



## **Get started**

### Cloud Tiering

NetApp  
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# Table of Contents

- Get started ..... 1
  - Supported object storage providers ..... 1
  - Tier data to AWS S3 ..... 1
  - Tier data to Azure Blob storage ..... 14
  - Tier data to Google Cloud Storage ..... 22
  - Tier data to StorageGRID ..... 30
- Set up licensing for Cloud Tiering ..... 37

# Get started

## Supported object storage providers

Cloud Tiering can tier inactive data from an ONTAP cluster to a public cloud (AWS S3, Microsoft Azure Blob storage, or Google Cloud Storage) or to a private cloud (StorageGRID).

### AWS S3

- [Quick start for AWS](#)
- [Supported S3 storage classes and regions](#)

### Azure Blob storage

- [Quick start for Azure](#)
- [Supported Azure Blob access tiers and regions](#)

### Google Cloud Storage

- [Quick start for Google Cloud Storage](#)
- [Supported Google Cloud storage classes and regions](#)

### StorageGRID using the S3 protocol

[Quick start for StorageGRID](#)

## Tier data to AWS S3

### Quick start for tiering inactive data to AWS

Getting started with Cloud Tiering in AWS includes a few steps.



#### Prepare to tier data to AWS

You need the following:

- An AFF or FAS system with all-SSD aggregates running ONTAP 9.2 or later, and an HTTPS connection to AWS S3.
- An AWS account that has an access key and [the required permissions](#) so the ONTAP cluster can tier inactive data in and out of AWS S3.
- A location for the Service Connector: either [an AWS VPC](#) or [an on-premises Linux host](#).

With either option, the Service Connector needs an outbound HTTPS connection to the ONTAP cluster, to S3 storage, and to the Cloud Tiering service.

## 2

### Tier inactive data from your first cluster

Log in to [NetApp Cloud Central](#), start a free trial of the Cloud Tiering service, and click **Let's Start, Discover Your First Cluster**.

## 3

### Set up licensing

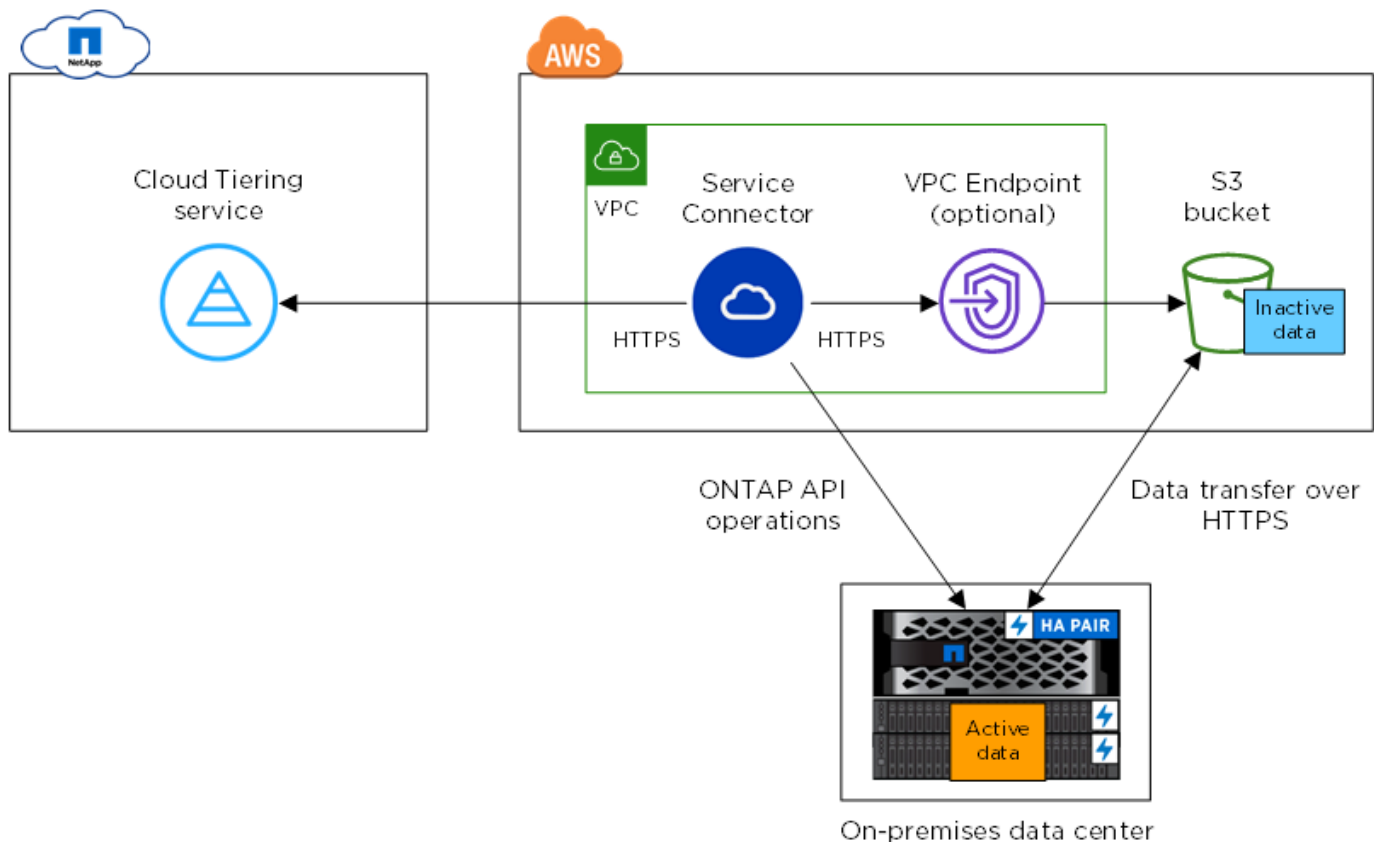
After your free trial ends, pay for Cloud Tiering through a pay-as-you-go subscription, an ONTAP tiering license, or a combination of both:

- To subscribe from the AWS Marketplace, click **Licensing**, click **Subscribe**, and then follow the prompts.
- To add a tiering license, [contact us if you need to purchase one](#), and then add it to your cluster from ONTAP System Manager.

## Preparing to tier inactive data to AWS S3

Before you use Cloud Tiering, verify support for your ONTAP cluster, prepare your object storage, and set up a location for the Service Connector.

The following image shows each component and the connections that you need to prepare between them:



Communication between the Service Connector and S3 is for object storage setup only. The Service Connector can reside on your premises, instead of in the cloud.

## Preparing your ONTAP clusters

Your ONTAP clusters must meet the following requirements when tiering data to AWS S3.

### Supported ONTAP platforms

Cloud Tiering supports AFF systems and all-SSD aggregates on FAS systems.

### Supported ONTAP version

ONTAP 9.2 or later

### Cluster networking requirements

- The ONTAP cluster initiates an HTTPS connection over port 443 to AWS S3.

ONTAP reads and writes data to and from object storage. The object storage never initiates, it just responds.

Although AWS Direct Connect provides better performance and lower data transfer charges, it is not required between the ONTAP cluster and AWS S3. Because performance is significantly better when using AWS Direct Connect, doing so is the recommended best practice.

- An inbound connection is required from the NetApp Service Connector, which can reside in an AWS VPC or on your premises.

A connection between the cluster and the Cloud Tiering service is not required.

- An intercluster LIF is required on each ONTAP node that hosts tiered volumes. The LIF must be associated with the *IPspace* that ONTAP should use to connect to object storage.

IPspaces enable network traffic segregation, allowing for separation of client traffic for privacy and security. [Learn more about IPspaces.](#)

When you set up data tiering, Cloud Tiering prompts you for the IPspace to use. You should choose the IPspace that each LIF is associated with. That might be the "Default" IPspace or a custom IPspace that you created.

### Supported volumes and aggregates

The total number of volumes that Cloud Tiering can tier might be less than the number of volumes on your ONTAP system. That's because volumes can't be tiered from some aggregates. For example, you can't tier data from SnapLock volumes or from MetroCluster configurations. Refer to ONTAP documentation for [functionality or features not supported by FabricPool.](#)



Cloud Tiering supports FlexGroup volumes, starting with ONTAP 9.5. Setup works the same as any other volume.

### Choosing a location for the Service Connector

The Service Connector is NetApp software that communicates with your ONTAP clusters. You can deploy the Service Connector on your premises or in an AWS VPC.

Be sure to set up the Service Connector in the same AWS account to which you want to tier data.

- [Installing the Service Connector on prem](#)
- [Preparing to deploy the Service Connector in an AWS VPC](#)

## Preparing to deploy the Service Connector in an AWS VPC

Cloud Tiering guides you through the process of deploying the Service Connector on an EC2 instance. Make sure that your AWS account and networking are set up.

### Setting up an AWS account for the Service Connector

The AWS account where you deploy the EC2 instance must have permissions and an access key. Cloud Tiering tiers data to an S3 bucket that resides in the same AWS account as the Service Connector.

#### Steps

1. Provide [the permissions in this policy](#) to the IAM user.

[AWS Documentation: Creating a Role to Delegate Permissions to an IAM User](#)

2. Create or locate an access key that you can provide to Cloud Tiering.

These credentials are used by the Cloud Tiering service to launch the EC2 instance in AWS. Providing your keys is secure and private. NetApp does not save them.

[AWS Documentation: Managing Access Keys for IAM Users](#)

### Setting up AWS networking for the Service Connector

The Service Connector needs a connection to your ONTAP clusters, to AWS S3, and to the Cloud Tiering service.

#### Steps

1. Identify a VPC for the Service Connector that enables the following connections:
  - An outbound internet connection to the Cloud Tiering service over port 443 (HTTPS)
  - An HTTPS connection over port 443 to S3
  - An HTTPS connection over port 443 to your ONTAP clusters

Cloud Tiering enables you to deploy the EC2 instance with a public IP address and you can configure it to use your own proxy server.

You don't need to create your own security group because Cloud Tiering can do that for you. The security group that Cloud Tiering creates has no inbound connectivity and open outbound connectivity.

2. If needed, enable a VPC Endpoint to S3.

A VPC Endpoint to S3 is recommended if you have a Direct Connect or VPN connection from your ONTAP cluster to the VPC and you want communication between the Service Connector and S3 to stay in your AWS internal network.

## Preparing AWS S3 for data tiering

When you set up data tiering to a new cluster, Cloud Tiering prompts you to create an S3 bucket or select an existing S3 bucket in the AWS account where you set up the Service Connector.

The AWS account must have permissions and an access key that you can enter in Cloud Tiering. The ONTAP cluster uses the access key to tier data in and out of S3.

## Steps

1. Provide the following permissions to the IAM user:

```
"s3:ListAllMyBuckets",  
"s3:ListBucket",  
"s3:GetBucketLocation",  
"s3:GetObject",  
"s3:PutObject",  
"s3:DeleteObject"
```

[AWS Documentation: Creating a Role to Delegate Permissions to an IAM User](#)

2. Create or locate an access key.

Cloud Tiering passes the access key on to the ONTAP cluster. The credentials are not stored in the Cloud Tiering service.

[AWS Documentation: Managing Access Keys for IAM Users](#)

## Installing the Service Connector on your premises for tiering to AWS S3

If you want to tier cold data to AWS S3, you can deploy the Service Connector either on your premises or in an AWS VPC. This page describes how to install the on-premises Service Connector.

To deploy the Service Connector in AWS, [follow the prompts in Cloud Tiering when discovering your first cluster](#).

### Understanding the relationship between the Service Connector and Cloud Manager

To install the Service Connector, you need to download and install [NetApp Cloud Manager software](#). You need to do this because the Service Connector is part of Cloud Manager.

### Verifying host requirements

[Refer to Connector host requirements in the Cloud Manager documentation](#).

### Preparing your networking

The Service Connector needs a connection to your ONTAP clusters, to AWS S3, and to the Cloud Tiering service.

## Steps

1. Set up an on-premises location for the Service Connector that enables the following connections:
  - An outbound internet connection to the Cloud Tiering service over port 443 (HTTPS)
  - An HTTPS connection over port 443 to S3
  - An HTTPS connection over port 443 to your ONTAP clusters
2. Ensure that outbound internet access is allowed to those endpoints:

- <http://dev.mysql.com/get/mysql-community-release-el7-5.noarch.rpm>
- <https://dl.fedoraproject.org/pub/epel/epel-release-latest-7.noarch.rpm>
- <https://s3.amazonaws.com/aws-cli/awscli-bundle.zip>

The installer accesses these URLs during the installation process.

### **Providing permissions to an AWS account**

After you install the Service Connector, you need to provide access keys for an AWS account. That account needs specific permissions so the Service Connector can set up data tiering to AWS S3 on your behalf.

Cloud Tiering tiers data to an S3 bucket that resides in this AWS account.

#### **Steps**

1. From the AWS IAM console, create an IAM policy by copying and pasting the permissions below.

For step-by-step instructions, refer to [AWS Documentation: Creating IAM Policies](#).



```

{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Effect": "Allow",
      "Action": [
        "sts:DecodeAuthorizationMessage",
        "s3:ListBucket",
        "ec2:DescribeRegions",
        "cloudformation:CreateStack",
        "cloudformation>DeleteStack",
        "cloudformation:DescribeStacks",
        "cloudformation:DescribeStackEvents",
        "cloudformation:ValidateTemplate"
      ],
      "Resource": "*"
    },
    {
      "Sid": "fabricPoolPolicy",
      "Effect": "Allow",
      "Action": [
        "s3:DeleteBucket",
        "s3:GetLifecycleConfiguration",
        "s3:PutLifecycleConfiguration",
        "s3:CreateBucket",
        "s3:GetBucketTagging",
        "s3:PutBucketTagging"
      ],
      "Resource": "arn:aws:s3:::fabric-pool*"
    }
  ]
}

```

2. Attach the policy to an IAM role or an IAM user.

For step-by-step instructions, refer to the following:

- [AWS Documentation: Creating IAM Roles](#)
- [AWS Documentation: Adding and Removing IAM Policies](#)

### Result

The account now has the required permissions. You need to provide access keys for the AWS account after you install the Service Connector.

## Installing the Service Connector on an on-premises Linux host

After you verify system and network requirements, download and install the software on a supported Linux host.

### About this task

- Root privileges are not required for installation.
- The Service Connector installs the AWS command line tools (awscli) to enable recovery procedures from NetApp support.

If you receive a message that installing the awscli failed, you can safely ignore the message. The Service Connector can operate successfully without the tools.

- The installer that is available on the NetApp Support Site might be an earlier version. After installation, the software automatically updates itself if a new version is available.

### Steps

1. Download the installation script for Cloud Manager 3.8.4 or later from the [NetApp Support Site](#), and then copy it to the Linux host.

[Why do I need to install Cloud Manager?](#)

2. Assign permissions to execute the script.

#### Example

```
chmod +x OnCommandCloudManager-V3.8.4.sh
```

3. Run the installation script:

```
./OnCommandCloudManager-V3.8.4.sh [silent] [proxy=ipaddress]  
[proxyport=port] [proxyuser=user_name] [proxypwd=password]
```

*silent* runs the installation without prompting you for information.

*proxy* is required if the host is behind a proxy server.

*proxyport* is the port for the proxy server.

*proxyuser* is the user name for the proxy server, if basic authentication is required.

*proxypwd* is the password for the user name that you specified.

4. Unless you specified the silent parameter, type **Y** to continue the script, and then enter the HTTP and HTTPS ports when prompted.

If you change the HTTP and HTTPS ports, you must ensure that users can access the Cloud Manager web console from a remote host:

- Modify the security group to allow inbound connections through the ports.
- Specify the port when you enter the URL to the web console.

The Service Connector is now installed. At the end of the installation, the Cloud Manager service (occm) restarts twice if you specified a proxy server.

5. Open a web browser and enter the following URL:

`https://ipaddress:port`

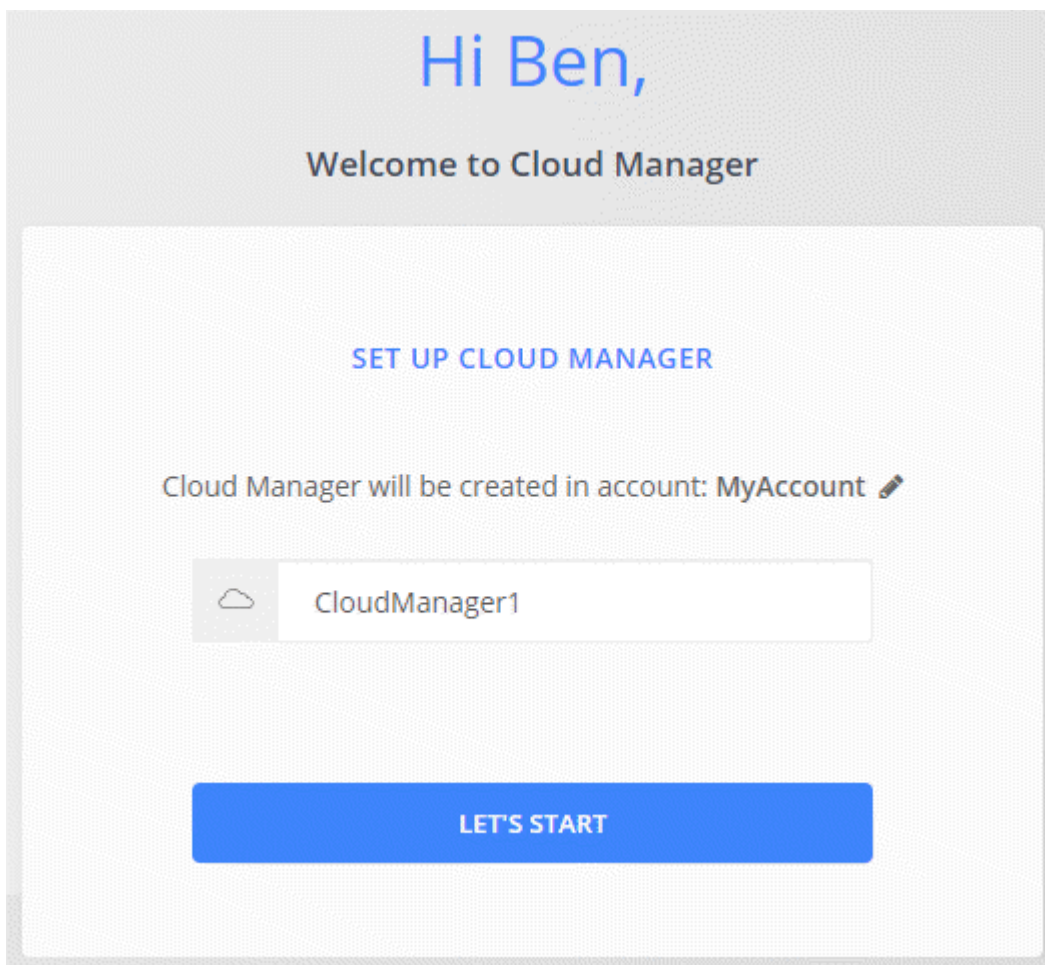
*ipaddress* can be localhost, a private IP address, or a public IP address, depending on the configuration of the host.

*port* is required if you changed the default HTTP (80) or HTTPS (443) ports. For example, if the HTTPS port was changed to 8443, you would enter `https://ipaddress:8443`

6. Sign up at NetApp Cloud Central or log in.
7. After you log in, set up Cloud Manager:
  - a. Specify the Cloud Central account to associate with this Cloud Manager system. This should be the same account that you specified when you ran the pre-installation script.

[Learn about Cloud Central accounts.](#)

- b. Enter a name for the system.



#### **After you finish**

Add an AWS account to Cloud Manager that has the required permissions.

## Adding the AWS account to Cloud Manager

After you provide an AWS account with the required permissions, you need to add AWS access keys to Cloud Manager. This enables the Service Connector to set up data tiering to AWS S3 on your behalf.

Cloud Tiering tiers data to an S3 bucket that resides in this AWS account.

### Steps

1. In the upper right of the Cloud Manager console, click the Settings icon, and select **Credentials**.



2. Click **Add Credentials** and select **AWS**.
3. Select **AWS keys**.
4. Confirm that the policy requirements have been met and then click **Create Account**.

### Result

The Service Connector is now installed with the permissions that it needs to tier cold data from your ONTAP systems to AWS S3. You should now see the Service Connector when you [set up tiering to a new cluster](#).

## Tiering inactive data from your first cluster to AWS S3

After you prepare your AWS environment, just log in to Cloud Tiering and start tiering inactive data from your first cluster.

### What you'll need

- To discover the cluster, you'll need the following:
  - The cluster management IP address.
  - The user name and password of an ONTAP account that has administrator-level privileges.

The Service Connector uses this account to send API operations to the ONTAP cluster.

- To deploy the Service Connector in AWS, you'll need the following:
  - The AWS region, VPC, and subnet in which the Service Connector will reside.
  - An AWS access key for an IAM user who has the required permissions.
- To set up tiering to S3, you'll need an AWS access key for an IAM user who has the required S3 permissions.

If you haven't met these requirements, see [Preparing your environment](#).

### Steps

1. Log in to [NetApp Cloud Central](#).
2. Select the Cloud Tiering service.
3. Click **Let's Start, Discover Your First Cluster**.
4. Complete the steps on the **Discover Cluster** page:

- a. Enter the cluster management IP address and the user name and password of an account that has administrator-level privileges.

Let's Discover Your Cluster

Please fill in cluster details:

Cluster Management IP Address

172.31.20.236

User Name (admin role is required)

admin

Password

.....

- b. Click **Discover Cluster**.

If you already have an existing Service Connector, then Cloud Tiering automatically attempts to use that Service Connector. Cloud Tiering moves on to the next step, if any existing Service Connector has connectivity to the cluster.

- c. If Cloud Tiering prompts you to create a Service Connector, click **Create your first Service Connector**.

If you have an existing Service Connector and Cloud Tiering can't use it, then you'll need to do one of two things:

- Click **Add Service Connector** to create a new Service Connector.
- Check the status and connectivity of any existing Service Connectors and then try to discover the cluster again.

- d. If you clicked the button to create a Service Connector, follow the prompts to deploy it in AWS:

- **Select Provider:** Select **Amazon Web Services** as the target location for the Service Connector.
- **AWS Credentials:** Enter the AWS access key ID and secret key for an IAM user that has [the required permissions](#) to deploy the Service Connector.
- **Location:** Select the AWS region, VPC, and subnet for the Service Connector EC2 instance.

Remember, the Service Connector must have a constant connection to the ONTAP cluster and a constant internet connection to the Cloud Tiering service.

- **Network:** Select a key pair to use for the EC2 instance, choose whether to assign a public IP, and specify an HTTP proxy, if one is required for outbound connectivity.
- **Security Group:** Select **Create a new security group** so Cloud Tiering can create the security group, or select your own. Then click **Go**.

The security group that Cloud Tiering creates has no inbound connectivity and open outbound connectivity.

Leave the page open until the deployment is complete.

e. Back on the Discover Cluster page, select the Service Connector that you just created.

5. Complete the steps on the **Tiering Setup** page:

- a. **S3 Bucket:** Add a new S3 bucket or select an existing S3 bucket that starts with the prefix *fabric-pool* and click **Continue**.

The *fabric-pool* prefix is required because the IAM policy for the Service Connector enables the instance to perform S3 actions on buckets named with that exact prefix.

For example, you could name the S3 bucket fabric-pool-AFF1, where AFF1 is the name of the cluster.

- b. **Storage Class:** Select the S3 storage class that you want to transition the data to after 30 days and click **Continue**.

If you choose Standard, then the data remains in that storage class.

- c. **Credentials:** Enter the access key ID and secret key for an IAM user who has [the required S3 permissions](#).


The IAM user must be in the same AWS account as the bucket that you selected or created on the **S3 Bucket** page.

- d. **Cluster Network:** Select the IPspace that ONTAP should use to connect to object storage and click **Continue**.

Selecting the correct IPspace ensures that Cloud Tiering can set up a connection from ONTAP to your cloud provider's object storage.

If you haven't reviewed requirements for the IPspace and the associated intercluster LIFs, see [ONTAP cluster requirements](#).

6. Click **Continue** to select the volumes that you want to tier.

7. For each volume, click the  icon, select a tiering policy, optionally adjust the cooling days, and click **Apply**.

[Learn about volume tiering policies and cooling days.](#)

Tier Volumes Learn how much you can save with each Tiering Policy

1 - 3 of 3 Volumes 🔍

Volume Name ↑↓	SVM Name ↑↓	Volume Size ↑↓	Used Size ↑↓	Cold Data ↑↓	Tier Status [3] ⇅	Tiering Policy ↑↓
vol1	svm_AFF1	200 GB	3.8 MB	2.66 ...   70 %	✓ Tiered Volume	All user data
vol2	svm_AFF1	400 GB	2.59 MB	1.81 ...   70 %	✓ Tiered Volume	Cold user data
vol3	svm_AFF1	325 GB	2.59 MB	0 B   0 %	✓ Tiered Volume	Cold snapshots

8. When you're done, click **Close**.

## Result

You've successfully set up data tiering from volumes on the cluster to S3 object storage.

## What's next?

Be sure to subscribe to the [Cloud Tiering service from the AWS Marketplace](#).

You can also add additional clusters or review information about the active and inactive data on the cluster. For details, see [Managing data tiering from your clusters](#).

## Supported S3 storage classes and regions

Cloud Tiering supports several S3 storage classes and most regions.

### Supported S3 storage classes

Cloud Tiering can apply a lifecycle rule so the data transitions from the *Standard* storage class to another storage class after 30 days. You can choose from the following storage classes:

- Standard-Infrequent Access
- One Zone-IA
- Intelligent

If you choose Standard, then the data remains in that storage class.

[Learn about S3 storage classes](#).

### Supported AWS regions

Cloud Tiering supports the following AWS regions.

#### Asia Pacific

- Mumbai
- Seoul
- Singapore
- Sydney
- Tokyo

## Europe

- Frankfurt
- Ireland
- London
- Paris
- Stockholm

## North America

- Canada Central
- GovCloud (US-West) – starting with ONTAP 9.3
- US East (N. Virginia)
- US East (Ohio)
- US West (N. California)
- US West (Oregon)

## South America

- São Paulo

# Tier data to Azure Blob storage

## Quick start for tiering inactive data to Azure

Getting started with Cloud Tiering in Microsoft Azure includes a few steps.



### Prepare to tier data to Azure Blob storage

You need the following:

- An AFF or FAS system with all-SSD aggregates running ONTAP 9.4 or later, and an HTTPS connection to Azure Blob storage.
- An Azure account that has the [required permissions](#) to deploy the Service Connector in a VNet.

The Service Connector needs an outbound HTTPS connection to the ONTAP cluster in your data center, to Azure Blob storage, and to the Cloud Tiering service.



### Tier inactive data from your first cluster

Log in to [NetApp Cloud Central](#), start a free trial of the Cloud Tiering service, and click **Let's Start, Discover Your First Cluster**.



### 3

## Set up licensing

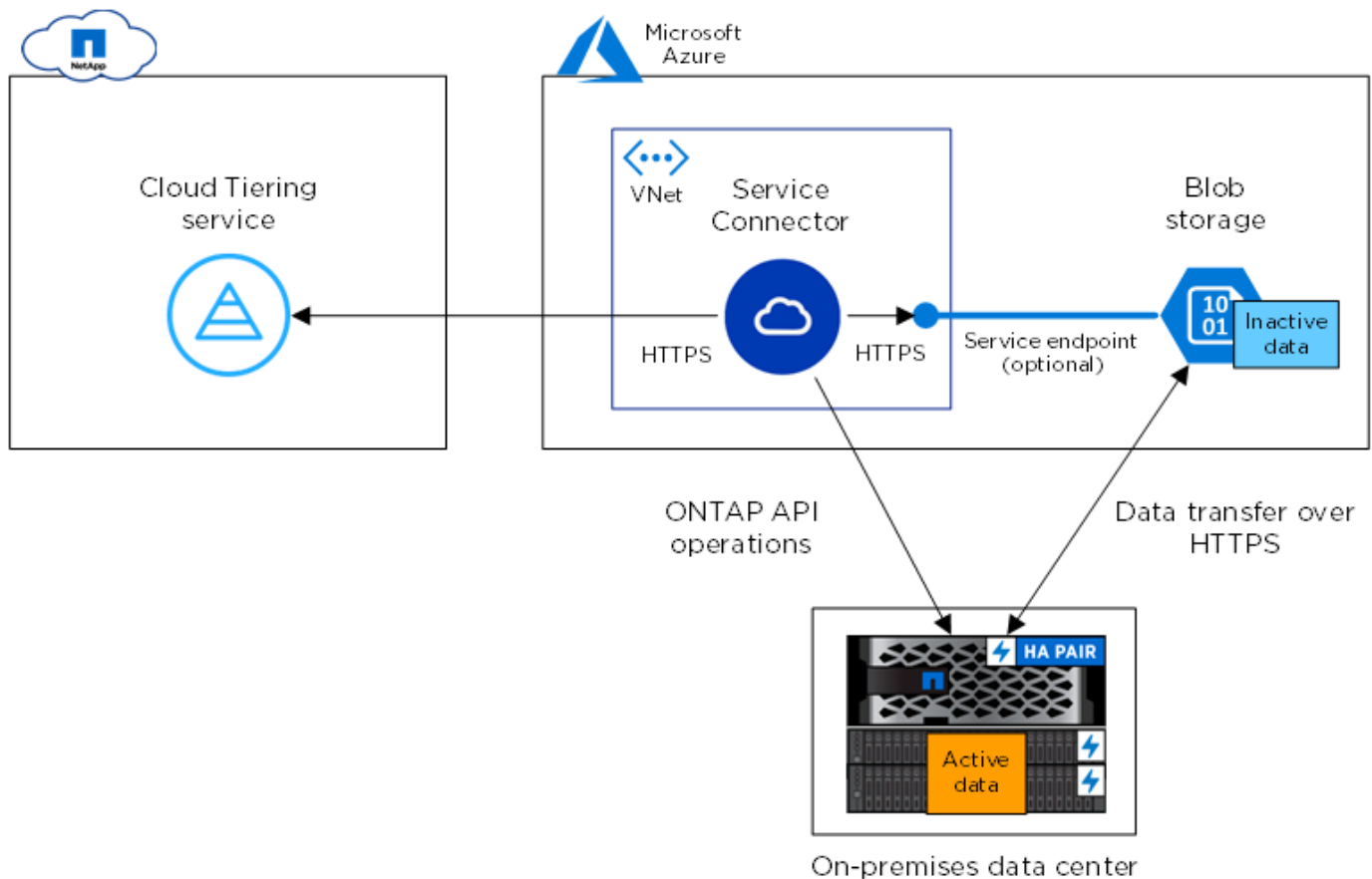
After your free trial ends, pay for Cloud Tiering through a pay-as-you-go subscription, an ONTAP tiering license, or a combination of both:

- To subscribe from the Azure Marketplace, click **Licensing**, click **Subscribe**, and then follow the prompts.
- To add a tiering license, [contact us if you need to purchase one](#), and then add it to your cluster from ONTAP System Manager.

## Preparing to tier inactive data to Azure Blob storage

Before you use Cloud Tiering, verify support for your ONTAP cluster, provide the required permissions, and set up your networking.

The following image shows each component and the connections that you need to prepare between them:



Communication between the Service Connector and Blob storage is for object storage setup only.

## Preparing your ONTAP clusters

Your ONTAP clusters must meet the following requirements when tiering data to Azure Blob storage.

## Supported ONTAP platforms

Cloud Tiering supports AFF systems and all-SSD aggregates on FAS systems.

## Supported ONTAP version

ONTAP 9.4 or later

## Cluster networking requirements

- The ONTAP cluster initiates an HTTPS connection over port 443 to Azure Blob storage.

ONTAP reads and writes data to and from object storage. The object storage never initiates, it just responds.

Although ExpressRoute provides better performance and lower data transfer charges, it is not required between the ONTAP cluster and Azure Blob storage. Because performance is significantly better when using ExpressRoute, doing so is the recommended best practice.

- An inbound connection is required from the NetApp Service Connector, which resides in an Azure VNet.

A connection between the cluster and the Cloud Tiering service is not required.

- An intercluster LIF is required on each ONTAP node that hosts tiered volumes. The LIF must be associated with the *IPspace* that ONTAP should use to connect to object storage.

IPspaces enable network traffic segregation, allowing for separation of client traffic for privacy and security. [Learn more about IPspaces.](#)

When you set up data tiering, Cloud Tiering prompts you for the IPspace to use. You should choose the IPspace that each LIF is associated with. That might be the "Default" IPspace or a custom IPspace that you created.

## Supported volumes and aggregates

The total number of volumes that Cloud Tiering can tier might be less than the number of volumes on your ONTAP system. That's because volumes can't be tiered from some aggregates. For example, you can't tier data from SnapLock volumes or from MetroCluster configurations. Refer to ONTAP documentation for [functionality or features not supported by FabricPool.](#)



Cloud Tiering supports FlexGroup volumes, starting with ONTAP 9.5. Setup works the same as any other volume.

## Preparing to deploy the Service Connector in Azure

The Service Connector is NetApp software that communicates with your ONTAP clusters. Cloud Tiering guides you through the process of deploying the Service Connector on an Azure virtual machine.

A few steps are required before you can deploy the Service Connector in Azure. You'll need to provide the required permissions and set up your networking.

It's important to note that Cloud Tiering tiers data to a Blob container that resides in the same Azure subscription as the Service Connector. So be sure to complete these steps in the Azure subscription where both the Service Connector and Blob container should reside.

## Steps

1. [Grant Azure permissions.](#)

## 2. Set up networking.

### Granting Azure permissions

Ensure that your Azure account has the required permissions to deploy the NetApp Service Connector in an Azure VNet.



During deployment, Cloud Tiering creates and assigns a role to the Service Connector that provides the required permissions so ONTAP can tier inactive data to Azure Blob storage.

### Steps

1. Create a custom role using the NetApp Cloud Central policy:
  - a. Download the [Cloud Central policy for Azure](#).



Right-click the link and click **Save link as...** to download the file.

- b. Modify the JSON file by adding your Azure subscription ID to the assignable scope.

### Example

```
"AssignableScopes": [  
  "/subscriptions/d333af45-0d07-4154-943d-c25fbzzzzzzz",  
],
```

- c. Use the JSON file to create a custom role in Azure.

The following example shows how to create a custom role using the Azure CLI 2.0:

```
az role definition create --role-definition C:\Policy_for_Setup_As_Service_Azure.json
```

You should now have a custom role called *Azure SetupAsService*.

2. Assign the role to the user who will deploy the Service Connector from Cloud Tiering:
  - a. Open the **Subscriptions** service and select the user's subscription.
  - b. Click **Access control (IAM)**.
  - c. Click **Add > Add role assignment** and then add the permissions:
    - Select the **Azure SetupAsService** role.



Azure SetupAsService is the default name provided in the [Cloud Central policy](#). If you chose a different name for the role, then select that name instead.

- Assign access to an **Azure AD user, group, or application**.
- Select the user account.
- Click **Save**.

### Result

The Azure user now has the permissions required to deploy the Service Connector.

## Setting up Azure networking

Cloud Tiering prompts you for the Azure VNet where the Service Connector should be deployed. Make sure that the VNet provides the required networking connections.

### Steps

1. Identify a VNet for the Service Connector that enables the following connections:
  - An outbound internet connection to the Cloud Tiering service over port 443 (HTTPS)
  - An HTTPS connection over port 443 to Azure Blob storage
  - An HTTPS connection over port 443 to your ONTAP clusters

Cloud Tiering enables you to deploy the virtual machine with a public IP address and you can configure it to use your own proxy server.

You don't need to create your own network security group because Cloud Tiering can do that for you. The security group that Cloud Tiering creates has no inbound connectivity and open outbound connectivity.

2. If needed, enable a VNet service endpoint to Azure storage.

A VNet service endpoint to Azure storage is recommended if you have an ExpressRoute or VPN connection from your ONTAP cluster to the VNet and you want communication between the Service Connector and Blob storage to stay in your virtual private network.

## Tiering inactive data from your first cluster to Azure Blob storage

After you prepare your Azure environment, just log in to Cloud Tiering and start tiering inactive data from your first cluster.

### What you'll need

- To discover the cluster, you'll need the following:
  - The cluster management IP address.
  - The user name and password of an ONTAP account that has administrator-level privileges.

The Service Connector uses this account to send API operations to the ONTAP cluster.

- To deploy the Service Connector in Azure, you'll need the following:
  - An Azure account that has the required permissions to deploy the Service Connector virtual machine.
  - The Azure subscription, region, VNet, and subnet in which the Service Connector will reside.

If you haven't met these requirements, see [Preparing to tier data to Azure](#).

### Steps

1. Log in to [NetApp Cloud Central](#).
2. Select the Cloud Tiering service.
3. Click **Let's Start, Discover Your First Cluster**.
4. Complete the steps on the **Discover Cluster** page:
  - a. Enter the cluster management IP address and the user name and password of an account that has

administrator-level privileges.

The screenshot shows a web form with the following content:

- Title: **Let's Discover Your Cluster**
- Instruction: **Please fill in cluster details:**
- Field 1: **Cluster Management IP Address** with the value **172.31.20.236**
- Field 2: **User Name (admin role is required)** with the value **admin**
- Field 3: **Password** with masked characters (dots)

b. Click **Discover Cluster**.

If you already have an existing Service Connector, then Cloud Tiering automatically attempts to use that Service Connector. Cloud Tiering moves on to the next step, if any existing Service Connector has connectivity to the cluster.

c. If Cloud Tiering prompts you to create a Service Connector, click **Create your first Service Connector**.

If you have an existing Service Connector and Cloud Tiering can't use it, then you'll need to do one of two things:

- Click **Add Service Connector** to create a new Service Connector.
- Check the status and connectivity of any existing Service Connectors and then try to discover the cluster again.

d. If you clicked the button to create a Service Connector, follow the prompts to deploy it in Azure:

- **Select Provider:** Select **Microsoft Azure** as the target location for the Service Connector.

When prompted, sign in and accept the permissions request from Microsoft.

The form is owned and hosted by Microsoft. Your credentials are not provided to NetApp.

- **Virtual Machine Authentication:** Enter a name for the virtual machine and choose an authentication method.
- **Basic Settings:** Select an Azure subscription, choose a region, and specify a new or existing resource group for the virtual machine.

- **Network:** Select a VNet and subnet, choose whether to assign a public IP address, and specify an HTTP proxy, if one is required for outbound connectivity.

Remember, the Service Connector must have a constant connection to the ONTAP cluster and a constant internet connection to the Cloud Tiering service.

- **Security Group:** Select **Create a new security group** so Cloud Tiering can create the security group, or select your own. Then click **Go**.

The security group that Cloud Tiering creates has no inbound connectivity and open outbound connectivity.

Leave the page open until the deployment is complete.

e. Back on the Discover Cluster page, select the Service Connector that you just created.

5. Complete the steps on the **Tiering Setup** page:

- Resource Group:** Select a resource group where an existing container is managed, or where you would like to create a new container for tiered data.
- Azure Container:** Add a new Blob container to a storage account or select an existing container and click **Continue**.


The storage account and containers that appear in this step belong to the resource group that you selected in the previous step.

- Access Tier:** Select the access tier that you want to use for the tiered data and click **Continue**.
- Cluster Network:** Select the IPspace that ONTAP should use to connect to object storage and click **Continue**.




Selecting the correct IPspace ensures that Cloud Tiering can set up a connection from ONTAP to your cloud provider's object storage.

If you haven't reviewed requirements for the IPspace and the associated intercluster LIFs, see [ONTAP cluster requirements](#).

6. Click **Continue** to select the volumes that you want to tier.

7. For each volume, click the  icon, select a tiering policy, optionally adjust the cooling days, and click **Apply**.

[Learn about volume tiering policies and cooling days.](#)

Tier Volumes							Learn how much you can save with each Tiering Policy
1 - 3 of 3 Volumes							Q
Volume Name ↑	SVM Name ↑	Volume Size ↑	Used Size ↑	Cold Data ↑	Tier Status [3] ▾	Tiering Policy ↑	
vol1	svm_AFF1	200 GB	3.8 MB	2.66 ... 70 %	✓ Tiered Volume	All user data 	
vol2	svm_AFF1	400 GB	2.59 MB	1.81 ... 70 %	✓ Tiered Volume	Cold user data 	
vol3	svm_AFF1	325 GB	2.59 MB	0 B 0 %	✓ Tiered Volume	Cold snapshots 	

8. When you're done, click **Close**.

## Result

You've successfully set up data tiering from volumes on the cluster to Azure Blob object storage.

## What's next?

Be sure to subscribe to the [Cloud Tiering service from the Azure Marketplace](#).

You can also add additional clusters or review information about the active and inactive data on the cluster. For details, see [Managing data tiering from your clusters](#).

## Supported Azure Blob access tiers and regions

Cloud Tiering supports the *Hot* access tier and most regions.

### Supported Azure Blob access tiers

When you set up data tiering to Azure, Cloud Tiering automatically uses the *Hot* access tier for your inactive data.

### Supported Azure regions

Cloud Tiering supports the following Azure regions.

#### Africa

- South Africa North

#### Asia Pacific

- Australia East
- Australia Southeast
- East Asia
- Japan East
- Japan West
- Korea Central
- Korea South
- Southeast Asia

#### Europe

- France Central
- Germany Central
- Germany Northeast
- North Europe
- UK South
- UK West
- West Europe

## North America

- Canada Central
- Canada East
- Central US
- East US
- East US 2
- North Central US
- South Central US
- West US
- West US 2
- West Central US

## South America

- Brazil South

# Tier data to Google Cloud Storage

## Quick start for tiering inactive data to Google Cloud Storage

Start tiering inactive data to Google Cloud Storage by completing a few steps.



### Prepare to tier data to Google Cloud Storage

You need the following:

- An AFF or FAS system with all-SSD aggregates that's running ONTAP 9.6 or later and has an HTTPS connection to Google Cloud Storage.
- A service account that has the predefined Storage Admin role and storage access keys.
- A service account that includes the permissions defined in the [Service Connector policy for GCP](#).
- Google Cloud APIs enabled in your project: Cloud Deployment Manager V2 API, Cloud Resource Manager API, and Compute Engine API.
- A GCP user that has the [required permissions](#) to deploy the Service Connector in a Google Cloud Platform VPC.

The VPC where you deploy the Service Connector must provide an outbound HTTPS connection to the ONTAP cluster in your data center, to Google Cloud Storage, and to the Cloud Tiering service.

For step-by-step instructions, see [Preparing to tier inactive data to Google Cloud Storage](#).



### Tier inactive data from your first cluster

Log in to [NetApp Cloud Central](#), start a free trial of the Cloud Tiering service, and click **Let's Start, Discover**



## Your First Cluster.

For step-by-step instructions, see [Tiering inactive data from your first cluster to Google Cloud Storage](#).

### 3 Set up licensing

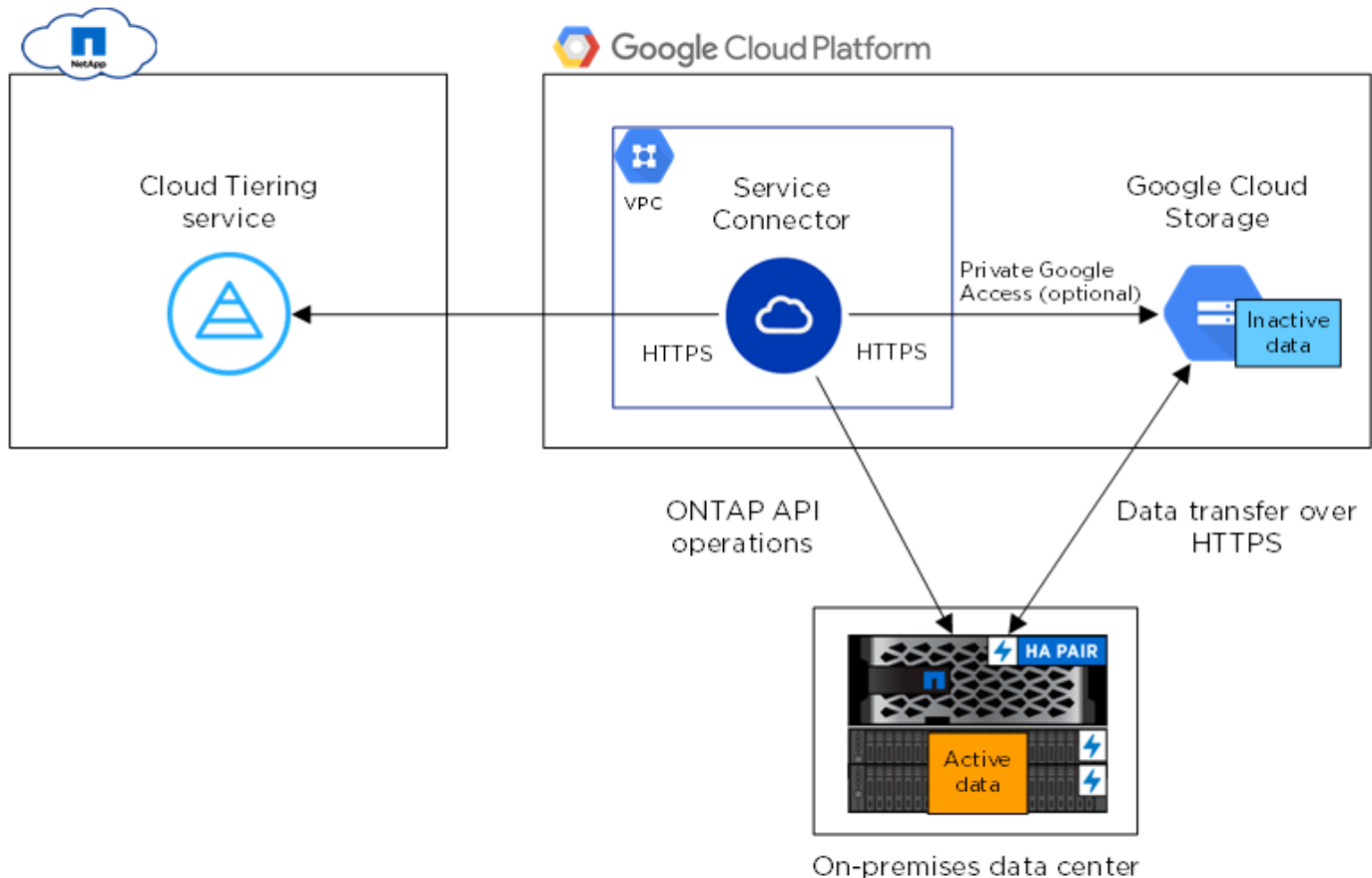
After your free trial ends, pay for Cloud Tiering through a pay-as-you-go subscription, an ONTAP tiering license, or a combination of both:

- To subscribe from the GCP Marketplace, click **Licensing**, click **Subscribe**, and then follow the prompts.
- To add a tiering license, [contact us if you need to purchase one](#), and then add it to your cluster from ONTAP System Manager.

## Preparing to tier inactive data to Google Cloud Storage

Before you start tiering data, verify support for your ONTAP cluster, provide the required permissions, and set up your networking.

The following image shows each component and the connections that you need to prepare between them:



Communication between the Service Connector and Google Cloud Storage is for object storage setup only.

## Preparing your ONTAP clusters

Your ONTAP clusters must meet the following requirements when tiering data to Google Cloud Storage.

### Supported ONTAP platforms

Cloud Tiering supports AFF systems and all-SSD aggregates on FAS systems.

### Supported ONTAP versions

ONTAP 9.6 or later

### Cluster networking requirements

- The ONTAP cluster initiates an HTTPS connection over port 443 to Google Cloud Storage.

ONTAP reads and writes data to and from object storage. The object storage never initiates, it just responds.

Although a Google Cloud Interconnect provides better performance and lower data transfer charges, it is not required between the ONTAP cluster and Google Cloud Storage. Because performance is significantly better when using Google Cloud Interconnect, doing so is the recommended best practice.

- An inbound connection is required from the NetApp Service Connector, which resides in an Google Cloud Platform VPC.

A connection between the cluster and the Cloud Tiering service is not required.

- An intercluster LIF is required on each ONTAP node that hosts tiered volumes. The LIF must be associated with the *IPspace* that ONTAP should use to connect to object storage.

IPspaces enable network traffic segregation, allowing for separation of client traffic for privacy and security. [Learn more about IPspaces.](#)

When you set up data tiering, Cloud Tiering prompts you for the IPspace to use. You should choose the IPspace that each LIF is associated with. That might be the "Default" IPspace or a custom IPspace that you created.

### Supported volumes and aggregates

The total number of volumes that Cloud Tiering can tier might be less than the number of volumes on your ONTAP system. That's because volumes can't be tiered from some aggregates. For example, you can't tier data from SnapLock volumes or from MetroCluster configurations. Refer to ONTAP documentation for [functionality or features not supported by FabricPool.](#)



Cloud Tiering supports FlexGroup volumes. Setup works the same as any other volume.

## Preparing to deploy the Service Connector in GCP

The Service Connector is NetApp software that communicates with your ONTAP clusters. Cloud Tiering guides you through the process of deploying the Service Connector on a GCP virtual machine instance.

A few steps are required before you can deploy the Service Connector in GCP. You'll need to provide the required permissions, set up a service account, and set up your networking.

It's important to note that Cloud Tiering tiers data to a Google Cloud bucket that resides in the same project as the Service Connector. So be sure to complete these steps in the project where both the Service Connector and bucket should reside.

## Steps

1. [Set up GCP permissions.](#)
2. [Set up a service account.](#)
3. [Set up networking.](#)

## Setting up GCP permissions

Ensure that your GCP user has the required permissions to deploy the NetApp Service Connector in a Google Cloud Platform VPC. You also need to enable a few APIs in the project.

## Steps

1. Ensure that the GCP user who deploys the Service Connector has the permissions in the [Cloud Central policy for GCP](#).

[You can create a custom role using the YAML file](#) and then attach it to the user. You'll need to use the gcloud command line to create the role.

2. [Enable the following Google Cloud APIs in your project:](#)
  - Cloud Deployment Manager V2 API
  - Cloud Resource Manager API
  - Compute Engine API

## Result

The GCP user now has the permissions required to deploy the Service Connector in GCP from Cloud Tiering.

## Setting up a service account

When you deploy the Service Connector from Cloud Tiering, you need to select a service account to associate with the VM instance. This service account needs specific permissions to enable management of tiering.

## Steps

1. [Create a role in GCP](#) that includes the permissions defined in the [Service Connector policy for GCP](#).

You'll need to use the gcloud command line to create the role.

2. [Create a GCP service account and apply the custom role that you just created.](#)

## Setting up GCP networking

Cloud Tiering prompts you for the VPC where the Service Connector should be deployed. Make sure that the VPC provides the required networking connections.

## Steps

1. Identify a VPC for the Service Connector that enables the following connections:
  - An outbound internet connection to the Cloud Tiering service over port 443 (HTTPS)
  - An HTTPS connection over port 443 to Google Cloud Storage
  - An HTTPS connection over port 443 to your ONTAP clusters

Cloud Tiering enables you to deploy the virtual machine with a public IP address and you can configure it to use your own proxy server.

You don't need to create your own firewall rules for the instance because Cloud Tiering can do that for you. The firewall rules that Cloud Tiering creates allows inbound connectivity over HTTP, HTTPS, and SSH. Outbound connectivity is open.

2. Optional: Enable Private Google Access on the subnet where you plan to deploy the Service Connector.

[Private Google Access](#) is recommended if you have a direct connection from your ONTAP cluster to the VPC and you want communication between the Service Connector and Google Cloud Storage to stay in your virtual private network. Note that Private Google Access works with VM instances that have only internal (private) IP addresses (no external IP addresses).

## Preparing Google Cloud Storage for data tiering

When you set up tiering, you need to provide Cloud Tiering with storage access keys for a service account that has Storage Admin permissions. A service account enables Cloud Tiering to authenticate and access Cloud Storage buckets used for data tiering. The keys are required so that Google Cloud Storage knows who is making the request.

### Steps

1. [Create a service account that has the predefined Storage Admin role](#).
2. Go to [GCP Storage Settings](#) and create access keys for the service account:
  - a. Select a project, and click **Interoperability**. If you haven't already done so, click **Enable interoperability access**.
  - b. Under **Access keys for service accounts**, click **Create a key for a service account**, select the service account that you just created, and click **Create Key**.

You'll need to [enter the keys in Cloud Tiering](#) later when you set up tiering.

## Tiering inactive data from your first cluster to Google Cloud Storage

After you prepare your Google Cloud environment, just log in to Cloud Tiering and start tiering inactive data from your first cluster.

### What you'll need

- To discover the cluster, you'll need the following:
  - The cluster management IP address.
  - The user name and password of an ONTAP account that has administrator-level privileges.

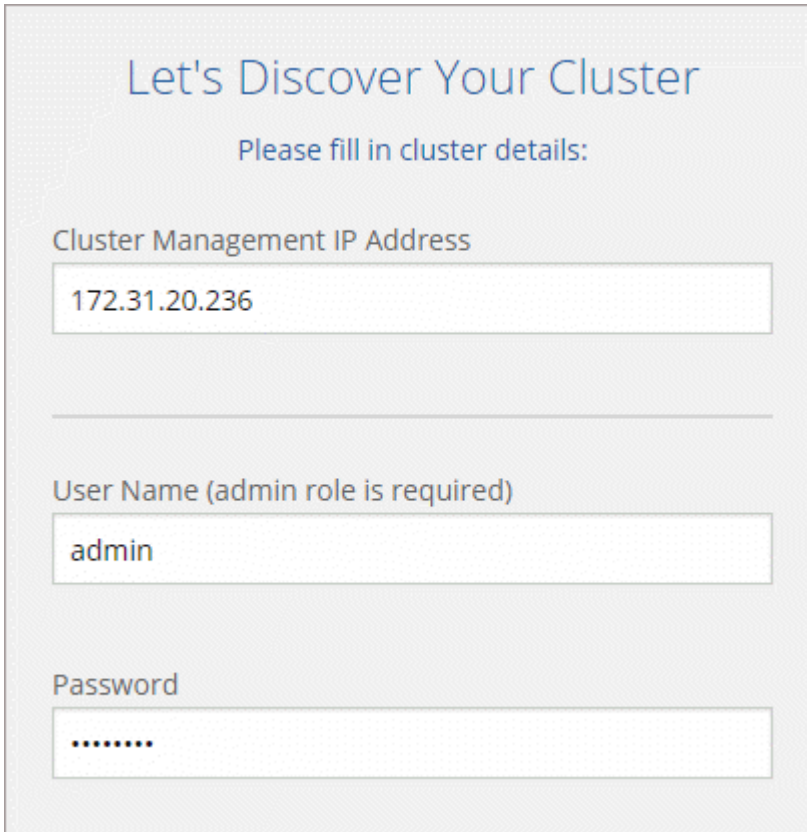
The Service Connector uses this account to send API operations to the ONTAP cluster.

- To deploy the Service Connector in GCP, you'll need the following:
  - A Google account that has the required permissions to deploy the Service Connector virtual machine.
  - The project, region, VPC, and subnet in which the Service Connector will reside.
  - A service account that includes the permissions defined in the [Service Connector policy for GCP](#).
- To set up tiering to Google Cloud Storage, you'll need storage access keys for a service account that has the Storage Admin role.

If you haven't met these requirements, see [Preparing to tier data to Google Cloud Storage](#).

## Steps

1. Log in to [NetApp Cloud Central](#).
2. Select the Cloud Tiering service.
3. Click **Let's Start, Discover Your First Cluster**.
4. Complete the steps on the **Discover Cluster** page:
  - a. Enter the cluster management IP address and the user name and password of an account that has administrator-level privileges.



Let's Discover Your Cluster

Please fill in cluster details:

Cluster Management IP Address

172.31.20.236

User Name (admin role is required)

admin

Password

.....

- b. Click **Discover Cluster**.

If you already have an existing Service Connector, then Cloud Tiering automatically attempts to use that Service Connector. Cloud Tiering moves on to the next step, if any existing Service Connector has connectivity to the cluster.

- c. If Cloud Tiering prompts you to create a Service Connector, click **Create your first Service Connector**.

If you have an existing Service Connector and Cloud Tiering can't use it, then you'll need to do one of two things:

- Click **Add Service Connector** to create a new Service Connector.
  - Check the status and connectivity of any existing Service Connectors and then try to discover the cluster again.
- d. If you clicked the button to create a Service Connector, follow the prompts to deploy it in GCP:
    - **Select Provider:** Select **Google Cloud Platform** as the target location for the Service Connector.

When prompted, sign in and accept the permissions request from Google. The form is owned and hosted by Google. Your credentials are not provided to NetApp.

- **Basic Settings:** Enter a name for the virtual machine, select a project, and then select a service account that includes the permissions defined in the [Service Connector policy for GCP](#).
- **Location:** Specify networking for the virtual machine—a region, zone, VPC, and subnet, and then choose whether you want to assign a public IP address and specify an HTTP proxy for outbound connectivity.

Remember, the Service Connector must have a constant connection to the ONTAP cluster and a constant internet connection to the Cloud Tiering service.

- **Firewall Policy:** Select **Create a new firewall policy** so Cloud Tiering can create the security group, or select an existing firewall policy. Then click **Go**.

The firewall policy that Cloud Tiering creates allows inbound HTTP, HTTPS, and SSH connectivity. It has open outbound connectivity.

Leave the page open until the deployment is complete.

e. Back on the Discover Cluster page, select the Service Connector that you just created.


5. Complete the steps on the **Tiering Setup** page:

- Bucket:** Add a new Google Cloud Storage bucket or select an existing bucket and click **Continue**.
- Storage Class:** Select the storage class that you want to use for the tiered data and click **Continue**.
- Credentials:** Enter the storage access key and secret key for a service account that has the Storage Admin role.
- Cluster Network:** Select the IPspace that ONTAP should use to connect to object storage and click **Continue**.




Selecting the correct IPspace ensures that Cloud Tiering can set up a connection from ONTAP to your cloud provider's object storage.

If you haven't reviewed requirements for the IPspace and the associated intercluster LIFs, see [ONTAP cluster requirements](#).

6. Click **Continue** to select the volumes that you want to tier.

7. For each volume, click the  icon, select a tiering policy, optionally adjust the cooling days, and click **Apply**.

[Learn about volume tiering policies and cooling days.](#)

Volume Name ↑	SVM Name ↑	Volume Size ↑	Used Size ↑	Cold Data ↑	Tier Status [3] ▾	Tiering Policy ↑
vol1	svm_AFF1	200 GB	3.8 MB	2.66 ... 70 %	✓ Tiered Volume	All user data 
vol2	svm_AFF1	400 GB	2.59 MB	1.81 ... 70 %	✓ Tiered Volume	Cold user data 
vol3	svm_AFF1	325 GB	2.59 MB	0 B 0 %	✓ Tiered Volume	Cold snapshots 

8. When you're done, click **Close**.

### **Result**

You've successfully set up data tiering from volumes on the cluster to Google Cloud object storage.

### **What's next?**

[Be sure to subscribe to the Cloud Tiering service from the GCP Marketplace.](#)

You can also add additional clusters or review information about the active and inactive data on the cluster. For details, see [Managing data tiering from your clusters](#).

## **Supported Google Cloud storage classes and regions**

Cloud Tiering supports the Standard storage class and most Google Cloud regions.

### **Supported access tiers**

Cloud Tiering uses the *Standard* access tier for your inactive data.

### **Supported Google Cloud regions**

Cloud Tiering supports the following regions.

#### **Americas**

- Iowa
- Los Angeles
- Montreal
- N. Virginia
- Oregon
- Sao-Paulo
- South Carolina

#### **Asia Pacific**

- Hong Kong
- Mumbai
- Osaka
- Singapore
- Sydney
- Taiwan
- Tokyo

#### **Europe**

- Belgium
- Finland

- Frankfurt
- London
- Netherlands
- Zurich

## Tier data to StorageGRID

### Quick start for tiering inactive data to StorageGRID

Getting started with Cloud Tiering by tiering data from an ONTAP cluster to StorageGRID includes a few steps.



#### Prepare to tier data to StorageGRID

You need the following:

- An AFF or FAS system with all-SSD aggregates running ONTAP 9.4 or later, and a connection over a user-specified port to StorageGRID.
- StorageGRID 10.3 or later with AWS access keys that have S3 permissions.
- A Service Connector installed on an on-premises Linux host.

The Service Connector needs an outbound HTTPS connection to the ONTAP cluster, to StorageGRID, and to the Cloud Tiering service.



#### Tier inactive data from your first cluster

Log in to [NetApp Cloud Central](#), start a free trial of the Cloud Tiering service, and click **Let's Start, Discover Your First Cluster**.

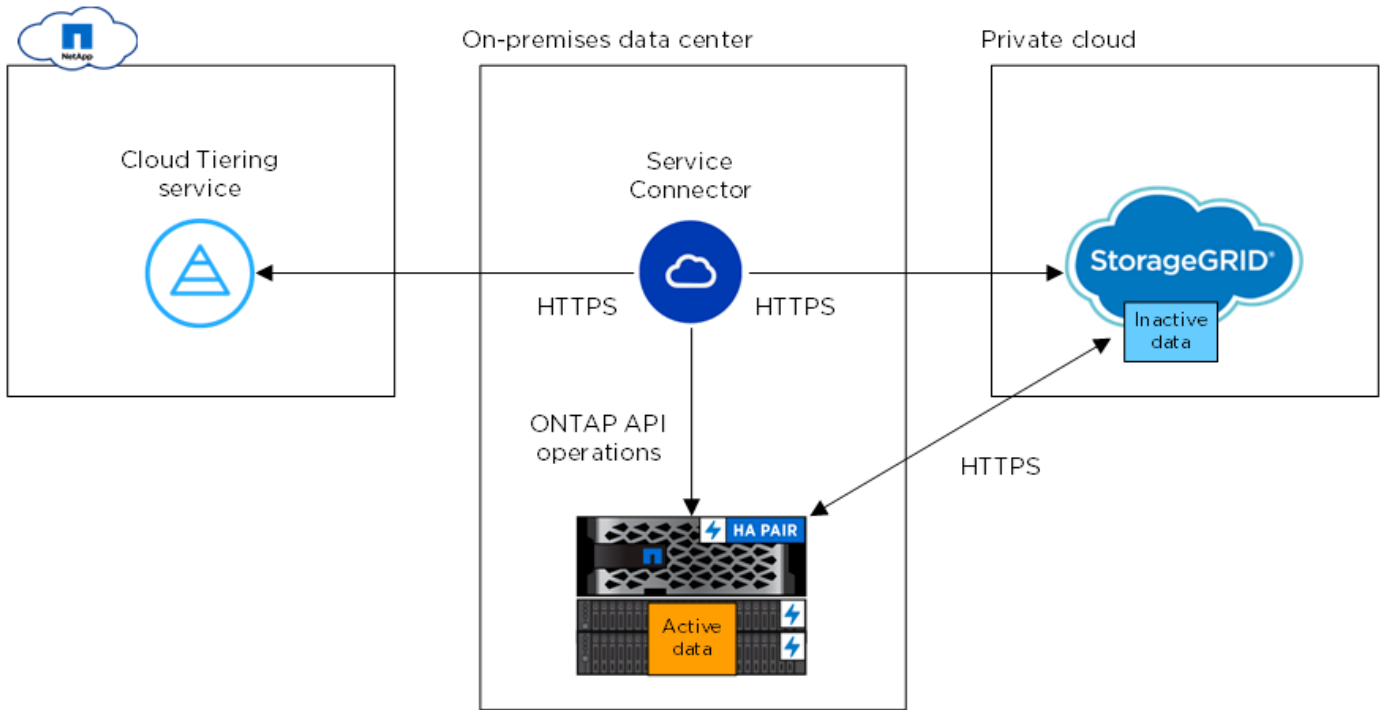
There are no charges when tiering data to StorageGRID. Neither a BYOL license or PAYGO registration is required.

### Preparing to tier inactive data to StorageGRID

Before you use Cloud Tiering, verify support for your ONTAP cluster, prepare StorageGRID, and install a Service Connector on an on-premises Linux host.

The following image shows each component and the connections that you need to prepare between them:





Communication between the Service Connector and StorageGRID is for object storage setup only.

## Preparing your ONTAP clusters

Your ONTAP clusters must meet the following requirements when tiering data to StorageGRID.

### Supported ONTAP platforms

Cloud Tiering supports AFF systems and all-SSD aggregates on FAS systems.

### Supported ONTAP version

ONTAP 9.4 or later

### Licensing

A FabricPool license isn't required on the ONTAP cluster when tiering data to StorageGRID.

### Cluster networking requirements

- The ONTAP cluster initiates an HTTPS connection over a user-specified port to StorageGRID (the port is configurable during tiering setup).

ONTAP reads and writes data to and from object storage. The object storage never initiates, it just responds.

- An inbound connection is required from the NetApp Service Connector, which resides on your premises.

A connection between the cluster and the Cloud Tiering service is not required.

- An intercluster LIF is required on each ONTAP node that hosts tiered volumes. The LIF must be associated with the *IPspace* that ONTAP should use to connect to object storage.

IPspaces enable network traffic segregation, allowing for separation of client traffic for privacy and security. [Learn more about IPspaces.](#)

When you set up data tiering, Cloud Tiering prompts you for the IPspace to use. You should choose the IPspace that each LIF is associated with. That might be the "Default" IPspace or a custom IPspace that you created.

### Supported volumes and aggregates

The total number of volumes that Cloud Tiering can tier might be less than the number of volumes on your ONTAP system. That's because volumes can't be tiered from some aggregates. For example, you can't tier data from SnapLock volumes or from MetroCluster configurations. Refer to ONTAP documentation for [functionality or features not supported by FabricPool](#).



Cloud Tiering supports FlexGroup volumes, starting with ONTAP 9.5. Setup works the same as any other volume.

### Preparing StorageGRID

StorageGRID must meet the following requirements.

#### Supported StorageGRID versions

StorageGRID 10.3 and later are supported.

#### S3 credentials

When you set up tiering to StorageGRID, you need to provide Cloud Tiering with an S3 access key and secret key. Cloud Tiering uses the keys to access your buckets.

These access keys must be associated with a user who has the following permissions:

```
"s3:ListAllMyBuckets",  
"s3:ListBucket",  
"s3:GetObject",  
"s3:PutObject",  
"s3:DeleteObject",  
"s3:CreateBucket"
```

#### Object versioning

You must not enable StorageGRID object versioning on the object store bucket.

### Installing the Service Connector on-prem for StorageGRID

To tier data to StorageGRID, you need to install a Service Connector on an on-prem Linux host.

#### Understanding the relationship between the Service Connector and Cloud Manager

To install the Service Connector, you need to download and install [NetApp Cloud Manager software](#). You need to do this because the Service Connector is part of Cloud Manager.

#### Verifying host requirements

The Service Connector is supported on a Linux host that meets the following requirements.

[Refer to Connector host requirements in the Cloud Manager documentation.](#)

## Preparing your networking

The Service Connector needs a connection to your ONTAP clusters, to StorageGRID, and to the Cloud Tiering service.

### Steps

1. Set up an on-premises location for the Service Connector that enables the following connections:
  - An outbound internet connection to the Cloud Tiering service over port 443 (HTTPS)
  - An HTTPS connection over port 443 to StorageGRID
  - An HTTPS connection over port 443 to your ONTAP clusters
2. Ensure that outbound internet access is allowed to those endpoints:
  - <http://dev.mysql.com/get/mysql-community-release-el7-5.noarch.rpm>
  - <https://dl.fedoraproject.org/pub/epel/epel-release-latest-7.noarch.rpm>
  - <https://s3.amazonaws.com/aws-cli/awscli-bundle.zip>

The installer accesses these URLs during the installation process.

## Installing the Service Connector on an on-premises Linux host

After you verify system and network requirements, download and install the software on a supported Linux host.

### About this task

- Root privileges are not required for installation.
- The Service Connector installs the AWS command line tools (awscli) to enable recovery procedures from NetApp support.

If you receive a message that installing the awscli failed, you can safely ignore the message. The Service Connector can operate successfully without the tools.

- The installer that is available on the NetApp Support Site might be an earlier version. After installation, the software automatically updates itself if a new version is available.

### Steps

1. Download the installation script for Cloud Manager 3.8.4 or later from the [NetApp Support Site](#), and then copy it to the Linux host.

[Why do I need to install Cloud Manager?](#)

2. Assign permissions to execute the script.

### Example

```
chmod +x OnCommandCloudManager-V3.8.4.sh
```

3. Run the installation script:

```
./OnCommandCloudManager-V3.8.4.sh [silent] [proxy=ipaddress]  
[proxyport=port] [proxyuser=user_name] [proxypwd=password]
```

*silent* runs the installation without prompting you for information.

*proxy* is required if the host is behind a proxy server.

*proxyport* is the port for the proxy server.

*proxyuser* is the user name for the proxy server, if basic authentication is required.

*proxypwd* is the password for the user name that you specified.

4. Unless you specified the silent parameter, type **Y** to continue the script, and then enter the HTTP and HTTPS ports when prompted.

If you change the HTTP and HTTPS ports, you must ensure that users can access the Cloud Manager web console from a remote host:

- Modify the security group to allow inbound connections through the ports.
- Specify the port when you enter the URL to the web console.

The Service Connector is now installed. At the end of the installation, the Cloud Manager service (occm) restarts twice if you specified a proxy server.

5. Open a web browser and enter the following URL:

`https://ipaddress:port`

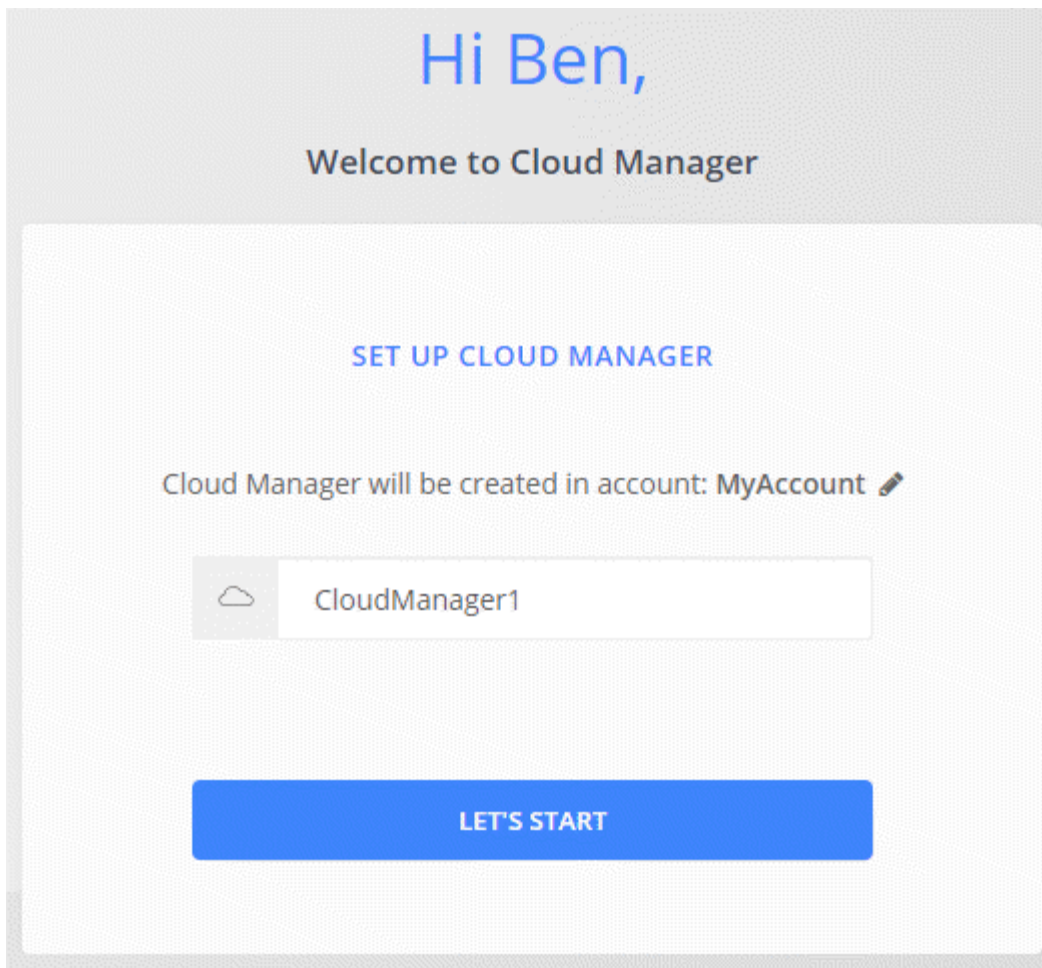
*ipaddress* can be localhost, a private IP address, or a public IP address, depending on the configuration of the host.

*port* is required if you changed the default HTTP (80) or HTTPS (443) ports. For example, if the HTTPS port was changed to 8443, you would enter `https://ipaddress:8443`

6. Sign up at NetApp Cloud Central or log in.
7. After you log in, set up Cloud Manager:
  - a. Specify the Cloud Central account to associate with this Cloud Manager system. This should be the same account that you specified when you ran the pre-installation script.

[Learn about Cloud Central accounts.](#)

- b. Enter a name for the system.



## Result

The Service Connector is now installed and setup. You can use it to discover a cluster in Cloud Tiering.

## Tiering inactive data from your first cluster to StorageGRID

After you prepare your environment, just log in to Cloud Tiering and start tiering inactive data from your first cluster.

### What you'll need

- To discover the cluster, you'll need the following:
  - The cluster management IP address.
  - The user name and password of an ONTAP account that has administrator-level privileges.

The Service Connector uses this account to send API operations to the ONTAP cluster.

- [A Service Connector installed in your on-premises network.](#)
- To set up tiering to StorageGRID, you'll need the following:
  - The FQDN of the server.
  - An AWS access key and secret key for an account that has the required S3 permissions.

If you haven't met these requirements, see [Preparing to tier data to StorageGRID.](#)

## Steps

1. Log in to [NetApp Cloud Central](#).
2. Select the Cloud Tiering service.
3. Click **Let's Start, Discover Your First Cluster**.
4. Complete the steps on the **Discover Cluster** page:
  - a. Enter the cluster management IP address and the user name and password of an account that has administrator-level privileges.

Let's Discover Your Cluster

Please fill in cluster details:

Cluster Management IP Address

172.31.20.236

User Name (admin role is required)

admin

Password

.....


- b. Click **Discover Cluster**.

Cloud Tiering automatically uses the on-premises Service Connector to discover the cluster.

5. Complete the steps on the **Tiering Setup** page:
  - a. **Choose your provider:** Select StorageGRID.
  - b. **Server:** Enter the FQDN of the StorageGRID server, enter the port that ONTAP should use for HTTPS communication with StorageGRID, and enter the access key and secret key for an AWS account that has the required S3 permissions.
  - c. **Bucket:** Add a new bucket or select an existing bucket for the tiered data.
  - d. **Cluster Network:** Select the IPspace that ONTAP should use to connect to object storage and click **Continue**.

Selecting the correct IPspace ensures that Cloud Tiering can set up a connection from ONTAP to your cloud provider's object storage.




If you haven't reviewed requirements for the IPspace and the associated intercluster LIFs, see [ONTAP cluster requirements](#).

- Click **Continue** to select the volumes that you want to tier.
- For each volume, click the  icon, select a tiering policy, optionally adjust the cooling days, and click **Apply**.

[Learn about volume tiering policies and cooling days.](#)

Tier Volumes [Learn how much you can save with each Tiering Policy](#)

1 - 3 of 3 Volumes 🔍

Volume Name ↑	SVM Name ↑	Volume Size ↑	Used Size ↑	Cold Data ↑	Tier Status [3] ▾	Tiering Policy ↑
vol1	svm_AFF1	200 GB	3.8 MB	2.66 ...   70 %	✓ Tiered Volume	All user data 
vol2	svm_AFF1	400 GB	2.59 MB	1.81 ...   70 %	✓ Tiered Volume	Cold user data 
vol3	svm_AFF1	325 GB	2.59 MB	0 B   0 %	✓ Tiered Volume	Cold snapshots 

- When you're done, click **Close**.

### Result

You've successfully set up data tiering from volumes on the cluster to StorageGRID.

### What's next?

You can add additional clusters or review information about the active and inactive data on the cluster. For details, see [Managing data tiering from your clusters](#).

## Set up licensing for Cloud Tiering

Pay for Cloud Tiering through a pay-as-you-go subscription, an ONTAP tiering license, or a combination of both. If you want to pay as you go, then you need to subscribe from the marketplace for the cloud provider to which you want to tier cold data. There's no need to subscribe from every marketplace.

[Learn how licensing works for Cloud Tiering.](#)



A license isn't required when tiering data to StorageGRID.

### Subscribing from the AWS Marketplace

Subscribe to Cloud Tiering from the AWS Marketplace to set up a pay-as-you-go subscription for data tiering from ONTAP clusters to AWS S3.



If you use NetApp Cloud Manager and you've already [subscribed through its new AWS Marketplace offering](#), then you're automatically subscribed to Cloud Tiering, as well. You'll see an active subscription in Cloud Tiering in the **Licensing** tab. You won't need to subscribe.

### Steps

- In Cloud Tiering, click **Licensing**.

2. Click **Subscribe** under AWS Marketplace and then click **Continue**.
3. Subscribe from the AWS Marketplace, and then log back in to Cloud Central to complete the registration.

The following video shows the process:

▶ [https://docs.netapp.com/us-en/cloud-tiering/media/video\\_subscribing\\_aws.mp4](https://docs.netapp.com/us-en/cloud-tiering/media/video_subscribing_aws.mp4) (video)

## Subscribing from the Azure Marketplace

Subscribe to Cloud Tiering from the Azure Marketplace to set up a pay-as-you-go subscription for data tiering from ONTAP clusters to Azure Blob storage.

### Steps

1. In Cloud Tiering, click **Licensing**.
2. Click **Subscribe** under Azure Marketplace and then click **Continue**.
3. Subscribe from the Azure Marketplace, and then log back in to Cloud Central to complete the registration.

The following video shows the process:

▶ [https://docs.netapp.com/us-en/cloud-tiering/media/video\\_subscribing\\_azure.mp4](https://docs.netapp.com/us-en/cloud-tiering/media/video_subscribing_azure.mp4) (video)

## Subscribing from the GCP Marketplace

Subscribe to Cloud Tiering from the GCP Marketplace to set up a pay-as-you-go subscription for data tiering from ONTAP clusters to Google Cloud storage.

### Steps

1. In Cloud Tiering, click **Licensing**.
2. Click **Subscribe** under GCP Marketplace and then click **Continue**.
3. Subscribe from the GCP Marketplace, and then log back in to Cloud Central to complete the registration.

The following video shows the process:

▶ [https://docs.netapp.com/us-en/cloud-tiering/media/video\\_subscribing\\_gcp.mp4](https://docs.netapp.com/us-en/cloud-tiering/media/video_subscribing_gcp.mp4) (video)

## Adding a tiering license to ONTAP

Bring your own license by purchasing an ONTAP FabricPool license from NetApp.



### Steps

1. If you don't have a FabricPool license, [contact us to purchase one](#).
2. In Cloud Tiering, go to the **Licensing** page.
3. In the Clusters List table, click **Activate license (BYOL)** for an on-prem ONTAP cluster.



Clusters List

2 Clusters Q

Cluster Name	Cluster Type	Tiered Capacity	License	Provider	
AFF1	On-prem	0 B	PAYGO		<a href="#">Activate license (BYOL)</a>
CloudVolumesONTAP1	Cloud Volumes ONTAP	0 B	---		

4. Enter the serial number of the license and then enter the NetApp Support Site account that's associated with the serial number.
5. Click **Activate license**.

### Result

Cloud Tiering registers the license and installs it on the cluster.

### After you finish

If you purchase additional add-on capacity at a later time, the license on the cluster is automatically updated with the new capacity. There's no need to apply a new NetApp License File (NLF) to the cluster.

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