Tier on-prem data to the cloud

BlueXP tiering

NetApp
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Tiering data from on-premises ONTAP clusters to Amazon S3

Free space on your on-prem ONTAP clusters by tiering inactive data to Amazon S3.

Quick start

Get started quickly by following these steps. Details for each step are provided in the following sections in this topic.

1 **Identify the configuration method you'll use**

Choose whether you'll connect your on-premises ONTAP cluster directly to AWS S3 over the public internet, or whether you'll use a VPN or AWS Direct Connect and route traffic through a private VPC Endpoint interface to AWS S3.

See the available connection methods.

2 **Prepare your BlueXP Connector**

If you already have a Connector deployed in your AWS VPC or on your premises, then you're all set. If not, then you'll need to create a Connector to tier ONTAP data to AWS S3 storage. You'll also need to customize network settings for the Connector so that it can connect to AWS S3.

See how to create a Connector and how to define required network settings.

3 **Prepare your on-premises ONTAP cluster**

Discover your ONTAP cluster in BlueXP, verify that the cluster meets minimum requirements, and customize network settings so the cluster can connect to AWS S3.

See how to get your on-premises ONTAP cluster ready.

4 **Prepare Amazon S3 as your tiering target**

Set up permissions for the Connector to create and manage the S3 bucket. You'll also need to set up permissions for the on-premises ONTAP cluster so it can read and write data to the S3 bucket.

See how to set up permissions for the Connector and for your on-prem cluster.

5 **Enable BlueXP tiering on the system**

Select an on-prem working environment, click **Enable** for the Tiering service, and follow the prompts to tier data to Amazon S3.

See how to enable Tiering for your volumes.

6

Set up licensing

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

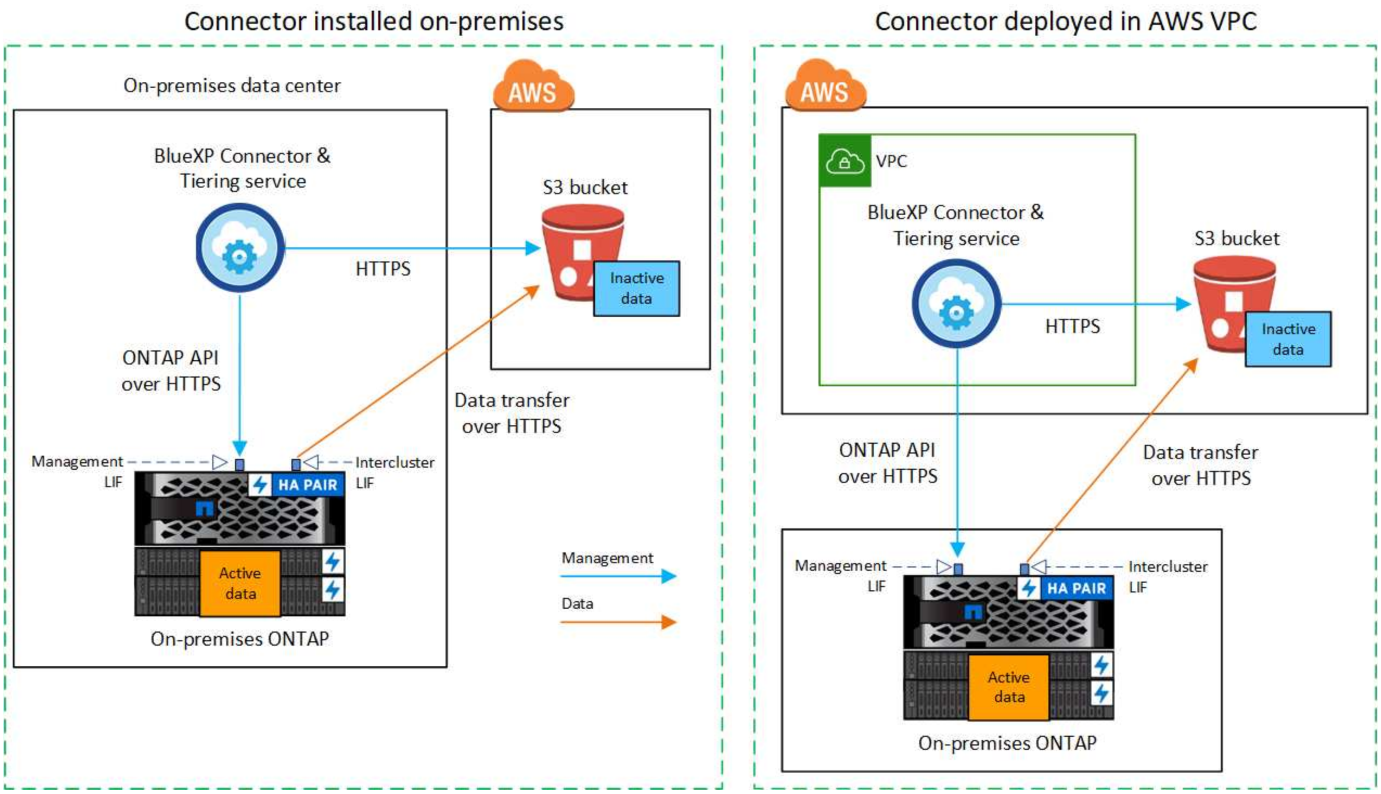
- To subscribe from the AWS Marketplace, go to the BlueXP Marketplace offering, click **Subscribe**, and then follow the prompts.
- To pay using a BlueXP tiering BYOL license, contact us if you need to purchase one, and then add it to your account from the BlueXP digital wallet.

Network diagrams for connection options

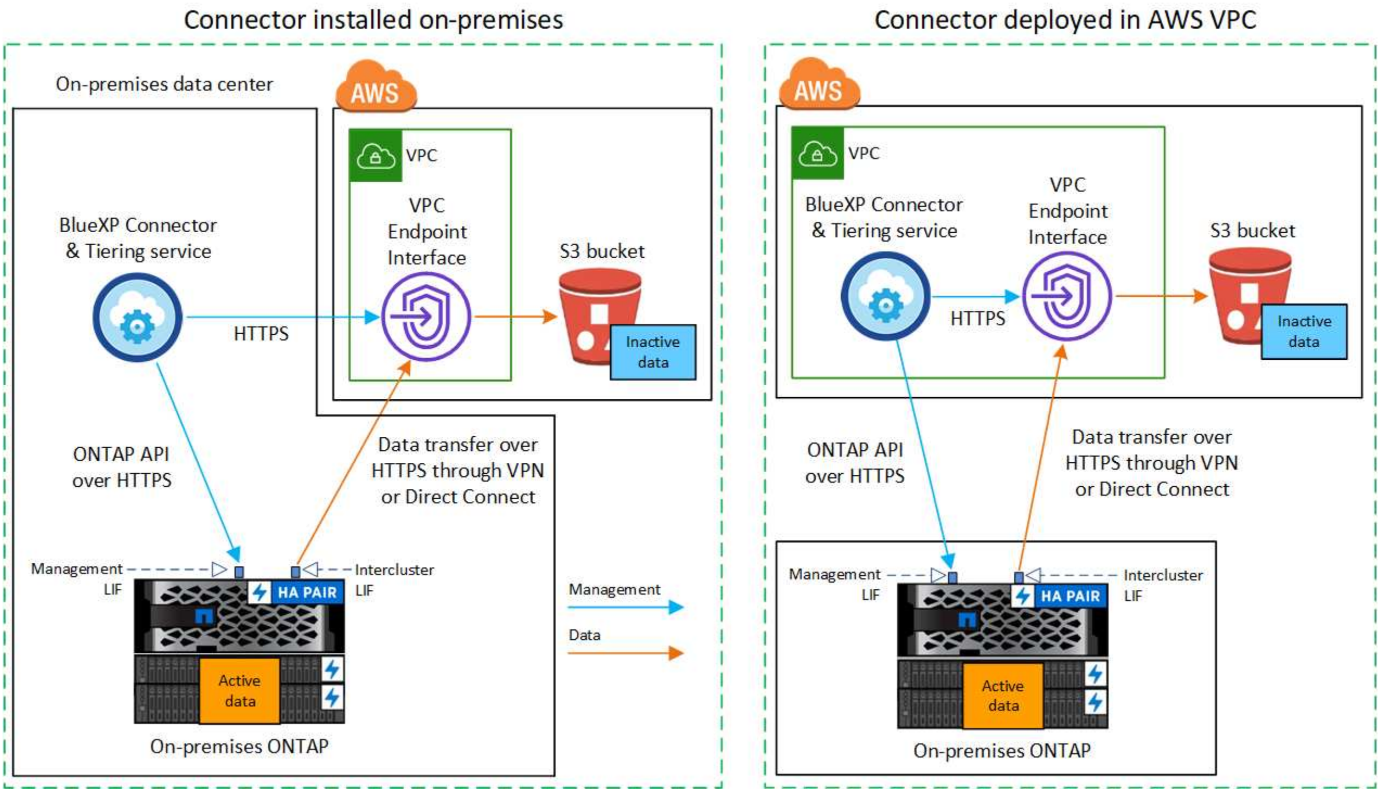
There are two connection methods you can use when configuring tiering from on-premises ONTAP systems to AWS S3.

- Public connection - Directly connect the ONTAP system to AWS S3 using a public S3 endpoint.
- Private connection - Use a VPN or AWS Direct Connect and route traffic through a VPC Endpoint interface that uses a private IP address.

The following diagram shows the **public connection** method and the connections that you need to prepare between the components. You can use a Connector that you've installed on your premises, or a Connector that you've deployed in the AWS VPC.



The following diagram shows the **private connection** method and the connections that you need to prepare between the components. You can use a Connector that you've installed on your premises, or a Connector that you've deployed in the AWS VPC.



ⓘ Communication between a Connector and S3 is for object storage setup only.

Prepare your Connector

The BlueXP Connector is the main software for BlueXP functionality. A Connector is required to tier your inactive ONTAP data.

Creating or switching Connectors

If you already have a Connector deployed in your AWS VPC or on your premises, then you're all set. If not, then you'll need to create a Connector in either of those locations to tier ONTAP data to AWS S3 storage. You can't use a Connector that's deployed in another cloud provider.

- Learn about Connectors
- Deploying a Connector in AWS
- Installing a Connector on a Linux host

Connector networking requirements

- Ensure that the network where the Connector is installed enables the following connections:
  - An HTTPS connection over port 443 to the BlueXP tiering service and to your S3 object storage (see the list of endpoints)
  - An HTTPS connection over port 443 to your ONTAP cluster management LIF
- Ensure that the Connector has permissions to manage the S3 bucket
- If you have a Direct Connect or VPN connection from your ONTAP cluster to the VPC, and you want communication between the Connector and S3 to stay in your AWS internal network (a **private** connection), you'll need to enable a VPC Endpoint interface to S3. See how to set up a VPC endpoint

interface.

Prepare your ONTAP cluster

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

ONTAP requirements

Supported ONTAP platforms

- When using ONTAP 9.8 and later: You can tier data from AFF systems, or FAS systems with all-SSD aggregates or all-HDD aggregates.
- When using ONTAP 9.7 and earlier: You can tier data from AFF systems, or FAS systems with all-SSD aggregates.

Supported ONTAP versions

- ONTAP 9.2 or later
- ONTAP 9.7 or later is required if you plan to use an AWS PrivateLink connection to object storage

Supported volumes and aggregates

The total number of volumes that BlueXP 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. Refer to the ONTAP documentation for functionality or features not supported by FabricPool.

ⓘ BlueXP tiering supports FlexGroup volumes starting with ONTAP 9.5. Setup works the same as any other volume.

Cluster networking requirements

- The cluster requires an inbound HTTPS connection from the Connector to the cluster management LIF.

  A connection between the cluster and the BlueXP tiering service is not required.

- An intercluster LIF is required on each ONTAP node that hosts the volumes you want to tier. These intercluster LIFs must be able to access the object store.

  The cluster initiates an outbound HTTPS connection over port 443 from the intercluster LIFs to Amazon S3 storage for tiering operations. ONTAP reads and writes data to and from object storage — the object storage never initiates, it just responds.

- The intercluster LIFs must be associated with the *IPspace* that ONTAP should use to connect to object storage. Learn more about IPspaces.

  When you set up BlueXP tiering, you are prompted for the IPspace to use. You should choose the IPspace that these LIFs are associated with. That might be the "Default" IPspace or a custom IPspace that you created.

  If you use are using a different IPspace than "Default", then you might need to create a static route to get access to the object storage.

  All intercluster LIFs within the IPspace must have access to the object store. If you can't configure this for the current IPspace, then you'll need to create a dedicated IPspace where all intercluster LIFs have access to the object store.

- If you are using a Private VPC Interface Endpoint in AWS for the S3 connection, then in order for HTTPS/443 to be used, you'll need to load the S3 endpoint certificate into the ONTAP cluster. See how to set up a VPC endpoint interface and load the S3 certificate.
- Ensure that your ONTAP cluster has permissions to access the S3 bucket.

Discover your ONTAP cluster in BlueXP

You need to discover your on-premises ONTAP cluster in BlueXP before you can start tiering cold data to object storage. You'll need to know the cluster management IP address and the password for the admin user account to add the cluster.

Learn how to discover a cluster.

Prepare your AWS environment

When you set up data tiering for a new cluster, you're prompted whether you want the service to create an S3 bucket or if you want to select an existing S3 bucket in the AWS account where the Connector is set up. The AWS account must have permissions and an access key that you can enter in BlueXP tiering. The ONTAP cluster uses the access key to tier data in and out of S3.

By default, the tiering service creates the bucket for you. If you want to use your own bucket, you can create one before you start the tiering activation wizard and then select that bucket in the wizard. See how to create S3 buckets from BlueXP. The bucket must be used exclusively for storing inactive data from your volumes - it cannot be used for any other purpose. The S3 bucket must be in a region that supports BlueXP tiering.

> If you are planning to configure BlueXP tiering to use a lower cost storage class where your tiered data will transition to after a certain number of days, you must not select any lifecycle rules when setting up the bucket in your AWS account. BlueXP tiering manages the lifecycle transitions.

Set up S3 permissions

You'll need to configure two sets of permissions:

- Permissions for the Connector so it can create and manage the S3 bucket.
- Permissions for the on-premises ONTAP cluster so it can read and write data to the S3 bucket.

Steps

1. **Connector permissions**:
   - Confirm that these S3 permissions are part of the IAM role that provides the Connector with permissions. They should have been included by default when you first deployed the Connector. If not, you'll need to add any missing permissions. See the AWS Documentation: Editing IAM policies for instructions.
   - The default bucket that BlueXP tiering creates has a prefix of "fabric-pool". If you want to use a different prefix for your bucket, you'll need to customize the permissions with the name you want to use. In the S3 permissions you'll see a line `"Resource": ["arn:aws:s3:::fabric-pool*"]`. You'll need to change "fabric-pool" to the prefix that you want to use. For example, if you want to use "tiering-1" as the prefix for your buckets, you'll change this line to `"Resource": ["arn:aws:s3:::tiering-1*"]`.

     If you want to use a different prefix for buckets that you'll use for additional clusters in this same BlueXP account, you can add another line with the prefix for other buckets. For example:

```
"Resource": ["arn:aws:s3:::tiering-1*"]
"Resource": ["arn:aws:s3:::tiering-2*"]
```

If you are creating your own bucket and do not use a standard prefix, you should change this line to `"Resource": ["arn:aws:s3:::*"]` so that any bucket is recognized. However, this may expose all your buckets instead of those you have designed to hold inactive data from your volumes.

2. **Cluster permissions**:

   - When activating the service, the Tiering wizard will prompt you to enter an access key and secret key. These credentials are passed to the ONTAP cluster so that ONTAP can tier data to the S3 bucket. For that, you'll need to create an IAM user with the following permissions:

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

     See the AWS Documentation: Creating a Role to Delegate Permissions to an IAM User for details.

3. Create or locate the access key.

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

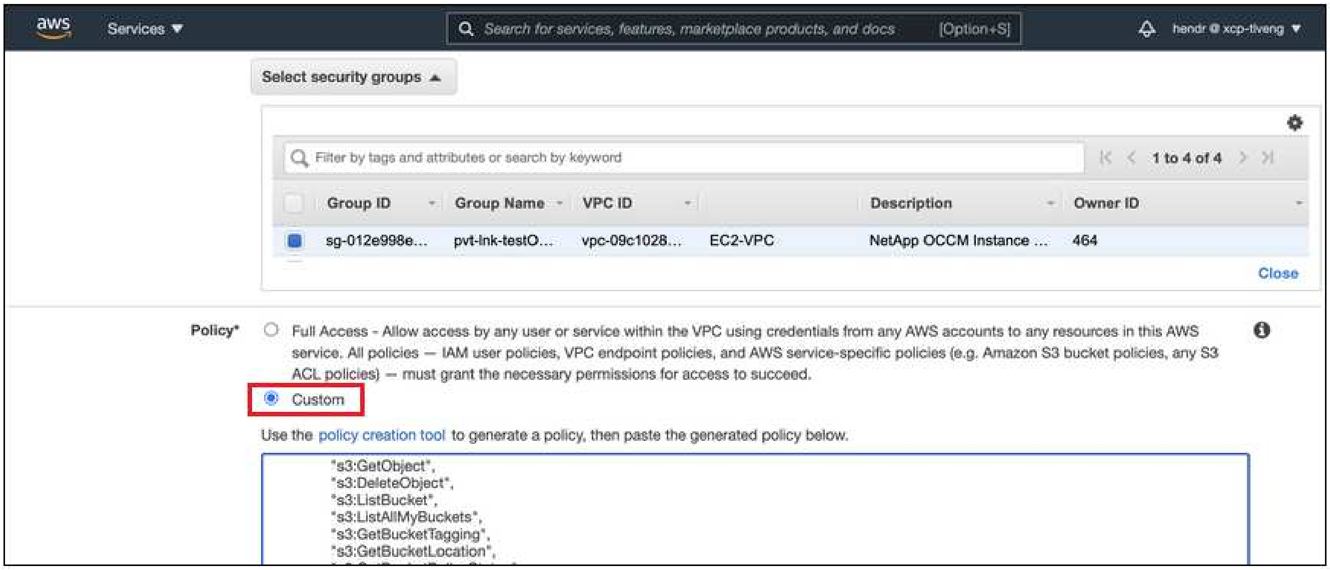
   AWS Documentation: Managing Access Keys for IAM Users

Configure your system for a private connection using a VPC endpoint interface

If you plan to use a standard public internet connection, then all the permissions are set by the Connector and there is nothing else you need to do. This type of connection is shown in the first diagram above.

If you want to have a more secure connection over the internet from your on-prem data center to the VPC, there's an option to select an AWS PrivateLink connection in the Tiering activation wizard. It's required if you plan to use a VPN or AWS Direct Connect to connect your on-premises system through a VPC Endpoint interface that uses a private IP address. This type of connection is shown in the second diagram above.

1. Create an Interface endpoint configuration using the Amazon VPC console or the command line. See details about using AWS PrivateLink for Amazon S3.
2. Modify the security group configuration that's associated with the BlueXP Connector. You must change the policy to "Custom" (from "Full Access"), and you must add the required S3 Connector permissions as shown earlier.


aws
Services ▼
Search for services, features, marketplace products, and docs [Option+S]
hendr @ xcp-tiveng ▼
Select security groups ▲
Filter by tags and attributes or search by keyword
1 to 4 of 4
Close

	Group ID	Group Name	VPC ID		Description	Owner ID
☑	sg-012e998e…	pvt-lnk-testO…	vpc-09c1028…	EC2-VPC	NetApp OCCM Instance …	464

Policy*
○ Full Access - Allow access by any user or service within the VPC using credentials from any AWS accounts to any resources in this AWS service. All policies — IAM user policies, VPC endpoint policies, and AWS service-specific policies (e.g. Amazon S3 bucket policies, any S3 ACL policies) — must grant the necessary permissions for access to succeed.
● Custom

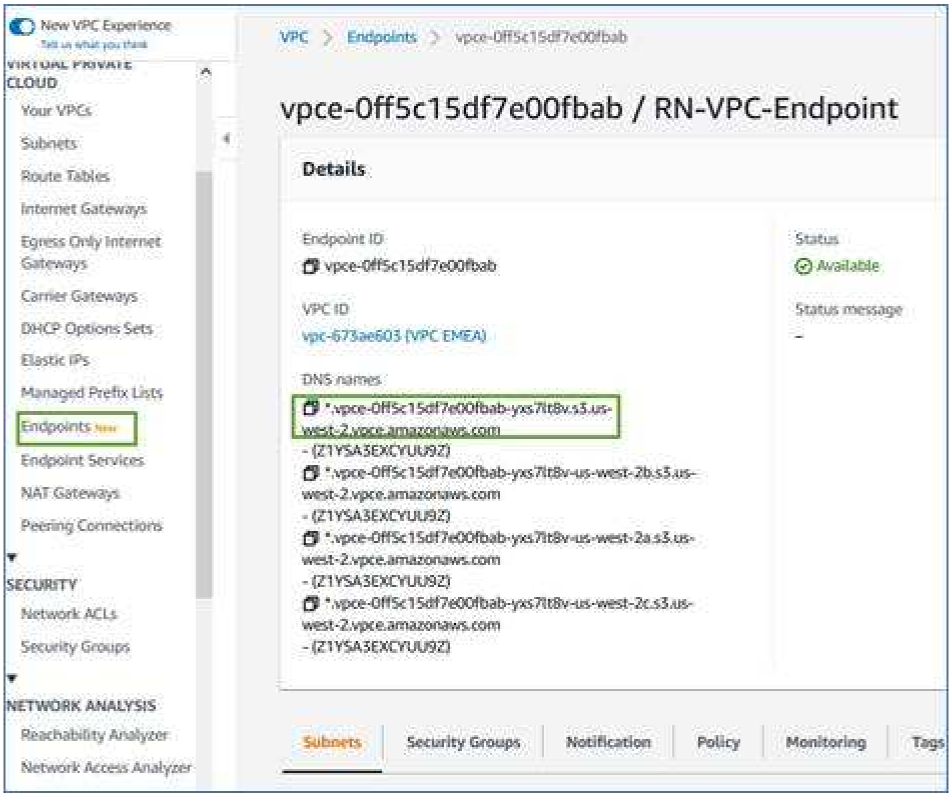
Use the policy creation tool to generate a policy, then paste the generated policy below.

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

If you’re using port 80 (HTTP) for communication to the private endpoint, you’re all set. You can enable BlueXP tiering on the cluster now.

If you’re using port 443 (HTTPS) for communication to the private endpoint, you must copy the certificate from the VPC S3 endpoint and add it to your ONTAP cluster, as shown in the next 4 steps.

3. Obtain the DNS name of the endpoint from the AWS Console.



vpce-0ff5c15df7e00fbab / RN-VPC-Endpoint

Details

Endpoint ID
vpce-0ff5c15df7e00fbab

Status
Available

VPC ID
vpc-673ae603 (VPC EMEA)

Status message
-

DNS names
*.vpce-0ff5c15df7e00fbab-yxs7lt8v.s3.us-west-2.vpce.amazonaws.com - (Z1YSA3EXCYUU9Z)
*.vpce-0ff5c15df7e00fbab-yxs7lt8v-us-west-2b.s3.us-west-2.vpce.amazonaws.com - (Z1YSA3EXCYUU9Z)
*.vpce-0ff5c15df7e00fbab-yxs7lt8v-us-west-2a.s3.us-west-2.vpce.amazonaws.com - (Z1YSA3EXCYUU9Z)
*.vpce-0ff5c15df7e00fbab-yxs7lt8v-us-west-2c.s3.us-west-2.vpce.amazonaws.com - (Z1YSA3EXCYUU9Z)

4. Obtain the certificate from the VPC S3 endpoint. You do this by logging into the VM that hosts the BlueXP Connector and running the following command. When entering the DNS name of the endpoint, add “bucket” to the beginning, replacing the “*”:

```
[ec2-user@ip-10-160-4-68 ~]$ openssl s_client -connect bucket.vpce-
0ff5c15df7e00fbab-yxs7lt8v.s3.us-west-2.vpce.amazonaws.com:443
-showcerts
```

5. From the output of this command, copy the data for the S3 certificate (all data between, and including, the BEGIN / END CERTIFICATE tags):

```
Certificate chain
0 s:/CN=s3.us-west-2.amazonaws.com`
   i:/C=US/O=Amazon/OU=Server CA 1B/CN=Amazon
-----BEGIN CERTIFICATE-----
MIIM6zCCC9OgAwIBAgIQA7MGJ4FaDBR8uL0KR3oltTANBgkqhkiG9w0BAQsFADBG
…
…
GqvbOz/oO2NWLLFCqI+xmkLcMiPrZy+/6Af+HH2mLCM4EsI2b+IpBmPkriWnnxo=
-----END CERTIFICATE-----
```

6. Log into the ONTAP cluster CLI and apply the certificate you copied using the following command (substitute your own storage VM name):

```
cluster1::> security certificate install -vserver <svm_name> -type
server-ca
Please enter Certificate: Press <Enter> when done
```

Tier inactive data from your first cluster to Amazon S3

After you prepare your AWS environment, start tiering inactive data from your first cluster.

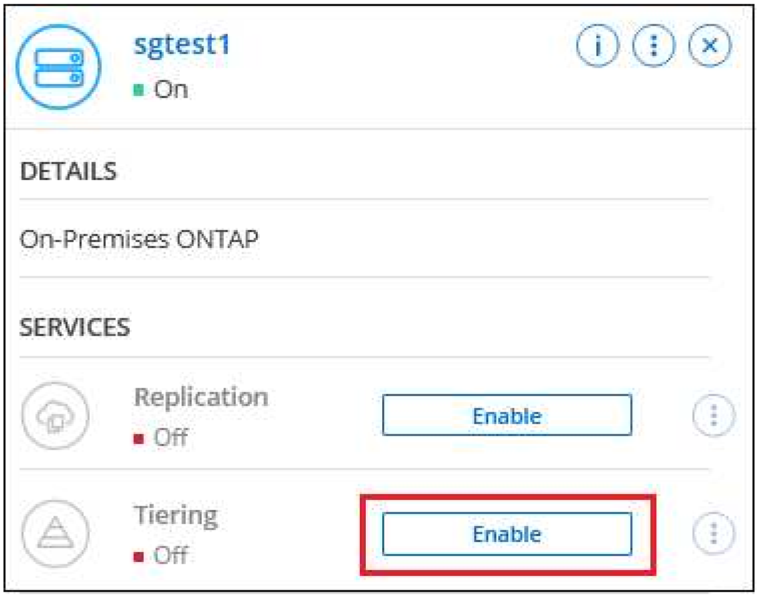
What you'll need

- An on-premises working environment.
- An AWS access key for an IAM user who has the required S3 permissions.

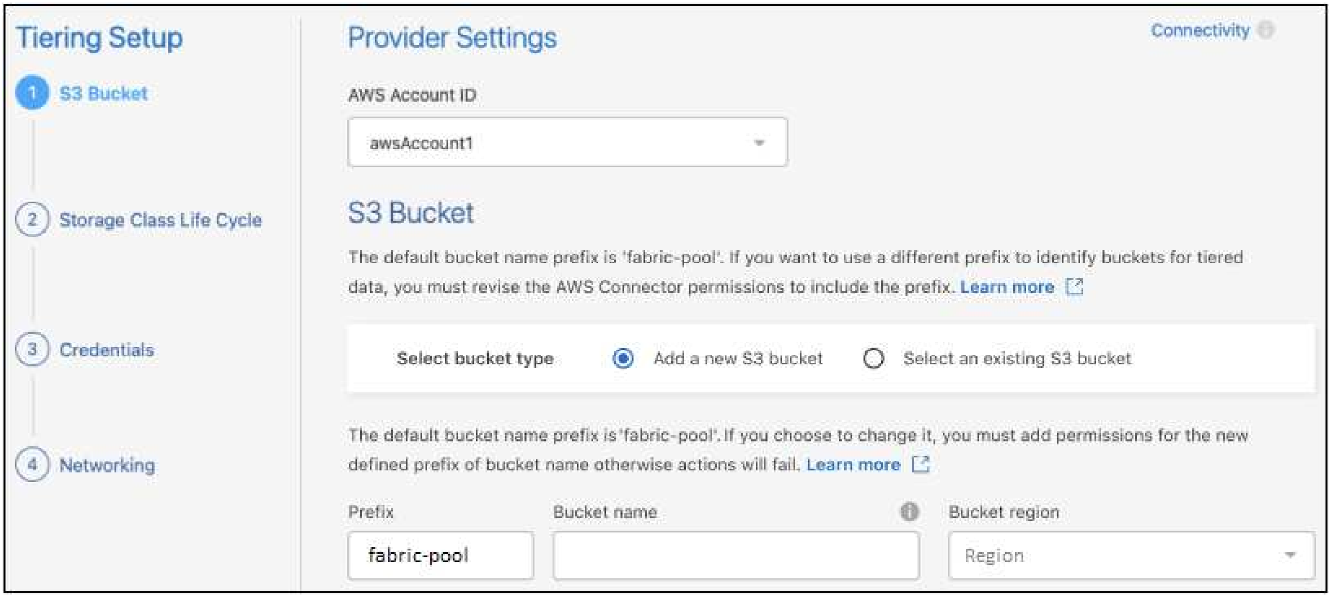
Steps

1. Select the on-prem ONTAP working environment.
2. Click **Enable** for the Tiering service from the right panel.

   If the Amazon S3 tiering destination exists as a working environment on the Canvas, you can drag the cluster onto the working environment to initiate the setup wizard.



3. **Define Object Storage Name**: Enter a name for this object storage. It must be unique from any other object storage you may be using with aggregates on this cluster.
4. **Select Provider**: Select **Amazon Web Services** and click **Continue**.



AWS Account ID: awsAccount1

The default bucket name prefix is 'fabric-pool'. If you want to use a different prefix to identify buckets for tiered data, you must revise the AWS Connector permissions to include the prefix. Learn more

Select bucket type ● Add a new S3 bucket ○ Select an existing S3 bucket

The default bucket name prefix is 'fabric-pool'. If you choose to change it, you must add permissions for the new defined prefix of bucket name otherwise actions will fail. Learn more

Prefix: fabric-pool

Bucket name:

Bucket region: Region

5. Complete the sections in the **Tiering Setup** page:

   a. **S3 Bucket**: Add a new S3 bucket or select an existing S3 bucket, select the bucket region, and click **Continue**.

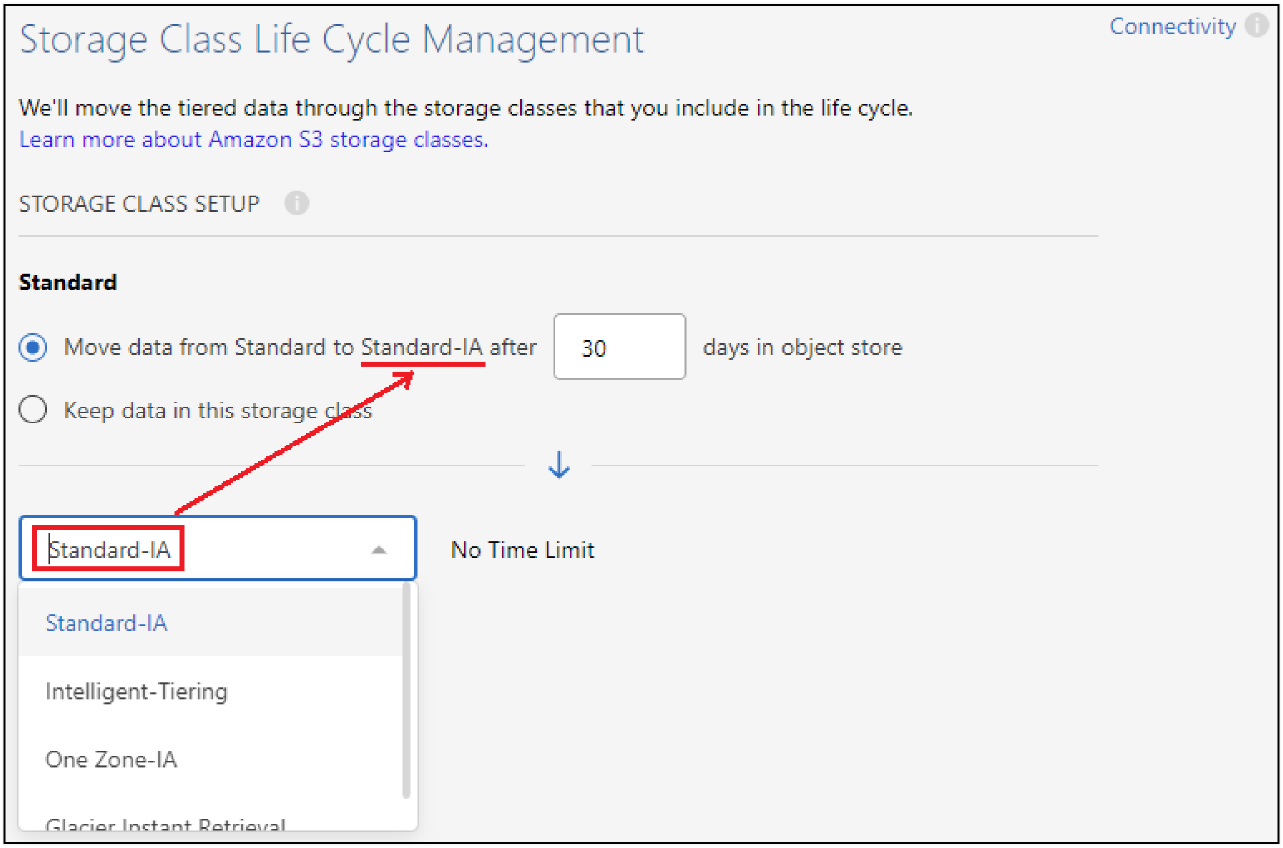
      When using an on-prem Connector, you must enter the AWS Account ID that provides access to the existing S3 bucket or new S3 bucket that will be created.

      The *fabric-pool* prefix is used by default because the IAM policy for the 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. You can define the prefix for the buckets used for tiering as well. See setting up S3 permissions to make sure you have AWS permissions that recognize any custom prefix you plan to use.

b. **Storage Class**: BlueXP tiering manages the lifecycle transitions of your tiered data. Data starts in the *Standard* class, but you can create a rule to apply a different storage class to the data after a certain number of days.

Select the S3 storage class that you want to transition the tiered data to and the number of days before the data is assigned to that class, and click **Continue**. For example, the screenshot below shows that tiered data is assigned to the *Standard-IA* class from the *Standard* class after 45 days in object storage.

If you choose **Keep data in this storage class**, then the data remains in the *Standard* storage class and no rules are applied. See supported storage classes.



Storage Class Life Cycle Management

We'll move the tiered data through the storage classes that you include in the life cycle.
Learn more about Amazon S3 storage classes.

STORAGE CLASS SETUP

Standard

● Move data from Standard to Standard-IA after 30 days in object store

○ Keep data in this storage class

Standard-IA

No Time Limit

Note that the lifecycle rule is applied to all objects in the selected bucket.

c. **Credentials**: Enter the access key ID and secret key for an IAM user who has the required S3 permissions, and click **Continue**.

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

d. **Networking**: Enter the networking details and click **Continue**.

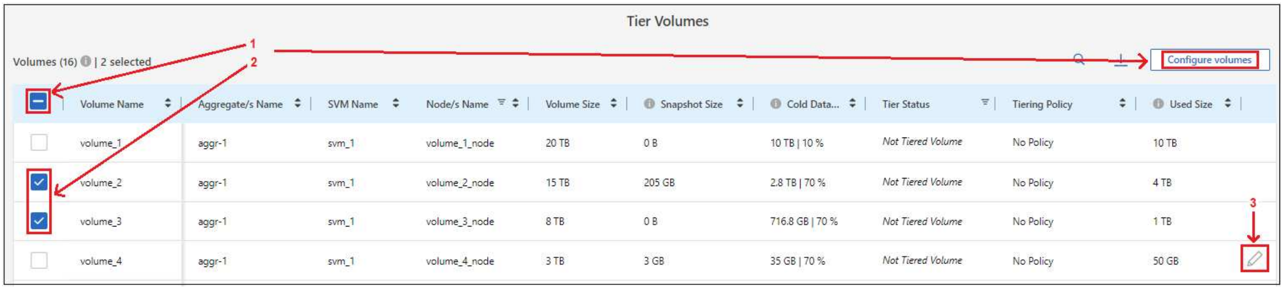
Select the IPspace in the ONTAP cluster where the volumes you want to tier reside. The intercluster LIFs for this IPspace must have outbound internet access so that they can connect to your cloud provider's object storage.

Optionally, choose whether you'll use an AWS PrivateLink that you have previously configured. See the setup information above. A dialog box is displayed to help guide you through the endpoint configuration.

You can also set the network bandwidth available to upload inactive data to object storage by defining the "Maximum transfer rate". Select the **Limited** radio button and enter the maximum bandwidth that can be used, or select **Unlimited** to indicate that there is no limit.

6. On the *Tier Volumes* page, select the volumes that you want to configure tiering for and launch the Tiering Policy page:

   - To select all volumes, check the box in the title row (☑ Volume Name) and click **Configure volumes**.
   - To select multiple volumes, check the box for each volume (☑ Volume_1) and click **Configure volumes**.
   - To select a single volume, click the row (or ✎ icon) for the volume.



Tier Volumes

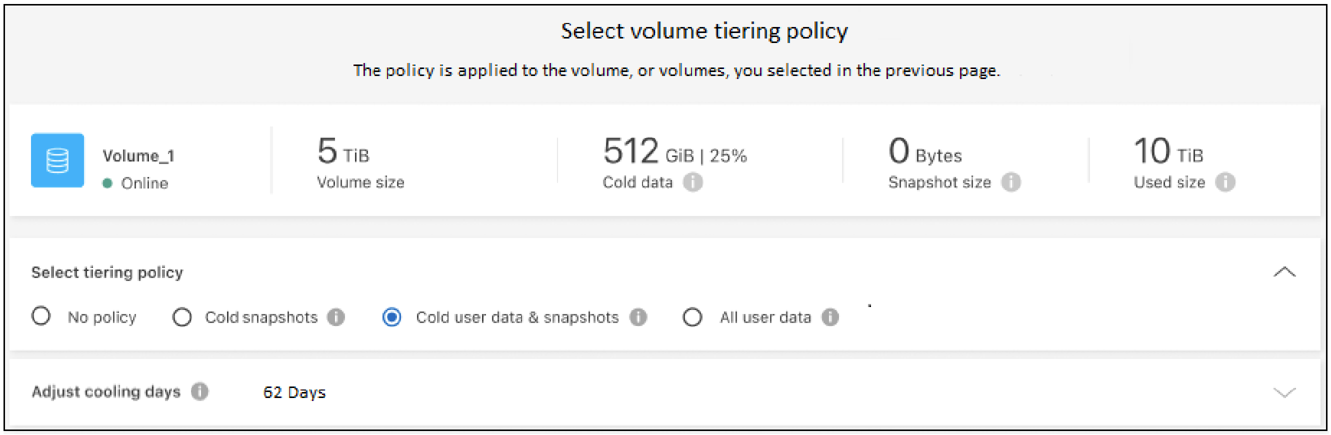
Volumes (16) | 2 selected

Configure volumes

☑	Volume Name	Aggregate/s Name	SVM Name	Node/s Name	Volume Size	Snapshot Size	Cold Data...	Tier Status	Tiering Policy	Used Size
□	volume_1	aggr-1	svm_1	volume_1_node	20 TB	0 B	10 TB | 10 %	*Not Tiered Volume*	No Policy	10 TB
☑	volume_2	aggr-1	svm_1	volume_2_node	15 TB	205 GB	2.8 TB | 70 %	*Not Tiered Volume*	No Policy	4 TB
☑	volume_3	aggr-1	svm_1	volume_3_node	8 TB	0 B	716.8 GB | 70 %	*Not Tiered Volume*	No Policy	1 TB
□	volume_4	aggr-1	svm_1	volume_4_node	3 TB	3 GB	35 GB | 70 %	*Not Tiered Volume*	No Policy	50 GB

7. In the *Tiering Policy* dialog, select a tiering policy, optionally adjust the cooling days for the selected volumes, and click **Apply**.

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



Select volume tiering policy

The policy is applied to the volume, or volumes, you selected in the previous page.

Volume_1 ● Online | 5 TiB Volume size | 512 GiB | 25% Cold data | 0 Bytes Snapshot size | 10 TiB Used size

Select tiering policy

○ No policy ○ Cold snapshots ● Cold user data & snapshots ○ All user data

Adjust cooling days 62 Days

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 BlueXP tiering service](#).

You can review information about the active and inactive data on the cluster. [Learn more about managing your tiering settings](#).

You can also create additional object storage in cases where you may want to tier data from certain aggregates on a cluster to different object stores. Or if you plan to use FabricPool Mirroring where your tiered data is replicated to an additional object store. [Learn more about managing object stores](#).

Tiering data from on-premises ONTAP clusters to Azure Blob storage

Free space on your on-prem ONTAP clusters by tiering inactive data to Azure Blob storage.

Quick start

Get started quickly by following these steps, or scroll down to the remaining sections for full details.

1 **Prepare to tier data to Azure Blob storage**

You need the following:

- An on-prem ONTAP cluster that’s running ONTAP 9.4 or later and has an HTTPS connection to Azure Blob storage. Learn how to discover a cluster.
- A Connector installed in an Azure VNet or on your premises.
- Networking for a Connector that enables an outbound HTTPS connection to the ONTAP cluster in your data center, to Azure storage, and to the BlueXP tiering service.

2 **Set up tiering**

In BlueXP, select an on-prem ONTAP working environment, click **Enable** for the Tiering service, and follow the prompts to tier data to Azure Blob storage.

3 **Set up licensing**

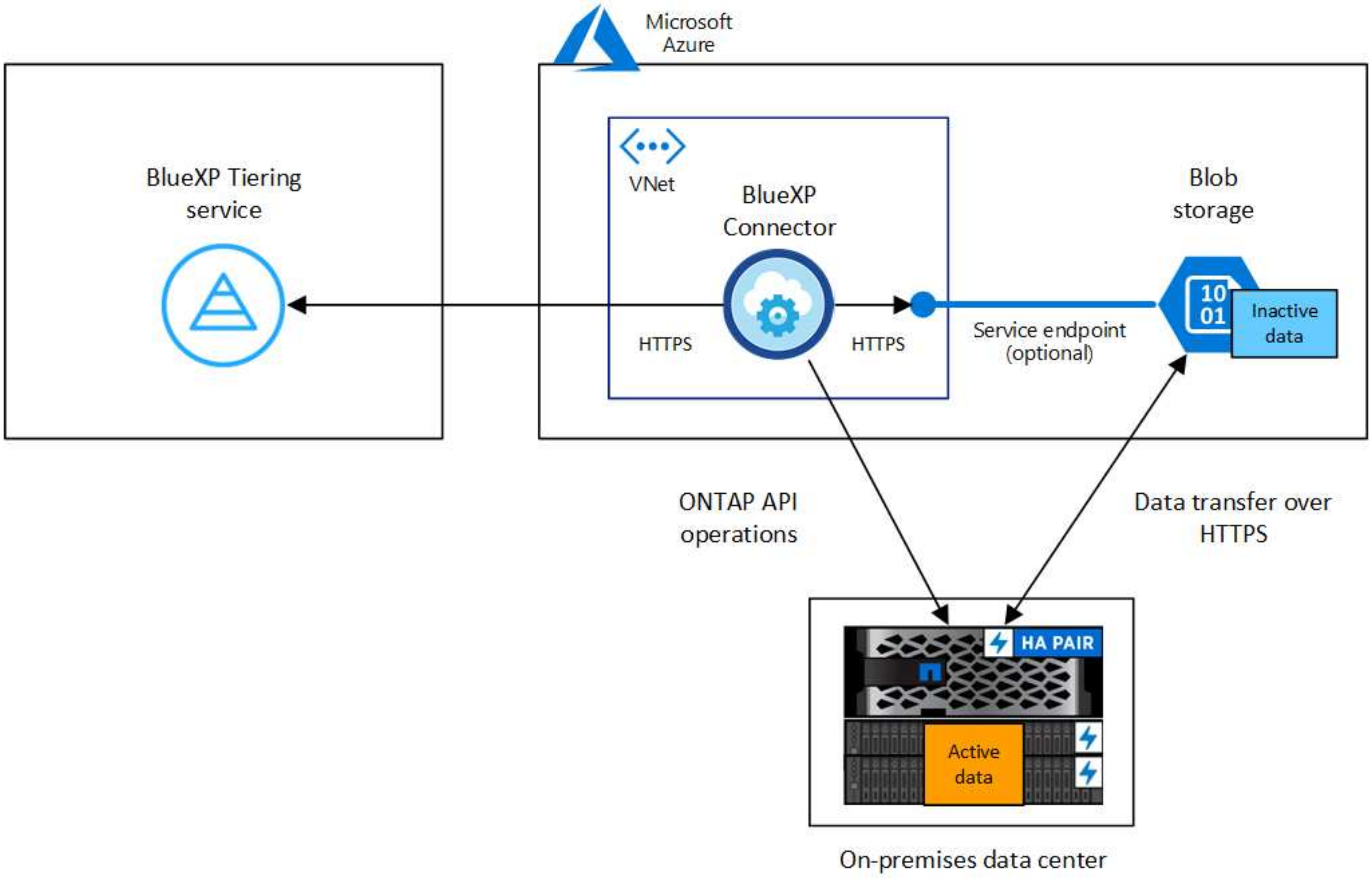
After your free trial ends, pay for BlueXP tiering through a pay-as-you-go subscription, an ONTAP BlueXP tiering BYOL license, or a combination of both:

- To subscribe from the Azure Marketplace, go to the BlueXP Marketplace offering, click **Subscribe**, and then follow the prompts.
- To pay using a BlueXP tiering BYOL license, contact us if you need to purchase one, and then add it to your account from the BlueXP digital wallet.

Requirements

Verify support for your ONTAP cluster, set up your networking, and prepare your object storage.

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



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

Supported ONTAP platforms

- When using ONTAP 9.8 and later: You can tier data from AFF systems, or FAS systems with all-SSD aggregates or all-HDD aggregates.
- When using ONTAP 9.7 and earlier: You can tier data from AFF systems, or FAS systems with all-SSD aggregates.

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’s not required between the ONTAP cluster and Azure Blob storage. But doing so is the recommended best practice.

- An inbound connection is required from the Connector, which can reside in an Azure VNet or on your premises.

A connection between the cluster and the BlueXP tiering service is not required.

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

  When you set up data tiering, BlueXP 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. Learn more about LIFs and IPspaces.

Supported volumes and aggregates

The total number of volumes that BlueXP 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. Refer to the ONTAP documentation for functionality or features not supported by FabricPool.

> ⓘ BlueXP tiering supports FlexGroup volumes, starting with ONTAP 9.5. Setup works the same as any other volume.

Discovering an ONTAP cluster

You need to create an on-prem ONTAP working environment in BlueXP before you can start tiering cold data.

Learn how to discover a cluster.

Creating or switching Connectors

A Connector is required to tier data to the cloud. When tiering data to Azure Blob storage, you can use a Connector that's in an Azure VNet or in your premises. You'll either need to create a new Connector or make sure that the currently selected Connector resides in Azure or on-prem.

- Learn about Connectors
- Deploying a Connector in Azure
- Installing a Connector on a Linux host

Verify that you have the necessary Connector permissions

If you created the Connector using BlueXP version 3.9.25 or greater, then you're all set. The custom role that provides the permissions that a Connector needs to manage resources and processes within your Azure network will be set up by default. See the required custom role permissions and the specific permissions required for BlueXP tiering.

If you created the Connector using an earlier version of BlueXP, then you'll need to edit the permission list for the Azure account to add any missing permissions.

Preparing networking for the Connector

Ensure that the Connector has the required networking connections. A Connector can be installed on-prem or in Azure.

Steps

1. Ensure that the network where the Connector is installed enables the following connections:

    - An HTTPS connection over port 443 to the BlueXP tiering service and to your Azure Blob object storage (see the list of endpoints)
    - An HTTPS connection over port 443 to your ONTAP cluster management LIF

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 Connector and Blob storage to stay in your virtual private network.

Preparing Azure Blob storage

When you set up tiering, you need to identify the resource group you want to use, and the storage account and Azure container that belong to the resource group. A storage account enables BlueXP tiering to authenticate and access the Blob container used for data tiering.

BlueXP tiering supports tiering to any storage account in any region that can be accessed via the Connector.

BlueXP tiering supports only the General Purpose v2 and Premium Block Blob types of storage accounts.

> ⓘ If you are planning to configure BlueXP tiering to use a lower cost access tier where your tiered data will transition to after a certain number of days, you must not select any lifecycle rules when setting up the container in your Azure account. BlueXP tiering manages the lifecycle transitions.

Tiering inactive data from your first cluster to Azure Blob storage

After you prepare your Azure environment, start tiering inactive data from your first cluster.

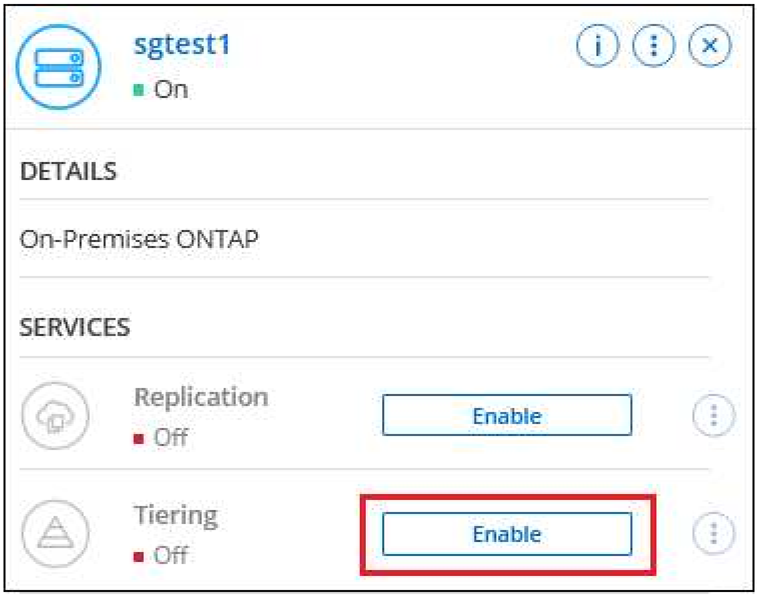
What you’ll need

An on-premises working environment.

Steps

1. Select the on-prem ONTAP working environment.
2. Click **Enable** for the Tiering service from the right panel.

   If the Azure Blob tiering destination exists as a working environment on the Canvas, you can drag the cluster onto the Azure Blob working environment to initiate the setup wizard.



sgtest1

■ On

DETAILS

On-Premises ONTAP

SERVICES

Replication

■ Off

Tiering

■ Off

3. **Define Object Storage Name**: Enter a name for this object storage. It must be unique from any other object storage you may be using with aggregates on this cluster.
4. **Select Provider**: Select **Microsoft Azure** and click **Continue**.
5. Complete the steps on the **Create Object Storage** pages:
   a. **Resource Group**: Select a resource group where an existing container is managed, or where you'd like to create a new container for tiered data, and click **Continue**.

      When using an on-prem Connector, you must enter the Azure Subscription that provides access to the resource group.

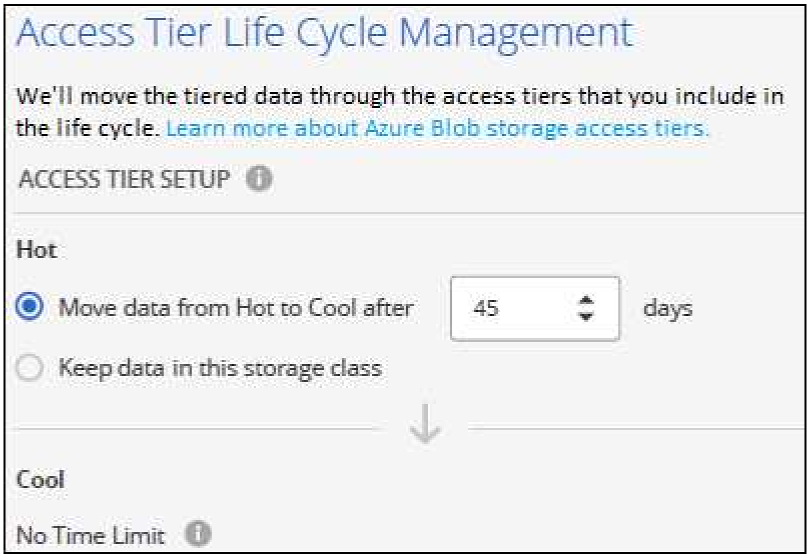
   b. **Azure Container**: Select the radio button to either add a new Blob container to a storage account or to use an existing container. Then select the storage account and choose the existing container, or enter the name for the new container. Then click **Continue**.

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

   c. **Access Tier Lifecycle**: BlueXP tiering manages the lifecycle transitions of your tiered data. Data starts in the *Hot* class, but you can create a rule to apply the *Cool* class to the data after a certain number of days.

      Select the access tier that you want to transition the tiered data to and the number of days before the data is assigned to that tier, and click **Continue**. For example, the screenshot below shows that tiered data is assigned to the *Cool* class from the *Hot* class after 45 days in object storage.

      If you choose **Keep data in this access tier**, then the data remains in the *Hot* access tier and no rules are applied. See supported access tiers.



Access Tier Life Cycle Management

We'll move the tiered data through the access tiers that you include in the life cycle. Learn more about Azure Blob storage access tiers.

ACCESS TIER SETUP ⓘ

Hot

● Move data from Hot to Cool after 45 days

○ Keep data in this storage class

Cool

No Time Limit ⓘ

Note that the lifecycle rule is applied to all blob containers in the selected storage account.

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

   Selecting the correct IPspace ensures that BlueXP tiering can set up a connection from ONTAP to your cloud provider’s object storage.

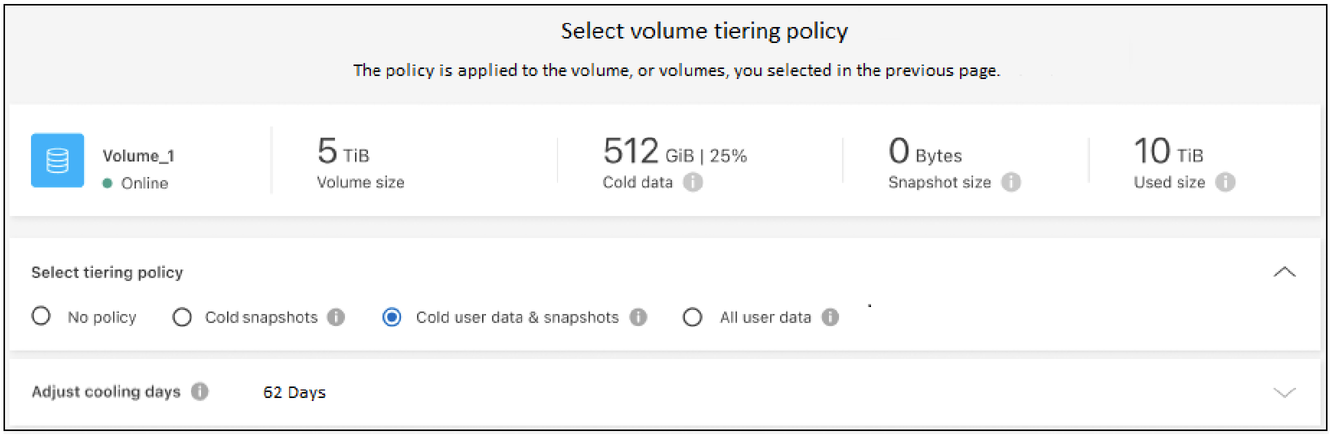
   You can also set the network bandwidth available to upload inactive data to object storage by defining the "Maximum transfer rate". Select the **Limited** radio button and enter the maximum bandwidth that can be used, or select **Unlimited** to indicate that there is no limit.

6. On the *Tier Volumes* page, select the volumes that you want to configure tiering for and launch the Tiering Policy page:

   - To select all volumes, check the box in the title row (☑ Volume Name) and click **Configure volumes**.
   - To select multiple volumes, check the box for each volume (☑ Volume_1) and click **Configure volumes**.
   - To select a single volume, click the row (or ✏ icon) for the volume.

7. In the *Tiering Policy* dialog, select a tiering policy, optionally adjust the cooling days for the selected volumes, and click **Apply**.

   Learn more about volume tiering policies and cooling days.



Select volume tiering policy

The policy is applied to the volume, or volumes, you selected in the previous page.

Volume_1
Online

5 TiB
Volume size

512 GiB | 25%
Cold data

0 Bytes
Snapshot size

10 TiB
Used size

Select tiering policy

○ No policy ○ Cold snapshots ● Cold user data & snapshots ○ All user data

Adjust cooling days 62 Days

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 BlueXP tiering service.

You can review information about the active and inactive data on the cluster. Learn more about managing your tiering settings.

You can also create additional object storage in cases where you may want to tier data from certain aggregates on a cluster to different object stores. Or if you plan to use FabricPool Mirroring where your tiered data is replicated to an additional object store. Learn more about managing object stores.

Tiering data from on-premises ONTAP clusters to Google Cloud Storage

Free space on your on-prem ONTAP clusters by tiering inactive data to Google Cloud Storage.

Quick start

Get started quickly by following these steps, or scroll down to the remaining sections for full details.

1

Prepare to tier data to Google Cloud Storage

You need the following:

- An on-prem ONTAP cluster that’s running ONTAP 9.6 or later and has an HTTPS connection to Google Cloud Storage. Learn how to discover a cluster.
- A service account that has the predefined Storage Admin role and storage access keys.
- A Connector installed in a Google Cloud Platform VPC.
- Networking for the Connector that enables an outbound HTTPS connection to the ONTAP cluster in your data center, to Google Cloud Storage, and to the BlueXP tiering service.

2 **Set up tiering**

In BlueXP, select an on-prem working environment, click **Enable** for the Tiering service, and follow the prompts to tier data to Google Cloud Storage.

3 **Set up licensing**

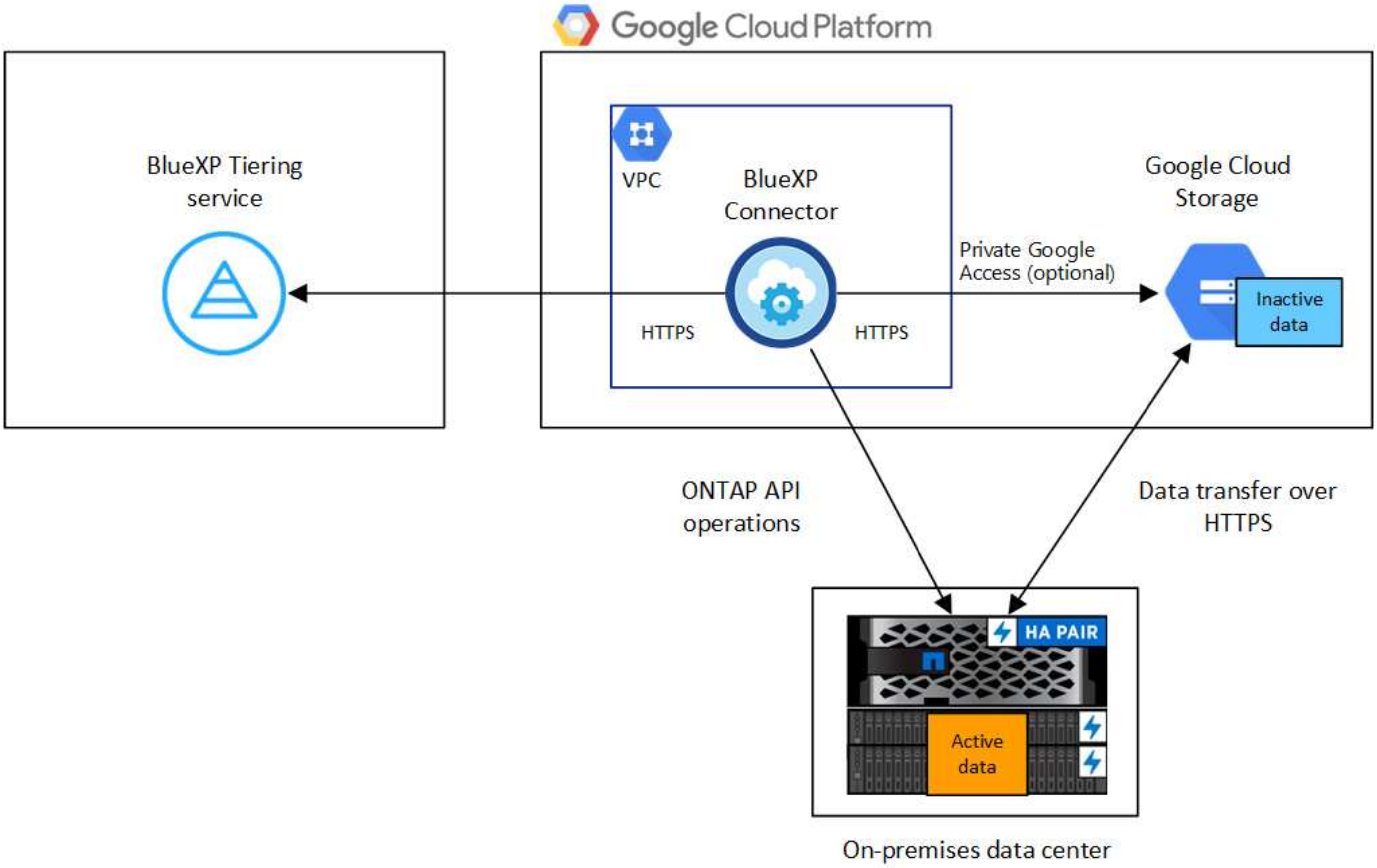
After your free trial ends, pay for BlueXP tiering through a pay-as-you-go subscription, an ONTAP BlueXP tiering BYOL license, or a combination of both:

- To subscribe from the GCP Marketplace, go to the BlueXP Marketplace offering, click **Subscribe**, and then follow the prompts.
- To pay using a BlueXP tiering BYOL license, contact us if you need to purchase one, and then add it to your account from the BlueXP digital wallet.

Requirements

Verify support for your ONTAP cluster, set up your networking, and prepare your object storage.

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



Communication between the 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

- When using ONTAP 9.8 and later: You can tier data from AFF systems, or FAS systems with all-SSD aggregates or all-HDD aggregates.
- When using ONTAP 9.7 and earlier: You can tier data from AFF systems, or FAS systems with all-SSD aggregates.

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’s not required between the ONTAP cluster and Google Cloud Storage. But doing so is the recommended best practice.

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

  A connection between the cluster and the BlueXP tiering service is not required.

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

  When you set up data tiering, BlueXP 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. Learn more about LIFs and IPspaces.

Supported volumes and aggregates

The total number of volumes that BlueXP 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. Refer to the ONTAP documentation for functionality or features not supported by FabricPool.

> ⓘ BlueXP tiering supports FlexGroup volumes. Setup works the same as any other volume.

Discovering an ONTAP cluster

You need to create an on-prem ONTAP working environment in BlueXP before you can start tiering cold data.

Learn how to discover a cluster.

Creating or switching Connectors

A Connector is required to tier data to the cloud. When tiering data to Google Cloud Storage, a Connector must be available in a Google Cloud Platform VPC. You’ll either need to create a new Connector or make sure that the currently selected Connector resides in GCP.

- Learn about Connectors
- Deploying a Connector in GCP

Preparing networking for the Connector

Ensure that the Connector has the required networking connections.

Steps

1. Ensure that the VPC where the Connector is installed enables the following connections:
   - An HTTPS connection over port 443 to the BlueXP tiering service and to your Google Cloud Storage (see the list of endpoints)
   - An HTTPS connection over port 443 to your ONTAP cluster management LIF
2. Optional: Enable Private Google Access on the subnet where you plan to deploy the 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 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

When you set up tiering, you need to provide storage access keys for a service account that has Storage Admin permissions. A service account enables BlueXP 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.

The Cloud Storage buckets must be in a region that supports BlueXP tiering.

> ⓘ If you are planning to configure BlueXP tiering to use lower cost storage classes where your tiered data will transition to after a certain number of days, you must not select any lifecycle rules when setting up the bucket in your GCP account. BlueXP tiering manages the lifecycle transitions.

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 later when you set up BlueXP tiering.

Tiering inactive data from your first cluster to Google Cloud Storage

After you prepare your Google Cloud environment, start tiering inactive data from your first cluster.

What you’ll need

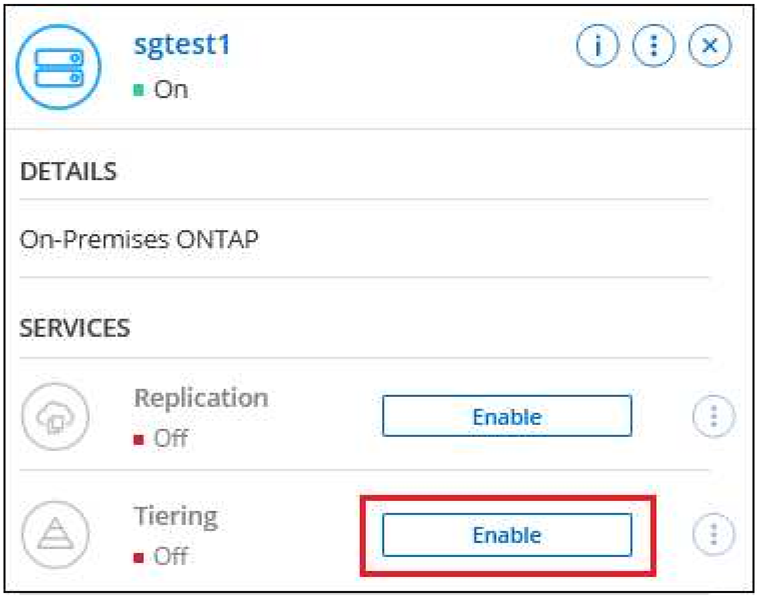
- An on-premises working environment.

- Storage access keys for a service account that has the Storage Admin role.

Steps

1. Select the on-prem ONTAP working environment.
2. Click **Enable** for the Tiering service from the right panel.

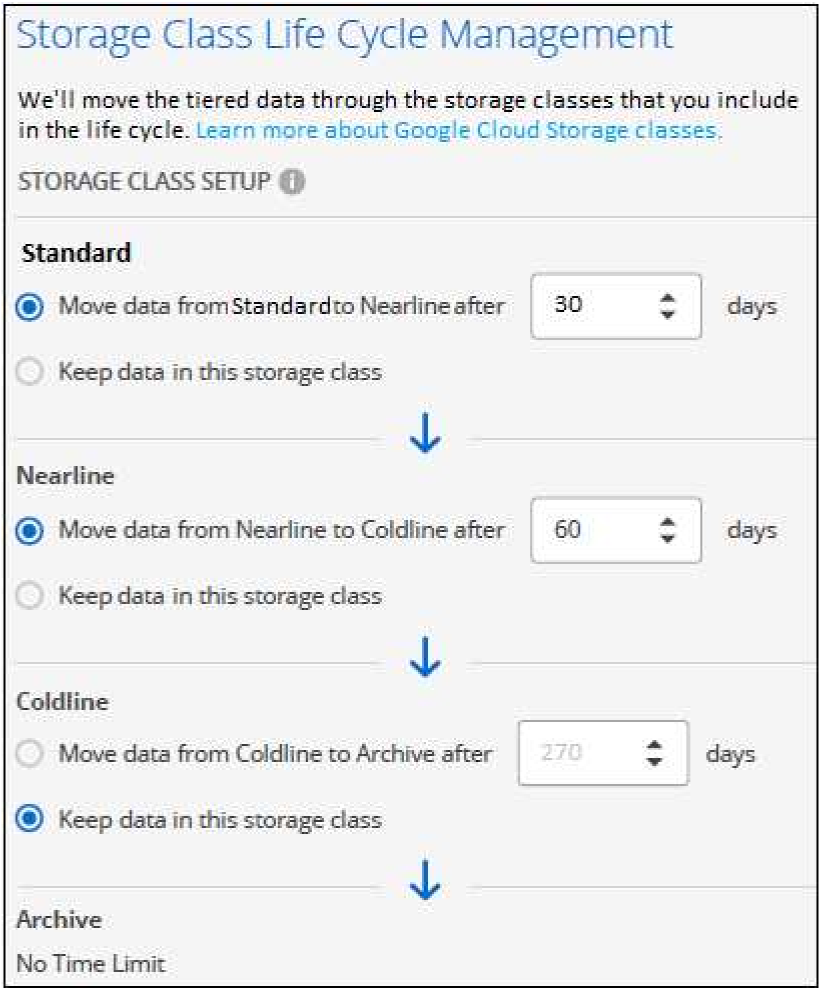
   If the Google Cloud Storage tiering destination exists as a working environment on the Canvas, you can drag the cluster onto the Google Cloud Storage working environment to initiate the setup wizard.

3. **Define Object Storage Name**: Enter a name for this object storage. It must be unique from any other object storage you may be using with aggregates on this cluster.
4. **Select Provider**: Select **Google Cloud** and click **Continue**.
5. Complete the steps on the **Create Object Storage** pages:
   a. **Bucket**: Add a new Google Cloud Storage bucket or select an existing bucket.
   b. **Storage Class Lifecycle**: BlueXP tiering manages the lifecycle transitions of your tiered data. Data starts in the *Standard* class, but you can create rules to apply different storage classes after a certain number of days.

      Select the Google Cloud storage class that you want to transition the tiered data to and the number of days before the data is assigned to that class, and click **Continue**. For example, the screenshot below shows that tiered data is assigned to the *Nearline* class from the *Standard* class after 30 days in object storage, and then to the *Coldline* class after 60 days in object storage.

      If you choose **Keep data in this storage class**, then the data remains in the that storage class. See supported storage classes.



Storage Class Life Cycle Management

We'll move the tiered data through the storage classes that you include in the life cycle. Learn more about Google Cloud Storage classes.

STORAGE CLASS SETUP

Standard

● Move data from Standard to Nearline after 30 days

○ Keep data in this storage class

Nearline

● Move data from Nearline to Coldline after 60 days

○ Keep data in this storage class

Coldline

○ Move data from Coldline to Archive after 270 days

● Keep data in this storage class

Archive

No Time Limit

Note that the lifecycle rule is applied to all objects in the selected bucket.

c. **Credentials**: Enter the storage access key and secret key for a service account that has the Storage Admin role.

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

Selecting the correct IPspace ensures that BlueXP tiering can set up a connection from ONTAP to your cloud provider’s object storage.

You can also set the network bandwidth available to upload inactive data to object storage by defining the "Maximum transfer rate". Select the **Limited** radio button and enter the maximum bandwidth that can be used, or select **Unlimited** to indicate that there is no limit.

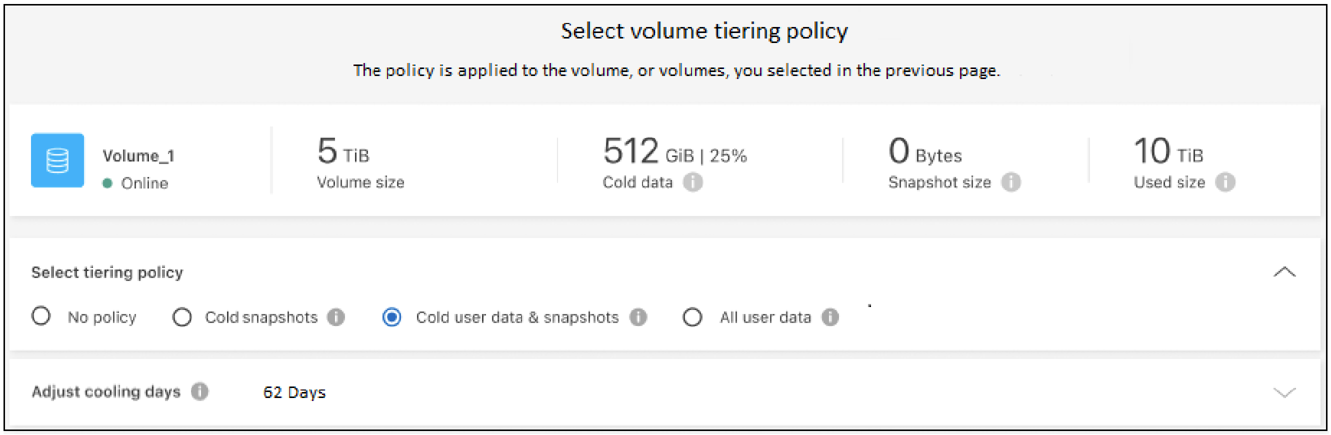
6. Click **Continue** to select the volumes that you want to tier.

7. On the *Tier Volumes* page, select the volumes that you want to configure tiering for and launch the Tiering Policy page:

   - To select all volumes, check the box in the title row (☑ Volume Name) and click **Configure volumes**.
   - To select multiple volumes, check the box for each volume (☑ Volume_1) and click **Configure volumes**.
   - To select a single volume, click the row (or ✎ icon) for the volume.

8. In the *Tiering Policy* dialog, select a tiering policy, optionally adjust the cooling days for the selected volumes, and click **Apply**.

   Learn more about volume tiering policies and cooling days.



Select volume tiering policy

The policy is applied to the volume, or volumes, you selected in the previous page.

Volume_1
● Online

5 TiB
Volume size

512 GiB | 25%
Cold data

0 Bytes
Snapshot size

10 TiB
Used size

Select tiering policy

○ No policy ○ Cold snapshots ● Cold user data & snapshots ○ All user data

Adjust cooling days 62 Days

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 BlueXP tiering service.

You can review information about the active and inactive data on the cluster. Learn more about managing your tiering settings.

You can also create additional object storage in cases where you may want to tier data from certain aggregates on a cluster to different object stores. Or if you plan to use FabricPool Mirroring where your tiered data is replicated to an additional object store. Learn more about managing object stores.

Tiering data from on-premises ONTAP clusters to StorageGRID

Free space on your on-prem ONTAP clusters by tiering inactive data to StorageGRID.

Quick start

Get started quickly by following these steps, or scroll down to the remaining sections for full details.

1

Prepare to tier data to StorageGRID

You need the following:

- An on-prem ONTAP cluster that's running ONTAP 9.4 or later, and a connection over a user-specified port to StorageGRID. Learn how to discover a cluster.
- StorageGRID 10.3 or later with AWS access keys that have S3 permissions.
- A Connector installed on your premises.

- Networking for the Connector that enables an outbound HTTPS connection to the ONTAP cluster, to StorageGRID, and to the BlueXP tiering service.

2

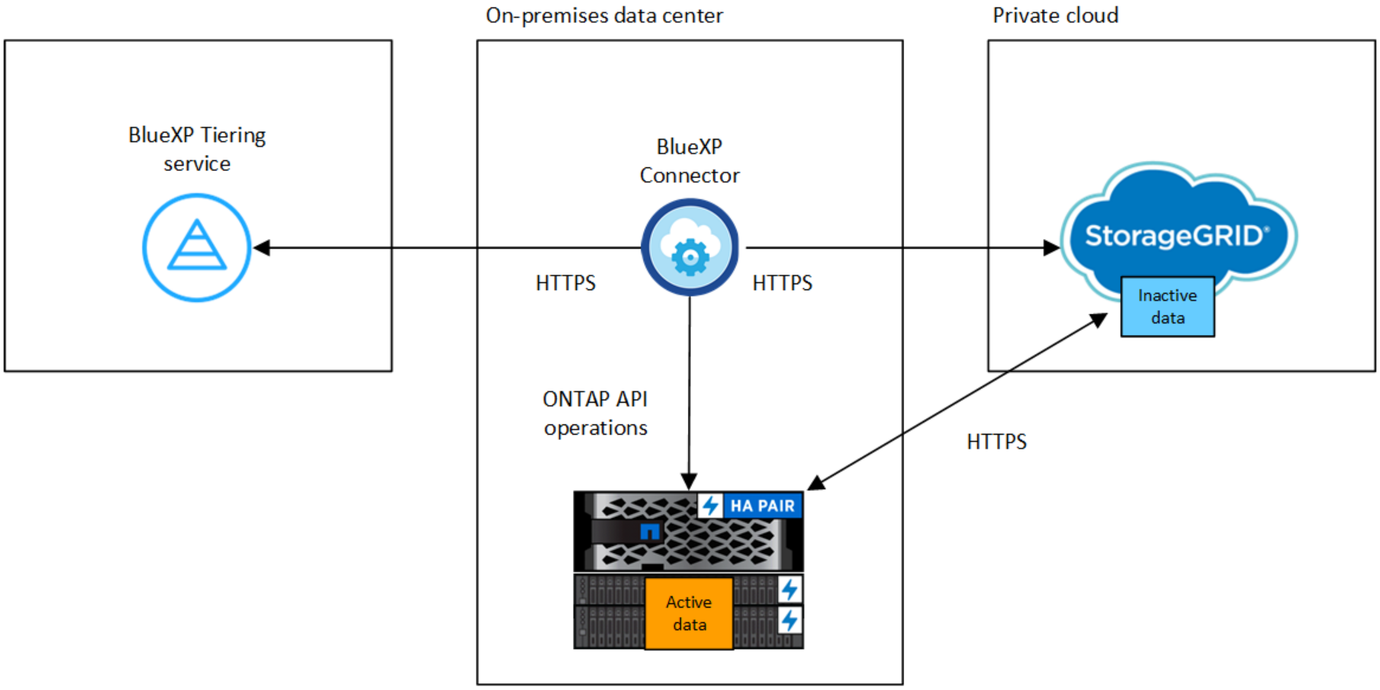
Set up tiering

In BlueXP, select an on-prem working environment, click **Enable** for the Tiering service, and follow the prompts to tier data to StorageGRID.

Requirements

Verify support for your ONTAP cluster, set up your networking, and prepare your object storage.

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



Communication between the 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

- When using ONTAP 9.8 and later: You can tier data from AFF systems, or FAS systems with all-SSD aggregates or all-HDD aggregates.
- When using ONTAP 9.7 and earlier: You can tier data from AFF systems, or FAS systems with all-SSD aggregates.

Supported ONTAP version

ONTAP 9.4 or later

Licensing

A BlueXP tiering license isn't required in your BlueXP account, nor is a FabricPool license 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 the StorageGRID Gateway Node (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 Connector, which must reside on your premises.

  A connection between the cluster and the BlueXP tiering service is not required.

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

  When you set up data tiering, BlueXP 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. Learn more about LIFs and IPspaces.

Supported volumes and aggregates

The total number of volumes that BlueXP 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. Refer to the ONTAP documentation for functionality or features not supported by FabricPool.

> ⓘ BlueXP tiering supports FlexGroup volumes, starting with ONTAP 9.5. Setup works the same as any other volume.

Discovering an ONTAP cluster

You need to create an on-prem ONTAP working environment in the BlueXP Canvas before you can start tiering cold data.

Learn how to discover a cluster.

Preparing StorageGRID

StorageGRID must meet the following requirements.

Supported StorageGRID versions

StorageGRID 10.3 and later is supported.

S3 credentials

When you set up tiering to StorageGRID, you need to provide BlueXP tiering with an S3 access key and secret key. BlueXP 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.

Creating or switching Connectors

A Connector is required to tier data to the cloud. When tiering data to StorageGRID, a Connector must be available on your premises. You'll either need to install a new Connector or make sure that the currently selected Connector resides on-prem.

- Learn about Connectors
- Installing a Connector on a Linux host
- Switching between Connectors

Preparing networking for the Connector

Ensure that the Connector has the required networking connections.

Steps

1. Ensure that the network where the Connector is installed enables the following connections:
   - An HTTPS connection over port 443 to the BlueXP tiering service (see the list of endpoints)
   - An HTTPS connection over port 443 to your StorageGRID system
   - An HTTPS connection over port 443 to your ONTAP cluster management LIF

Tiering inactive data from your first cluster to StorageGRID

After you prepare your environment, start tiering inactive data from your first cluster.

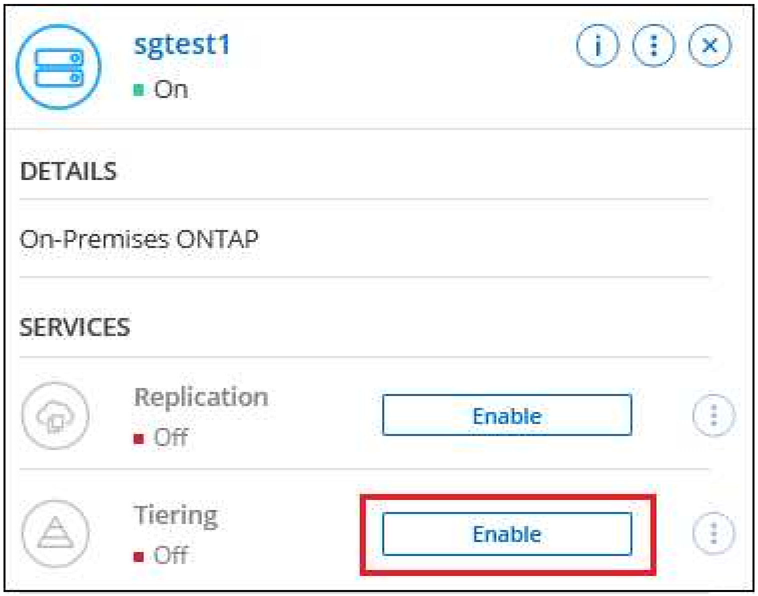
What you'll need

- An on-premises working environment.
- The FQDN of the StorageGRID Gateway Node, and the port that will be used for HTTPS communications.
- An AWS access key that has the required S3 permissions.

Steps

1. Select the on-prem ONTAP working environment.
2. Click **Enable** for the Tiering service from the right panel.

   If the StorageGRID tiering destination exists as a working environment on the Canvas, you can drag the cluster onto the StorageGRID working environment to initiate the setup wizard.



3. **Define Object Storage Name**: Enter a name for this object storage. It must be unique from any other object storage you may be using with aggregates on this cluster.
4. **Select Provider**: Select **StorageGRID** and click **Continue**.
5. Complete the steps on the **Create Object Storage** pages:
    a. **Server**: Enter the FQDN of the StorageGRID Gateway Node, the port that ONTAP should use for HTTPS communication with StorageGRID, and the access key and secret key for an account that has the required S3 permissions.
    b. **Bucket**: Add a new bucket or select an existing bucket that starts with the prefix *fabric-pool* and click **Continue**.

        The *fabric-pool* prefix is required because the IAM policy for the 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.

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

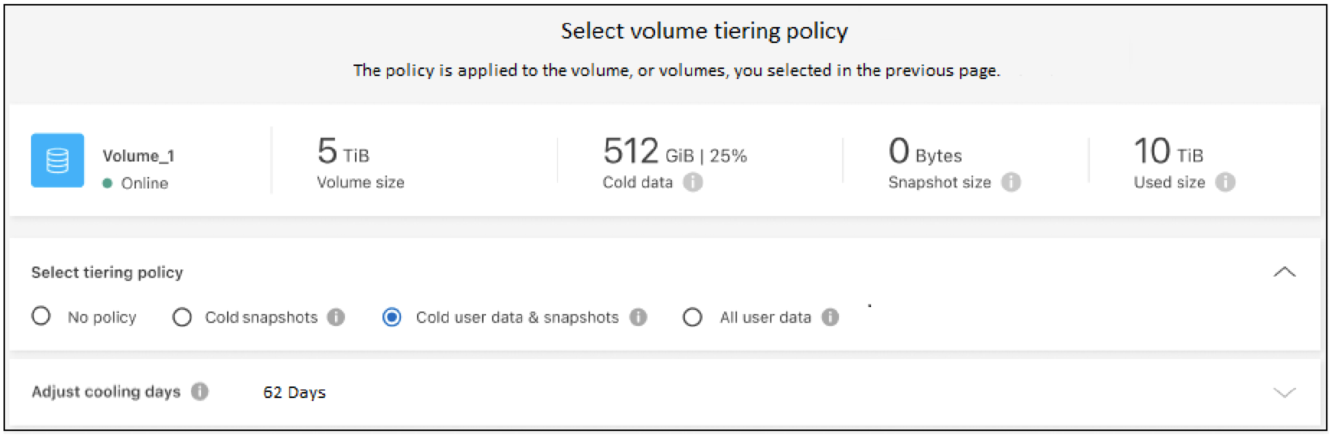
        Selecting the correct IPspace ensures that BlueXP tiering can set up a connection from ONTAP to StorageGRID object storage.

        You can also set the network bandwidth available to upload inactive data to object storage by defining the "Maximum transfer rate". Select the **Limited** radio button and enter the maximum bandwidth that can be used, or select **Unlimited** to indicate that there is no limit.

6. On the *Tier Volumes* page, select the volumes that you want to configure tiering for and launch the Tiering Policy page:
    - To select all volumes, check the box in the title row (☑ Volume Name) and click **Configure volumes**.
    - To select multiple volumes, check the box for each volume (☑ Volume_1) and click **Configure volumes**.
    - To select a single volume, click the row (or ✎ icon) for the volume.

7. In the *Tiering Policy* dialog, select a tiering policy, optionally adjust the cooling days for the selected volumes, and click **Apply**.

   Learn more about volume tiering policies and cooling days.



Select volume tiering policy

The policy is applied to the volume, or volumes, you selected in the previous page.

Volume_1
● Online

5 TiB
Volume size

512 GiB | 25%
Cold data

0 Bytes
Snapshot size

10 TiB
Used size

Select tiering policy

○ No policy ○ Cold snapshots ● Cold user data & snapshots ○ All user data

Adjust cooling days 62 Days

Result

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

What’s next?

You can review information about the active and inactive data on the cluster. Learn more about managing your tiering settings.

You can also create additional object storage in cases where you may want to tier data from certain aggregates on a cluster to different object stores. Or if you plan to use FabricPool Mirroring where your tiered data is replicated to an additional object store. Learn more about managing object stores.

Tiering data from on-premises ONTAP clusters to S3 object storage

Free space on your on-prem ONTAP clusters by tiering inactive data to any object storage service which uses the Simple Storage Service (S3) protocol.

At this time, MinIO object storage has been qualified.

> Customers who want to use object stores that are not officially supported as a cloud tier can do so using these instructions. Customers must test and confirm that the object store meets their requirements.
>
> NetApp does not support, nor is liable, for any issues arising from any third-party Object Store Service, specifically where it does not have agreed support arrangements with the third party with whom the product originated. It is acknowledged and agreed that NetApp shall not be liable for any associated damage or otherwise be required to provide support on that third-party product.

Quick start

Get started quickly by following these steps, or scroll down to the remaining sections for full details.

1

Prepare to tier data to S3-compatible object storage

You need the following:

- A source on-prem ONTAP cluster that’s running ONTAP 9.8 or later, and a connection over a user-specified port to the destination S3-compatible object storage. Learn how to discover a cluster.
- The FQDN, Access Key, and Secret Key for the object storage server so that the ONTAP cluster can access the bucket.
- A Connector installed on your premises.
- Networking for the Connector that enables an outbound HTTPS connection to the source ONTAP cluster, to the S3-compatible object storage, and to the BlueXP tiering service.

2

Set up tiering

In BlueXP, select an on-prem working environment, click **Enable** for the Tiering service, and follow the prompts to tier data to S3-compatible object storage.

3

Set up licensing

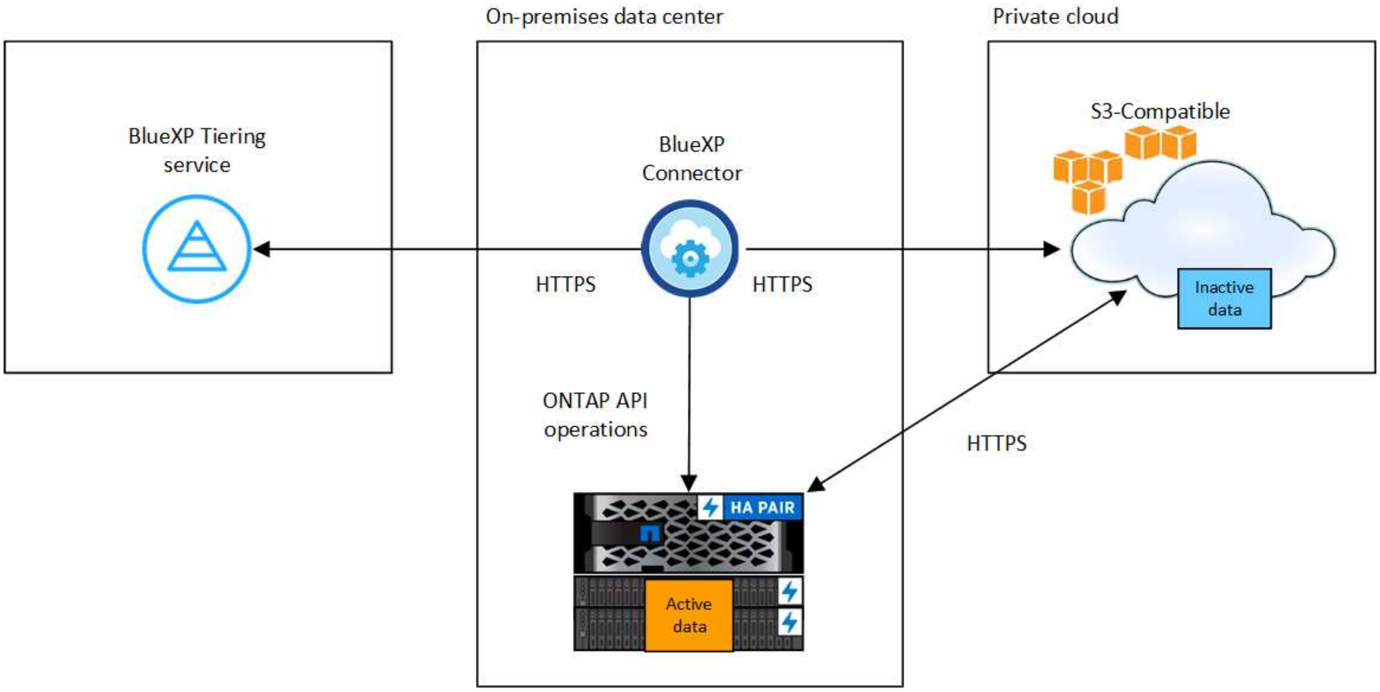
Pay for BlueXP tiering through a pay-as-you-go subscription from your cloud provider, a NetApp BlueXP tiering bring-your-own-license, or a combination of both:

- To subscribe to the BlueXP PAYGO offering from the AWS Marketplace, Azure Marketplace, or GCP Marketplace, click **Subscribe** and follow the prompts.
- To pay using a BlueXP tiering BYOL license, contact us if you need to purchase one, and then add it to your account from the BlueXP digital wallet.

Requirements

Verify support for your ONTAP cluster, set up your networking, and prepare your object storage.

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



> ⓘ Communication between the Connector and the S3-compatible object storage server is for object storage setup only.

Preparing your ONTAP clusters

Your source ONTAP clusters must meet the following requirements when tiering data to S3-compatible object storage.

Supported ONTAP platforms

You can tier data from AFF systems, or FAS systems with all-SSD aggregates or all-HDD aggregates.

Supported ONTAP version

ONTAP 9.8 or later

Cluster networking requirements

- The ONTAP cluster initiates an HTTPS connection over a user-specified port to S3-compatible object storage (the port is configurable during tiering setup).

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

- An inbound connection is required from the Connector, which must reside on your premises.

  A connection between the cluster and the BlueXP tiering service is not required.

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

  When you set up data tiering, BlueXP 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. Learn more about LIFs and IPspaces.

Supported volumes and aggregates

The total number of volumes that BlueXP 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. Refer to the ONTAP documentation for functionality or features not supported by FabricPool.

BlueXP tiering supports both FlexVol and FlexGroup volumes.

Discovering an ONTAP cluster

You need to create an on-prem ONTAP working environment in the BlueXP Canvas before you can start tiering cold data.

Learn how to discover a cluster.

Preparing S3-compatible object storage

S3-compatible object storage must meet the following requirements.

S3 credentials

When you set up tiering to S3-compatible object storage, you’re prompted to create an S3 bucket or to select an existing S3 bucket. You need to provide BlueXP tiering with an S3 access key and secret key. BlueXP tiering uses the keys to access your bucket.

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"
```

Creating or switching Connectors

A Connector is required to tier data to the cloud. When tiering data to S3-compatible object storage, a Connector must be available on your premises. You’ll either need to install a new Connector or make sure that the currently selected Connector resides on-prem.

- Learn about Connectors
- Installing a Connector on a Linux host
- Switching between Connectors

Preparing networking for the Connector

Ensure that the Connector has the required networking connections.

Steps

1. Ensure that the network where the Connector is installed enables the following connections:
   - An HTTPS connection over port 443 to the BlueXP tiering service (see the list of endpoints)

- An HTTPS connection over port 443 to S3-compatible object storage
- An HTTPS connection over port 443 to your ONTAP cluster management LIF

Tiering inactive data from your first cluster to S3-compatible object storage

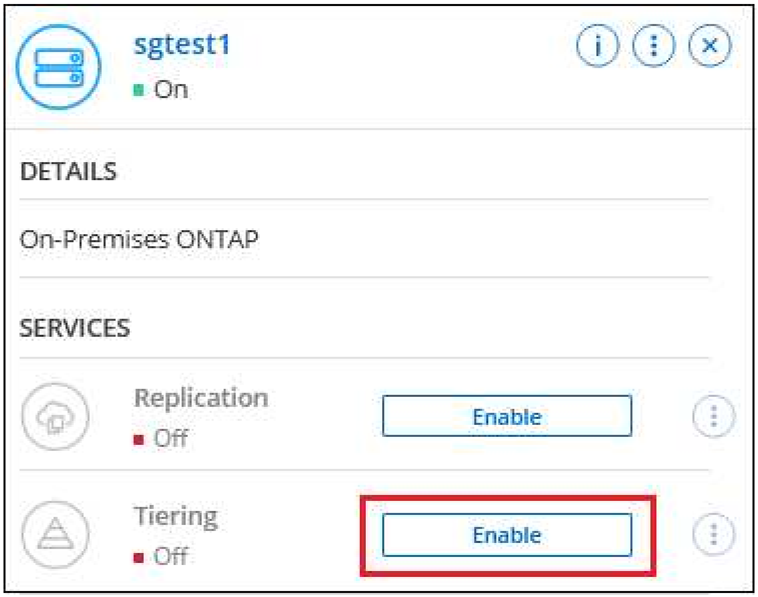
After you prepare your environment, start tiering inactive data from your first cluster.

What you'll need

- An on-premises working environment.
- The FQDN of the S3-compatible object storage server and the port that will be used for HTTPS communications.
- An access key and secret key that has the required S3 permissions.

Steps

1. Select the on-prem ONTAP working environment.
2. Click **Enable** for the Tiering service from the right panel.



sgtest1

🟩 On

DETAILS

On-Premises ONTAP

SERVICES

Replication 🟥 Off | Enable

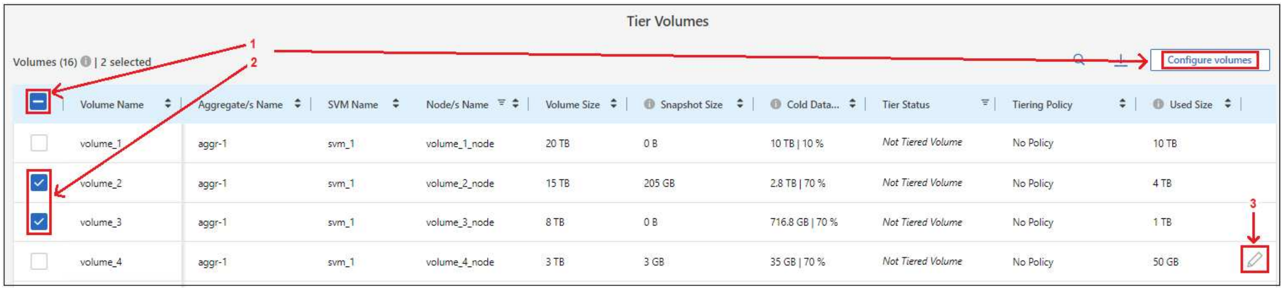
Tiering 🟥 Off | Enable

3. **Define Object Storage Name**: Enter a name for this object storage. It must be unique from any other object storage you may be using with aggregates on this cluster.
4. **Select Provider**: Select **S3 Compatible** and click **Continue**.
5. Complete the steps on the **Create Object Storage** pages:
   a. **Server**: Enter the FQDN of the S3-compatible object storage server, the port that ONTAP should use for HTTPS communication with the server, and the access key and secret key for an account that has the required S3 permissions.
   b. **Bucket**: Add a new bucket or select an existing bucket and click **Continue**.
   c. **Cluster Network**: Select the IPspace that ONTAP should use to connect to object storage and click **Continue**.

      Selecting the correct IPspace ensures that BlueXP tiering can set up a connection from ONTAP to your S3-compatible object storage.

You can also set the network bandwidth available to upload inactive data to object storage by defining the "Maximum transfer rate". Select the **Limited** radio button and enter the maximum bandwidth that can be used, or select **Unlimited** to indicate that there is no limit.

6. On the *Success* page click **Continue** to set up your volumes now.
7. On the *Tier Volumes* page, select the volumes that you want to configure tiering for and click **Continue**:
   - To select all volumes, check the box in the title row (☑ Volume Name) and click **Configure volumes**.
   - To select multiple volumes, check the box for each volume (☑ Volume_1) and click **Configure volumes**.
   - To select a single volume, click the row (or ✎ icon) for the volume.



Tier Volumes

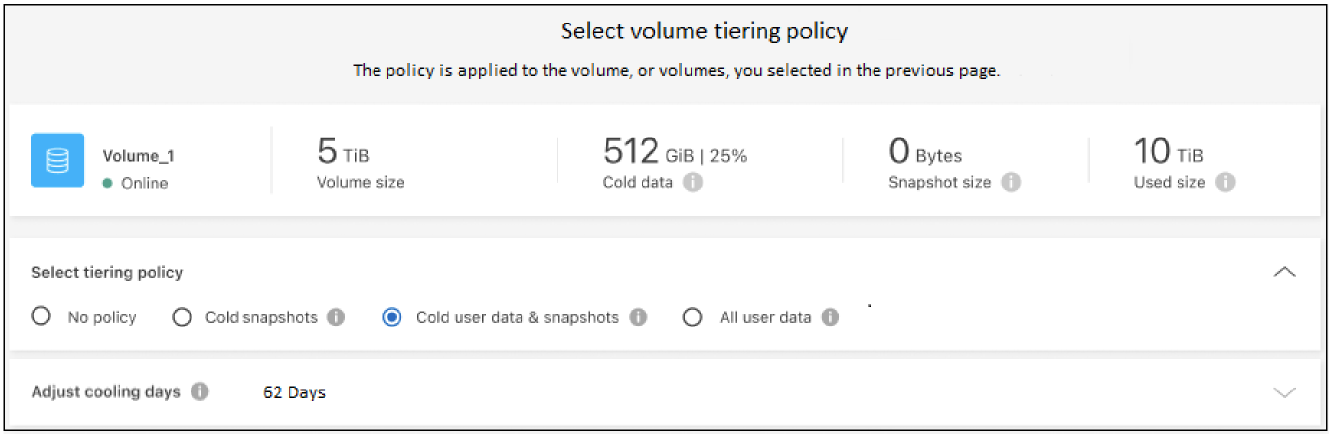
Volumes (16) | 2 selected

Configure volumes

	Volume Name	Aggregate/s Name	SVM Name	Node/s Name	Volume Size	Snapshot Size	Cold Data...	Tier Status	Tiering Policy	Used Size
□	volume_1	aggr-1	svm_1	volume_1_node	20 TB	0 B	10 TB | 10 %	*Not Tiered Volume*	No Policy	10 TB
☑	volume_2	aggr-1	svm_1	volume_2_node	15 TB	205 GB	2.8 TB | 70 %	*Not Tiered Volume*	No Policy	4 TB
☑	volume_3	aggr-1	svm_1	volume_3_node	8 TB	0 B	716.8 GB | 70 %	*Not Tiered Volume*	No Policy	1 TB
□	volume_4	aggr-1	svm_1	volume_4_node	3 TB	3 GB	35 GB | 70 %	*Not Tiered Volume*	No Policy	50 GB

8. In the *Tiering Policy* dialog, select a tiering policy, optionally adjust the cooling days for the selected volumes, and click **Apply**.

   Learn more about volume tiering policies and cooling days.



Select volume tiering policy

The policy is applied to the volume, or volumes, you selected in the previous page.

Volume_1
● Online

5 TiB
Volume size

512 GiB | 25%
Cold data

0 Bytes
Snapshot size

10 TiB
Used size

Select tiering policy

○ No policy ○ Cold snapshots ● Cold user data & snapshots ○ All user data

Adjust cooling days 62 Days

Result

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

What’s next?

Be sure to subscribe to the BlueXP tiering service.

You can review information about the active and inactive data on the cluster. Learn more about managing your tiering settings.

You can also create additional object storage in cases where you may want to tier data from certain aggregates on a cluster to different object stores. Or if you plan to use FabricPool Mirroring where your tiered data is replicated to an additional object store. Learn more about managing object stores.

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