same account. This is by design and allows projects within the same account to share fleet instances.

Note

Most AWS services treat a colon (:) or a forward slash (/) as the same character in ARNs. However, CodeBuild uses an exact match in resource patterns and rules. Be sure to use the correct characters when you create event patterns so that they match the ARN syntax in the resource.

For example, you can indicate a specific build project (*myBuildProject*) in your statement using its ARN as follows:

Overview of managing access

"Resource": "arn:aws:codebuild:us-east-2:123456789012:project/myBuildProject"

To specify all resources, or if an API action does not support ARNs, use the wildcard character (*) in the Resource element as follows:

```
"Resource": "*"
```

Some CodeBuild API actions accept multiple resources (for example, BatchGetProjects). To specify multiple resources in a single statement, separate their ARNs with commas, as follows:

```
"Resource": [
   "arn:aws:codebuild:us-east-2:123456789012:project/myBuildProject",
   "arn:aws:codebuild:us-east-2:123456789012:project/myOtherBuildProject"
]
```

CodeBuild provides a set of operations to work with the CodeBuild resources. For a list, see <u>AWS</u> CodeBuild permissions reference.

Understanding resource ownership

The AWS account owns the resources that are created in the account, regardless of who created the resources. Specifically, the resource owner is the AWS account of the <u>principal entity</u> (that is, the root account, an user, or an IAM role) that authenticates the resource creation request. The following examples illustrate how this works:

- If you use the root account credentials of your AWS account to create a rule, your AWS account is the owner of the CodeBuild resource.
- If you create an user in your AWS account and grant permissions to create CodeBuild resources to that user, the user can create CodeBuild resources. However, your AWS account, to which the user belongs, owns the CodeBuild resources.
- If you create an IAM role in your AWS account with permissions to create CodeBuild resources, anyone who can assume the role can create CodeBuild resources. Your AWS account, to which the role belongs, owns the CodeBuild resources.

Managing access to resources

A permissions policy describes who has access to which resources.

🚯 Note

This section discusses the use of IAM in AWS CodeBuild. It doesn't provide detailed information about the IAM service. For complete IAM documentation, see <u>What Is IAM?</u> in the *IAM User Guide*. For information about IAM policy syntax and descriptions, see <u>AWS IAM</u> <u>Policy Reference</u> in the *IAM User Guide*.

Policies attached to an IAM identity are referred to as identity-based policies (IAM policies). Policies attached to a resource are referred to as resource-based policies. CodeBuild supports identity-based policies, and resource-based policies for certain read only APIs for the purpose of cross-account resource sharing.

Secure access to S3 buckets

We strongly recommend that you include the following permissions in your IAM role to verify the S3 bucket associated with your CodeBuild project is owned by you or someone you trust. These permissions are not included in AWS managed policies and roles. You must add them yourself.

- s3:GetBucketAcl
- s3:GetBucketLocation

If the owner of an S3 bucket used by your project changes, you must verify you still own the bucket and update permissions in your IAM role if not. For more information, see <u>Allow users to interact</u> with CodeBuild and Allow CodeBuild to interact with other AWS services.

Specifying policy elements: Actions, effects, and principals

For each AWS CodeBuild resource, the service defines a set of API operations. To grant permissions for these API operations, CodeBuild defines a set of actions that you can specify in a policy. Some API operations can require permissions for more than one action in order to perform the API operation. For more information, see <u>AWS CodeBuild resources and operations</u> and <u>AWS CodeBuild permissions reference</u>.

The following are the basic policy elements:

• **Resource** – You use an Amazon Resource Name (ARN) to identify the resource that the policy applies to.

- Action You use action keywords to identify resource operations you want to allow or deny. For example, the codebuild:CreateProject permission gives the user permissions to perform the CreateProject operation.
- Effect You specify the effect, either allow or deny, when the user requests the action. If you don't explicitly grant access to (allow) a resource, access is implicitly denied. You can also explicitly deny access to a resource. You might do this to make sure a user cannot access a resource, even if a different policy grants access.
- Principal In identity-based policies (IAM policies), the user the policy is attached to is the implicit principal. For resource-based policies, you specify the user, account, service, or other entity that you want to receive permissions.

To learn more about IAM policy syntax and descriptions, see <u>AWS IAM Policy Reference</u> in the *IAM User Guide*.

For a table showing all of the CodeBuild API actions and the resources they apply to, see the <u>AWS</u> <u>CodeBuild permissions reference</u>.

Using identity-based policies for AWS CodeBuild

This topic provides examples of identity-based policies that demonstrate how an account administrator can attach permissions policies to IAM identities (that is, users, groups, and roles) and thereby grant permissions to perform operations on AWS CodeBuild resources.

🔥 Important

We recommend that you first review the introductory topics that explain the basic concepts and options available to manage access to your CodeBuild resources. For more information, see <u>Overview of managing access permissions to your AWS CodeBuild resources</u>.

Topics

- Permissions required to use the AWS CodeBuild console
- Permissions required for AWS CodeBuild to connect to Amazon Elastic Container Registry
- Permissions required for the AWS CodeBuild console to connect to source providers
- AWS managed (predefined) policies for AWS CodeBuild
- <u>CodeBuild managed policies and notifications</u>

- CodeBuild updates to AWS managed policies
- Customer-managed policy examples

The following shows an example of a permissions policy that allows a user to get information about build projects only in the us-east-2 region for account 123456789012 for any build project that starts with the name my:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": "codebuild:BatchGetProjects",
            "Resource": "arn:aws:codebuild:us-east-2:123456789012:project/my*"
        }
    ]
}
```

Permissions required to use the AWS CodeBuild console

A user who uses the AWS CodeBuild console must have a minimum set of permissions that allows the user to describe other AWS resources for the AWS account. You must have permissions from the following services:

- AWS CodeBuild
- Amazon CloudWatch
- CodeCommit (if you are storing your source code in an AWS CodeCommit repository)
- Amazon Elastic Container Registry (Amazon ECR) (if you are using a build environment that relies on a Docker image in an Amazon ECR repository)

Note

As of July 26, 2022, the default IAM policy has been updated. For more information, see <u>Permissions required for AWS CodeBuild to connect to Amazon Elastic Container</u> <u>Registry</u>.

 Amazon Elastic Container Service (Amazon ECS) (if you are using a build environment that relies on a Docker image in an Amazon ECR repository)

- AWS Identity and Access Management (IAM)
- AWS Key Management Service (AWS KMS)
- Amazon Simple Storage Service (Amazon S3)

If you create an IAM policy that is more restrictive than the minimum required permissions, the console won't function as intended.

Permissions required for AWS CodeBuild to connect to Amazon Elastic Container Registry

As of July 26, 2022, AWS CodeBuild has updated its default IAM policy for Amazon ECR permission. The following permissions have been removed from the default policy:

```
"ecr:PutImage",
"ecr:InitiateLayerUpload",
"ecr:UploadLayerPart",
"ecr:CompleteLayerUpload"
```

For CodeBuild projects that were created before July 26, 2022, we recommend you update your policy with the following Amazon ECR policy:

```
"Action": [
    "ecr:BatchCheckLayerAvailability",
    "ecr:GetDownloadUrlForLayer",
    "ecr:BatchGetImage"
]
```

For more information on updating your policy, see <u>Allow users to interact with CodeBuild</u>.

Permissions required for the AWS CodeBuild console to connect to source providers

The AWS CodeBuild console uses the following API actions to connect to source providers (for example, GitHub repositories).

- codebuild:ListConnectedOAuthAccounts
- codebuild:ListRepositories

- codebuild:PersistOAuthToken
- codebuild:ImportSourceCredentials

You can associate source providers (such as GitHub repositories) with your build projects using the AWS CodeBuild console. To do this, you must first add the preceding API actions to IAM access policies associated with the user you use to access the AWS CodeBuild console.

The ListConnectedOAuthAccounts, ListRepositories, and PersistOAuthToken API actions are not intended to be called by your code. Therefore, these API actions are not included in the AWS CLI and AWS SDKs.

AWS managed (predefined) policies for AWS CodeBuild

AWS addresses many common use cases by providing standalone IAM policies that are created and administered by AWS. These AWS managed policies grant necessary permissions for common use cases so you can avoid having to investigate what permissions are needed. The managed policies for CodeBuild also provide permissions to perform operations in other services, such as IAM, AWS CodeCommit,Amazon EC2, Amazon ECR, Amazon SNS, and Amazon CloudWatch Events, as required for the responsibilities for the users who have been granted the policy in question. For example, the AWSCodeBuildAdminAccess policy is an administrative-level user policy that allows users with this policy to create and manage CloudWatch Events rules for project builds and Amazon SNS topics for notifications about project-related events (topics whose names are prefixed with arn:aws:codebuild:), as well as administer projects and report groups in CodeBuild. For more information, see <u>AWS Managed Policies</u> in the *IAM User Guide*.

The following AWS managed policies, which you can attach to users in your account, are specific to AWS CodeBuild.

AWSCodeBuildAdminAccess

Provides full access to CodeBuild including permissions to administrate CodeBuild build projects.

AWSCodeBuildDeveloperAccess

Provides access to CodeBuild but does not allow build project administration.

AWSCodeBuildReadOnlyAccess

Provides read-only access to CodeBuild.

To access build output artifacts that CodeBuild creates, you must also attach the AWS managed policy named AmazonS3ReadOnlyAccess.

To create and manage CodeBuild service roles, you must also attach the AWS managed policy named IAMFullAccess.

You can also create your own custom IAM policies to allow permissions for CodeBuild actions and resources. You can attach these custom policies to the users or groups that require those permissions.

Topics

- <u>AWSCodeBuildAdminAccess</u>
- <u>AWSCodeBuildDeveloperAccess</u>
- AWSCodeBuildReadOnlyAccess

AWSCodeBuildAdminAccess

The AWSCodeBuildAdminAccess policy provides full access to CodeBuild, including permissions to administer CodeBuild build projects. Apply this policy only to administrative-level users to grant them full control over CodeBuild projects, report groups, and related resources in your AWS account, including the ability to delete projects and report groups.

The AWSCodeBuildAdminAccess policy contains the following policy statement:

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Sid": "AWSServicesAccess",
      "Action": [
        "codebuild:*",
        "codecommit:GetBranch",
        "codecommit:GetCommit",
        "codecommit:GetRepository",
        "codecommit:ListBranches",
        "codecommit:ListRepositories",
        "cloudwatch:GetMetricStatistics",
        "ec2:DescribeVpcs",
        "ec2:DescribeSecurityGroups",
        "ec2:DescribeSubnets",
        "ecr:DescribeRepositories",
```

```
"ecr:ListImages",
    "elasticfilesystem:DescribeFileSystems",
    "events:DeleteRule",
    "events:DescribeRule",
    "events:DisableRule",
    "events:EnableRule",
    "events:ListTargetsByRule",
    "events:ListRuleNamesByTarget",
    "events:PutRule",
    "events:PutTargets",
    "events:RemoveTargets",
    "logs:GetLogEvents",
    "s3:GetBucketLocation",
    "s3:ListAllMyBuckets"
  ],
  "Effect": "Allow",
  "Resource": "*"
},
{
  "Sid": "CWLDeleteLogGroupAccess",
  "Action": [
    "logs:DeleteLogGroup"
  ],
  "Effect": "Allow",
  "Resource": "arn:aws:logs:*:*:log-group:/aws/codebuild/*:log-stream:*"
},
{
  "Sid": "SSMParameterWriteAccess",
  "Effect": "Allow",
  "Action": [
    "ssm:PutParameter"
  ],
  "Resource": "arn:aws:ssm:*:*:parameter/CodeBuild/*"
},
{
  "Sid": "SSMStartSessionAccess",
  "Effect": "Allow",
  "Action": [
    "ssm:StartSession"
  ],
 "Resource": "arn:aws:ecs:*:*:task/*/*"
},
{
  "Sid": "CodeStarConnectionsReadWriteAccess",
```

```
"Effect": "Allow",
  "Action": [
    "codestar-connections:CreateConnection",
    "codestar-connections:DeleteConnection",
    "codestar-connections:UpdateConnectionInstallation",
    "codestar-connections:TagResource",
    "codestar-connections:UntagResource",
    "codestar-connections:ListConnections",
    "codestar-connections:ListInstallationTargets",
    "codestar-connections:ListTagsForResource",
    "codestar-connections:GetConnection",
    "codestar-connections:GetIndividualAccessToken",
    "codestar-connections:GetInstallationUrl",
    "codestar-connections:PassConnection",
    "codestar-connections:StartOAuthHandshake",
    "codestar-connections:UseConnection"
  ],
  "Resource": [
    "arn:aws:codestar-connections:*:*:connection/*",
    "arn:aws:codeconnections:*:*:connection/*"
 ]
},
{
  "Sid": "CodeStarNotificationsReadWriteAccess",
  "Effect": "Allow",
  "Action": [
    "codestar-notifications:CreateNotificationRule",
    "codestar-notifications:DescribeNotificationRule",
    "codestar-notifications:UpdateNotificationRule",
    "codestar-notifications:DeleteNotificationRule",
    "codestar-notifications:Subscribe",
    "codestar-notifications:Unsubscribe"
  ],
  "Resource": "*",
  "Condition": {
    "StringLike": {
      "codestar-notifications:NotificationsForResource": "arn:aws:codebuild:*"
   }
 }
},
{
  "Sid": "CodeStarNotificationsListAccess",
  "Effect": "Allow",
  "Action": [
```

```
"codestar-notifications:ListNotificationRules",
        "codestar-notifications:ListEventTypes",
        "codestar-notifications:ListTargets",
        "codestar-notifications:ListTagsforResource"
      ],
      "Resource": "*"
    },
    {
      "Sid": "CodeStarNotificationsSNSTopicCreateAccess",
      "Effect": "Allow",
      "Action": [
        "sns:CreateTopic",
        "sns:SetTopicAttributes"
      ],
      "Resource": "arn:aws:sns:*:*:codestar-notifications*"
    },
    {
      "Sid": "SNSTopicListAccess",
      "Effect": "Allow",
      "Action": [
        "sns:ListTopics",
        "sns:GetTopicAttributes"
      ],
      "Resource": "*"
    },
    {
      "Sid": "CodeStarNotificationsChatbotAccess",
      "Effect": "Allow",
      "Action": [
        "chatbot:DescribeSlackChannelConfigurations",
        "chatbot:ListMicrosoftTeamsChannelConfigurations"
      ],
      "Resource": "*"
    }
  ]
}
```

AWSCodeBuildDeveloperAccess

The AWSCodeBuildDeveloperAccess policy allows access to all of the functionality of CodeBuild and project and report group-related resources. This policy does not allow users to delete CodeBuild projects or report groups, or related resources in other AWS services, such as CloudWatch Events. We recommend that you apply this policy to most users.

{

```
"Statement": [
  {
    "Sid": "AWSServicesAccess",
    "Action": [
      "codebuild:StartBuild",
      "codebuild:StopBuild",
      "codebuild:StartBuildBatch",
      "codebuild:StopBuildBatch",
      "codebuild:RetryBuild",
      "codebuild:RetryBuildBatch",
      "codebuild:BatchGet*",
      "codebuild:GetResourcePolicy",
      "codebuild:DescribeTestCases",
      "codebuild:DescribeCodeCoverages",
      "codebuild:List*",
      "codecommit:GetBranch",
      "codecommit:GetCommit",
      "codecommit:GetRepository",
      "codecommit:ListBranches",
      "cloudwatch:GetMetricStatistics",
      "events:DescribeRule",
      "events:ListTargetsByRule",
      "events:ListRuleNamesByTarget",
      "logs:GetLogEvents",
      "s3:GetBucketLocation",
      "s3:ListAllMyBuckets"
    ],
    "Effect": "Allow",
    "Resource": "*"
 },
  {
    "Sid": "SSMParameterWriteAccess",
    "Effect": "Allow",
    "Action": [
      "ssm:PutParameter"
    ],
    "Resource": "arn:aws:ssm:*:*:parameter/CodeBuild/*"
  },
  {
    "Sid": "SSMStartSessionAccess",
    "Effect": "Allow",
```

```
"Action": [
    "ssm:StartSession"
  ],
  "Resource": "arn:aws:ecs:*:*:task/*/*"
},
{
  "Sid": "CodeStarConnectionsUserAccess",
  "Effect": "Allow",
  "Action": [
    "codestar-connections:ListConnections",
    "codestar-connections:GetConnection"
  ],
  "Resource": [
    "arn:aws:codestar-connections:*:*:connection/*",
    "arn:aws:codeconnections:*:*:connection/*"
  1
},
{
  "Sid": "CodeStarNotificationsReadWriteAccess",
  "Effect": "Allow",
  "Action": [
    "codestar-notifications:CreateNotificationRule",
    "codestar-notifications:DescribeNotificationRule",
    "codestar-notifications:UpdateNotificationRule",
    "codestar-notifications:Subscribe",
    "codestar-notifications:Unsubscribe"
  ],
  "Resource": "*",
  "Condition": {
    "StringLike": {
      "codestar-notifications:NotificationsForResource": "arn:aws:codebuild:*"
    }
  }
},
{
  "Sid": "CodeStarNotificationsListAccess",
  "Effect": "Allow",
  "Action": [
    "codestar-notifications:ListNotificationRules",
    "codestar-notifications:ListEventTypes",
    "codestar-notifications:ListTargets",
    "codestar-notifications:ListTagsforResource"
  ],
  "Resource": "*"
```

```
},
    {
      "Sid": "SNSTopicListAccess",
      "Effect": "Allow",
      "Action": [
        "sns:ListTopics",
        "sns:GetTopicAttributes"
      ],
      "Resource": "*"
    },
    {
      "Sid": "CodeStarNotificationsChatbotAccess",
      "Effect": "Allow",
      "Action": [
        "chatbot:DescribeSlackChannelConfigurations",
        "chatbot:ListMicrosoftTeamsChannelConfigurations"
      ],
      "Resource": "*"
    }
  ],
  "Version": "2012-10-17"
}
```

AWSCodeBuildReadOnlyAccess

The AWSCodeBuildReadOnlyAccess policy grants read-only access to CodeBuild and related resources in other AWS services. Apply this policy to users who can view and run builds, view projects, and view report groups, but cannot make any changes to them.

The AWSCodeBuildReadOnlyAccess policy contains the following policy statement:

```
{
    "Statement": [
    {
        "Sid": "AWSServicesAccess",
        "Action": [
            "codebuild:BatchGet*",
            "codebuild:GetResourcePolicy",
            "codebuild:List*",
            "codebuild:DescribeTestCases",
            "codebuild:DescribeCodeCoverages",
            "codecommit:GetBranch",
            "codecommit:GetCommit",
            "codecommit:GetComm
```

```
"codecommit:GetRepository",
    "cloudwatch:GetMetricStatistics",
    "events:DescribeRule",
    "events:ListTargetsByRule",
    "events:ListRuleNamesByTarget",
    "logs:GetLogEvents"
  ],
  "Effect": "Allow",
  "Resource": "*"
},
{
  "Sid": "CodeStarConnectionsUserAccess",
  "Effect": "Allow",
  "Action": [
    "codestar-connections:ListConnections",
    "codestar-connections:GetConnection"
  ],
  "Resource": [
    "arn:aws:codestar-connections:*:*:connection/*",
    "arn:aws:codeconnections:*:*:connection/*"
  ]
},
{
  "Sid": "CodeStarNotificationsPowerUserAccess",
  "Effect": "Allow",
  "Action": [
    "codestar-notifications:DescribeNotificationRule"
  ],
  "Resource": "*",
  "Condition": {
    "StringLike": {
      "codestar-notifications:NotificationsForResource": "arn:aws:codebuild:*"
    }
  }
},
{
  "Sid": "CodeStarNotificationsListAccess",
  "Effect": "Allow",
  "Action": [
    "codestar-notifications:ListNotificationRules",
    "codestar-notifications:ListEventTypes",
    "codestar-notifications:ListTargets"
  ],
  "Resource": "*"
```

```
}
],
"Version": "2012-10-17"
}
```

CodeBuild managed policies and notifications

CodeBuild supports notifications, which can notify users of important changes to build projects. Managed policies for CodeBuild include policy statements for notification functionality. For more information, see <u>What are notifications?</u>.

Permissions related to notifications in full access managed policies

The AWSCodeBuildFullAccess managed policy includes the following statements to allow full access to notifications. Users with this managed policy applied can also create and manage Amazon SNS topics for notifications, subscribe and unsubscribe users to topics, list topics to choose as targets for notification rules, and list AWS Chatbot clients configured for Slack.

```
{
       "Sid": "CodeStarNotificationsReadWriteAccess",
       "Effect": "Allow",
       "Action": [
           "codestar-notifications:CreateNotificationRule",
           "codestar-notifications:DescribeNotificationRule",
           "codestar-notifications:UpdateNotificationRule",
           "codestar-notifications:DeleteNotificationRule",
           "codestar-notifications:Subscribe",
           "codestar-notifications:Unsubscribe"
       ],
       "Resource": "*",
       "Condition" : {
           "StringLike" : {"codestar-notifications:NotificationsForResource" :
"arn:aws:codebuild:*"}
       }
  },
   {
       "Sid": "CodeStarNotificationsListAccess",
       "Effect": "Allow",
       "Action": [
           "codestar-notifications:ListNotificationRules",
           "codestar-notifications:ListTargets",
           "codestar-notifications:ListTagsforResource",
```

```
"codestar-notifications:ListEventTypes"
    ],
    "Resource": "*"
},
{
    "Sid": "CodeStarNotificationsSNSTopicCreateAccess",
    "Effect": "Allow",
    "Action": [
        "sns:CreateTopic",
        "sns:SetTopicAttributes"
    ],
    "Resource": "arn:aws:sns:*:*:codestar-notifications*"
},
{
    "Sid": "SNSTopicListAccess",
    "Effect": "Allow",
    "Action": [
        "sns:ListTopics"
    ],
    "Resource": "*"
},
{
    "Sid": "CodeStarNotificationsChatbotAccess",
    "Effect": "Allow",
    "Action": [
        "chatbot:DescribeSlackChannelConfigurations",
        "chatbot:ListMicrosoftTeamsChannelConfigurations"
      ],
   "Resource": "*"
}
```

Permissions related to notifications in read-only managed policies

The AWSCodeBuildReadOnlyAccess managed policy includes the following statements to allow read-only access to notifications. Users with this managed policy applied can view notifications for resources, but cannot create, manage, or subscribe to them.

```
{
    "Sid": "CodeStarNotificationsPowerUserAccess",
    "Effect": "Allow",
    "Action": [
        "codestar-notifications:DescribeNotificationRule"
],
```

```
"Resource": "*",
       "Condition" : {
           "StringLike" : {"codestar-notifications:NotificationsForResource" :
"arn:aws:codebuild:*"}
       }
  },
   {
       "Sid": "CodeStarNotificationsListAccess",
       "Effect": "Allow",
       "Action": [
           "codestar-notifications:ListNotificationRules",
           "codestar-notifications:ListEventTypes",
           "codestar-notifications:ListTargets"
       ],
       "Resource": "*"
   }
```

Permissions related to notifications in other managed policies

The AWSCodeBuildDeveloperAccess managed policy includes the following statements to allow users to create, edit, and subscribe to notifications. Users cannot delete notification rules or manage tags for resources.

```
{
       "Sid": "CodeStarNotificationsReadWriteAccess",
       "Effect": "Allow",
       "Action": [
           "codestar-notifications:CreateNotificationRule",
           "codestar-notifications:DescribeNotificationRule",
           "codestar-notifications:UpdateNotificationRule",
           "codestar-notifications:Subscribe",
           "codestar-notifications:Unsubscribe"
       ],
       "Resource": "*",
       "Condition" : {
           "StringLike" : {"codestar-notifications:NotificationsForResource" :
"arn:aws:codebuild*"}
       }
  },
   {
       "Sid": "CodeStarNotificationsListAccess",
       "Effect": "Allow",
       "Action": [
```



For more information about IAM and notifications, see <u>Identity and Access Management for AWS</u> <u>CodeStar Notifications</u>.

CodeBuild updates to AWS managed policies

View details about updates to AWS managed policies for CodeBuild since this service began tracking these changes. For automatic alerts about changes to this page, subscribe to the RSS feed on <u>AWS CodeBuild User Guide document history</u>.

Change	Description	Date
AWSCodeBuildAdminA ccess , AWSCodeBu ildDeveloperAccess , and AWSCodeBuildReadOn	CodeBuild added a resource to these policies to support the AWS CodeConnections rebranding.	April 18, 2024

Change	Description	Date
lyAccess – Update to existing policies	The AWSCodeBuildAdminA ccess , AWSCodeBu ildDeveloperAccess , and AWSCodeBuildReadOn lyAccess policies have been changed to add a resource, arn:aws:c odeconnections:*:* :connection/* .	
AWSCodeBuildAdminA ccess and AWSCodeBu ildDeveloperAccess – Update to existing policies	CodeBuild added a permissio n to these policies to support an additional notification type using AWS Chatbot. The AWSCodeBuildAdminA ccess and AWSCodeBu ildDeveloperAccess policies have been changed to add a permission, chatbot:L istMicrosoftTeamsC hannelConfiguratio ns .	May 16, 2023
CodeBuild started tracking changes	CodeBuild started tracking changes for its AWS managed policies.	May 16, 2021

Customer-managed policy examples

In this section, you can find example user policies that grant permissions for AWS CodeBuild actions. These policies work when you are using the CodeBuild API, AWS SDKs, or AWS CLI. When you are using the console, you must grant additional, console-specific permissions. For information, see Permissions required to use the AWS CodeBuild console.

You can use the following sample IAM policies to limit CodeBuild access for your users and roles.

Topics

- Allow a user to get information about build projects
- Allow a user to get information about fleets
- Allow a user to get information about report groups
- Allow a user to get information about reports
- Allow a user to create build projects
- Allow a user to create a fleet
- Allow a user to create a report group
- Allow a user to delete a fleet
- Allow a user to delete a report group
- Allow a user to delete a report
- Allow a user to delete build projects
- Allow a user to get a list of build project names
- Allow a user to change information about build projects
- Allow a user to change a fleet
- <u>Allow a user to change a report group</u>
- Allow a user to get information about builds
- Allow a user to get a list of build IDs for a build project
- Allow a user to get a list of build IDs
- Allow a user to get a list of fleets
- Allow a user to get a list of report groups
- Allow a user to get a list of reports
- <u>Allow a user to get a list of reports for a report group</u>
- <u>Allow a user to get a list of test cases for a report</u>
- Allow a user to start running builds
- <u>Allow a user to attempt to stop builds</u>
- Allow a user to attempt to delete builds
- Allow a user to get information about Docker images that are managed by CodeBuild
- Allow a user to add a permission policy for a fleet service role

- Allow CodeBuild access to AWS services required to create a VPC network interface
- Use a deny statement to prevent AWS CodeBuild from disconnecting from source providers

Allow a user to get information about build projects

The following example policy statement allows a user to get information about build projects in the us-east-2 Region for account 123456789012 for any build project that starts with the name my:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": "codebuild:BatchGetProjects",
            "Resource": "arn:aws:codebuild:us-east-2:123456789012:project/my*"
        }
    ]
}
```

Allow a user to get information about fleets

The following example policy statement allows a user to get information about fleets in the useast-2 Region for account 123456789012:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": "codebuild:BatchGetFleets",
            "Resource": "arn:aws:codebuild:us-east-2:123456789012:fleet/*"
        }
    ]
}
```

Allow a user to get information about report groups

The following example policy statement allows a user to get information about report groups in the us-east-2 Region for account 123456789012:

```
{
   "Version": "2012-10-17",
   "Statement": [
    {
        "Effect": "Allow",
        "Action": "codebuild:BatchGetReportGroups",
        "Resource": "arn:aws:codebuild:us-east-2:123456789012:report-group/*"
    }
]
}
```

Allow a user to get information about reports

The following example policy statement allows a user to get information about reports in the useast-2 Region for account 123456789012:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": "codebuild:BatchGetReports",
            "Resource": "arn:aws:codebuild:us-east-2:123456789012:report-group/*"
        }
    ]
}
```

Allow a user to create build projects

The following example policy statement allows a user to create build projects with any name but only in the us-east-2 Region for account 123456789012 and only using the specified CodeBuild service role:

```
"Effect": "Allow",
    "Action": "iam:PassRole",
    "Resource": "arn:aws:iam::123456789012:role/CodeBuildServiceRole"
    }
]
```

The following example policy statement allows a user to create build projects with any name but only in the us-east-2 Region for account 123456789012 and only using the specified CodeBuild service role. It also enforces that the user can only use the specified service role with AWS CodeBuild and not any other AWS services.

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Effect": "Allow",
      "Action": "codebuild:CreateProject",
      "Resource": "arn:aws:codebuild:us-east-2:123456789012:project/*"
    },
    {
      "Effect": "Allow",
      "Action": "iam:PassRole",
      "Resource": "arn:aws:iam::123456789012:role/CodeBuildServiceRole",
      "Condition": {
          "StringEquals": {"iam:PassedToService": "codebuild.amazonaws.com"}
      }
    }
  ]
}}
```

Allow a user to create a fleet

The following example policy statement allows a user to create a fleet in the us-east-2 Region for account 123456789012:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
          "Effect": "Allow",
          "Action": "codebuild:CreateFleet",
```

```
"Resource": "arn:aws:codebuild:us-east-2:123456789012:fleet/*"
}
]
}
```

Allow a user to create a report group

The following example policy statement allows a user to create a report group in the us-east-2 Region for account 123456789012:

```
{
   "Version": "2012-10-17",
   "Statement": [
    {
        "Effect": "Allow",
        "Action": "codebuild:CreateReportGroup",
        "Resource": "arn:aws:codebuild:us-east-2:123456789012:report-group/*"
    }
  ]
}
```

Allow a user to delete a fleet

The following example policy statement allows a user to delete a fleet in the us-east-2 Region for account 123456789012:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": "codebuild:DeleteFleet",
            "Resource": "arn:aws:codebuild:us-east-2:123456789012:fleet/*"
        }
    ]
}
```

Allow a user to delete a report group

The following example policy statement allows a user to delete a report group in the us-east-2 Region for account 123456789012:

```
{
   "Version": "2012-10-17",
   "Statement": [
    {
        "Effect": "Allow",
        "Action": "codebuild:DeleteReportGroup",
        "Resource": "arn:aws:codebuild:us-east-2:123456789012:report-group/*"
    }
]
}
```

Allow a user to delete a report

The following example policy statement allows a user to delete a report in the us-east-2 Region for account 123456789012:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": "codebuild:DeleteReport",
            "Resource": "arn:aws:codebuild:us-east-2:123456789012:report-group/*"
        }
    ]
}
```

Allow a user to delete build projects

The following example policy statement allows a user to delete build projects in the us-east-2 Region for account 123456789012 for any build project that starts with the name my:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": "codebuild:DeleteProject",
            "Resource": "arn:aws:codebuild:us-east-2:123456789012:project/my*"
        }
    ]
}
```

Allow a user to get a list of build project names

The following example policy statement allows a user to get a list of build project names for the same account:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": "codebuild:ListProjects",
            "Resource": "*"
        }
    ]
}
```

Allow a user to change information about build projects

The following example policy statement allows a user to change information about build projects with any name but only in the us-east-2 Region for account 123456789012 and only using the specified AWS CodeBuild service role:

```
{
    "Version": "2012-10-17",
    "Statement": [
    {
        "Effect": "Allow",
        "Action": "codebuild:UpdateProject",
        "Resource": "arn:aws:codebuild:us-east-2:123456789012:project/*"
    },
    {
        "Effect": "Allow",
        "Action": "iam:PassRole",
        "Resource": "arn:aws:iam::123456789012:role/CodeBuildServiceRole"
    }
  ]
}
```

Allow a user to change a fleet

The following example policy statement allows a user to change a fleet in the us-east-2 Region for account 123456789012:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": "codebuild:UpdateFleet",
            "Resource": "arn:aws:codebuild:us-east-2:123456789012:fleet/*"
        }
    ]
}
```

Allow a user to change a report group

The following example policy statement allows a user to change a report group in the us-east-2 Region for account 123456789012:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": "codebuild:UpdateReportGroup",
            "Resource": "arn:aws:codebuild:us-east-2:123456789012:report-group/*"
        }
    ]
}
```

Allow a user to get information about builds

The following example policy statement allows a user to get information about builds in the useast-2 Region for account 123456789012 for the build projects named my-build-project and my-other-build-project:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
          "Effect": "Allow",
          "Action": "codebuild:BatchGetBuilds",
          "Resource": [
          "arn:aws:codebuild:us-east-2:123456789012:project/my-build-project",
```

```
"arn:aws:codebuild:us-east-2:123456789012:project/my-other-build-project"
]
}
```

Allow a user to get a list of build IDs for a build project

The following example policy statement allows a user to get a list of build IDs in the us-east-2 Region for account 123456789012 for the build projects named my-build-project and my-other-build-project:

Allow a user to get a list of build IDs

The following example policy statement allows a user to get a list of all build IDs for the same account:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": "codebuild:ListBuilds",
            "Resource": "*"
        }
    ]
}
```

Allow a user to get a list of fleets

The following example policy statement allows a user to get a list of fleets in the us-east-2 Region for account 123456789012:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": "codebuild:ListFleets",
            "Resource": "*"
        }
    ]
}
```

Allow a user to get a list of report groups

The following example policy statement allows a user to get a list of report groups in the us - east - 2 Region for account 123456789012:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": "codebuild:ListReportGroups",
            "Resource": "*"
        }
    ]
}
```

Allow a user to get a list of reports

The following example policy statement allows a user to get a list of reports in the us-east-2 Region for account 123456789012:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "
```

```
"Action": "codebuild:ListReports",
    "Resource": "*"
}
]
```

Allow a user to get a list of reports for a report group

The following example policy statement allows a user to get a list of reports for a report group in the us-east-2 Region for account 123456789012:

```
{
   "Version": "2012-10-17",
   "Statement": [
    {
        "Effect": "Allow",
        "Action": "codebuild:ListReportsForReportGroup",
        "Resource": "arn:aws:codebuild:us-east-2:123456789012:report-group/*"
    }
]
```

Allow a user to get a list of test cases for a report

The following example policy statement allows a user to get a list of test cases for a report in the us-east-2 Region for account 123456789012:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": "codebuild:DescribeTestCases",
            "Resource": "arn:aws:codebuild:us-east-2:123456789012:report-group/*"
        }
    ]
}
```

Allow a user to start running builds

The following example policy statement allows a user to run builds in the us-east-2 Region for account 123456789012 for a build project that starts with the name my:

User Guide

```
{
   "Version": "2012-10-17",
   "Statement": [
    {
        "Effect": "Allow",
        "Action": "codebuild:StartBuild",
        "Resource": "arn:aws:codebuild:us-east-2:123456789012:project/my*"
    }
  ]
}
```

Allow a user to attempt to stop builds

The following example policy statement allows a user to attempt to stop running builds only in the us-east-2 region for account 123456789012 for any build project that starts with the name my:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": "codebuild:StopBuild",
            "Resource": "arn:aws:codebuild:us-east-2:123456789012:project/my*"
        }
    ]
}
```

Allow a user to attempt to delete builds

The following example policy statement allows a user to attempt to delete builds only in the useast-2 Region for account 123456789012 for any build project that starts with the name my:

```
{
   "Version": "2012-10-17",
   "Statement": [
    {
        "Effect": "Allow",
        "Action": "codebuild:BatchDeleteBuilds",
        "Resource": "arn:aws:codebuild:us-east-2:123456789012:project/my*"
    }
]
```

Allow a user to get information about Docker images that are managed by CodeBuild

The following example policy statement allows a user to get information about all Docker images that are managed by CodeBuild:

```
{
   "Version": "2012-10-17",
   "Statement": [
    {
        "Effect": "Allow",
        "Action": "codebuild:ListCuratedEnvironmentImages",
        "Resource": "*"
    }
  ]
}
```

Allow a user to add a permission policy for a fleet service role

The following example resource policy statement allows a user to add a VPC permission policy for a fleet service role:

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Sid": "CodeBuildFleetVpcCreateNI",
      "Effect": "Allow",
      "Action": [
        "ec2:CreateNetworkInterface"
      ],
      "Resource": [
        "arn:aws:ec2:region:account-id:subnet/subnet-id-1",
        "arn:aws:ec2:region:account-id:security-group/security-group-id-1",
        "arn:aws:ec2:region:account-id:network-interface/*"
      ]
    },
    {
      "Sid": "CodeBuildFleetVpcPermission",
      "Effect": "Allow",
      "Action": [
        "ec2:DescribeDhcpOptions",
```

User Guide

```
"ec2:DescribeNetworkInterfaces",
        "ec2:DescribeSecurityGroups",
        "ec2:DescribeSubnets",
        "ec2:DescribeVpcs",
        "ec2:ModifyNetworkInterfaceAttribute",
        "ec2:DeleteNetworkInterface"
      ],
      "Resource": "*"
    },
    {
      "Sid": "CodeBuildFleetVpcNIPermission",
      "Effect": "Allow",
      "Action": [
        "ec2:CreateNetworkInterfacePermission"
      ],
      "Resource": "arn:aws:ec2:region:account-id:network-interface/*",
      "Condition": {
        "StringEquals": {
          "ec2:Subnet": [
            "arn:aws:ec2:region:account-id:subnet/subnet-id-1"
          ]
        }
      }
    }
  ]
}
```

The following example resource policy statement allows a user to add a custom Amazon Managed Image (AMI) permission policy for a fleet service role:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": "ec2:DescribeImages",
            "Resource": "*"
        }
    ]
}
```

The following example trust policy statement allows a user to add a permission policy for a fleet service role:

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Sid": "CodeBuildFleetVPCTrustPolicy",
      "Effect": "Allow",
      "Principal": {
        "Service": "codebuild.amazonaws.com"
      },
      "Action": "sts:AssumeRole",
      "Condition": {
        "StringEquals": {
          "aws:SourceAccount": "account-id"
        }
      }
    }
  ]
}
```

Allow CodeBuild access to AWS services required to create a VPC network interface

The following example policy statement grants AWS CodeBuild permission to create a network interface in a VPC with two subnets:

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Effect": "Allow",
      "Action": [
        "ec2:CreateNetworkInterface",
        "ec2:DescribeDhcpOptions",
        "ec2:DescribeNetworkInterfaces",
        "ec2:DeleteNetworkInterface",
        "ec2:DescribeSubnets",
        "ec2:DescribeSecurityGroups",
        "ec2:DescribeVpcs"
      ],
      "Resource": "*"
    },
    {
      "Effect": "Allow",
      "Action": [
```

```
"ec2:CreateNetworkInterfacePermission"
      ],
      "Resource": "arn:aws:ec2:region:account-id:network-interface/*",
      "Condition": {
        "StringEquals": {
          "ec2:AuthorizedService": "codebuild.amazonaws.com"
        },
        "ArnEquals": {
          "ec2:Subnet": [
            "arn:aws:ec2:region:account-id:subnet/subnet-id-1",
            "arn:aws:ec2:region:account-id:subnet/subnet-id-2"
          ]
        }
      }
    }
  ]
}
```

Use a deny statement to prevent AWS CodeBuild from disconnecting from source providers

The following example policy statement uses a deny statement to prevent AWS CodeBuild from disconnecting from source providers. It uses codebuild:DeleteOAuthToken, which is the inverse of codebuild:PersistOAuthToken and codebuild:ImportSourceCredentials, to connect with source providers. For more information, see <u>Permissions required for the AWS</u> CodeBuild console to connect to source providers.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Deny",
            "Action": "codebuild:Delete0AuthToken",
            "Resource": "*"
        }
    ]
}
```

AWS CodeBuild permissions reference

You can use AWS-wide condition keys in your AWS CodeBuild policies to express conditions. For a list, see <u>Available Keys</u> in the *IAM User Guide*.

You specify the actions in the policy's Action field. To specify an action, use the codebuild: prefix followed by the API operation name (for example, codebuild:CreateProject and codebuild:StartBuild). To specify multiple actions in a single statement, separate them with commas (for example, "Action": ["codebuild:CreateProject", "codebuild:StartBuild"]).

Using Wildcard Characters

You specify an ARN, with or without a wildcard character (*), as the resource value in the policy's Resource field. You can use a wildcard to specify multiple actions or resources. For example, codebuild: * specifies all CodeBuild actions and codebuild: Batch* specifies all CodeBuild actions that begin with the word Batch. The following example grants access to all build project with names that begin with my:

arn:aws:codebuild:us-east-2:123456789012:project/my*

CodeBuild API operations and required permissions for actions

BatchDeleteBuilds

Action: codebuild: BatchDeleteBuilds

Required to delete builds.

```
Resource: arn:aws:codebuild:region-ID:account-ID:project/project-name
```

BatchGetBuilds

Action: codebuild: BatchGetBuilds

Required to get information about builds.

```
Resource: arn:aws:codebuild:region-ID:account-ID:project/project-name
```

BatchGetProjects

Action: codebuild:BatchGetProjects

Required to get information about build projects.

Resource: arn:aws:codebuild:region-ID:account-ID:project/project-name

BatchGetReportGroups

Action: codebuild:BatchGetReportGroups

Required to get information about report groups.

Resource: arn:aws:codebuild:*region-ID*:*account-ID*:report-group/*reportgroup-name*

BatchGetReports

Action: codebuild:BatchGetReports

Required to get information about reports.

Resource: arn:aws:codebuild:*region-ID*:account-ID:report-group/report-

group-name

BatchPutTestCases ¹

Action: codebuild:BatchPutTestCases

Required to create or update a test report.

Resource: arn:aws:codebuild:*region-ID*:*account-ID*:report-group/*reportgroup-name*

CreateProject

Actions: codebuild:CreateProject, iam:PassRole

Required to create build projects.

Resources:

- arn:aws:codebuild:region-ID:account-ID:project/project-name
- arn:aws:iam::account-ID:role/role-name

CreateReport¹

Action: codebuild:CreateReport

Required to create a test report.

Resource: arn:aws:codebuild:*region-ID*:account-ID:report-group/*reportgroup-name*

CreateReportGroup

Action: codebuild:CreateReportGroup

Required to create a report group.

Resource: arn:aws:codebuild:*region-ID*:*account-ID*:report-group/*reportgroup-name*

CreateWebhook

Action: codebuild:CreateWebhook

Required to create a webhook.

Resource: arn:aws:codebuild:*region-ID*:*account-ID*:project/*project-name*

DeleteProject

Action: codebuild:DeleteProject

Required to delete a CodeBuild project.

Resource: arn:aws:codebuild:region-ID:account-ID:project/project-name

DeleteReport

Action: codebuild:DeleteReport

Required to delete a report.

Resource: arn:aws:codebuild:region-ID:account-ID:report-group/report-

group-name

DeleteReportGroup

Action: codebuild:DeleteReportGroup

Required to delete a report group.

Resource: arn:aws:codebuild:region-ID:account-ID:report-group/report-

group-name

DeleteSourceCredentials

Action: codebuild:DeleteSourceCredentials

Required to delete a set of SourceCredentialsInfo objects that contain information about credentials for a GitHub, GitHub Enterprise Server, or Bitbucket repository.

Resource: *

AWS CodeBuild permissions reference

DeleteWebhook

Action: codebuild:DeleteWebhook

Required to create a webhook.

Resource: arn:aws:codebuild:*region-ID*:*account-ID*:project/*project-name*

DescribeTestCases

Action: codebuild:DescribeTestCases

Required to return a paginated list of test cases.

Resource: arn:aws:codebuild:*region-ID*:*account-ID*:report-group/*reportgroup-name*

ImportSourceCredentials

Action: codebuild:ImportSourceCredentials

Required to import a set of SourceCredentialsInfo objects that contain information about credentials for a GitHub, GitHub Enterprise Server, or Bitbucket repository.

Resource: *

InvalidateProjectCache

Action: codebuild: InvalidateProjectCache

Required to reset the cache for a project.

Resource: arn:aws:codebuild:region-ID:account-ID:project/project-name

ListBuildBatches

Action: codebuild:ListBuildBatches

Required to get a list of build batch IDs.

Resource: *

ListBuildBatchesForProject

Action: codebuild:ListBuildBatchesForProject

Required to get a list of build batch IDs for a specific project.

Resource: arn:aws:codebuild:region-ID:account-ID:project/project-name
ListBuilds

Action: codebuild:ListBuilds

Required to get a list of build IDs.

Resource: *

ListBuildsForProject

Action: codebuild:ListBuildsForProject

Required to get a list of build IDs for a build project.

Resource: arn:aws:codebuild:*region-ID*:*account-ID*:project/*project-name*

ListCuratedEnvironmentImages

Action: codebuild:ListCuratedEnvironmentImages

Required to get information about all Docker images that are managed by AWS CodeBuild.

Resource: * (required, but does not refer to an addressable AWS resource)

ListProjects

Action: codebuild:ListProjects

Required to get a list of build project names.

Resource: *

ListReportGroups

Action: codebuild:ListReportGroups

Required to get a list of report groups.

Resource: *

ListReports

Action: codebuild:ListReports

Required to get a list of reports.

Resource: *

AWS CodeBuild permissions reference

ListReportsForReportGroup

Action: codebuild:ListReportsForReportGroup

Required to get a list of reports for a report group.

Resource: arn:aws:codebuild:*region-ID*:account-ID:report-group/*report*group-name

RetryBuild

Action: codebuild:RetryBuild

Required to retry builds.

Resource: arn:aws:codebuild:*region-ID*:account-ID:project/project-name StartBuild

Action: codebuild:StartBuild

Required to start running builds.

Resource: arn:aws:codebuild:region-ID:account-ID:project/project-name
StopBuild

Action: codebuild:StopBuild

Required to attempt to stop running builds.

```
Resource: arn:aws:codebuild:region-ID:account-ID:project/project-name
UpdateProject
```

Actions: codebuild:UpdateProject, iam:PassRole

Required to change information about builds.

Resources:

- arn:aws:codebuild:region-ID:account-ID:project/project-name
- arn:aws:iam::account-ID:role/role-name

UpdateProjectVisibility

Actions: codebuild:UpdateProjectVisibility, iam: PassRole

Required to change the public visibility of a project's builds.

Resources:

- arn:aws:codebuild:region-ID:account-ID:project/project-name
- arn:aws:iam::account-ID:role/role-name

UpdateReport ¹

Action: codebuild: UpdateReport

Required to create or update a test report.

Resource: arn:aws:codebuild:*region-ID*:account-ID:report-group/reportgroup-name

UpdateReportGroup

Action: codebuild:UpdateReportGroup

Required to update a report group.

```
Resource: arn:aws:codebuild:region-ID:account-ID:report-group/report-
group-name
```

UpdateWebhook

Action: codebuild:UpdateWebhook

Required to update a webhook.

Resource: arn:aws:codebuild:region-ID:account-ID:project/project-name

¹ Used for permission only. There is no API for this action.

Using tags to control access to AWS CodeBuild resources

Conditions in IAM policy statements are part of the syntax that you can use to specify permissions to CodeBuild project-based actions. You can create a policy that allows or denies actions on projects based on the tags associated with those projects, and then apply those policies to the IAM groups you configure for managing users. For information about applying tags to a project using the console or AWS CLI, see Create a build project in AWS CodeBuild. For information about

applying tags using the CodeBuild SDK, see <u>CreateProject</u> and <u>Tags</u> in the *CodeBuild API Reference*. For information about using tags to control access to AWS resources, see <u>Controlling Access to AWS</u> Resources Using Resource Tags in the *IAM User Guide*.

<u> Important</u>

When using the reserved capacity feature, data cached on fleet instances, including source files, Docker layers, and cached directories specified in the buildspec, can be accessible to other projects within the same account. This is by design and allows projects within the same account to share fleet instances.

Example Example 1: Limit CodeBuild project actions based on resource tags

The following example denies all BatchGetProjects actions on projects tagged with the key Environment with the key value of Production. A user's administrator must attach this IAM policy in addition to the managed user policy to unauthorized users. The aws:ResourceTag condition key is used to control access to resources based on their tags.

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Effect": "Deny",
      "Action": [
        "codebuild:BatchGetProjects"
      ],
      "Resource": "*",
      "Condition": {
        "ForAnyValue:StringEquals": {
          "aws:ResourceTag/Environment": "Production"
        }
      }
    }
  ]
}
```

Example Example 2: Limit CodeBuild project actions based on request tags

The following policy denies users permission to the CreateProject action if the request contains a tag with the key Environment and the key value Production. In addition, the policy prevents

these unauthorized users from modifying projects by using the aws:TagKeys condition key to not allow UpdateProject if the request contains a tag with the key Environment. An administrator must attach this IAM policy in addition to the managed user policy to users who are not authorized to perform these actions. The aws:RequestTag condition key is used to control which tags can be passed in an IAM request

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Effect": "Deny",
      "Action": [
        "codebuild:CreateProject"
      ],
      "Resource": "*",
      "Condition": {
        "ForAnyValue:StringEquals": {
          "aws:RequestTag/Environment": "Production"
        }
      }
    },
    {
      "Effect": "Deny",
      "Action": [
        "codebuild:UpdateProject"
      ],
      "Resource": "*",
      "Condition": {
        "ForAnyValue:StringEquals": {
          "aws:TagKeys": ["Environment"]
        }
      }
    }
  ]
}
```

Example Example 3: Deny or allow actions on report groups based on resource tags

You can create a policy that allows or denies actions on CodeBuild resources (projects and report groups) based on the AWS tags associated with those resources, and then apply those policies to the IAM groups you configure for managing users. For example, you can create a policy that denies all CodeBuild actions on any report group with the AWS tag key Status and the key

AWS CodeBuild

value of Secret, and then apply that policy to the IAM group you created for general developers (*Developers*). You then need to make sure that the developers working on those tagged report groups are not members of that general *Developers* group, but belong instead to a different IAM group that does not have the restrictive policy applied (SecretDevelopers).

The following example denies all CodeBuild actions on report groups tagged with the key Status and the key value of Secret:

```
{
  "Version": "2012-10-17",
  "Statement" : [
    {
      "Effect" : "Deny",
      "Action" : [
        "codebuild:BatchGetReportGroups,"
        "codebuild:CreateReportGroup",
        "codebuild:DeleteReportGroup",
        "codebuild:ListReportGroups",
        "codebuild:ListReportsForReportGroup",
        "codebuild:UpdateReportGroup"
       ]
      "Resource" : "*",
      "Condition" : {
         "StringEquals" : "aws:ResourceTag/Status": "Secret"
        }
    }
  ]
}
```

Example Example 4: Limit CodeBuild actions to AWSCodeBuildDeveloperAccess based on resource tags

You can create policies that allow CodeBuild actions on all report groups and projects that are not tagged with specific tags. For example, the following policy allows the equivalent of <u>AWSCodeBuildDeveloperAccess</u> permissions for all report groups and projects except those tagged with the specified tags:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
```



Viewing resources in the console

The AWS CodeBuild console requires the ListRepositories permission to display a list of repositories for your AWS account in the AWS Region where you are signed in. The console also includes a **Go to resource** function to quickly perform a case insensitive search for resources. This search is performed in your AWS account in the AWS Region where you are signed in. The following resources are displayed across the following services:

- AWS CodeBuild: Build projects
- AWS CodeCommit: Repositories
- AWS CodeDeploy: Applications

• AWS CodePipeline: Pipelines

To perform this search across resources in all services, you must have the following permissions:

- CodeBuild: ListProjects
- CodeCommit: ListRepositories
- CodeDeploy: ListApplications
- CodePipeline: ListPipelines

Results are not returned for a service's resources if you do not have permissions for that service. Even if you have permissions for viewing resources, some resources are not returned if there is an explicit Deny to view those resources.

Compliance validation for AWS CodeBuild

Third-party auditors assess the security and compliance of AWS CodeBuild as part of multiple AWS compliance programs. These include SOC, PCI, FedRAMP, HIPAA, and others.

For a list of AWS services in scope of specific compliance programs, see <u>AWS services in scope by</u> compliance program. For general information, see AWS compliance programs.

You can download third-party audit reports using AWS Artifact. For more information, see Downloading reports in AWS Artifact.

Your compliance responsibility when using CodeBuild is determined by the sensitivity of your data, your company's compliance objectives, and applicable laws and regulations. If your use of CodeBuild is subject to compliance with standards such as HIPAA, PCI, or FedRAMP, AWS provides resources to help:

- <u>Security and compliance quick start guides</u> These deployment guides discuss architectural considerations and provide steps for deploying security- and compliance-focused baseline environments on AWS.
- <u>Architecting for HIPAA Security and Compliance Whitepaper</u> This whitepaper describes how companies can use AWS to create HIPAA-compliant applications.
- <u>AWS compliance resources</u> This collection of workbooks and guides might apply to your industry and location.

- <u>AWS Config</u> This AWS service assesses how well your resource configurations comply with internal practices, industry guidelines, and regulations.
- <u>AWS Security Hub</u> Monitor your usage of AWS CodeBuild as it relates to security best practices by using <u>AWS Security Hub</u>. Security Hub uses security controls to evaluate resource configurations and security standards to help you comply with various compliance frameworks. For more information about using Security Hub to evaluate CodeBuild resources, see <u>AWS</u> <u>CodeBuild controls</u> in the AWS Security Hub User Guide.

Resilience in AWS CodeBuild

The AWS global infrastructure is built around AWS Regions and Availability Zones. AWS Regions provide multiple physically separated and isolated Availability Zones, which are connected with low-latency, high-throughput, and highly redundant networking. With Availability Zones, you can design and operate applications and databases that automatically fail over between Availability Zones without interruption. Availability Zones are more highly available, fault tolerant, and scalable than traditional single or multiple data center infrastructures.

For more information about AWS Regions and Availability Zones, see <u>AWS global infrastructure</u>.

Infrastructure security in AWS CodeBuild

As a managed service, AWS CodeBuild is protected by AWS global network security. For information about AWS security services and how AWS protects infrastructure, see <u>AWS Cloud</u> <u>Security</u>. To design your AWS environment using the best practices for infrastructure security, see <u>Infrastructure Protection</u> in *Security Pillar AWS Well-Architected Framework*.

You use AWS published API calls to access CodeBuild through the network. Clients must support the following:

- Transport Layer Security (TLS). We require TLS 1.2 and recommend TLS 1.3.
- Cipher suites with perfect forward secrecy (PFS) such as DHE (Ephemeral Diffie-Hellman) or ECDHE (Elliptic Curve Ephemeral Diffie-Hellman). Most modern systems such as Java 7 and later support these modes.

Additionally, requests must be signed by using an access key ID and a secret access key that is associated with an IAM principal. Or you can use the <u>AWS Security Token Service</u> (AWS STS) to generate temporary security credentials to sign requests.

Access your source provider in CodeBuild

For GitHub or GitHub Enterprise Server, you use a personal access token, a Secrets Manager secret, or an OAuth app to access the source provider. For Bitbucket, you use either an access token, an app password, a Secrets Manager secret, or an OAuth app to access the source provider.

Topics

- Create and store a token in a Secrets Manager secret
- GitHub and GitHub Enterprise Server access in CodeBuild
- Bitbucket access in CodeBuild
- GitLab access in CodeBuild

Create and store a token in a Secrets Manager secret

If you choose to use to store your access token using Secrets Manager, you can use either an existing secret connection or create a new secret. To create a new secret, do the following:

AWS Management Console

To create a Secrets Manager secret in the AWS Management Console

- 1. For **Source provider**, choose **Bitbucket**, **GitHub**, or **GitHub Enterprise**.
- 2. For **Credential**, do one of the following:
 - Choose Default source credential to use your account's default source credential to apply to all projects.
 - a. If you aren't connected to your source provider, choose **Manage default source** credential.
 - b. For **Credential type**, choose a credential type other than **CodeConnections**.
 - c. For Service, choose Secrets Manager and for Secrets choose New secret.
 - d. In **Secret name**, enter the name of your secret.
 - e. In Secret description optional, enter a description for your secret.
 - f. Depending on the source provider you chose, enter your token or username and app password and choose **Save**.
 - Choose **Custom source credential** to use a custom source credential to override your account's default settings.

- a. For **Credential type**, choose a credential type other than **CodeConnections**.
- b. In **Connection**, choose **Create a secret**.
- c. In **Secret name**, enter the name of your secret.
- d. In **Secret description optional**, enter a description for your secret.
- e. Depending on the source provider you chose, enter your token or username and app password, and choose **Create**.

AWS CLI

To create a Secrets Manager secret in the AWS CLI

• Open a terminal (Linux, macOS, or Unix) or command prompt (Windows). Use the AWS CLI to run the Secrets Manager **create-secret** command.

The Secrets Manager secrets that CodeBuild accept must be in the same account and AWS Region as the CodeBuild project and must be in the following JSON format:

```
{
    "ServerType": ServerType,
    "AuthType: AuthType,
    "Token": string,
    "Username": string // Optional and is only used for Bitbucket app
  password
    }
```

Field	Valid values	Description
ServerType	GITHUB GITHUB_ENTERPRISE BITBUCKET	The third party source provider for your Secrets Manager secret.
AuthType	PERSONAL_ACCESS_TO KEN BASIC_AUTH	The type of access token used by the credentials. For GitHub, only PERSONAL_ ACCESS_TOKEN is valid. BASIC_AUTH is only valid for Bitbucket app password.
Token	string	For GitHub or GitHub Enterprise, this is the personal access token. For Bitbucket, this is either the access token or the Bitbucket app password.
Username	string	The Bitbucket username when the AuthType is BASIC_AUTH. This parameter is not valid for other types of source providers.

Additionally, CodeBuild uses the following resource tags on the secret to ensure the secrets are easily selectable when creating or editing projects.

Tag key	Tag value	Description
codebuild:source:provider	github github_enterprise bitbucket	Tells CodeBuild which provider this secret is intended for.
codebuild:source:type	personal_access_token basic_auth	Tells CodeBuild the type of access token in this secret.

GitHub and GitHub Enterprise Server access in CodeBuild

For GitHub, you can use a personal access token, an OAuth app, a Secrets Manager secret, or a GitHub App connection to access the source provider. For GitHub Enterprise Server, you can use a personal access token, a Secrets Manager secret, or a GitHub App connection to access the source provider.

Topics

- GitHub App connections for GitHub and GitHub Enterprise Server
- GitHub and GitHub Enterprise Server access token
- GitHub OAuth app

GitHub App connections for GitHub and GitHub Enterprise Server

You can use GitHub App to connect with CodeBuild. GitHub App connections are supported through <u>AWS CodeConnections</u>.

The source provider access enables you to trigger a build by subscribing to <u>GitHub webhook</u> <u>events</u> using <u>CreateWebhook</u>, or to use <u>Self-hosted GitHub Actions runners in AWS CodeBuild</u> in CodeBuild.

🚯 Note

CodeConnections is available in less regions than CodeBuild. You can use cross-region connections in CodeBuild. Connections created in opt-in regions, cannot be used in other regions. For more information, see AWS CodeConnections endpoints and quotas.

Topics

- Step 1: Create a connection to GitHub App (console)
- Step 2: Grant CodeBuild project IAM role access to use the connection
- Step 3: Configure CodeBuild to use the new connection

Step 1: Create a connection to GitHub App (console)

Use these steps to use the CodeBuild console to add a connection for your project in GitHub.

To create a connection to GitHub

• Follow the instructions in the *Developer Tools User Guide* for Create a connection to GitHub.

Step 2: Grant CodeBuild project IAM role access to use the connection

You can grant CodeBuild project IAM role access to use the GitHub tokens vended by your connection.

To grant CodeBuild project IAM role access

- 1. Create an IAM role for your CodeBuild project by following the instructions to <u>Allow CodeBuild</u> to interact with other AWS services for your CodeBuild project.
- 2. While following the instructions, add the following IAM policy to your CodeBuild project role to grant access to the connection.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
         "Effect": "Allow",
         "Action": [
         "codeconnections:GetConnectionToken",
         "CodeconnectionS:GetConnectionS:GetConnectionS:GetConnectionS:GetConnectionS:GetConnectionS:GetConnectionS:GetConnectionS:GetConnectionS:GetConnectionS:GetConnectionS:GetConnectionS:GetConnectionS:GetConnectionS:GetConnectionS:GetConnectionS:GetConnectionS:GetConnectionS:GetConnectionS:GetConnectionS:GetConnectionS:GetConnectionS:GetConnectionS:GetConnectionS:GetConnectionS:GetConnectionS:GetConnectionS:GetConnectionS:GetConnectionS:GetConnectionS:GetConnectionS:GetConnectionS:GetConnectionS:GetConnectionS:GetConnectionS:GetConnectionS:GetConnectionS:GetConnectionS:GetConnectionS:GetConnectionS:GetConnectionS:GetConnectionS:GetConnectionS:GetConnectionS:GetConnectionS:GetConnectionS:GetConnectionS:GetConnectionS:GetConnectionS:GetConnectionS:GetConnectionS:GetConnectionS:GetConnectionS:GetConnectionS:GetConnectionS:GetConnectionS:
```

Step 3: Configure CodeBuild to use the new connection

You can configure a connection as an account level credential and use it in a project.

AWS Management Console

To configure a connection as an account level credential in the AWS Management Console

- 1. For **Source provider**, choose **GitHub**.
- 2. For **Credential**, do one of the following:
 - Choose Default source credential to use your account's default source credential to apply to all projects.
 - a. If you aren't connected to GitHub, choose Manage default source credential.
 - b. For Credential type, choose GitHub App.
 - c. In **Connection**, choose to use an existing connection or create a new connection.
 - Choose Custom source credential to use a custom source credential to override your account's default settings.
 - a. For **Credential type**, choose **GitHub App**.
 - b. In **Connection**, choose to use an existing connection or create a new connection.

AWS CLI

To configure a connection as an account level credential in the AWS CLI

 Open a terminal (Linux, macOS, or Unix) or command prompt (Windows). Use the AWS CLI to run the **import-source-credentials** command, specifying the --auth-type, -server-type, and --token for your connection. Use the following command:

```
aws codebuild import-source-credentials --auth-type CODECONNECTIONS --server-
type GITHUB --token <<u>connection-arn</u>>
```

You can also set up multiple tokens for your CodeBuild projects. For more information, see Configure multiple tokens as source level credentials.

GitHub and GitHub Enterprise Server access token

Access token prerequisites

Before you begin, you must add the proper permission scopes to your GitHub access token.

For GitHub, your personal access token must have the following scopes.

- repo: Grants full control of private repositories.
- repo:status: Grants read/write access to public and private repository commit statuses.
- **admin:repo_hook**: Grants full control of repository hooks. This scope is not required if your token has the repo scope.
- **admin:org_hook**: Grants full control of organization hooks. This scope is only required if you are using the organization webhook feature.

For more information, see <u>Understanding scopes for OAuth apps</u> on the GitHub website.

If you are using fine-grained personal access tokens, depending on your use case, your personal access token might need the following permissions:

- **Contents: Read-only**: Grants access to private repositories. This permission is required if you are using private repositories as source.
- **Commit statuses: Read and write**: Grants permission to create commit statuses. This permission is required if your project has webhook set up, or you have report build status feature enabled.
- Webhooks: Read and write: Grants permission to manage webhooks. This permission is required if your project has webhook set up.
- **Pull requests: Read-only**: Grants permission to access pull requests. This permission is required if your webhook has a FILE_PATH filter on pull request events.

 Administration: Read and write: This permission is required if you are using the self-hosted GitHub Actions runner feature with CodeBuild. For more details, see <u>Create a registration token</u> for a repository and Self-hosted GitHub Actions runners in AWS CodeBuild.

🚯 Note

If you want to access organization repositories, make sure you specify the organization as the resource owner of the access token.

For more information, see <u>Permissions required for fine-grained personal access tokens</u> on the GitHub website.

Connect GitHub with an access token (console)

To use the console to connect your project to GitHub using an access token, do the following when you create a project. For information, see Create a build project (console).

- 1. For **Source provider**, choose **GitHub**.
- 2. For **Credential**, do one of the following:
 - Choose Default source credential to use your account's default source credential to apply to all projects.
 - a. If you aren't connected to GitHub, choose Manage default source credential.
 - b. For **Credential type**, choose **Personal access token**.
 - c. If you chose **Default source credential**, for **Service** choose which service you'd like to use to store your token and do the following:
 - If you choose to use **Secrets Manager**, you can choose to use an existing secret connection or create a new secret and choose **Save**. For more information how to create a new secret, see **Create and store a token in a Secrets Manager secret**.
 - If you choose to use **CodeBuild**, enter your **GitHub personal access token** and choose **Save**.
 - Choose **Custom source credential** to use a custom source credential to override your account's default settings.
 - a. For **Credential type**, choose **Personal access token**.
 - b. In **Connection**, choose to use an existing secret connection or create a new secret.

Connect GitHub with an access token (CLI)

Follow these steps to use the AWS CLI to connect your project to GitHub using an access token. For information about using the AWS CLI with AWS CodeBuild, see the Command line reference.

1. Run the **import-source-credentials** command:

```
aws codebuild import-source-credentials --generate-cli-skeleton
```

JSON-formatted data appears in the output. Copy the data to a file (for example, *import-source-credentials.json*) in a location on the local computer or instance where the AWS CLI is installed. Modify the copied data as follows, and save your results.

```
{
    "serverType": "server-type",
    "authType": "auth-type",
    "shouldOverwrite": "should-overwrite",
    "token": "token",
    "username": "username"
}
```

Replace the following:

- *server-type*: Required value. The source provider used for this credential. Valid values are GITHUB, BITBUCKET, GITHUB_ENTERPRISE, GITLAB, and GITLAB_SELF_MANAGED.
- auth-type: Required value. The type of authentication used to connect to a repository.
 Valid values are OAUTH, BASIC_AUTH, PERSONAL_ACCESS_TOKEN, CODECONNECTIONS, and SECRETS_MANAGER. For GitHub, only PERSONAL_ACCESS_TOKEN is allowed.
 BASIC_AUTH is only allowed with Bitbucket app password.
- should-overwrite: Optional value. Set to false to prevent overwriting the repository source credentials. Set to true to overwrite the repository source credentials. The default value is true.
- token: Required value. For GitHub or GitHub Enterprise Server, this is the personal access token. For Bitbucket, this is the personal access token or app password. For the auth-type CODECONNECTIONS, this is the connection ARN. For the auth-type SECRETS_MANAGER, this is the secret ARN.
- *username*: Optional value. This parameter is ignored for GitHub and GitHub Enterprise Server source providers.

 To connect your account with an access token, switch to the directory that contains the import-source-credentials.json file you saved in step 1 and run the import-sourcecredentials command again.

```
aws codebuild import-source-credentials --cli-input-json file://import-source-
credentials.json
```

JSON-formatted data appears in the output with an Amazon Resource Name (ARN).

```
{
    "arn": "arn:aws:codebuild:region:account-id:token/server-type"
}
```

1 Note

If you run the **import-source-credentials** command with the same server type and auth type a second time, the stored access token is updated.

After your account is connected with an access token, you can use create-project to create your CodeBuild project. For more information, see <u>Create a build project (AWS CLI)</u>.

3. To view the connected access tokens, run the list-source-credentials command.

aws codebuild list-source-credentials

A JSON-formatted sourceCredentialsInfos object appears in the output:

```
{
    "sourceCredentialsInfos": [
        {
            "authType": "auth-type",
            "serverType": "server-type",
            "arn": "arn"
        }
    ]
}
```

The sourceCredentialsObject contains a list of connected source credentials information:

- The authType is the type of authentication used by credentials. This can be OAUTH, BASIC_AUTH, PERSONAL_ACCESS_TOKEN, CODECONNECTIONS, or SECRETS_MANAGER.
- The serverType is the type of source provider. This can be GITHUB, GITHUB_ENTERPRISE, BITBUCKET, GITLAB, or GITLAB_SELF_MANAGED.
- The arn is the ARN of the token.
- 4. To disconnect from a source provider and remove its access tokens, run the **delete-sourcecredentials** command with its ARN.

```
aws codebuild delete-source-credentials --arn arn-of-your-credentials
```

JSON-formatted data is returned with an ARN of the deleted credentials.

```
{
    "arn": "arn:aws:codebuild:region:account-id:token/server-type"
}
```

GitHub OAuth app

Connect GitHub using OAuth (console)

To use the console to connect your project to GitHub using an OAuth app, do the following when you create a project. For information, see <u>Create a build project (console)</u>.

- 1. For **Source provider**, choose **GitHub**.
- 2. For **Credential**, do one of the following:
 - Choose Default source credential to use your account's default source credential to apply to all projects.
 - a. If you aren't connected to GitHub, choose **Manage default source credential**.
 - b. For Credential type, choose OAuth.
 - c. If you chose **Default source credential**, for **Service** choose which service you'd like to use to store your token and do the following:

- If you choose to use **Secrets Manager**, you can choose to use an existing secret connection or create a new secret and choose **Save**. For more information how to create a new secret, see Create and store a token in a Secrets Manager secret.
- If you choose to use **CodeBuild**, continue by choosing **Connect to GitHub**.
- Choose Custom source credential to use a custom source credential to override your account's default settings.
 - a. For **Credential type**, choose **OAuth**.
 - b. In **Connection**, choose to use an existing secret connection or create a new secret.

To review your authorized OAuth apps, navigate to <u>Applications</u> on GitHub, and verify that an application named AWS CodeBuild (*region*) owned by aws-codesuite is listed.

Bitbucket access in CodeBuild

For Bitbucket, you use either an access token, an app password, an OAuth app, or a Bitbucket connection to access the source provider.

Topics

- Bitbucket App connections
- Bitbucket app password or access token
- Bitbucket OAuth app

Bitbucket App connections

You can use Bitbucket to connect with CodeBuild. Bitbucket App connections are supported through <u>AWS CodeConnections</u>.

Note

CodeConnections is available in less regions than CodeBuild. You can use cross-region connections in CodeBuild. Connections created in opt-in regions, cannot be used in other regions. For more information, see <u>AWS CodeConnections endpoints and quotas</u>.

Topics

Bitbucket access

- Step 1: Create a connection to Bitbucket (console)
- Step 2: Grant CodeBuild project IAM role access to use the connection
- Step 3: Configure CodeBuild to use the new connection

Step 1: Create a connection to Bitbucket (console)

Use these steps to use the CodeBuild console to add a connection for your project in Bitbucket.

To create a connection to Bitbucket

• Follow the instructions in the Developer Tools User Guide for Create a connection to Bitbucket.

Step 2: Grant CodeBuild project IAM role access to use the connection

You can grant CodeBuild project IAM role access to use the Bitbucket tokens vended by your connection.

To grant CodeBuild project IAM role access

- 1. Create an IAM role for your CodeBuild project by following the instructions to <u>Allow CodeBuild</u> to interact with other AWS services for your CodeBuild project.
- 2. While following the instructions, add the following IAM policy to your CodeBuild project role to grant access to the connection.

```
{
   "Version": "2012-10-17",
   "Statement": [
      {
        "Effect": "Allow",
        "Action": [
           "codeconnections:GetConnectionToken",
           "codeconnections:GetConnection"
      ],
        "Resource": [
           <connection-arn>
      ]
      }
]
```

Step 3: Configure CodeBuild to use the new connection

You can configure a connection as an account level credential and use it in a project.

AWS Management Console

To configure a connection as an account level credential in the AWS Management Console

- 1. For **Source provider**, choose **Bitbucket**.
- 2. For **Credential**, do one of the following:
 - Choose **Default source credential** to use your account's default source credential to apply to all projects.
 - a. If you aren't connected to Bitbucket, choose Manage default source credential.
 - b. For **Credential type**, choose **CodeConnections**.
 - c. In **Connection**, choose to use an existing connection or create a new connection.
 - Choose **Custom source credential** to use a custom source credential to override your account's default settings.
 - a. For **Credential type**, choose **CodeConnections**.
 - b. In **Connection**, choose to use an existing connection or create a new connection.

AWS CLI

To configure a connection as an account level credential in the AWS CLI

 Open a terminal (Linux, macOS, or Unix) or command prompt (Windows). Use the AWS CLI to run the **import-source-credentials** command, specifying the --auth-type, -server-type, and --token for your connection.

Use the following command:

aws codebuild import-source-credentials --auth-type CODECONNECTIONS --servertype BITBUCKET --token <connection-arn>

For more information on setting up multiple tokens in your CodeBuild project, see <u>Configure</u> multiple tokens as source level credentials.

Bitbucket app password or access token

Prerequisites

Before you begin, you must add the proper permission scopes to your Bitbucket app password or access token.

For Bitbucket, your app password or access token must have the following scopes.

- **repository:read**: Grants read access to all the repositories to which the authorizing user has access.
- **pullrequest:read**: Grants read access to pull requests. If your project has a Bitbucket webhook, then your app password or access token must have this scope.
- **webhook**: Grants access to webhooks. If your project has a webhook operation, then your app password or access token must have this scope.

For more information, see <u>Scopes for Bitbucket Cloud REST API</u> and <u>OAuth on Bitbucket Cloud</u> on the Bitbucket website.

Connect Bitbucket with an app password (console)

To use the console to connect your project to Bitbucket using an app password, do the following when you create a project. For information, see <u>Create a build project (console)</u>.

- 1. For Source provider, choose Bitbucket.
- 2. For **Credential**, do one of the following:
 - Choose Default source credential to use your account's default source credential to apply to all projects.
 - a. If you aren't connected to Bitbucket, choose Manage default source credential.
 - b. For **Credential type**, choose **App password**.
 - c. If you chose **Default source credential**, for **Service** choose which service you'd like to use to store your token and do the following:
 - If you choose to use Secrets Manager, you can choose to use an existing secret connection or create a new secret and choose Save. For more information how to create a new secret, see Create and store a token in a Secrets Manager secret.
 - If you choose to use **CodeBuild**, enter your **Bitbucket username** and **Bitbucket app password** and choose **Save**.

- Choose **Custom source credential** to use a custom source credential to override your account's default settings.
 - a. For **Credential type**, choose **App password**.
 - b. In **Connection**, choose to use an existing secret connection or create a new secret.

Connect Bitbucket with an access token (console)

To use the console to connect your project to Bitbucket using an access token, do the following when you create a project. For information, see Create a build project (console).

- 1. For **Source provider**, choose **Bitbucket**.
- 2. For **Credential**, do one of the following:
 - Choose Default source credential to use your account's default source credential to apply to all projects.
 - a. If you aren't connected to Bitbucket, choose Manage default source credential.
 - b. For Credential type, choose Personal access token.
 - c. If you chose **Default source credential**, for **Service** choose which service you'd like to use to store your token and do the following:
 - If you choose to use **Secrets Manager**, you can choose to use an existing secret connection or create a new secret and choose **Save**. For more information how to create a new secret, see Create and store a token in a Secrets Manager secret.
 - If you choose to use CodeBuild, enter your Bitbucket access token and choose Save.
 - Choose **Custom source credential** to use a custom source credential to override your account's default settings.
 - a. For **Credential type**, choose **Personal access token**.
 - b. In **Connection**, choose to use an existing secret connection or create a new secret.

Connect Bitbucket with an app password or access token(CLI)

Follow these steps to use the AWS CLI to connect your project to Bitbucket using an app password or access token. For information about using the AWS CLI with AWS CodeBuild, see the <u>Command</u> <u>line reference</u>.

1. Run the **import-source-credentials** command:

```
aws codebuild import-source-credentials --generate-cli-skeleton
```

JSON-formatted data appears in the output. Copy the data to a file (for example, *import-source-credentials.json*) in a location on the local computer or instance where the AWS CLI is installed. Modify the copied data as follows, and save your results.

```
{
    "serverType": "BITBUCKET",
    "authType": "auth-type",
    "shouldOverwrite": "should-overwrite",
    "token": "token",
    "username": "username"
}
```

Replace the following:

- *server-type*: Required value. The source provider used for this credential. Valid values are GITHUB, BITBUCKET, GITHUB_ENTERPRISE, GITLAB, and GITLAB_SELF_MANAGED.
- auth-type: Required value. The type of authentication used to connect to a repository.
 Valid values are OAUTH, BASIC_AUTH, PERSONAL_ACCESS_TOKEN, CODECONNECTIONS, and SECRETS_MANAGER. For GitHub, only PERSONAL_ACCESS_TOKEN is allowed.
 BASIC_AUTH is only allowed with Bitbucket app password.
- should-overwrite: Optional value. Set to false to prevent overwriting the repository source credentials. Set to true to overwrite the repository source credentials. The default value is true.
- token: Required value. For GitHub or GitHub Enterprise Server, this is the personal access token. For Bitbucket, this is the personal access token or app password. For the auth-type CODECONNECTIONS, this is the connection ARN. For the auth-type SECRETS_MANAGER, this is the secret ARN.
- *username*: Optional value. This parameter is ignored for GitHub and GitHub Enterprise Server source providers.
- 2. To connect your account with an app password or an access token, switch to the directory that contains the import-source-credentials.json file you saved in step 1 and run the **import-source-credentials** command again.

```
aws codebuild import-source-credentials --cli-input-json file://import-source-
credentials.json
```

JSON-formatted data appears in the output with an Amazon Resource Name (ARN).

```
{
    "arn": "arn:aws:codebuild:region:account-id:token/server-type"
}
```

i Note

If you run the **import-source-credentials** command with the same server type and auth type a second time, the stored access token is updated.

After your account is connected with an app password, you can use create-project to create your CodeBuild project. For more information, see <u>Create a build project (AWS CLI)</u>.

3. To view the connected app passwords or access tokens, run the **list-source-credentials** command.

```
aws codebuild list-source-credentials
```

A JSON-formatted sourceCredentialsInfos object appears in the output:

```
{
    "sourceCredentialsInfos": [
        {
            "authType": "auth-type",
            "serverType": "BITBUCKET",
            "arn": "arn"
        }
    ]
}
```

The sourceCredentialsObject contains a list of connected source credentials information:

- The authType is the type of authentication used by credentials. This can be OAUTH, BASIC_AUTH, PERSONAL_ACCESS_TOKEN, CODECONNECTIONS, or SECRETS_MANAGER.
- The serverType is the type of source provider. This can be GITHUB, GITHUB_ENTERPRISE, BITBUCKET, GITLAB, or GITLAB_SELF_MANAGED.
- The arn is the ARN of the token.
- 4. To disconnect from a source provider and remove its app password or access tokens, run the **delete-source-credentials** command with its ARN.

```
aws codebuild delete-source-credentials --arn arn-of-your-credentials
```

JSON-formatted data is returned with an ARN of the deleted credentials.

```
{
    "arn": "arn:aws:codebuild:region:account-id:token/server-type"
}
```

Bitbucket OAuth app

Connect Bitbucket using OAuth (console)

To use the console to connect your project to Bitbucket using an OAuth app, do the following when you create a project. For information, see Create a build project (console).

- 1. For Source provider, choose Bitbucket.
- 2. For **Credential**, do one of the following:
 - Choose Default source credential to use your account's default source credential to apply to all projects.
 - a. If you aren't connected to Bitbucket, choose Manage default source credential.
 - b. For **Credential type**, choose **OAuth**.
 - c. If you chose **Default source credential**, for **Service** choose which service you'd like to use to store your token and do the following:
 - If you choose to use **Secrets Manager**, you can choose to use an existing secret connection or create a new secret and choose **Save**.For more information how to create a new secret, see Create and store a token in a Secrets Manager secret.

- If you choose to use **CodeBuild**, continue by choosing **Connect to Bitbucket**.
- Choose **Custom source credential** to use a custom source credential to override your account's default settings.
 - a. For **Credential type**, choose **OAuth**.
 - b. In **Connection**, choose to use an existing secret connection or create a new secret.

To review your authorized OAuth apps, navigate to <u>Application authorizations</u> on Bitbucket, and verify that an application named AWS CodeBuild (*region*) is listed.

GitLab access in CodeBuild

For GitLab, you use a GitLab connection to access the source provider.

Topics

Connect CodeBuild to GitLab

Connect CodeBuild to GitLab

Connections allow you to authorize and establish configurations that associate your third-party provider with your AWS resources using AWS CodeConnections. To associate your third-party repository as a source for your build project, you use a connection.

To add a GitLab or GitLab Self Managed source provider in CodeBuild, you can choose either to:

- Use the CodeBuild console Create build project wizard or Edit Source page to choose the GitLab or GitLab Self Managed provider option. See <u>Create a connection to GitLab (console)</u> to add the source provider. The console helps you create a connections resource.
- Use the CLI to create your connections resources, see <u>Create a connection to GitLab (CLI)</u> to create a connections resource with the CLI.

🚯 Note

You can also create a connection using the Developer Tools console under **Settings**. See Create a Connection.

🚯 Note

By authorizing this connection installation in GitLab, you grant our service permissions to process your data by accessing your account, and you can revoke the permissions at any time by uninstalling the application.

Create a connection to GitLab

This section describes how to connect GitLab to CodeBuild. For more information about GitLab connections, see <u>Connect CodeBuild to GitLab</u>.

Before you begin:

• You must have already created an account with GitLab.

Note

Connections only provide access to repositories owned by the account that was used to create and authorize the connection.

Note

You can create connections to a repository where you have the **Owner** role in GitLab, and then the connection can be used with the repository with resources such as CodeBuild. For repositories in groups, you do not need to be the group owner.

• To specify a source for your build project, you must have already created a repository on GitLab.

Topics

- Create a connection to GitLab (console)
- Create a connection to GitLab (CLI)

Create a connection to GitLab (console)

Use these steps to use the CodeBuild console to add a connection for your project (repository) in GitLab.

To create or edit your build project

- 1. Sign in to the CodeBuild console.
- 2. Choose one of the following.
 - Choose to create a build project. Follow the steps in <u>Create a build project (console)</u> to complete the first screen and in the **Source** section, under **Source Provider**, choose **GitLab**.
 - Choose to edit an existing build project. Choose Edit, and then choose Source. In the Edit Source page, under Source provider, choose GitLab.
- 3. Choose one of the following:
 - Under **Connection**, choose **Default connection**. Default connection applies a default GitLab connection across all projects.
 - Under **Connection**, choose **Custom connection**. Custom connection applies a custom GitLab connection that overrides your account's default settings.
- 4. Do one of the following:
 - Under Default connection or Custom connection, if you have not already created a connection to your provider, choose Create a new GitLab connection. Proceed to step 5 to create the connection.
 - Under **Connection**, if you have already created a connection to your provider, choose the connection. Proceed to step 10.

Note

If you close the pop-up window before a GitLab connection is created, you need to refresh the page.

 To create a connection to a GitLab repository, under Select a provider, choose GitLab. In Connection name, enter the name for the connection that you want to create. Choose Connect to GitLab.

Developer Tools > <u>Connections</u> > Create connection	
Create a connection Info	
Create GitLab connection Info	
Connection name	
► Tags - optional	
	Connect to GitLab

- When the sign-in page for GitLab displays, log in with your credentials, and then choose Sign 6. in.
- If this is your first time authorizing the connection, an authorization page displays with a 7. message requesting authorization for the connection to access your GitLab account.

Choose Authorize.

Authorize AWS Connector for GitLab to use your account?

An application called AWS Connector for GitLab is requesting access to your GitLab account. This application was created by Amazon AWS. Please note that this application is not provided by GitLab and you should verify its authenticity before allowing access.

This application will be able to:

Access the authenticated user's API

Grants complete read/write access to the API, including all groups and projects, the container registry, the dependency proxy, and the package registry.

- Read the authenticated user's personal information
 Grants read-only access to the authenticated user's profile through the /user API endpoint, which includes username, public email, and full name. Also grants access to read-only API endpoints under /users.
- Read Api

Grants read access to the API, including all groups and projects, the container registry, and the package registry.

• Allows read-only access to the repository Grants read-only access to repositories on private projects using Git-over-HTTP or the Repository Files API.

Allows read-write access to the repository Grants read-write access to repositories on private projects using Git-over-HTTP (not using the API).

- 8. The browser returns to the connections console page. Under **GitLab connection settings**, the new connection is shown in **Connection name**.
- 9. Choose **Connect**.

After a GitLab connection is successfully created, a success banner will be displayed at the top.

- 10. On the **Create build project** page, in the **Default connection** or **Custom connection** dropdown list, make sure your connection ARN is listed. If not, choose the refresh button to have it appear.
- 11. In **Repository**, choose the name of your project in GitLab by specifying the project path with the namespace. For example, for a group-level repository, enter the repository name in the following format: group-name/repository-name. For more information about the path and namespace, see the path_with_namespace field in https://docs.gitlab.com/ee/api/projects.html#get-single-project. For more information about the namespace in GitLab, see https://docs.gitlab.com/ee/api/projects.html#get-single-project.

🚯 Note

For groups in GitLab, you must manually specify the project path with the namespace. For example, for a repository named myrepo in a group mygroup, enter the following: mygroup/myrepo. You can find the project path with the namespace in the URL in GitLab.

12. In **Source version - optional**, enter a pull request ID, branch, commit ID, tag, or reference and a commit ID. For more information, see Source version sample with AWS CodeBuild.

1 Note

We recommend that you choose Git branch names that don't look like commit IDs, such as 811dd1ba1aba14473856cee38308caed7190c0d or 5392f7. This helps you avoid Git checkout collisions with actual commits.

13. In **Git clone depth - optional**, you can create a shallow clone with a history truncated to the specified number of commits. If you want a full clone, choose **Full**.

14. In **Build Status - optional**, select **Report build statuses to source provider when your builds start and finish** if you want the status of your build's start and completion reported to your source provider.

To be able to report the build status to the source provider, the user associated with the source provider must have write access to the repo. If the user does not have write access, the build status cannot be updated. For more information, see Source provider access.

Create a connection to GitLab (CLI)

You can use the AWS Command Line Interface (AWS CLI) to create a connection.

To do this, use the **create-connection** command.

<u> Important</u>

A connection created through the AWS CLI or AWS CloudFormation is in PENDING status by default. After you create a connection with the CLI or AWS CloudFormation, use the console to edit the connection to make its status AVAILABLE.

To create a connection

 Follow the instructions in the *Developer Tools console User Guide* for <u>Create a connection to</u> <u>GitLab (CLI)</u>.

Cross-service confused deputy prevention

The confused deputy problem is a security issue where an entity that doesn't have permission to perform an action can coerce a more-privileged entity to perform the action. In AWS, cross-service impersonation can result in the confused deputy problem. Cross-service impersonation can occur when one service (the *calling service*) calls another service (the *called service*). The calling service can be manipulated to use its permissions to act on another customer's resources in a way it should not otherwise have permission to access. To prevent this, AWS provides tools that help you protect your data for all services with service principals that have been given access to resources in your account.

We recommend using the <u>aws:SourceArn</u> and <u>aws:SourceAccount</u> global condition context keys in resource policies to limit the permissions that AWS CodeBuild gives another service to the resource. Use aws:SourceArn if you want only one resource to be associated with the cross-service access. Use aws:SourceAccount if you want to allow any resource in that account to be associated with the cross-service use.

The most effective way to protect against the confused deputy problem is to use the aws:SourceArn global condition context key with the full ARN of the resource. If you don't know the full ARN of the resource or if you are specifying multiple resources, use the aws:SourceArn global context condition key with wildcard characters (*) for the unknown portions of the ARN. For example, arn:aws:codebuild:*:123456789012:*.

If the aws: SourceArn value does not contain the account ID, such as an Amazon S3 bucket ARN, you must use both global condition context keys to limit permissions.

The value of aws:SourceArn must be the CodeBuild project ARN.

The following example shows how you can use the aws:SourceArn and aws:SourceAccount global condition context keys in CodeBuild to prevent the confused deputy problem.

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Principal": {
                 "Service": "codebuild.amazonaws.com"
            },
            "Action": "sts:AssumeRole",
            "Condition": {
                 "StringEquals": {
                     "aws:SourceArn": "arn:aws:codebuild:region-ID:account-
ID:project/project-name"
                }
            }
        }
    ]
}
```

User Guide

Advanced topics

This section includes several advanced topics that are useful to more experienced AWS CodeBuild users.

Topics

- <u>Allow users to interact with CodeBuild</u>
- <u>Allow CodeBuild to interact with other AWS services</u>
- Encrypt build outputs using a customer managed key
- Interact with CodeBuild using the AWS CLI
- Command line reference for AWS CodeBuild
- AWS SDKs and tools reference for AWS CodeBuild
- Using this service with an AWS SDK
- Specify the AWS CodeBuild endpoint
- Use AWS CodeBuild with AWS CodePipeline to test code and run builds
- Use AWS CodeBuild with Codecov
- Use AWS CodeBuild with Jenkins
- Use AWS CodeBuild with serverless applications
- Third party notices for AWS CodeBuild for Windows

Allow users to interact with CodeBuild

If you follow the steps in <u>Getting started using the console</u> to access AWS CodeBuild for the first time, you most likely do not need the information in this topic. However, as you continue using CodeBuild, you might want to do things such as give other users and groups in your organization the ability to interact with CodeBuild.

To allow an IAM user or group to interact with AWS CodeBuild, you must give them access permissions to CodeBuild. This section describes how to do this with the IAM console or the AWS CLI.

If you will access CodeBuild with your AWS root account (not recommended) or an administrator user in your AWS account, then you do not need to follow these instructions.

For information about AWS root accounts and administrator users, see <u>The AWS account root user</u> and Creating Your First AWS account root user and Group in the *user Guide*.

To add CodeBuild access permissions to an IAM group or user (console)

1. Open the IAM console at <u>https://console.aws.amazon.com/iam/</u>.

You should have already signed in to the AWS Management Console by using one of the following:

- Your AWS root account. This is not recommended. For more information, see <u>The AWS</u> account root user in the *user Guide*.
- An administrator user in your AWS account. For more information, see <u>Creating Your First</u> AWS account root user and Group in the *user Guide*.
- An user in your AWS account with permission to perform the following minimum set of actions:

```
iam:AttachGroupPolicy
iam:AttachUserPolicy
iam:CreatePolicy
iam:ListAttachedGroupPolicies
iam:ListAttachedUserPolicies
iam:ListGroups
iam:ListPolicies
iam:ListUsers
```

For more information, see Overview of IAM Policies in the user Guide.

- 2. In the navigation pane, choose **Policies**.
- 3. To add a custom set of AWS CodeBuild access permissions to an IAM group or IAM user, skip ahead to step 4 in this procedure.

To add a default set of CodeBuild access permissions to an IAM group or IAM user, choose **Policy Type**, **AWS Managed**, and then do the following:

 To add full access permissions to CodeBuild, select the box named AWSCodeBuildAdminAccess, choose Policy Actions, and then choose Attach. Select the box next to the target IAM group or user, and then choose Attach Policy. Repeat this for the policies named AmazonS3ReadOnlyAccess and IAMFullAccess.

- To add access permissions to CodeBuild for everything except build project administration, select the box named AWSCodeBuildDeveloperAccess, choose Policy Actions, and then choose Attach. Select the box next to the target IAM group or user, and then choose Attach Policy. Repeat this for the policy named AmazonS3ReadOnlyAccess.
- To add read-only access permissions to CodeBuild, select the boxes named AWSCodeBuildReadOnlyAccess. Select the box next to the target IAM group or user, and then choose Attach Policy. Repeat this for the policy named AmazonS3ReadOnlyAccess.

You have now added a default set of CodeBuild access permissions to an IAM group or user. Skip the rest of the steps in this procedure.

- 4. Choose Create Policy.
- 5. On the Create Policy page, next to Create Your Own Policy, choose Select.
- On the Review Policy page, for Policy Name, enter a name for the policy (for example, CodeBuildAccessPolicy). If you use a different name, be sure to use it throughout this procedure.
- 7. For **Policy Document**, enter the following, and then choose **Create Policy**.

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Sid": "CodeBuildAccessPolicy",
      "Effect": "Allow",
      "Action": [
        "codebuild:*"
      ],
      "Resource": "*"
    },
    {
      "Sid": "CodeBuildRolePolicy",
      "Effect": "Allow",
      "Action": [
        "iam:PassRole"
      ],
      "Resource": "arn:aws:iam::account-ID:role/role-name"
    },
    {
      "Sid": "CloudWatchLogsAccessPolicy",
      "Effect": "Allow",
```

```
"Action": [
        "logs:FilterLogEvents",
        "logs:GetLogEvents"
      ],
      "Resource": "*"
    },
    {
      "Sid": "S3AccessPolicy",
      "Effect": "Allow",
      "Action": [
        "s3:CreateBucket",
        "s3:GetObject",
        "s3:List*",
        "s3:PutObject"
      ],
      "Resource": "*"
    },
    {
      "Sid": "S3BucketIdentity",
      "Effect": "Allow",
      "Action": [
        "s3:GetBucketAcl",
        "s3:GetBucketLocation"
      ],
      "Resource": "*"
    }
  ]
}
```

🚯 Note

This policy allows access to all CodeBuild actions and to a potentially large number of AWS resources. To restrict permissions to specific CodeBuild actions, change the value of codebuild:* in the CodeBuild policy statement. For more information, see <u>Identity</u> and access management. To restrict access to specific AWS resources, change the value of the Resource object. For more information, see <u>Identity and access management</u>.

- 8. In the navigation pane, choose **Groups** or **Users**.
- 9. In the list of groups or users, choose the name of the IAM group or IAM user to which you want to add CodeBuild access permissions.

10. For a group, on the group settings page, on the **Permissions** tab, expand **Managed Policies**, and then choose **Attach Policy**.

For a user, on the user settings page, on the **Permissions** tab, choose **Add permissions**.

11. For a group, on the **Attach Policy** page, select **CodeBuildAccessPolicy**, and then choose **Attach Policy**.

For a user, on the Add permissions page, choose Attach existing policies directly. Select CodeBuildAccessPolicy, choose Next: Review, and then choose Add permissions.

To add CodeBuild access permissions to an IAM group or user (AWS CLI)

- Make sure you have configured the AWS CLI with the AWS access key and AWS secret access key that correspond to one of the IAM entities, as described in the previous procedure. For more information, see <u>Getting Set Up with the AWS Command Line Interface</u> in the AWS *Command Line Interface User Guide*.
- 2. To add a custom set of AWS CodeBuild access permissions to an IAM group or IAM user, skip to step 3 in this procedure.

To add a default set of CodeBuild access permissions to an IAM group or IAM user, do the following:

Run one of the following commands, depending on whether you want to add permissions to an IAM group or user:

```
aws iam attach-group-policy --group-name group-name --policy-arn policy-arn
aws iam attach-user-policy --user-name user-name --policy-arn policy-arn
```

You must run the command three times, replacing *group-name* or *user-name* with the IAM group name or user name, and replacing *policy-arn* once for each of the following policy Amazon Resource Names (ARNs):

- To add full access permissions to CodeBuild, use the following policy ARNs:
 - arn:aws:iam::aws:policy/AWSCodeBuildAdminAccess
 - arn:aws:iam::aws:policy/AmazonS3ReadOnlyAccess
 - arn:aws:iam::aws:policy/IAMFullAccess

- To add access permissions to CodeBuild for everything except build project administration, use the following policy ARNs:
 - arn:aws:iam::aws:policy/AWSCodeBuildDeveloperAccess
 - arn:aws:iam::aws:policy/AmazonS3ReadOnlyAccess
- To add read-only access permissions to CodeBuild, use the following policy ARNs:
 - arn:aws:iam::aws:policy/AWSCodeBuildReadOnlyAccess
 - arn:aws:iam::aws:policy/AmazonS3ReadOnlyAccess

You have now added a default set of CodeBuild access permissions to an IAM group or user. Skip the rest of the steps in this procedure.

3. In an empty directory on the local workstation or instance where the AWS CLI is installed, create a file named put-group-policy.json or put-user-policy.json. If you use a different file name, be sure to use it throughout this procedure.

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Sid": "CodeBuildAccessPolicy",
      "Effect": "Allow",
      "Action": [
        "codebuild:*"
      ],
      "Resource": "*"
    },
    {
      "Sid": "CodeBuildRolePolicy",
      "Effect": "Allow",
      "Action": [
        "iam:PassRole"
      ],
      "Resource": "arn:aws:iam::account-ID:role/role-name"
    },
    {
      "Sid": "CloudWatchLogsAccessPolicy",
      "Effect": "Allow",
      "Action": [
        "logs:FilterLogEvents",
        "logs:GetLogEvents"
```

```
],
      "Resource": "*"
    },
    {
      "Sid": "S3AccessPolicy",
      "Effect": "Allow",
      "Action": [
        "s3:CreateBucket",
        "s3:GetObject",
        "s3:List*",
        "s3:PutObject"
      ],
      "Resource": "*"
    },
    {
      "Sid": "S3BucketIdentity",
      "Effect": "Allow",
      "Action": [
        "s3:GetBucketAcl",
        "s3:GetBucketLocation"
      ],
      "Resource": "*"
    }
  ]
}
```

🚯 Note

This policy allows access to all CodeBuild actions and to a potentially large number of AWS resources. To restrict permissions to specific CodeBuild actions, change the value of codebuild:* in the CodeBuild policy statement. For more information, see <u>Identity and access management</u>. To restrict access to specific AWS resources, change the value of the related Resource object. For more information, see <u>Identity and</u> <u>access management</u> or the specific AWS service's security documentation.

4. Switch to the directory where you saved the file, and then run one of the following commands. You can use different values for CodeBuildGroupAccessPolicy and CodeBuildUserAccessPolicy. If you use different values, be sure to use them here.

For an IAM group:

```
aws iam put-group-policy --group-name group-name --policy-name
CodeBuildGroupAccessPolicy --policy-document file://put-group-policy.json
```

For an user:

```
aws iam put-user-policy --user-name user-name --policy-name
CodeBuildUserAccessPolicy --policy-document file://put-user-policy.json
```

In the preceding commands, replace *group-name* or *user-name* with the name of the target IAM group or user.

Allow CodeBuild to interact with other AWS services

If you follow the steps in <u>Getting started using the console</u> to access AWS CodeBuild for the first time, you most likely do not need the information in this topic. However, as you continue using CodeBuild, you might want to do things such as allow CodeBuild to interact with other AWS services.

To allow CodeBuild to interact with dependent AWS services on your behalf, you need an AWS CodeBuild service role. You can create a CodeBuild service role by using the CodeBuild or AWS CodePipeline consoles. For information, see:

- Create a build project (console)
- Create a pipeline that uses CodeBuild (CodePipeline console)
- Add a CodeBuild build action to a pipeline (CodePipeline console)
- Change a build project's settings (console)

If you do not plan to use these consoles, this section describes how to create a CodeBuild service role with the IAM console or the AWS CLI.

<u> Important</u>

CodeBuild uses the service role for all operations that are performed on your behalf. If the role includes permissions that the user shouldn't have, you can unintentionally escalate a user's permissions. Ensure that the role grants least privilege.

The service role described on this page contains a policy that grants the minimum permissions required to use CodeBuild. You may need to add additional permissions, depending on your use case.

To create a CodeBuild service role (console)

1. Open the IAM console at https://console.aws.amazon.com/iam/.

You should have already signed in to the console by using one of the following:

- Your AWS root account. This is not recommended. For more information, see <u>The AWS</u> account root user in the *user Guide*.
- An administrator user in your AWS account. For more information, see <u>Creating Your First</u> AWS account root user and Group in the *user Guide*.
- An user in your AWS account with permission to perform the following minimum set of actions:

```
iam:AddRoleToInstanceProfile
iam:AttachRolePolicy
iam:CreateInstanceProfile
iam:CreatePolicy
iam:CreateRole
iam:GetRole
iam:ListAttachedRolePolicies
iam:ListPolicies
iam:ListRoles
iam:PassRole
iam:PutRolePolicy
iam:UpdateAssumeRolePolicy
```

For more information, see <u>Overview of IAM Policies</u> in the user Guide.

- 2. In the navigation pane, choose **Policies**.
- 3. Choose **Create Policy**.

{

- 4. On the **Create Policy** page, choose **JSON**.
- 5. For the JSON policy, enter the following, and then choose **Review Policy**:

```
"Version": "2012-10-17",
```

```
"Statement": [
  {
    "Sid": "CloudWatchLogsPolicy",
    "Effect": "Allow",
    "Action": [
      "logs:CreateLogGroup",
      "logs:CreateLogStream",
      "logs:PutLogEvents"
   ],
   "Resource": "*"
 },
  {
    "Sid": "CodeCommitPolicy",
    "Effect": "Allow",
    "Action": [
      "codecommit:GitPull"
    ],
    "Resource": "*"
 },
  {
    "Sid": "S3GetObjectPolicy",
    "Effect": "Allow",
    "Action": [
      "s3:GetObject",
      "s3:GetObjectVersion"
    ],
   "Resource": "*"
  },
  {
    "Sid": "S3PutObjectPolicy",
    "Effect": "Allow",
    "Action": [
      "s3:PutObject"
   ],
    "Resource": "*"
 },
  {
    "Sid": "ECRPullPolicy",
    "Effect": "Allow",
    "Action": [
      "ecr:BatchCheckLayerAvailability",
      "ecr:GetDownloadUrlForLayer",
      "ecr:BatchGetImage"
    ],
```

```
"Resource": "*"
  },
  {
    "Sid": "ECRAuthPolicy",
    "Effect": "Allow",
    "Action": [
      "ecr:GetAuthorizationToken"
    ],
    "Resource": "*"
  },
  {
    "Sid": "S3BucketIdentity",
    "Effect": "Allow",
    "Action": [
      "s3:GetBucketAcl",
      "s3:GetBucketLocation"
    ],
    "Resource": "*"
  }
]
```

i Note

}

This policy contains statements that allow access to a potentially large number of AWS resources. To restrict AWS CodeBuild to access specific AWS resources, change the value of the Resource array. For more information, see the security documentation for the AWS service.

On the Review Policy page, for Policy Name, enter a name for the policy (for example, CodeBuildServiceRolePolicy), and then choose Create policy.

🚺 Note

If you use a different name, be sure to use it throughout this procedure.

- 7. In the navigation pane, choose **Roles**.
- 8. Choose Create role.
- 9. On the **Create role** page, with **AWS Service** already selected, choose **CodeBuild**, and then choose **Next:Permissions**.

- 10. On the **Attach permissions policies** page, select **CodeBuildServiceRolePolicy**, and then choose **Next: Review**.
- 11. On the **Create role and review** page, for **Role name**, enter a name for the role (for example, **CodeBuildServiceRole**), and then choose **Create role**.

To create a CodeBuild service role (AWS CLI)

- Make sure you have configured the AWS CLI with the AWS access key and AWS secret access key that correspond to one of the IAM entities, as described in the previous procedure. For more information, see <u>Getting Set Up with the AWS Command Line Interface</u> in the AWS *Command Line Interface User Guide*.
- 2. In an empty directory on the local workstation or instance where the AWS CLI is installed, create two files named create-role.json and put-role-policy.json. If you choose different file names, be sure to use them throughout this procedure.

create-role.json:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Principal": {
               "Service": "codebuild.amazonaws.com"
        },
            "Action": "sts:AssumeRole"
        }
    ]
}
```

🚯 Note

We recommend that you use the aws:SourceAccount and aws:SourceArn condition keys to protect yourself against <u>the confused deputy problem</u>. For example, you can edit the previous trust policy with the following condition blocks. The aws:SourceAccount is the owner of the CodeBuild project and the aws:SourceArn is the CodeBuild project ARN.

If you would like to restrict your service role to an AWS account, create-role.json might look similar to this:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Principal": {
                "Service": "codebuild.amazonaws.com"
            },
            "Action": "sts:AssumeRole",
            "Condition": {
                "StringEquals": {
                     "aws:SourceAccount": [
                         "account-ID"
                     ]
                }
            }
        }
    ]
}
```

If you would like to restrict your service role to a specific CodeBuild project, create-role.json might look similar to this:

}

]

🚯 Note

}

If you don't know or haven't decided on a name for your CodeBuild project and want a trust policy restriction on a particular ARN pattern, you can replace that portion of the ARN with a wildcard (*). After you create your project, you can then update the trust policy.

```
put-role-policy.json:
```

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Sid": "CloudWatchLogsPolicy",
      "Effect": "Allow",
      "Action": [
        "logs:CreateLogGroup",
        "logs:CreateLogStream",
        "logs:PutLogEvents"
      ],
      "Resource": "*"
    },
    {
      "Sid": "CodeCommitPolicy",
      "Effect": "Allow",
      "Action": [
        "codecommit:GitPull"
      ],
      "Resource": "*"
    },
    {
      "Sid": "S3GetObjectPolicy",
      "Effect": "Allow",
      "Action": [
        "s3:GetObject",
        "s3:GetObjectVersion"
```

```
],
      "Resource": "*"
    },
    {
      "Sid": "S3PutObjectPolicy",
      "Effect": "Allow",
      "Action": [
        "s3:PutObject"
      ],
      "Resource": "*"
    },
    {
      "Sid": "S3BucketIdentity",
      "Effect": "Allow",
      "Action": [
        "s3:GetBucketAcl",
        "s3:GetBucketLocation"
      ],
      "Resource": "*"
    }
  ]
}
```

Note

This policy contains statements that allow access to a potentially large number of AWS resources. To restrict AWS CodeBuild to access specific AWS resources, change the value of the Resource array. For more information, see the security documentation for the AWS service.

3. Switch to the directory where you saved the preceding files, and then run the following two commands, one at a time, in this order. You can use different values for CodeBuildServiceRole and CodeBuildServiceRolePolicy, but be sure to use them here.

```
aws iam create-role --role-name CodeBuildServiceRole --assume-role-policy-document
file://create-role.json
```

```
aws iam put-role-policy --role-name CodeBuildServiceRole --policy-name
CodeBuildServiceRolePolicy --policy-document file://put-role-policy.json
```

Encrypt build outputs using a customer managed key

If you follow the steps in <u>Getting started using the console</u> to access AWS CodeBuild for the first time, you most likely do not need the information in this topic. However, as you continue using CodeBuild, you might want to do things such as encrypt build artifacts.

For AWS CodeBuild to encrypt its build output artifacts, it needs access to a KMS key. By default, CodeBuild uses the AWS managed key for Amazon S3 in your AWS account.

If you do not want to use the AWS managed key, you must create and configure a customer managed key yourself. This section describes how to do this with the IAM console.

For information about customer managed keys, see <u>AWS Key Management Service Concepts</u> and <u>Creating Keys</u> in the AWS KMS Developer Guide.

To configure a customer managed key for use by CodeBuild, follow the instructions in the "How to Modify a Key Policy" section of <u>Modifying a Key Policy</u> in the AWS KMS Developer Guide. Then add the following statements (between *### BEGIN ADDING STATEMENTS HERE ###* and *### END ADDING STATEMENTS HERE ###*) to the key policy. Ellipses (...) are used for brevity and to help you locate where to add the statements. Do not remove any statements, and do not type these ellipses into the key policy.

```
{
  "Version": "2012-10-17",
  "Id": "...",
  "Statement": [
    ### BEGIN ADDING STATEMENTS HERE ###
    {
      "Sid": "Allow access through Amazon S3 for all principals in the account that are
 authorized to use Amazon S3",
      "Effect": "Allow",
      "Principal": {
        "AWS": "*"
      },
      "Action": [
        "kms:Encrypt",
        "kms:Decrypt",
        "kms:ReEncrypt*",
        "kms:GenerateDataKey*",
        "kms:DescribeKey"
      ],
      "Resource": "*",
```

```
"Condition": {
        "StringEquals": {
          "kms:ViaService": "s3.region-ID.amazonaws.com",
          "kms:CallerAccount": "account-ID"
        }
      }
    },
    {
      "Effect": "Allow",
      "Principal": {
        "AWS": "arn:aws:iam::account-ID:role/CodeBuild-service-role"
      },
      "Action": [
        "kms:Encrypt",
        "kms:Decrypt",
        "kms:ReEncrypt*",
        "kms:GenerateDataKey*",
        "kms:DescribeKey"
      ],
      "Resource": "*"
    },
    ### END ADDING STATEMENTS HERE ###
    {
      "Sid": "Enable IAM User Permissions",
      . . .
    },
    {
      "Sid": "Allow access for Key Administrators",
      . . .
    },
    {
      "Sid": "Allow use of the key",
      . . .
    },
    {
      "Sid": "Allow attachment of persistent resources",
      . . .
    }
  ]
}
```

 region-ID represents the ID of the AWS region where the Amazon S3 buckets associated with CodeBuild are located (for example, us-east-1).

- *account-ID* represents the ID of the of the AWS account that owns the customer managed key.
- *CodeBuild-service-role* represents the name of the CodeBuild service role you created or identified earlier in this topic.

Note

To create or configure a customer managed key through the IAM console, you must first sign in to the AWS Management Console by using one of the following:

- Your AWS root account. This is not recommended. For more information, see <u>The Account</u> <u>Root User</u> in the *user Guide*.
- An administrator user in your AWS account. For more information, see <u>Creating Your First</u> AWS account root user and Group in the *user Guide*.
- An user in your AWS account with permission to create or modify the customer managed key. For more information, see <u>Permissions Required to Use the AWS KMS Console</u> in the AWS KMS Developer Guide.

Interact with CodeBuild using the AWS CLI

If you follow the steps in <u>Getting started using the console</u> to access AWS CodeBuild for the first time, you most likely do not need the information in this topic. However, as you continue using CodeBuild, you might want to do things such as allow users to use the AWS CLI to interact with CodeBuild instead of (or in addition to) the CodeBuild console, the CodePipeline console, or the AWS SDKs.

To install and configure the AWS CLI, see <u>Getting Set Up with the AWS Command Line Interface</u> in the AWS Command Line Interface User Guide.

After installing the AWS CLI, complete the following tasks:

1. Run the following command to confirm whether your installation of the AWS CLI supports CodeBuild:

aws codebuild list-builds

If successful, information similar to the following will appear in the output:

```
{
   "ids": []
}
```

The empty square brackets indicate that you have not yet run any builds.

2. If an error is output, you must uninstall your current version of the AWS CLI and then install the latest version. For more information, see <u>Uninstalling the AWS CLI</u> and <u>Installing the AWS</u> <u>Command Line Interface</u> in the AWS Command Line Interface User Guide.

Command line reference for AWS CodeBuild

The AWS CLI provides commands for automating AWS CodeBuild. Use the information in this topic as a supplement to the <u>AWS Command Line Interface User Guide</u> and the <u>AWS CLI Reference for</u> AWS CodeBuild.

Not what you're looking for? If you want to use the AWS SDKs to call CodeBuild, see the <u>AWS SDKs</u> and tools reference.

To use the information in this topic, you should have already installed the AWS CLI and configured it for use with CodeBuild, as described in Interact with CodeBuild using the AWS CLI.

To use the AWS CLI to specify the endpoint for CodeBuild, see <u>Specify the AWS CodeBuild endpoint</u> (AWS CLI).

Run this command to get a list of CodeBuild commands.

```
aws codebuild help
```

Run this command to get information about a CodeBuild command, where *command-name* is the name of the command.

```
aws codebuild command-name help
```

CodeBuild commands include:

 batch-delete-builds: Deletes one or more builds in CodeBuild. For more information, see Delete builds (AWS CLI).

- batch-get-builds: Gets information about multiple builds in CodeBuild. For more information, see View build details (AWS CLI).
- batch-get-projects: Gets information about one or more specified build projects. For more information, see <u>View a build project's details (AWS CLI)</u>.
- create-project: Creates a build project. For more information, see Create a build project (AWS CLI).
- delete-project: Deletes a build project. For more information, see <u>Delete a build project (AWS</u> <u>CLI)</u>.
- list-builds: Lists Amazon Resource Names (ARNs) for builds in CodeBuild. For more information, see <u>View a list of build IDs (AWS CLI)</u>.
- list-builds-for-project: Gets a list of build IDs that are associated with a specified build project. For more information, see <u>View a list of build IDs for a build project (AWS CLI)</u>.
- list-curated-environment-images: Gets a list of Docker images managed by CodeBuild that you can use for your builds. For more information, see <u>Docker images provided by</u> <u>CodeBuild</u>.
- list-projects: Gets a list of build project names. For more information, see <u>View a list of build project names (AWS CLI)</u>.
- start-build: Starts running a build. For more information, see Run a build (AWS CLI).
- stop-build: Attempts to stop the specified build from running. For more information, see <u>Stop</u> a build (AWS CLI).
- update-project: Changes information about the specified build project. For more information, see <u>Change a build project's settings (AWS CLI)</u>.

AWS SDKs and tools reference for AWS CodeBuild

To use one the AWS SDKs or tools to automate AWS CodeBuild, see the following resources.

If you want to use the AWS CLI to run CodeBuild, see the Command line reference.

Supported AWS SDKs and tools for AWS CodeBuild

The following AWS SDKs and tools support CodeBuild:

 The <u>AWS SDK for C++</u>. For more information, see the <u>Aws::CodeBuild</u> namespace section of the AWS SDK for C++ API Reference.

- The <u>AWS SDK for Go</u>. For more information, see the <u>codebuild</u> section of the AWS SDK for Go API Reference.
- The <u>AWS SDK for Java</u>. For more information, see the com.amazonaws.services.codebuild and com.amazonaws.services.codebuild.model sections of the <u>AWS SDK for Java API</u> reference.
- The <u>AWS SDK for JavaScript in the browser</u> and the <u>AWS SDK for JavaScript in Node.js</u>. For more information, see the <u>Class: AWS.CodeBuild</u> section of the *AWS SDK for JavaScript API Reference*.
- The <u>AWS SDK for .NET</u>. For more information, see the <u>Amazon.CodeBuild</u> and <u>Amazon.CodeBuild.Model</u> namespace sections of the AWS SDK for .NET API Reference.
- The <u>AWS SDK for PHP</u>. For more information, see the <u>Namespace Aws\CodeBuild</u> section of the AWS SDK for PHP API Reference.
- The <u>AWS SDK for Python (Boto3)</u>. For more information, see the <u>CodeBuild</u> section of the *Boto 3 Documentation*.
- The <u>AWS SDK for Ruby</u>. For more information, see the <u>Module: Aws::CodeBuild</u> section of the AWS SDK for Ruby API Reference.
- The <u>AWS Tools for PowerShell</u>. For more information, see the <u>AWS CodeBuild</u> section of the AWS *Tools for PowerShell Cmdlet Reference*.

Using this service with an AWS SDK

AWS software development kits (SDKs) are available for many popular programming languages. Each SDK provides an API, code examples, and documentation that make it easier for developers to build applications in their preferred language.

SDK documentation	Code examples
AWS SDK for C++	AWS SDK for C++ code examples
AWS CLI	AWS CLI code examples
AWS SDK for Go	AWS SDK for Go code examples
AWS SDK for Java	AWS SDK for Java code examples
AWS SDK for JavaScript	AWS SDK for JavaScript code examples

SDK documentation	Code examples
AWS SDK for Kotlin	AWS SDK for Kotlin code examples
AWS SDK for .NET	AWS SDK for .NET code examples
AWS SDK for PHP	AWS SDK for PHP code examples
AWS Tools for PowerShell	Tools for PowerShell code examples
AWS SDK for Python (Boto3)	AWS SDK for Python (Boto3) code examples
AWS SDK for Ruby	AWS SDK for Ruby code examples
AWS SDK for Rust	AWS SDK for Rust code examples
AWS SDK for SAP ABAP	AWS SDK for SAP ABAP code examples
AWS SDK for Swift	AWS SDK for Swift code examples

For examples specific to this service, see Code examples for CodeBuild using AWS SDKs.

Example availability

Can't find what you need? Request a code example by using the **Provide feedback** link at the bottom of this page.

Specify the AWS CodeBuild endpoint

You can use the AWS Command Line Interface (AWS CLI) or one of the AWS SDKs to specify the endpoint used by AWS CodeBuild. There is an endpoint for each region in which CodeBuild is available. In addition to a regional endpoint, four regions also have a Federal Information Processing Standards (FIPS) endpoint. For more information about FIPS endpoints, see <u>FIPS 140-2</u> overview.

Specifying an endpoint is optional. If you don't explicitly tell CodeBuild which endpoint to use, the service uses the endpoint associated with the region your AWS account uses. CodeBuild never

defaults to a FIPS endpoint. If you want to use a FIPS endpoint, you must associate CodeBuild with it using one of the following methods.

🚺 Note

You can use an alias or region name to specify an endpoint using an AWS SDK. If you use the AWS CLI, then you must use the full endpoint name.

For endpoints that can be used with CodeBuild, see CodeBuild regions and endpoints.

Topics

- Specify the AWS CodeBuild endpoint (AWS CLI)
- Specify the AWS CodeBuild endpoint (AWS SDK)

Specify the AWS CodeBuild endpoint (AWS CLI)

You can use the AWS CLI to specify the endpoint through which AWS CodeBuild is accessed by using the --endpoint-url argument in any CodeBuild command. For example, run this command to get a list of project build names using the Federal Information Processing Standards (FIPS) endpoint in the US East (N. Virginia) Region:

```
aws codebuild list-projects --endpoint-url https://codebuild-fips.us-
east-1.amazonaws.com
```

Include the https:// at the begining of the endpoint.

The --endpoint-url AWS CLI argument is available to all AWS services. For more information about this and other AWS CLI arguments, see AWS CLI Command Reference.

Specify the AWS CodeBuild endpoint (AWS SDK)

You can use an AWS SDK to specify the endpoint through which AWS CodeBuild is accessed. Although this example uses the <u>AWS SDK for Java</u>, you can specify the endpoint with the other AWS SDKs.

Use the withEndpointConfiguration method when constructing the AWSCodeBuild client. Here is format to use:

```
AWSCodeBuild awsCodeBuild = AWSCodeBuildClientBuilder.standard().
    withEndpointConfiguration(new AwsClientBuilder.EndpointConfiguration("endpoint",
    "region")).
    withCredentials(new AWSStaticCredentialsProvider(sessionCredentials)).
    build();
```

For information about AWSCodeBuildClientBuilder, see Class AWSCodeBuildClientBuilder.

The credentials used in withCredentials must be of type AWSCredentialsProvider. For more information, see Working with AWS credentials.

Do not include https:// at the begining of the endpoint.

If you want to specify a non-FIPS endpoint, you can use the region instead of the actual endpoint. For example, to specify the endpoint in the US East (N. Virginia) region, you can use us-east-1 instead of the full endpoint name, codebuild.us-east-1.amazonaws.com.

If you want to specify a FIPS endpoint, you can use an alias to simplify your code. Only FIPS endpoints have an alias. Other endpoints must be specified using their region or full name.

The following table lists the alias for each of the four available FIPS endpoints:

Region name	Region	Endpoint	Alias
US East (N. Virginia)	us-east-1	codebuild-fips.us-east-1.amazonaws.com	us-east-1- fips
US East (Ohio)	us-east-2	codebuild-fips.us-east-2.amazonaws.com	us-east-2- fips
US West (N. California)	us-west-1	codebuild-fips.us-west-1.amazonaws.com	us-west-1- fips
US West (Oregon)	us-west-2	codebuild-fips.us-west-2.amazonaws.com	us-west-2- fips

To specify use of the FIPS endpoint in the US West (Oregon) region using an alias:

```
AWSCodeBuild awsCodeBuild = AWSCodeBuildClientBuilder.standard().
    withEndpointConfiguration(new AwsClientBuilder.EndpointConfiguration("us-west-2-
fips", "us-west-2")).
    withCredentials(new AWSStaticCredentialsProvider(sessionCredentials)).
    build();
```

To specify use of the non-FIPS endpoint in the US East (N. Virginia) region:

```
AWSCodeBuild awsCodeBuild = AWSCodeBuildClientBuilder.standard().
    withEndpointConfiguration(new AwsClientBuilder.EndpointConfiguration("us-east-1",
    "us-east-1")).
    withCredentials(new AWSStaticCredentialsProvider(sessionCredentials)).
    build();
```

To specify use of the non-FIPS endpoint in the Asia Pacific (Mumbai) region:

```
AWSCodeBuild awsCodeBuild = AWSCodeBuildClientBuilder.standard().
    withEndpointConfiguration(new AwsClientBuilder.EndpointConfiguration("ap-south-1",
    "ap-south-1")).
    withCredentials(new AWSStaticCredentialsProvider(sessionCredentials)).
    build();
```

Use AWS CodeBuild with AWS CodePipeline to test code and run builds

You can automate your release process by using AWS CodePipeline to test your code and run your builds with AWS CodeBuild.

The following table lists tasks and the methods available for performing them. Using the AWS SDKs to accomplish these tasks is outside the scope of this topic.

Task	Available approaches	Approaches described in this topic
Create a continuous delivery (CD) pipeline with CodePipeline that automates builds with CodeBuild	 CodePipeline console AWS CLI AWS SDKs 	 Use the CodePipeline console Use the AWS CLI You can adapt the information in this topic to use the AWS SDKs. For more information, see the create-pi peline action documentation for your programmi ng language in the SDKs section of Tools for Amazon Web Services or see CreatePipeline in the AWS CodePipeline API Reference.
Add test and build automation with CodeBuild to an existing pipeline in CodePipeline	• AWS SDKs e	 Use the CodePipeline console to add build automation Use the CodePipeline console to add test automation For the AWS CLI, you can adapt the information in this topic to create a pipeline that contains a CodeBuild build action or test action. For more information, see Edit a pipeline (AWS CLI) and the CodePipeline pipeline structure reference in the AWS CodePipeline User Guide. You can adapt the information in this topic to use the AWS SDKs. For more information, see the update-pi peline action documentation for your programmi ng language through the SDKs section of Tools for Amazon Web Services or see UpdatePipeline in the AWS CodePipeline API Reference.

Topics

- Prerequisites
- Create a pipeline that uses CodeBuild (CodePipeline console)
- Create a pipeline that uses CodeBuild (AWS CLI)
- Add a CodeBuild build action to a pipeline (CodePipeline console)
- Add a CodeBuild test action to a pipeline (CodePipeline console)

Prerequisites

- 1. Answer the questions in <u>Plan a build</u>.
- 2. If you are using an user to access CodePipeline instead of an AWS root account or an administrator user, attach the managed policy named AWSCodePipelineFullAccess to the user (or to the IAM group to which the user belongs). Using an AWS root account is not recommended. This policy grants the user permission to create the pipeline in CodePipeline. For more information, see Attaching managed policies in the user Guide.

🚯 Note

The IAM entity that attaches the policy to the user (or to the IAM group to which the user belongs) must have permission in IAM to attach policies. For more information, see <u>Delegating permissions to administer IAM users</u>, groups, and credentials in the *user Guide*.

3. Create a CodePipeline service role, if you do not already have one available in your AWS account. CodePipeline uses this service role to interact with other AWS services, including AWS CodeBuild, on your behalf. For example, to use the AWS CLI to create a CodePipeline service role, run the IAM create-role command:

For Linux, macOS, or Unix:

```
aws iam create-role --role-name AWS-CodePipeline-CodeBuild-Service-Role
    --assume-role-policy-document '{"Version":"2012-10-17","Statement":
    {"Effect":"Allow","Principal":
    {"Service":"codepipeline.amazonaws.com"},"Action":"sts:AssumeRole"}}'
```

For Windows:

```
aws iam create-role --role-name AWS-CodePipeline-CodeBuild-Service-Role --assume-
role-policy-document "{\"Version\":\"2012-10-17\",\"Statement\":{\"Effect\":
\"Allow\",\"Principal\":{\"Service\":\"codepipeline.amazonaws.com\"},\"Action\":
\"sts:AssumeRole\"}}"
```

🚯 Note

The IAM entity that creates this CodePipeline service role must have permission in IAM to create service roles.

4. After you create a CodePipeline service role or identify an existing one, you must add the default CodePipeline service role policy to the service role as described in <u>Review the default</u> <u>CodePipeline service role policy</u> in the AWS CodePipeline User Guide, if it isn't already a part of the policy for the role.

🚯 Note

The IAM entity that adds this CodePipeline service role policy must have permission in IAM to add service role policies to service roles.

5. Create and upload the source code to a repository type supported by CodeBuild and CodePipeline, such as CodeCommit, Amazon S3, Bitbucket, or GitHub. The source code should contain a buildspec file, but you can declare one when you define a build project later in this topic. For more information, see the Buildspec reference.

🔥 Important

If you plan to use the pipeline to deploy built source code, the build output artifact must be compatible with the deployment system you use.

• For AWS OpsWorks, see <u>Application source</u> and <u>Using CodePipeline with AWS</u> <u>OpsWorks</u> in the AWS OpsWorks User Guide.

Create a pipeline that uses CodeBuild (CodePipeline console)

Use the following procedure to create a pipeline that uses CodeBuild to build and deploy your source code.

To create a pipeline that only tests your source code:

- Use the following procedure to create the pipeline, and then delete the Build and Beta stages from the pipeline. Then use the <u>Add a CodeBuild test action to a pipeline (CodePipeline console)</u> procedure in this topic to add to the pipeline a test action that uses CodeBuild.
- Use one of the other procedures in this topic to create the pipeline, and then use the <u>Add a</u> <u>CodeBuild test action to a pipeline (CodePipeline console)</u> procedure in this topic to add to the pipeline a test action that uses CodeBuild.

To use the create pipeline wizard in CodePipeline to create a pipeline that uses CodeBuild

- 1. Sign in to the AWS Management Console by using:
 - Your AWS root account. This is not recommended. For more information, see <u>The account</u> root user in the *user Guide*.
 - An administrator user in your AWS account. For more information, see <u>Creating your first</u> AWS account root user and group in the *user Guide*.
 - An user in your AWS account with permission to use the following minimum set of actions:

codepipeline:* iam:ListRoles iam:PassRole s3:CreateBucket s3:GetBucketPolicy s3:GetObject s3:ListAllMyBuckets s3:ListBucket s3:PutBucketPolicy codecommit:ListBranches codecommit:ListRepositories codedeploy:GetApplication codedeploy:GetDeploymentGroup codedeploy:ListApplications codedeploy:ListDeploymentGroups elasticbeanstalk:DescribeApplications elasticbeanstalk:DescribeEnvironments lambda:GetFunctionConfiguration lambda:ListFunctions opsworks:DescribeStacks opsworks:DescribeApps opsworks:DescribeLayers

- 2. Open the AWS CodePipeline console at <u>https://console.aws.amazon.com/codesuite/</u> codepipeline/home.
- 3. In the AWS Region selector, choose the AWS Region where your build project AWS resources are located. This must be an AWS Region where CodeBuild is supported. For more information, see AWS CodeBuild in the Amazon Web Services General Reference.
- 4. Create a pipeline. If a CodePipeline information page is displayed, choose **Create pipeline**. If a **Pipelines** page is displayed, choose **Create pipeline**.
- 5. On the **Step 1: Choose pipeline settings** page, for **Pipeline name**, enter a name for the pipeline (for example, **CodeBuildDemoPipeline**). If you choose a different name, be sure to use it throughout this procedure.
- 6. For **Role name**, do one of the following:

Choose **New service role**, and in **Role Name**, enter the name for your new service role.

Choose **Existing service role**, and then choose the CodePipeline service role you created or identified as part of this topic's prerequisites.

- 7. For **Artifact store**, do one of the following:
 - Choose **Default location** to use the default artifact store, such as the S3 artifact bucket designated as the default, for your pipeline in the AWS Region you have selected for your pipeline.
 - Choose **Custom location** if you already have an existing artifact store you have created, such as an S3 artifact bucket, in the same AWS Region as your pipeline.

i Note

This is not the source bucket for your pipeline's source code. This is the artifact store for your pipeline. A separate artifact store, such as an S3 bucket, is required for each pipeline, in the same AWS Region as the pipeline.

- 8. Choose Next.
- 9. On the **Step 2: Add source stage** page, for **Source provider**, do one of the following:
 - If your source code is stored in an S3 bucket, choose Amazon S3. For Bucket, select the S3 bucket that contains your source code. For S3 object key, enter the name of the file the contains the source code (for example, *file-name*.zip). Choose Next.

- If your source code is stored in an AWS CodeCommit repository, choose CodeCommit. For Repository name, choose the name of the repository that contains the source code. For Branch name, choose the name of the branch that contains the version of the source code you want to build. Choose Next.
- If your source code is stored in a GitHub repository, choose GitHub. Choose Connect to GitHub, and follow the instructions to authenticate with GitHub. For Repository, choose the name of the repository that contains the source code. For Branch, choose the name of the branch that contains the version of the source code you want to build.

Choose Next.

- 10. On the Step 3: Add build stage page, for Build provider, choose CodeBuild.
- 11. If you already have a build project you want to use, for **Project name**, choose the name of the build project and skip to the next step in this procedure.

If you need to create a new CodeBuild build project, follow the instructions in <u>Create a build</u> project (console) and return to this procedure.

If you choose an existing build project, it must have build output artifact settings already defined (even though CodePipeline overrides them). For more information, see <u>Change a build</u> project's settings (console).

🔥 Important

If you enable webhooks for a CodeBuild project, and the project is used as a build step in CodePipeline, then two identical builds are created for each commit. One build is triggered through webhooks, and one through CodePipeline. Because billing is on a per-build basis, you are billed for both builds. Therefore, if you are using CodePipeline, we recommend that you disable webhooks in CodeBuild. In the AWS CodeBuild console, clear the **Webhook** box. For more information, see <u>Change a build project's</u> <u>settings (console)</u>.

- 12. On the **Step 4: Add deploy stage** page, do one of the following:
 - If you do not want to deploy the build output artifact, choose **Skip**, and confirm this choice when prompted.
 - If you want to deploy the build output artifact, for **Deploy provider**, choose a deployment provider, and then specify the settings when prompted.

Choose Next.

- 13. On the **Review** page, review your choices, and then choose **Create pipeline**.
- 14. After the pipeline runs successfully, you can get the build output artifact. With the pipeline displayed in the CodePipeline console, in the **Build** action, choose the tooltip. Make a note of the value for **Output artifact** (for example, **MyAppBuild**).

🚯 Note

You can also get the build output artifact by choosing the **Build artifacts** link on the build details page in the CodeBuild console. To get to this page, skip the rest of the steps in this procedure, and see <u>View build details (console)</u>.

- 15. Open the Amazon S3 console at https://console.aws.amazon.com/s3/.
- 16. In the list of buckets, open the bucket used by the pipeline. The name of the bucket should follow the format codepipeline-*region-ID-random-number*. You can use the AWS CLI to run the CodePipeline get-pipeline command to get the name of the bucket, where *my-pipeline-name* is the display name of your pipeline:

aws codepipeline get-pipeline --name my-pipeline-name

In the output, the pipeline object contains an artifactStore object, which contains a location value with the name of the bucket.

- 17. Open the folder that matches the name of your pipeline (depending on the length of the pipeline's name, the folder name might be truncated), and then open the folder that matches the value for **Output artifact** that you noted earlier.
- 18. Extract the contents of the file. If there are multiple files in that folder, extract the contents of the file with the latest **Last Modified** timestamp. (You might need to give the file the .zip extension so that you can work with it in your system's ZIP utility.) The build output artifact is in the extracted contents of the file.
- 19. If you instructed CodePipeline to deploy the build output artifact, use the deployment provider's instructions to get to the build output artifact on the deployment targets.

Create a pipeline that uses CodeBuild (AWS CLI)

Use the following procedure to create a pipeline that uses CodeBuild to build your source code.

To use the AWS CLI to create a pipeline that deploys your built source code or that only tests your source code, you can adapt the instructions in <u>Edit a pipeline (AWS CLI)</u> and the <u>CodePipeline</u> pipeline structure reference in the AWS CodePipeline User Guide.

 Create or identify a build project in CodeBuild. For more information, see <u>Create a build</u> project.

🔥 Important

The build project must define build output artifact settings (even though CodePipeline overrides them). For more information, see the description of artifacts in Create a build project (AWS CLI).

- 2. Make sure you have configured the AWS CLI with the AWS access key and AWS secret access key that correspond to one of the IAM entities described in this topic. For more information, see <u>Getting set up with the AWS Command Line Interface</u> in the AWS Command Line Interface User Guide.
- 3. Create a JSON-formatted file that represents the structure of the pipeline. Name the file create-pipeline.json or similar. For example, this JSON-formatted structure creates a pipeline with a source action that references an S3 input bucket and a build action that uses CodeBuild:

```
{
    "pipeline": {
        "roleArn": "arn:aws:iam::<account-id>:role/<AWS-CodePipeline-service-role-
name>",
        "stages": [
        {
            "name": "Source",
            "actions": [
            {
                "inputArtifacts": [],
                "name": "Source",
                "actionTypeId": {
                "category": "Source",
                "owner": "AWS",
                "owner": "AWS",
                "owner": "AWS",
                "owner": "AWS",
                "owner": "AWS",
                "actionTypeId": 1
                "owner": "AWS",
                "owner": "AWS",
                "owner": "AWS",
                "owner": "AWS",
                "owner": "AWS",
                "actionTypeId": 1
                "owner": "AWS",
                "ow
```

```
"version": "1",
        "provider": "S3"
      },
      "outputArtifacts": [
        {
          "name": "MyApp"
        }
      ],
      "configuration": {
        "S3Bucket": "<bucket-name>",
        "S3ObjectKey": "<source-code-file-name.zip>"
      },
      "runOrder": 1
    }
  ]
},
{
  "name": "Build",
  "actions": [
    {
      "inputArtifacts": [
        {
          "name": "MyApp"
        }
      ],
      "name": "Build",
      "actionTypeId": {
        "category": "Build",
        "owner": "AWS",
        "version": "1",
        "provider": "CodeBuild"
      },
      "outputArtifacts": [
        {
          "name": "default"
        }
      ],
      "configuration": {
        "ProjectName": "<build-project-name>"
      },
      "runOrder": 1
    }
  ]
}
```

```
],
   "artifactStore": {
      "type": "S3",
      "location": "<CodePipeline-internal-bucket-name>"
    },
    "name": "<my-pipeline-name>",
    "version": 1
   }
}
```

In this JSON-formatted data:

- The value of roleArn must match the ARN of the CodePipeline service role you created or identified as part of the prerequisites.
- The values of S3Bucket and S3ObjectKey in configuration assume the source code is stored in an S3 bucket. For settings for other source code repository types, see the CodePipeline pipeline structure reference in the AWS CodePipeline User Guide.
- The value of ProjectName is the name of the CodeBuild build project you created earlier in this procedure.
- The value of location is the name of the S3 bucket used by this pipeline. For more information, see <u>Create a policy for an S3 Bucket to use as the artifact store for CodePipeline</u> in the AWS CodePipeline User Guide.
- The value of name is the name of this pipeline. All pipeline names must be unique to your account.

Although this data describes only a source action and a build action, you can add actions for activities related to testing, deploying the build output artifact, invoking AWS Lambda functions, and more. For more information, see the <u>AWS CodePipeline pipeline structure</u> <u>reference</u> in the *AWS CodePipeline User Guide*.

4. Switch to the folder that contains the JSON file, and then run the CodePipeline <u>create-</u> pipeline command, specifying the file name:

aws codepipeline create-pipeline --cli-input-json file://create-pipeline.json

🚯 Note

You must create the pipeline in an AWS Region where CodeBuild is supported. For more information, see AWS CodeBuild in the *Amazon Web Services General Reference*.

The JSON-formatted data appears in the output, and CodePipeline creates the pipeline.

5. To get information about the pipeline's status, run the CodePipeline <u>get-pipeline-state</u> command, specifying the name of the pipeline:

```
aws codepipeline get-pipeline-state --name <my-pipeline-name>
```

In the output, look for information that confirms the build was successful. Ellipses (...) are used to show data that has been omitted for brevity.

```
{
  . . .
  "stageStates": [
    . . .
    {
       "actionStates": [
         {
           "actionName": "CodeBuild",
           "latestExecution": {
              "status": "SUCCEEDED",
              . . .
           },
           . . .
         }
       ]
    }
  ]
}
```

If you run this command too early, you might not see any information about the build action. You might need to run this command multiple times until the pipeline has finished running the build action. 6. After a successful build, follow these instructions to get the build output artifact. Open the Amazon S3 console at https://console.aws.amazon.com/s3/.

1 Note

You can also get the build output artifact by choosing the **Build artifacts** link on the related build details page in the CodeBuild console. To get to this page, skip the rest of the steps in this procedure, and see View build details (console).

7. In the list of buckets, open the bucket used by the pipeline. The name of the bucket should follow the format codepipeline-<region-ID>-<random-number>. You can get the bucket name from the create-pipeline.json file or you can run the CodePipeline get-pipeline command to get the bucket's name.

aws codepipeline get-pipeline --name <pipeline-name>

In the output, the pipeline object contains an artifactStore object, which contains a location value with the name of the bucket.

- 8. Open the folder that matches the name of your pipeline (for example, <pipeline-name>).
- 9. In that folder, open the folder named default.
- 10. Extract the contents of the file. If there are multiple files in that folder, extract the contents of the file with the latest **Last Modified** timestamp. (You might need to give the file a .zip extension so that you can work with it in your system's ZIP utility.) The build output artifact is in the extracted contents of the file.

Add a CodeBuild build action to a pipeline (CodePipeline console)

- 1. Sign in to the AWS Management Console by using:
 - Your AWS root account. This is not recommended. For more information, see <u>The account</u> root user in the user Guide.
 - An administrator user in your AWS account. For more information, see <u>Creating your first</u> AWS account root user and group in the *user Guide*.
 - An user in your AWS account with permission to perform the following minimum set of actions:

codepipeline:* iam:ListRoles iam:PassRole s3:CreateBucket s3:GetBucketPolicy s3:GetObject s3:ListAllMyBuckets s3:ListBucket s3:PutBucketPolicy codecommit:ListBranches codecommit:ListRepositories codedeploy:GetApplication codedeploy:GetDeploymentGroup codedeploy:ListApplications codedeploy:ListDeploymentGroups elasticbeanstalk:DescribeApplications elasticbeanstalk:DescribeEnvironments lambda:GetFunctionConfiguration lambda:ListFunctions opsworks:DescribeStacks opsworks:DescribeApps opsworks:DescribeLayers

- 2. Open the CodePipeline console at https://console.aws.amazon.com/codesuite/codepipeline/ https://console.aws.amazon.com/codesuite/codepipeline/
- 3. In the AWS region selector, choose the AWS Region where your pipeline is located. This must be a Region where CodeBuild is supported. For more information, see <u>CodeBuild</u> in the *Amazon Web Services General Reference*.
- 4. On the **Pipelines** page, choose the name of the pipeline.
- 5. On the pipeline details page, in the **Source** action, choose the tooltip. Make a note of the value for **Output artifact** (for example, **MyApp**).

i Note

This procedure shows you how to add a build action in a build stage between the **Source** and **Beta** stages. If you want to add the build action somewhere else, choose the tooltip on the action just before the place where you want to add the build action, and make a note of the value for **Output artifact**.

6. Choose Edit.

7. Between the **Source** and **Beta** stages, choose **Add stage**.

Note

This procedure shows you how to add a build stage between the **Source** and **Beta** stages to your pipeline. To add a build action to an existing stage, choose **Edit stage** in the stage, and then skip to step 8 of this procedure. To add the build stage somewhere else, choose **Add stage** in the desired place.

Edit: Source	Edit stage
Source S3	(;
	+ Add stage

- 8. For **Stage name**, enter the name of the build stage (for example, **Build**). If you choose a different name, use it throughout this procedure.
- 9. Inside of the selected stage, choose **Add action**.

i Note

This procedure shows you how to add the build action inside of a build stage. To add the build action somewhere else, choose **Add action** in the desired place. You might first need to choose **Edit stage** in the existing stage where you want to add the build action.

- 10. In **Edit action**, for **Action name**, enter a name for the action (for example, **CodeBuild**). If you choose a different name, use it throughout this procedure.
- 11. For Action provider, choose CodeBuild.

12. If you already have a build project you want to use, for **Project name**, choose the name of the build project and skip to the next step in this procedure.

If you need to create a new CodeBuild build project, follow the instructions in <u>Create a build</u> project (console) and return to this procedure.

If you choose an existing build project, it must have build output artifact settings already defined (even though CodePipeline overrides them). For more information, see the description of **Artifacts** in <u>Create a build project (console)</u> or <u>Change a build project's settings (console)</u>.

🔥 Important

If you enable webhooks for a CodeBuild project, and the project is used as a build step in CodePipeline, then two identical builds are created for each commit. One build is triggered through webhooks and one through CodePipeline. Because billing is on a per-build basis, you are billed for both builds. Therefore, if you are using CodePipeline, we recommend that you disable webhooks in CodeBuild. In the CodeBuild console, clear the **Webhook** box. For more information, see <u>Change a build project's settings</u> (console)

- 13. For **Input artifacts**, choose the output artifact that you noted earlier in this procedure.
- 14. For **Output artifacts**, enter a name for the output artifact (for example, **MyAppBuild**).
- 15. Choose **Add action**.
- 16. Choose **Save**, and then choose **Save** to save your changes to the pipeline.
- 17. Choose Release change.
- 18. After the pipeline runs successfully, you can get the build output artifact. With the pipeline displayed in the CodePipeline console, in the Build action, choose the tooltip. Make a note of the value for Output artifact (for example, MyAppBuild).

i Note

You can also get the build output artifact by choosing the **Build artifacts** link on the build details page in the CodeBuild console. To get to this page, see <u>View build details</u> (console), and then skip to step 31 of this procedure.

19. Open the Amazon S3 console at https://console.aws.amazon.com/s3/.

20. In the list of buckets, open the bucket used by the pipeline. The name of the bucket should follow the format codepipeline-*region-ID-random-number*. You can use the AWS CLI to run the CodePipeline get-pipeline command to get the name of the bucket:

aws codepipeline get-pipeline --name my-pipeline-name

In the output, the pipeline object contains an artifactStore object, which contains a location value with the name of the bucket.

- 21. Open the folder that matches the name of your pipeline (depending on the length of the pipeline's name, the folder name might be truncated), and then open the folder matching the value for **Output artifact** that you noted earlier in this procedure.
- 22. Extract the contents of the file. If there are multiple files in that folder, extract the contents of the file with the latest **Last Modified** timestamp. (You might need to give the file the .zip extension so that you can work with it in your system's ZIP utility.) The build output artifact is in the extracted contents of the file.
- 23. If you instructed CodePipeline to deploy the build output artifact, use the deployment provider's instructions to get to the build output artifact on the deployment targets.

Add a CodeBuild test action to a pipeline (CodePipeline console)

- 1. Sign in to the AWS Management Console by using:
 - Your AWS root account. This is not recommended. For more information, see <u>The account</u> root user in the user Guide.
 - An administrator user in your AWS account. For more information, see <u>Creating your first</u> AWS account root user and group in the user Guide.
 - An user in your AWS account with permission to perform the following minimum set of actions:

```
codepipeline:*
iam:ListRoles
iam:PassRole
s3:CreateBucket
s3:GetBucketPolicy
s3:GetObject
s3:ListAllMyBuckets
s3:ListBucket
```

s3:PutBucketPolicy codecommit:ListBranches codecommit:ListRepositories codedeploy:GetApplication codedeploy:GetDeploymentGroup codedeploy:ListApplications codedeploy:ListDeploymentGroups elasticbeanstalk:DescribeApplications elasticbeanstalk:DescribeEnvironments lambda:GetFunctionConfiguration lambda:ListFunctions opsworks:DescribeStacks opsworks:DescribeApps opsworks:DescribeLayers

- 2. Open the CodePipeline console at https://console.aws.amazon.com/codesuite/codepipeline/home.
- 3. In the AWS region selector, choose the AWS Region where your pipeline is located. This must be an AWS Region where CodeBuild is supported. For more information, see <u>AWS CodeBuild</u> in the *Amazon Web Services General Reference*.
- 4. On the **Pipelines** page, choose the name of the pipeline.
- 5. On the pipeline details page, in the **Source** action, choose the tooltip. Make a note of the value for **Output artifact** (for example, **MyApp**).

🚺 Note

This procedure shows you how to add a test action inside of a test stage between the **Source** and **Beta** stages. If you want to add the test action somewhere else, rest your mouse pointer on the action just before, and make a note of the value for **Output artifact**.

- 6. Choose Edit.
- 7. Immediately after the **Source** stage, choose **Add stage**.

🚯 Note

This procedure shows you how to add a test stage immediately after the **Source** stage to your pipeline. To add a test action to an existing stage, choose **Edit stage** in the

stage, and then skip to step 8 of this procedure. To add the test stage somewhere else, choose **Add stage** in the desired place.

Edit: Source	Edit stage
Source S3	١
+	Add stage

- 8. For **Stage name**, enter the name of the test stage (for example, **Test**). If you choose a different name, use it throughout this procedure.
- 9. In the selected stage, choose **Add action**.

🚺 Note

This procedure shows you how to add the test action in a test stage. To add the test action somewhere else, choose **Add action** in the desired place. You might first need to choose **Edit** in the existing stage where you want to add the test action.

- 10. In **Edit action**, for **Action name**, enter a name for the action (for example, **Test**). If you choose a different name, use it throughout this procedure.
- 11. For Action provider, under Test, choose CodeBuild.
- 12. If you already have a build project you want to use, for **Project name**, choose the name of the build project and skip to the next step in this procedure.

If you need to create a new CodeBuild build project, follow the instructions in <u>Create a build</u> project (console) and return to this procedure.

🔥 Important

If you enable webhooks for a CodeBuild project, and the project is used as a build step in CodePipeline, then two identical builds are created for each commit. One build is triggered through webhooks and one through CodePipeline. Because billing is on a per-build basis, you are billed for both builds. Therefore, if you are using CodePipeline, we recommend that you disable webhooks in CodeBuild. In the CodeBuild console, clear the **Webhook**box. For more information, see <u>Change a build project's settings</u> (console)

- 13. For **Input artifacts**, select the value for **Output artifact** that you noted earlier in this procedure.
- 14. (Optional) If you want your test action to produce an output artifact, and you set up your buildspec accordingly, then for **Output artifact**, enter the value you want to assign to the output artifact.
- 15. Choose Save.
- 16. Choose Release change.
- 17. After the pipeline runs successfully, you can get the test results. In the **Test** stage of the pipeline, choose the **CodeBuild** hyperlink to open the related build project page in the CodeBuild console.
- 18. On the build project page, in **Build history**, choose the **Build run** hyperlink.
- 19. On the build run page, in **Build logs**, choose the **View entire log** hyperlink to open the build log in the Amazon CloudWatch console.
- 20. Scroll through the build log to view the test results.

Use AWS CodeBuild with Codecov

Codecov is a tool that measures the test coverage of your code. Codecov identifies which methods and statements in your code are not tested. Use the results to determine where to write tests to improve the quality of your code. Codecov is available for three of the source repositories supported by CodeBuild: GitHub, GitHub Enterprise Server, and Bitbucket. If your build project uses GitHub Enterprise Server, you must use Codecov Enterprise. When you run a build of a CodeBuild project that is integrated with Codecov, Codecov reports that analyzes code in your repository are uploaded to Codecov. The build logs include a link to the reports. This sample shows you how to integrate a Python and a Java build project with Codecov. For a list of languages supported by Codecov, see <u>Codecov supported languages</u> on the Codecov website.

Integrate Codecov into a build project

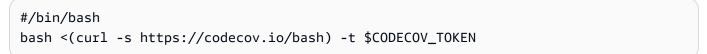
Use the following procedure to integration Codecov into a build project.

To integrate Codecov with your build project

- 1. Go to <u>https://codecov.io/signup</u> and sign up for a GitHub or Bitbucket source repository. If you use GitHub Enterprise, see Codecov Enterprise on the Codecov website.
- 2. In Codecov, add the repository for which you want coverage.
- 3. When token information is displayed, choose **Copy**.

Overview		ဖို Branches	ិរិ Pulls	៉េា Compare	Ø _o ^o Settings		
Let's get your project covered.							
STEP 1 - COPY TOKEN							
	Upload To	ken		🔁 Сору			

- 4. Add the copied token as an environment variable named CODECOV_TOKEN to your build project. For more information, see Change a build project's settings (console).
- 5. Create a text file named my_script.sh in your repository. Enter the following into the file:



6. Choose the **Python** or **Java** tab, as appropriate for your build project uses, and follow these steps.

Java

1. Add the following JaCoCo plugin to pom.xml in your repository.

<build></build>					
<plugins></plugins>					
<plugin></plugin>					
<groupid>org.jacoco</groupid>					
<artifactid>jacoco-maven-plugin</artifactid>					
<version>0.8.2</version>					
<executions></executions>					
<execution></execution>					
<goals></goals>					
<goal>prepare-agent</goal>					
<execution></execution>					
<id>report</id>					
<phase>test</phase>					
<goals></goals>					
<goal>report</goal>					

2. Enter the following commands in your buildspec file. For more information, see Buildspec syntax.

```
build:
    - mvn test -f pom.xml -fn
postbuild:
    - echo 'Connect to CodeCov'
    - bash my_script.sh
```

Python

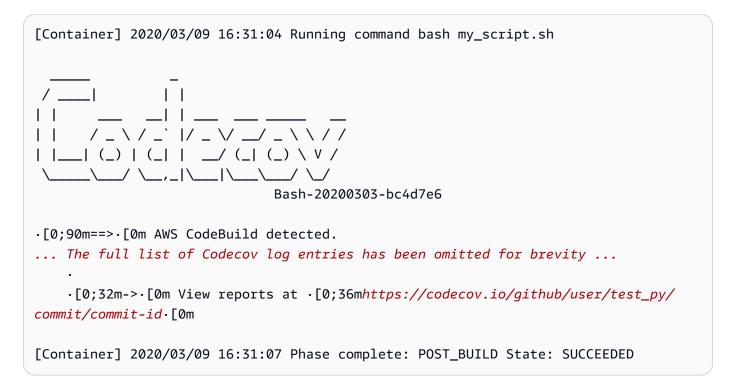
Enter the following commands in your buildspec file. For more information, see <u>Buildspec</u> <u>syntax</u>.

build:
 - pip install coverage

```
coverage run -m unittest discover
postbuild:

echo 'Connect to CodeCov'
bash my_script.sh
```

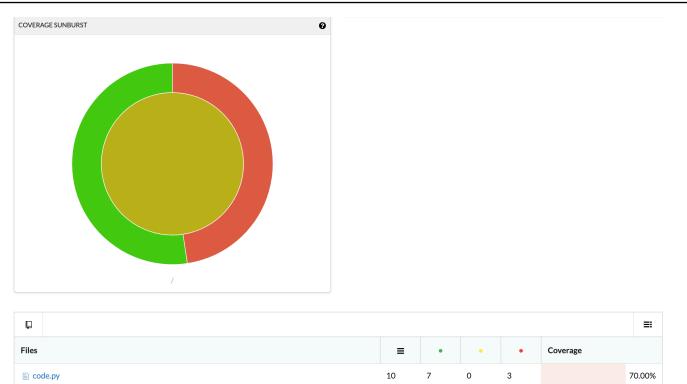
 Run a build of your build project. A link to Codecov reports generated for your project appears in your build logs. Use the link to view the Codecov reports. For more information, see <u>Run</u> <u>AWS CodeBuild builds manually</u> and <u>Log AWS CodeBuild API calls with AWS CloudTrail</u>. Codecov information in the build logs looks like the following:



The reports look like the following:

100.00%

85.71%



11

21

11

18

0

0

0

3

Use AWS CodeBuild with Jenkins

You can use the Jenkins plugin for AWS CodeBuild to integrate CodeBuild with your Jenkins build jobs. Instead of sending your build jobs to Jenkins build nodes, you use the plugin to send your build jobs to CodeBuild. This eliminates the need for you to provision, configure, and manage Jenkins build nodes.

Topics

- Set up Jenkins
- Install the plugin

tests.py

Project Totals (2 files)

• Use the plugin

Set up Jenkins

For information about setting up Jenkins with the AWS CodeBuild plugin, and to download the plugin source code, see https://github.com/awslabs/aws-codebuild-jenkins-plugin.

Install the plugin

If you already have a Jenkins server set up and would like to only install the AWS CodeBuild plugin, on your Jenkins instance, in the Plugin Manager, search for **CodeBuild Plugin for Jenkins**.

Use the plugin

To use AWS CodeBuild with sources from outside of a VPC

- Create a project in the CodeBuild console. For more information, see <u>Create a build project</u> (console).
 - Choose the AWS Region where you want to run the build.
 - (Optional) Set the Amazon VPC configuration to allow the CodeBuild build container to access resources in your VPC.
 - Write down the name of your project. You need it in step 3.
 - (Optional) If your source repository is not natively supported by CodeBuild, you can set Amazon S3 as the input source type for your project.
- 2. In the IAMconsole, create an user to be used by the Jenkins plugin.
 - When you create credentials for the user, choose **Programmatic Access**.
 - Create a policy similar to the following and then attach the policy to your user.

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Effect": "Allow",
      "Resource": ["arn:aws:logs:{{region}}:{{awsAccountId}}:log-group:/aws/
codebuild/{{projectName}}:*"],
      "Action": ["logs:GetLogEvents"]
    },
    {
      "Effect": "Allow",
      "Resource": ["arn:aws:s3:::{{inputBucket}}"],
      "Action": ["s3:GetBucketVersioning"]
   },
    {
      "Effect": "Allow",
      "Resource": ["arn:aws:s3:::{{inputBucket}}/{{inputObject}}"],
```

```
"Action": ["s3:PutObject"]
    },
    {
      "Effect": "Allow",
      "Resource": ["arn:aws:s3:::{{outputBucket}}/*"],
      "Action": ["s3:GetObject"]
    },
    {
      "Effect": "Allow",
      "Resource": ["arn:aws:codebuild:{{region}}:{{awsAccountId}}:project/
{{projectName}}"],
      "Action": ["codebuild:StartBuild",
        "codebuild:BatchGetBuilds",
        "codebuild:BatchGetProjects"]
    }
  ]
}
```

- 3. Create a freestyle project in Jenkins.
 - On the Configure page, choose Add build step, and then choose Run build on CodeBuild.
 - Configure your build step.
 - Provide values for **Region**, **Credentials**, and **Project Name**.
 - Choose Use Project source.
 - Save the configuration and run a build from Jenkins.
- 4. For **Source Code Management**, choose how you want to retrieve your source. You might need to install the GitHub plugin (or the Jenkins plugin for your source repository provider) on your Jenkins server.
 - On the Configure page, choose Add build step, and then choose Run build on AWS CodeBuild.
 - Configure your build step.
 - Provide values for Region, Credentials, and Project Name.
 - Choose Use Jenkins source.
 - Save the configuration and run a build from Jenkins.

To use the AWS CodeBuild plugin with the Jenkins pipeline plugin

• On your Jenkins pipeline project page, use the snippet generator to generate a pipeline script that adds CodeBuild as a step in your pipeline. It should generate a script similar to this:

```
awsCodeBuild projectName: 'project', credentialsType: 'keys', region: 'us-west-2',
sourceControlType: 'jenkins'
```

Use AWS CodeBuild with serverless applications

The AWS Serverless Application Model (AWS SAM) is an open-source framework for building serverless applications. For more information, see the <u>AWS serverless application model</u> repository on GitHub.

You can use AWS CodeBuild to package and deploy serverless applications that follow the AWS SAM standard. For the deployment step, CodeBuild can use AWS CloudFormation. To automate the building and deployment of serverless applications with CodeBuild and AWS CloudFormation, you can use AWS CodePipeline.

For more information, see <u>Deploying Serverless Applications</u> in the AWS Serverless Application Model Developer Guide.

Related resources

- For information about getting started with AWS CodeBuild, see <u>Getting started with AWS</u> <u>CodeBuild using the console</u>.
- For information about troubleshooting issues in CodeBuild, see Troubleshooting AWS CodeBuild.
- For information about quotas in CodeBuild, see <u>Quotas for AWS CodeBuild</u>.

Third party notices for AWS CodeBuild for Windows

When you use CodeBuild for Windows builds, you have the option to use some third party packages and modules to enable your built application to run on Microsoft Windows operating systems and to interoperate with some third party products. The following list contains the applicable third-party legal terms that govern your use of the specified third-party packages and modules.

Topics

- 1) base Docker image—windowsservercore
- 2) windows-base Docker image—choco
- 3) windows-base Docker image—git --version 2.16.2
- 4) windows-base Docker image—microsoft-build-tools --version 15.0.26320.2
- 5) windows-base Docker image—nuget.commandline --version 4.5.1
- 7) windows-base Docker image—netfx-4.6.2-devpack
- 8) windows-base Docker image—visualfsharptools, v 4.0
- 9) windows-base Docker image—netfx-pcl-reference-assemblies-4.6
- 10) windows-base Docker image—visualcppbuildtools v 14.0.25420.1
- 11) windows-base Docker image—microsoft-windows-netfx3-ondemand-package.cab
- 12) windows-base Docker image—dotnet-sdk

1) base Docker image—windowsservercore

(license terms available at: https://hub.docker.com/_/microsoft-windows-servercore)

License: By requesting and using this Container OS Image for Windows containers, you acknowledge, understand, and consent to the following Supplemental License Terms:

MICROSOFT SOFTWARE SUPPLEMENTAL LICENSE TERMS

CONTAINER OS IMAGE

Microsoft Corporation (or based on where you live, one of its affiliates) (referenced as "us," "we," or "Microsoft") licenses this Container OS Image supplement to you ("Supplement"). You are licensed to use this Supplement in conjunction with the underlying host operating system software ("Host Software") solely to assist running the containers feature in the Host Software. The Host Software license terms apply to your use of the Supplement. You may not use it if you do not have a license for the Host Software. You may use this Supplement with each validly licensed copy of the Host Software.

ADDITIONAL LICENSING REQUIREMENTS AND/OR USE RIGHTS

Your use of the Supplement as specified in the preceding paragraph may result in the creation or modification of a container image ("Container Image") that includes certain Supplement components. For clarity, a Container Image is separate and distinct from a virtual machine or virtual appliance image. Pursuant to these license terms, we grant you a restricted right to redistribute such Supplement components under the following conditions:

(i) you may use the Supplement components only as used in, and as a part of your Container Image,

(ii) you may use such Supplement components in your Container Image as long as you have significant primary functionality in your Container Image that is materially separate and distinct from the Supplement; and

(iii) you agree to include these license terms (or similar terms required by us or a hoster) with your Container Image to properly license the possible use of the Supplement components by your endusers.

We reserve all other rights not expressly granted herein.

By using this Supplement, you accept these terms. If you do not accept them, do not use this Supplement.

As part of the Supplemental License Terms for this Container OS Image for Windows containers, you are also subject to the underlying Windows Server host software license terms, which are located at: <u>https://www.microsoft.com/en-us/useterms.</u>

2) windows-base Docker image—choco

(license terms available at: https://github.com/chocolatey/choco/blob/master/LICENSE)

Copyright 2011 - Present RealDimensions Software, LLC

Licensed under the Apache License, version 2.0 (the "License"); you may not use these files except in compliance with the License. You may obtain a copy of the License at

http://www.apache.org/licenses/LICENSE-2.0

Unless required by applicable law or as agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. See the License for the specific language governing permissions and limitations under the License.

3) windows-base Docker image—git --version 2.16.2

(license terms available at: https://chocolatey.org/packages/git/2.16.2)

Licensed under GNU General Public License, version 2, available at: <u>https://www.gnu.org/licenses/</u>old-licenses/gpl-2.0.html.

4) windows-base Docker image—microsoft-build-tools --version 15.0.26320.2

(license terms available at: https://www.visualstudio.com/license-terms/mt171552/)

MICROSOFT VISUAL STUDIO 2015 EXTENSIONS, VISUAL STUDIO SHELLS and C++ REDISTRIBUTABLE

These license terms are an agreement between Microsoft Corporation (or based on where you live, one of its affiliates) and you. They apply to the software named above. The terms also apply to any Microsoft services or updates for the software, except to the extent those have additional terms.

IF YOU COMPLY WITH THESE LICENSE TERMS, YOU HAVE THE RIGHTS BELOW.

- 1. **INSTALLATION AND USE RIGHTS**. You may install and use any number of copies of the software.
- 2. TERMS FOR SPECIFIC COMPONENTS.
 - a. Utilities. The software may contain some items on the Utilities List at https://docs.microsoft.com/en-us/visualstudio/productinfo/2015-redistribution-vs. You may copy and install those items, if included with the software, on to yours or other third party machines, to debug and deploy your applications and databases you developed with the software. Please note that Utilities are designed for temporary use, that Microsoft may not be able to patch or update Utilities separately from the rest of the software, and that some Utilities by their nature may make it possible for others to access machines on which they are installed. As a result, you should delete all Utilities you have installed after you finish debugging or deploying your applications and databases. Microsoft is not responsible for any third party use or access of Utilities you install on any machine.
 - b. Microsoft Platforms. The software may include components from Microsoft Windows; Microsoft Windows Server; Microsoft SQL Server; Microsoft Exchange; Microsoft Office; and Microsoft SharePoint. These components are governed by separate agreements and their own product support policies, as described in the license terms found in the installation directory for that component or in the "Licenses" folder accompanying the software.

- c. Third Party Components. The software may include third party components with separate legal notices or governed by other agreements, as described in the ThirdPartyNotices file accompanying the software. Even if such components are governed by other agreements, the disclaimers and the limitations on and exclusions of damages below also apply. The software may also include components licensed under open source licenses with source code availability obligations. Copies of those licenses, if applicable, are included in the ThirdPartyNotices file. You may obtain this source code from us, if and as required under the relevant open source licenses, by sending a money order or check for \$5.00 to: Source Code Compliance Team, Microsoft Corporation, 1 Microsoft Way, Redmond, WA 98052. Please write source code for one or more of the components listed below in the memo line of your payment:
 - Remote Tools for Visual Studio 2015;
 - Standalone Profiler for Visual Studio 2015;
 - IntelliTraceCollector for Visual Studio 2015;
 - Microsoft VC++ Redistributable 2015;
 - Multibyte MFC Library for Visual Studio 2015;
 - Microsoft Build Tools 2015;
 - Feedback Client;
 - Visual Studio 2015 Integrated Shell; or
 - Visual Studio 2015 Isolated Shell.

We may also make a copy of the source code available at <u>http://</u> <u>thirdpartysource.microsoft.com</u>.

- 3. DATA. The software may collect information about you and your use of the software, and send that to Microsoft. Microsoft may use this information to provide services and improve our products and services. You may opt-out of many of these scenarios, but not all, as described in the product documentation. There are also some features in the software that may enable you to collect data from users of your applications. If you use these features to enable data collection in your applications, you must comply with applicable law, including providing appropriate notices to users of your applications. You can learn more about data collection and use in the help documentation and the privacy statement at https://privacy.microsoft.com/enus/privacystatement. Your use of the software operates as your consent to these practices.
- 4. **SCOPE OF LICENSE**. The software is licensed, not sold. This agreement only gives you some rights to use the software. Microsoft reserves all other rights. Unless applicable law gives you

more rights despite this limitation, you may use the software only as expressly permitted in this agreement. In doing so, you must comply with any technical limitations in the software that only allow you to use it in certain ways. You may not

- work around any technical limitations in the software;
- reverse engineer, decompile or disassemble the software, or attempt to do so, except and only to the extent required by third party licensing terms governing the use of certain open-source components that may be included with the software;
- remove, minimize, block or modify any notices of Microsoft or its suppliers in the software;
- use the software in any way that is against the law; or
- share, publish, rent or lease the software, or provide the software as a stand-alone hosted as solution for others to use.
- 5. **EXPORT RESTRICTIONS**. You must comply with all domestic and international export laws and regulations that apply to the software, which include restrictions on destinations, end users, and end use. For further information on export restrictions, visit (aka.ms/exporting).
- 6. SUPPORT SERVICES. Because this software is "as is," we may not provide support services for it.
- 7. **ENTIRE AGREEMENT**. This agreement, and the terms for supplements, updates, Internetbased services and support services that you use, are the entire agreement for the software and support services.
- 8. **APPLICABLE LAW**. If you acquired the software in the United States, Washington law applies to interpretation of and claims for breach of this agreement, and the laws of the state where you live apply to all other claims. If you acquired the software in any other country, its laws apply.
- 9. CONSUMER RIGHTS; REGIONAL VARIATIONS. This agreement describes certain legal rights. You may have other rights, including consumer rights, under the laws of your state or country. Separate and apart from your relationship with Microsoft, you may also have rights with respect to the party from which you acquired the software. This agreement does not change those other rights if the laws of your state or country do not permit it to do so. For example, if you acquired the software in one of the below regions, or mandatory country law applies, then the following provisions apply to you:
 - a. **Australia**. You have statutory guarantees under the Australian Consumer Law and nothing in this agreement is intended to affect those rights.
 - b. **Canada**. If you acquired this software in Canada, you may stop receiving updates by turning off the automatic update feature, disconnecting your device from the Internet (if and when you re-connect to the Internet, however, the software will resume checking for and installing

updates), or uninstalling the software. The product documentation, if any, may also specify how to turn off updates for your specific device or software.

c. Germany and Austria.

- i. **Warranty**. The properly licensed software will perform substantially as described in any Microsoft materials that accompany the software. However, Microsoft gives no contractual guarantee in relation to the licensed software.
- ii. Limitation of Liability. In case of intentional conduct, gross negligence, claims based on the Product Liability Act, as well as, in case of death or personal or physical injury, Microsoft is liable according to the statutory law.Subject to the foregoing clause (ii), Microsoft will only be liable for slight negligence if Microsoft is in breach of such material contractual obligations, the fulfillment of which facilitate the due performance of this agreement, the breach of which would endanger the purpose of this agreement and the compliance with which a party may constantly trust in (so-called "cardinal obligations"). In other cases of slight negligence, Microsoft will not be liable for slight negligence.
- 10DISCLAIMER OF WARRANTY. THE SOFTWARE IS LICENSED "AS-IS." YOU BEAR THE RISK OF USING IT. MICROSOFT GIVES NO EXPRESS WARRANTIES, GUARANTEES OR CONDITIONS. TO THE EXTENT PERMITTED UNDER YOUR LOCAL LAWS, MICROSOFT EXCLUDES THE IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NON-INFRINGEMENT.
- 11LIMITATION ON AND EXCLUSION OF DAMAGES. YOU CAN RECOVER FROM MICROSOFT AND ITS SUPPLIERS ONLY DIRECT DAMAGES UP TO U.S. \$5.00. YOU CANNOT RECOVER ANY OTHER DAMAGES, INCLUDING CONSEQUENTIAL, LOST PROFITS, SPECIAL, INDIRECT OR INCIDENTAL DAMAGES. This limitation applies to (a) anything related to the software, services, content (including code) on third party Internet sites, or third party applications; and (b) claims for breach of contract, breach of warranty, guarantee or condition, strict liability, negligence, or other tort to the extent permitted by applicable law.

It also applies even if Microsoft knew or should have known about the possibility of the damages. The above limitation or exclusion may not apply to you because your country may not allow the exclusion or limitation of incidental, consequential or other damages.

EULA ID: VS2015_Update3_ShellsRedist_<ENU>

5) windows-base Docker image—nuget.commandline --version 4.5.1

(license terms available at: https://github.com/NuGet/Home/blob/dev/LICENSE.txt)

Copyright (c) .NET Foundation. All rights reserved.

Licensed under the Apache License, version 2.0 (the "License"); you may not use these files except in compliance with the License. You may obtain a copy of the License at

http://www.apache.org/licenses/LICENSE-2.0

Unless required by applicable law or as agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. See the License for the specific language governing permissions and limitations under the License.

7) windows-base Docker image—netfx-4.6.2-devpack

MICROSOFT SOFTWARE SUPPLEMENTAL LICENSE TERMS

.NET FRAMEWORK AND ASSOCIATED LANGUAGE PACKS FOR MICROSOFT WINDOWS OPERATING SYSTEM

Microsoft Corporation (or based on where you live, one of its affiliates) licenses this supplement to you. If you are licensed to use Microsoft Windows operating system software (the "software"), you may use this supplement. You may not use it if you do not have a license for the software. You may use this supplement with each validly licensed copy of the software.

The following license terms describe additional use terms for this supplement. These terms and the license terms for the software apply to your use of the supplement. If there is a conflict, these supplemental license terms apply.

BY USING THIS SUPPLEMENT, YOU ACCEPT THESE TERMS. IF YOU DO NOT ACCEPT THEM, DO NOT USE THIS SUPPLEMENT.

If you comply with these license terms, you have the rights below.

- 1. **DISTRIBUTABLE CODE.** The supplement is comprised of Distributable Code. "Distributable Code" is code that you are permitted to distribute in programs you develop if you comply with the terms below.
 - a. Right to Use and Distribute.

- You may copy and distribute the object code form of the supplement.
- <u>Third Party Distribution</u>. You may permit distributors of your programs to copy and distribute the Distributable Code as part of those programs.

b. Distribution Requirements. For any Distributable Code you distribute, you must

- add significant primary functionality to it in your programs;
- for any Distributable Code having a filename extension of .lib, distribute only the results of running such Distributable Code through a linker with your program;
- distribute Distributable Code included in a setup program only as part of that setup program without modification;
- require distributors and external end users to agree to terms that protect it at least as much as this agreement;
- display your valid copyright notice on your programs; and
- indemnify, defend, and hold harmless Microsoft from any claims, including attorneys' fees, related to the distribution or use of your programs.

c. Distribution Restrictions. You may not

- alter any copyright, trademark or patent notice in the Distributable Code;
- use Microsoft's trademarks in your programs' names or in a way that suggests your programs come from or are endorsed by Microsoft;
- distribute Distributable Code to run on a platform other than the Windows platform;
- include Distributable Code in malicious, deceptive or unlawful programs; or
- modify or distribute the source code of any Distributable Code so that any part of it becomes subject to an Excluded License. An Excluded License is one that requires, as a condition of use, modification or distribution, that
 - the code be disclosed or distributed in source code form; or
 - others have the right to modify it.
- SUPPORT SERVICES FOR SUPPLEMENT. Microsoft provides support services for this software as described at <u>www.support.microsoft.com/common/international.aspx</u>.

8) windows-base Docker image—visualfsharptools, v 4.0

(license terms available at: https://github.com/dotnet/fsharp/blob/main/License.txt)

Sopyrights (c) Michosoft Sorporation4. All rights reserved.

Licensed under the Apache License, version 2.0 (the "License"); you may not use these files except in compliance with the License. You may obtain a copy of the License at

http://www.apache.org/licenses/LICENSE-2.0

Unless required by applicable law or as agreed to in writing, software distributed under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. See the License for the specific language governing permissions and limitations under the License.

9) windows-base Docker image—netfx-pcl-reference-assemblies-4.6

MICROSOFT SOFTWARE LICENSE TERMS

MICROSOFT .NET PORTABLE CLASS LIBRARY REFERENCE ASSEMBLIES – 4.6

These license terms are an agreement between Microsoft Corporation (or based on where you live, one of its affiliates) and you. Please read them. They apply to the software named above. The terms also apply to any Microsoft

- updates,
- supplements,
- Internet-based services, and
- support services

for this software, unless other terms accompany those items. If so, those terms apply.

BY USING THE SOFTWARE, YOU ACCEPT THESE TERMS. IF YOU DO NOT ACCEPT THEM, DO NOT USE THE SOFTWARE.

IF YOU COMPLY WITH THESE LICENSE TERMS, YOU HAVE THE PERPETUAL RIGHTS BELOW.

- 1. **INSTALLATION AND USE RIGHTS**. You may install and use any number of copies of the software to design, develop and test your programs.
- 2. ADDITIONAL LICENSING REQUIREMENTS AND/OR USE RIGHTS.

- a. **Distributable Code**. You may distribute the software in developer tool programs you develop, to enable customers of your programs to develop portable libraries for use with any device or operating system, if you comply with the terms below.
 - i. Right to Use and Distribute. The software is "Distributable Code."
 - <u>Distributable Code</u>. You may copy and distribute the object code form of the software.
 - <u>Third Party Distribution</u>. You may permit distributors of your programs to copy and distribute the Distributable Code as part of those programs.
 - ii. Distribution Requirements. For any Distributable Code you distribute, you must
 - add significant primary functionality to it in your programs;
 - require distributors and your customers to agree to terms that protect it at least as much as this agreement;
 - display your valid copyright notice on your programs; and
 - indemnify, defend, and hold harmless Microsoft from any claims, including attorneys' fees, related to the distribution or use of your programs.

iii. Distribution Restrictions. You may not

- alter any copyright, trademark or patent notice in the Distributable Code;
- use Microsoft's trademarks in your programs' names or in a way that suggests your programs come from or are endorsed by Microsoft;
- include Distributable Code in malicious, deceptive or unlawful programs; or
- modify or distribute the Distributable Code so that any part of it becomes subject to an Excluded License. An Excluded License is one that requires, as a condition of use, modification or distribution, that
 - the code be disclosed or distributed in source code form; or
 - others have the right to modify it.
- 3. **SCOPE OF LICENSE**. The software is licensed, not sold. This agreement only gives you some rights to use the software. Microsoft reserves all other rights. Unless applicable law gives you more rights despite this limitation, you may use the software only as expressly permitted in this agreement. In doing so, you must comply with any technical limitations in the software that only allow you to use it in certain ways. You may not
 - work around any technical limitations in the software;
 - reverse engineer, decompile or disassemble the software, except and only to the extent that applicable law expressly permits, despite this limitation;

- publish the software for others to copy; or
- rent, lease or lend the software.
- 4. FEEDBACK. You may provide feedback about the software. If you give feedback about the software to Microsoft, you give to Microsoft, without charge, the right to use, share and commercialize your feedback in any way and for any purpose. You also give to third parties, without charge, any patent rights needed for their products, technologies and services to use or interface with any specific parts of a Microsoft software or service that includes the feedback. You will not give feedback that is subject to a license that requires Microsoft to license its software or documentation to third parties because we include your feedback in them. These rights survive this agreement.
- 5. **TRANSFER TO A THIRD PARTY**. The first user of the software may transfer it, and this agreement, directly to a third party. Before the transfer, that party must agree that this agreement applies to the transfer and use of the software. The first user must uninstall the software before transferring it separately from the device. The first user may not retain any copies.
- 6. EXPORT RESTRICTIONS. The software is subject to United States export laws and regulations. You must comply with all domestic and international export laws and regulations that apply to the software. These laws include restrictions on destinations, end users and end use. For additional information, see <u>www.microsoft.com/exporting</u>.
- 7. SUPPORT SERVICES. Because this software is "as is," we may not provide support services for it.
- 8. **ENTIRE AGREEMENT**. This agreement, and the terms for supplements, updates, Internet-based services and support services that you use, are the entire agreement for the software and any support services we provide.

9. APPLICABLE LAW.

- a. **United States**. If you acquired the software in the United States, Washington state law governs the interpretation of this agreement and applies to claims for breach of it, regardless of conflict of laws principles. The laws of the state where you live govern all other claims, including claims under state consumer protection laws, unfair competition laws, and in tort.
- b. **Outside the United States**. If you acquired the software in any other country, the laws of that country apply.
- 10**LEGAL EFFECT**. This agreement describes certain legal rights. You may have other rights under the laws of your country. You may also have rights with respect to the party from whom you acquired the software. This agreement does not change your rights under the laws of your country if the laws of your country do not permit it to do so.

11DISCLAIMER OF WARRANTY. THE SOFTWARE IS LICENSED "AS-IS." YOU BEAR THE RISK OF USING IT. MICROSOFT GIVES NO EXPRESS WARRANTIES, GUARANTEES OR CONDITIONS. YOU MAY HAVE ADDITIONAL CONSUMER RIGHTS OR STATUTORY GUARANTEES UNDER YOUR LOCAL LAWS WHICH THIS AGREEMENT CANNOT CHANGE. TO THE EXTENT PERMITTED UNDER YOUR LOCAL LAWS, MICROSOFT EXCLUDES THE IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NON-INFRINGEMENT.

FOR AUSTRALIA—YOU HAVE STATUTORY GUARANTEES UNDER THE AUSTRALIAN CONSUMER LAW AND NOTHING IN THESE TERMS IS INTENDED TO AFFECT THOSE RIGHTS. 12LIMITATION ON AND EXCLUSION OF REMEDIES AND DAMAGES. YOU CAN RECOVER FROM MICROSOFT AND ITS SUPPLIERS ONLY DIRECT DAMAGES UP TO U.S. \$5.00. YOU CANNOT RECOVER ANY OTHER DAMAGES, INCLUDING CONSEQUENTIAL, LOST PROFITS, SPECIAL, INDIRECT OR INCIDENTAL DAMAGES.

This limitation applies to

- anything related to the software, services, content (including code) on third party Internet sites, or third party programs; and
- claims for breach of contract, breach of warranty, guarantee or condition, strict liability, negligence, or other tort to the extent permitted by applicable law.

It also applies even if Microsoft knew or should have known about the possibility of the damages. The above limitation or exclusion may not apply to you because your country may not allow the exclusion or limitation of incidental, consequential or other damages.

10) windows-base Docker image—visualcppbuildtools v 14.0.25420.1

(license terms available at: https://www.visualstudio.com/license-terms/mt644918/)

MICROSOFT VISUAL C++ BUILD TOOLS

MICROSOFT SOFTWARE LICENSE TERMS

MICROSOFT VISUAL C++ BUILD TOOLS

These license terms are an agreement between Microsoft Corporation (or based on where you live, one of its affiliates) and you. They apply to the software named above. The terms also apply to any Microsoft services or updates for the software, except to the extent those have different terms.

IF YOU COMPLY WITH THESE LICENSE TERMS, YOU HAVE THE RIGHTS BELOW.

1. INSTALLATION AND USE RIGHTS.

- a. One user may use copies of the software to develop and test their applications.
- 2. DATA. The software may collect information about you and your use of the software, and send that to Microsoft. Microsoft may use this information to provide services and improve our products and services. You may opt-out of many of these scenarios, but not all, as described in the product documentation. There are also some features in the software that may enable you to collect data from users of your applications. If you use these features to enable data collection in your applications, you must comply with applicable law, including providing appropriate notices to users of your applications. You can learn more about data collection and use in the help documentation and the privacy statement at http://go.microsoft.com/fwlink/?

3. TERMS FOR SPECIFIC COMPONENTS.

- a. **Build Server**. The software may contain some Build Server components listed in BuildServer.TXT files, and/or any files listed on the BuildeServer list located following this Microsoft Software License Terms. You may copy and install those items, if included in the software, onto your build machines. You and others in your organization may use these items on your build machines solely for the purpose of compiling, building, verifying and archiving your applications or running quality or performance tests as part of the build process.
- b. **Microsoft Platforms**. The software may include components from Microsoft Windows; Microsoft Windows Server; Microsoft SQL Server; Microsoft Exchange; Microsoft Office; and Microsoft SharePoint. These components are governed by separate agreements and their own product support policies, as described in the license terms found in the installation directory for that component or in the "Licenses" folder accompanying the software.
- c. **Third Party Components**. The software may include third party components with separate legal notices or governed by other agreements, as described in the ThirdPartyNotices file accompanying the software. Even if such components are governed by other agreements, the disclaimers and the limitations on and exclusions of damages below also apply.
- d. **Package Managers**. The software may include package managers, like Nuget, that give you the option to download other Microsoft and third party software packages to use with your application. Those packages are under their own licenses, and not this agreement. Microsoft does not distribute, license or provide any warranties for any of the third party packages.

- 4. SCOPE OF LICENSE. The software is licensed, not sold. This agreement only gives you some rights to use the software. Microsoft reserves all other rights. Unless applicable law gives you more rights despite this limitation, you may use the software only as expressly permitted in this agreement. In doing so, you must comply with any technical limitations in the software that only allow you to use it in certain ways. For more information, see https://docs.microsoft.com/en-us/legal/information-protection/software-license-terms#1-installation-and-use-rights. You may not
 - work around any technical limitations in the software;
 - reverse engineer, decompile or disassemble the software, or attempt to do so, except and only to the extent required by third party licensing terms governing use of certain open source components that may be included with the software;
 - remove, minimize, block or modify any notices of Microsoft or its suppliers;
 - use the software in any way that is against the law; or
 - share, publish, rent or lease the software, or provide the software as a stand-alone hosted as solution for others to use.
- 5. **EXPORT RESTRICTIONS**. You must comply with all domestic and international export laws and regulations that apply to the software, which include restrictions on destinations, end users and end use. For further information on export restrictions, visit (aka.ms/exporting).
- 6. SUPPORT SERVICES. Because this software is "as is," we may not provide support services for it.
- 7. **ENTIRE AGREEMENT**. This agreement, and the terms for supplements, updates, Internetbased services and support services that you use, are the entire agreement for the software and support services.
- 8. **APPLICABLE LAW**. If you acquired the software in the United States, Washington law applies to interpretation of and claims for breach of this agreement, and the laws of the state where you live apply to all other claims. If you acquired the software in any other country, its laws apply.
- 9. CONSUMER RIGHTS; REGIONAL VARIATIONS. This agreement describes certain legal rights. You may have other rights, including consumer rights, under the laws of your state or country. Separate and apart from your relationship with Microsoft, you may also have rights with respect to the party from which you acquired the software. This agreement does not change those other rights if the laws of your state or country do not permit it to do so. For example, if you acquired the software in one of the below regions, or mandatory country law applies, then the following provisions apply to you:
 - **Australia**. You have statutory guarantees under the Australian Consumer Law and nothing in this agreement is intended to affect those rights.

- **Canada**. If you acquired this software in Canada, you may stop receiving updates by turning off the automatic update feature, disconnecting your device from the Internet (if and when you re-connect to the Internet, however, the software will resume checking for and installing updates), or uninstalling the software. The product documentation, if any, may also specify how to turn off updates for your specific device or software.
- Germany and Austria.
 - **Warranty**. The properly licensed software will perform substantially as described in any Microsoft materials that accompany the software. However, Microsoft gives no contractual guarantee in relation to the licensed software.
 - *Limitation of Liability*. In case of intentional conduct, gross negligence, claims based on the Product Liability Act, as well as, in case of death or personal or physical injury, Microsoft is liable according to the statutory law.

Subject to the foregoing clause (ii), Microsoft will only be liable for slight negligence if Microsoft is in breach of such material contractual obligations, the fulfillment of which facilitate the due performance of this agreement, the breach of which would endanger the purpose of this agreement and the compliance with which a party may constantly trust in (so-called "cardinal obligations"). In other cases of slight negligence, Microsoft will not be liable for slight negligence.

- 10LEGAL EFFECT. This agreement describes certain legal rights. You may have other rights under the laws of your state or country. This agreement does not change your rights under the laws of your state or country if the laws of your state or country do not permit it to do so. Without limitation of the foregoing, for Australia, YOU HAVE STATUTORY GUARANTEES UNDER THE AUSTRALIAN CONSUMER LAW AND NOTHING IN THESE TERMS IS INTENDED TO AFFECT THOSE RIGHTS
- 11DISCLAIMER OF WARRANTY. THE SOFTWARE IS LICENSED "AS-IS." YOU BEAR THE RISK OF USING IT. MICROSOFT GIVES NO EXPRESS WARRANTIES, GUARANTEES OR CONDITIONS. TO THE EXTENT PERMITTED UNDER YOUR LOCAL LAWS, MICROSOFT EXCLUDES THE IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NON-INFRINGEMENT.
- 12LIMITATION ON AND EXCLUSION OF DAMAGES. YOU CAN RECOVER FROM MICROSOFT AND ITS SUPPLIERS ONLY DIRECT DAMAGES UP TO U.S. \$5.00. YOU CANNOT RECOVER ANY OTHER DAMAGES, INCLUDING CONSEQUENTIAL, LOST PROFITS, SPECIAL, INDIRECT OR INCIDENTAL DAMAGES.

This limitation applies to (a) anything related to the software, services, content (including code) on third party Internet sites, or third party applications; and (b) claims for breach of contract, breach of warranty, guarantee or condition, strict liability, negligence, or other tort to the extent permitted by applicable law.

It also applies even if Microsoft knew or should have known about the possibility of the damages. The above limitation or exclusion may not apply to you because your country may not allow the exclusion or limitation of incidental, consequential or other damages.

11) windows-base Docker image—microsoft-windows-netfx3ondemand-package.cab

MICROSOFT SOFTWARE SUPPLEMENTAL LICENSE TERMS

MICROSOFT .NET FRAMEWORK 3.5 SP1 FOR MICROSOFT WINDOWS OPERATING SYSTEM

Microsoft Corporation (or based on where you live, one of its affiliates) licenses this supplement to you. If you are licensed to use Microsoft Windows operating system software (for which this supplement is applicable) (the "software"), you may use this supplement. You may not use it if you do not have a license for the software. You may use a copy of this supplement with each validly licensed copy of the software.

The following license terms describe additional use terms for this supplement. These terms and the license terms for the software apply to your use of the supplement. If there is a conflict, these supplemental license terms apply.

BY USING THIS SUPPLEMENT, YOU ACCEPT THESE TERMS. IF YOU DO NOT ACCEPT THEM, DO NOT USE THIS SUPPLEMENT.

If you comply with these license terms, you have the rights below.

- 1. **SUPPORT SERVICES FOR SUPPLEMENT**. Microsoft provides support services for this software as described at <u>www.support.microsoft.com/common/international.aspx</u>.
- 2. **MICROSOFT .NET BENCHMARK TESTING**. The software includes the .NET Framework, Windows Communication Foundation, Windows Presentation Foundation, and Windows Workflow

Foundation components of the Windows operating systems (.NET Components). You may conduct internal benchmark testing of the .NET Components. You may disclose the results of any benchmark test of the .NET Components, provided that you comply with the conditions set forth at http://go.microsoft.com/fwlink/?LinkID=66406.

Notwithstanding any other agreement you may have with Microsoft, if you disclose such benchmark test results, Microsoft shall have the right to disclose the results of benchmark tests it conducts of your products that compete with the applicable .NET Component, provided it complies with the same conditions set forth at http://go.microsoft.com/fwlink/?LinkID=66406.

12) windows-base Docker image—dotnet-sdk

(available at https://github.com/dotnet/core/blob/main/LICENSE.TXT)

The MIT License (MIT)

Copyright (c) Microsoft Corporation

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

Code examples for CodeBuild using AWS SDKs

The following code examples show how to use CodeBuild with an AWS software development kit (SDK).

Actions are code excerpts from larger programs and must be run in context. While actions show you how to call individual service functions, you can see actions in context in their related scenarios.

For a complete list of AWS SDK developer guides and code examples, see <u>Using this service with</u> <u>an AWS SDK</u>. This topic also includes information about getting started and details about previous SDK versions.

Code examples

- Basic examples for CodeBuild using AWS SDKs
 - Actions for CodeBuild using AWS SDKs
 - Use CreateProject with an AWS SDK or CLI
 - Use ListBuilds with an AWS SDK or CLI
 - Use ListProjects with an AWS SDK or CLI
 - Use StartBuild with an AWS SDK or CLI

Basic examples for CodeBuild using AWS SDKs

The following code examples show how to use the basics of AWS CodeBuild with AWS SDKs.

Examples

- Actions for CodeBuild using AWS SDKs
 - Use CreateProject with an AWS SDK or CLI
 - Use ListBuilds with an AWS SDK or CLI
 - Use ListProjects with an AWS SDK or CLI
 - Use StartBuild with an AWS SDK or CLI

Actions for CodeBuild using AWS SDKs

The following code examples demonstrate how to perform individual CodeBuild actions with AWS SDKs. Each example includes a link to GitHub, where you can find instructions for setting up and running the code.

The following examples include only the most commonly used actions. For a complete list, see the <u>AWS CodeBuild API Reference</u>.

Examples

- Use CreateProject with an AWS SDK or CLI
- Use ListBuilds with an AWS SDK or CLI
- Use ListProjects with an AWS SDK or CLI
- Use StartBuild with an AWS SDK or CLI

Use CreateProject with an AWS SDK or CLI

The following code examples show how to use CreateProject.

CLI

AWS CLI

Example 1: To create an AWS CodeBuild build project

The following create-project example creates a CodeBuild build project using source files from an S3 bucket

```
aws codebuild create-project \
    --name "my-demo-project" \
    --source "{\"type\": \"S3\",\"location\": \"codebuild-us-west-2-123456789012-
input-bucket/my-source.zip\"}" \
    --artifacts {"\"type\": \"S3\",\"location\": \"codebuild-us-
west-2-123456789012-output-bucket\""} \
    --environment "{\"type\": \"LINUX_CONTAINER\",\"image\": \"aws/codebuild/
standard:1.0\",\"computeType\": \"BUILD_GENERAL1_SMALL\"}" \
    --service-role "arn:aws:iam::123456789012:role/service-role/my-codebuild-
service-role"
```

Output:

```
User Guide
```

```
{
    "project": {
        "arn": "arn:aws:codebuild:us-west-2:123456789012:project/my-demo-
project",
        "name": "my-cli-demo-project",
        "encryptionKey": "arn:aws:kms:us-west-2:123456789012:alias/aws/s3",
        "serviceRole": "arn:aws:iam::123456789012:role/service-role/my-codebuild-
service-role",
        "lastModified": 1556839783.274,
        "badge": {
            "badgeEnabled": false
        },
        "queuedTimeoutInMinutes": 480,
        "environment": {
            "image": "aws/codebuild/standard:1.0",
            "computeType": "BUILD_GENERAL1_SMALL",
            "type": "LINUX_CONTAINER",
            "imagePullCredentialsType": "CODEBUILD",
            "privilegedMode": false,
            "environmentVariables": []
        },
        "artifacts": {
            "location": "codebuild-us-west-2-123456789012-output-bucket",
            "name": "my-cli-demo-project",
            "namespaceType": "NONE",
            "type": "S3",
            "packaging": "NONE",
            "encryptionDisabled": false
        },
        "source": {
            "type": "S3",
            "location": "codebuild-us-west-2-123456789012-input-bucket/my-
source.zip",
            "insecureSsl": false
        },
        "timeoutInMinutes": 60,
        "cache": {
            "type": "NO_CACHE"
        },
        "created": 1556839783.274
    }
```

}

Example 2: To create an AWS CodeBuild build project using a JSON input file for the parameters

The following create-project example creates a CodeBuild build project by passing all of the required parameters in a JSON input file. Create the input file template by running the command with only the --generate-cli-skeleton parameter.

aws codebuild create-project --cli-input-json file://create-project.json

The input JSON file create-project.json contains the following content:

```
{
    "name": "codebuild-demo-project",
    "source": {
        "type": "S3",
        "location": "codebuild-region-ID-account-ID-input-bucket/MessageUtil.zip"
    },
    "artifacts": {
        "type": "S3",
        "location": "codebuild-region-ID-account-ID-output-bucket"
    },
    "environment": {
        "type": "LINUX_CONTAINER",
        "image": "aws/codebuild/standard:1.0",
        "computeType": "BUILD_GENERAL1_SMALL"
    },
    "serviceRole": "serviceIAMRole"
}
```

Output:

```
{
    "project": {
        "name": "codebuild-demo-project",
        "serviceRole": "serviceIAMRole",
        "tags": [],
        "artifacts": {
            "packaging": "NONE",
            "type": "S3",
            "location": "codebuild-region-ID-account-ID-output-bucket",
            "
```

```
"name": "message-util.zip"
        },
        "lastModified": 1472661575.244,
        "timeoutInMinutes": 60,
        "created": 1472661575.244,
        "environment": {
            "computeType": "BUILD_GENERAL1_SMALL",
            "image": "aws/codebuild/standard:1.0",
            "type": "LINUX_CONTAINER",
            "environmentVariables": []
        },
        "source": {
            "type": "S3",
            "location": "codebuild-region-ID-account-ID-input-bucket/
MessageUtil.zip"
        },
        "encryptionKey": "arn:aws:kms:region-ID:account-ID:alias/aws/s3",
        "arn": "arn:aws:codebuild:region-ID:account-ID:project/codebuild-demo-
project"
    }
}
```

For more information, see Create a Build Project (AWS CLI) in the AWS CodeBuild User Guide.

• For API details, see CreateProject in AWS CLI Command Reference.

JavaScript

SDK for JavaScript (v3)

Note

There's more on GitHub. Find the complete example and learn how to set up and run in the <u>AWS Code Examples Repository</u>.

Create a project.

```
import {
   ArtifactsType,
   CodeBuildClient,
   ComputeType,
```

```
CreateProjectCommand,
  EnvironmentType,
  SourceType,
} from "@aws-sdk/client-codebuild";
// Create the AWS CodeBuild project.
export const createProject = async (
  projectName = "MyCodeBuilder",
 roleArn = "arn:aws:iam::xxxxxxxxxx:role/CodeBuildAdmin",
 buildOutputBucket = "xxxx",
 githubUrl = "https://...",
) => {
  const codeBuildClient = new CodeBuildClient({});
 const response = await codeBuildClient.send(
    new CreateProjectCommand({
      artifacts: {
        // The destination of the build artifacts.
        type: ArtifactsType.S3,
        location: buildOutputBucket,
      },
      // Information about the build environment. The combination of
 "computeType" and "type" determines the
     // requirements for the environment such as CPU, memory, and disk space.
      environment: {
        // Build environment compute types.
        // https://docs.aws.amazon.com/codebuild/latest/userguide/build-env-ref-
compute-types.html
        computeType: ComputeType.BUILD_GENERAL1_SMALL,
        // Docker image identifier.
        // See https://docs.aws.amazon.com/codebuild/latest/userguide/build-env-
ref-available.html
        image: "aws/codebuild/standard:7.0",
        // Build environment type.
        type: EnvironmentType.LINUX_CONTAINER,
      },
      name: projectName,
     // A role ARN with permission to create a CodeBuild project, write to the
 artifact location, and write CloudWatch logs.
      serviceRole: roleArn,
      source: {
        // The type of repository that contains the source code to be built.
        type: SourceType.GITHUB,
```

```
// The location of the repository that contains the source code to be
built.
      location: githubUrl,
    },
  }),
 );
console.log(response);
11
     {
11
        '$metadata': {
11
          httpStatusCode: 200,
          requestId: 'b428b244-777b-49a6-a48d-5dffedced8e7',
11
11
          extendedRequestId: undefined,
11
          cfId: undefined,
11
          attempts: 1,
11
          totalRetryDelay: 0
11
        },
11
        project: {
11
          arn: 'arn:aws:codebuild:us-east-1:xxxxxxxxx:project/MyCodeBuilder',
          artifacts: {
11
11
            encryptionDisabled: false,
11
            location: 'xxxxx-xxxxxx-xxxxx',
11
            name: 'MyCodeBuilder',
11
            namespaceType: 'NONE',
11
            packaging: 'NONE',
11
            type: 'S3'
11
          },
11
          badge: { badgeEnabled: false },
11
          cache: { type: 'NO_CACHE' },
11
          created: 2023-08-18T14:46:48.979Z,
          encryptionKey: 'arn:aws:kms:us-east-1:xxxxxxxxxx:alias/aws/s3',
11
//
          environment: {
            computeType: 'BUILD_GENERAL1_SMALL',
11
11
            environmentVariables: [],
11
            image: 'aws/codebuild/standard:7.0',
11
            imagePullCredentialsType: 'CODEBUILD',
11
            privilegedMode: false,
11
            type: 'LINUX_CONTAINER'
11
          },
11
          lastModified: 2023-08-18T14:46:48.979Z,
11
          name: 'MyCodeBuilder',
11
          projectVisibility: 'PRIVATE',
11
          queuedTimeoutInMinutes: 480,
11
          serviceRole: 'arn:aws:iam::xxxxxxxxxrole/CodeBuildAdmin',
11
          source: {
```

```
insecureSsl: false,
 11
             location: 'https://...',
 11
 11
             reportBuildStatus: false,
 11
             type: 'GITHUB'
 11
           },
 11
           timeoutInMinutes: 60
 11
         }
 //
       }
  return response;
};
```

- For more information, see AWS SDK for JavaScript Developer Guide.
- For API details, see <u>CreateProject</u> in AWS SDK for JavaScript API Reference.

For a complete list of AWS SDK developer guides and code examples, see <u>Using this service with</u> <u>an AWS SDK</u>. This topic also includes information about getting started and details about previous SDK versions.

Use ListBuilds with an AWS SDK or CLI

The following code examples show how to use ListBuilds.

C++

SDK for C++

í) Note

There's more on GitHub. Find the complete example and learn how to set up and run in the AWS Code Examples Repository.

```
//! List the CodeBuild builds.
/*!
   \param sortType: 'SortOrderType' type.
   \param clientConfiguration: AWS client configuration.
   \return bool: Function succeeded.
   */
bool AwsDoc::CodeBuild::listBuilds(Aws::CodeBuild::Model::SortOrderType sortType,
```

```
const Aws::Client::ClientConfiguration
&clientConfiguration) {
   Aws::CodeBuild::CodeBuildClient codeBuildClient(clientConfiguration);
   Aws::CodeBuild::Model::ListBuildsRequest listBuildsRequest;
   listBuildsRequest.SetSortOrder(sortType);
   Aws::String nextToken; // Used for pagination.
   do {
       if (!nextToken.empty()) {
           listBuildsRequest.SetNextToken(nextToken);
       }
       Aws::CodeBuild::Model::ListBuildsOutcome listBuildsOutcome =
codeBuildClient.ListBuilds(
               listBuildsRequest);
       if (listBuildsOutcome.IsSuccess()) {
           const Aws::Vector<Aws::String> &ids =
listBuildsOutcome.GetResult().GetIds();
           if (!ids.empty()) {
               std::cout << "Information about each build:" << std::endl;</pre>
               Aws::CodeBuild::Model::BatchGetBuildsRequest getBuildsRequest;
               getBuildsRequest.SetIds(listBuildsOutcome.GetResult().GetIds());
               Aws::CodeBuild::Model::BatchGetBuildsOutcome getBuildsOutcome =
codeBuildClient.BatchGetBuilds(
                       getBuildsRequest);
               if (getBuildsOutcome.IsSuccess()) {
                   const Aws::Vector<Aws::CodeBuild::Model::Build> &builds =
getBuildsOutcome.GetResult().GetBuilds();
                   std::cout << builds.size() << " build(s) found." <</pre>
std::endl;
                   for (auto val: builds) {
                       std::cout << val.GetId() << std::endl;</pre>
                   }
               } else {
                   std::cerr << "Error getting builds"</pre>
                              << getBuildsOutcome.GetError().GetMessage() <<
std::endl;
                   return false;
               }
```

```
} else {
                 std::cout << "No builds found." << std::endl;</pre>
            }
            // Get the next token for pagination.
            nextToken = listBuildsOutcome.GetResult().GetNextToken();
        } else {
            std::cerr << "Error listing builds"</pre>
                       << listBuildsOutcome.GetError().GetMessage()
                       << std::endl;
            return false;
        }
    } while (!nextToken.
            empty()
            );
    return true;
}
```

• For API details, see ListBuilds in AWS SDK for C++ API Reference.

CLI

AWS CLI

To get a list of AWS CodeBuild builds IDs.

The following list-builds example gets a list of CodeBuild IDs sorted in ascending order.

aws codebuild list-builds --sort-order ASCENDING

The output includes a nextToken value which indicates that there is more output available.

```
{
    "nextToken": "4AEA6u7J...The full token has been omitted for
    brevity...MzY2OA==",
    "ids": [
```

```
"codebuild-demo-project:815e755f-bade-4a7e-80f0-efe51EXAMPLE"
    "codebuild-demo-project:84a7f3d1-d40e-4956-b4cf-7a9d4EXAMPLE"
    ... The full list of build IDs has been omitted for brevity ...
    "codebuild-demo-project:931d0b72-bf6f-4040-a472-5c707EXAMPLE"
]
}
```

Run this command again and provide the nextToken value in the previous response as a parameter to get the next part of the output. Repeat until you don't receive a nextToken value in the response.

```
aws codebuild list-builds --sort-order ASCENDING --next-
token 4AEA6u7J...The full token has been omitted for brevity...MzY20A==
```

Next part of the output:

```
{
    "ids": [
        "codebuild-demo-project:49015049-21cf-4b50-9708-df115EXAMPLE",
        "codebuild-demo-project:543e7206-68a3-46d6-a4da-759abEXAMPLE",
        ... The full list of build IDs has been omitted for brevity ...
        "codebuild-demo-project:c282f198-4582-4b38-bdc0-26f96EXAMPLE"
    ]
}
```

For more information, see View a List of Build IDs (AWS CLI) in the AWS CodeBuild User Guide

• For API details, see ListBuilds in AWS CLI Command Reference.

For a complete list of AWS SDK developer guides and code examples, see <u>Using this service with</u> <u>an AWS SDK</u>. This topic also includes information about getting started and details about previous SDK versions.

Use ListProjects with an AWS SDK or CLI

The following code examples show how to use ListProjects.

C++

SDK for C++

Note

There's more on GitHub. Find the complete example and learn how to set up and run in the <u>AWS Code Examples Repository</u>.

```
//! List the CodeBuild projects.
/*!
 \param sortType: 'SortOrderType' type.
 \param clientConfiguration: AWS client configuration.
 \return bool: Function succeeded.
 */
bool AwsDoc::CodeBuild::listProjects(Aws::CodeBuild::Model::SortOrderType
 sortType,
                                     const Aws::Client::ClientConfiguration
 &clientConfiguration) {
    Aws::CodeBuild::CodeBuildClient codeBuildClient(clientConfiguration);
    Aws::CodeBuild::Model::ListProjectsRequest listProjectsRequest;
    listProjectsRequest.SetSortOrder(sortType);
    Aws::String nextToken; // Next token for pagination.
    Aws::Vector<Aws::String> allProjects;
    do {
        if (!nextToken.empty()) {
            listProjectsRequest.SetNextToken(nextToken);
        }
        Aws::CodeBuild::Model::ListProjectsOutcome outcome =
 codeBuildClient.ListProjects(
                listProjectsRequest);
        if (outcome.IsSuccess()) {
            const Aws::Vector<Aws::String> &projects =
 outcome.GetResult().GetProjects();
            allProjects.insert(allProjects.end(), projects.begin(),
 projects.end());
```

• For API details, see ListProjects in AWS SDK for C++ API Reference.

CLI

AWS CLI

To get a list of AWS CodeBuild build project names.

The following list-projects example gets a list of CodeBuild build projects sorted by name in ascending order.

```
aws codebuild list-projects --sort-by NAME --sort-order ASCENDING
```

The output includes a nextToken value which indicates that there is more output available.

```
{
    "nextToken": "Ci33ACF6...The full token has been omitted for brevity...U
+AkMx8=",
    "projects": [
        "codebuild-demo-project",
        "codebuild-demo-project2",
```

```
... The full list of build project names has been omitted for
brevity ...
"codebuild-demo-project99"
]
}
```

Run this command again and provide the nextToken value from the previous response as a parameter to get the next part of the output. Repeat until you don't receive a nextToken value in the response.

```
aws codebuild list-projects --sort-by NAME --sort-order ASCENDING --next-
token Ci33ACF6...The full token has been omitted for brevity...U+AkMx8=
{
    "projects": [
        "codebuild-demo-project100",
        "codebuild-demo-project101",
        ... The full list of build project names has been omitted for brevity ...
        "codebuild-demo-project122"
    ]
}
```

For more information, see <u>View a List of Build Project Names (AWS CLI)</u> in the AWS CodeBuild User Guide.

• For API details, see ListProjects in AWS CLI Command Reference.

For a complete list of AWS SDK developer guides and code examples, see <u>Using this service with</u> <u>an AWS SDK</u>. This topic also includes information about getting started and details about previous SDK versions.

Use StartBuild with an AWS SDK or CLI

The following code examples show how to use StartBuild.

C++

SDK for C++

Note

There's more on GitHub. Find the complete example and learn how to set up and run in the AWS Code Examples Repository.

```
//! Start an AWS CodeBuild project build.
/*!
 \param projectName: A CodeBuild project name.
 \param clientConfiguration: AWS client configuration.
 \return bool: Function succeeded.
 */
bool AwsDoc::CodeBuild::startBuild(const Aws::String &projectName,
                                    const Aws::Client::ClientConfiguration
&clientConfiguration) {
    Aws::CodeBuild::CodeBuildClient codeBuildClient(clientConfiguration);
    Aws::CodeBuild::Model::StartBuildRequest startBuildRequest;
    startBuildRequest.SetProjectName(projectName);
    Aws::CodeBuild::Model::StartBuildOutcome outcome =
 codeBuildClient.StartBuild(
            startBuildRequest);
    if (outcome.IsSuccess()) {
        std::cout << "Successfully started build" << std::endl;</pre>
        std::cout << "Build ID: " << outcome.GetResult().GetBuild().GetId()</pre>
                  << std::endl;
    }
    else {
        std::cerr << "Error starting build" << outcome.GetError().GetMessage()</pre>
                  << std::endl;
    }
    return outcome.IsSuccess();
}
```

• For API details, see <u>StartBuild</u> in AWS SDK for C++ API Reference.

CLI

AWS CLI

To start running a build of an AWS CodeBuild build project.

The following start-build example starts a build for the specified CodeBuild project. The build overrides both the project's setting for the number of minutes the build is allowed to be queued before it times out and the project's artifact settings.

```
aws codebuild start-build \
    --project-name "my-demo-project" \
    --queued-timeout-in-minutes-override 5 \
    --artifacts-override {"\"type\": \"S3\",\"location\":
    \"arn:aws:s3:::artifacts-override\",\"overrideArtifactName\":true"}
```

Output:

```
{
    "build": {
        "serviceRole": "arn:aws:iam::123456789012:role/service-role/my-codebuild-
service-role",
        "buildStatus": "IN_PROGRESS",
        "buildComplete": false,
        "projectName": "my-demo-project",
        "timeoutInMinutes": 60,
        "source": {
            "insecureSsl": false,
            "type": "S3",
            "location": "codebuild-us-west-2-123456789012-input-bucket/my-
source.zip"
        },
        "queuedTimeoutInMinutes": 5,
        "encryptionKey": "arn:aws:kms:us-west-2:123456789012:alias/aws/s3",
        "currentPhase": "QUEUED",
        "startTime": 1556905683.568,
        "environment": {
            "computeType": "BUILD_GENERAL1_MEDIUM",
            "environmentVariables": [],
            "type": "LINUX_CONTAINER",
```

```
"privilegedMode": false,
            "image": "aws/codebuild/standard:1.0",
            "imagePullCredentialsType": "CODEBUILD"
        },
        "phases": [
            {
                "phaseStatus": "SUCCEEDED",
                "startTime": 1556905683.568,
                "phaseType": "SUBMITTED",
                "durationInSeconds": 0,
                "endTime": 1556905684.524
            },
            {
                "startTime": 1556905684.524,
                "phaseType": "QUEUED"
            }
        ],
        "logs": {
            "deepLink": "https://console.aws.amazon.com/cloudwatch/home?
region=us-west-2#logEvent:group=null;stream=null"
        },
        "artifacts": {
            "encryptionDisabled": false,
            "location": "arn:aws:s3:::artifacts-override/my-demo-project",
            "overrideArtifactName": true
        },
        "cache": {
            "type": "NO CACHE"
        },
        "id": "my-demo-project::12345678-a1b2-c3d4-e5f6-11111EXAMPLE",
        "initiator": "my-aws-account-name",
        "arn": "arn:aws:codebuild:us-west-2:123456789012:build/my-demo-
project::12345678-a1b2-c3d4-e5f6-11111EXAMPLE"
    }
}
```

For more information, see Run a Build (AWS CLI) in the AWS CodeBuild User Guide.

• For API details, see <u>StartBuild</u> in AWS CLI Command Reference.

For a complete list of AWS SDK developer guides and code examples, see <u>Using this service with</u> <u>an AWS SDK</u>. This topic also includes information about getting started and details about previous SDK versions.

Troubleshooting AWS CodeBuild

Use the information in this topic to help you identify, diagnose, and address issues. To learn how to log and monitor CodeBuild builds to troubleshoot issues, see Logging and monitoring.

Topics

- Apache Maven builds reference artifacts from the wrong repository
- Build commands run as root by default
- Builds might fail when file names have non-U.S. English characters
- Builds might fail when getting parameters from Amazon EC2 Parameter Store
- Cannot access branch filter in the CodeBuild console
- <u>Cannot view build success or failure</u>
- Build status not reported to source provider
- Cannot find and select the base image of the Windows Server Core 2019 platform
- Earlier commands in buildspec files are not recognized by later commands
- Error: "Access denied" when attempting to download cache
- Error: "BUILD_CONTAINER_UNABLE_TO_PULL_IMAGE" when using a custom build image
- Error: "Build container found dead before completing the build. build container died because it was out of memory, or the Docker image is not supported. ErrorCode: 500"
- Error: "Cannot connect to the Docker daemon" when running a build
- Error: "CodeBuild is not authorized to perform: sts:AssumeRole" when creating or updating a build project
- Error: "Error calling GetBucketAcl: Either the bucket owner has changed or the service role no longer has permission to called s3:GetBucketAcl"
- Error: "Failed to upload artifacts: Invalid arn" when running a build
- Error: "Git clone failed: Unable to access 'your-repository-URL': SSL certificate problem: Self signed certificate"
- Error: "The bucket you are attempting to access must be addressed using the specified endpoint" when running a build
- Error: "This build image requires selecting at least one runtime version."
- Error: "QUEUED: INSUFFICIENT_SUBNET" when a build in a build queue fails

- Error: "Unable to download cache: RequestError: Send request failed caused by: x509: Failed to load system roots and no roots provided"
- Error: "Unable to download certificate from S3. AccessDenied"
- Error: "Unable to locate credentials"
- <u>RequestError timeout error when running CodeBuild in a proxy server</u>
- The bourne shell (sh) must exist in build images
- Warning: "Skipping install of runtimes. runtime version selection is not supported by this build image" when running a build
- Error: "Unable to verify JobWorker identity" when opening the CodeBuild console
- Build failed to start
- Accessing GitHub metadata in locally cached builds
- AccessDenied: The bucket owner for the report group does not match the owner of the S3 bucket...

Apache Maven builds reference artifacts from the wrong repository

Issue: When you use Maven with an AWS CodeBuild-provided Java build environment, Maven pulls build and plugin dependencies from the secure central Maven repository at https://repo1.maven.org/maven2. This happens even if your build project's pom.xml file explicitly declares other locations to use instead.

Possible cause: CodeBuild-provided Java build environments include a file named settings.xml that is preinstalled in the build environment's /root/.m2 directory. This settings.xml file contains the following declarations, which instruct Maven to always pull build and plugin dependencies from the secure central Maven repository at https://repo1.maven.org/maven2.

```
<settings>
<activeProfiles>
<activeProfile>securecentral</activeProfile>
</activeProfiles>
<profiles>
<profile>
<id>securecentral</id>
<repositories>
<repository>
```

```
<id>central</id>
          <url>https://repo1.maven.org/maven2</url>
          <releases>
            <enabled>true</enabled>
          </releases>
        </repository>
      </repositories>
      <pluginRepositories>
        <pluginRepository>
          <id>central</id>
          <url>https://repo1.maven.org/maven2</url>
          <releases>
            <enabled>true</enabled>
          </releases>
        </pluginRepository>
      </pluginRepositories>
    </profile>
  </profiles>
</settings>
```

Recommended solution: Do the following:

- 1. Add a settings.xml file to your source code.
- 2. In this settings.xml file, use the preceding settings.xml format as a guide to declare the repositories you want Maven to pull the build and plugin dependencies from instead.
- 3. In the install phase of your build project, instruct CodeBuild to copy your settings.xml file to the build environment's /root/.m2 directory. For example, consider the following snippet from a buildspec.yml file that demonstrates this behavior.

```
version 0.2
phases:
    install:
        commands:
        - cp ./settings.xml /root/.m2/settings.xml
```

Build commands run as root by default

Issue: AWS CodeBuild runs your build commands as the root user. This happens even if your related build image's Dockerfile sets the USER instruction to a different user.

Cause: By default, CodeBuild runs all build commands as the root user.

Recommended solution: None.

Builds might fail when file names have non-U.S. English characters

Issue: When you run a build that uses files with file names that contain non-U.S. English characters (for example, Chinese characters), the build fails.

Possible cause: Build environments provided by AWS CodeBuild have their default locale set to POSIX. POSIX localization settings are less compatible with CodeBuild and file names that contain non-U.S. English characters and can cause related builds to fail.

Recommended solution: Add the following commands to the pre_build section of your buildspec file. These commands make the build environment use U.S. English UTF-8 for its localization settings, which is more compatible with CodeBuild and file names that contain non-U.S. English characters.

For build environments based on Ubuntu:

pre_build: commands:

- export LC_ALL="en_US.UTF-8"
- locale-gen en_US en_US.UTF-8
- dpkg-reconfigure locales

For build environments based on Amazon Linux:

```
pre_build:
    commands:
    - export LC_ALL="en_US.utf8"
```

Builds might fail when getting parameters from Amazon EC2 Parameter Store

Issue: When a build tries to get the value of one or more parameters stored in Amazon EC2 Parameter Store, the build fails in the DOWNLOAD_SOURCE phase with the error Parameter does not exist.

Possible cause: The service role the build project relies on does not have permission to call the ssm: GetParameters action or the build project uses a service role that is generated by AWS CodeBuild and allows calling the ssm:GetParameters action, but the parameters have names that do not start with /CodeBuild/.

Recommended solutions:

 If the service role was not generated by CodeBuild, update its definition to allow CodeBuild to call the ssm:GetParameters action. For example, the following policy statement allows calling the ssm:GetParameters action to get parameters with names starting with /CodeBuild/:

```
{
   "Version": "2012-10-17",
   "Statement": [
    {
        "Action": "ssm:GetParameters",
        "Effect": "Allow",
        "Resource": "arn:aws:ssm:REGION_ID:ACCOUNT_ID:parameter/CodeBuild/*"
    }
]
}
```

 If the service role was generated by CodeBuild, update its definition to allow CodeBuild to access parameters in Amazon EC2 Parameter Store with names other than those starting with /CodeBuild/. For example, the following policy statement allows calling the ssm:GetParameters action to get parameters with the specified name:

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Action": "ssm:GetParameters",
            "Effect": "Allow",
            "Resource": "arn:aws:ssm:REGION_ID:ACCOUNT_ID:parameter/PARAMETER_NAME"
        }
    ]
}
```

Cannot access branch filter in the CodeBuild console

Issue: The branch filter option is not available in the console when you create or update an AWS CodeBuild project.

Possible cause: The branch filter option is deprecated. It has been replaced by webhook filter groups, which provide more control over the webhook events that trigger a new build in CodeBuild.

Recommended solution: To migrate a branch filter that you created before the introduction of webhook filters, create a webhook filter group with a HEAD_REF filter with the regular expression ^refs/heads/branchName\$. For example, if your branch filter regular expression was ^branchName\$, then the updated regular expression you put in the HEAD_REF filter is ^refs/ heads/branchName\$. For more information, see <u>Bitbucket webhook events</u> and <u>Filter GitHub</u> webhook events (console).

Cannot view build success or failure

Issue: You cannot see the success or failure of a retried build.

Possible cause: The option to report your build's status is not enabled.

Recommended solutions: Enable **Report build status** when you create or update a CodeBuild project. This option tells CodeBuild to report back the status when you trigger a build. For more information, see reportBuildStatus in the AWS CodeBuild API Reference.

Build status not reported to source provider

Issue: After allowing build status reporting to a source provider, such as GitHub or Bitbucket, the build status is not updated.

Possible cause: The user associated with the source provider does not have write access to the repo.

Recommended solutions: To be able to report the build status to the source provider, the user associated with the source provider must have write access to the repo. If the user does not have write access, the build status cannot be updated. For more information, see <u>Source provider access</u>.

Cannot access branch filter in the CodeBuild console

Cannot find and select the base image of the Windows Server Core 2019 platform

Issue: You cannot find or select the base image of the Windows Server Core 2019 platform.

Possible cause: You are using an AWS Region that does not support this image.

Recommended solutions: Use one of the following AWS Regions where the base image of the Windows Server Core 2019 platform is supported:

- US East (N. Virginia)
- US East (Ohio)
- US West (Oregon)
- Europe (Ireland)

Earlier commands in buildspec files are not recognized by later commands

Issue: The results of one or more commands in your buildspec file are not recognized by later commands in the same buildspec file. For example, a command might set a local environment variable, but a command run later might fail to get the value of that local environment variable.

Possible cause: In buildspec file version 0.1, AWS CodeBuild runs each command in a separate instance of the default shell in the build environment. This means that each command runs in isolation from all other commands. By default, then, you cannot run a single command that relies on the state of any previous commands.

Recommended solutions: We recommend that you use build spec version 0.2, which solves this issue. If you must use buildspec version 0.1, we recommend that you use the shell command chaining operator (for example, && in Linux) to combine multiple commands into a single command. Or include a shell script in your source code that contains multiple commands, and then call that shell script from a single command in the buildspec file. For more information, see <u>Shells</u> and commands in build environments and <u>Environment variables in build environments</u>.

Error: "Access denied" when attempting to download cache

Issue: When attempting to download the cache on a build project that has cache enabled, you receive an Access denied error.

Possible causes:

- You have just configured caching as part of your build project.
- The cache has recently been invalidated through the InvalidateProjectCache API.
- The service role being used by CodeBuild does not have s3:GetObject and s3:PutObject permissions to the S3 bucket that is holding the cache.

Recommended solution: For first time use, it's normal to see this immediately after updating the cache configuration. If this error persists, then you should check to see if your service role has s3:GetObject and s3:PutObject permissions to the S3 bucket that is holding the cache. For more information, see <u>Specifying S3 permissions</u> in the *Amazon S3 Developer Guide*.

Error: "BUILD_CONTAINER_UNABLE_TO_PULL_IMAGE" when using a custom build image

Issue: When you try to run a build that uses a custom build image, the build fails with the error BUILD_CONTAINER_UNABLE_TO_PULL_IMAGE.

Possible cause: The build image's overall uncompressed size is larger than the build environment compute type's available disk space. To check your build image's size, use Docker to run the docker images REPOSITORY: TAG command. For a list of available disk space by compute type, see <u>Build</u> environment compute modes and types.

Recommended solution: Use a larger compute type with more available disk space, or reduce the size of your custom build image.

Possible cause: AWS CodeBuild does not have permission to pull the build image from your Amazon Elastic Container Registry (Amazon ECR).

Recommended solution: Update the permissions in your repository in Amazon ECR so that CodeBuild can pull your custom build image into the build environment. For more information, see the Amazon ECR sample. **Possible cause:** The Amazon ECR image you requested is not available in the AWS Region that your AWS account is using.

Recommended solution: Use an Amazon ECR image that is in the same AWS Region as the one your AWS account is using.

Possible cause: You are using a private registry in a VPC that does not have public internet access. CodeBuild cannot pull an image from a private IP address in a VPC. For more information, see <u>Private</u> registry with AWS Secrets Manager sample for CodeBuild.

Recommended solution: If you use a private registry in a VPC, make sure the VPC has public internet access.

Possible cause: If the error message contains "**toomanyrequests**", and the image is obtained from Docker Hub, this error means the Docker Hub pull limit has been reached.

Recommended solution: Use a Docker Hub private registry, or obtain your image from Amazon ECR. For more information about using a private registry, see <u>Private registry with AWS Secrets</u> <u>Manager sample for CodeBuild</u>. For more information about using Amazon ECR, see <u>Amazon</u> <u>ECR sample for CodeBuild</u>.

Error: "Build container found dead before completing the build. build container died because it was out of memory, or the Docker image is not supported. ErrorCode: 500"

Issue: When you try to use a Microsoft Windows or Linux container in AWS CodeBuild, this error occurs during the PROVISIONING phase.

Possible causes:

- The container OS version is not supported by CodeBuild.
- HTTP_PROXY, HTTPS_PROXY, or both are specified in the container.

Recommended solutions:

• For Microsoft Windows, use a Windows container with a container OS that is version microsoft/ windowsservercore:10.0.x (for example, microsoft/windowsservercore:10.0.14393.2125).

 For Linux, clear the HTTP_PROXY and HTTPS_PROXY settings in your Docker image, or specify the VPC configuration in your build project.

Error: "Cannot connect to the Docker daemon" when running a build

Issue: Your build fails and you receive an error similar to Cannot connect to the Docker daemon at unix:/var/run/docker.sock. Is the docker daemon running? in the build log.

Possible cause: You are not running your build in privileged mode.

Recommended solution: To fix this error, you must enable privileged mode and update your buildspec using the following instructions.

To run your build in privileged mode, follow these steps:

- 1. Open the CodeBuild console at https://console.aws.amazon.com/codebuild/.
- 2. In the navigation pane, choose **Build projects**, then choose your build project.
- 3. From **Edit**, choose **Environment**.
- 4. Choose Additional configuration.
- 5. From Privileged, select Enable this flag if you want to build Docker images or want your builds to get elevated privileges.
- 6. Choose **Update environment**.
- 7. Choose **Start build** to retry your build.

You'll also need to start the Docker daemon inside your container. The install phase of your buildspec might look similar to this.

```
phases:
    install:
        commands:
            - nohup /usr/local/bin/dockerd --host=unix:///var/run/docker.sock --
host=tcp://127.0.0.1:2375 --storage-driver=overlay2 &
            - timeout 15 sh -c "until docker info; do echo .; sleep 1; done"
```

For more information about the OverlayFS storage driver referenced in the buildspec file, see <u>Use</u> the OverlayFS storage driver on the Docker website.

🚺 Note

If the base operating system is Alpine Linux, in the buildspec.yml add the -t argument to timeout:

- timeout -t 15 sh -c "until docker info; do echo .; sleep 1; done"

To learn more about how to build and run a Docker image by using AWS CodeBuild, see <u>Docker in</u> custom image sample for CodeBuild.

Error: "CodeBuild is not authorized to perform: sts:AssumeRole" when creating or updating a build project

Issue: When you try to create or update a build project, you receive the error Code:InvalidInputException, Message:CodeBuild is not authorized to perform: sts:AssumeRole on arn:aws:iam::account-ID:role/service-role-name.

Possible causes:

- The AWS Security Token Service (AWS STS) has been deactivated for the AWS region where you are attempting to create or update the build project.
- The AWS CodeBuild service role associated with the build project does not exist or does not have sufficient permissions to trust CodeBuild.

Recommended solutions:

- Make sure AWS STS is activated for the AWS region where you are attempting to create or update the build project. For more information, see <u>Activating and deactivating AWS STS in an</u> <u>AWS Region</u> in the *IAM User Guide*.
- Make sure the target CodeBuild service role exists in your AWS account. If you are not using the console, make sure you did not misspell the Amazon Resource Name (ARN) of the service role when you created or updated the build project.

 Make sure the target CodeBuild service role has sufficient permissions to trust CodeBuild. For more information, see the trust relationship policy statement in <u>Allow CodeBuild to interact with</u> other AWS services.

Error: "Error calling GetBucketAcl: Either the bucket owner has changed or the service role no longer has permission to called s3:GetBucketAcl"

Issue: When you run a build, you receive an error about a change in ownership of an S3 bucket and GetBucketAcl permissions.

Possible cause: You added the s3:GetBucketAcl and s3:GetBucketLocation permissions to your IAM role. These permissions secure your project's S3 bucket and ensure that only you can access it. After you added these permissions, the owner of the S3 bucket changed.

Recommended solution: Verify you are an owner of the S3 bucket, and then add permissions to your IAM role again. For more information, see <u>Secure access to S3 buckets</u>.

Error: "Failed to upload artifacts: Invalid arn" when running a build

Issue: When you run a build, the UPLOAD_ARTIFACTS build phase fails with the error Failed to upload artifacts: Invalid arn.

Possible cause: Your S3 output bucket (the bucket where AWS CodeBuild stores its output from the build) is in an AWS Region different from the CodeBuild build project.

Recommended solution: Update the build project's settings to point to an output bucket that is in the same AWS Region as the build project.

Error: "Git clone failed: Unable to access 'your-repository-URL': SSL certificate problem: Self signed certificate"

Issue: When you try to run a build project, the build fails with this error.

Possible cause: Your source repository has a self-signed certificate, but you have not chosen to install the certificate from your S3 bucket as part of your build project.

Recommended solutions:

- Edit your project. For **Certificate**, choose **Install certificate from S3**. For **Bucket of certificate**, choose the S3 bucket where your SSL certificate is stored. For **Object key of certificate**, enter the name of your S3 object key.
- Edit your project. Select **Insecure SSL** to ignore SSL warnings while connecting to your GitHub Enterprise Server project repository.

🚯 Note

We recommend that you use **Insecure SSL** for testing only. It should not be used in a production environment.

Error: "The bucket you are attempting to access must be addressed using the specified endpoint" when running a build

Issue: When you run a build, the DOWNLOAD_SOURCE build phase fails with the error The bucket you are attempting to access must be addressed using the specified endpoint. Please send all future requests to this endpoint.

Possible cause: Your pre-built source code is stored in an S3 bucket, and that bucket is in an AWS Region different from the AWS CodeBuild build project.

Recommended solution: Update the build project's settings to point to a bucket that contains your pre-built source code. Make sure that bucket is in the same AWS Region as the build project.

Error: "This build image requires selecting at least one runtime version."

Issue: When you run a build, the DOWNLOAD_SOURCE build phase fails with the error YAML_FILE_ERROR: This build image requires selecting at least one runtime version.

Possible cause: Your build uses version 1.0 or later of the Amazon Linux 2 (AL2) standard image, or version 2.0 or later of the Ubuntu standard image, and a runtime is not specified in the buildspec file.

Recommended solution: If you use the aws/codebuild/standard:2.0 CodeBuild managed image, you must specify a runtime version in the runtime-versions section of the buildspec file. For example, you might use the following buildspec file for a project that uses PHP:

1 Note

If you specify a runtime-versions section and use an image other than Ubuntu Standard Image 2.0 or later, or the Amazon Linux 2 (AL2) standard image 1.0 or later, the build issues the warning, "Skipping install of runtimes. Runtime version selection is not supported by this build image."

For more information, see Specify runtime versions in the buildspec file.

Error: "QUEUED: INSUFFICIENT_SUBNET" when a build in a build queue fails

Issue: A build in a build queue fails with an error similar to QUEUED: INSUFFICIENT_SUBNET.

Possible causes: The IPv4 CIDR block specified for your VPC uses a reserved IP address. The first four IP addresses and the last IP address in each subnet CIDR block are not available for you to use and cannot be assigned to an instance. For example, in a subnet with CIDR block 10.0.0/24, the following five IP addresses are reserved:

• 10.0.0.0: Network address.

- 10.0.0.1: Reserved by AWS for the VPC router.
- 10.0.0.2: Reserved by AWS. The IP address of the DNS server is always the base of the VPC network range plus two; however, we also reserve the base of each subnet range plus two. For VPCs with multiple CIDR blocks, the IP address of the DNS server is located in the primary CIDR. For more information, see Amazon DNS server in the Amazon VPC User Guide.
- 10.0.0.3: Reserved by AWS for future use.
- 10.0.0.255: Network broadcast address. We do not support broadcast in a VPC. This address is reserved.

Recommended solutions: Check if your VPC uses a reserved IP address. Replace any reserved IP address with one that is not reserved. For more information, see <u>VPC and subnet sizing</u> in the *Amazon VPC User Guide*.

Error: "Unable to download cache: RequestError: Send request failed caused by: x509: Failed to load system roots and no roots provided"

Issue: When you try to run a build project, the build fails with this error.

Possible cause: You configured caching as part of your build project and are using an older Docker image that includes an expired root certificate.

Recommended solution: Update the Docker image that is being used in your AWS CodeBuild the project. For more information, see Docker images provided by CodeBuild.

Error: "Unable to download certificate from S3. AccessDenied"

Issue: When you try to run a build project, the build fails with this error.

Possible causes:

- You have chosen the wrong S3 bucket for your certificate.
- You have entered the wrong object key for your certificate.

Recommended solutions:

- Edit your project. For **Bucket of certificate**, choose the S3 bucket where your SSL certificate is stored.
- Edit your project. For Object key of certificate, enter the name of your S3 object key.

Error: "Unable to locate credentials"

Issue: When you try to run the AWS CLI, use an AWS SDK, or call another similar component as part of a build, you get build errors that are directly related to the AWS CLI, AWS SDK, or component. For example, you might get a build error such as Unable to locate credentials.

Possible causes:

- The version of the AWS CLI, AWS SDK, or component in the build environment is incompatible with AWS CodeBuild.
- You are running a Docker container within a build environment that uses Docker, and the container does not have access to the AWS credentials by default.

Recommended solutions:

- Make sure your build environment has the following version or higher of the AWS CLI, AWS SDK, or component.
 - AWS CLI: 1.10.47
 - AWS SDK for C++: 0.2.19
 - AWS SDK for Go: 1.2.5
 - AWS SDK for Java: 1.11.16
 - AWS SDK for JavaScript: 2.4.7
 - AWS SDK for PHP: 3.18.28
 - AWS SDK for Python (Boto3): 1.4.0
 - AWS SDK for Ruby: 2.3.22
 - Botocore: 1.4.37
 - CoreCLR: 3.2.6-beta
 - Node.js: 2.4.7
- If you need to run a Docker container in a build environment and the container requires AWS credentials, you must pass through the credentials from the build environment to the container.

In your buildspec file, include a Docker run command such as the following. This example uses the aws s3 ls command to list your available S3 buckets. The -e option passes through the environment variables required for your container to access AWS credentials.

```
docker run -e AWS_DEFAULT_REGION -e AWS_CONTAINER_CREDENTIALS_RELATIVE_URI your-
image-tag aws s3 ls
```

- If you are building a Docker image and the build requires AWS credentials (for example, to download a file from Amazon S3), you must pass through the credentials from the build environment to the Docker build process as follows.
 - 1. In your source code's Dockerfile for the Docker image, specify the following ARG instructions.

```
ARG AWS_DEFAULT_REGION
ARG AWS_CONTAINER_CREDENTIALS_RELATIVE_URI
```

 In your buildspec file, include a Docker build command such as the following. The --buildarg options sets the environment variables required for your Docker build process to access the AWS credentials.

```
docker build --build-arg AWS_DEFAULT_REGION=$AWS_DEFAULT_REGION --build-arg
AWS_CONTAINER_CREDENTIALS_RELATIVE_URI=$AWS_CONTAINER_CREDENTIALS_RELATIVE_URI -
t your-image-tag .
```

RequestError timeout error when running CodeBuild in a proxy server

Issue: You receive a RequestError error similar to one of the following:

- RequestError: send request failed caused by: Post https://logs.<yourregion>.amazonaws.com/: dial tcp 52.46.158.105:443: i/o timeout from CloudWatch Logs.
- Error uploading artifacts: RequestError: send request failed caused by: Put https://your-bucket.s3.your-aws-region.amazonaws.com/*: dial tcp 52.219.96.208:443: connect: connection refused from Amazon S3.

Possible causes:

RequestError timeout error when running CodeBuild in a proxy server

- ssl-bump is not configured properly.
- Your organization's security policy does not allow you to use ssl_bump.
- Your buildspec file does not have proxy settings specified using a proxy element.

Recommended solutions:

- Make sure ssl-bump is configured properly. If you use Squid for your proxy server, see Configure Squid as an explicit proxy server.
- Follow these steps to use private endpoints for Amazon S3 and CloudWatch Logs:
 - In your private subnet routing table, remove the rule you added that routes traffic destined for the internet to your proxy server. For information, see <u>Creating a subnet in your VPC</u> in the *Amazon VPC User Guide*.
 - 2. Create a private Amazon S3 endpoint and CloudWatch Logs endpoint and associate them with the private subnet of your Amazon VPC. For information, see <u>VPC endpoint services</u> in the *Amazon VPC User Guide*.
 - 3. Confirm **Enable Private DNS Name** in your Amazon VPC is selected. For more information, see Creating an interface endpoint in the *Amazon VPC User Guide*.
- If you do not use ssl-bump for an explicit proxy server, add a proxy configuration to your buildspec file using a proxy element. For more information, see <u>Run CodeBuild in an explicit</u> <u>proxy server</u> and <u>Buildspec syntax</u>.

```
version: 0.2
proxy:
    upload-artifacts: yes
    logs: yes
phases:
    build:
        commands:
```

The bourne shell (sh) must exist in build images

Issue: You are using a build image that is not provided by AWS CodeBuild, and your builds fail with the message Build container found dead before completing the build.

The bourne shell (sh) must exist in build images

Possible cause: The Bourne shell (sh) is not included in your build image. CodeBuild needs sh to run build commands and scripts.

Recommended solution: If sh in not present in your build image, be sure to include it before you start any more builds that use your image. (CodeBuild already includes sh in its build images.)

Warning: "Skipping install of runtimes. runtime version selection is not supported by this build image" when running a build

Issue: When you run a build, the build log contains this warning.

Possible cause: Your build does not use version 1.0 or later of the Amazon Linux 2 (AL2) standard image, or version 2.0 or later of the Ubuntu standard image, and a runtime is specified in a runtime-versions section in your buildspec file.

Recommended solution: Be sure your buildspec file does not contain a runtime-versions section. The runtime-versions section is only required if you use the Amazon Linux 2 (AL2) standard image or later or the Ubuntu standard image version 2.0 or later.

Error: "Unable to verify JobWorker identity" when opening the CodeBuild console

Issue: When you open the CodeBuild console, an "Unable to verify JobWorker identity" error message is displayed.

Possible cause: The IAM role that is used for console access has a tag with jobId as the key. This tag key is reserved for CodeBuild and will cause this error if it is present.

Recommended solution: Change any custom IAM role tags that have the key jobId to have a different key, such as jobIdentifier.

Build failed to start

Issue: When starting a build, you receive a **Build failed to start** error message.

Possible cause: The number of concurrent builds has been reached.

Recommended solutions: Wait until other builds are complete, or increase the concurrent build limit for the project, and start the build again. For more information, see Project configuration.

Accessing GitHub metadata in locally cached builds

Issue: In some cases, the .git directory in a cached build is a text file and not a directory.

Possible causes: When local source caching is enabled for a build, CodeBuild creates a gitlink for the .git directory. This means that the .git directory is actually a text file containing the path to the directory.

Recommended solutions: In all cases, use the following command to obtain the Git metadata directory. This command will work no matter the format of .git:

git rev-parse --git-dir

AccessDenied: The bucket owner for the report group does not match the owner of the S3 bucket...

Issue: When uploading test data to an Amazon S3 bucket, CodeBuild is unable to write the test data to the bucket.

Possible causes:

- The account specified for the report group bucket owner does not match the owner of the Amazon S3 bucket.
- The service role does not have write access to the bucket.

Recommended solutions:

- Change the report group bucket owner to match the owner of the Amazon S3 bucket.
- Modify the service role to allow write access to the Amazon S3 bucket.

Quotas for AWS CodeBuild

The following tables list the current quotas in AWS CodeBuild. These quotas are for each supported AWS Region for each AWS account, unless otherwise specified.

Service quotas

The following are the default quotas for the AWS CodeBuild service.

Name	Default	Adjus e	Description
Associated tags per project	Each supported Region: 50	No	Maximum number of tags you can associate with a build project
Build projects	Each supported Region: 5,000	<u>Yes</u>	Maximum number of build projects
Build timeout in minutes	Each supported Region: 2,160	No	Maximum build timeout in minutes
Concurrent request for information about builds	Each supported Region: 100	No	Maximum number of builds you can request information about at any one time using the AWS CLI or an AWS SDK.
Concurrent requests for information on build projects	Each supported Region: 100	No	Maximum number of build projects you can request information about at any one time using the AWS CLI or an AWS SDK.
Concurrently running builds for ARM Lambda/10GB environment	Each supported Region: 1	<u>Yes</u>	Maximum number of concurrently

AWS CodeBuild

Name	Default	Adjus e	Description
			running builds for ARM Lambda/10GB environment
Concurrently running builds for ARM Lambda/1GB environment	Each supported Region: 1	<u>Yes</u>	Maximum number of concurrently running builds for ARM Lambda/1GB environme nt
Concurrently running builds for ARM Lambda/2GB environment	Each supported Region: 1	<u>Yes</u>	Maximum number of concurrently running builds for ARM Lambda/2GB environme nt
Concurrently running builds for ARM Lambda/4GB environment	Each supported Region: 1	<u>Yes</u>	Maximum number of concurrently running builds for ARM Lambda/4GB environme nt
Concurrently running builds for ARM Lambda/8GB environment	Each supported Region: 1	<u>Yes</u>	Maximum number of concurrently running builds for ARM Lambda/8GB environme nt
Concurrently running builds for ARM/2XLarge environment	Each supported Region: 1	<u>Yes</u>	Maximum number of concurrently running builds for ARM/2XLarge environment

AWS CodeBuild

Name	Default	Adjus e	Description
Concurrently running builds for ARM/ Large environment	Each supported Region: 1	<u>Yes</u>	Maximum number of concurrently running builds for ARM/Large environment
Concurrently running builds for ARM/ Medium environment	Each supported Region: 1	<u>Yes</u>	Maximum number of concurrently running builds for ARM/Medium environment
Concurrently running builds for ARM/ Small environment	Each supported Region: 1	<u>Yes</u>	Maximum number of concurrently running builds for ARM/Small environment
Concurrently running builds for ARM/ XLarge environment	Each supported Region: 1	<u>Yes</u>	Maximum number of concurrently running builds for ARM/XLarge environment
Concurrently running builds for Linux GPU Large environment	Each supported Region: 0	<u>Yes</u>	Maximum number of concurrently running builds for Linux GPU/ Large environment
Concurrently running builds for Linux GPU Small environment	Each supported Region: 0	<u>Yes</u>	Maximum number of concurrently running builds for Linux GPU/ Small environment
Concurrently running builds for Linux Lambda/10GB environment	Each supported Region: 1	<u>Yes</u>	Maximum number of concurrently running builds for Linux Lambda/10GB environment

Name	Default	Adjus e	Description
Concurrently running builds for Linux Lambda/1GB environment	Each supported Region: 1	<u>Yes</u>	Maximum number of concurrently running builds for Linux Lambda/1GB environme nt
Concurrently running builds for Linux Lambda/2GB environment	Each supported Region: 1	<u>Yes</u>	Maximum number of concurrently running builds for Linux Lambda/2GB environme nt
Concurrently running builds for Linux Lambda/4GB environment	Each supported Region: 1	<u>Yes</u>	Maximum number of concurrently running builds for Linux Lambda/4GB environme nt
Concurrently running builds for Linux Lambda/8GB environment	Each supported Region: 1	<u>Yes</u>	Maximum number of concurrently running builds for Linux Lambda/8GB environme nt
Concurrently running builds for Linux/2XLarge environment	Each supported Region: 0	<u>Yes</u>	Maximum number of concurrently running builds for Linux/2XLarge environment
Concurrently running builds for Linux/ Large environment	Each supported Region: 1	<u>Yes</u>	Maximum number of concurrently running builds for Linux/Large environment

AWS CodeBuild

Name	Default	Adjus e	Description
Concurrently running builds for Linux/ Medium environment	Each supported Region: 1	<u>Yes</u>	Maximum number of concurrently running builds for Linux/Medium environment
Concurrently running builds for Linux/ Small environment	Each supported Region: 1	<u>Yes</u>	Maximum number of concurrently running builds for Linux/Small environment
Concurrently running builds for Linux/ XLarge environment	Each supported Region: 1	Yes	Maximum number of concurrently running builds for Linux/XLarge environment
Concurrently running builds for Windows Server 2019/Large environme nt	Each supported Region: 1	<u>Yes</u>	Maximum number of concurrently running builds for Windows Server 2019/Large environment
Concurrently running builds for Windows Server 2019/Medium environment	Each supported Region: 1	<u>Yes</u>	Maximum number of concurrently running builds for Windows Server 2019/Medium environment
Concurrently running builds for Windows/Large environment	Each supported Region: 1	Yes	Maximum number of concurrently running builds for Windows/L arge environment

Name	Default	Adjus e	Description
Concurrently running builds for Windows/Medium environment	Each supported Region: 1	<u>Yes</u>	Maximum number of concurrently running builds for Windows/M edium environment
Minimum period for build timeout in minutes	Each supported Region: 5	No	Minimum build timeout in minutes
Security groups under VPC configura tion	Each supported Region: 5	No	Security groups available for VPC configuration
Subnets under VPC configuration	Each supported Region: 16	No	Subnets available for VPC configuration

í) Note

Internal metrics will determine the default quotas for concurrent running builds.

Quotas for the maximum number of concurrent running builds vary, depending on the compute type. For some platforms and compute types, the default is 20. To request a higher concurrent build quota, or if you get a "Cannot have more than X active builds for the account" error, use the link above to make the request. For more information on pricing, see <u>AWS CodeBuild pricing</u>.

Other limits

Build projects

Resource	Default
Allowed characters in a build project descripti on	Any

Resource	Default
Allowed characters in a build project name	The letters $A-Z$ and $a-z$, the numbers $0-9$, and the special characters – and _
Length of a build project name	2 to 150 characters, inclusive
Maximum length of a build project description	255 characters
Maximum number of reports you can add to a project	5
Number of minutes you can specify in a build project for the build timeout of all related builds	5 to 2160 (36 hours)

Builds

Resource	Default
Maximum time the history of a build is retained	1 year
Number of minutes you can specify for the build timeout of a single build	5 to 2160 (36 hours)

Compute fleets

Resource	Default
Concurrent number of compute fleets	10
Concurrently running instances for ARM/Small environment fleets	1

Resource	Default
Concurrently running instances for ARM/Large environment fleets	1
Concurrently running instances for Linux/Sma ll environment fleets	1
Concurrently running instances for Linux/Med ium environment fleets	1
Concurrently running instances for Linux/Lar ge environment fleets	1
Concurrently running instances for Linux/XLa rge environment fleets	1
Concurrently running instances for Linux/2XL arge environment fleets	0
Concurrently running instances for Linux GPU/ Small environment fleets	0
Concurrently running instances for Linux GPU/ Large environment fleets	0
Concurrently running instances for Windows Server 2019/Medium environment fleets	1
Concurrently running instances for Windows Server 2019/Large environment fleets	1
Concurrently running instances for Windows Server 2022/Medium environment fleets	1
Concurrently running instances for Windows Server 2022/Large environment fleets	1
Concurrently running instances for Mac ARM/ Medium environment fleets	1

Resource	Default
Concurrently running instances for Mac ARM/ Large environment fleets	1

Reports

Resource	Default
Maximum duration a test report is available after it is created	30 days
Maximum length of a test case message	5,000 characters
Maximum length of a test case name	1,000 characters
Maximum number of report groups per AWS account	5,000
Maximum number of test cases per report	500

Tags

Tag limits apply to tags on CodeBuild build projects and CodeBuild report group resources.

Resource	Default
Resource tag key names	Any combination of Unicode letters, numbers, spaces, and allowed characters in UTF-8 between 1 and 127 characters in length. Allowed characters are + - = : / @ Tag key names must be unique, and each key can only have one value. A tag key name cannot: • begin with aws :

Resource	Default
	 consist only of spaces end with a space contain emojis or any of the following characters: ? ^ * [\ ~ ! # \$ % & * () > < " ' ` [] { } ;
Resource tag values	Any combination of Unicode letters, numbers, spaces, and allowed characters in UTF-8 between 0 and 255 characters in length. Allowed characters are $+ - = : / @$ A key can only have one value, but many keys can have the same value. A tag key value cannot contain emojis or any of the following characters: ? ^ * [\ ~ ! # \$ % & * () > < " ' ` [] { } ;

AWS CodeBuild User Guide document history

The following table describes the important changes to the documentation since the last release of AWS CodeBuild. For notification about updates to this documentation, you can subscribe to an RSS feed.

• Latest API version: 2016-10-06

Change	Description	Date
New content: Self-managed GitLab runners	Add new content for self- managed GitLab runners	September 17, 2024
<u>New content: GitLab group</u> webhooks	Add support for GitLab group webhooks.	September 17, 2024
<u>New content: Run buildspec</u> <u>commands the INSTALL,</u> <u>PRE_BUILD, and POST_BUILD</u> <u>phases</u>	Add support for -with-bui ldspec .	August 20, 2024
Updated content: Reserved capacity	Reserved capacity fleets now support macOS.	August 19, 2024
New content: GitHub App connections	Add support for GitHub App connections.	August 14, 2024
New content: Bitbucket App connections	Add support for Bitbucket App connections.	August 14, 2024
<u>New content: Multiple access</u> tokens in CodeBuild	Add support for sourcing access tokens to third party providers from secrets in AWS Secrets Manager or through AWS CodeConne ctions connections.	August 14, 2024

<u>Updated content: Reserved</u> capacity	Reserved capacity fleets now support ARM Medium, ARM XLarge, and ARM 2XLarge compute types.	August 5, 2024
Updated content: Reserved capacity	CodeBuild now supports VPC connectivity for reserved capacity fleets on Windows.	August 1, 2024
<u>New ARM compute types</u>	CodeBuild now supports ARM Medium, ARM XLarge, and ARM 2XLarge compute types. For more information, see <u>Build environment compute</u> <u>types</u> .	July 10, 2024
Updated content: SHA signature	Update the Secure Hash Algorithm (SHA) signature for the x86_64 and ARM.	June 19, 2024
New content: GitHub global and organization webhooks	Add support for GitHub global and organization webhooks.	June 17, 2024
New content: Add new webhook filter type	Add support for a new webhook filter type (REPOSITORY_NAME).	June 17, 2024
Updated disk space	The ARM Small and ARM Large compute types now have increased disk space.	June 4, 2024
New content: GitHub manual webhooks	Add support for GitHub manual webhooks.	May 23, 2024

<u>Updated content: Reserved</u> <u>capacity</u>	CodeBuild now supports VPC connectivity for reserved capacity fleets on Amazon Linux.	May 15, 2024
<u>Updated content: Lambda</u> compute images	Add Lambda support for .NET 8 (al-lambda/aarch64/ dotnet8 and al-lambda/ x86_64/dotnet8)	May 8, 2024
Updated quota: Build timeout	Update maximum build timeout quota to 2160 minutes (36 hours).	May 1, 2024
<u>Updated content: AWS</u> <u>managed (predefined) policies</u> <u>for AWS CodeBuild</u>	The AWSCodeBuildAdminA ccess, AWSCodeBuildDevelo perAccess, and AWSCodeBu ildReadOnlyAccess policies have been updated to reflect the AWS CodeConnections rebranding.	April 30, 2024
New content: Bitbucket app password or access token	Add support for Bitbucket access tokens.	April 11, 2024
New content: Auto-discover reports in CodeBuild	CodeBuild now supports report auto-discover.	April 4, 2024
New content: Self-hosted GitHub Actions runners	Add new content for self-host ed GitHub Actions runners	April 2, 2024
New content: GitLab connections	Add support for GitLab and GitHub Self Managed connections.	March 25, 2024

<u>New content: Add new</u> webhook events and filter types	Add support for new webhook events (RELEASED and PRERELEASED) and filter types (TAG_NAME and RELEASE_NAME).	March 15, 2024
New content: Add a new webhook event: PULL_REQU EST_CLOSED	Add support for a new webhook event: PULL_REQU EST_CLOSED .	February 20, 2024
Updated content: Docker images provided by CodeBuild	Add support for Windows Server Core 2019 (windows- base:2019-3.0)	February 7, 2024
Updated content: Docker images provided by CodeBuild	Add support for new runtimes for Amazon Linux 2023 (al2/ aarch64/standard/3.0)	January 29, 2024
New content: Reserved capacity	CodeBuild now supports reserved capacity fleets in CodeBuild.	January 18, 2024
<u>New compute type</u>	CodeBuild now supports a Linux XLarge compute type. For more information, see <u>Build environment compute</u> <u>types</u> .	January 8, 2024
<u>Updated content: Docker</u> images provided by CodeBuild	Add support for new runtimes for Amazon Linux 2 (al2/standard/5.0) and Ubuntu (ubuntu/st andard/7.0)	December 14, 2023
Updated content: Docker images provided by CodeBuild	Add support for new Lambda compute images	December 8, 2023

<u>New content: AWS Lambda</u> <u>compute</u>	Add new content for the AWS Lambda compute	November 6, 2023
Updated content: Docker images provided by CodeBuild	Add support for Amazon Linux 2 (al2/stand ard/5.0)	May 17, 2023
<u>Changes to managed policies</u> for CodeBuild	Details about updates to AWS managed politices for CodeBuild are now available . For more information, see <u>CodeBuild updates to AWS</u> <u>managed policies</u> .	May 16, 2023
<u>Updated content: Docker</u> images provided by CodeBuild	Remove support for Amazon Linux 2 (al2/stand ard/3.0) and add support for Amazon Linux 2 (al2/ standard/corretto8) and Amazon Linux 2 (al2/ standard/corretto11)	May 9, 2023
Updated content: Docker images provided by CodeBuild	Add support for Ubuntu 22.04 (ubuntu/st andard/7.0)	April 13, 2023
Updated content: Docker images provided by CodeBuild	Remove support for Ubuntu 18.04 (ubuntu/st andard/4.0) and Amazon Linux 2 (al2/aarch64/ standard/1.0)	March 31, 2023

<u>Updated content: Remove</u> <u>VPC limitation</u>	Removing the following limitation: If you configure CodeBuild to work with a VPC, local caching is not supported. Starting 02/28/22, your VPC build will take longer since a new Amazon EC2 instance will be used for each build.	March 1, 2023
<u>Updated content: Docker</u> images provided by CodeBuild	Remove support for Ubuntu 18.04 (ubuntu/ standard/3.0) and Amazon Linux 2 (al2/stand ard/2.0)	June 30, 2022
<u>Amazon ECR Sample: Restrict</u> image access	When CodeBuild credentials are used to pull an Amazon ECR image, you can restrict image access to a specific CodeBuild project. For more information, see <u>Amazon ECR</u> <u>sample</u> .	March 10, 2022
<u>Added region support</u>	The ARM_CONTAINER compute type is now supported in the following additional regions: Asia Pacific (Seoul), Canada (Central), Europe (London), and Europe (Paris). For more informati on, see <u>Build environment</u> <u>compute types</u> .	March 10, 2022

<u>New VPC limitation</u>	If you configure CodeBuild to work with a VPC, local caching is not supported. Starting 02/28/22, your VPC build will take longer since a new Amazon EC2 instance will be used for each build.	February 25, 2022
<u>Batch report mode</u>	CodeBuild now allows you to select how batch build statuses are sent to the source provider for a project. For more information, see <u>Batch</u> <u>report mode</u> .	October 4, 2021
<u>New compute type</u>	CodeBuild now supports a small ARM compute type. For more information, see <u>Build</u> environment compute types.	September 13, 2021
Public build projects	CodeBuild now allows you to make the build results for your build projects available to the public without requiring access to an AWS account. For more information, see <u>Public build</u> <u>projects</u> .	August 11, 2021
Session debugging for batch builds	CodeBuild now supports session debugging for batch builds. For more information, see build-graph and build-list.	March 3, 2021

<u>Project level concurrent build</u> <u>limit</u>	CodeBuild now allows you to limit the number of concurren t builds for a build project. For more information, see <u>Project</u> <u>configuration</u> and <u>concurren</u> <u>tBuildLimit</u> .	February 16, 2021
<u>New buildspec property:</u> <u>s3-prefix</u>	CodeBuild now provides the s3-prefix buildspec property for artifacts that allows you to specify a path prefix for artifacts that are uploaded to Amazon S3. For more information, see <u>s3-</u> <u>prefix</u> .	February 9, 2021
<u>New buildspec property:</u> <u>on-failure</u>	CodeBuild now provides the on-failure buildspec property for build phases that allows you to determine what happens when a build phase fails. For more information, see <u>on-failure</u> .	February 9, 2021
<u>New buildspec property:</u> <u>exclude-paths</u>	CodeBuild now provides the exclude-paths buildspec property for artifacts that allows you to exclude paths from your build artifacts. For more information, see <u>exclude-paths</u> .	February 9, 2021

<u>New buildspec property:</u> enable-symlinks	CodeBuild now provides the enable-symlinks buildspec property for artifacts that allows you to preserve symbolic links in a ZIP artifact. For more information, see <u>enable-sy</u> <u>mlinks</u> .	February 9, 2021
<u>Buildspec artifact name</u> <u>enhancement</u>	CodeBuild now allows the artifacts/name property to contain path information. For more information, see <u>name</u> .	February 9, 2021
Code coverage reporting	CodeBuild now provides code coverage reports. For more information, see <u>Code</u> <u>coverage reports</u> .	July 30, 2020
<u>Batch builds</u>	CodeBuild now supports running concurrent and coordinated builds of a project. For more information, see <u>Batch builds in CodeBuild</u> .	July 30, 2020
<u>Windows Server 2019 image</u>	CodeBuild now provides a Windows Server Core 2019 build image. For more information, see <u>Docker</u> <u>images provided by CodeBuild</u>	July 20, 2020

•

<u>Session Manager</u>	CodeBuild now allows you to pause a running build and then use AWS Systems Manager Session Manager to connect to the build container and view the state of the container. For more informati on, see <u>Session Manager</u> .	July 20, 2020
<u>Updated topic</u>	CodeBuild now supports specifying a shell to use in their build environments in the buildspec file. For more information, see <u>Build</u> <u>specification reference</u> .	June 25, 2020
<u>Test reporting with test</u> <u>frameworks</u>	Added several topics the describe how to generate CodeBuild test reports with several test frameworks. For more information, see <u>Test</u> <u>reporting with test framework</u> <u>S</u> .	May 29, 2020
Updated topics	CodeBuild now supports adding tags to report groups. For more information, see <u>ReportGroup</u> .	May 21, 2020
Support for test reporting	CodeBuild support for test reporting is now generally available.	May 21, 2020

Updated topics	CodeBuild now supports creating create webhook filters for Github and Bitbucket that trigger builds only when the head commit message matches the specified expression. For more information, see <u>GitHub pull</u> request and webhook filter <u>sample</u> and <u>Bitbucket pull</u> request and webhook filter <u>sample</u> .	May 6, 2020
<u>New topics</u>	CodeBuild now supports sharing build project and report group resources. For more information, see <u>Working with shared projects</u> and <u>Working with shared</u> <u>report groups</u> .	December 13, 2019
<u>New and updated topics</u>	CodeBuild now supports test reporting during the run of a build project. For more information, see <u>Working</u> with test reporting, <u>Create</u> <u>a test report</u> , and <u>Create a</u> <u>test report using the AWS CLI</u> <u>sample</u> .	November 25, 2019
<u>Updated topic</u>	CodeBuild now supports Linux GPU and Arm environme nt types, and the 2xlarge compute type. For more information, see <u>Build</u> <u>environment compute types</u> .	November 19, 2019

<u>Updated topics</u>	CodeBuild now supports build numbers on all builds, exporting environment variables, and AWS Secrets Manager integration. For more information, see <u>Exported variables</u> and <u>Secrets Manager</u> in <u>Buildspec</u> <u>syntax</u> .	November 6, 2019
<u>New topic</u>	CodeBuild now supports notification rules. You can use notification rules to notify users of important changes in build projects. For more information, see <u>Create a</u> <u>notification rule</u> .	November 5, 2019
Updated topics	CodeBuild now supports the Android version 29 and Go version 1.13 runtimes. For more information, see <u>Docker</u> <u>images provided by CodeBuild</u> and <u>Buildspec syntax</u> .	September 10, 2019
<u>Updated topics</u>	When you create a project, you can now choose the Amazon Linux 2 (AL2) managed image. For more information, see <u>Docker</u> <u>images provided by CodeBuild</u> and <u>Runtime versions in</u> <u>buildspec file sample for</u> <u>CodeBuild</u> .	August 16, 2019

<u>Updated topic</u>	When you create a project, you can now choose to disable encryption of S3 logs and, if you use a Git-based source repository, include Git submodules. For more information, see <u>Create a</u> <u>build project in CodeBuild</u> .	March 8, 2019
<u>New topic</u>	CodeBuild now supports local caching. You can specify local caching in one or more of four modes when you create a build. For more informati on, see <u>Build caching in</u> <u>CodeBuild</u> .	February 21, 2019
<u>New topics</u>	CodeBuild now supports webhook filter groups to specify events that trigger a build. For more information, see <u>Filter GitHub webhook</u> <u>events</u> and <u>Filter Bitbucket</u> <u>webhook events</u> .	February 8, 2019
<u>New topic</u>	The CodeBuild User Guide now shows how to use CodeBuild with a proxy server. For more information, see <u>Use</u> <u>CodeBuild with a proxy server</u> .	February 4, 2019

<u>Updated topics</u>	CodeBuild now supports using an Amazon ECR image that is in another AWS account. Several topics have been updated to reflect this change, including Amazon ECR sample for CodeBuild, Create a build project, and Create a CodeBuild service role.	January 24, 2019
<u>Support for private Docker</u> <u>registries</u>	CodeBuild now supports using a Docker image that is stored in a private registry as your runtime environme nt. For more information, see <u>Private registry with AWS</u> <u>Secrets Manager sample</u> .	January 24, 2019
<u>Updated topic</u>	CodeBuild now supports using an access token to connect to GitHub (with a personal access token) and Bitbucket (with an app password) repositories. For more information, see <u>Create</u> <u>a build project (console)</u> and <u>Use access tokens with your</u> <u>source provider</u> .	December 6, 2018
<u>Updated topic</u>	CodeBuild now supports new build metrics that measure the duration of each phase in a build. For more information, see <u>CodeBuild CloudWatch</u> <u>metrics</u> .	November 15, 2018

VPC endpoint policy topic	Amazon VPC endpoints for CodeBuild now support policies. For more informati on, see <u>Create a VPC</u> <u>endpoint policy for CodeBuild</u>	November 9, 2018
Updated content	Topics have been updated to reflect the new console experience.	October 30, 2018
<u>Amazon EFS sample</u>	CodeBuild can mount an Amazon EFS file system during a build using commands in a project's buildspec file. For more information, see <u>Amazon EFS</u> <u>sample for CodeBuild</u> .	October 26, 2018
<u>Bitbucket webhooks</u>	CodeBuild now supports webhooks when you use Bitbucket for your repositor y. For more information, see <u>Bitbucket pull request sample</u> for CodeBuild.	October 2, 2018
<u>S3 logs</u>	CodeBuild now supports build logs in an S3 bucket. Previousl y, you could only build logs using CloudWatch Logs. For more information, see <u>Create</u> <u>project</u> .	September 17, 2018

<u>Multiple inpout sources and</u> <u>multiple output artifacts</u>	CodeBuild now supports projects that use more than one input source and publish more than one set of artifacts . For more information, see <u>Multiple input sources and</u> input artifacts sample and <u>CodePipeline integration with</u> <u>CodeBuild and multiple input</u> sources and output artifacts sample.	August 30, 2018
Semantic versioning sample	The CodeBuild User Guide now has a use case-base d sample that demonstra tes how to use semantic versioning to create artifact names at build time. For more information, see <u>Use</u> <u>semantic versioning to name</u> <u>build artifacts sample</u> .	August 14, 2018
<u>New static website sample</u>	The CodeBuild User Guide now has a use case-based sample that demonstrates how to host build output in an S3 bucket. The sample takes advantage of the recent support of unencrypted build artifacts. For more informati on, see <u>Create a static website</u> with build output hosted in an <u>S3 bucket</u> .	August 14, 2018

Support for overriding an artifact name with semantic versioning	You can now use semantic versioning to specify a format that CodeBuild uses to name build artifacts. This is useful because a build artifact with a hard-coded name overwrite s previous build artifacts that use the same hard-code d name. For example, if a build is triggered multiple times a day, you can now add a timestamp to its artifact name. Each build artifact name is unique and does not overwrite the artifacts of previous builds.	August 7, 2018
Support of unencrypted build artifacts	CodeBuild now supports builds with unencrypted build artifacts. For more informati on, see <u>Create a build project</u> (console).	July 26, 2018
Support for Amazon CloudWatch metrics and alarms	CodeBuild now provides integration with CloudWatc h metrics and alarms. You can use the CodeBuild or CloudWatch console to monitor builds at the project and account level. For more information, see <u>Monitoring</u> <u>builds</u> .	July 19, 2018

Support for reporting a build's status	CodeBuild can now report the status of a build's start and completion to your source provider. For more informati on, see <u>Create a build project</u> <u>in CodeBuild</u> .	July 10, 2018
Environment variables added to CodeBuild documentation	The Environment variables in build environments page was updated with the CODEBUILD _BUILD_ID, CODEBUILD _LOG_PATH, and CODEBUILD _START_TIME environment variables.	July 9, 2018
Support for a finally block in the buildspec file	The CodeBuild documenta tion was updated with details about the optional finally block in a buildspec file. Commands in the finally block always run after the commands in its correspon ding commands block. For more information, see Buildspec syntax.	June 20, 2018
CodeBuild agent update notifications	The CodeBuild documenta tion was updated with details about how you can use Amazon SNS to be notified when new versions of the CodeBuild agent are released. For more information, see <u>Receive notifications for</u> <u>new AWS CodeBuild agent</u> <u>versions</u> .	June 15, 2018

Earlier updates

The following table describes important changes in each release of the AWS CodeBuild User Guide before June 2018.

Change	Description	Date
Support for Windows builds	CodeBuild now supports builds for the Microsoft Windows Server platform, including a prepackaged build environment for the .NET Core 2.0 on Windows. For more information, see <u>Run</u> <u>Microsoft Windows samples</u> <u>for CodeBuild</u> .	May 25, 2018
Support for build idempoten cy	When you run the start- build command with the AWS Command Line Interface (AWS CLI), you can specify that the build is idempoten t. For more information, see <u>Run a build (AWS CLI)</u> .	May 15, 2018
Support for overriding more build project settings	You can now override more build project settings when you create a build. The overrides are only for that build. For more informati on, see <u>Run AWS CodeBuild</u> <u>builds manually</u> .	May 15, 2018
VPC Endpoint support	You can now use VPC endpoints to improve the security of your builds. For	March 18, 2018

Change	Description	Date
	more information, see <u>Use</u> <u>VPC endpoints</u> .	
Support of triggers	You can now create triggers to schedule builds at regular frequencies. For more information, see <u>Create AWS</u> <u>CodeBuild triggers</u> .	March 28, 2018
FIPS endpoints documenta tion	You can now learn about how to use the AWS Command Line Interface (AWS CLI) or an AWS SDK to tell CodeBuild to use one of four Federal Information Processing Standards (FIPS) endpoints . For more information, see Specify the AWS CodeBuild endpoint .	March 28, 2018
AWS CodeBuild available in Asia Pacific (Mumbai), Europe (Paris), and South America (São Paulo)	AWS CodeBuild is now available in the Asia Pacific (Mumbai), Europe (Paris), and South America (São Paulo) regions. For more informati on, see <u>AWS CodeBuild</u> in the <i>Amazon Web Services General</i> <i>Reference</i> .	March 28, 2018
GitHub Enterprise Server support	CodeBuild can now build from source code stored in a GitHub Enterprise Server repository. For more informati on, see <u>Run the GitHub</u> <u>Enterprise Server sample</u> .	January, 25, 2018

Change	Description	Date
Git clone depth support	CodeBuild now supports the creation of a shallow clone with a history truncated to the specified number of commits. For more informati on, see <u>Create a build project</u> .	January, 25, 2018
VPC support	VPC-enabled builds are now able to access resources inside your VPC. For more informati on, see <u>VPC support</u> .	November, 27, 2017
Dependency caching support	CodeBuild now supports the dependency caching. This allows CodeBuild to save certain reusable pieces of the build environment in the cache and use this across builds.	November, 27, 2017
Build badges support	CodeBuild now supports the use of build badges, which provide an embeddable, dynamically generated image (badge) that displays the status of the latest build for a project. For more information, see <u>Build badges sample</u> .	November 27, 2017

Change	Description	Date
AWS Config integration	AWS Config now supports CodeBuild as an AWS resource, which means the service can track your CodeBuild projects. For more information about AWS Config, see <u>AWS Config</u> <u>sample</u> .	October 20, 2017
Automatically rebuild updated source code in GitHub repositories	If your source code is stored in a GitHub repository, you can enable AWS CodeBuild to rebuild your source code whenever a code change is pushed to the repository. For more information, see <u>Run</u> <u>the GitHub pull request and</u> <u>webhook filter sample</u> .	September 21, 2017

Change	Description	Date
New ways for storing and retrieving sensitive or large environment variables in Amazon EC2 Systems Manager Parameter Store	You can now use the AWS CodeBuild console or the AWS CLI to retrieve sensitive or large environment variables stored in Amazon EC2 Systems Manager Parameter Store. You can also now use the AWS CodeBuild console to store these types of environment variables in Amazon EC2 Systems Manager Parameter Store. Previously, you could only retrieve these types of environment variables by including them in a buildspec or by running build commands to automate the AWS CLI. You could only store these types of environme nt variables by using the Amazon EC2 Systems Manager Parameter Store console. For more informati on, see Create a build project , Change build project settings , and <u>Run builds manually</u> .	September 14, 2017
Build deletion support	You can now delete builds in AWS CodeBuild. For more information, see <u>Delete builds</u>	August 31, 2017

Change	Description	Date
Updated way to retrieve sensitive or large environme nt variables stored in Amazon EC2 Systems Manager Parameter Store by using a buildspec	AWS CodeBuild now makes it easier to use a buildspec to retrieve sensitive or large environment variables stored in Amazon EC2 Systems Manager Parameter Store. Previously, you could only retrieve these types of environment variables by running build commands to automate the AWS CLI. For more information, see the parameter-store mapping in Buildspec syntax.	August 10, 2017
AWS CodeBuild supports Bitbucket	CodeBuild can now build from source code stored in a Bitbucket repository. For more information, see <u>Create</u> <u>a build project</u> and <u>Run builds</u> <u>manually</u> .	August 10, 2017
AWS CodeBuild available in US West (N. California), Europe (London), and Canada (Central)	AWS CodeBuild is now available in the US West (N. California), Europe (London), and Canada (Central) regions. For more information, see <u>AWS CodeBuild</u> in the <i>Amazon Web Services General</i> <i>Reference</i> .	June 29, 2017

Change	Description	Date
Alternate buildspec file names and locations supported	You can now specify an alternate file name or location of a buildspec file to use for a build project, instead of a default buildspec file named buildspec.yml at the root of the source code. For more information, see <u>Buildspec file name and</u> <u>storage location</u> .	June 27, 2017
Updated build notifications sample	CodeBuild now provides built-in support for build notifications through Amazon CloudWatch Events and Amazon Simple Notification Service (Amazon SNS). The previous <u>Build notifications</u> <u>sample</u> has been updated to demonstrate this new behavior.	June 22, 2017
Docker in custom image sample added	A sample showing how to use CodeBuild and a custom Docker build image to build and run a Docker image has been added. For more information, see the <u>Docker in</u> <u>custom image sample</u> .	June 7, 2017

Change	Description	Date
Fetch source code for GitHub pull requests	When you run a build with CodeBuild that relies on source code stored in a GitHub repository, you can now specify a GitHub pull request ID to build. You can also specify a commit ID, a branch name, or a tag name instead. For more informati on, see the Source version value in <u>Run a build (console)</u> or the sourceVersion value in <u>Run a build (AWS CLI)</u>	June 6, 2017
Build specification version updated	A new version of the buildspec format has been released. Version 0.2 addresses the issue of CodeBuild running each build command in a separate instance of the default shell. Also in version 0.2, environment_variab les is renamed to env, and plaintext is renamed to variables . For more information, see <u>Build</u> <u>specification reference for</u> <u>CodeBuild</u> .	May 9, 2017

Change	Description	Date
Dockerfiles for build images available in GitHub	Definitions for many of the build images provided by AWS CodeBuild are available as Dockerfiles in GitHub. For more information, see the Definition column of the table in <u>Docker images provided by</u> <u>CodeBuild</u> .	May 2, 2017
AWS CodeBuild available in Europe (Frankfurt), Asia Pacific (Singapore), Asia Pacific (Sydney), and Asia Pacific (Tokyo)	AWS CodeBuild is now available in the Europe (Frankfurt), Asia Pacific (Singapore), Asia Pacific (Sydney), and Asia Pacific (Tokyo) regions. For more information, see <u>AWS</u> <u>CodeBuild</u> in the Amazon Web Services General Reference.	March 21, 2017
CodePipeline test action support for CodeBuild	You can now add to a pipeline in CodePipeline a test action that uses CodeBuild. For more information, see <u>Add</u> <u>a CodeBuild test action to</u> <u>a pipeline (CodePipeline</u> <u>console)</u> .	March 8, 2017

Change	Description	Date
Buildspec files support fetching build output from within selected top-level directories	Buildspec files now enable you to specify individual top-level directories whose contents you can instruct CodeBuild to include in build output artifacts. You do this by using the base-dire ctory mapping. For more information, see <u>Buildspec</u> <u>syntax</u> .	February 8, 2017
Built-in environment variables	AWS CodeBuild provides additional built-in environme nt variables for your builds to use. These include environme nt variables describing the entity that started the build, the URL to the source code repository, the source code's version ID, and more. For more information, see Environment variables in build environments.	January 30, 2017
AWS CodeBuild available in US East (Ohio)	AWS CodeBuild is now available in the US East (Ohio) region. For more informati on, see <u>AWS CodeBuild</u> in the <i>Amazon Web Services General</i> <i>Reference</i> .	January 19, 2017

Change	Description	Date
Shell and command behaviors information	CodeBuild runs each command you specify in a separate instance of a build environment's default shell. This default behavior can produce some unexpecte d side effects for your commands. We recommend some approaches to work around this default behavior if needed. For more informati on, see <u>Shells and commands</u> in build environments.	December 9, 2016
Environment variables information	CodeBuild provides several environment variables that you can use in your build commands. You can also define your own environment variables. For more informati on, see <u>Environment variables</u> in build environments.	December 7, 2016
Troubleshooting topic	Troubleshooting informati on is now available. For more information, see <u>Troublesh</u> <u>ooting AWS CodeBuild</u> .	December 5, 2016
Jenkins plugin initial release	This is the initial release of the CodeBuild Jenkins plugin. For more information, see <u>Use</u> <u>AWS CodeBuild with Jenkins</u> .	December 5, 2016
User Guide initial release	This is the initial release of the <i>CodeBuild User Guide</i> .	December 1, 2016