Deploy BlueXP classification

BlueXP classification

NetApp
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Deploy BlueXP classification in the cloud using BlueXP

Complete a few steps to deploy BlueXP classification in the cloud. BlueXP will deploy the BlueXP classification instance in the same cloud provider network as the BlueXP Connector.

Note that you can also install BlueXP classification on a Linux host that has internet access. This type of installation may be a good option if you prefer to scan on-premises ONTAP systems using a BlueXP classification instance that's also located on premises — but this is not a requirement. The software functions exactly the same way regardless of which installation method you choose.

Quick start

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

1

Create a Connector

If you don't already have a Connector, create a Connector now. See creating a Connector in AWS, creating a Connector in Azure, or creating a Connector in GCP.

You can also install the Connector on-premises on a Linux host in your network or on a Linux host in the cloud.

2

Review prerequisites

Ensure that your environment can meet the prerequisites. This includes outbound internet access for the instance, connectivity between the Connector and BlueXP classification over port 443, and more. See the complete list.

3

Deploy BlueXP classification

Launch the installation wizard to deploy the BlueXP classification instance in the cloud.

4

Subscribe to the BlueXP classification service

The first 1 TB of data that BlueXP classification scans in BlueXP is free for 30 days. A BlueXP subscription through your cloud provider Marketplace, or a BYOL license from NetApp, is required to continue scanning data after that point.

Create a Connector

If you don't already have a Connector, create a Connector in your cloud provider. See creating a Connector in AWS or creating a Connector in Azure, or creating a Connector in GCP. In most cases you will probably have a Connector set up before you attempt to activate BlueXP classification because most BlueXP features require a Connector, but there are cases where you'll you need to set one up now.

There are some scenarios where you have to use a Connector that's deployed in a specific cloud provider:

- When scanning data in Cloud Volumes ONTAP in AWS, Amazon FSx for ONTAP, or in AWS S3 buckets, you use a Connector in AWS.
- When scanning data in Cloud Volumes ONTAP in Azure or in Azure NetApp Files, you use a Connector in Azure.
  - For Azure NetApp Files, it must be deployed in the same region as the volumes you wish to scan.
- When scanning data in Cloud Volumes ONTAP in GCP, you use a Connector in GCP.

On-prem ONTAP systems, non-NetApp file shares, generic S3 Object storage, databases, OneDrive folders, SharePoint accounts, and Google Drive accounts can be scanned when using any of these cloud Connectors.

Note that you can also install the Connector on-premises on a Linux host in your network or in the cloud. Some users planning to install BlueXP classification on-prem may also choose to install the Connector on-prem.

As you can see, there may be some situations where you need to use multiple Connectors.

Government region support

BlueXP classification is supported when the Connector is deployed in a Government region (AWS GovCloud, Azure Gov, or Azure DoD). When deployed in this manner, BlueXP classification has the following restrictions:

- OneDrive accounts, SharePoint accounts, and Google Drive accounts can't be scanned.
- Microsoft Azure Information Protection (AIP) label functionality can't be integrated.

See more information about deploying the Connector in a Government region.

Review prerequisites

Review the following prerequisites to make sure that you have a supported configuration before you deploy BlueXP classification in the cloud. When you deploy BlueXP classification in the cloud, it's located in the same subnet as the Connector.

Enable outbound internet access from BlueXP classification

BlueXP classification requires outbound internet access. If your virtual or physical network uses a proxy server for internet access, ensure that the BlueXP classification instance has outbound internet access to contact the following endpoints. The proxy must be non-transparent - we don't currently support transparent proxies.

Review the appropriate table below depending on whether you are deploying BlueXP classification in AWS, Azure, or GCP.

Required endpoints for AWS

Endpoints	Purpose
https://api.bluexp.netapp.com	Communication with the BlueXP service, which includes NetApp accounts.
https://netapp-cloud-account.auth0.com https://auth0.com	Communication with the BlueXP website for centralized user authentication.
https://cloud-compliance-support-netapp.s3.us-west-2.amazonaws.com https://hub.docker.com https://auth.docker.io https://registry-1.docker.io https://index.docker.io/ https://dseasb33srnrn.cloudfront.net/ https://production.cloudflare.docker.com/	Provides access to software images, manifests, and templates.
https://kinesis.us-east-1.amazonaws.com	Enables NetApp to stream data from audit records.
https://cognito-idp.us-east-1.amazonaws.com https://cognito-identity.us-east-1.amazonaws.com https://user-feedback-store-prod.s3.us-west-2.amazonaws.com https://customer-data-production.s3.us-west-2.amazonaws.com	Enables BlueXP classification to access and download manifests and templates, and to send logs and metrics.

Required endpoints for Azure

Endpoints	Purpose
https://api.bluexp.netapp.com	Communication with the BlueXP service, which includes NetApp accounts.
https://netapp-cloud-account.auth0.com https://auth0.com	Communication with the BlueXP website for centralized user authentication.
https://support.compliance.api.bluexp.netapp.com/ https://hub.docker.com https://auth.docker.io https://registry-1.docker.io https://index.docker.io/ https://dseasb33srnrn.cloudfront.net/ https://production.cloudflare.docker.com/	Provides access to software images, manifests, templates, and to send logs and metrics.
https://support.compliance.api.bluexp.netapp.com/	Enables NetApp to stream data from audit records.

Required endpoints for GCP

Endpoints	Purpose
https://api.bluexp.netapp.com	Communication with the BlueXP service, which includes NetApp accounts.

Endpoints	Purpose
https://netapp-cloud-account.auth0.com https://auth0.com	Communication with the BlueXP website for centralized user authentication.
https://support.compliance.api.bluexp.netapp.com/ https://hub.docker.com https://auth.docker.io https://registry-1.docker.io https://index.docker.io/ https://dseasb33srnrn.cloudfront.net/ https://production.cloudflare.docker.com/	Provides access to software images, manifests, templates, and to send logs and metrics.
https://support.compliance.api.bluexp.netapp.com/	Enables NetApp to stream data from audit records.

Ensure that BlueXP has the required permissions

Ensure that BlueXP has permissions to deploy resources and create security groups for the BlueXP classification instance. You can find the latest BlueXP permissions in the policies provided by NetApp.

Ensure that the BlueXP Connector can access BlueXP classification

Ensure connectivity between the Connector and the BlueXP classification instance. The security group for the Connector must allow inbound and outbound traffic over port 443 to and from the BlueXP classification instance. This connection enables deployment of the BlueXP classification instance and enables you to view information in the Compliance and Governance tabs. BlueXP classification is supported in Government regions in AWS and Azure.

Additional inbound and outbound security group rules are required for AWS and AWS GovCloud deployments. See Rules for the Connector in AWS for details.

Additional inbound and outbound security group rules are required for Azure and Azure Government deployments. See Rules for the Connector in Azure for details.

Ensure that you can keep BlueXP classification running

The BlueXP classification instance needs to stay on to continuously scan your data.

Ensure web browser connectivity to BlueXP classification

After BlueXP classification is enabled, ensure that users access the BlueXP interface from a host that has a connection to the BlueXP classification instance.

The BlueXP classification instance uses a private IP address to ensure that the indexed data isn’t accessible to the internet. As a result, the web browser that you use to access BlueXP must have a connection to that private IP address. That connection can come from a direct connection to your cloud provider (for example, a VPN), or from a host that’s inside the same network as the BlueXP classification instance.

Check your vCPU limits

Ensure that your cloud provider’s vCPU limit allows for the deployment of an instance with the necessary number of cores. You’ll need to verify the vCPU limit for the relevant instance family in the region where BlueXP is running. See the required instance types.

See the following links for more details on vCPU limits:

- AWS documentation: Amazon EC2 service quotas
- Azure documentation: Virtual machine vCPU quotas
- Google Cloud documentation: Resource quotas

Note that you can deploy BlueXP classification on an instance in AWS cloud environments with fewer CPUs and less RAM, but there are limitations when using these systems. See Using a smaller instance type for details.

Deploy BlueXP classification in the cloud

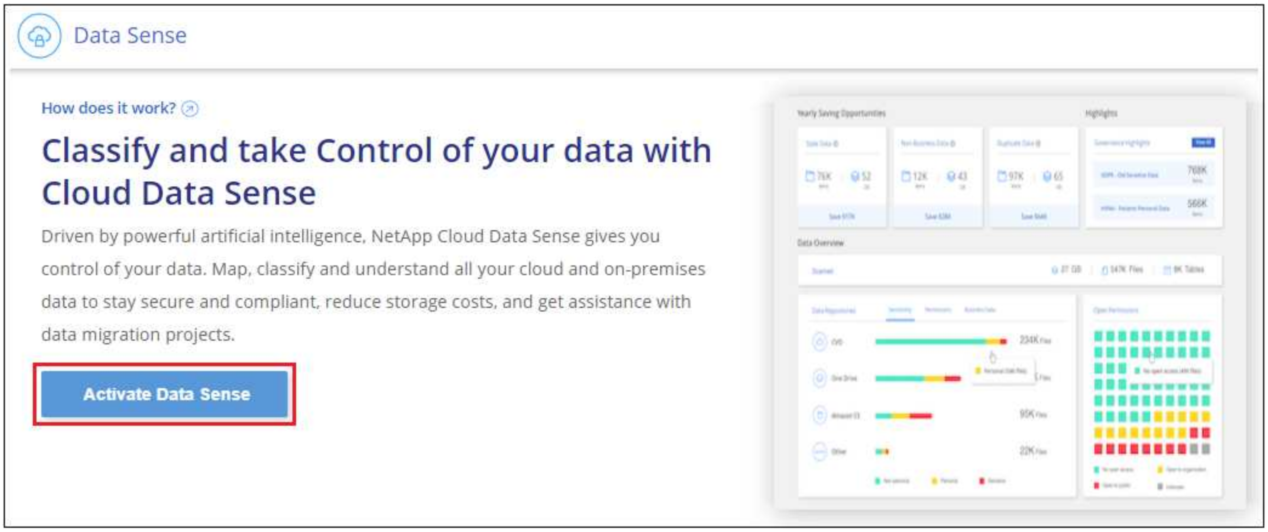
Follow these steps to deploy an instance of BlueXP classification in the cloud. The Connector will deploy the instance in the cloud, and then install BlueXP classification software on that instance.

Note that when deploying BlueXP classification from a BlueXP Connector in an AWS environment, you can select the default instance size or you can select from two smaller instance types. See the available instance types and limitations. In regions where the default instance type isn’t available, BlueXP classification runs on an alternate instance type.

Deploy in AWS

Steps

1. From the BlueXP left navigation menu, click **Governance > Classification**.



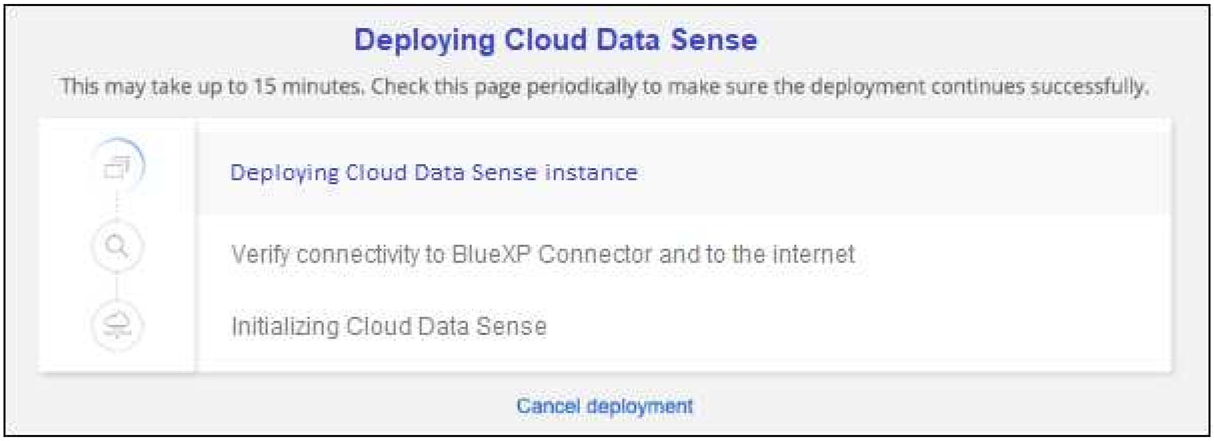
Data Sense

How does it work?

Classify and take Control of your data with Cloud Data Sense

Driven by powerful artificial intelligence, NetApp Cloud Data Sense gives you control of your data. Map, classify and understand all your cloud and on-premises data to stay secure and compliant, reduce storage costs, and get assistance with data migration projects.

2. Click **Activate Data Sense**.
3. From the *Installation* page, click **Deploy > Deploy** to use the "Large" instance size and start the cloud deployment wizard.
4. The wizard displays progress as it goes through the deployment steps. It will stop and prompt for input if it runs into any issues.



Deploying Cloud Data Sense

This may take up to 15 minutes. Check this page periodically to make sure the deployment continues successfully.

Deploying Cloud Data Sense instance

Verify connectivity to BlueXP Connector and to the internet

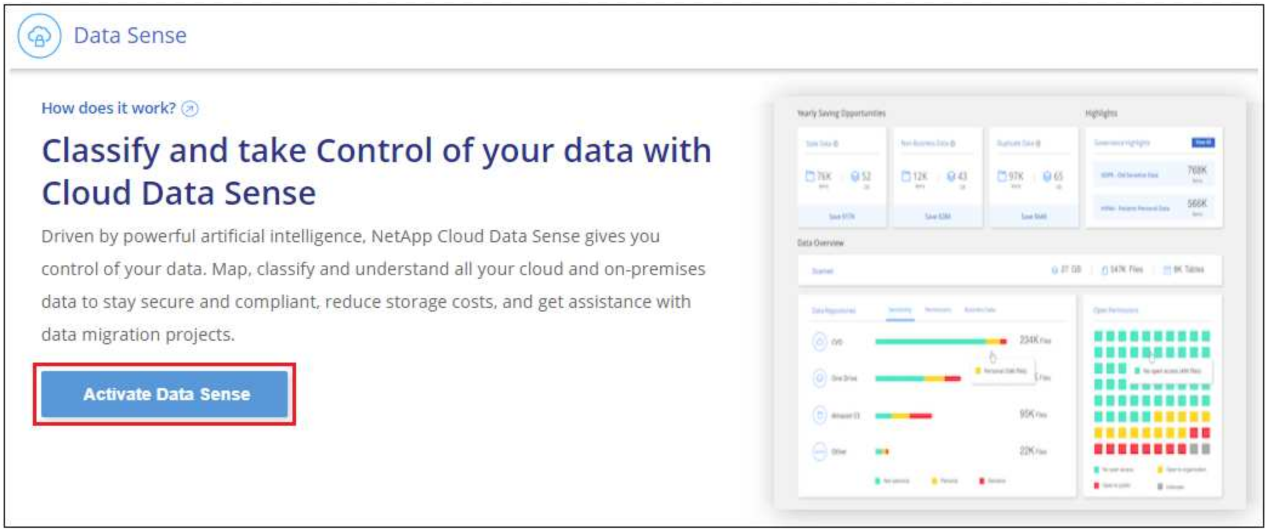
Initializing Cloud Data Sense

5. When the instance is deployed and BlueXP classification is installed, click **Continue to configuration** to go to the *Configuration* page.

Deploy in Azure

Steps

1. From the BlueXP left navigation menu, click **Governance > Classification**.
2. Click **Activate Data Sense**.



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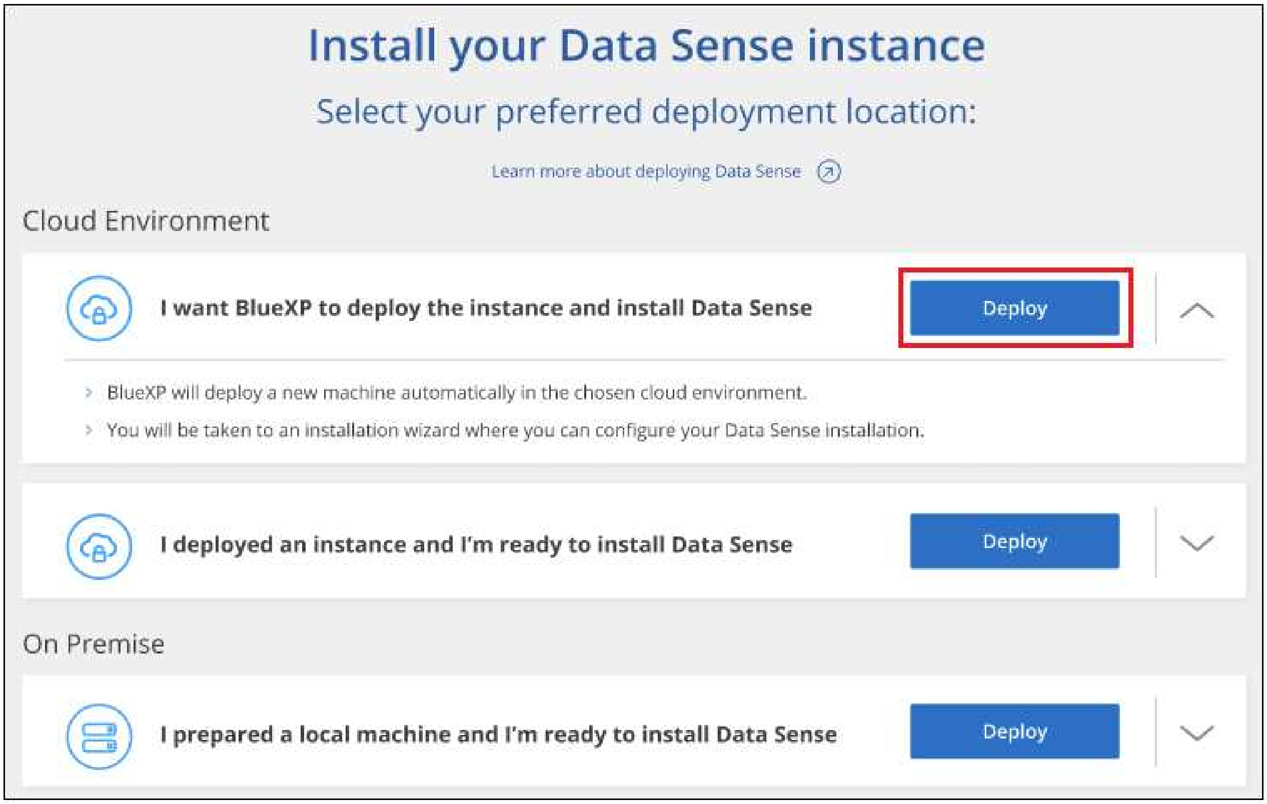
Activate Data Sense

3. Click **Deploy** to start the cloud deployment wizard.



Install your Data Sense instance

Select your preferred deployment location:

Learn more about deploying Data Sense

Cloud Environment

I want BlueXP to deploy the instance and install Data Sense — Deploy

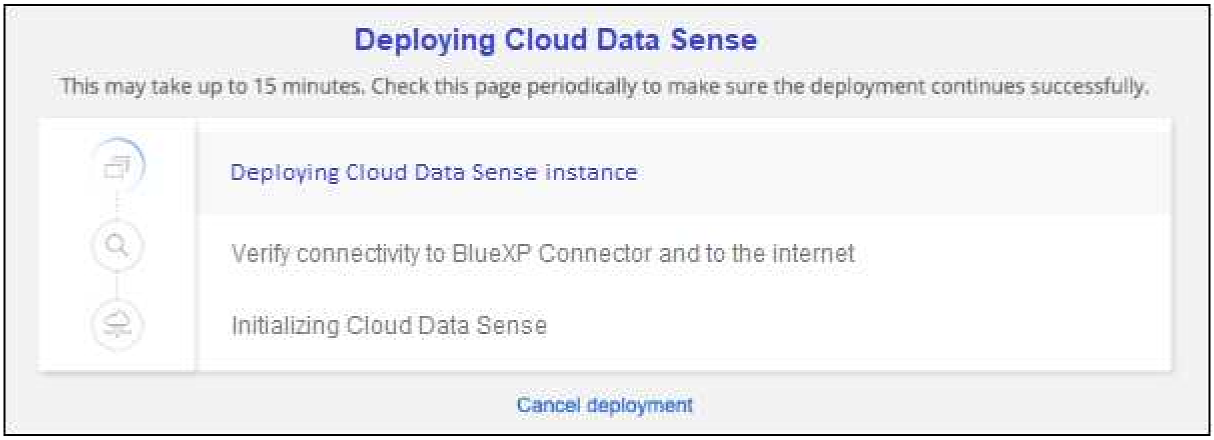
- BlueXP will deploy a new machine automatically in the chosen cloud environment.
- You will be taken to an installation wizard where you can configure your Data Sense installation.

I deployed an instance and I'm ready to install Data Sense — Deploy

On Premise

I prepared a local machine and I'm ready to install Data Sense — Deploy

4. The wizard displays progress as it goes through the deployment steps. It will stop and prompt for input if it runs into any issues.



Deploying Cloud Data Sense

This may take up to 15 minutes. Check this page periodically to make sure the deployment continues successfully.

Deploying Cloud Data Sense instance

Verify connectivity to BlueXP Connector and to the internet

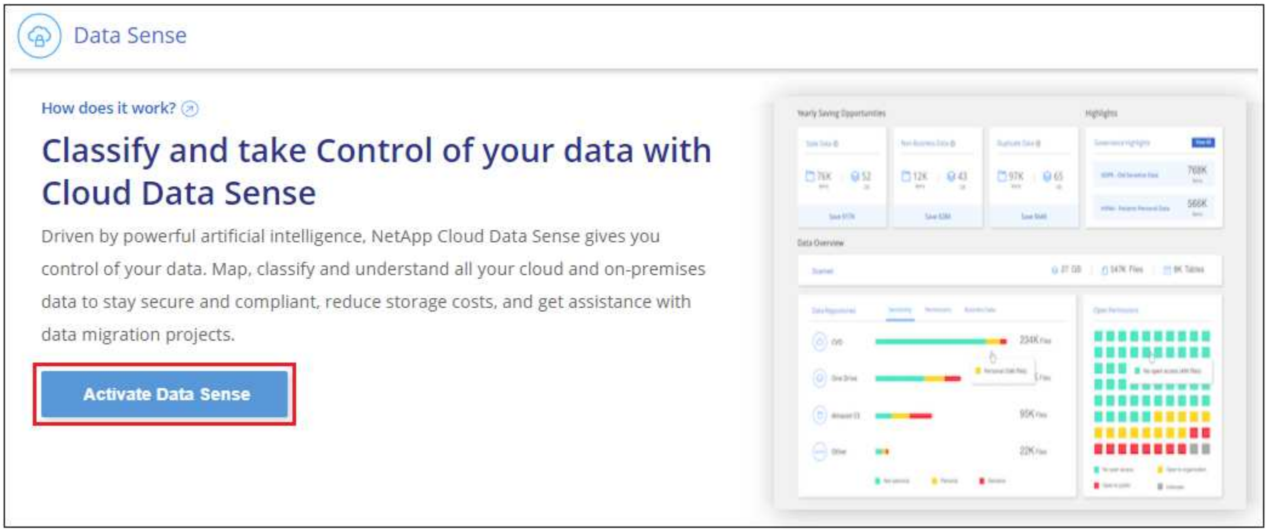
Initializing Cloud Data Sense

5. When the instance is deployed and BlueXP classification is installed, click **Continue to configuration** to go to the *Configuration* page.

Deploy in Google Cloud

Steps

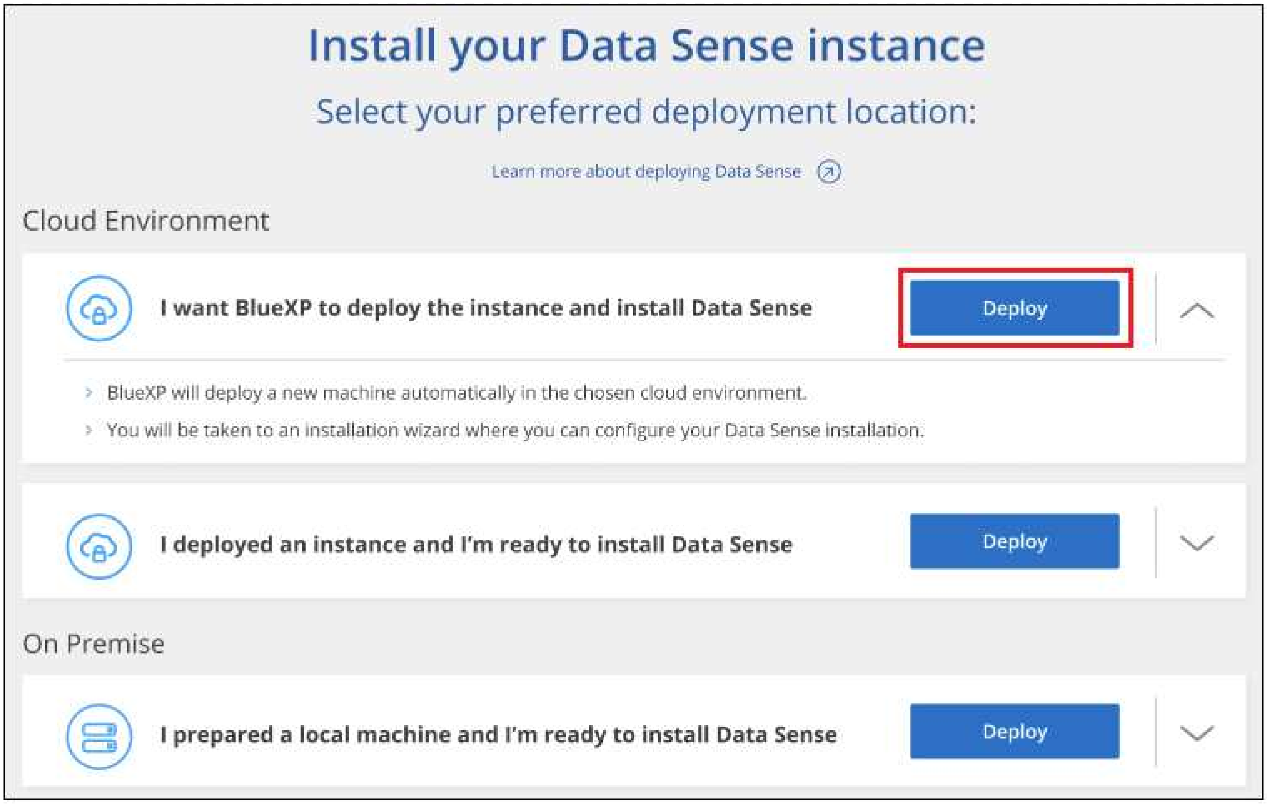
1. From the BlueXP left navigation menu, click **Governance > Classification**.
2. Click **Activate Data Sense**.



Classify and take Control of your data with Cloud Data Sense

Driven by powerful artificial intelligence, NetApp Cloud Data Sense gives you control of your data. Map, classify and understand all your cloud and on-premises data to stay secure and compliant, reduce storage costs, and get assistance with data migration projects.

3. Click **Deploy** to start the cloud deployment wizard.



Install your Data Sense instance

Select your preferred deployment location:

Learn more about deploying Data Sense

Cloud Environment

I want BlueXP to deploy the instance and install Data Sense

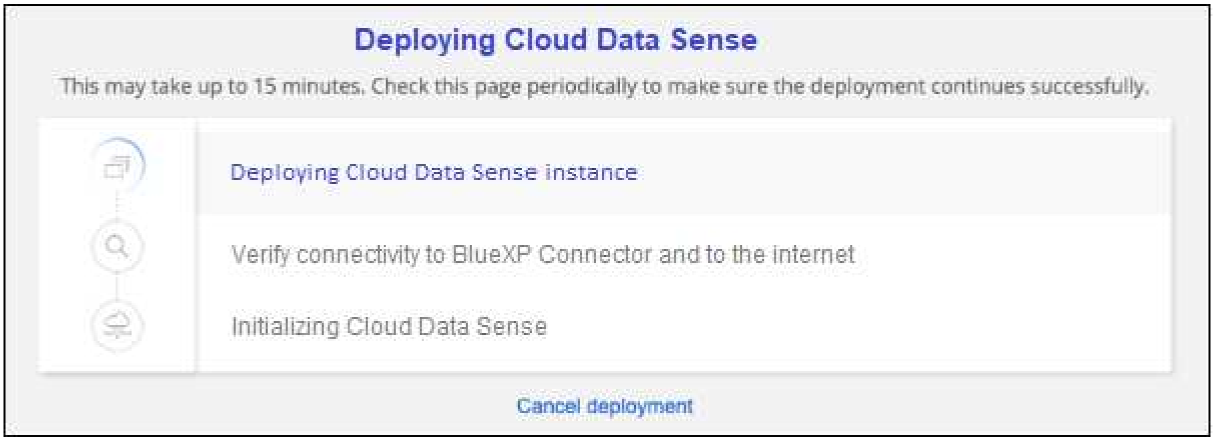
- BlueXP will deploy a new machine automatically in the chosen cloud environment.
- You will be taken to an installation wizard where you can configure your Data Sense installation.

I deployed an instance and I'm ready to install Data Sense

On Premise

I prepared a local machine and I'm ready to install Data Sense

4. The wizard displays progress as it goes through the deployment steps. It will stop and prompt for input if it runs into any issues.



Deploying Cloud Data Sense

This may take up to 15 minutes. Check this page periodically to make sure the deployment continues successfully.

Deploying Cloud Data Sense instance

Verify connectivity to BlueXP Connector and to the internet

Initializing Cloud Data Sense

5. When the instance is deployed and BlueXP classification is installed, click **Continue to configuration** to go to the *Configuration* page.

Result

BlueXP deploys the BlueXP classification instance in your cloud provider.

Upgrades to the BlueXP Connector and BlueXP classification software is automated as long as the instances have internet connectivity.

What's Next

From the Configuration page you can select the data sources that you want to scan.

You can also set up licensing for BlueXP classification at this time. You will not be charged until your 30-day free trial ends.

Install BlueXP classification on a host that has internet access

Complete a few steps to install BlueXP classification on a Linux host in your network, or on a Linux host in the cloud, that has internet access. You'll need to deploy the Linux host manually in your network or in the cloud as part of this installation.

The on-prem installation may be a good option if you prefer to scan on-premises ONTAP systems using a BlueXP classification instance that's also located on premises — but this is not a requirement. The software functions exactly the same way regardless of which installation method you choose.

The BlueXP classification installation script starts by checking if the system and environment meet the required prerequisites. If the prerequisites are all met, then the installation starts. If you would like to verify the prerequisites independently of running the BlueXP classification installation, there is a separate software package you can download that only tests for the prerequisites. See how to check if your Linux host is ready to install BlueXP classification.

The typical installation on a Linux host *in your premises* has the following components and connections.

The typical installation on a Linux host *in the cloud* has the following components and connections.

For very large configurations where you'll be scanning petabytes of data, you can include multiple hosts to provide additional processing power. When using multiple host systems, the primary system is called the *Manager node*, and the additional systems that provide extra processing power are called *Scanner nodes*.

Note that you can also install BlueXP classification in an on-premises site that doesn't have internet access for completely secure sites.

Quick start

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

1

Create a Connector

If you don't already have a Connector, deploy the Connector on-premises on a Linux host in your network, or on a Linux host in the cloud.

You can also create a Connector with your cloud provider. See creating a Connector in AWS, creating a Connector in Azure, or creating a Connector in GCP.

2

Review prerequisites

Ensure that your environment can meet the prerequisites. This includes outbound internet access for the instance, connectivity between the Connector and BlueXP classification over port 443, and more. See the complete list.

You also need a Linux system that meets the following requirements.

3

Download and deploy BlueXP classification

Download the Cloud BlueXP classification software from the NetApp Support Site and copy the installer file to the Linux host you plan to use. Then launch the installation wizard and follow the prompts to deploy the BlueXP classification instance.

4

Subscribe to the BlueXP classification service

The first 1 TB of data that BlueXP classification scans in BlueXP is free for 30 days. A subscription to your cloud provider Marketplace, or a BYOL license from NetApp, is required to continue scanning data after that point.

Create a Connector

A BlueXP Connector is required before you can install and use BlueXP classification. In most cases you'll probably have a Connector set up before you attempt to activate BlueXP classification because most BlueXP features require a Connector, but there are cases where you'll you need to set one up now.

To create one in your cloud provider environment, see creating a Connector in AWS, creating a Connector in Azure, or creating a Connector in GCP.

There are some scenarios where you have to use a Connector that's deployed in a specific cloud provider:

- When scanning data in Cloud Volumes ONTAP in AWS, Amazon FSx for ONTAP, or in AWS S3 buckets, you use a Connector in AWS.
- When scanning data in Cloud Volumes ONTAP in Azure or in Azure NetApp Files, you use a Connector in Azure.

  For Azure NetApp Files, it must be deployed in the same region as the volumes you wish to scan.
- When scanning data in Cloud Volumes ONTAP in GCP, you use a Connector in GCP.

On-prem ONTAP systems, non-NetApp file shares, generic S3 Object storage, databases, OneDrive folders, SharePoint accounts, and Google Drive accounts can be scanned using any of these cloud Connectors.

Note that you can also deploy the Connector on-premises on a Linux host in your network or on a Linux host in the cloud. Some users planning to install BlueXP classification on-prem may also choose to install the Connector on-prem.

As you can see, there may be some situations where you need to use multiple Connectors.

You'll need the IP address or host name of the Connector system when installing BlueXP classification. You'll have this information if you installed the Connector in your premises. If the Connector is deployed in the cloud, you can find this information from the BlueXP console: click the Help icon, select **Support**, and click **BlueXP Connector**.

Prepare the Linux host system

BlueXP classification software must run on a host that meets specific operating system requirements, RAM requirements, software requirements, and so on. The Linux host can be in your network, or in the cloud.

Ensure that you can keep BlueXP classification running. The BlueXP classification machine needs to stay on to continuously scan your data.

- BlueXP classification is not supported on a host that is shared with other applications - the host must be a dedicated host.
- When building the host system in your premises, you can choose among three system sizes depending on the size of the data set that you plan to have BlueXP classification scan.

System size	CPU	RAM (swap memory must be disabled)	Disk
Extra Large	32 CPUs	128 GB RAM	1 TiB SSD on /, or - 100 GiB available on /opt - 895 GiB available on /var/lib/docker - 5 GiB on /tmp
Large	16 CPUs	64 GB RAM	500 GiB SSD on /, or - 100 GiB available on /opt - 395 GiB available on /var/lib/docker - 5 GiB on /tmp
Medium	8 CPUs	32 GB RAM	200 GiB SSD on /, or - 50 GiB available on /opt - 145 GiB available on /var/lib/docker - 5 GiB on /tmp
Small	8 CPUs	16 GB RAM	100 GiB SSD on /, or - 50 GiB available on /opt - 45 GiB available on /var/lib/docker - 5 GiB on /tmp

Note that there are limitations when using the smaller systems. See Using a smaller instance type for details.

- When deploying a compute instance in the cloud for your BlueXP classification installation, we recommend a system that meets the "Large" system requirements above:
  - **AWS EC2 instance type**: We recommend "m6i.4xlarge". See additional AWS instance types.
  - **Azure VM size**: We recommend "Standard_D16s_v3". See additional Azure instance types.
  - **GCP machine type**: We recommend "n2-standard-16". See additional GCP instance types.
- **UNIX folder permissions**: The following minimum UNIX permissions are required:

Folder	Minimum Permissions
/tmp	`rwxrwxrwt`

Folder	Minimum Permissions
/opt	`rwxr-xr-x`
/var/lib/docker	`rwx------`
/usr/lib/systemd/system	`rwxr-xr-x`

- **Operating system**:
  - The following operating systems require using the Docker container engine:
    - Red Hat Enterprise Linux version 7.8 and 7.9
    - CentOS version 7.8 and 7.9
    - Ubuntu 22.04 (requires BlueXP classification version 1.23 or greater)
  - The following operating systems require using the Podman container engine, and they require BlueXP classification version 1.26 or greater:
    - Red Hat Enterprise Linux version 9.0, 9.1, and 9.2

      Note that the following features are not currently supported when using RHEL 9.x:

      - Installation in a dark site
      - Distributed scanning; using a master scanner node and remote scanner nodes
- **Red Hat Subscription Management**: The host must be registered with Red Hat Subscription Management. If it's not registered, the system can't access repositories to update required 3rd-party software during installation.
- **Additional software**: You must install the following software on the host before you install BlueXP classification:
  - Depending on the OS you are using, you'll need to install one of the container engines:
    - Docker Engine version 19.3.1 or greater. View installation instructions.

      Watch this video for a quick demo of installing Docker on CentOS.
    - Podman version 4 or greater. To install Podman, update your system packages (`sudo yum update -y`), and then install Podman (`sudo yum install podman -y`).
  - Python version 3.6 or greater. View installation instructions.
- **NTP considerations**: NetApp recommends configuring the BlueXP classification system to use a Network Time Protocol (NTP) service. The time must be synchronized between the BlueXP classification system and the BlueXP Connector system.
- **Firewalld considerations**: If you are planning to use `firewalld`, we recommend that you enable it before installing BlueXP classification. Run the following commands to configure `firewalld` so that it is compatible with BlueXP classification:

```
firewall-cmd --permanent --add-service=http
firewall-cmd --permanent --add-service=https
firewall-cmd --permanent --add-port=80/tcp
firewall-cmd --permanent --add-port=8080/tcp
firewall-cmd --permanent --add-port=443/tcp
firewall-cmd --reload
```

If you’re planning to use additional BlueXP classification hosts as scanner nodes, add these rules to your primary system at this time:

```
firewall-cmd --permanent --add-port=2377/tcp
firewall-cmd --permanent --add-port=7946/udp
firewall-cmd --permanent --add-port=7946/tcp
firewall-cmd --permanent --add-port=4789/udp
```

Note that you must restart Docker or Podman whenever you enable or update `firewalld` settings.

ⓘ The IP address of the BlueXP classification host system can’t be changed after installation.

Enable outbound internet access from BlueXP classification

BlueXP classification requires outbound internet access. If your virtual or physical network uses a proxy server for internet access, ensure that the BlueXP classification instance has outbound internet access to contact the following endpoints.

Endpoints	Purpose
https://api.bluexp.netapp.com	Communication with the BlueXP service, which includes NetApp accounts.
https://netapp-cloud-account.auth0.com https://auth0.com	Communication with the BlueXP website for centralized user authentication.
https://support.compliance.api.bluexp.netapp.com/ https://hub.docker.com https://auth.docker.io https://registry-1.docker.io https://index.docker.io/ https://dseasb33srnrn.cloudfront.net/ https://production.cloudflare.docker.com/	Provides access to software images, manifests, templates, and to send logs and metrics.
https://support.compliance.api.bluexp.netapp.com/	Enables NetApp to stream data from audit records.
https://github.com/docker https://download.docker.com	Provides prerequisite packages for docker installation.

Endpoints	Purpose
http://mirror.centos.org http://mirrorlist.centos.org http://mirror.centos.org/centos/7/extras/x86_64/Packages/container-selinux-2.107-3.el7.noarch.rpm	Provides prerequisite packages for CentOS installation.
http://packages.ubuntu.com/ http://archive.ubuntu.com	Provides prerequisite packages for Ubuntu installation.

Verify that all required ports are enabled

You must ensure that all required ports are open for communication between the Connector, BlueXP classification, Active Directory, and your data sources.

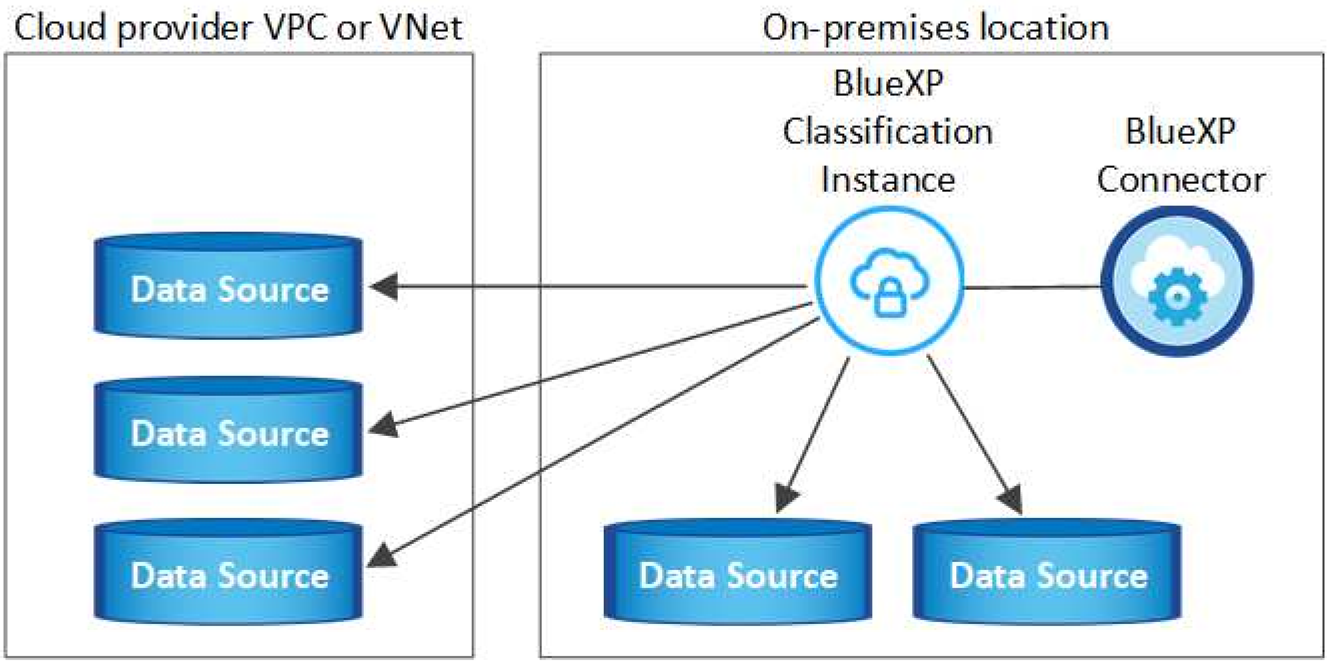
Connection Type	Ports	Description
Connector <> BlueXP classification	8080 (TCP), 443 (TCP), and 80	The firewall or routing rules for the Connector must allow inbound and outbound traffic over port 443 to and from the BlueXP classification instance. Make sure port 8080 is open so you can see the installation progress in BlueXP.
Connector <> ONTAP cluster (NAS)	443 (TCP)	BlueXP discovers ONTAP clusters using HTTPS. If you use custom firewall policies, they must meet the following requirements: • The Connector host must allow outbound HTTPS access through port 443. If the Connector is in the cloud, all outbound communication is allowed by the predefined firewall or routing rules. • The ONTAP cluster must allow inbound HTTPS access through port 443. The default "mgmt" firewall policy allows inbound HTTPS access from all IP addresses. If you modified this default policy, or if you created your own firewall policy, you must associate the HTTPS protocol with that policy and enable access from the Connector host.

Connection Type	Ports	Description
BlueXP classification <> ONTAP cluster	• For NFS - 111 (TCP\UDP) and 2049 (TCP\UDP) • For CIFS - 139 (TCP\UDP) and 445 (TCP\UDP)	BlueXP classification needs a network connection to each Cloud Volumes ONTAP subnet or on-prem ONTAP system. Firewalls or routing rules for Cloud Volumes ONTAP must allow inbound connections from the BlueXP classification instance. Make sure these ports are open to the BlueXP classification instance: • For NFS - 111 and 2049 • For CIFS - 139 and 445 NFS volume export policies must allow access from the BlueXP classification instance.
BlueXP classification <> Active Directory	389 (TCP & UDP), 636 (TCP), 3268 (TCP), and 3269 (TCP)	You must have an Active Directory already set up for the users in your company. Additionally, BlueXP classification needs Active Directory credentials to scan CIFS volumes. You must have the information for the Active Directory: • DNS Server IP Address, or multiple IP Addresses • User Name and Password for the server • Domain Name (Active Directory Name) • Whether you are using secure LDAP (LDAPS) or not • LDAP Server Port (typically 389 for LDAP, and 636 for secure LDAP)

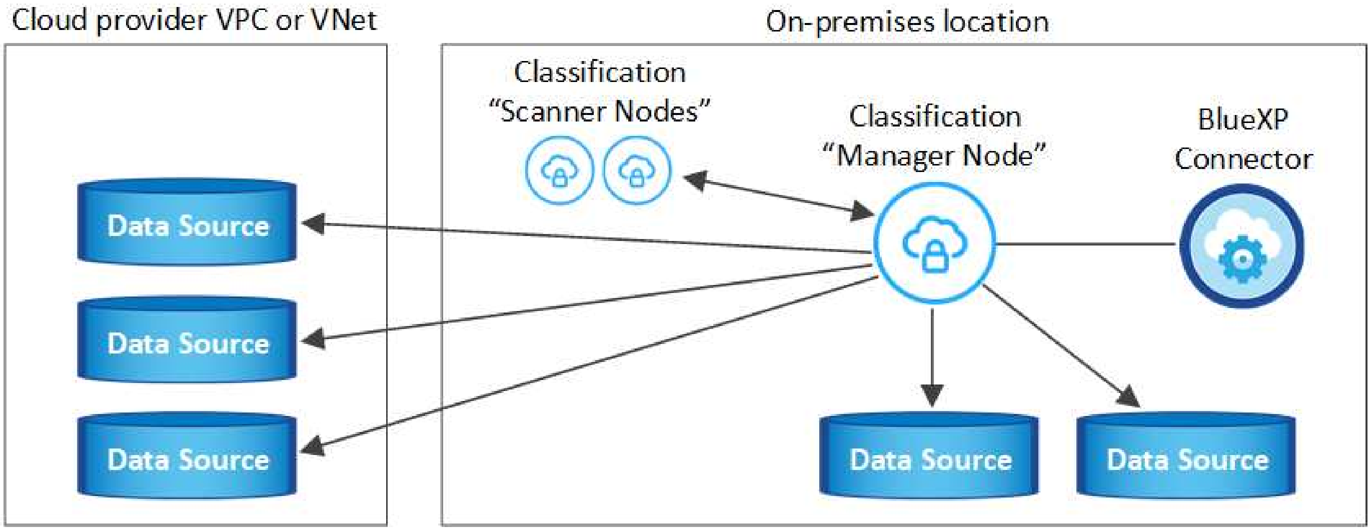
If you are using multiple BlueXP classification hosts to provide additional processing power to scan your data sources, you’ll need to enable additional ports/protocols. See the additional port requirements.

Install BlueXP classification on the Linux host

For typical configurations you’ll install the software on a single host system. See those steps here.



For very large configurations where you'll be scanning petabytes of data, you can include multiple hosts to provide additional processing power. See those steps here.



See Preparing the Linux host system and Reviewing prerequisites for the full list of requirements before you deploy BlueXP classification.

Upgrades to BlueXP classification software is automated as long as the instance has internet connectivity.

ⓘ BlueXP classification is currently unable to scan S3 buckets, Azure NetApp Files, or FSx for ONTAP when the software is installed on premises. In these cases you'll need to deploy a separate Connector and instance of BlueXP classification in the cloud and switch between Connectors for your different data sources.

Single-host installation for typical configurations

Review the requirements and follow these steps when installing BlueXP classification software on a single on-premises host.

Watch this video to see how to install BlueXP classification.

Note that all installation activities are logged when installing BlueXP classification. If you run into any issues during installation, you can view the contents of the installation audit log. It is written to `/opt/netapp/install_logs/`. See more details here.

What you'll need

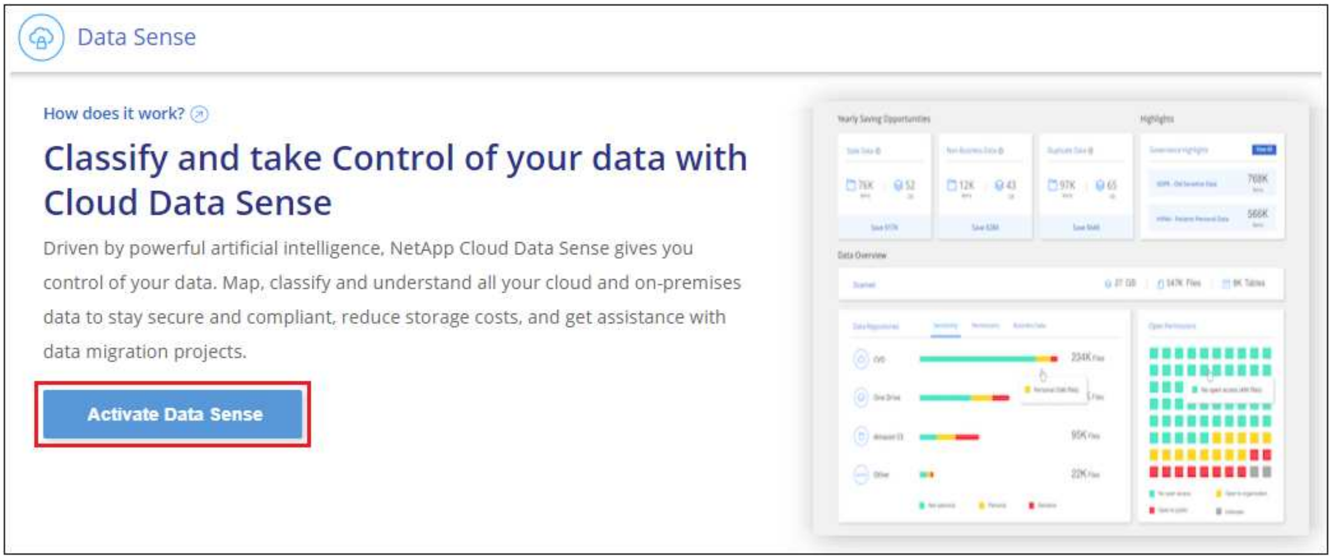
- Verify that your Linux system meets the host requirements.
- Verify that the system has the two prerequisite software packages installed (Docker Engine or Podman, and Python 3).
- Make sure you have root privileges on the Linux system.
- If you're using a proxy for access to the internet:
  - You'll need the proxy server information (IP address or host name, connection port, connection scheme: https or http, user name and password).
  - If the proxy is performing TLS interception, you'll need to know the path on the BlueXP classification Linux system where the TLS CA certificates are stored.
  - The proxy must be non-transparent - we don't currently support transparent proxies.
  - The user must be a local user. Domain users are not supported.
- Verify that your offline environment meets the required permissions and connectivity.

Steps

1. Download the BlueXP classification software from the NetApp Support Site. The file you should select is named **DATASENSE-INSTALLER-<version>.tar.gz**.
2. Copy the installer file to the Linux host you plan to use (using `scp` or some other method).
3. Unzip the installer file on the host machine, for example:

   ```
   tar -xzf DATASENSE-INSTALLER-V1.25.0.tar.gz
   ```

4. In BlueXP, select **Governance > Classification**.
5. Click **Activate Data Sense**.



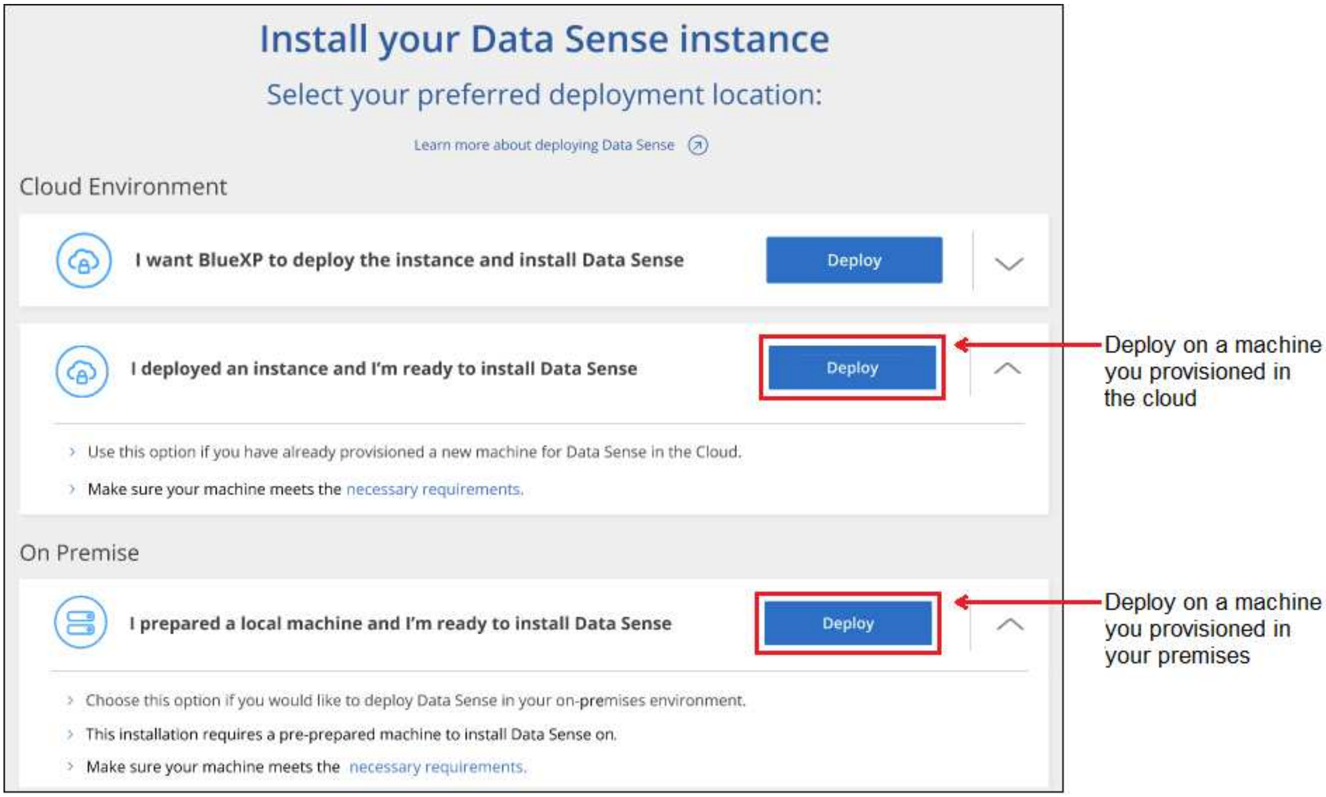
Data Sense

How does it work?

Classify and take Control of your data with Cloud Data Sense

Driven by powerful artificial intelligence, NetApp Cloud Data Sense gives you control of your data. Map, classify and understand all your cloud and on-premises data to stay secure and compliant, reduce storage costs, and get assistance with data migration projects.

6. Depending on whether you are installing BlueXP classification on an instance you prepared in the cloud or on an instance you prepared in your premises, click the appropriate **Deploy** button to start the BlueXP classification installation.



Install your Data Sense instance

Select your preferred deployment location:

Learn more about deploying Data Sense

Cloud Environment

I want BlueXP to deploy the instance and install Data Sense

I deployed an instance and I'm ready to install Data Sense

- Use this option if you have already provisioned a new machine for Data Sense in the Cloud.
- Make sure your machine meets the necessary requirements.

On Premise

I prepared a local machine and I'm ready to install Data Sense

- Choose this option if you would like to deploy Data Sense in your on-premises environment.
- This installation requires a pre-prepared machine to install Data Sense on.
- Make sure your machine meets the necessary requirements.

Deploy
Deploy
Deploy
Deploy on a machine you provisioned in the cloud
Deploy on a machine you provisioned in your premises

7. The *Deploy Data Sense On Premises* dialog is displayed. Copy the provided command (for example: `sudo ./install.sh -a 12345 -c 27AG75 -t 2198qq`) and paste it in a text file so you can use it later. Then click **Close** to dismiss the dialog.

8. On the host machine, enter the command you copied and then follow a series of prompts, or you can provide the full command including all required parameters as command line arguments.

   Note that the installer performs a pre-check to make sure your system and networking requirements are in place for a successful installation. Watch this video to understand the pre-check messages and implications.

Enter parameters as prompted:	Enter the full command:
1. Paste the command you copied from step 7: `sudo ./install.sh -a <account_id> -c <client_id> -t <user_token>` If you are installing on a cloud instance (not on your premises), add `--manual-cloud-install <cloud_provider>`. 2. Enter the IP address or host name of the BlueXP classification host machine so it can be accessed by the Connector system. 3. Enter the IP address or host name of the BlueXP Connector host machine so it can be accessed by the BlueXP classification system. 4. Enter proxy details as prompted. If your BlueXP Connector already uses a proxy, there is no need to enter this information again here since BlueXP classification will automatically use the proxy used by the Connector.	Alternatively, you can create the whole command in advance, providing the necessary host and proxy parameters: `sudo ./install.sh -a <account_id> -c <client_id> -t <user_token> --host <ds_host> --manager-host <cm_host> --manual-cloud-install <cloud_provider> --proxy-host <proxy_host> --proxy-port <proxy_port> --proxy-scheme <proxy_scheme> --proxy-user <proxy_user> --proxy-password <proxy_password> --cacert-folder-path <ca_cert_dir>`

Variable values:

- *account_id* = NetApp Account ID
- *client_id* = Connector Client ID (add the suffix "clients" to the client ID if it not already there)
- *user_token* = JWT user access token
- *ds_host* = IP address or host name of the BlueXP classification Linux system.
- *cm_host* = IP address or host name of the BlueXP Connector system.
- *cloud_provider* = When installing on a cloud instance, enter "AWS", "Azure", or "Gcp" depending on cloud provider.
- *proxy_host* = IP or host name of the proxy server if the host is behind a proxy server.
- *proxy_port* = Port to connect to the proxy server (default 80).
- *proxy_scheme* = Connection scheme: https or http (default http).
- *proxy_user* = Authenticated user to connect to the proxy server, if basic authentication is required. The user must be a local user - domain users are not supported.
- *proxy_password* = Password for the user name that you specified.
- *ca_cert_dir* = Path on the BlueXP classification Linux system containing additional TLS CA certificate bundles. Only required if the proxy is performing TLS interception.

Result

The BlueXP classification installer installs packages, registers the installation, and installs BlueXP classification. Installation can take 10 to 20 minutes.

If there is connectivity over port 8080 between the host machine and the Connector instance, you’ll see the installation progress in the BlueXP classification tab in BlueXP.

What’s Next

From the Configuration page you can select the data sources that you want to scan.

You can also set up licensing for BlueXP classification at this time. You will not be charged until your 30-day free trial ends.

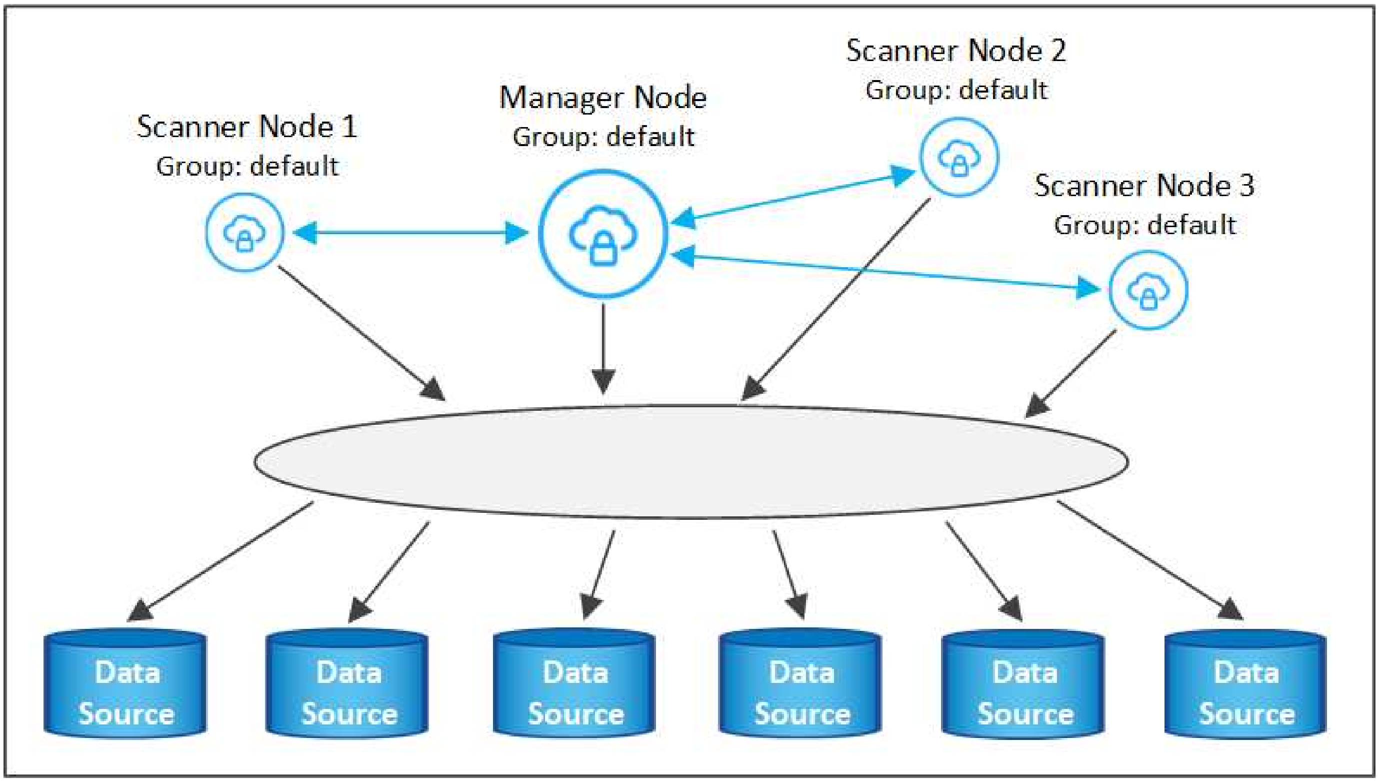
Add scanner nodes to an existing deployment

You can add more scanner nodes if you find that you need more scanning processing power to scan your data sources. You can add the scanner nodes immediately after installing the manager node, or you can add a scanner node later. For example, if you realize that the amount of data in one of your data sources has doubled or tripled in size after 6 months, you can add a new scanner node to assist with data scanning.

There are two ways in which you can add additional scanner nodes:

- add a node to assist with scanning all data sources
- add a node to assist with scanning a specific data source, or a specific group of data sources (typically based on location)

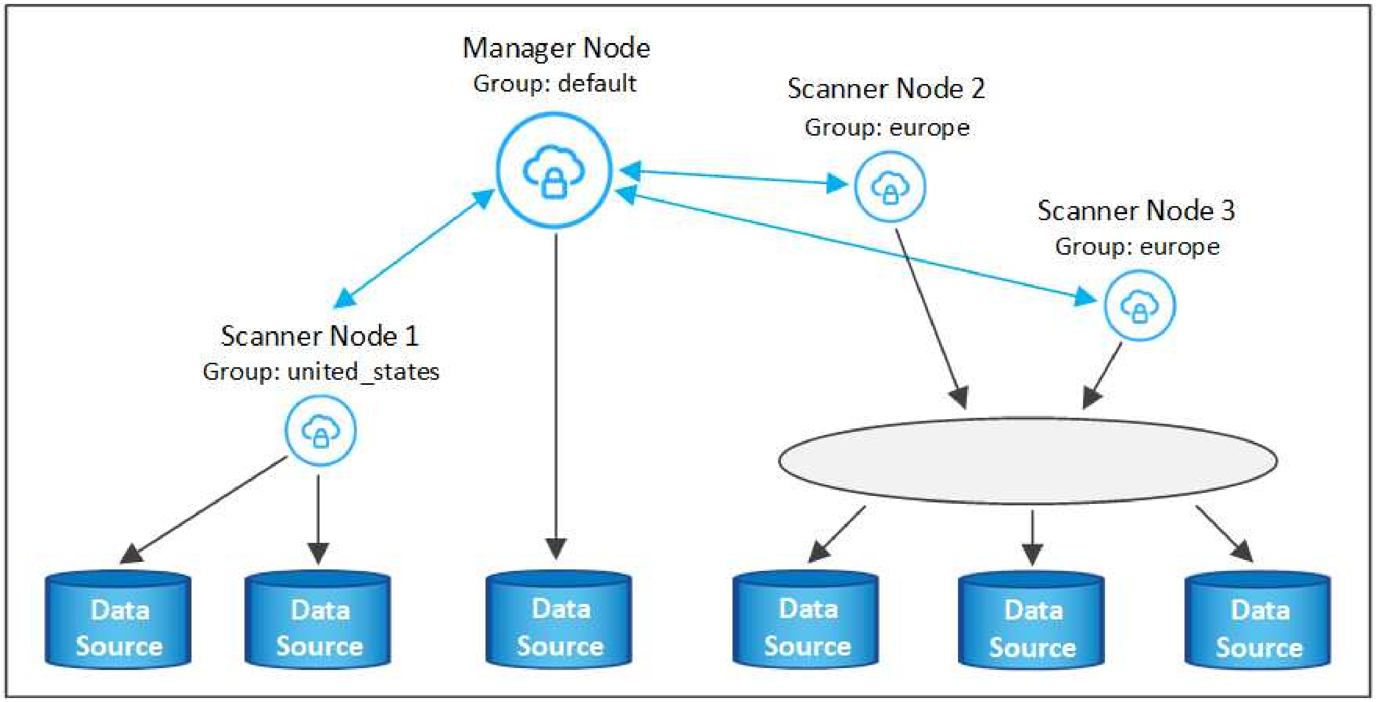
By default, any new scanner nodes you add are added to the general pool of scanning resources. This is called the "default scanner group". In the image below, there is 1 Manager node and 3 Scanner nodes in the "default" group that are all scanning data from all 6 data sources.



If you have certain data sources that you want to be scanned by scanner nodes that are physically closer to the data sources, you can define a scanner node, or group of scanner nodes, to scan a specific data source, or group of data sources. In the image below, there is 1 Manager node and 3 Scanner nodes.

- The Manager node is in the "default" group, and it is scanning 1 data source
- Scanner node 1 is in the "united_states" group, and it is scanning 2 data sources

- Scanner nodes 2 and 3 are in the "europe" group, and they share the scanning tasks for 3 data sources



BlueXP classification scanner groups can be defined as separate geographic areas where your data is stored. You can deploy multiple BlueXP classification scanner nodes around the world and choose a scanner group for each node. In that way, each scanner node will scan the data that is the closest to it. The closer the scanner node is to the data, the better, because it reduces network latency as much as possible while scanning data.

You can choose which scanner groups to add to BlueXP classification and you can choose their names. BlueXP classification does not enforce that a node mapped to a scanner group named "europe" will be deployed in Europe.

You'll follow these steps to install additional BlueXP classification scanner nodes:

1. Prepare the Linux host systems that will act as the Scanner nodes
2. Download the Data Sense software to these Linux systems
3. Run a command on the Manager node to identify the Scanner nodes
4. Follow the steps to deploy the software on the Scanner nodes (and to optionally define a "scanner group" for certain Scanner nodes)
5. If you defined a scanner group, on the Manager node:
   a. Open the file "working_environment_to_scanner_group_config.yml" and define the working environments that will be scanned by each scanner group
   b. Run the following script to register this mapping information with all Scanner nodes: `update_we_scanner_group_from_config_file.sh`

What you'll need

- Verify that all your Linux systems for Scanner nodes meet the host requirements.
- Verify that the systems have the two prerequisite software packages installed (Docker Engine or Podman, and Python 3).
- Make sure you have root privileges on the Linux systems.

- Verify that your environment meets the required permissions and connectivity.
- You must have the IP addresses of the Scanner node hosts that you are adding.
- You must have the IP address of the BlueXP classification Manager node host system
- You must have the IP address or host name of the Connector system, your NetApp Account ID, Connector Client ID, and user access token. If you're planning to use scanner groups, you'll need to know the Working Environment ID for each data source in your account. See ***Prerequisite steps*** below to get this information.
- The following ports and protocols must be enabled on all hosts:

Port	Protocols	Description
2377	TCP	Cluster management communications
7946	TCP, UDP	Inter-node communication
4789	UDP	Overlay network traffic
50	ESP	Encrypted IPsec overlay network (ESP) traffic
111	TCP, UDP	NFS Server for sharing files between the hosts (needed from each scanner node to manager node)
2049	TCP, UDP	NFS Server for sharing files between the hosts (needed from each scanner node to manager node)

- If you are using `firewalld` on your BlueXP classification machines, we recommend that you enable it before installing BlueXP classification. Run the following commands to configure `firewalld` so that it is compatible with BlueXP classification:

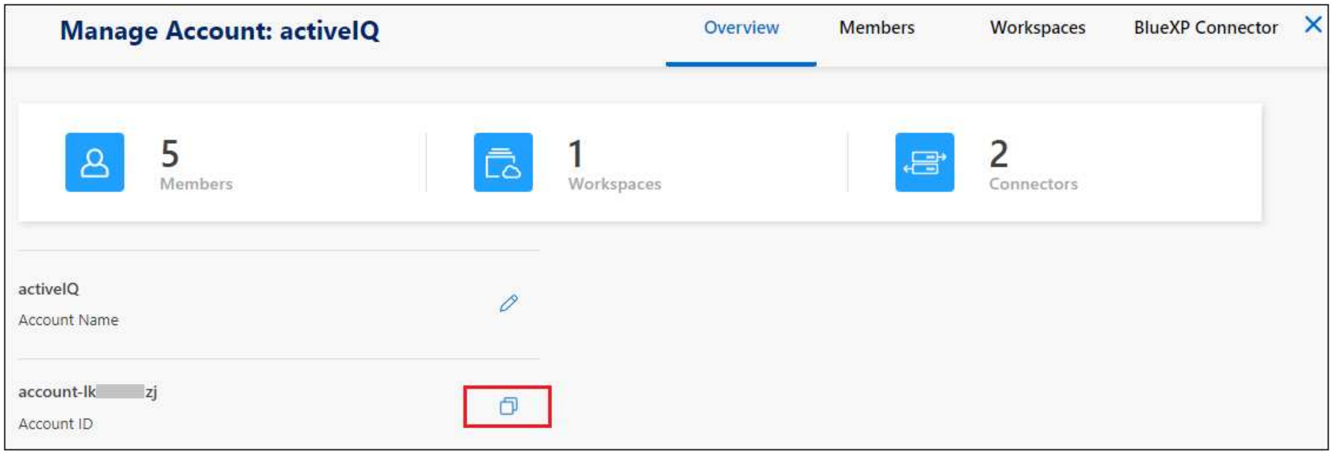
```
firewall-cmd --permanent --add-service=http
firewall-cmd --permanent --add-service=https
firewall-cmd --permanent --add-port=80/tcp
firewall-cmd --permanent --add-port=8080/tcp
firewall-cmd --permanent --add-port=443/tcp
firewall-cmd --permanent --add-port=2377/tcp
firewall-cmd --permanent --add-port=7946/udp
firewall-cmd --permanent --add-port=7946/tcp
firewall-cmd --permanent --add-port=4789/udp
firewall-cmd --reload
```

Note that you must restart Docker or Podman whenever you enable or update `firewalld` settings.

Prerequisite steps

Follow these steps to get the NetApp Account ID, Connector Client ID, Connector Server Name, and user access token that are required to add scanner nodes.

1. From the BlueXP menu bar, click **Account > Manage Accounts**.



Manage Account: activeIQ

5 Members

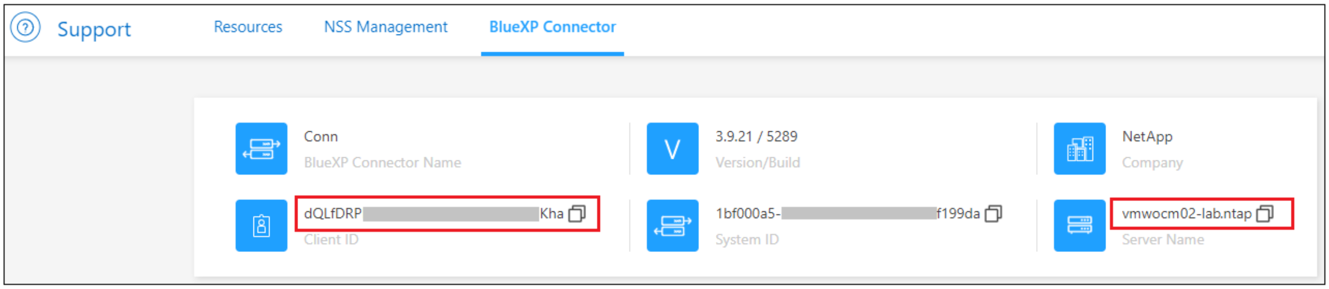
1 Workspaces

2 Connectors

activeIQ
Account Name

account-lk[redacted]zj
Account ID

2. Copy the *Account ID*.
3. From the BlueXP menu bar, click **Help > Support > BlueXP Connector**.



Conn
BlueXP Connector Name

3.9.21 / 5289
Version/Build

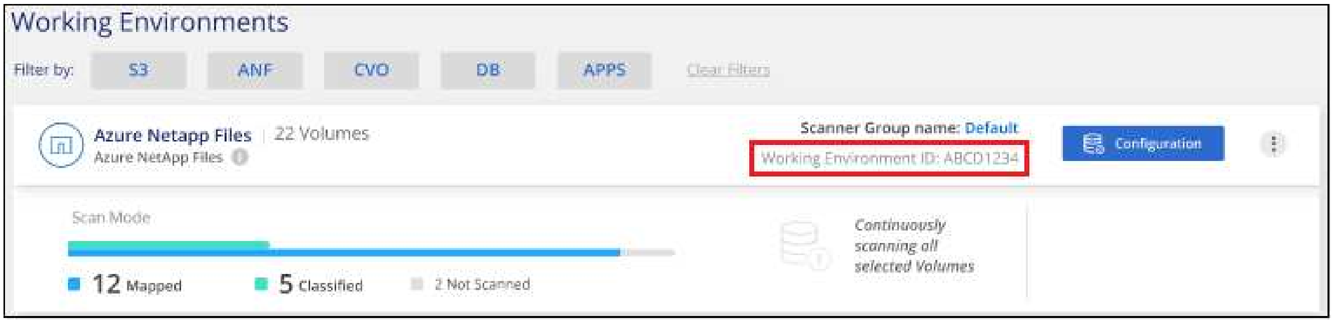
NetApp
Company

dQLfDRP[redacted]Kha
Client ID

1bf000a5-[redacted]f199da
System ID

vmwocm02-lab.ntap
Server Name

4. Copy the connector *Client ID* and the *Server Name*.
5. If you’re planning to use scanner groups, from the BlueXP classification Configuration tab, copy the Working Environment ID for each working environment that you plan to add to a scanner group.



Azure Netapp Files | 22 Volumes
Azure NetApp Files

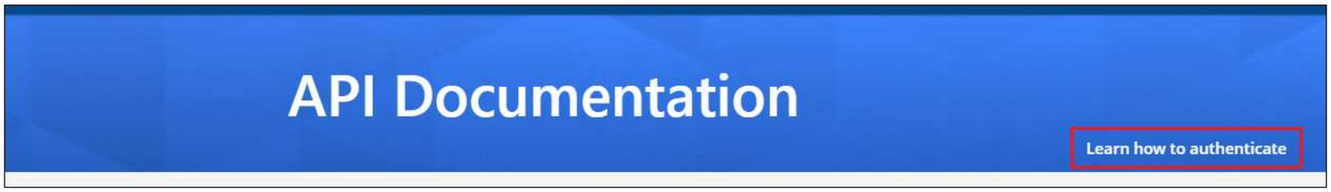
Scanner Group name: Default
Working Environment ID: ABCD1234

Scan Mode

12 Mapped
5 Classified
2 Not Scanned

Continuously scanning all selected Volumes

6. Go to the API Documentation Developer Hub and click **Learn how to authenticate**.



7. Follow the authentication instructions, using the username and password of the account admin in the "username" and "password" parameters.
8. Then copy the *access token* from the response.

Steps

1. On the BlueXP classification Manager node, run the script "add_scanner_node.sh". For example, this command adds 2 scanner nodes:

   ```
   sudo ./add_scanner_node.sh -a <account_id> -c <client_id> -m <cm_host> -h
   <ds_manager_ip> -n <node_private_ip_1,node_private_ip_2> -t <user_token>
   ```

   Variable values:

   - *account_id* = NetApp Account ID
   - *client_id* = Connector Client ID (add the suffix "clients" to the client ID that you copied in the Prerequisite steps)
   - *cm_host* = IP address or host name of the Connector system
   - *ds_manager_ip* = Private IP address of the BlueXP classification Manager node system
   - *node_private_ip* = IP addresses of the BlueXP classification Scanner node systems (multiple scanner node IPs are separated by a comma)
   - *user_token* = JWT user access token

2. Before the add_scanner_node script completes, a dialog displays the installation command needed for the scanner nodes. Copy the command (for example: `sudo ./node_install.sh -m 10.11.12.13 -t ABCDEF1s35212 -u red95467j`) and save it in a text file.

3. On **each** scanner node host:

   a. Copy the Data Sense installer file (**DATASENSE-INSTALLER-<version>.tar.gz**) to the host machine (using `scp` or some other method).

   b. Unzip the installer file.

   c. Paste and execute the command that you copied in step 2.

   d. If you want to add a scanner node into a "scanner group", add the parameter **-r <scanner_group_name>** to the command. Otherwise, the scanner node is added to the "default" group.

      When the installation finishes on all scanner nodes and they have been joined to the manager node, the "add_scanner_node.sh" script finishes as well. The installation can take 10 to 20 minutes.

4. If you added any scanner nodes into a scanner group, return to the Manager node and perform the following 2 tasks:

   a. Open the file "/opt/netapp/Datasense/working_environment_to_scanner_group_config.yml" and enter the mapping for which scanner groups will scan specific working environments. You'll need to have the *Working Environment ID* for each data source. For example, the following entries add 2 working environments to the "europe" scanner group and 2 to the "united_states" scanner group:

```
scanner_groups:
 europe:
   working_environments:
     - "working_environment_id1"
     - "working_environment_id2"
 united_states:
   working_environments:
     - "working_environment_id3"
     - "working_environment_id4"
```

Any working environment that is not added to the list is scanned by the "default" group - you must have at least one manager or scanner node in the "default" group.

b. Run the following script to register this mapping information with all Scanner nodes: `/opt/netapp/Datasense/tools/update_we_scanner_group_from_config_file.sh`

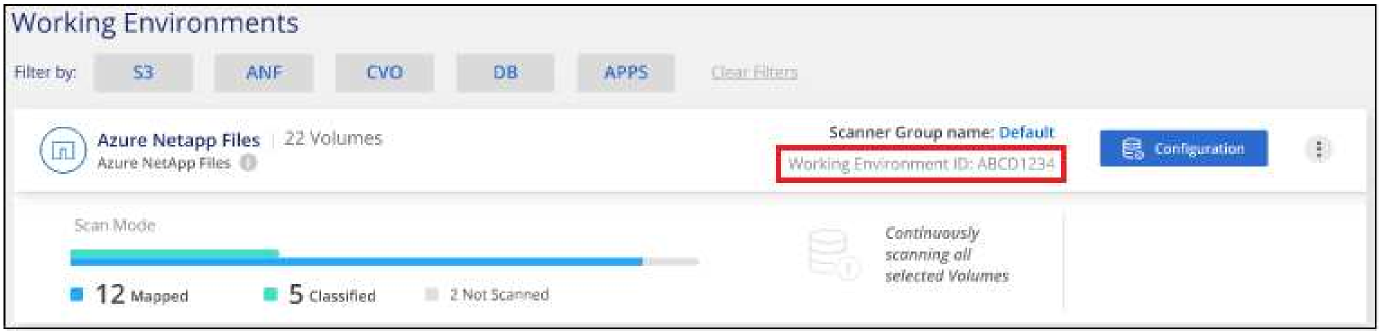
Result

BlueXP classification is set up with Manager and Scanner nodes to scan all your data sources.

What’s Next

From the Configuration page you can select the data sources that you want to scan - if you haven’t already done that. If you created scanner groups, each data source is scanned by the Scanner nodes in the respective group.

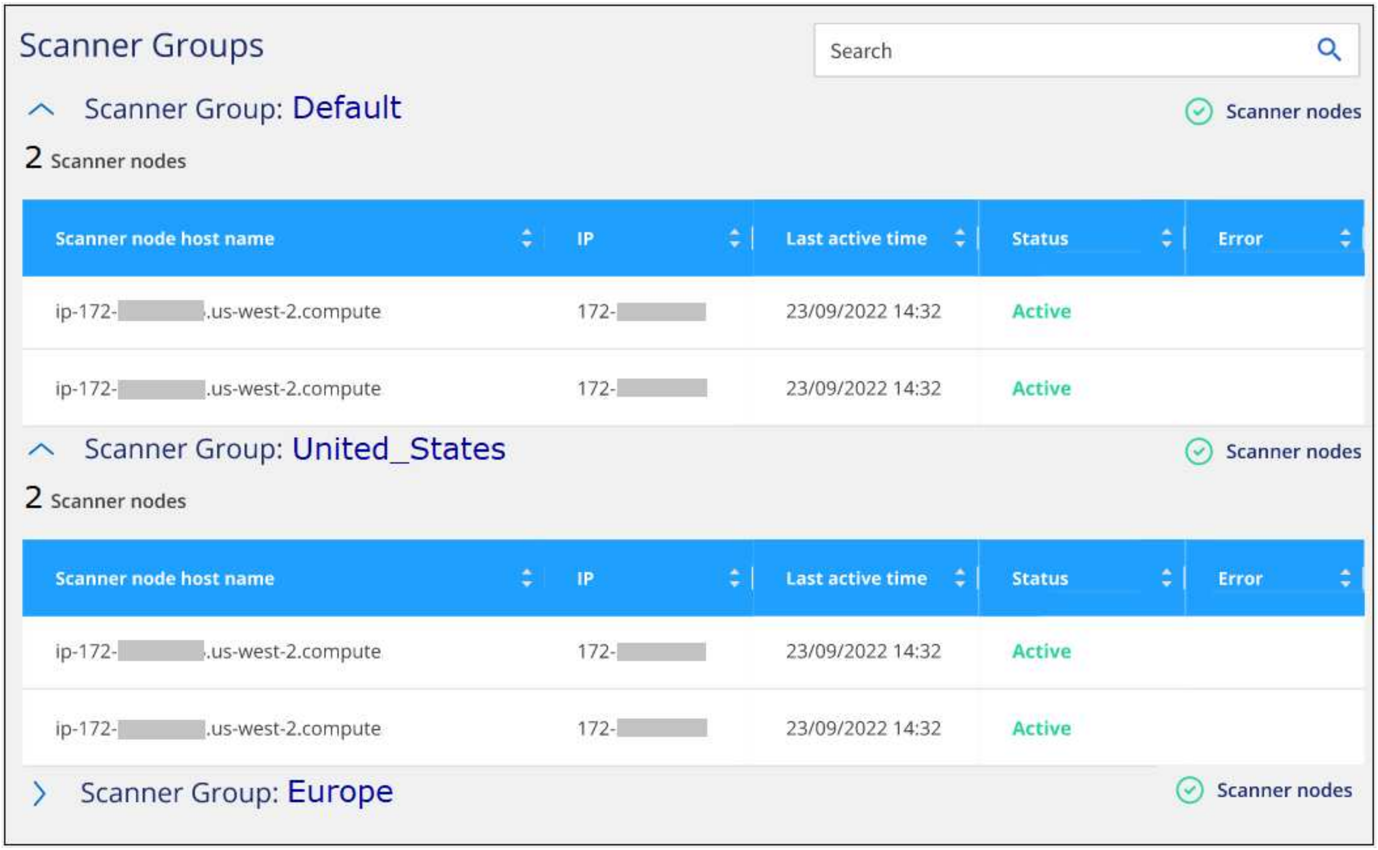
You can see the Scanner Group name for each working environment in the Configuration page.



Scanner Group name: Default

Working Environment ID: ABCD1234

You can also see the list of all scanner groups along with the IP address and status for each scanner node in the group in the bottom of the Configuration page.



Scanner Group: Default ✓ Scanner nodes

2 Scanner nodes

Scanner node host name	IP	Last active time	Status	Error
ip-172-[redacted].us-west-2.compute	172-[redacted]	23/09/2022 14:32	Active	
ip-172-[redacted].us-west-2.compute	172-[redacted]	23/09/2022 14:32	Active	

Scanner Group: United_States ✓ Scanner nodes

2 Scanner nodes

Scanner node host name	IP	Last active time	Status	Error
ip-172-[redacted].us-west-2.compute	172-[redacted]	23/09/2022 14:32	Active	
ip-172-[redacted].us-west-2.compute	172-[redacted]	23/09/2022 14:32	Active	

Scanner Group: Europe ✓ Scanner nodes

You can set up licensing for BlueXP classification at this time. You will not be charged until your 30-day free trial ends.

Multi-host installation for large configurations

For very large configurations where you'll be scanning petabytes of data, you can include multiple hosts to provide additional processing power. When using multiple host systems, the primary system is called the *Manager node* and the additional systems that provide extra processing power are called *Scanner nodes*.

Follow these steps when installing BlueXP classification software on multiple on-premises hosts at the same time. Note that you can't use "scanner groups" when deploying multiple hosts in this fashion.

What you'll need

- Verify that all your Linux systems for the Manager and Scanner nodes meet the host requirements.
- Verify that the systems have the two prerequisite software packages installed (Docker or Podman Engine, and Python 3).
- Make sure you have root privileges on the Linux systems.
- Verify that your environment meets the required permissions and connectivity.
- You must have the IP addresses of the scanner node hosts that you plan to use.
- The following ports and protocols must be enabled on all hosts:

Port	Protocols	Description
2377	TCP	Cluster management communications
7946	TCP, UDP	Inter-node communication

Port	Protocols	Description
4789	UDP	Overlay network traffic
50	ESP	Encrypted IPsec overlay network (ESP) traffic
111	TCP, UDP	NFS Server for sharing files between the hosts (needed from each scanner node to manager node)
2049	TCP, UDP	NFS Server for sharing files between the hosts (needed from each scanner node to manager node)

Steps

1. Follow steps 1 through 7 from the Single-host installation on the manager node.
2. As shown in step 8, when prompted by the installer, you can enter the required values in a series of prompts, or you can provide the required parameters as command line arguments to the installer.

   In addition to the variables available for a single-host installation, a new option **-n <node_ip>** is used to specify the IP addresses of the scanner nodes. Multiple scanner node IPs are separated by a comma.

   For example, this command adds 3 scanner nodes:

   ```
   sudo ./install.sh -a <account_id> -c <client_id> -t <user_token> --host
   <ds_host> --manager-host <cm_host> -n <node_ip1>,<node_ip2>,<node_ip3> --proxy
   -host <proxy_host> --proxy-port <proxy_port> --proxy-scheme <proxy_scheme>
   --proxy-user <proxy_user> --proxy-password <proxy_password>
   ```

3. Before the manager node installation completes, a dialog displays the installation command needed for the scanner nodes. Copy the command (for example, `sudo ./node_install.sh -m 10.11.12.13 -t ABCDEF-1-3u69m1-1s35212`) and save it in a text file.
4. On **each** scanner node host:
   a. Copy the Data Sense installer file (**DATASENSE-INSTALLER-<version>.tar.gz**) to the host machine (using `scp` or some other method).
   b. Unzip the installer file.
   c. Paste and execute the command that you copied in step 3.

      When the installation finishes on all scanner nodes and they have been joined to the manager node, the manager node installation finishes as well.

Result

The BlueXP classification installer finishes installing packages, and registers the installation. Installation can take 10 to 20 minutes.

What's Next

From the Configuration page you can select the data sources that you want to scan.

You can also set up licensing for BlueXP classification at this time. You will not be charged until your 30-day free trial ends.

Install BlueXP classification on a host with no internet access

Complete a few steps to install BlueXP classification on a Linux host in an on-premises site that doesn’t have internet access - also known as "private mode". This type of installation is perfect for your secure sites.

Learn about the different deployment modes for the BlueXP Connector and BlueXP classification.

Note that you can also deploy BlueXP classification in an on-premises site that has internet access.

The BlueXP classification installation script starts by checking if the system and environment meet the required prerequisites. If the prerequisites are all met, then the installation starts. If you would like to verify the prerequisites independently of running the BlueXP classification installation, there is a separate software package you can download that only tests for the prerequisites. See how to check if your Linux host is ready to install BlueXP classification.

Supported data sources

When installed private mode (sometimes called an "offline" or "dark" site), BlueXP classification can only scan data from data sources that are also local to the on-premises site. At this time, BlueXP classification can scan the following **local** data sources:

- On-premises ONTAP systems
- Database schemas
- SharePoint On-Premises accounts (SharePoint Server)
- Non-NetApp NFS or CIFS file shares
- Object Storage that uses the Simple Storage Service (S3) protocol

There is no support currently for scanning Cloud Volumes ONTAP, Azure NetApp Files, FSx for ONTAP, AWS S3, or Google Drive, OneDrive, or SharePoint Online accounts when BlueXP classification is deployed in private mode.

Limitations

Most BlueXP classification features work when it is deployed in a site with no internet access. However, certain features that require internet access are not supported, for example:

- Managing Microsoft Azure Information Protection (AIP) labels
- Sending email alerts to BlueXP users when certain critical Policies return results
- Setting BlueXP roles for different users (for example, Account Admin or Compliance Viewer)
- Copying and synchronizing source files using BlueXP copy and sync
- Receiving user feedback
- Automated software upgrades from BlueXP

  Both the BlueXP Connector and BlueXP classification will require periodic manual upgrades to enable new features. You can see the BlueXP classification version at the bottom of the BlueXP classification UI pages. Check the BlueXP classification Release Notes to see the new features in each release and whether you want those features. Then you can follow the steps to upgrade the BlueXP Connector and upgrade your

BlueXP classification software.

Quick start

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

1 **Install the BlueXP Connector**

If you don’t already have a Connector installed in private mode, deploy the Connector on a Linux host now.

2 **Review BlueXP classification prerequisites**

Ensure that your Linux system meets the host requirements, that it has all required software installed, and that your offline environment meets the required permissions and connectivity.

3 **Download and deploy BlueXP classification**

Download the BlueXP classification software from the NetApp Support Site and copy the installer file to the Linux host you plan to use. Then launch the installation wizard and follow the prompts to deploy the BlueXP classification instance.

4 **Subscribe to the BlueXP classification service**

The first 1 TB of data that BlueXP classification scans in BlueXP is free for 30 days. A BYOL license from NetApp is required to continue scanning data after that point.

Install the BlueXP Connector

If you don’t already have a BlueXP Connector installed in private mode, deploy the Connector on a Linux host in your offline site.

Prepare the Linux host system

BlueXP classification software must run on a host that meets specific operating system requirements, RAM requirements, software requirements, and so on.

- BlueXP classification is not supported on a host that is shared with other applications - the host must be a dedicated host.
- When building the host system in your premises, you can choose among three system sizes depending on the size of the data set that you plan to have BlueXP classification scan.

System size	CPU	RAM (swap memory must be disabled)	Disk
Extra Large	32 CPUs	128 GB RAM	1 TiB SSD on /, or - 100 GiB available on /opt - 895 GiB available on /var/lib/docker - 5 GiB on /tmp

System size	CPU	RAM (swap memory must be disabled)	Disk
Large	16 CPUs	64 GB RAM	500 GiB SSD on /, or - 100 GiB available on /opt - 395 GiB available on /var/lib/docker - 5 GiB on /tmp
Medium	8 CPUs	32 GB RAM	200 GiB SSD on /, or - 50 GiB available on /opt - 145 GiB available on /var/lib/docker - 5 GiB on /tmp
Small	8 CPUs	16 GB RAM	100 GiB SSD on /, or - 50 GiB available on /opt - 45 GiB available on /var/lib/docker - 5 GiB on /tmp

Note that there are limitations when using the smaller systems. See Using a smaller instance type for details.

- When deploying a compute instance in the cloud for your BlueXP classification installation, we recommend a system that meets the "Large" system requirements above:
  - **AWS EC2 instance type**: We recommend "m6i.4xlarge". See additional AWS instance types.
  - **Azure VM size**: We recommend "Standard_D16s_v3". See additional Azure instance types.
  - **GCP machine type**: We recommend "n2-standard-16". See additional GCP instance types.
- **UNIX folder permissions**: The following minimum UNIX permissions are required:

Folder	Minimum Permissions
/tmp	`rwxrwxrwt`
/opt	`rwxr-xr-x`
/var/lib/docker	`rwx------`
/usr/lib/systemd/system	`rwxr-xr-x`

- **Operating system**:
  - The following operating systems require using the Docker container engine:
    - Red Hat Enterprise Linux version 7.8 and 7.9
    - CentOS version 7.8 and 7.9
    - Ubuntu 22.04 (requires BlueXP classification version 1.23 or greater)
  - The following operating systems require using the Podman container engine, and they require BlueXP classification version 1.26 or greater:
    - Red Hat Enterprise Linux version 9.0, 9.1, and 9.2

      Note that the following features are not currently supported when using RHEL 9.x:

            - Installation in a dark site
            - Distributed scanning; using a master scanner node and remote scanner nodes

- **Red Hat Subscription Management**: The host must be registered with Red Hat Subscription Management. If it’s not registered, the system can’t access repositories to update required 3rd-party software during installation.
- **Additional software**: You must install the following software on the host before you install BlueXP classification:
    - Depending on the OS you are using, you’ll need to install one of the container engines:
        - Docker Engine version 19.3.1 or greater. View installation instructions.

          Watch this video for a quick demo of installing Docker on CentOS.
        - Podman version 4 or greater. To install Podman, update your system packages (`sudo yum update -y`), and then install Podman (`sudo yum install podman -y`).
    - Python version 3.6 or greater. View installation instructions.
- **NTP considerations**: NetApp recommends configuring the BlueXP classification system to use a Network Time Protocol (NTP) service. The time must be synchronized between the BlueXP classification system and the BlueXP Connector system.
- **Firewalld considerations**: If you are planning to use `firewalld`, we recommend that you enable it before installing BlueXP classification. Run the following commands to configure `firewalld` so that it is compatible with BlueXP classification:

  ```
  firewall-cmd --permanent --add-service=http
  firewall-cmd --permanent --add-service=https
  firewall-cmd --permanent --add-port=80/tcp
  firewall-cmd --permanent --add-port=8080/tcp
  firewall-cmd --permanent --add-port=443/tcp
  firewall-cmd --reload
  ```

  Note that you must restart Docker or Podman whenever you enable or update `firewalld` settings.

> The IP address of the BlueXP classification host system can’t be changed after installation.

Verify BlueXP and BlueXP classification prerequisites

Review the following prerequisites to make sure that you have a supported configuration before you deploy BlueXP classification.

- Ensure that the Connector has permissions to deploy resources and create security groups for the BlueXP classification instance. You can find the latest BlueXP permissions in the policies provided by NetApp.
- Ensure that you can keep BlueXP classification running. The BlueXP classification instance needs to stay on to continuously scan your data.
- Ensure web browser connectivity to BlueXP classification. After BlueXP classification is enabled, ensure that users access the BlueXP interface from a host that has a connection to the BlueXP classification instance.

The BlueXP classification instance uses a private IP address to ensure that the indexed data isn’t accessible to others. As a result, the web browser that you use to access BlueXP must have a connection to that private IP address. That connection can come from a host that’s inside the same network as the BlueXP classification instance.

Verify that all required ports are enabled

You must ensure that all required ports are open for communication between the Connector, BlueXP classification, Active Directory, and your data sources.

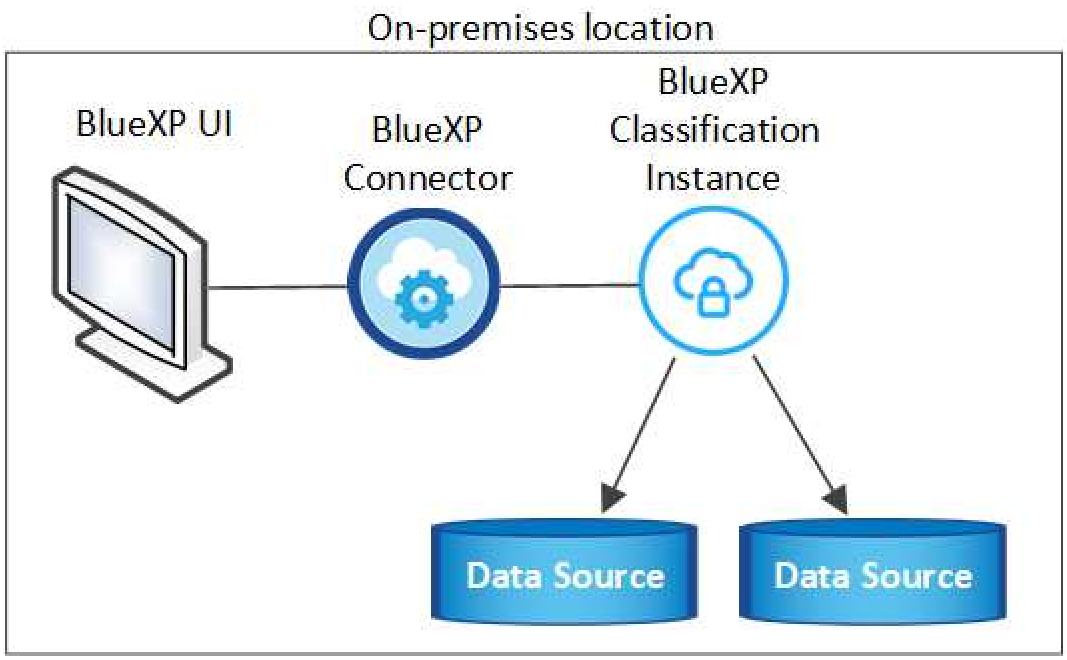
Connection Type	Ports	Description
Connector <> BlueXP classification	8080 (TCP), 6000 (TCP), 443 (TCP), and 80	The security group for the Connector must allow inbound and outbound traffic over ports 6000 and 443 to and from the BlueXP classification instance. • Port 6000 is required so that the BlueXP classification BYOL license works in a dark site. • Port 8080 should be open so you can see the installation progress in BlueXP.
Connector <> ONTAP cluster (NAS)	443 (TCP)	BlueXP discovers ONTAP clusters using HTTPS. If you use custom firewall policies, they must meet the following requirements: • The Connector host must allow outbound HTTPS access through port 443. If the Connector is in the cloud, all outbound communication is allowed by the predefined security group. • The ONTAP cluster must allow inbound HTTPS access through port 443. The default "mgmt" firewall policy allows inbound HTTPS access from all IP addresses. If you modified this default policy, or if you created your own firewall policy, you must associate the HTTPS protocol with that policy and enable access from the Connector host.

Connection Type	Ports	Description
BlueXP classification <> ONTAP cluster	• For NFS - 111 (TCP\UDP) and 2049 (TCP\UDP) • For CIFS - 139 (TCP\UDP) and 445 (TCP\UDP)	BlueXP classification needs a network connection to each Cloud Volumes ONTAP subnet or on-prem ONTAP system. Security groups for Cloud Volumes ONTAP must allow inbound connections from the BlueXP classification instance. Make sure these ports are open to the BlueXP classification instance: • For NFS - 111 and 2049 • For CIFS - 139 and 445 NFS volume export policies must allow access from the BlueXP classification instance.
BlueXP classification <> Active Directory	389 (TCP & UDP), 636 (TCP), 3268 (TCP), and 3269 (TCP)	You must have an Active Directory already set up for the users in your company. Additionally, BlueXP classification needs Active Directory credentials to scan CIFS volumes. You must have the information for the Active Directory: • DNS Server IP Address, or multiple IP Addresses • User Name and Password for the server • Domain Name (Active Directory Name) • Whether you are using secure LDAP (LDAPS) or not • LDAP Server Port (typically 389 for LDAP, and 636 for secure LDAP)

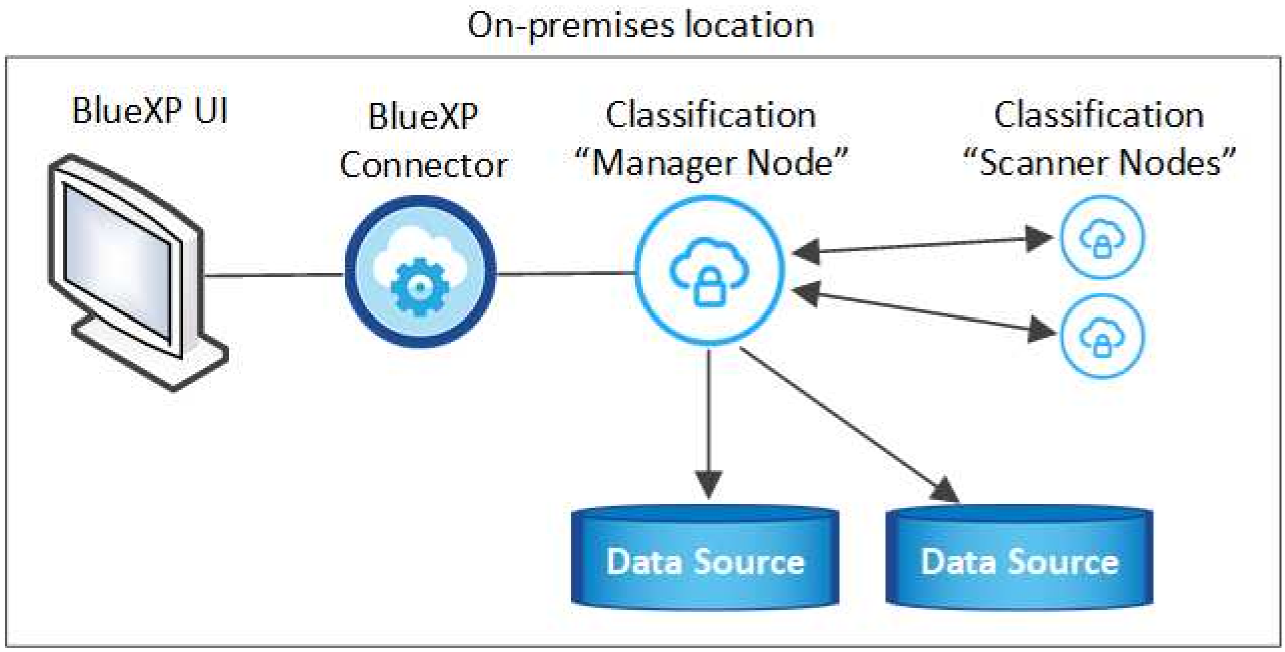
If you are using multiple BlueXP classification hosts to provide additional processing power to scan your data sources, you'll need to enable additional ports/protocols. See the additional port requirements.

Install BlueXP classification on the on-premises Linux host

For typical configurations you'll install the software on a single host system. See those steps here.



For very large configurations where you'll be scanning petabytes of data, you can include multiple hosts to provide additional processing power. See those steps here.



Single-host installation for typical configurations

Follow these steps when installing BlueXP classification software on a single on-premises host in an offline environment.

Note that all installation activities are logged when installing BlueXP classification. If you run into any issues during installation, you can view the contents of the installation audit log. It is written to `/opt/netapp/install_logs/`. See more details here.

What you'll need

- Verify that your Linux system meets the host requirements.
- Verify that you have installed the two prerequisite software packages (Docker Engine or Podman, and Python 3).
- Make sure you have root privileges on the Linux system.
- Verify that your offline environment meets the required permissions and connectivity.

Steps

1. On an internet-configured system, download the BlueXP classification software from the NetApp Support Site. The file you should select is named **DataSense-offline-bundle-<version>.tar.gz**.
2. Copy the installer bundle to the Linux host you plan to use in private mode.
3. Unzip the installer bundle on the host machine, for example:

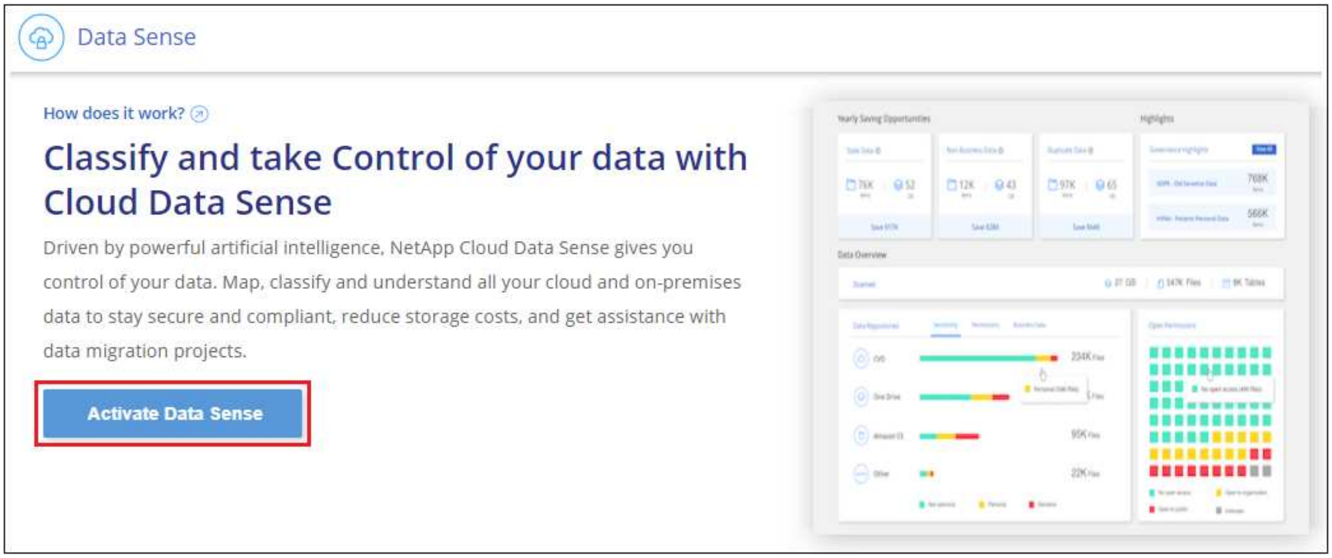
   ```
   tar -xzf DataSense-offline-bundle-v1.25.0.tar.gz
   ```

   This extracts required software and the actual installation file **cc_onprem_installer.tar.gz**.

4. Unzip the installation file on the host machine, for example:

   ```
   tar -xzf cc_onprem_installer.tar.gz
   ```

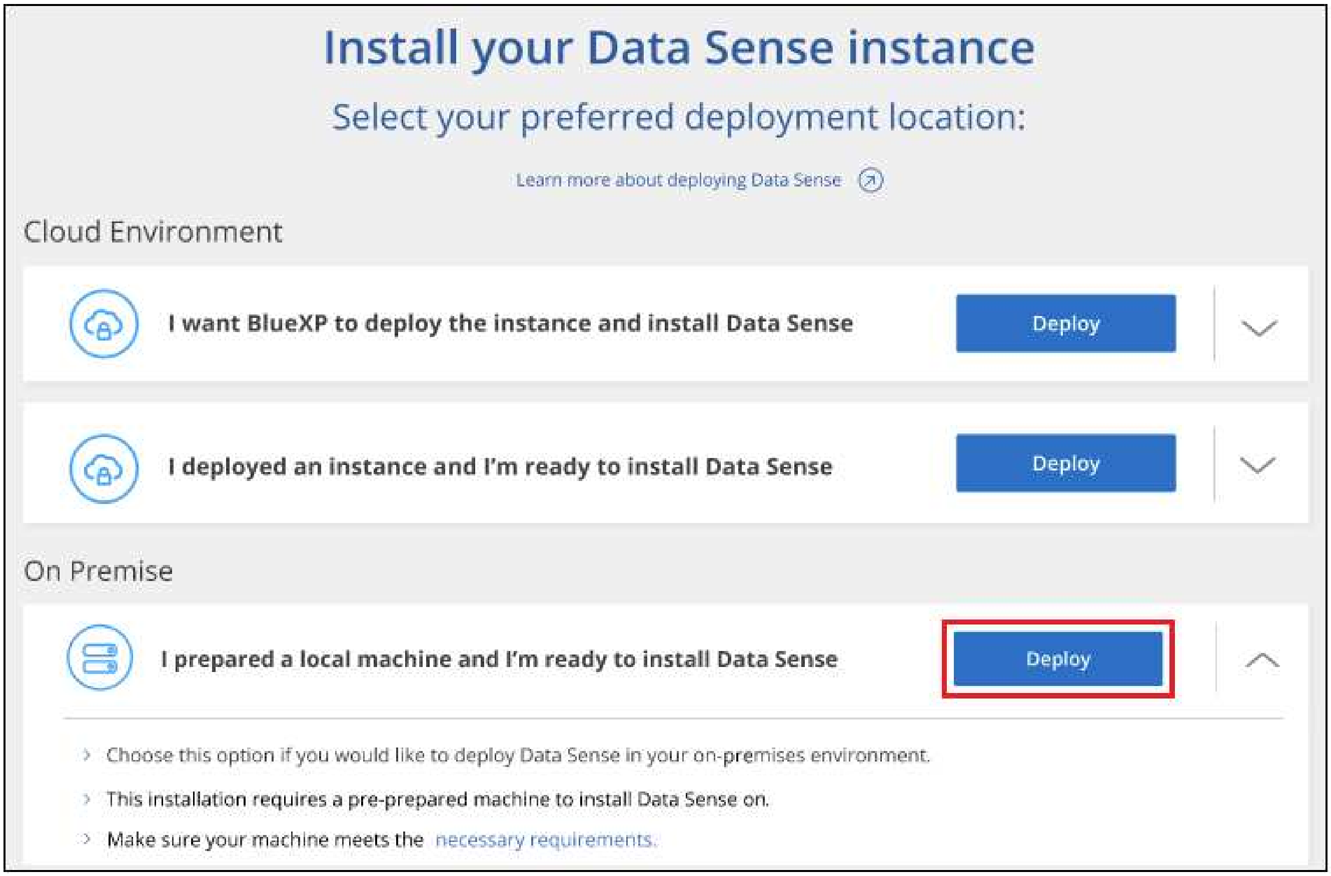
5. Launch BlueXP and select **Governance > Classification**.
6. Click **Activate Data Sense**.



Classify and take Control of your data with Cloud Data Sense

Driven by powerful artificial intelligence, NetApp Cloud Data Sense gives you control of your data. Map, classify and understand all your cloud and on-premises data to stay secure and compliant, reduce storage costs, and get assistance with data migration projects.

7. Click **Deploy** to start the on-prem installation.



Install your Data Sense instance

Select your preferred deployment location:

Learn more about deploying Data Sense

Cloud Environment

I want BlueXP to deploy the instance and install Data Sense

I deployed an instance and I'm ready to install Data Sense

On Premise

I prepared a local machine and I'm ready to install Data Sense

- Choose this option if you would like to deploy Data Sense in your on-premises environment.
- This installation requires a pre-prepared machine to install Data Sense on.
- Make sure your machine meets the necessary requirements.

8. The *Deploy Data Sense On Premises* dialog is displayed. Copy the provided command (for example: `sudo ./install.sh -a 12345 -c 27AG75 -t 2198qq --darksite`) and paste it in a text file so you can use it later. Then click **Close** to dismiss the dialog.
9. On the host machine, enter the command you copied and then follow a series of prompts, or you can provide the full command including all required parameters as command line arguments.

   Note that the installer performs a pre-check to make sure your system and networking requirements are in place for a successful installation.

Enter parameters as prompted:	Enter the full command:
1. Paste the information you copied from step 8: `sudo ./install.sh -a <account_id> -c <client_id> -t <user_token> --darksite` 2. Enter the IP address or host name of the BlueXP classification host machine so it can be accessed by the Connector system. 3. Enter the IP address or host name of the BlueXP Connector host machine so it can be accessed by the BlueXP classification system.	Alternatively, you can create the whole command in advance, providing the necessary host parameters: `sudo ./install.sh -a <account_id> -c <client_id> -t <user_token> --host <ds_host> --manager-host <cm_host> --no-proxy --darksite`

Variable values:

- *account_id* = NetApp Account ID

- *client_id* = Connector Client ID (add the suffix "clients" to the client ID if it not already there)
- *user_token* = JWT user access token
- *ds_host* = IP address or host name of the BlueXP classification system.
- *cm_host* = IP address or host name of the BlueXP Connector system.

Result

The BlueXP classification installer installs packages, registers the installation, and installs BlueXP classification. Installation can take 10 to 20 minutes.

If there is connectivity over port 8080 between the host machine and the Connector instance, you'll see the installation progress in the BlueXP classification tab in BlueXP.

What's Next

From the Configuration page you can select the local on-prem ONTAP clusters and databases that you want to scan.

You can also set up BYOL licensing for BlueXP classification from the BlueXP digital wallet page at this time. You will not be charged until your 30-day free trial ends.

Multi-host installation for large configurations

For very large configurations where you'll be scanning petabytes of data, you can include multiple hosts to provide additional processing power. When using multiple host systems, the primary system is called the *Manager node* and the additional systems that provide extra processing power are called *Scanner nodes*.

Follow these steps when installing BlueXP classification software on multiple on-premises hosts in an offline environment.

What you'll need

- Verify that all your Linux systems for the Manager and Scanner nodes meet the host requirements.
- Verify that you have installed the two prerequisite software packages (Docker Engine or Podman, and Python 3).
- Make sure you have root privileges on the Linux systems.
- Verify that your offline environment meets the required permissions and connectivity.
- You must have the IP addresses of the scanner node hosts that you plan to use.
- The following ports and protocols must be enabled on all hosts:

Port	Protocols	Description
2377	TCP	Cluster management communications
7946	TCP, UDP	Inter-node communication
4789	UDP	Overlay network traffic
50	ESP	Encrypted IPsec overlay network (ESP) traffic
111	TCP, UDP	NFS Server for sharing files between the hosts (needed from each scanner node to manager node)
2049	TCP, UDP	NFS Server for sharing files between the hosts (needed from each scanner node to manager node)

Steps

1. Follow steps 1 through 8 from the Single-host installation on the manager node.
2. As shown in step 9, when prompted by the installer, you can enter the required values in a series of prompts, or you can provide the required parameters as command line arguments to the installer.

   In addition to the variables available for a single-host installation, a new option **-n <node_ip>** is used to specify the IP addresses of the scanner nodes. Multiple node IPs are separated by a comma.

   For example, this command adds 3 scanner nodes:

   ```
   sudo ./install.sh -a <account_id> -c <client_id> -t <user_token> --host <ds_host> --manager-host <cm_host> -n <node_ip1>,<node_ip2>,<node_ip3> --no-proxy --darksite
   ```

3. Before the manager node installation completes, a dialog displays the installation command needed for the scanner nodes. Copy the command (for example: `sudo ./node_install.sh -m 10.11.12.13 -t ABCDEF-1-3u69m1-1s35212`) and save it in a text file.
4. On **each** scanner node host:
   1. Copy the Data Sense installer file (**cc_onprem_installer.tar.gz**) to the host machine.
   2. Unzip the installer file.
   3. Paste and run the command that you copied in step 3.

      When the installation finishes on all scanner nodes and they have been joined to the manager node, the manager node installation finishes as well.

Result

The BlueXP classification installer finishes installing packages, and registers the installation. Installation can take 15 to 25 minutes.

What's Next

From the Configuration page you can select the local on-prem ONTAP clusters and local databases that you want to scan.

You can also set up BYOL licensing for BlueXP classification from the BlueXP digital wallet page at this time. You will not be charged until your 30-day free trial ends.

Upgrade BlueXP classification software

Since BlueXP classification software is updated with new features on a regular basis, you should get into a routine to check for new versions periodically to make sure you're using the newest software and features. You'll need to upgrade BlueXP classification software manually because there's no internet connectivity to perform the upgrade automatically.

Before you begin

- We recommend that your BlueXP Connector software is upgraded to the newest available version. See the Connector upgrade steps.
- Starting with BlueXP classification version 1.24 you can perform upgrades to any future version of software.

  If your BlueXP classification software is running a version prior to 1.24, you can upgrade only one major version at a time. For example, if you have version 1.21.x installed, you can upgrade only to 1.22.x. If you are a few major versions behind, you’ll need to upgrade the software multiple times.

Steps

1. On an internet-configured system, download the BlueXP classification software from the NetApp Support Site. The file you should select is named **DataSense-offline-bundle-<version>.tar.gz**.
2. Copy the software bundle to the Linux host where BlueXP classification is installed in the dark site.
3. Unzip the software bundle on the host machine, for example:

   ```
   tar -xvf DataSense-offline-bundle-v1.25.0.tar.gz
   ```

   This extracts the installation file **cc_onprem_installer.tar.gz**.

4. Unzip the installation file on the host machine, for example:

   ```
   tar -xzf cc_onprem_installer.tar.gz
   ```

   This extracts the upgrade script **start_darksite_upgrade.sh** and any required third-party software.

5. Run the upgrade script on the host machine, for example:

   ```
   start_darksite_upgrade.sh
   ```

Result

The BlueXP classification software is upgraded on your host. The update can take 5 to 10 minutes.

Note that no upgrade is required on scanner nodes if you have deployed BlueXP classification on multiple hosts systems for scanning very large configurations.

You can verify that the software has been updated by checking the version at the bottom of the BlueXP classification UI pages.

Check that your Linux host is ready to install BlueXP classification

Before installing BlueXP classification manually on a Linux host, you can run a script on the host to verify that all the prerequisites are in place for installing BlueXP classification. You can run this script on a Linux host in your network, or on a Linux host in the cloud. The host can be connected to the internet, or the host can reside in a site that doesn’t have internet access (a "dark site").

There is also a prerequisite test script that is part of the BlueXP classification installation script. The script described here is specifically designed for users who want to verify the Linux host independently of running the BlueXP classification installation script.

Getting Started

You’ll perform the following tasks.

1. Optionally, install a BlueXP Connector if you don’t already have one installed. You can run the test script without having a Connector installed, but the script checks for connectivity between the Connector and the BlueXP classification host machine - so it is recommended that you have a Connector.
2. Prepare the host machine and verify that it meets all the requirements.
3. Enable outbound internet access from the BlueXP classification host machine.
4. Verify that all required ports are enabled on all systems.
5. Download and run the Prerequisite test script.

Create a Connector

A BlueXP Connector is required before you can install and use BlueXP classification. You can, however, run the Prerequisites script without a Connector.

You can install the Connector on-premises on a Linux host in your network or on a Linux host in the cloud. Some users planning to install BlueXP classification on-prem may also choose to install the Connector on-prem.

To create a Connector in your cloud provider environment, see creating a Connector in AWS, creating a Connector in Azure, or creating a Connector in GCP.

You’ll need the IP address or host name of the Connector system when running the Prerequisites script. You’ll have this information if you installed the Connector in your premises. If the Connector is deployed in the cloud, you can find this information from the BlueXP console: click the Help icon, select **Support**, and click **BlueXP Connector**.

Verify host requirements

BlueXP classification software must run on a host that meets specific operating system requirements, RAM requirements, software requirements, and so on.

- BlueXP classification is not supported on a host that is shared with other applications - the host must be a dedicated host.
- When building the host system in your premises, you can choose among three system sizes depending on the size of the data set that you plan to have BlueXP classification scan.

System size	CPU	RAM (swap memory must be disabled)	Disk
Extra Large	32 CPUs	128 GB RAM	1 TiB SSD on /, or - 100 GiB available on /opt - 895 GiB available on /var/lib/docker - 5 GiB on /tmp

System size	CPU	RAM (swap memory must be disabled)	Disk
Large	16 CPUs	64 GB RAM	500 GiB SSD on /, or - 100 GiB available on /opt - 395 GiB available on /var/lib/docker - 5 GiB on /tmp
Medium	8 CPUs	32 GB RAM	200 GiB SSD on /, or - 50 GiB available on /opt - 145 GiB available on /var/lib/docker - 5 GiB on /tmp
Small	8 CPUs	16 GB RAM	100 GiB SSD on /, or - 50 GiB available on /opt - 45 GiB available on /var/lib/docker - 5 GiB on /tmp

Note that there are limitations when using the smaller systems. See Using a smaller instance type for details.

- When deploying a compute instance in the cloud for your BlueXP classification installation, we recommend a system that meets the "Large" system requirements above:
  - **AWS EC2 instance type**: We recommend "m6i.4xlarge". See additional AWS instance types.
  - **Azure VM size**: We recommend "Standard_D16s_v3". See additional Azure instance types.
  - **GCP machine type**: We recommend "n2-standard-16". See additional GCP instance types.
- **UNIX folder permissions**: The following minimum UNIX permissions are required:

Folder	Minimum Permissions
/tmp	`rwxrwxrwt`
/opt	`rwxr-xr-x`
/var/lib/docker	`rwx------`
/usr/lib/systemd/system	`rwxr-xr-x`

- **Operating system**:
  - The following operating systems require using the Docker container engine:
    - Red Hat Enterprise Linux version 7.8 and 7.9
    - CentOS version 7.8 and 7.9
    - Ubuntu 22.04 (requires BlueXP classification version 1.23 or greater)
  - The following operating systems require using the Podman container engine, and they require BlueXP classification version 1.26 or greater:
    - Red Hat Enterprise Linux version 9.0, 9.1, and 9.2

      Note that the following features are not currently supported when using RHEL 9.x:

        - Installation in a dark site
        - Distributed scanning; using a master scanner node and remote scanner nodes

- **Red Hat Subscription Management**: The host must be registered with Red Hat Subscription Management. If it's not registered, the system can't access repositories to update required 3rd-party software during installation.
- **Additional software**: You must install the following software on the host before you install BlueXP classification:
    - Depending on the OS you are using, you'll need to install one of the container engines:
        - Docker Engine version 19.3.1 or greater. View installation instructions.

          Watch this video for a quick demo of installing Docker on CentOS.

        - Podman version 4 or greater. To install Podman, update your system packages (`sudo yum update -y`), and then install Podman (`sudo yum install podman -y`).
    - Python version 3.6 or greater. View installation instructions.
- **NTP considerations**: NetApp recommends configuring the BlueXP classification system to use a Network Time Protocol (NTP) service. The time must be synchronized between the BlueXP classification system and the BlueXP Connector system.
- **Firewalld considerations**: If you are planning to use `firewalld`, we recommend that you enable it before installing BlueXP classification. Run the following commands to configure `firewalld` so that it is compatible with BlueXP classification:

  ```
  firewall-cmd --permanent --add-service=http
  firewall-cmd --permanent --add-service=https
  firewall-cmd --permanent --add-port=80/tcp
  firewall-cmd --permanent --add-port=8080/tcp
  firewall-cmd --permanent --add-port=443/tcp
  firewall-cmd --reload
  ```

  If you're planning to use additional BlueXP classification hosts as scanner nodes (in a distributed model), add these rules to your primary system at this time:

  ```
  firewall-cmd --permanent --add-port=2377/tcp
  firewall-cmd --permanent --add-port=7946/udp
  firewall-cmd --permanent --add-port=7946/tcp
  firewall-cmd --permanent --add-port=4789/udp
  ```

  Note that you must restart Docker or Podman whenever you enable or update `firewalld` settings.

Enable outbound internet access from BlueXP classification

BlueXP classification requires outbound internet access. If your virtual or physical network uses a proxy server for internet access, ensure that the BlueXP classification instance has outbound internet access to contact the following endpoints.

💡 This section is not required for host systems installed in sites without internet connectivity.

Endpoints	Purpose
https://api.bluexp.netapp.com	Communication with the BlueXP service, which includes NetApp accounts.
https://netapp-cloud-account.auth0.com https://auth0.com	Communication with the BlueXP website for centralized user authentication.
https://support.compliance.api.bluexp.netapp.com/ https://hub.docker.com https://auth.docker.io https://registry-1.docker.io https://index.docker.io/ https://dseasb33srnrn.cloudfront.net/ https://production.cloudflare.docker.com/	Provides access to software images, manifests, templates, and to send logs and metrics.
https://support.compliance.api.bluexp.netapp.com/	Enables NetApp to stream data from audit records.
https://github.com/docker https://download.docker.com	Provides prerequisite packages for docker installation.
http://mirror.centos.org http://mirrorlist.centos.org http://mirror.centos.org/centos/7/extras/x86_64/Packages/container-selinux-2.107-3.el7.noarch.rpm	Provides prerequisite packages for CentOS installation.
http://packages.ubuntu.com/ http://archive.ubuntu.com	Provides prerequisite packages for Ubuntu installation.

Verify that all required ports are enabled

You must ensure that all required ports are open for communication between the Connector, BlueXP classification, Active Directory, and your data sources.

Connection Type	Ports	Description
Connector <> BlueXP classification	8080 (TCP), 443 (TCP), and 80	The firewall or routing rules for the Connector must allow inbound and outbound traffic over port 443 to and from the BlueXP classification instance. Make sure port 8080 is open so you can see the installation progress in BlueXP.
Connector <> ONTAP cluster (NAS)	443 (TCP)	BlueXP discovers ONTAP clusters using HTTPS. If you use custom firewall policies, the Connector host must allow outbound HTTPS access through port 443. If the Connector is in the cloud, all outbound communication is allowed by the predefined firewall or routing rules.

Run the BlueXP classification Prerequisites script

Follow these steps to run the BlueXP classification Prerequisites script.

Watch this video to see how to run the Prerequisites script and interpret the results.

What you'll need

- Verify that your Linux system meets the host requirements.
- Verify that the system has the two prerequisite software packages installed (Docker Engine or Podman, and Python 3).
- Make sure you have root privileges on the Linux system.

Steps

1. Download the BlueXP classification Prerequisites script from the NetApp Support Site. The file you should select is named **standalone-pre-requisite-tester-<version>**.
2. Copy the file to the Linux host you plan to use (using `scp` or some other method).
3. Assign permissions to run the script.

   ```
   chmod +x standalone-pre-requisite-tester-v1.25.0
   ```

4. Run the script using the following command.

   ```
    ./standalone-pre-requisite-tester-v1.25.0 <--darksite>
   ```

   Add the option "--darksite" only if you are running the script on a host that doesn't have internet access. Certain prerequisite tests are skipped when the host is not connected to the internet.

5. The script prompts you for the IP address of the BlueXP classification host machine.
   - Enter the IP address or host name.
6. The script prompts whether you have an installed BlueXP Connector.
   - Enter **N** if you do not have an installed Connector.
   - Enter **Y** if you do have an installed Connector. And then enter the IP address or host name of the BlueXP Connector so the test script can test this connectivity.
7. The script runs a variety of tests on the system and it displays results as it progresses. When it finishes it writes a log of the session to a file named `prerequisites-test-<timestamp>.log` in the directory `/opt/netapp/install_logs`.

Result

If all the prerequisites tests ran successfully, you can install BlueXP classification on the host when you are ready.

If any issues were discovered, they are categorized as "Recommended" or "Required" to be fixed. Recommended issues are typically items that would make the BlueXP classification scanning and categorizing tasks run slower. These items do not need to be corrected - but you may want to address them.

If you have any "Required" issues, you should fix the issues and run the Prerequisites test script again.

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