



Implementation Guide

# Edit in the Cloud on AWS



# Edit in the Cloud on AWS: Implementation Guide

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# Build a virtual, video editing environment on AWS using the Edit in the Cloud on AWS solution

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Edit in the Cloud on AWS helps you, the content creator, to build a virtual, video editing environment in the Amazon Web Services (AWS) Cloud. This allows you to reach your editors and creative professionals where they reside and scale up and down elastically. There is no upfront cost for high-priced GPU workstations. And the solution saves you costs associated with transferring large assets to collaborators or shipping unencrypted drives using couriers.

The solution provides the following features:

- An edit host that runs your favorite video editing software for news, sports, promotional, or post-production work.
- A shared pool of high-performance network storage so that you can collaborate with other users on projects.
- A remote streaming application so that you can access your workstation remotely and securely without having to transfer content to on-premises.

This implementation guide provides an overview of the Edit in the Cloud on AWS solution, its reference architecture and components, considerations for planning the deployment, configuration steps for deploying the solution to the AWS Cloud.

The guide is intended for DevOps teams who have practical experience architecting in the AWS Cloud.

Use this navigation table to quickly find answers to these questions:

If you want to . . .	Read . . .
Know the cost for running this solution.	<a href="#">Cost</a>
The estimated cost for running this solution in the US East (N. Virginia) Region is USD \$1,323.04 per month.	

If you want to . . .	Read . . .
Understand the security considerations for this solution.	<a href="#">Security</a>
Know how to plan for quotas for this solution.	<a href="#">Quotas</a>
Know which AWS Regions support this solution.	<a href="#">Supported AWS Regions</a>
View or download the AWS CloudFormation template included in this solution to automatically deploy the infrastructure resources (the "stack") for this solution.	<a href="#">AWS CloudFormation template</a>

## Features and benefits

The solution provides the following features:

### Cost savings

There is no upfront cost for high-priced GPU workstations on AWS.

### Works with your favorite software

This solution has been tested with industry standard editing and graphics software to provide reliability and flexibility.

### Scales to the number of collaborators

This solution uses shared network storage, which is accessible across multi-pool editors, creating a collaboration system without the need for additional software.

### Provides two remote display protocol options

This solution is integrated with [Teradici Cloud Access software](#), which uses the [PC-over-IP](#) (PCoIP) protocol. Alternatively, you can choose [NICE DCV](#) for remote desktop and application streaming.

### Simplifies the video editing process

[AWS CloudFormation](#) automates the deployment of GPU drivers, Teradici or NICE DCV, and shared storage. Simply load your favorite post-production applications and plugins, then upload media to begin working on your project.

## Integration with Service Catalog AppRegistry and AWS Systems Manager Application Manager

This solution includes a Service Catalog AppRegistry resource to register the solution's CloudFormation template and its underlying resources as an application in both [AWS Service Catalog AppRegistry](#) and [AWS Systems Manager Application Manager](#). With this integration, you can centrally manage the solution's resources.

## Use cases

### Post production

Studios and content creators must have scalable solutions to onboard editors and artists for visual effects and animation. A smooth onboarding process helps editors and artists increase output, meet deadlines, manage production costs, and satisfy requirements for localized tax credits. With Edit in the Cloud on AWS, you pay only for what you use, even as you scale services up and down to meet production schedules.

## Concepts and definitions

This section describes key concepts and defines terminology specific to this solution:

### Video editing

The manipulation and arrangement of video shots. Video editing is used to structure and present all video information, including films and television shows, video advertisements and video essays.

### Remote desktop protocol

A secure network communication protocol that provides a user with a graphical interface to connect to another computer over a network connection.

### Network storage

Network-attached storage is a file-level computer data storage server connected to a computer network providing data access to a heterogeneous group of clients.

For a general reference of AWS terms, see the [AWS glossary](#) in the *AWS General Reference*.

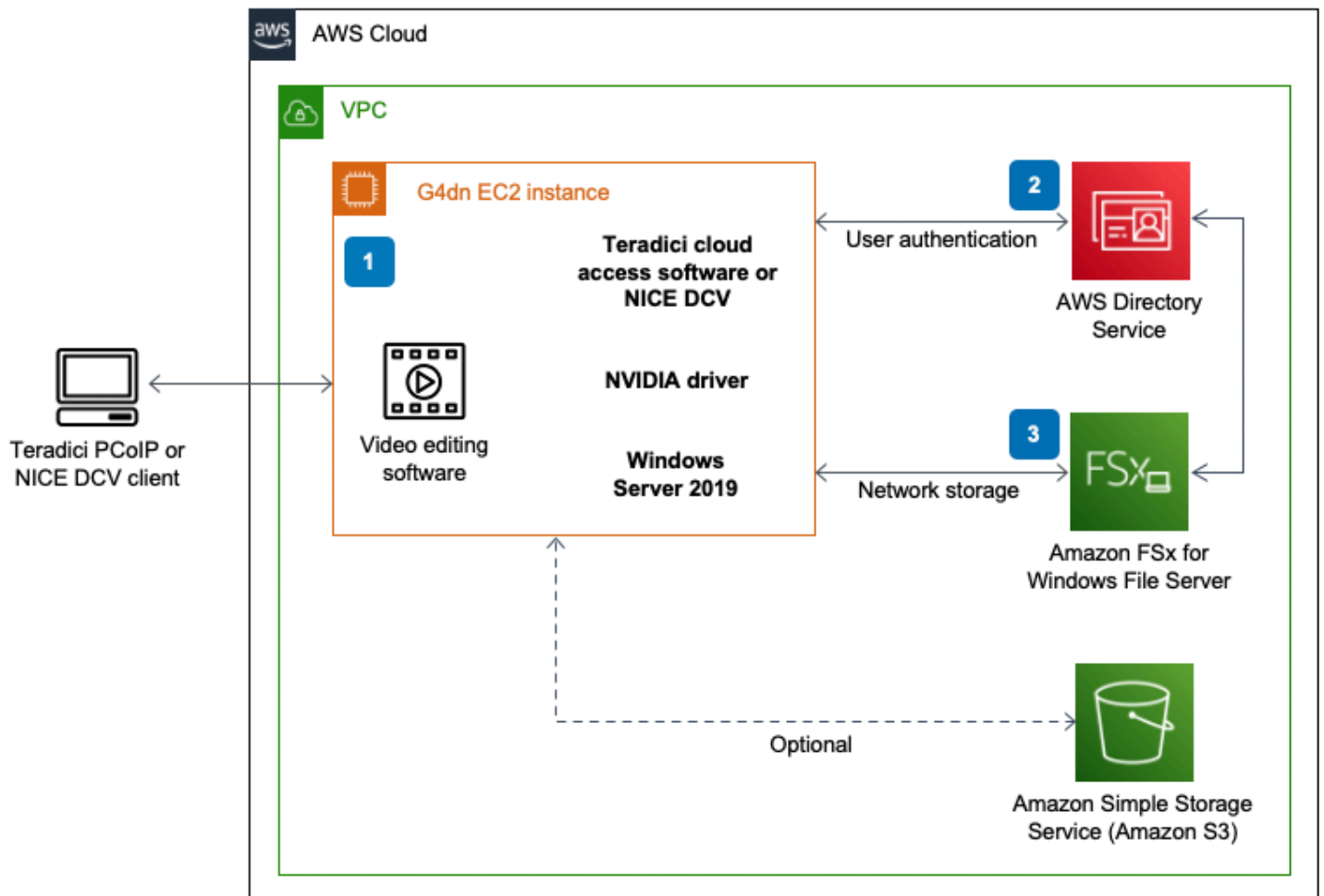


# Architecture overview

This section provides a reference implementation architecture diagram for the components deployed with this solution.

## Architecture diagram

Deploying this solution with the default parameters deploys the following components in your AWS account.



### Edit in the Cloud on AWS architecture

The high-level process flow for the solution components deployed with the AWS CloudFormation template is as follows:

1. An [Amazon Elastic Compute Cloud](#) (Amazon EC2) instance for Windows Server 2019 with Teradici Cloud Access Software or NICE DCV and NVIDIA T4 GPU drivers for running your Non-Linear Editor (NLE) software of choice. During deployment, the solution gives you the option to install either Teradici's Cloud Access Software, or NICE DCV. Users can then access the cloud workstation using either Teradici's PC-over-IP (PCoIP) client or the NICE DCV client, accordingly.
2. [AWS Directory Service](#) for user authentication.
3. [Amazon FSx for Windows File Server](#) to access digital assets via the Amazon EC2 instance through your editor of choice. FSx for Windows File Server will auto-mount the network share upon startup of the Windows Amazon EC2 instance. FSx for Windows File Server will be used for storing your media assets to be used by your non-linear editor (NLE).

### Note

This solution does not deploy an Amazon S3 bucket with associated IAM roles for access; however, it allows you to configure your own S3 bucket for media file storage.

## AWS Well-Architected design considerations

This solution uses the best practices from the [AWS Well-Architected Framework](#), which helps customers design and operate reliable, secure, efficient, and cost-effective workloads in the cloud.

This section describes how the design principles and best practices of the Well-Architected Framework benefit this solution.

### Operational excellence

This section describes how we architected this solution using the principles and best practices of the [operational excellence pillar](#).

The Edit in the Cloud on AWS solution tracks all assets via AWS CloudTrail, and logs from AWS EC2, FSx for Windows File Server, and Directory Service to provide observability into the infrastructure and solution components.

### Security

This section describes how we architected this solution using the principles and best practices of the [security pillar](#).

This solution uses Directory Service for user administration and authentication. Amazon FSx works with Microsoft Active Directory to integrate with your existing Microsoft Windows environments. Active Directory is the Microsoft directory service used to store information about objects on the network and make this information easy for administrators and users to find and use. These objects typically include shared resources such as file servers, network users, and computer accounts.

AWS Identity and Access Management (IAM) roles allow customers to assign granular access policies and permissions to services and users on the AWS Cloud. This solution creates a role attached to the EC2 instance with least privilege, allowing access to specific Amazon S3 buckets (when applicable).

The security groups created in this solution are designed to control and isolate network traffic between specified public IP ranges and the edit host instance. Security groups are also used to control access to Amazon FSx from the edit host. Microsoft Active Directory and Amazon FSx access is also controlled via security group access. For more information, refer to [Using Amazon FSx with AWS Directory Service for Microsoft Active Directory](#).

## Reliability

This section describes how we architected this solution using the principles and best practices of the [reliability pillar](#).

The solution uses FSx for Windows File Server, which sets up and provisions file servers and storage volumes, replicates data, manages failover and failback, and eliminates much of the administrative overhead.

## Performance efficiency

This section describes how we architected this solution using the principles and best practices of the [performance efficiency pillar](#).

The solution uses the [Amazon EC2 G4dn](#) instance which provides high performance and is cost effective for graphics applications that are optimized for NVIDIA GPUs. G4dn instances have up to 1.8X better graphics performance and up to 2X video transcoding capability over the previous generation G3 instances.

The solution is automatically tested and reviewed by solutions architects and subject matter experts for areas to experiment and improve.

## Cost optimization

This section describes how we architected this solution using the principles and best practices of the [cost optimization pillar](#).

The cost for running Edit in the Cloud on AWS varies based on a number of factors, including how long you keep your EC2 running, how much data you transfer into AWS, and other service costs associated with this solution. For example, this solution does not deploy an Amazon S3 bucket; however, it allows you to configure your own Amazon S3 bucket for media file storage.

Customers can measure the efficiency of the workloads, and the costs associated with delivery, by using Application Manager.

## Sustainability

This section describes how we architected this solution using the principles and best practices of the [sustainability pillar](#).

Video editors, loggers, graphic designers, colorists, and other post-production team members work on cloud-based virtual computers instead of dedicated systems at their desk. This reduces editor travel, provides the right-size computer to meet project requirements, and reduces idle resources and need for temporary transfer storage devices.

# Architecture details

This section describes the components and AWS services that make up this solution and the architecture details on how these components work together.

## Amazon EC2

The [Amazon EC2 G4 GPU](#) instance family used in this solution provides the latest generation NVIDIA T4 Tensor Core GPU, AWS custom Intel Cascade Lake CPUs, up to 100 Gbps of networking throughput, and up to 1.8 TB of local non-volatile memory express (NVMe) storage. These instances are well-suited for streaming graphics-intensive applications that rely on NVIDIA GPU libraries such as CUDA.

## Teradici

Using Teradici's PC-over-IP (PCoIP) technology, you can modify content by connecting to a remote workstation, instead of transferring large files to a local machine. The Teradici client runs on your desktop or laptop and gives access to an EC2 G4dn instance.

We also recommend that you familiarize yourself with [Cloud Access Software](#) from Teradici that runs on the EC2 instance and serves up the PCoIP protocol.

## NICE DCV

With NICE DCV and Amazon EC2, customers can run graphics-intensive applications remotely on EC2 instances, and stream their user interface to simple client machines, eliminating the need for expensive dedicated workstations. The [NICE DCV client](#) runs on your desktop or laptop and gives access to an EC2 G4dn instance.

We also recommend that you familiarize yourself with the NICE DCV server software that runs on the EC2 instance and serves the DCV protocol. For additional information, refer to [What is NICE DCV?](#) in the *NICE DCV Administrator Guide*.

## Amazon FSx for Windows File Server

FSx for Windows File Server provides fully managed, highly reliable, and scalable file storage that is accessible over the industry-standard Server Message Block (SMB) protocol. It delivers a wide range

of administrative features such as user quotas, end-user file restore, and Microsoft Active Directory integration. It also offers single-AZ and multi-AZ deployment options, fully managed backups, and encryption of data at rest and in transit.

## AWS services in this solution

AWS service	Description
<a href="#">AWS EC2</a>	<b>Core.</b> It provides the G4dn instance for Windows Server 2019 with <a href="#">Teradici</a> Cloud Access Software or NICE DCV and NVIDIA T4 GPU drivers for running your Non-Linear Editor (NLE) software of choice.
<a href="#">Amazon FSx</a> for Windows File Server	<b>Core.</b> It provides the file system to access digital media assets via the Amazon EC2 instance through your editor of choice. FSx for Windows File Server will auto-mount the network share upon startup of the Windows Amazon EC2 instance. FSx for Windows File Server is used for storing your media assets to be used by your NLE.
<a href="#">AWS Directory Service</a>	<b>Core.</b> It provides managed active directory for user authentication.
<a href="#">Amazon S3</a>	<b>Optional.</b> It provides an optional S3 bucket for additional media file storage.
<a href="#">NICE DCV</a>	<b>Optional.</b> It provides the remote display protocol to configure on the EC2 instance for remote access. The <a href="#">NICE DCV client</a> runs on your desktop or laptop and gives access to the <a href="#">EC2 G4dn instance</a> .

# Plan your deployment

This section describes the [cost](#), [security](#), [quotas](#), and other considerations prior to deploying the solution.

## Cost

You are responsible for the cost of the AWS services used while running this solution. The total cost will depend on your activity. This depends on how long you keep your EC2 running, how much data you transfer into AWS, and other service costs that are associated with this solution. For example, this solution does not deploy an Amazon S3 bucket; however, it allows you to configure your own S3 bucket for media file storage.

The default EC2 this solution deploys is a g4dn.4xlarge EC2 instance for running Windows. As of this revision, the cost for running this solution with the default settings in the US East (N. Virginia) Region is **\$1,323.04 per month**. This includes estimated charges for FSx for Windows File Server and Directory Service. To reduce cost, consider turning off your Windows EC2 instance when not in use. See the pricing webpage for each AWS service used in this solution.

We recommend creating a [budget](#) through [AWS Cost Explorer](#) to help manage costs. Prices are subject to change. For full details, see the pricing webpage for each [AWS service used in this solution](#).

## Sample cost table

The following table provides a sample cost breakdown for deploying this solution with the default parameters in the US East (N. Virginia) Region for one month.

AWS service	Dimensions	Cost [USD]
AWS Directory Service	<b>Base price:</b> Standard x 730 hours (entire month)	\$87.60
Amazon EC2	<b>On-Demand pricing:</b>	\$192.64 \$64.80

AWS service	Dimensions	Cost [USD]
	G4dn.4xlarge x 160 hours (work hours only)	
	<b>Outbound data transfer:</b>	
	10 Mbps x 160 hours (work hours only)	
	(4.5 GB x 160 hours)	
Amazon FSx for Windows File Server	<b>Storage:</b> 5 TB x \$0.130 GB- month	\$650.00
		\$72.00
	<b>Throughput:</b> 16 MBps x \$4.50/MBps	\$256.00
	<b>Backup:</b> 5 TB x \$0.050/GB	
	<b>Total:</b>	<b>\$1,323.04 [USD]/month</b>

## Security

When you build systems on AWS infrastructure, security responsibilities are shared between you and AWS. This [shared responsibility model](#) reduces your operational burden because AWS operates, manages, and controls the components including the host operating system, the virtualization layer, and the physical security of the facilities in which the services operate. For more information about AWS security, visit [AWS Cloud Security](#).

## AWS Directory Service

This solution uses Directory Service for user administration and authentication. Amazon FSx works with Microsoft Active Directory to integrate with your existing Microsoft Windows environments. Active Directory is the Microsoft directory service used to store information about objects on the network and make this information easy for administrators and users to find and use. These objects typically include shared resources such as file servers and network user and computer accounts.



## IAM roles

AWS Identity and Access Management (IAM) roles allow customers to assign granular access policies and permissions to services and users on the AWS Cloud. This solution creates a role attached to the EC2 instance with least privilege, allowing access to specific S3 buckets (when applicable).

## Security groups

The solution creates security groups designed to control and isolate network traffic between specified public IP ranges and the edit host instance. Security groups are also used to control access to Amazon FSx from the edit host. Microsoft Active Directory and Amazon FSx access is also controlled via security group access. For more information, refer to [Using Amazon FSx with AWS Directory Service for Microsoft Active Directory](#).

## Supported AWS Regions

This solution uses AWS Directory Service, Amazon EC2, and FSx for Windows File Server which are available in all AWS Regions. For the most current availability of AWS services by Region, see the [AWS Regional Services List](#).

## Quotas

Service quotas, also referred to as limits, are the maximum number of service resources or operations for your AWS account. Before deploying the solution, you must request a vCPU limit increase based on the G4dn instance size you want to run. For details about submitting a limit increase, see [How do I calculate an EC2 vCPU limit increase request for my On-Demand Instance?](#)

## Quotas for AWS services in this solution

Make sure you have sufficient quota for each of the [services implemented in this solution](#). For more information, see [AWS service quotas](#).

Use the following links to go to the page for that service. To view the service quotas for all AWS services in the documentation without switching pages, view the information in the [Service endpoints and quotas](#) page in the PDF instead.

# Deploy the solution

This solution uses [AWS CloudFormation templates and stacks](#) to automate its deployment. The CloudFormation template(s) specifies(y) the AWS resources included in this solution and their properties. The CloudFormation stack provisions the resources that are described in the template(s).

## Deployment process overview

Follow the step-by-step instructions in this section to configure and deploy the solution into your account.

Before you launch the solution, review the [cost](#), [architecture](#), [network security](#), and other considerations discussed earlier in this guide.

**Time to deploy:** Approximately one hour

### [Step 1. Launch the stack](#)

- Launch the AWS CloudFormation template into your AWS account.
- Enter values for required parameters.
- Review the template parameters, and adjust if necessary.

### [Step 2. \(Optional\) Add Teradici license to the EC2 instance](#)

If you have chosen to deploy the instance using Teradici's Cloud Access Software, you must obtain a license for this software from Teradici. To apply for the license, follow these high-level steps:

- Obtain the EC2 IP address.
- Activate the Teradici license.

### [Step 3. Mount the NVMe disk](#)

- Use Windows PowerShell terminal to mount the NVMe disk.

### [Step 4. \(Optional\) Load data from Amazon S3](#)

- Use Windows PowerShell terminal to load data from Amazon S3.

### Important

This solution includes an option to send anonymized operational metrics to AWS. We use this data to better understand how customers use this solution and related services and products. AWS owns the data gathered through this survey. Data collection is subject to the [AWS Privacy Policy](#).

To opt out of this feature, download the template, modify the AWS CloudFormation mapping section, and then use the AWS CloudFormation console to upload your updated template and deploy the solution. For more information, see the [Anonymized data collection](#) section of this guide.

## AWS CloudFormation template

You can download the CloudFormation template for this solution before deploying it.

[View template](#)

**Edit-in-the-cloud-on-aws.template** - Use this template to launch the solution and all associated components. The default configuration deploys the core and supporting services found in the [AWS services in this solution](#) section. You can customize the template based on your specific needs.

### Note

If you have previously deployed this solution, see [Update the solution](#) for update instructions.

## Step 1: Launch the stack

Follow the step-by-step instructions in this section to configure and deploy the solution into your account.

**Time to deploy:** Approximately one hour

1. Sign in to the AWS Management Console and select the button to launch the `aws-edit-in-the-cloud` AWS CloudFormation template.



- The template launches in the US East (N. Virginia) Region by default. To launch the solution in a different AWS Region, use the Region selector in the console navigation bar.
- On the **Create stack** page, verify that the correct template URL is in the **Amazon S3 URL** text box and choose **Next**.
- On the **Specify stack details** page, assign a name to your solution stack. For information about naming character limitations, see [IAM and AWS STS quotas](#) in the *AWS Identity and Access Management User Guide*.
- Under **Parameters**, review the parameters for this solution template and modify them as necessary. This solution uses the following default values.

Parameter	Default	Description
<b>Network Configuration</b>		
Availability Zones	<i>&lt;Requires input&gt;</i>	Select two Availability Zones to use for the VPC subnets. The template presents all Availability Zones available, select two.
VPC CIDR	10.0.0.0/16	CIDR block for the VPC that contains the Windows EC2 instance.
Private Subnet 1 CIDR	10.0.0.0/19	CIDR block for private subnet 1 located in Availability Zone 1.
Private Subnet 2 CIDR	10.0.32.0/19	CIDR block for private subnet 2 located in Availability Zone 2.

Parameter	Default	Description
Public Subnet 1 CIDR	10.0.128.0/20	CIDR block for the public DMZ subnet 1 located in Availability Zone 1.
Public Subnet 2 CIDR	10.0.144.0/20	CIDR block for the public DMZ subnet 2 located in Availability Zone 2.
<b>Amazon EC2 Configuration</b>		
Amazon EC2 instance type for the video editing server	g4dn.4xlarge	The Amazon EC2 instance type for the video editing servers. <div data-bbox="1068 835 1510 1480"><p><b>Note</b></p><p>You can change the size of the EC2 instance that you can use for editing; however, the majority of the price is based on the size of the EC2 instance that you select here. Check the <a href="#">Cost</a> section for more information.</p></div>

Parameter	Default	Description
Edit Host Access CIDR	<i>&lt;Requires input&gt;</i>	<p>The CIDR block that is used for the security group on your Amazon EC2 instance editing host.</p> <div data-bbox="1068 445 1510 856"><p><b>Note</b></p><p>Use a website such as, <a href="https://checkip.amazonaws.com">https://checkip.amazonaws.com</a> to determine your public facing IP address for this step.</p></div>
Key Pair Name	<i>&lt;Requires input&gt;</i>	<p>The PEM key that allows you to securely connect to your EC2 instance after it launches. You can create a PEM key in the Amazon EC2 console.</p>
Remote Display Protocol	nicedcv	<p>The remote display protocol to configure on the instance for remote access. Select either <code>teradici</code> or <code>nicedcv</code>.</p>

Parameter	Default	Description
Teradici Download Token	< Required if choosing Teradici as Remote Display Protocol >	<p>Please look at the implementation guide section <a href="#">(Optional) Add Teradici license to the EC2 instance</a> for additional steps.</p> <p>Download Token for Teradici Graphics Agent for Windows installer. Copy this 16-character token, located immediately after 'https://dl.teradici.com/' in the download URLs provided within the "Download using a script" section of <a href="#">Teradici Cloud Access Software</a>, after signing in and agreeing to the EULA.</p>
<b>Microsoft Active Directory Configuration</b>		
Domain DNS Name	example.com	Fully qualified domain name (FQDN) of the forest root domain.
Domain NetBIOS Name	Example	NetBIOS name of the domain (up to 15 characters) for users of earlier versions of Windows.
Domain Admin User	Admin	User name for the account that will be added as Domain Administrator. This is separate from the default <b>Administrator</b> account.

Parameter	Default	Description
Domain Admin Password	<i>&lt;Requires input&gt;</i>	Password for the Domain Administrator user. Must be at least 8 characters containing letters, numbers, and symbols.
Standard or Enterprise	Standard	AWS Directory Service edition. Select Standard or Enterprise from the dropdown.
<b>FSx Configuration</b>		
FSx File System Size	1024	The storage capacity of the file system being created. 32 GiB - 65,536 GiB (64 TiB)
FSx Throughput	16	The throughput capacity of an Amazon FSx file system, measured in megabytes per second in powers of 2 (8, 16, 32, ..., 1024), with the recommended value based on the file system size: 8 for <800 GiB, 16 for <1,600 GiB, ... 512 for <51,200 GiB, 1,024 for >=51,200 GiB
FSx AZ Deployment Mode	SINGLE_AZ_2	Specifies the file system deployment type.
<b>Other Parameters</b>		
Project	edit-in-the-cloud-on-aws	Used for billing and resource groups.



6. Choose **Next**.
7. On the **Configure stack options** page, choose **Next**.
8. On the **Review** page, review and confirm the settings. Check the box acknowledging that the template will create AWS Identity and Access Management (IAM) resources.
9. Choose **Create stack** to deploy the stack.

You can view the status of the stack in the AWS CloudFormation console in the **Status** column. You should receive a CREATE\_COMPLETE status in approximately one hour.

### Note

This solution includes the custom-resource AWS Lambda function, which runs only during initial configuration or when resources are updated or deleted. Do not delete this function because it is necessary to manage associated resources.

## Step 2. (Optional) Add Teradici license to the EC2 instance

If you have chosen to deploy your instance with NICE DCV as the Remote Desktop Protocol, skip this step and move to [Step 3. Mount the NVMe disk](#).

If you have chosen to deploy your instance with Teradici Cloud Access Software, you must [purchase a software license](#) from Teradici and install it on the instance after deployment.

After the stack deploys, use Windows Remote Desktop to add a Teradici license to the EC2 instance. First, obtain the public IP address of the EC2 edit host.

To download the Teradici CAS Graphics Agent for Windows, Teradici provides you with a unique download token. This solution uses this token as a parameter of the CloudFormation template.

To obtain the download token from Teradici:

1. Open <https://docs.teradici.com/find/product/cloud-access-software>
1. Select the download link for the Teradici Graphics Agent for Windows.
2. You will be prompted to sign in (if not already signed in).
3. After signing in, select the **Downloads and scripts** link.

4. A EULA will prompt. After reviewing and agreeing to the EULA, select the **Download using a script** link.
5. Example download commands using cURL will display. Each sample command contains a download URL that contains a 16-character token that immediately follows "https://dl.teradici.com/". For example, in the URL https://dl.teradici.com/1234567890abcdef/pcoip-agent/, 1234567890abcdef is the token.
6. Copy this token; it is unique to your Teradici login.
7. Paste this token in the **TeradiciDownloadToken** parameter required by the CloudFormation template.

## NICE DCV installation notes

You do not need a license server to install and use NICE DCV on an EC2 instance. This solution sets up the necessary access to a specific Amazon S3 bucket, which is used to obtain a license for NICE DCV when running on EC2.

NICE DCV clients for Windows, MacOS and Linux can be downloaded from the [download page](#).

### Obtain the EC2 IP address

1. Navigate to the [Amazon Elastic Compute Cloud console](#).
2. In the navigation pane, choose **Instances**.
3. Select the win-host EC2 instance.
4. On the **Networking** tab, copy the value for **Public IPv4 address**.

### Windows connection steps

1. Open **Remote Desktop**. If you can't find it, choose **Start**, enter **MSTSC**, and press **Enter**.
2. When prompted, enter the IP address of the edit host and choose **Connect**.
3. When prompted, enter the sign-in credentials. The username is the value that you entered for the **Domain Admin User** parameter (Admin by default). The password is the value that you entered for the **Domain Admin Password** parameter when launching the stack.

## MacOS connection steps

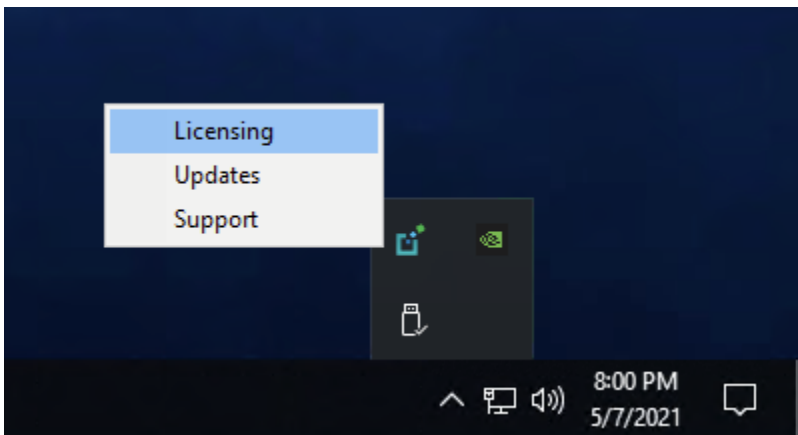
If you use MacOS, you must download the [Microsoft Remote Desktop Client](#) from the App Store.

1. Open Microsoft Remote Desktop.
2. Select the + icon, then select **Add PC**.
3. For **PC Name**, enter the IP address of the edit host. You can specify a friendly name for easy reference, such as *Edit Host*.
4. Choose **Add**.
5. When the new PC appears in your connection options, select it to connect to the EC2 instance.
6. When prompted, enter the sign-in credentials. The username is the value that you entered for the **Domain Admin User** parameter (Admin by default). The password is the value that you entered for the **Domain Admin Password** parameter when launching the stack.

## Activate the Teradici license

In order to use Teradici, you must [purchase a license](#) first.

1. Select the Teradici icon (refer to Teradici icon figure), and choose **Licensing**.



### Teradici icon

2. In the **PCoIP Control Panel** box, enter your registration code, and choose **Register**.

## Connect to the edit host

After activating your Teradici license, connect to the edit host using a [Teradici PCoIP Client](#).

1. On the connection screen, enter in the IP address of your edit host and a connection name for future reference.
2. When prompted for a sign-in credentials, use the same credentials you used earlier to connect to the instance using Windows Remote Desktop.

You are now connected to your edit host using Teradici.

## Step 3. Mount the NVMe disk

In this deployment, we will mount ephemeral storage to the edit host for a scratch media edit space. Ephemeral storage provides low-latency to the host as it is physically attached storage.

### Important

Any assets stored on this volume will be lost upon edit host reboot or termination. We recommend saving all project assets to the FSx file share.

1. Open Windows PowerShell terminal:
  - a. Choose **Start**.
  - b. Enter "powershell" in the Search bar.
  - c. Right click the Windows PowerShell icon and choose **Run as Administrator**.
  - d. If prompted with an alert to allow Windows PowerShell to make changes on your device, select **Yes**.
2. In the Windows PowerShell terminal, enter the following PowerShell command to change to the correct directory:

```
cd C:\ProgramData\Amazon\EC2-Windows\Launch\Scripts
```

3. Enter the following PowerShell command to mount the NVMe disk:

```
.\InitializeDisks.ps1
```

The FSx file share mounts to the F drive upon user sign in.

## Step 4. (Optional) Load data from Amazon S3

Follow these steps to move your media assets from Amazon S3 to FSx for Windows File Server.

1. Choose **Start**.
2. Enter "powershell" in the Search bar.
3. Select **Windows PowerShell for AWS**.
4. Change to the FSx File Share drive mapping:

```
F:
```

5. Create a new directory for media:

```
mkdir Media
```

6. Use the following command to list the contents of your S3 bucket:

```
aws s3 ls s3://<bucket-name>
```

7. Use the following command to load the data from your S3 Bucket into the FSx File Share:

```
aws s3 sync  
s3://<bucket-name>/<key-prefix>  
.\Media\
```

*<key-prefix>* is any folder or object you want to load into the file share.

## To verify that your files were synchronized from S3 to the FSx file share

1. Navigate to your Windows File Explorer, then to your FSx File Share, which is mounted to the F: Drive.
2. From your file share, verify that the **Media** folder is there.
3. Open the **Media** folder and check that the contents of your S3 Bucket have synchronized.

# Monitor the solution with Service Catalog AppRegistry

This solution includes a Service Catalog AppRegistry resource to register the CloudFormation template and underlying resources as an application in both [Service Catalog AppRegistry](#) and [AWS Systems Manager Application Manager](#).

AWS Systems Manager Application Manager gives you an application-level view into this solution and its resources so that you can:

- Monitor its resources, costs for the deployed resources across stacks and AWS accounts, and logs associated with this solution from a central location.
- View operations data for the resources of this solution (such as deployment status, CloudWatch alarms, resource configurations, and operational issues) in the context of an application.

The following figure depicts an example of the application view for the solution stack in Application Manager.

The screenshot displays the AWS Systems Manager Application Manager console. On the left, a sidebar shows a list of components under 'Components (2)', including 'AWS-Systems-Manager-Application-Manager' and 'AWS-Systems-Manager-A'. The main content area is titled 'AWS-Systems-Manager-Application-Manager' and features a 'Start runbook' button. Below the title is the 'Application information' section, which includes fields for 'Application type' (AWS-AppRegistry), 'Name' (AWS-Systems-Manager-Application-Manager), and 'Application monitoring' (Not enabled). A description states: 'Service Catalog application to track and manage all your resources for the solution'. A 'View in AppRegistry' button is also present. Below this is a navigation bar with tabs for 'Overview', 'Resources', 'Instances', 'Compliance', 'Monitoring', 'OpsItems', 'Logs', 'Runbooks', and 'Cost'. The 'Overview' tab is active, showing 'Insights and Alarms' and 'Cost' sections. The 'Insights and Alarms' section includes a 'View all' button and a note to 'Monitor your application health with Amazon CloudWatch'. The 'Cost' section includes a 'View all' button and a note to 'View resource costs per application using AWS Cost Explorer'. A 'Cost (USD)' section is partially visible below.

## Solution stack in Application Manager

## Activate CloudWatch Application Insights

1. Sign in to the [Systems Manager console](#).

2. In the navigation pane, choose **Application Manager**.
3. In **Applications**, search for the application name for this solution and select it.

The application name will have App Registry in the **Application Source** column, and will have a combination of the solution name, Region, account ID, or stack name.

4. In the **Components** tree, choose the application stack you want to activate.
5. In the **Monitoring** tab, in **Application Insights**, select **Auto-configure Application Insights**.

The screenshot shows the AWS Application Insights interface. At the top, there is a navigation bar with tabs: Overview, Resources, Provisioning, Compliance, **Monitoring**, OpsItems, Logs, Runbooks, and Cost. Below the navigation bar, the page title is "Application Insights (0) Info". To the right of the title are a toggle for "View Ignored Problems", an "Actions" dropdown menu, and an "Add an application" button. Below the title, it says "Problems detected by severity". There is a search bar with the placeholder text "Find problems", a "Last 7 days" filter, a refresh button, and navigation arrows. Below the search bar is a table header with columns: Problem su..., Status, Severity, Source, Start time, and Insights. The main content area displays a message: "Advanced monitoring is not enabled". Below this message, there is explanatory text: "When you onboard your first application, a service-linked role (SLR) is created in your account. The SLR is predefined by CloudWatch Application Insights and includes the permissions the service requires to monitor AWS services on your behalf." At the bottom of this section is a button labeled "Auto-configure Application Insights".

Monitoring for your applications is now activated and the following status box appears:

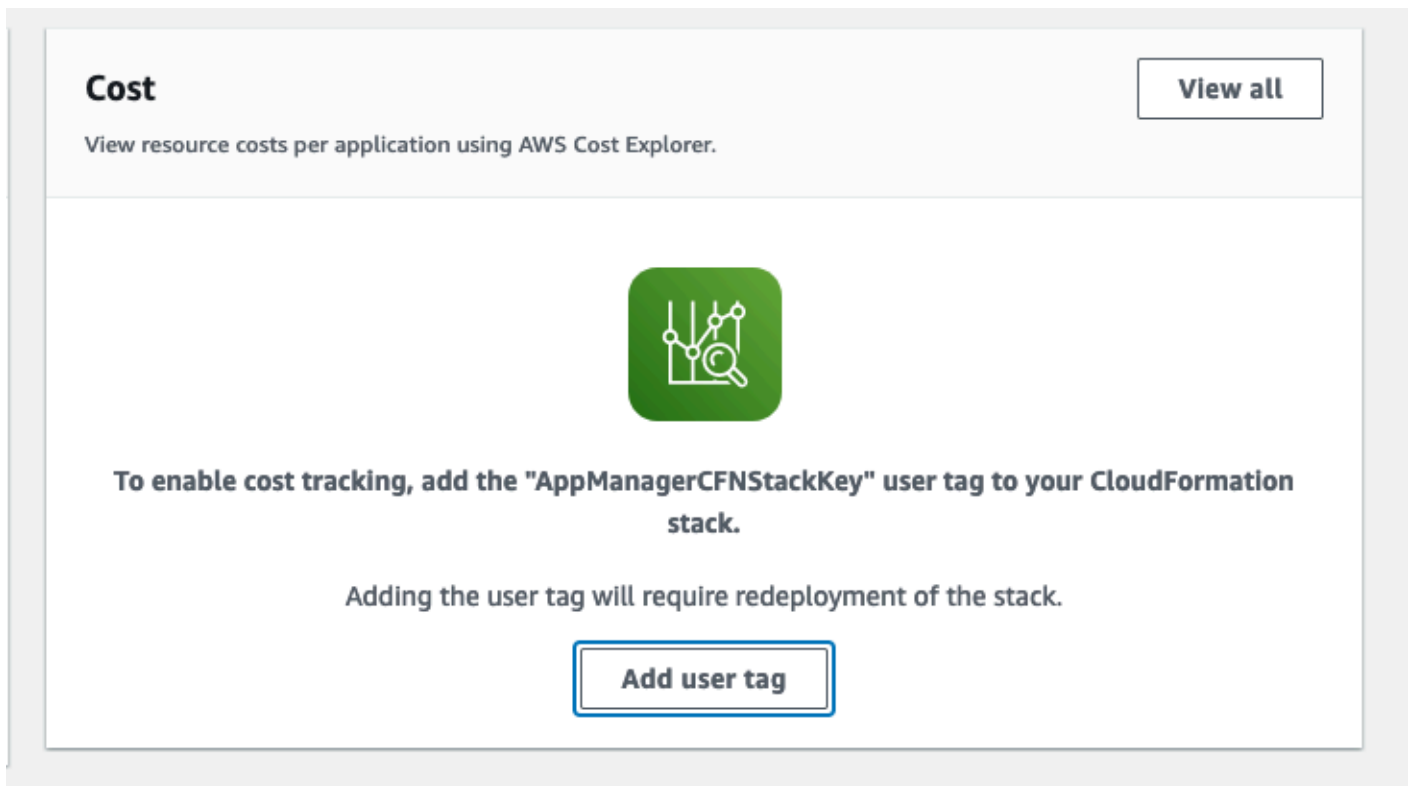
The screenshot shows the AWS Application Insights interface after monitoring has been activated. The navigation bar and top controls are the same as in the previous screenshot. The main content area now displays a green-bordered box with a success message: "Application monitoring has been successfully enabled. It will take some time to display any results. Please use the refresh button to view results." The rest of the interface, including the search bar and table header, remains the same.



## Confirm cost tags associated with the solution

After you activate cost allocation tags associated with the solution, you must confirm the cost allocation tags to see the costs for this solution. To confirm cost allocation tags:

1. Sign in to the [Systems Manager console](#).
2. In the navigation pane, choose **Application Manager**.
3. In **Applications**, choose the application name for this solution and select it.
4. In the **Overview** tab, in **Cost**, select **Add user tag**.



5. On the **Add user tag** page, enter `confirm`, then select **Add user tag**.

The activation process can take up to 24 hours to complete and the tag data to appear.

## Activate cost allocation tags associated with the solution

After you confirm the cost tags associated with this solution, you must activate the cost allocation tags to see the costs for this solution. The cost allocation tags can only be activated from the management account for the organization.

To activate cost allocation tags:

1. Sign in to the [AWS Billing and Cost Management and Cost Management console](#).
2. In the navigation pane, select **Cost Allocation Tags**.
3. On the **Cost allocation tags** page, filter for the AppManagerCFNStackKey tag, then select the tag from the results shown.
4. Choose **Activate**.

## AWS Cost Explorer

You can see the overview of the costs associated with the application and application components within the Application Manager console through integration with AWS Cost Explorer. Cost Explorer helps you manage costs by providing a view of your AWS resource costs and usage over time.

1. Sign in to the [AWS Cost Management console](#).
2. In the navigation menu, select **Cost Explorer** to view the solution's costs and usage over time.

# Update the solution

If you have previously deployed the solution, follow this procedure to update the solution's CloudFormation stack to get the latest version of the solution's framework.

1. Sign in to the [AWS CloudFormation console](#), select your existing Edit in the Cloud on AWS CloudFormation stack, and select **Update**.
2. Select **Replace current template**.
3. Under **Specify template**:
  - a. Select **Amazon S3 URL**.
  - b. Copy the link of the [latest template](#).
  - c. Paste the link in the **Amazon S3 URL** box.
  - d. Verify that the correct template URL shows in the **Amazon S3 URL** text box, and choose **Next**. Choose **Next** again.
4. Under **Parameters**, review the parameters for the template and modify them as necessary. For details about the parameters, see [Step 1. Launch the Stack](#).
5. Choose **Next**.
6. On the **Configure stack options** page, choose **Next**.
7. On the **Review** page, review and confirm the settings. Check the box acknowledging that the template will create AWS Identity and Access Management (IAM) resources.
8. Choose **View change set** and verify the changes.
9. Choose **Update stack** to deploy the stack.

You can view the status of the stack in the AWS CloudFormation console in the **Status** column. You should receive a UPDATE\_COMPLETE status in approximately one hour.

# Troubleshooting

If you need help with this solution, contact AWS Support to open a support case for this solution.

## Contact AWS Support

If you have [AWS Developer Support](#), [AWS Business Support](#), or [AWS Enterprise Support](#), you can use the Support Center to get expert assistance with this solution. The following sections provide instructions.

### Create case

1. Sign in to [Support Center](#).
2. Choose **Create case**.

### How can we help?

1. Choose **Technical**.
2. For **Service**, select **Solutions**.
3. For **Category**, select **Other Solutions**.
4. For **Severity**, select the option that best matches your use case.
5. When you enter the **Service**, **Category**, and **Severity**, the interface populates links to common troubleshooting questions. If you can't resolve your question with these links, choose **Next step: Additional information**.

### Additional information

1. For **Subject**, enter text summarizing your question or issue.
2. For **Description**, describe the issue in detail.
3. Choose **Attach files**.
4. Attach the information that AWS Support needs to process the request.

## Help us resolve your case faster

1. Enter the requested information.
2. Choose **Next step: Solve now or contact us**.

## Solve now or contact us

1. Review the **Solve now** solutions.
2. If you can't resolve your issue with these solutions, choose **Contact us**, enter the requested information, and choose **Submit**.

# Uninstall the solution

You can uninstall the Edit on the Cloud on AWS solution from the AWS Management Console or by using the AWS Command Line Interface. If you added additional resources, such as an Amazon S3 bucket, you must delete these manually.

## Using the AWS Management Console

1. Sign in to the [AWS CloudFormation console](#).
2. On the **Stacks** page, select this solution's installation stack.
3. Choose **Delete**.

## Using AWS Command Line Interface

Determine whether the AWS Command Line Interface (AWS CLI) is available in your environment. For installation instructions, see [What Is the AWS Command Line Interface](#) in the *AWS CLI User Guide*. After confirming that the AWS CLI is available, run the following command.

```
$ aws cloudformation delete-stack --stack-name  
<installation-stack-name>
```

# Developer guide

## Source code

Visit our solution [GitHub repository](#) to download the source files for this solution and to share your customizations with others. Refer to the [README.md](#) file for additional information.

## Reference

This section includes information about an optional feature for collecting unique metrics for this solution, pointers to related resources, and a list of builders who contributed to this AWS Solution.

### Anonymized data collection

This solution includes an option to send anonymized operational metrics to AWS. We use this data to better understand how customers use this solution and related services and products. When invoked, the following information is collected and sent to AWS:

- **Solution ID** - The AWS solution identifier
- **Unique ID (UUID)** - Randomly generated, unique identifier for each Edit in the Cloud on AWS deployment
- **Timestamp** - Data-collection timestamp
- **Example: Instance Data** - Count of the state and type of instances that are managed by the EC2 Scheduler in each AWS Region

Example data:

Running: {t2.micro: 2}, {m3.large:2}

Stopped: {t2.large: 1}, {m3.xlarge:3}

AWS owns the data gathered through this survey. Data collection is subject to the [AWS Privacy Notice](#). To opt out of this feature, complete the following steps before launching the AWS CloudFormation template.

1. Download the [AWS CloudFormation template](#) to your local hard drive.
2. Open the AWS CloudFormation template with a text editor.
3. Modify the AWS CloudFormation template mapping section from:

```
AnonymizedData:  
  SendAnonymizedData:  
    Data: Yes
```



to:

```
AnonymizedData:  
  SendAnonymizedData:  
    Data: No
```

4. Sign in to the [AWS CloudFormation console](#).
5. Select Create stack.
6. On the Create stack page, Specify template section, select Upload a template file.
7. Under **Upload a template file**, choose **Choose file** and select the edited template from your local drive.
8. Choose **Next** and follow the steps in [Launch the stack](#) in the Deploy the solution section of this guide.

## Related resources

### Blog posts

- [Deploying your favorite post-production applications on AWS Virtual Desktop infrastructure](#)
- [Getting started with AWS cloud video editing](#)

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# Revisions

Date	Change
May 2021	Initial release
June 2021	Release v1.0.1: bug fix. For more information, refer to the <a href="#">CHANGELOG.md</a> file in the GitHub repository.
August 2021	Release v2.0.0: Changed the default value of a field in the Active Directory sub-template to save cost. For more information, refer to the <a href="#">CHANGELOG.md</a> file in the GitHub repository.
January 2022	Release v2.1.0: Added an option to install NICE DCV as the Remote Desktop Protocol on the EC2 instance as an alternative to the existing support for Teradici Cloud Access Software. For more information, refer to the <a href="#">CHANGELOG.md</a> file in the GitHub repository.
March 2022	Release v2.1.1: bug fixes. For more information, refer to the <a href="#">CHANGELOG.md</a> file in the GitHub repository.
March 2022	Release v2.2.0: Reinstated Teradici CAS. For more information, refer to the <a href="#">CHANGELOG.md</a> file in the GitHub repository.
June 2022	Release v2.3.0: Updated the domain join process to use a Systems Manager document rather than PowerShell. For more information, refer to the <a href="#">CHANGELOG.md</a> file in the GitHub repository.
November 2022	Release v2.3.1: Fixed deployment tests, fixed customer issue where the solution was not

Date	Change
	deploying in AWS Regions outside of us-east-1 , upgraded to Node.js v14. For more information, refer to the <a href="#">CHANGELOG.md</a> file in the GitHub repository.
April 2023	Release v2.3.2: Updated the latest GRID / NVIDIA driver location to C:\Windows\System32\DriverStore\FileRepository\nvgrid*\ instead of C:\Program Files\NVIDIA Corporation\NVSMI . For more information, refer to the <a href="#">CHANGELOG.md</a> file in the GitHub repository.
July 2023	Release v2.4.0: Added appregistry integration, converted to CDK, updated Node.JS to 18 and JS SDK to V3, and added package_lock.json files to packages. Updated documentation template and parameter names. For more information, refer to the <a href="#">CHANGELOG.md</a> file in the GitHub repository.
November 2023	Release v2.4.1: Updated package versions to resolve security vulnerabilities. For more information, refer to the <a href="#">CHANGELOG.md</a> file in the GitHub repository.
November 2023	Documentation update: Added <a href="#">Confirm cost tags associated with the solution</a> to the Monitoring the solution with AWS Service Catalog AppRegistry section.

## Notices

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