



Connectors

Set up and administration

NetApp
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Connectors

Advanced deployment

Create a Connector from the AWS Marketplace

For an AWS commercial region, it's best to create a Connector directly from BlueXP, but you can launch a Connector from the AWS Marketplace, if you prefer. For AWS Government regions, you can't deploy the Connector in a Government region from the BlueXP SaaS website, so the next best option is to do so from the AWS Marketplace.



You can also download and install the Connector software on an existing Linux host in your network or in the cloud. [Learn how to install the Connector on an existing Linux host.](#)

Create the Connector in an AWS commercial region

You can launch the Connector instance in an AWS commercial region directly from the AWS Marketplace offering for BlueXP.

Before you get started

The IAM user who creates the Connector must have AWS Marketplace permissions to subscribe and unsubscribe.

Steps

1. Set up permissions in AWS:
 - a. From the IAM console, create the required policies by copying and pasting the contents of [the IAM policies for the Connector](#).
 - b. Create an IAM role with the role type Amazon EC2 and attach the policies that you created in the previous step to the role.
2. Go to the [BlueXP page on the AWS Marketplace](#) to deploy the Connector from an AMI:
3. On the Marketplace page, click **Continue to Subscribe** and then click **Continue to Configuration**.



4. Change any of the default options and click **Continue to Launch**.
5. Under **Choose Action**, select **Launch through EC2** and then click **Launch**.

These steps describe how to launch the instance from the EC2 Console because the console enables you to attach an IAM role to the Connector instance. This isn't possible using the **Launch from Website** action.

6. Follow the prompts to configure and deploy the instance:
 - **Name and tags:** Enter a name and tags for the instance.
 - **Application and OS Image:** Skip this section. The Connector AMI is already selected.
 - **Instance type:** Depending on region availability, choose one of the supported instance types (t3.xlarge is recommended).

[Review the instance requirements.](#)

- **Key pair (login):** Select the key pair that you want to use to securely connect to the instance.
- **Network settings:** Edit the network settings as needed:
 - Choose the desired VPC and subnet.
 - Specify whether the instance should have a public IP address.
 - Specify firewall settings that enable the required connection methods for the Connector instance: SSH, HTTP, and HTTPS.

- **Configure storage:** Keep the default storage options.
- **Advanced details:** Under **IAM instance profile**, choose the IAM role that you created in step 1.
- **Summary:** Review the summary and click **Launch instance**.

AWS launches the software with the specified settings. The Connector instance and software should be running in approximately five minutes.

7. Open a web browser from a host that has a connection to the Connector instance and enter the following URL:

`https://ipaddress`

8. After you log in, set up the Connector:

- a. Specify the NetApp account to associate with the Connector.

[Learn about NetApp accounts.](#)

- b. Enter a name for the system.

9. Open a web browser and go to <https://console.bluexp.netapp.com> to start using the Connector with BlueXP.

Result

The Connector is now installed and set up with your NetApp account. BlueXP will automatically use this Connector when you create new working environments. But if you have more than one Connector, you'll need to [switch between them](#).

If you have Amazon S3 buckets in the same AWS account where you created the Connector, you'll see an Amazon S3 working environment appear on the Canvas automatically. [Learn more about what you can do with this working environment.](#)

Create the Connector in an AWS Government region

To deploy the Connector in an AWS Government region, you need to go to the EC2 service and select the BlueXP offering from the AWS Marketplace.

Steps

1. Set up permissions in AWS:
 - a. From the IAM console, create your own policy by copying and pasting the contents of [the IAM policy for the Connector](#).
 - b. Create an IAM role with the role type Amazon EC2 and attach the policy that you created in the previous step to the role.
2. Go to the BlueXP offering in the AWS Marketplace.

The IAM user must have AWS Marketplace permissions to subscribe and unsubscribe.

- a. Open the EC2 service and select **Launch instance**.
- b. Select **AWS Marketplace**.
- c. Search for BlueXP and select the offering.



d. Click **Continue**.

3. Follow the prompts to configure and deploy the instance:

- **Choose an Instance Type:** Depending on region availability, choose one of the supported instance types (t3.xlarge is recommended).

[Review the instance requirements.](#)

- **Configure Instance Details:** Select a VPC and subnet, choose the IAM role that you created in step 1, enable termination protection (recommended), and choose any other configuration options that meet your requirements.

Number of instances	1	Launch into Auto Scaling Group
Purchasing option	<input type="checkbox"/> Request Spot instances	
Network	vpc-a76d91c2 VPC4QA (default)	Create new VPC
Subnet	subnet-39536c13 QASubnet1 us-east-1b 155 IP Addresses available	Create new subnet
Auto-assign Public IP	Enable	
Placement group	<input type="checkbox"/> Add instance to placement group	
Capacity Reservation	Open	Create new Capacity Reservation
IAM role	Cloud_Manager	Create new IAM role
CPU options	<input type="checkbox"/> Specify CPU options	
Shutdown behavior	Stop	
Enable termination protection	<input checked="" type="checkbox"/> Protect against accidental termination	
Monitoring	<input type="checkbox"/> Enable CloudWatch detailed monitoring Additional charges apply.	

- **Add Storage:** Keep the default storage options.
- **Add Tags:** Enter tags for the instance, if desired.
- **Configure Security Group:** Specify the required connection methods for the Connector instance:

SSH, HTTP, and HTTPS.

- **Review:** Review your selections and click **Launch**.

AWS launches the software with the specified settings. The Connector instance and software should be running in approximately five minutes.

4. Open a web browser from a host that has a connection to the Connector instance and enter the following URL:

`https://ipaddress`

5. After you log in, set up the Connector:

- a. Specify the NetApp account to associate with the Connector.

[Learn about NetApp accounts.](#)

- b. Enter a name for the system.

Result

The Connector is now installed and set up with your NetApp account.

Any time that you want to use BlueXP, open your web browser and connect to the IP address of the Connector instance: `https://ipaddress`

Since the Connector was deployed in a Government region, it's not accessible from <https://console.bluexp.netapp.com>.

Open port 3128 for AutoSupport messages

If you plan to deploy Cloud Volumes ONTAP systems in a subnet where an outbound internet connection won't be available, then BlueXP automatically configures Cloud Volumes ONTAP to use the Connector as a proxy server.

The only requirement is to ensure that the Connector's security group allows *inbound* connections over port 3128. You'll need to open this port after you deploy the Connector.

If you use the default security group for Cloud Volumes ONTAP, then no changes are needed to its security group. But if you plan to define strict outbound rules for Cloud Volumes ONTAP, then you'll also need to ensure that the Cloud Volumes ONTAP security group allows *outbound* connections over port 3128.

Create a Connector from the Azure Marketplace

For an Azure commercial region, it's best to create a Connector directly from BlueXP, but you can launch a Connector from the Azure Marketplace, if you prefer. For Azure Government regions, you can't deploy the Connector in a Government region from the BlueXP SaaS website, so the next best option is to do so from the Azure Marketplace.



You can also download and install the Connector software on an existing Linux host in your network or in the cloud. [Learn how to install the Connector on an existing Linux host.](#)

Creating a Connector in Azure

Deploy the Connector in Azure using the image in the Azure Marketplace and then log in to the Connector to specify your NetApp account.

Steps

1. Go to the NetApp Connector VM page in the Azure Marketplace.
 - [Azure Marketplace page for commercial regions](#)
 - [Azure Marketplace page for Azure Government regions](#)
2. Click **Get it now** and then click **Continue**.
3. From the Azure portal, click **Create** and follow the steps to configure the virtual machine.

Note the following as you configure the VM:

- The Connector can perform optimally with either HDD or SSD disks.
- Choose a VM size that meets CPU and RAM requirements. We recommend DS3 v2.

[Review the VM requirements.](#)

- For the network security group, the Connector requires inbound connections using SSH, HTTP, and HTTPS.

[Learn more about security group rules for the Connector.](#)

- Under **Management**, enable **System assigned managed identity** for the Connector by selecting **On**.

This setting is important because a managed identity allows the Connector virtual machine to identify itself to Azure Active Directory without providing any credentials. [Learn more about managed identities for Azure resources.](#)

4. On the **Review + create** page, review your selections and click **Create** to start the deployment.

Azure deploys the virtual machine with the specified settings. The virtual machine and Connector software should be running in approximately five minutes.

5. Open a web browser from a host that has a connection to the Connector virtual machine and enter the following URL:

`https://ipaddress`

6. After you log in, set up the Connector:
 - a. Specify the NetApp account to associate with the Connector.

[Learn about NetApp accounts.](#)

- b. Enter a name for the system.

Result

The Connector is now installed and set up with your NetApp account.

If the Connector is in an Azure commercial region, open a web browser and go to <https://console.bluelxp.netapp.com> to start using the Connector with BlueXP.

If the Connector is in an Azure Government region, you can use BlueXP by opening your web browser and connecting to the IP address of the Connector instance: <https://ipaddress>

Since the Connector was deployed in a Government region, it's not accessible from <https://console.bluexp.netapp.com>.

Granting Azure permissions

When you deployed the Connector in Azure, you should have enabled a [system-assigned managed identity](#). You must now grant the required Azure permissions by creating a custom role and then by assigning the role to the Connector virtual machine for one or more subscriptions.

Steps

1. Create a custom role:
 - a. Copy the contents of the [custom role permissions for the Connector](#) and save them in a JSON file.
 - b. Modify the JSON file by adding Azure subscription IDs to the assignable scope.

You should add the ID for each Azure subscription from which users will create Cloud Volumes ONTAP systems.

Example

```
"AssignableScopes": [  
  "/subscriptions/d333af45-0d07-4154-943d-c25fbzzzzzzz",  
  "/subscriptions/54b91999-b3e6-4599-908e-416e0zzzzzzz",  
  "/subscriptions/398e471c-3b42-4ae7-9b59-ce5bbzzzzzzz"
```

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

The following steps describe how to create the role by using Bash in Azure Cloud Shell.

- Start [Azure Cloud Shell](#) and choose the Bash environment.
- Upload the JSON file.



- Use the Azure CLI to create the custom role:

```
az role definition create --role-definition Connector_Policy.json
```

You should now have a custom role called BlueXP Operator that you can assign to the Connector virtual machine.

2. Assign the role to the Connector virtual machine for one or more subscriptions:

- a. Open the **Subscriptions** service and then select the subscription in which you want to deploy Cloud Volumes ONTAP systems.
- b. Click **Access control (IAM) > Add > Add role assignment**.
- c. In the **Role** tab, select the **BlueXP Operator** role and click **Next**.



BlueXP Operator is the default name provided in the BlueXP policy. If you chose a different name for the role, then select that name instead.

- d. In the **Members** tab, complete the following steps:
 - Assign access to a **Managed identity**.
 - Click **Select members**, select the subscription in which the Connector virtual machine was created, choose **Virtual machine**, and then select the Connector virtual machine.
 - Click **Select**.
 - Click **Next**.
- e. Click **Review + assign**.
- f. If you want to deploy Cloud Volumes ONTAP from additional subscriptions, switch to that subscription and then repeat these steps.

Result

The Connector now has the permissions that it needs to manage resources and processes within your public cloud environment. BlueXP will automatically use this Connector when you create new working environments. But if you have more than one Connector, you'll need to [switch between them](#).

If you have Azure Blob storage in the same Azure account where you created the Connector, you'll see an Azure Blob working environment appear on the Canvas automatically. [Learn more about what you can do with this working environment](#).

Open port 3128 for AutoSupport messages

If you plan to deploy Cloud Volumes ONTAP systems in a subnet where an outbound internet connection won't be available, then BlueXP automatically configures Cloud Volumes ONTAP to use the Connector as a proxy server.

The only requirement is to ensure that the Connector's security group allows *inbound* connections over port 3128. You'll need to open this port after you deploy the Connector.

If you use the default security group for Cloud Volumes ONTAP, then no changes are needed to its security group. But if you plan to define strict outbound rules for Cloud Volumes ONTAP, then you'll also need to ensure that the Cloud Volumes ONTAP security group allows *outbound* connections over port 3128.

Install the Connector on an existing Linux host that has internet access

The most common way to create a Connector is directly from BlueXP or from a cloud provider's marketplace. But you have the option to download and install the Connector software on an existing Linux host in your network or in the cloud. These steps are specific to hosts that have internet access.

[Learn about other ways to deploy a Connector.](#)



If you want to create a Cloud Volumes ONTAP system in Google Cloud, then you must have a Connector that's running in Google Cloud as well. You can't use a Connector that's running in AWS, Azure, or on-prem.

Verify host requirements

The Connector software must run on a host that meets specific operating system requirements, RAM requirements, port requirements, and so on.

A dedicated host is required

The Connector is not supported on a host that is shared with other applications. The host must be a dedicated host.

CPU

4 cores or 4 vCPUs

RAM

14 GB

AWS EC2 instance type

An instance type that meets the CPU and RAM requirements above. We recommend t3.xlarge.

Azure VM size

An instance type that meets the CPU and RAM requirements above. We recommend DS3 v2.

GCP machine type

An instance type that meets the CPU and RAM requirements above. We recommend n2-standard-4.

The Connector is supported in Google Cloud on a VM instance with an OS that supports [Shielded VM features](#)

Supported operating systems

- CentOS 7.6, 7.7, 7.8, and 7.9
- Red Hat Enterprise Linux 7.6, 7.7, 7.8, 7.9, 8.6, and 8.7

The Red Hat Enterprise Linux system must be registered with Red Hat Subscription Management. If it is not registered, the system cannot access repositories to update required 3rd party software during Connector installation.

The Connector is supported on English-language versions of these operating systems.

Hypervisor

A bare metal or hosted hypervisor that is certified to run CentOS or Red Hat Enterprise Linux
[Red Hat Solution: Which hypervisors are certified to run Red Hat Enterprise Linux?](#)

Disk space in /opt

100 GiB of space must be available

Disk space in /var

20 GiB of space must be available

Docker Engine

Docker Engine version 19.3.1 or later is required on the host before you install the Connector. [View installation instructions](#)

Outbound internet access

The installer for the Connector must access the following URLs during the installation process:

- <https://support.netapp.com>
- <https://mysupport.netapp.com>
- <https://cloudmanager.cloud.netapp.com/tenancy>
- <https://stream.cloudmanager.cloud.netapp.com>
- <https://cloudmanagerinfraproduct.azurecr.io>
- <https://production-artifacts.cloudmanager.cloud.netapp.com>
- https://*.blob.core.windows.net

The host might try to update operating system packages during installation. The host can contact different mirroring sites for these OS packages.

Install the Connector

After you verify that you have a supported Linux host, you can obtain the Connector software and then install it.

What you'll need

- Root privileges to install the Connector.
- Details about a proxy server, if a proxy is required for internet access from the Connector. HTTP and HTTPS are supported.

You have the option to configure a proxy server after installation but doing so requires restarting the Connector.

- A CA-signed certificate, if the proxy server uses HTTPS.

About this task

- The installation 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 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

Connector automatically updates itself if a new version is available.

Steps

1. Verify that docker is enabled and running.

```
sudo systemctl enable docker && sudo systemctl start docker
```

2. If the `http_proxy` or `https_proxy` system variables are set on the host, remove them:

```
unset http_proxy
unset https_proxy
```

If you don't remove these system variables, the installation will fail.

3. Download the Connector software from the [NetApp Support Site](#), and then copy it to the Linux host.

You should download the Connector installer that's meant for use in your network or in the cloud.

4. Assign permissions to run the script.

```
chmod +x OnCommandCloudManager-V3.9.23
```

5. Run the installation script.

```
./OnCommandCloudManager-V3.9.23 --proxy <HTTP or HTTPS proxy server>
--cacert <path and file name of a CA-signed certificate>
```

The `--proxy` and `--cacert` parameters are optional. If you have a proxy server, you will need to enter the parameter(s) as shown. The installer doesn't prompt you to provide information about a proxy.

Here's an example of the command using both optional parameters:

```
./OnCommandCloudManager-V3.9.23 --proxy
https://user:password@10.0.0.30:8080/ --cacert
/tmp/cacert/certificate.cer
```

`--proxy` configures the Connector to use an HTTP or HTTPS proxy server using one of the following formats:

- `http://address:port`
- `http://username:password@address:port`
- `https://address:port`
- `https://username:password@address:port`

--cacert specifies a CA-signed certificate to use for HTTPS access between the Connector and the proxy server. This parameter is required only if you specify an HTTPS proxy server.

Result

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

Set up the Connector

Sign up or log in and then set up the Connector to work with your account.

Steps

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

`https://ipaddress`

ipaddress can be localhost, a private IP address, or a public IP address, depending on the configuration of the host. For example, if the Connector is in the public cloud without a public IP address, you must enter a private IP address from a host that has a connection to the Connector host.

2. Sign up or log in.
3. If you installed the Connector in Google Cloud, set up a service account that has the permissions that BlueXP needs to create and manage Cloud Volumes ONTAP systems in projects.
 - a. [Create a role in GCP](#) that includes the permissions defined in the [Connector policy for GCP](#).
 - b. [Create a GCP service account and apply the custom role that you just created](#).
 - c. [Associate this service account with the Connector VM](#).
 - d. If you want to deploy Cloud Volumes ONTAP in other projects, [grant access by adding the service account with the BlueXP role to that project](#). You'll need to repeat this step for each project.
4. After you log in, set up BlueXP:
 - a. Specify the NetApp account to associate with the Connector.
[Learn about NetApp accounts](#).
 - b. Enter a name for the system.

Result

The Connector is now installed and set up with your NetApp account. BlueXP will automatically use this Connector when you create new working environments.

After you finish

Set up permissions so BlueXP can manage resources and processes within your public cloud environment:

- AWS: [Set up an AWS account and then add it to BlueXP](#)
- Azure: [Set up an Azure account and then add it to BlueXP](#)
- Google Cloud: See step 3 above

Install the Connector in a location with no internet access

You can install the Connector in a location that has complete isolation from the internet,

either on premises or in a cloud region. You can then use the BlueXP services that are supported in that environment.

On premises overview

In an on-premises environment without internet, you can use BlueXP to discover on-prem ONTAP clusters, replicate data between them, back up volumes using Cloud Backup, and scan them with Cloud Data Sense. No other BlueXP services are supported in this type of deployment, except for the Digital Wallet.

Cloud overview

In a cloud region without internet, you can use BlueXP to deploy Cloud Volumes ONTAP systems and to discover on-premises ONTAP clusters (if there's a connection from your cloud environment to on your on-premises environment). No other BlueXP services are supported in this type of deployment, except for the Digital Wallet.

The cloud region can be a region for secure US agencies like AWS C2S/SC2S, Azure IL6, or any commercial region.

These installation instructions are specifically for the use case described above. [Learn about other ways to deploy a Connector.](#)

Verify host requirements

The Connector software must run on a host that meets specific operating system requirements, RAM requirements, port requirements, and so on.

A dedicated host is required

The Connector is not supported on a host that is shared with other applications. The host must be a dedicated host.

CPU

4 cores or 4 vCPUs

RAM

14 GB

Supported operating systems

- CentOS 7.6, 7.7, 7.8, and 7.9
- Red Hat Enterprise Linux 7.6, 7.7, 7.8, 7.9, 8.6, and 8.7

The Red Hat Enterprise Linux system must be registered with Red Hat Subscription Management. If it is not registered, the system cannot access repositories to update required 3rd party software during Connector installation.

The Connector is supported on English-language versions of these operating systems.

Hypervisor

A bare metal or hosted hypervisor that is certified to run CentOS or Red Hat Enterprise Linux
[Red Hat Solution: Which hypervisors are certified to run Red Hat Enterprise Linux?](#)

Disk type

An SSD is required

Disk space in /opt

100 GiB of space must be available

Disk space in /var

20 GiB of space must be available

Docker Engine

Docker Engine version 19 or later is required on the host before you install the Connector. [View installation instructions](#)

Install the Connector

After you verify that you have a supported Linux host, you can obtain the Connector software and then install it.

Required privileges

Root privileges are required to install the Connector.

Steps

1. Verify that docker is enabled and running.

```
sudo systemctl enable docker && sudo systemctl start docker
```

2. Download the Connector installer for restricted networks without internet access from the [NetApp Support Site](#)
3. Copy the installer to the Linux host.
4. Assign permissions to run the script.

```
chmod +x /path/Cloud-Manager-Connector-offline-<version>
```

Where <version> is the version of the Connector that you downloaded.

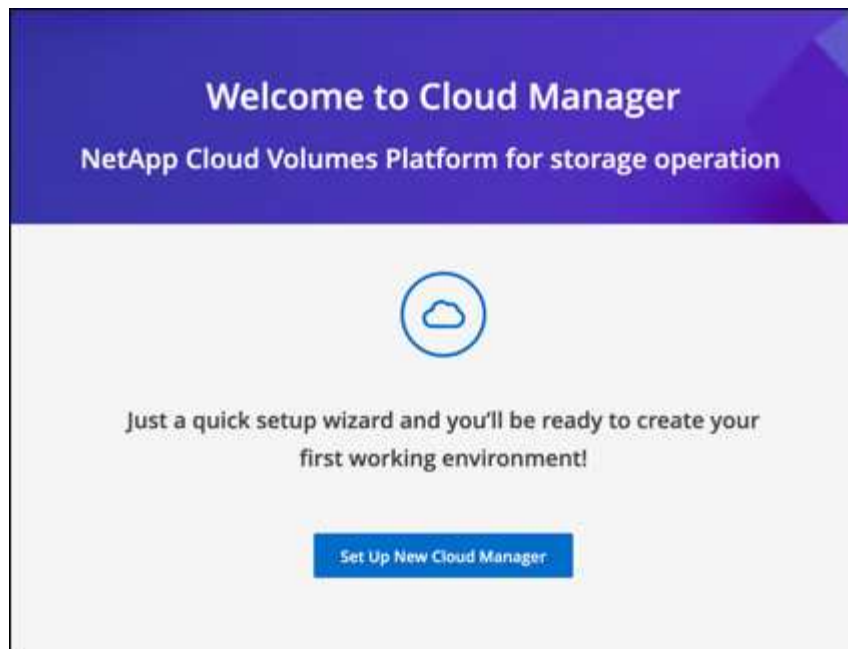
5. Run the installation script:

```
sudo /path/Cloud-Manager-Connector-offline-<version>
```

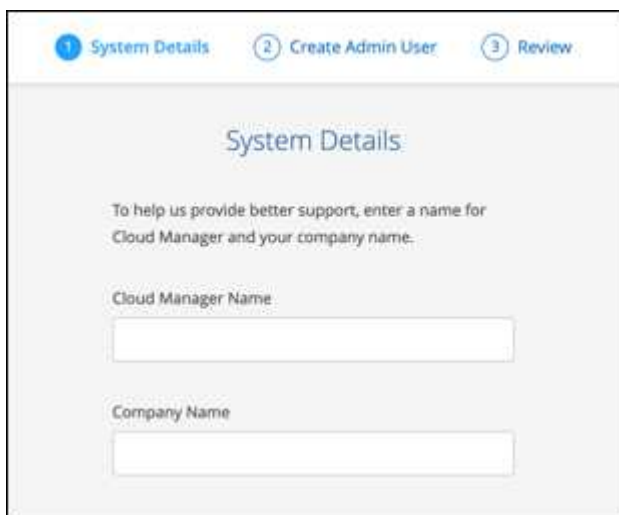
Where <version> is the version of the Connector that you downloaded.

6. Open a web browser and enter `https://ipaddress` where *ipaddress* is the IP address of the Linux host.

You should see the following screen.



7. Click **Set Up New BlueXP** and follow the prompts to set up the system.
 - **System Details:** Enter a name for the Connector and your company name.

A screenshot of the 'System Details' setup screen. At the top, there are three steps: '1 System Details' (active), '2 Create Admin User', and '3 Review'. The main heading is 'System Details'. Below it, a message says: 'To help us provide better support, enter a name for Cloud Manager and your company name.' There are two input fields: 'Cloud Manager Name' and 'Company Name', each with a text box below it.

- **Create Admin User:** Create the admin user for the system.

This user account runs locally on the system. There's no connection to the auth0 service available through BlueXP.

- **Review:** Review the details, accept the license agreement, and then click **Set Up**.

8. Log in to BlueXP using the admin user that you just created.

Result

The Connector is now installed and you can start using the BlueXP features that are available in a dark site deployment.

What's next?

In an on-prem environment:

- [Discover on-prem ONTAP clusters](#)
- [Replicate data between on-prem ONTAP clusters](#)
- [Back up on-prem ONTAP volume data to StorageGRID using Cloud Backup](#)
- [Scan on-prem ONTAP volume data using Cloud Data Sense](#)

In a cloud environment, you can [deploy Cloud Volumes ONTAP](#)

When new versions of the Connector software are available, they'll be posted to the NetApp Support Site. [Learn how to upgrade the Connector.](#)

Finding the system ID for a Connector

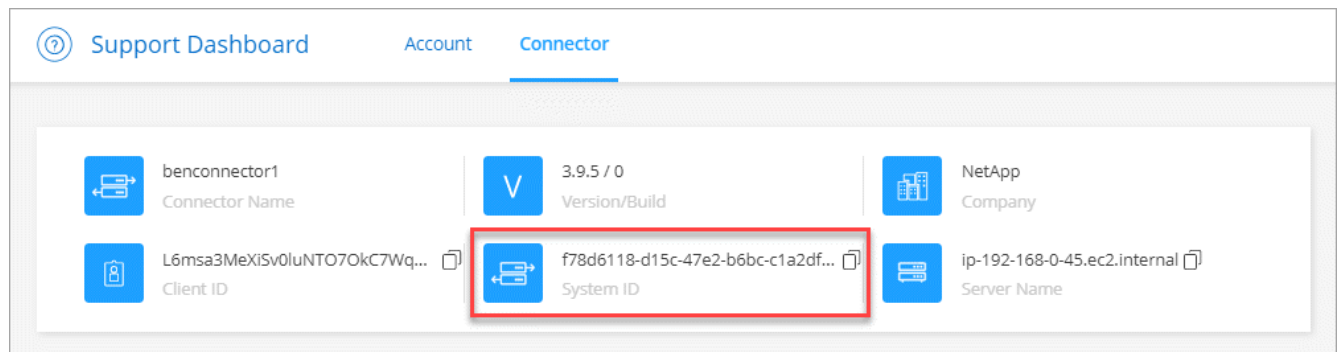
To help you get started, your NetApp representative might ask you for the system ID for a Connector. The ID is typically used for licensing and troubleshooting purposes.

Steps

1. In the upper right of the BlueXP console, click the Help icon.
2. Click **Support > Connector**.

The system ID appears at the top.

Example



Managing existing Connectors

After you create one or more Connectors, you can manage them by switching between Connectors, connecting to the local user interface running on a Connector, and more.

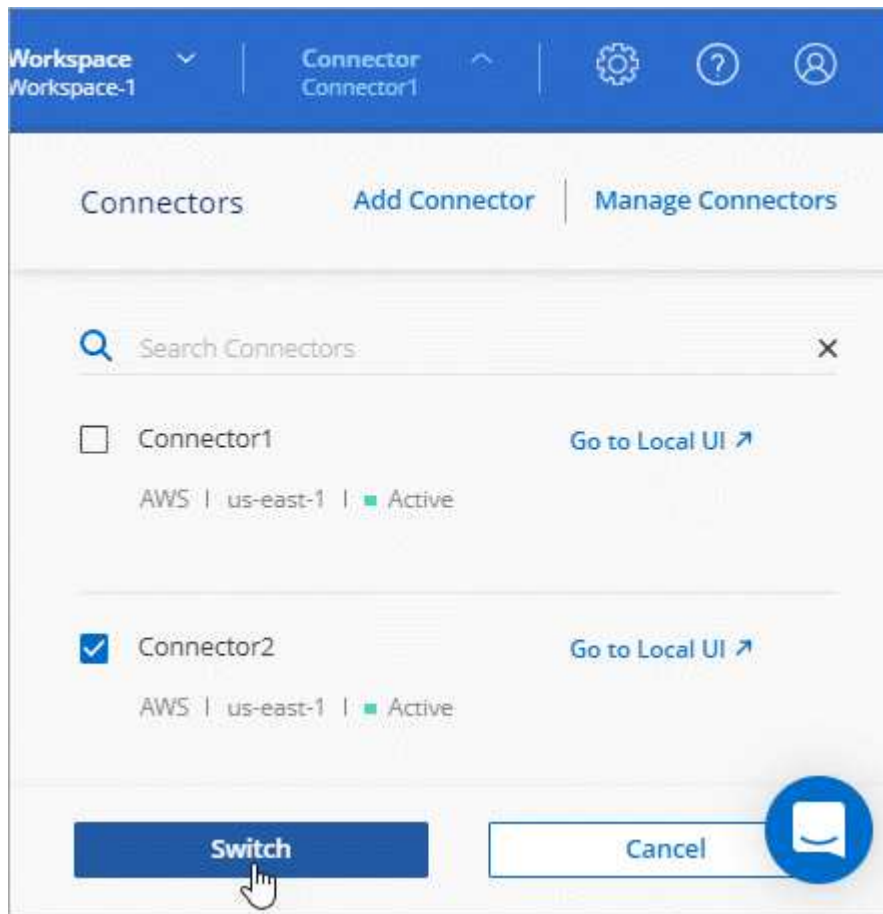
Switch between Connectors

If you have multiple Connectors, you can switch between them to see the Working Environments that are associated with a specific Connector.

For example, let's say that you're working in a multi-cloud environment. You might have one Connector in AWS and another in Google Cloud. You'd need to switch between those Connectors to manage the Cloud Volumes ONTAP systems running in those clouds.

Step

1. Click the **Connector** drop-down, select another Connector, and then click **Switch**.



BlueXP refreshes and shows the Working Environments associated with the selected Connector.

Access the local UI

While you should perform almost all tasks from the SaaS user interface, a local user interface is still available on the Connector. If you're accessing BlueXP from a Government region or a site that doesn't have outbound internet access, then you need to use the local user interface running on the Connector.

Steps

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

`https://ipaddress`

ipaddress can be localhost, a private IP address, or a public IP address, depending on the configuration of the host. For example, if the Connector is in the public cloud without a public IP address, you must enter a private IP address from a host that has a connection to the Connector host.

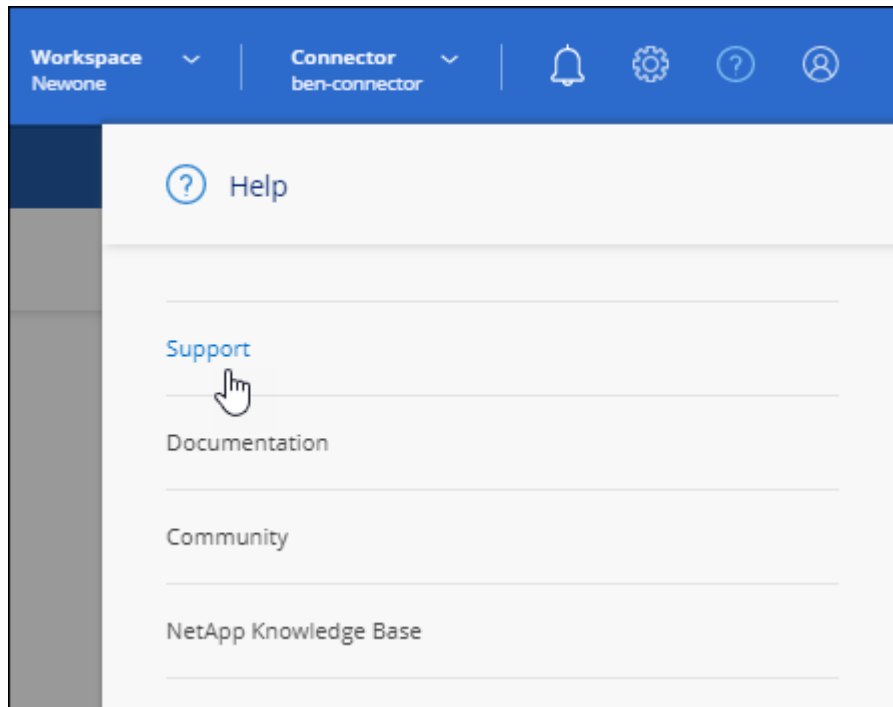
2. Enter your user name and password to log in.

Download or send an AutoSupport message

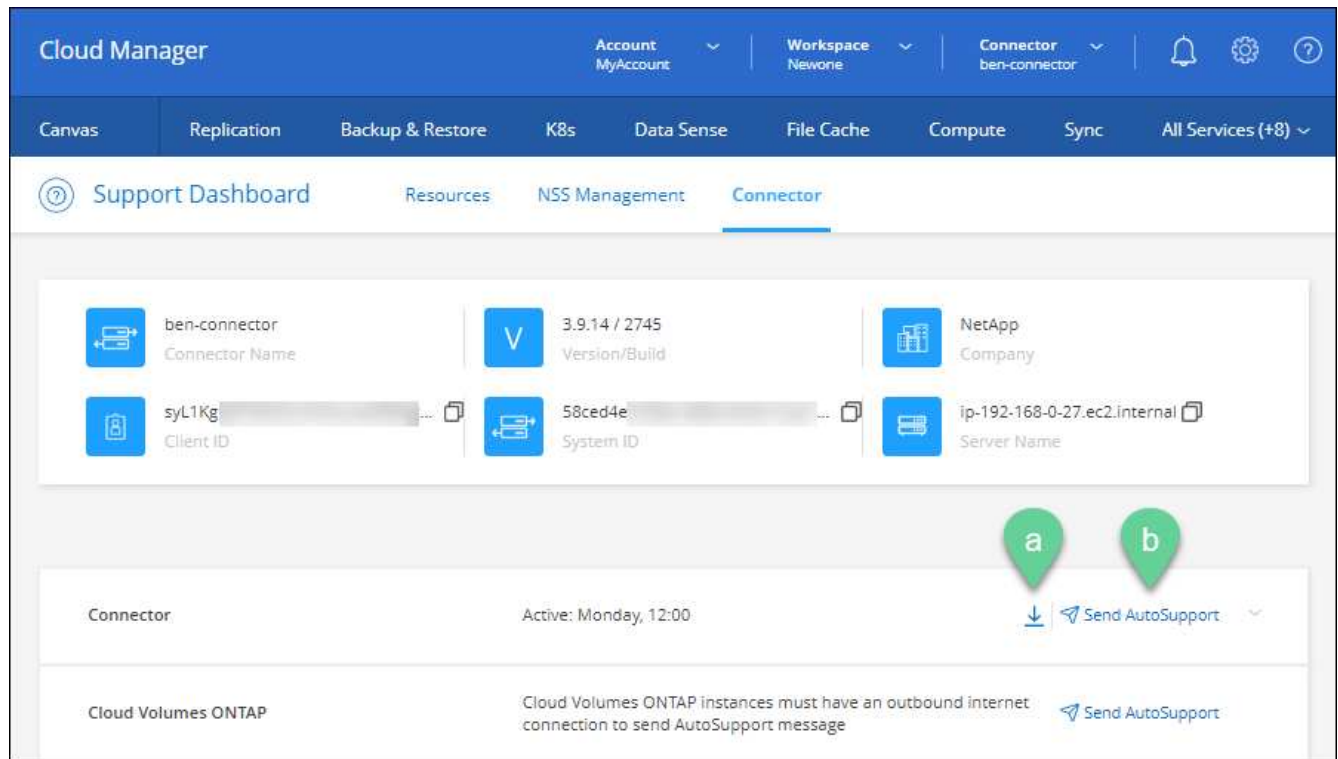
If you're having problems, NetApp personnel might ask you to send an AutoSupport message to NetApp support for troubleshooting purposes.

Steps

1. Connect to the Connector local UI, as described in the section above.
2. In the upper right of the BlueXP console, click the Help icon, and select **Support**.



3. Click **Connector**.
4. Depending on how you need to send the information to NetApp support, choose one of the following options:
 - a. Select the option to download the AutoSupport message to your local machine. You can then send it to NetApp Support using a preferred method.
 - b. Click **Send AutoSupport** to directly send the message to NetApp Support.



Connect to the Linux VM

If you need to connect to the Linux VM that the Connector runs on, you can do so by using the connectivity options available from your cloud provider.

AWS

When you created the Connector instance in AWS, you provided an AWS access key and secret key. You can use this key pair to SSH to the instance.

[AWS Docs: Connect to your Linux instance](#)

Azure

When you created the Connector VM in Azure, you chose to authenticate with a password or SSH public key. Use the authentication method that you chose to connect to the VM.

[Azure Docs: SSH into your VM](#)

Google Cloud

You can't specify an authentication method when you create a Connector in Google Cloud. However, you can connect to the Linux VM instance using the Google Cloud Console or Google Cloud CLI (gcloud).

[Google Cloud Docs: Connect to Linux VMs](#)

Apply security updates

Update the operating system on the Connector to ensure that it's patched with the latest security updates.

Steps

1. Access the CLI shell on the Connector host.
2. Run the following commands with elevated privileges:

```
sudo -s
service netapp-service-manager stop
yum -y update --security
service netapp-service-manager start
```

Change the IP address for a Connector

If it's required for your business, you can change the internal IP address and public IP address of the Connector instance that is automatically assigned by your cloud provider.

Steps

1. Follow the instructions from your cloud provider to change the local IP address or public IP address (or both) for the Connector instance.
2. If you changed the public IP address and you need to connect to the local user interface running on the Connector, restart the Connector instance to register the new IP address with BlueXP.
3. If you changed the private IP address, update the backup location for Cloud Volumes ONTAP configuration files so that the backups are being sent to the new private IP address on the Connector.
 - a. Run the following command from the Cloud Volumes ONTAP CLI to remove the current backup target:

```
system configuration backup settings modify -destination ""
```

- b. Go to BlueXP and open the working environment.
- c. Click the menu and select **Advanced > Configuration Backups**.
- d. Click **Set Backup Target**.

Edit a Connector's URIs

Add and remove the URIs for a Connector.

Steps

1. Click the **Connector** drop-down from the BlueXP header.
2. Click **Manage Connectors**.
3. Click the action menu for a Connector and click **Edit URIs**.
4. Add and remove URIs and then click **Apply**.

Fix download failures when using a Google Cloud NAT gateway

The Connector automatically downloads software updates for Cloud Volumes ONTAP. The download can fail if your configuration uses a Google Cloud NAT gateway. You can correct this issue by limiting the number of parts that the software image is divided into. This step must be completed by using the BlueXP API.

Step

1. Submit a PUT request to `/occm/config` with the following JSON as body:

```
{
  "maxDownloadSessions": 32
}
```

The value for *maxDownloadSessions* can be 1 or any integer greater than 1. If the value is 1, then the downloaded image will not be divided.

Note that 32 is an example value. The value that you should use depends on your NAT configuration and the number of sessions that you can have simultaneously.

[Learn more about the `/occm/config` API call.](#)

Upgrade the Connector in a location without internet access

If you [installed the Connector in a location where there's no internet access](#), you can upgrade the Connector when a newer version is available from the NetApp Support Site.

The Connector needs to restart during the upgrade process so the user interface will be unavailable during the upgrade.

Steps

1. Download the Connector software from the [NetApp Support Site](#).
2. Copy the installer to the Linux host.
3. Assign permissions to run the script.

```
chmod +x /path/cloud-manager-connector-offline-<version>
```

Where `<version>` is the version of the Connector that you downloaded.

4. Run the installation script:

```
sudo /path/cloud-manager-connector-offline-<version>
```

Where `<version>` is the version of the Connector that you downloaded.

5. After the upgrade is complete, you can verify the Connector's version by going to **Help > Support > Connector**.

What about software upgrades on hosts that have internet access?

The Connector automatically updates its software to the latest version, as long as it has outbound internet access to obtain the software update.

Remove Connectors from BlueXP

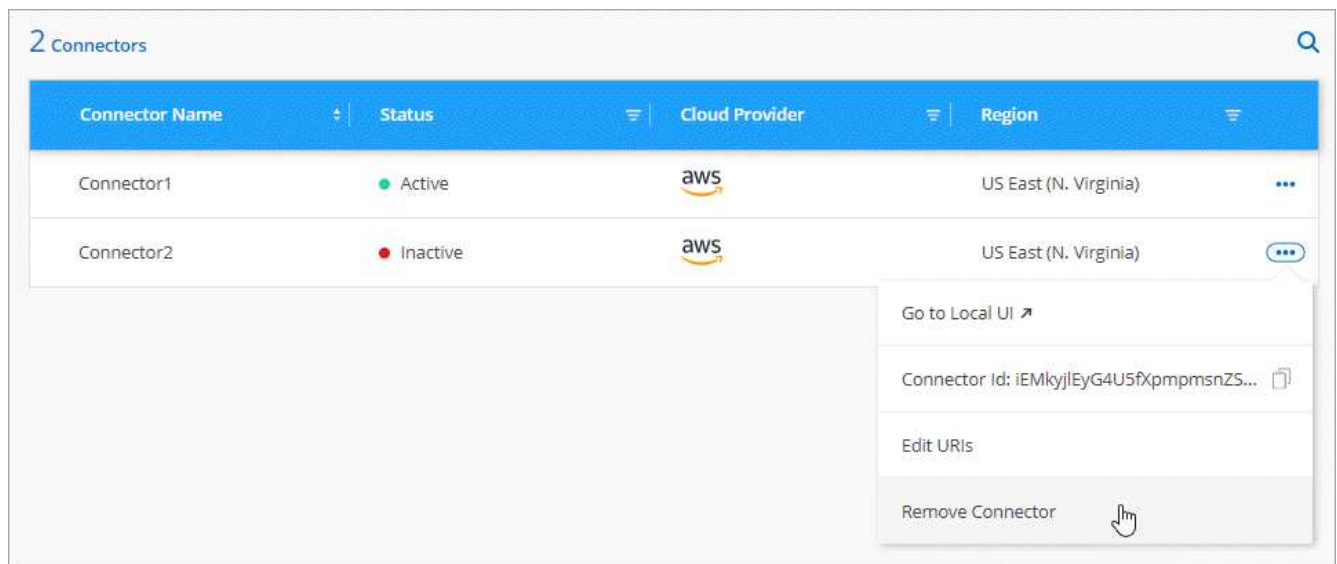
If a Connector is inactive, you can remove it from the list of Connectors in BlueXP. You might do this if you deleted the Connector virtual machine or if you uninstalled the Connector software.

Note the following about removing a Connector:

- This action doesn't delete the virtual machine.
- This action can't be reverted—once you remove a Connector from BlueXP, you can't add it back

Steps

1. Click the **Connector** drop-down from the BlueXP header.
2. Click **Manage Connectors**.
3. Click the action menu for an inactive Connector and click **Remove Connector**.



4. Enter the name of the Connector to confirm and then click Remove.

Result

BlueXP removes the Connector from its records.

Uninstall the Connector software

Uninstall the Connector software to troubleshoot issues or to permanently remove the software from the host. The steps that you need to use depends on whether you installed the Connector on a host that has internet access or a host in a restricted network that doesn't have internet access.

Uninstall from a host with internet access

The online Connector includes an uninstallation script that you can use to uninstall the software.

Step

1. From the Linux host, run the uninstallation script:

```
/opt/application/netapp/service-manager-2/uninstall.sh [silent]
```


silent runs the script without prompting you for confirmation.

Uninstall from a host without internet access

Use these commands if you downloaded the Connector software from the NetApp Support Site and installed it in a restricted network that doesn't have internet access.

Step

1. From the Linux host, run the following commands:

```
docker-compose -f /opt/application/netapp/ds/docker-compose.yml down -v  
rm -rf /opt/application/netapp/ds
```

Managing an HTTPS certificate for secure access

By default, BlueXP uses a self-signed certificate for HTTPS access to the web console. You can install a certificate signed by a certificate authority (CA), which provides better security protection than a self-signed certificate.

Before you get started

You need to create a Connector before you can change BlueXP settings. [Learn how](#).

Installing an HTTPS certificate

Install a certificate signed by a CA for secure access.

Steps

1. In the upper right of the BlueXP console, click the Settings icon, and select **HTTPS Setup**.

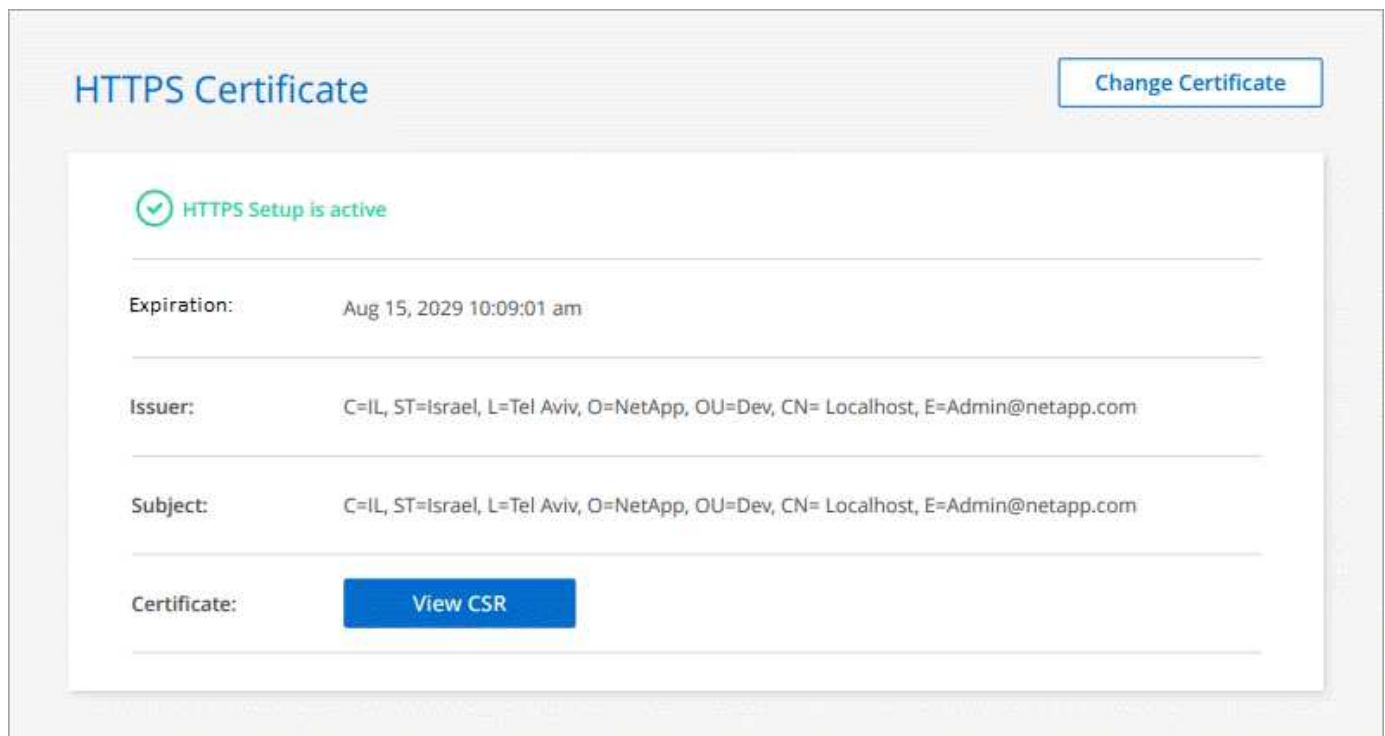


2. In the HTTPS Setup page, install a certificate by generating a certificate signing request (CSR) or by installing your own CA-signed certificate:

Option	Description
Generate a CSR	<p>a. Enter the host name or DNS of the Connector host (its Common Name), and then click Generate CSR.</p> <p>BlueXP displays a certificate signing request.</p> <p>b. Use the CSR to submit an SSL certificate request to a CA.</p> <p>The certificate must use the Privacy Enhanced Mail (PEM) Base-64 encoded X.509 format.</p> <p>c. Upload the certificate file and then click Install.</p>
Install your own CA-signed certificate	<p>a. Select Install CA-signed certificate.</p> <p>b. Load both the certificate file and the private key and then click Install.</p> <p>The certificate must use the Privacy Enhanced Mail (PEM) Base-64 encoded X.509 format.</p>

Result

BlueXP now uses the CA-signed certificate to provide secure HTTPS access. The following image shows a BlueXP account that is configured for secure access:



Renewing the BlueXP HTTPS certificate

You should renew the BlueXP HTTPS certificate before it expires to ensure secure access to the BlueXP console. If you don't renew the certificate before it expires, a warning appears when users access the web console using HTTPS.

Steps

1. In the upper right of the BlueXP console, click the Settings icon, and select **HTTPS Setup**.

Details about the BlueXP certificate displays, including the expiration date.

2. Click **Change Certificate** and follow the steps to generate a CSR or install your own CA-signed certificate.

Result

BlueXP uses the new CA-signed certificate to provide secure HTTPS access.

Configure a Connector to use a proxy server

If your corporate policies require you to use a proxy server for all communication to the internet, then you need to configure your Connectors to use that proxy server. If you didn't configure a Connector to use a proxy server during installation, then you can configure the Connector to use that proxy server at any time.

BlueXP supports HTTP and HTTPS. The proxy server can be in the cloud or in your network.

Configuring the Connector to use a proxy server provides outbound internet access if a public IP address or a NAT gateway isn't available. This proxy server provides only the Connector with an outbound connection. It doesn't provide any connectivity for Cloud Volumes ONTAP systems.

If Cloud Volumes ONTAP systems don't have an outbound internet connection to send AutoSupport messages, BlueXP automatically configures those Cloud Volumes ONTAP systems to use a proxy server that's included with the Connector. The only requirement is to ensure that the Connector's security group allows inbound connections over port 3128. You'll need to open this port after you deploy the Connector.

Enable a proxy on a Connector

When you configure a Connector to use a proxy server, that Connector and the Cloud Volumes ONTAP systems that it manages (including any HA mediators), all use the proxy server.

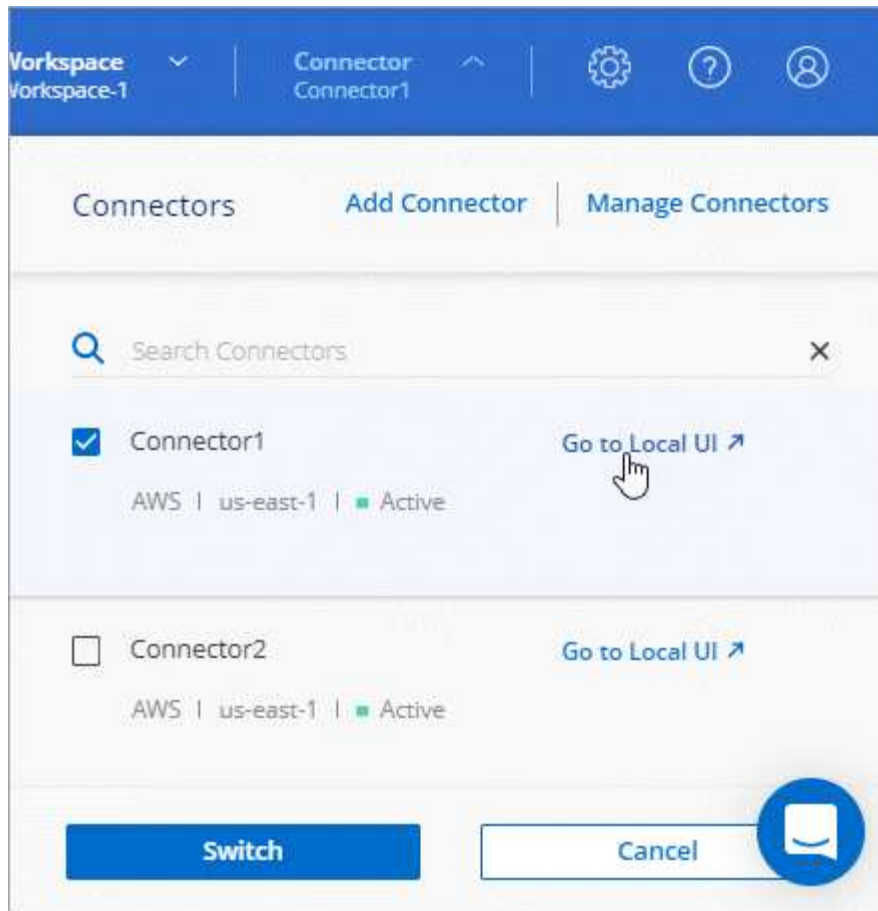
Note that this operation restarts the Connector. Ensure that the Connector isn't performing any operations before you proceed.

Steps

1. [Log in to the BlueXP SaaS interface](#) from a machine that has a network connection to the Connector instance.

If the Connector doesn't have a public IP address, you'll need a VPN connection or you'll need to connect from a jump host that's in the same network as the Connector.

2. Click the **Connector** drop-down and then click **Go to local UI** for a specific Connector.



The BlueXP interface running on the Connector loads in a new browser tab.

3. In the upper right of the BlueXP console, click the Settings icon, and select **Connector Settings**.



4. Under **General**, click **HTTP Proxy Configuration**.
5. Set up the proxy:
 - a. Click **Enable Proxy**.
 - b. Specify the server using the syntax `http://address:port` or `https://address:port`
 - c. Specify a user name and password if basic authentication is required for the server
 - d. Click **Save**.



BlueXP doesn't support passwords that include the @ character.

Enable direct API traffic

If you configured a Connector to use a proxy server, you can enable direct API traffic on the Connector in order to send API calls directly to cloud provider services without going through the proxy. This option is supported with Connectors that are running in AWS, in Azure, or in Google Cloud.

If you disabled the use of Azure Private Links with Cloud Volumes ONTAP and are using service endpoints instead, then you must enable direct API traffic. Otherwise, the traffic won't be routed properly.

[Learn more about using an Azure Private Link or service endpoints with Cloud Volumes ONTAP](#)

Steps

1. In the upper right of the BlueXP console, click the Settings icon, and select **Connector Settings**.



2. Under **General**, click **Support Direct API Traffic**.
3. Click the checkbox to enable the option and then click **Save**.

Default configuration for the Connector

You might want to learn more about the Connector before you deploy it, or if you need to troubleshoot any issues.

Default configuration with internet access

The following configuration details apply if you deployed the Connector from BlueXP, from your cloud provider's marketplace, or if you manually installed the Connector on an on-premises Linux host that has internet access.

AWS details

If you deployed the Connector from BlueXP or from the cloud provider's marketplace, note the following:

- The EC2 instance type is t3.xlarge.
- The operating system for the image is Red Hat Enterprise Linux 7.6 (HVM).

The operating system does not include a GUI. You must use a terminal to access the system.

- The user name for the EC2 Linux instance is ec2-user.
- The default system disk is a 100 GiB gp2 disk.

Azure details

If you deployed the Connector from BlueXP or from the cloud provider's marketplace, note the following:

- The VM type is DS3 v2.
- The operating system for the image is CentOS 7.6.

The operating system does not include a GUI. You must use a terminal to access the system.

- The default system disk is a 100 GiB premium SSD disk.

Google Cloud details

If you deployed the Connector from BlueXP or from the cloud provider's marketplace, note the following:

- The VM instance is n2-standard-4.
- The operating system for the image is Red Hat Enterprise Linux 8.6.

The operating system does not include a GUI. You must use a terminal to access the system.

- The default system disk is a 100 GiB SSD persistent disk.

Installation folder

The Connector installation folder resides in the following location:

`/opt/application/netapp/cloudmanager`

Log files

Log files are contained in the following folders:

- `/opt/application/netapp/cloudmanager/log`
or
- `/opt/application/netapp/service-manager-2/logs` (starting with new 3.9.23 installations)

The logs in these folders provide details about the Connector and docker images.

- `/opt/application/netapp/cloudmanager/docker_occm/data/log`

The logs in this folder provide details about cloud services and the BlueXP service that runs on the Connector.

Connector service

- The BlueXP service is named `occm`.
- The `occm` service is dependent on the MySQL service.

If the MySQL service is down, then the `occm` service is down too.

Ports

The Connector uses the following ports on the Linux host:

- 80 for HTTP access
- 443 for HTTPS access

Default configuration without internet access

The following configuration applies if you manually installed the Connector on an on-premises Linux host that doesn't have internet access. [Learn more about this installation option.](#)

- The Connector installation folder resides in the following location:

/opt/application/netapp/ds

- Log files are contained in the following folders:

/var/lib/docker/volumes/ds_occmdata/_data/log

The logs in this folder provide details about the Connector and docker images.

- All services are running inside docker containers

The services are dependent on the docker runtime service running

- The Connector uses the following ports on the Linux host:

- 80 for HTTP access
- 443 for HTTPS access

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