



Get started

Cloud Data Sense

NetApp
May 12, 2022

This PDF was generated from <https://docs.netapp.com/us-en/cloud-manager-data-sense/concept-cloud-compliance.html> on May 12, 2022. Always check docs.netapp.com for the latest.

Table of Contents

- Get started 1
 - Learn about Cloud Data Sense 1
 - Deploy Cloud Data Sense 7
 - Activate scanning on your data sources 27
 - Integrate your Active Directory with Cloud Data Sense 69
 - Set up licensing for Cloud Data Sense 72
 - Frequently asked questions about Cloud Data Sense 77

Get started

Learn about Cloud Data Sense

Cloud Data Sense is a data governance service for Cloud Manager that scans your corporate on-premises and cloud data sources and working environments to map and classify data, and to identify private information. This can help reduce your security and compliance risk, decrease storage costs, and assist with your data migration projects.

[Learn about the use cases for Cloud Data Sense.](#)

Features

Cloud Data Sense provides several tools that can help you with your compliance efforts. You can use Data Sense to:

- Identify Personal Identifiable Information (PII)
- Identify a wide scope of sensitive information as required by GDPR, CCPA, PCI, and HIPAA privacy regulations
- Respond to Data Subject Access Requests (DSAR)
- Notify Cloud Manager users through email when files contain certain PII (you define this criteria using [Policies](#))
- View and modify [Azure Information Protection \(AIP\) labels](#) in your files
- Add custom tags to files (for example, "needs to be moved") and assign a Cloud Manager user so that person can own updates to the files
- Copy, move, and delete files

Cloud Data Sense also provides tools that can help with your governance efforts. You can use Cloud Data Sense to:

- Identify the stale data, non-business data, duplicate files, files with open permissions, and very large files in your systems.

You can use this information to decide whether you want to move, delete, or tier some files to less expensive object storage.

- View the size of data and whether any of the data contains sensitive information prior to moving it.

This is useful if you are planning to migrate data from on-premises locations to the cloud.

Supported working environments and data sources

Cloud Data Sense can scan data from the following types of working environments and data sources:

Working environments:

- Cloud Volumes ONTAP (deployed in AWS, Azure, or GCP)
- On-premises ONTAP clusters

- Azure NetApp Files
- Amazon FSx for ONTAP
- Amazon S3

Data sources:

- Non-NetApp file shares
- Object storage (that uses S3 protocol)
- Databases
- OneDrive accounts
- SharePoint accounts
- Google Drive accounts

Data Sense supports NFS versions 3.x, 4.0, and 4.1, and CIFS versions 1.x, 2.0, 2.1, and 3.0.

Cost

- The cost to use Cloud Data Sense depends on the amount of data that you're scanning. The first 1 TB of data that Data Sense scans in a Cloud Manager workspace is free. This includes all data from all working environments and data sources. A subscription to the AWS, Azure, or GCP Marketplace, or a BYOL license from NetApp, is required to continue scanning data after that point. See [pricing](#) for details.

[Learn how to license Cloud Data Sense.](#)

- Installing Cloud Data Sense in the cloud requires deploying a cloud instance, which results in charges from the cloud provider where it is deployed. See [the type of instance that is deployed for each cloud provider](#). There is no cost if you install Data Sense on an on-premises system.
- Cloud Data Sense requires that you have deployed a Cloud Manager Connector. In many cases you already have a Connector because of other storage and services you are using in Cloud Manager. The Connector instance results in charges from the cloud provider where it is deployed. See the [type of instance that is deployed for each cloud provider](#). There is no cost if you install the Connector on an on-premises system.

Data transfer costs

Data transfer costs depend on your setup. If the Cloud Data Sense instance and data source are in the same Availability Zone and region, then there are no data transfer costs. But if the data source, such as a Cloud Volumes ONTAP system or S3 Bucket, is in a *different* Availability Zone or region, then you'll be charged by your cloud provider for data transfer costs. See these links for more details:

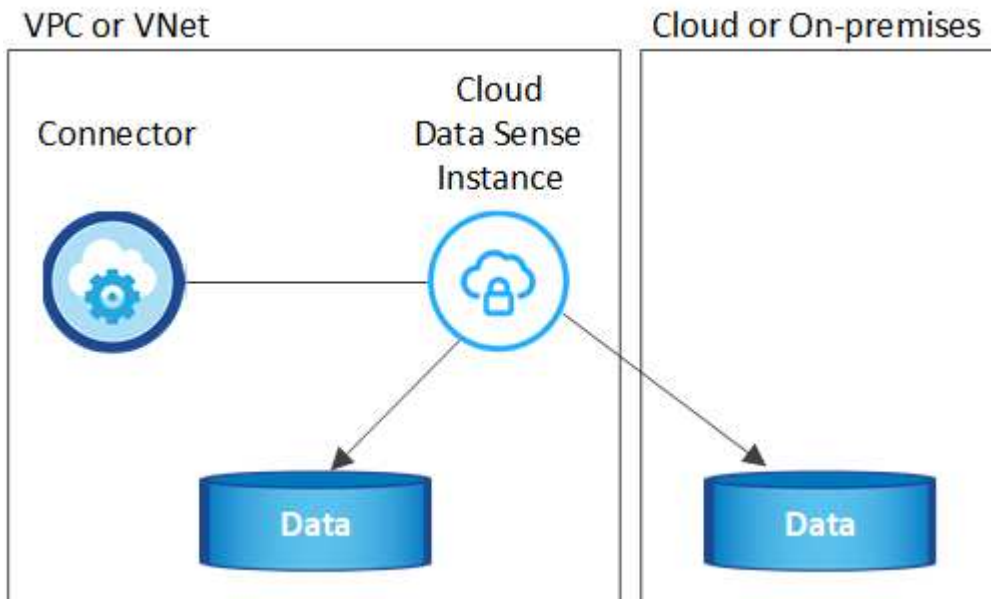
- [AWS: Amazon EC2 Pricing](#)
- [Microsoft Azure: Bandwidth Pricing Details](#)
- [Google Cloud: Storage Transfer Service pricing](#)

The Cloud Data Sense instance

When you deploy Data Sense in the cloud, Cloud Manager deploys the instance in the same subnet as the Connector. [Learn more about Connectors.](#)



If the Connector is installed on-prem, it deploys the Cloud Data Sense instance in same VPC or VNet as the first Cloud Volumes ONTAP system in the request. You can install Data Sense on-prem as well.



Note the following about the default instance:

- In AWS, Cloud Data Sense runs on an [m5.4xlarge instance](#) with a 500 GB GP2 disk. The operating system image is Amazon Linux 2 (Red Hat 7.3.1).

In regions where m5.4xlarge isn't available, Data Sense runs on an m4.4xlarge instance instead.

- In Azure, Cloud Data Sense runs on a [Standard_D16s_v3 VM](#) with a 512 GB disk. The operating system image is CentOS 7.8.
- In GCP, Cloud Data Sense runs on an [n2-standard-16 VM](#) with a 512 GB Standard persistent disk. The operating system image is CentOS 7.9.

In regions where n2-standard-16 isn't available, Data Sense runs on an n2d-standard-16 or n1-standard-16 VM instead.

- The instance is named *CloudCompliance* with a generated hash (UUID) concatenated to it. For example: *CloudCompliance-16bb6564-38ad-4080-9a92-36f5fd2f71c7*
- Only one Data Sense instance is deployed per Connector.
- Upgrades of Data Sense software is automated as long as the instance has internet access.



The instance should remain running at all times because Cloud Data Sense continuously scans the data.

Using a smaller instance type

You can deploy Data Sense on a system with fewer CPUs and less RAM, but there are some limitations when using these less powerful systems.

System size	Specs	Limitations
Extra Large (default)	16 CPUs, 64 GB RAM, 500 GB SSD	None
Medium	8 CPUs, 32 GB RAM, 200 GB SSD	Slower scanning, and can only scan up to 1 million files.
Small	8 CPUs, 16 GB RAM, 100 GB SSD	Same limitations as "Medium", plus the ability to identify data subject names inside files is disabled.

When deploying Data Sense in the cloud, email ng-contact-data-sense@netapp.com for assistance if you want to use one of these smaller systems. We'll need to work with you to deploy these smaller cloud configurations.

When deploying Data Sense on-premises, just use a Linux host with the smaller specifications. You do not need to contact NetApp for assistance.

How Cloud Data Sense works

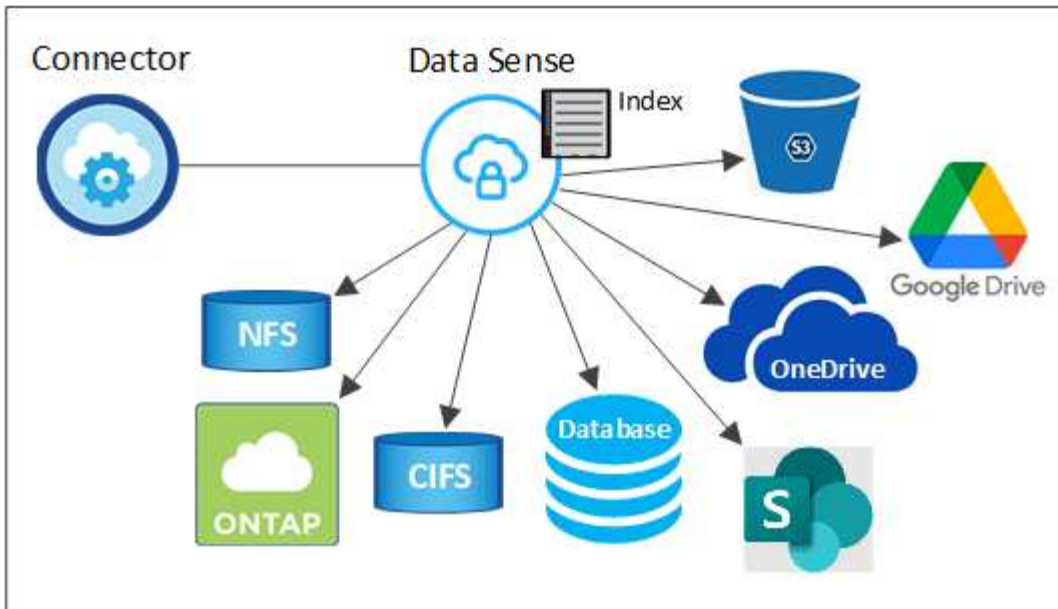
At a high-level, Cloud Data Sense works like this:

1. You deploy an instance of Data Sense in Cloud Manager.
2. You enable high-level mapping or deep-level scanning on one or more working environments or data sources.
3. Data Sense scans the data using an AI learning process.
4. You use the provided dashboards and reporting tools to help in your compliance and governance efforts.

How scans work

After you enable Cloud Data Sense and select the volumes, buckets, database schemas, or OneDrive or SharePoint user data you want to scan, it immediately starts scanning the data to identify personal and sensitive data. It maps your organizational data, categorizes each file, and identifies and extracts entities and predefined patterns in the data. The result of the scan is an index of personal information, sensitive personal information, data categories, and file types.

Data Sense connects to the data like any other client by mounting NFS and CIFS volumes. NFS volumes are automatically accessed as read-only, while you need to provide Active Directory credentials to scan CIFS volumes.



After the initial scan, Data Sense continuously scans your data to detect incremental changes (this is why it's important to keep the instance running).

You can enable and disable scans at the volume level, at the bucket level, at the database schema level, at the OneDrive user level, and at the SharePoint site level.

What's the difference between Mapping and Classification scans

Cloud Data Sense enables you to run a general "mapping" scan on selected working environments and data sources. Mapping provides only a high-level overview of your data, whereas Classification provides deep-level scanning of your data. Mapping can be done on your data sources very quickly because it does not access files to see the data inside.

Many users like this functionality because they want to quickly scan their data to identify the data sources that require more research - and then they can enable classification scans only on those required data sources or volumes.

The table below shows some of the differences:

Feature	Classification	Mapping
Scan speed	Slow	Fast
List of file types and used capacity	Yes	Yes
Number of files and used capacity	Yes	Yes
Age and size of files	Yes	Yes
Ability to run a Data Mapping Report	Yes	Yes
Data Investigation page to view file details	Yes	No
Search for names within files	Yes	No
Create policies that provide custom search results	Yes	No
Categorize data using AIP labels and Status tags	Yes	No

Feature	Classification	Mapping
Copy, delete, and move source files	Yes	No
Ability to run other reports	Yes	No

Information that Cloud Data Sense indexes

Data Sense collects, indexes, and assigns categories to your data (files). The data that Data Sense indexes includes the following:

Standard metadata

Cloud Data Sense collects standard metadata about files: the file type, its size, creation and modification dates, and so on.

Personal data

Personally identifiable information such as email addresses, identification numbers, or credit card numbers. [Learn more about personal data.](#)

Sensitive personal data

Special types of sensitive information, such as health data, ethnic origin, or political opinions, as defined by GDPR and other privacy regulations. [Learn more about sensitive personal data.](#)

Categories

Cloud Data Sense takes the data that it scanned and divides it into different types of categories. Categories are topics based on AI analysis of the content and metadata of each file. [Learn more about categories.](#)

Types

Cloud Data Sense takes the data that it scanned and breaks it down by file type. [Learn more about types.](#)

Name entity recognition

Cloud Data Sense uses AI to extract natural persons' names from documents. [Learn about responding to Data Subject Access Requests.](#)

Networking overview

Cloud Manager deploys the Cloud Data Sense instance with a security group that enables inbound HTTP connections from the Connector instance.

When using Cloud Manager in SaaS mode, the connection to Cloud Manager is served over HTTPS, and the private data sent between your browser and the Data Sense instance are secured with end-to-end encryption, which means NetApp and third parties can't read it.

Outbound rules are completely open. Internet access is needed to install and upgrade the Data Sense software and to send usage metrics.

If you have strict networking requirements, [learn about the endpoints that Cloud Data Sense contacts.](#)

User access to compliance information

The role each user has been assigned provides different capabilities within Cloud Manager and within Cloud Data Sense:

- An **Account Admin** can manage compliance settings and view compliance information for all working environments.
- A **Workspace Admin** can manage compliance settings and view compliance information only for systems that they have permissions to access. If a Workspace Admin can't access a working environment in Cloud Manager, then they can't see any compliance information for the working environment in the Data Sense tab.
- Users with the **Compliance Viewer** role can only view compliance information and generate reports for systems that they have permission to access. These users cannot enable/disable scanning of volumes, buckets, or database schemas. These users can't copy, move, or delete files either.

[Learn more about Cloud Manager roles](#) and how to [add users with specific roles](#).

Deploy Cloud Data Sense

Deploy Cloud Data Sense in the cloud

Complete a few steps to deploy Cloud Data Sense in the cloud.

Note that you can also [deploy Data Sense on a Linux host that has internet access](#). The type of installation may be a good option if you prefer to scan on-premises ONTAP systems using a Data Sense 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 [deploy the Connector on-premises](#) on a Linux host in your network or 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 Cloud Data Sense over port 443, and more. [See the complete list](#).

The default configuration requires 16 vCPUs for the Cloud Data Sense instance. See [more details about the instance type](#).

3

Deploy Cloud Data Sense

Launch the installation wizard to deploy the Cloud Data Sense instance in the cloud.

4

Subscribe to the Cloud Data Sense service

The first 1 TB of data that Cloud Data Sense scans in Cloud Manager is free. A Cloud Manager 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 Cloud Data Sense because most [Cloud Manager 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.
- 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 [deploy the Connector on-premises](#) on a Linux host in your network or in the cloud. Some users planning to install Data Sense 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](#).



If you're planning on scanning Azure NetApp Files volumes, you need to make sure you're deploying in the same region as the volumes you wish to scan.

Review prerequisites

Review the following prerequisites to make sure that you have a supported configuration before you deploy Cloud Data Sense in the cloud.

Enable outbound internet access from Cloud Data Sense

Cloud Data Sense requires outbound internet access. If your virtual or physical network uses a proxy server for internet access, ensure that the Data Sense instance has outbound internet access to contact the following endpoints. When you deploy Data Sense in the cloud, it's located in the same subnet as the Connector.

Review the appropriate table below depending on whether you are deploying Cloud Data Sense in AWS, Azure, or GCP.

Required endpoints for AWS deployments:

Endpoints	Purpose
https://cloudmanager.cloud.netapp.com	Communication with the Cloud Manager service, which includes NetApp accounts.
https://netapp-cloud-account.auth0.com https://auth0.com	Communication with NetApp Cloud Central for centralized user authentication.

Endpoints	Purpose
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://dseasb33srrn.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 Cloud Data Sense to access and download manifests and templates, and to send logs and metrics.

Required endpoints for Azure and GCP deployments:

Endpoints	Purpose
https://cloudmanager.cloud.netapp.com	Communication with the Cloud Manager service, which includes NetApp accounts.
https://netapp-cloud-account.auth0.com https://auth0.com	Communication with NetApp Cloud Central for centralized user authentication.
https://support.compliance.cloudmanager.cloud.netapp.com/ https://hub.docker.com https://auth.docker.io https://registry-1.docker.io https://index.docker.io/ https://dseasb33srrn.cloudfront.net/ https://production.cloudflare.docker.com/	Provides access to software images, manifests, templates, and to send logs and metrics.
https://support.compliance.cloudmanager.cloud.netapp.com/	Enables NetApp to stream data from audit records.

Ensure that Cloud Manager has the required permissions

Ensure that Cloud Manager has permissions to deploy resources and create security groups for the Cloud Data Sense instance. You can find the latest Cloud Manager permissions in [the policies provided by NetApp](#).

Check your vCPU limits

Ensure that your cloud provider's vCPU limit allows for the deployment of an instance with 16 cores. You'll need to verify the vCPU limit for the relevant instance family in the region where Cloud Manager 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 Data Sense on a system with fewer CPUs and less RAM, but there are limitations when using these systems. See [Using a smaller instance type](#) for details.

Ensure that the Cloud Manager Connector can access Cloud Data Sense

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

Additional inbound and outbound rules are required for AWS and AWS GovCloud deployments. See [Rules for the Connector in AWS](#) for details.

Additional inbound and outbound rules are required for Azure and Azure Government deployments. See [Rules for the Connector in Azure](#) for details.

Ensure that you can keep Cloud Data Sense running

The Cloud Data Sense instance needs to stay on to continuously scan your data.

Ensure web browser connectivity to Cloud Data Sense

After Cloud Data Sense is enabled, ensure that users access the Cloud Manager interface from a host that has a connection to the Data Sense instance.

The Data Sense 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 Cloud Manager 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 Data Sense instance.

Deploy Data Sense in the cloud

Follow these steps to deploy an instance of Cloud Data Sense in the cloud.

Steps

1. In Cloud Manager, click **Data Sense**.
2. Click **Activate Data Sense**.



3. Click **Activate Data Sense** to start the cloud deployment wizard.



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



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

Result

Cloud Manager deploys the Cloud Data Sense instance in your cloud provider.

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 Cloud Data Sense](#) at this time. You will not be charged until the amount of data exceeds 1 TB.

Deploy Cloud Data Sense on a Linux host that has internet access

Complete a few steps to deploy Cloud Data Sense on a Linux host in your network, or in the cloud, that has internet access.

The on-prem installation may be a good option if you prefer to scan on-premises ONTAP systems using a Data Sense 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.

Note that you can also [deploy Data Sense 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, create a Connector now. See [creating a Connector in AWS](#), [creating a Connector in Azure](#), or [creating a Connector in GCP](#).

You can also [deploy the Connector on-premises](#) on a Linux host in your network or 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 Cloud Data Sense over port 443, and more. [See the complete list](#).

You also need a Linux system that meets the [following requirements](#).

3

Deploy Cloud Data Sense

Download the Cloud Data Sense 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 Data Sense instance.

4

Subscribe to the Cloud Data Sense service

The first 1 TB of data that Cloud Data Sense scans in Cloud Manager is free. 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

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 Cloud Data Sense because most [Cloud Manager features require a Connector](#), but there are cases where you'll 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.
- 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 in the cloud. Some users planning to install Data Sense 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](#).



If you're planning on scanning Azure NetApp Files volumes, you need to make sure you're deploying in the same region as the volumes you wish to scan.

Prepare the Linux host system

Data Sense software must run on a host that meets specific operating system requirements, RAM requirements, software requirements, and so on. Data Sense is not supported on a host that is shared with other applications - the host must be a dedicated host.

- Operating system: Red Hat Enterprise Linux or CentOS version 8.0 or 8.1
 - The OS must be capable of installing the docker engine (for example, disable the *firewalld* service if needed)
- Disk: SSD with 500 GiB available on /, or
 - 100 GiB available on /opt
 - 400 GiB available on /var
 - 5 GiB on /tmp
- RAM: 64 GB (swap memory must be disabled on the host)
- CPU: 16 cores

Note that you can deploy Data Sense on a system with fewer CPUs and less RAM, but there are limitations when using these systems. See [Using a smaller instance type](#) for details.

- A Red Hat Enterprise Linux system 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.
- The following software must be installed on the host. If it doesn't already exist on the host, then the installer will install the software for you:

- Docker Engine version 19 or later. [View installation instructions.](#)
- Python 3 version 3.6 or later. [View installation instructions.](#)

Verify Cloud Manager and Data Sense prerequisites

Review the following prerequisites to make sure that you have a supported configuration before you deploy Cloud Data Sense on a Linux system.

Enable outbound internet access from Cloud Data Sense

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

Endpoints	Purpose
https://cloudmanager.cloud.netapp.com	Communication with the Cloud Manager service, which includes NetApp accounts.
https://netapp-cloud-account.auth0.com https://auth0.com	Communication with NetApp Cloud Central for centralized user authentication.
https://support.compliance.cloudmanager.cloud.netapp.com/ https://hub.docker.com https://auth.docker.io https://registry-1.docker.io https://index.docker.io/ https://dseasb33srrn.cloudfront.net/ https://production.cloudflare.docker.com/	Provides access to software images, manifests, templates, and to send logs and metrics.
https://support.compliance.cloudmanager.cloud.netapp.com/	Enables NetApp to stream data from audit records.
https://github.com/docker https://download.docker.com 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 installation.

Ensure that Cloud Manager has the required permissions

Ensure that Cloud Manager has permissions to deploy resources and create security groups for the Cloud Data Sense instance. You can find the latest Cloud Manager permissions in [the policies provided by NetApp](#).

Ensure that the Cloud Manager Connector can access Cloud Data Sense

Ensure connectivity between the Connector and the Cloud Data Sense instance. The security group for the Connector must allow inbound and outbound traffic over port 443 to and from the Data Sense instance.

This connection enables deployment of the Data Sense instance and enables you to view information in the Compliance and Governance tabs.

Make sure port 8080 is open so you can see the installation progress in Cloud Manager.

Ensure that you can keep Cloud Data Sense running

The Cloud Data Sense instance needs to stay on to continuously scan your data.

Ensure web browser connectivity to Cloud Data Sense

After Cloud Data Sense is enabled, ensure that users access the Cloud Manager interface from a host that has a connection to the Data Sense instance.

The Data Sense 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 Cloud Manager 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 Data Sense instance.

Deploy Data Sense on premises

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 Cloud Data Sense.

Upgrades to Data Sense software is automated as long as the instance has internet connectivity.



Cloud Data Sense 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 Data Sense in the cloud and [switch between Connectors](#) for your different data sources.

Single-host installation for typical configurations

Follow these steps when installing Data Sense software on a single on-premises host.

What you'll need

- Verify that your Linux system meets the [host requirements](#).
- (Optional) Verify that the system has the two prerequisite software packages installed (Docker Engine and Python 3). The installer will install this software if it is not already on the system.
- Make sure you have root privileges on the Linux system.
- If you are using a proxy, and it is performing TLS interception, you'll need to know the path on the Data Sense Linux system where the TLS CA certificates are stored.
- Verify that your offline environment meets the required [permissions and connectivity](#).

Steps

1. Download the Cloud Data Sense software from the [NetApp Support Site](#). The file you should select is named `cc_onprem_installer_<version>.tar.gz`.
2. Copy the installer file to the Linux host you plan to use (using `scp` or some other method).
3. In Cloud Manager, click **Data Sense**.
4. Click **Activate Data Sense**.



5. Click **Activate Data Sense** to start the on-prem deployment wizard.



6. In the *Deploy Data Sense On Premises* dialog, copy the provided command and paste it in a text file so you can use it later, and click **Close**. For example:

```
sudo ./install.sh -a 12345 -c 27AG75 -t 2198qq
```

7. Unzip the installer file on the host machine, for example:

```
tar -xzf cc_onprem_installer_1.10.0.tar.gz
```

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:

Enter parameters as prompted:	Enter the full command:
<ol style="list-style-type: none"> 1. Paste the information you copied from step 6: <code>sudo ./install.sh -a <account_id> -c <agent_id> -t <token></code> 2. Enter the IP address or host name of the Data Sense host machine so it can be accessed by the Connector instance. 3. Enter the IP address or host name of the Cloud Manager Connector host machine so it can be accessed by the Data Sense instance. 4. Enter proxy details as prompted. If your Cloud Manager already uses a proxy, there is no need to enter this information again here since Data Sense will automatically use the proxy used by Cloud Manager. 	<p>Alternatively, you can create the whole command in advance, providing the necessary host and proxy parameters:</p> <pre>sudo ./install.sh -a <account_id> -c <agent_id> -t <token> --host <ds_host> --manager-host <cm_host> --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></pre>

Variable values:

- *account_id* = NetApp Account ID
- *agent_id* = Connector ID
- *token* = jwt user token
- *ds_host* = IP address or host name of the Data Sense Linux system.
- *cm_host* = IP address or host name of the Cloud Manager Connector system.
- *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.
- *proxy_password* = Password for the user name that you specified.
- *ca_cert_dir* = Path on the Data Sense Linux system containing additional TLS CA certificate bundles. Only required if the proxy is performing TLS interception.

Result

The Cloud Data Sense installer installs packages, installs docker, registers the installation, and installs Data Sense. Installation can take 10 to 20 minutes.

If there is connectivity over port 8080 between the host machine and the Connector instance, you will see the installation progress in the Data Sense tab in Cloud Manager.

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 Cloud Data Sense](#) at this time. You will not be charged until the amount of data exceeds 1 TB.

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 Data Sense software on multiple on-premises hosts.

What you'll need

- Verify that all your Linux systems for the Manager and Scanner nodes meet the [host requirements](#).
- (Optional) Verify that the systems have the two prerequisite software packages installed (Docker Engine and Python 3). The installer will install this software if it is not already on the systems.
- 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
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 <agent_id> -t <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 and save it in a text file. For example:

```
sudo ./node_install.sh -m 10.11.12.13 -t ABCDEF-1-3u69m1-1s35212
```

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

- a. Copy the Data Sense installer file (**cc_onprem_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 Cloud Data Sense installer finishes installing packages, docker, 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 Cloud Data Sense](#) at this time. You will not be charged until the amount of data exceeds 1 TB.

Deploy Cloud Data Sense on prem without internet access

Complete a few steps to deploy Cloud Data Sense on a host in an on-premises site that doesn't have internet access. This type of installation is perfect for your secure sites.

Note that you can also [deploy Data Sense in an on-premises site that has internet access](#).

Supported data sources

When installed in this manner (sometimes called an "offline" or "dark" site), Data Sense can only scan data from data sources that are also local to the on-premises site. At this time, Data Sense can scan the following local data sources:

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

For special situations where you need a very secure Cloud Manager installation, but you also want to scan local data from OneDrive accounts or SharePoint accounts, you can use the Data Sense offline installer and provide internet access to a few select endpoints. See [SharePoint and OneDrive special requirements](#) for details.

There is no support currently for scanning Cloud Volumes ONTAP, Azure NetApp Files, FSx for ONTAP, AWS S3, or Google Drive accounts when Data Sense is deployed in a dark site.

Limitations

Most Data Sense 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 Cloud Manager users when certain critical Policies return results
- Setting Cloud Manager roles for different users (for example, Account Admin or Compliance Viewer)
- Copying and synchronizing source files using Cloud Sync
- Receiving user feedback
- Automated software upgrades from Cloud Manager

Both the Cloud Manager Connector and Data Sense will require periodic manual upgrades to enable new features. You can see the Data Sense version at the bottom of the Data Sense UI pages. Check the [Cloud Data Sense Release Notes](#) to see the new features in each release and whether you want those features. Then you can follow the steps to [upgrade your Data Sense software](#).

Quick start

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

1

Install the Cloud Manager Connector

If you don't already have a Connector installed at your offline on-premises site, [deploy the Connector](#) on a Linux host now.

2

Review Data Sense 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

Deploy Data Sense

Download the Cloud Data Sense 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 Cloud Data Sense instance.

4

Subscribe to the Cloud Data Sense service

The first 1 TB of data that Cloud Data Sense scans in Cloud Manager is free. A BYOL license from NetApp is required to continue scanning data after that point.

Install the Cloud Manager Connector

If you don't already have a Cloud Manager Connector installed at your offline on-premises site, [deploy the Connector](#) on a Linux host in your offline site.

Prepare the Linux host system

Data Sense software must run on a host that meets specific operating system requirements, RAM requirements, software requirements, and so on. Data Sense is not supported on a host that is shared with other applications - the host must be a dedicated host.

- Operating system: Red Hat Enterprise Linux or CentOS version 8.0 or 8.1

- The OS must be capable of installing the Docker Engine (for example, disable the *firewalld* service if needed)
- Disk: SSD with 500 GiB available on /, or
 - 100 GiB available on /opt
 - 400 GiB available on /var
 - 5 GiB on /tmp
- RAM: 64 GB (swap memory must be disabled on the host)
- CPU: 16 cores

Note that you can deploy Data Sense on a system with fewer CPUs and less RAM, but there are limitations when using these systems. See [Using a smaller instance type](#) for details.

You must install the following software on the host before you install Data Sense:

- Docker Engine version 19 or later. [View installation instructions.](#)
- Python 3 version 3.6 or later. [View installation instructions.](#)

Verify Cloud Manager and Data Sense prerequisites

Review the following prerequisites to make sure that you have a supported configuration before you deploy Cloud Data Sense.

- Ensure that Cloud Manager has permissions to deploy resources and create security groups for the Cloud Data Sense instance.
- Ensure that the Cloud Manager Connector can access the Data Sense instance. The security group for the Connector must allow inbound and outbound traffic over port 443 to and from the Data Sense instance.

This connection enables deployment of the Data Sense instance and enables you to view compliance and governance information.

Make sure port 8080 is open so you can see the installation progress in Cloud Manager.

- Ensure that you can keep Cloud Data Sense running. The Cloud Data Sense instance needs to stay on to continuously scan your data.
- Ensure web browser connectivity to Cloud Data Sense. After Cloud Data Sense is enabled, ensure that users access the Cloud Manager interface from a host that has a connection to the Data Sense instance.

The Data Sense 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 Cloud Manager must have a connection to that private IP address. That connection can come from a host that's inside the same network as the Data Sense instance.

SharePoint and OneDrive special requirements

When Cloud Manager and Data Sense are deployed in a site with no internet access, you can scan local files in SharePoint and OneDrive accounts by providing internet access to a few select endpoints.

Endpoints	Purpose
login.microsoft.com graph.microsoft.com	Communication with Microsoft servers to log in to the selected online service.
https://cloudmanager.cloud.netapp.com	Communication with the Cloud Manager service, which includes NetApp accounts.

Access to *cloudmanager.cloud.netapp.com* is required only during the initial connections to these external services.

Deploy Data Sense

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 Data Sense software on a single on-premises host in an offline environment.

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 and Python 3).
- Make sure you have root privileges on the Linux system.
- Verify that your offline environment meets the required [permissions and connectivity](#).

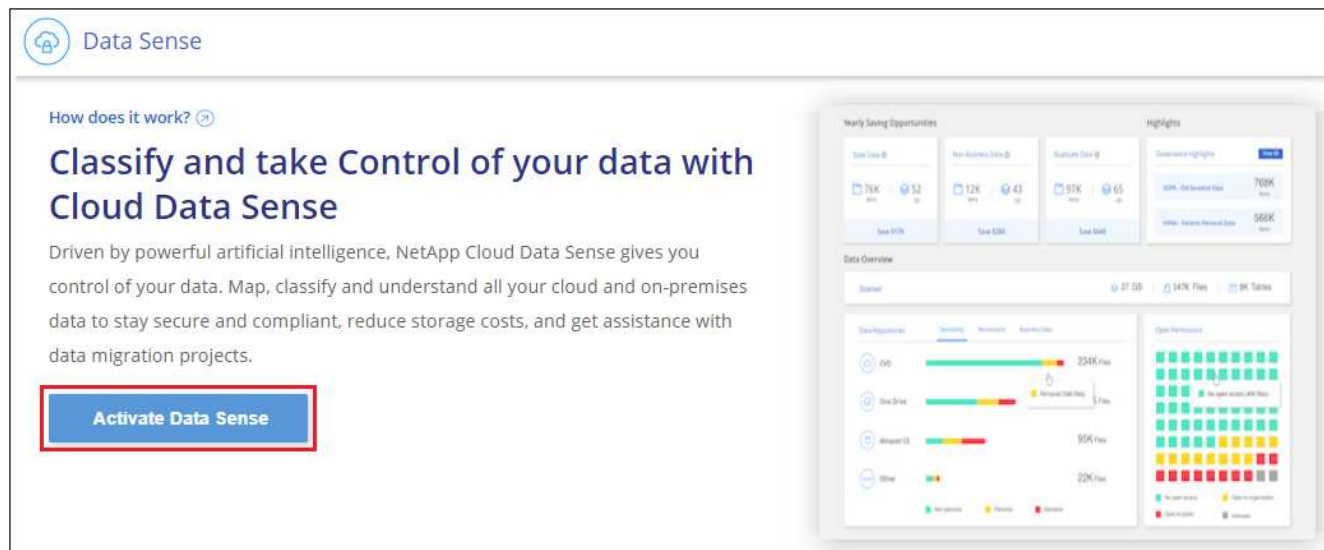
Steps

1. On an internet-configured system, download the Cloud Data Sense 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 the dark site.
3. Unzip the installer bundle on the host machine, for example:

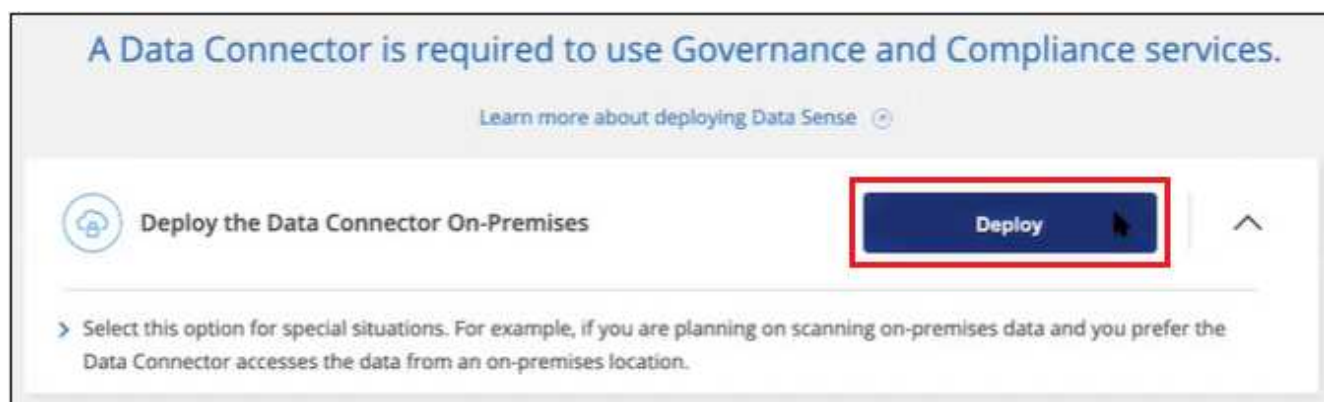
```
tar -xzf DataSense-offline-bundle-v1.10.0.tar.gz
```

This extracts required software and the actual installation file **cc_onprem_installer_<version>.tar.gz**.

4. Launch Cloud Manager and click the **Data Sense** tab.
5. Click **Activate Data Sense**.



6. Click **Deploy** to start the on-prem deployment wizard.



7. In the *Deploy Data Sense On Premises* dialog, copy the provided command and paste it in a text file so you can use it later, and click **Close**. For example:

```
sudo ./install.sh -a 12345 -c 27AG75 -t 2198qq --darksite
```

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

```
tar -xzf cc_onprem_installer_1.10.0.tar.gz
```

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:

Enter parameters as prompted:	Enter the full command:
<ol style="list-style-type: none"> 1. Paste the information you copied from step 7: <code>sudo ./install.sh -a <account_id> -c <agent_id> -t <token> --darksite</code> 2. Enter the IP address or host name of the Data Sense host machine so it can be accessed by the Connector instance. 3. Enter the IP address or host name of the Cloud Manager Connector host machine so it can be accessed by the Data Sense instance. 	<p>Alternatively, you can create the whole command in advance, providing the necessary host parameters:</p> <pre>sudo ./install.sh -a <account_id> -c <agent_id> -t <token> --host <ds_host> --manager-host <cm_host> --no-proxy --darksite</pre>

Variable values:

- *account_id* = NetApp Account ID
- *agent_id* = Connector ID
- *token* = jwt user token
- *ds_host* = IP address or host name of the Data Sense Linux system.
- *cm_host* = IP address or host name of the Cloud Manager Connector system.

Result

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

If there is connectivity over port 8080 between the host machine and the Connector instance, you will see the installation progress in the Data Sense tab in Cloud Manager.

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 Cloud Data Sense](#) from the Digital Wallet page at this time. You will not be charged until the amount of data exceeds 1 TB.

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 Data Sense 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 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 <agent_id> -t <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 and save it in a text file. For example:

```
sudo ./node_install.sh -m 10.11.12.13 -t ABCDEF-1-3u69m1-1s35212
```

4. On **each** scanner node host:
 - a. Copy the Data Sense installer file (**cc_onprem_installer_<version>.tar.gz**) to the host machine.
 - b. Unzip the installer file.
 - c. 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 Cloud Data Sense 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 Cloud Data Sense](#) from the Digital Wallet page at this time. You will not be charged until the amount of data exceeds 1 TB.

Upgrade Data Sense software

Since Data Sense 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 Data Sense software manually because there's no internet connectivity to perform the upgrade automatically.

Before you begin

- Data Sense software can be upgraded one major version at a time. For example, if you have version 1.9.x installed, you can upgrade only to 1.10.x. If you are a few major versions behind, you'll need to upgrade the software multiple times.
- Verify that your on-prem Connector software has been upgraded to the newest available version. [See the Connector upgrade steps](#).

Steps

1. On an internet-configured system, download the Cloud Data Sense 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 Data Sense is installed in the dark site.
3. Unzip the software bundle on the host machine, for example:

```
tar -xvf DataSense-offline-bundle-v1.10.0.tar.gz
```

This extracts the installation file **cc_onprem_installer_<version>.tar.gz**.

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

```
tar -xzf cc_onprem_installer_1.10.0.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 Data Sense 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 Data Sense 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 Data Sense UI pages.

Activate scanning on your data sources

Getting started with Cloud Data Sense for Cloud Volumes ONTAP and on-premises ONTAP

Complete a few steps to start scanning your Cloud Volumes ONTAP and on-premises ONTAP volumes using Cloud Data Sense.

Quick start

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

1

Discover the data sources that you want to scan

Before you can scan volumes, you must add the systems as working environments in Cloud Manager:

- For Cloud Volumes ONTAP systems, these working environments should already be available in Cloud Manager
- For on-premises ONTAP systems, [Cloud Manager must discover the ONTAP clusters](#)

2

Deploy the Cloud Data Sense instance

[Deploy Cloud Data Sense](#) if there isn't already an instance deployed.

3

Enable Cloud Data Sense and select the volumes to scan

Click **Data Sense**, select the **Configuration** tab, and activate compliance scans for volumes in specific working environments.

4

Ensure access to volumes

Now that Cloud Data Sense is enabled, ensure that it can access all volumes.

- The Cloud Data Sense instance 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 Data Sense instance.
- Make sure these ports are open to the Data Sense instance:
 - For NFS – ports 111 and 2049.
 - For CIFS – ports 139 and 445.
- NFS volume export policies must allow access from the Data Sense instance.
- Data Sense needs Active Directory credentials to scan CIFS volumes.

Click **Compliance > Configuration > Edit CIFS Credentials** and provide the credentials.

5

Manage the volumes you want to scan

Select or deselect the volumes that you want to scan and Cloud Data Sense will start or stop scanning them.

Discovering the data sources that you want to scan

If the data sources you want to scan are not already in your Cloud Manager environment, you can add them to the canvas at this time.

Your Cloud Volumes ONTAP systems should already be available in the Canvas in Cloud Manager. For on-premises ONTAP systems, you'll need to have [Cloud Manager discover these clusters](#).

Deploying the Cloud Data Sense instance

Deploy Cloud Data Sense if there isn't already an instance deployed.

If you are scanning Cloud Volumes ONTAP and on-premises ONTAP systems that are accessible over the internet, you can [deploy Cloud Data Sense in the cloud](#) or [in an on-premises location that has internet access](#).

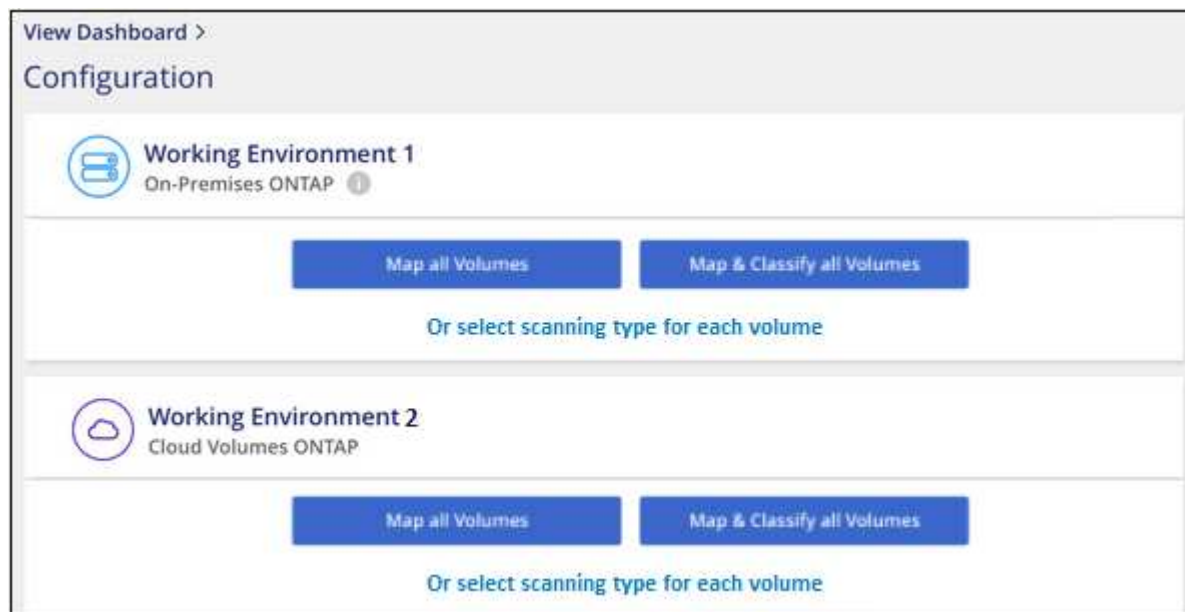
If you are scanning on-premises ONTAP systems that have been installed in a dark site that has no internet access, you need to [deploy Cloud Data Sense in the same on-premises location that has no internet access](#). This also requires that the Cloud Manager Connector is deployed in that same on-premises location.

Upgrades to Data Sense software is automated as long as the instance has internet connectivity.

Enabling Cloud Data Sense in your working environments

You can enable Cloud Data Sense on Cloud Volumes ONTAP systems (in AWS, Azure, and GCP) and on on-premises ONTAP clusters.

1. At the top of Cloud Manager, click **Data Sense** and then select the **Configuration** tab.



2. Select how you want to scan the volumes in each working environment. [Learn about mapping and classification scans](#):

- To map all volumes, click **Map all Volumes**.
- To map and classify all volumes, click **Map & Classify all Volumes**.
- To customize scanning for each volume, click **Or select scanning type for each volume**, and then choose the volumes you want to map and/or classify.

See [Enabling and disabling compliance scans on volumes](#) for details.

3. In the confirmation dialog box, click **Approve** to have Data Sense start scanning your volumes.

Result

Cloud Data Sense starts scanning the volumes you selected in the working environment. Results will be available in the Compliance dashboard as soon as Cloud Data Sense finishes the initial scans. The time that it takes depends on the amount of data—it could be a few minutes or hours.

Verifying that Cloud Data Sense has access to volumes

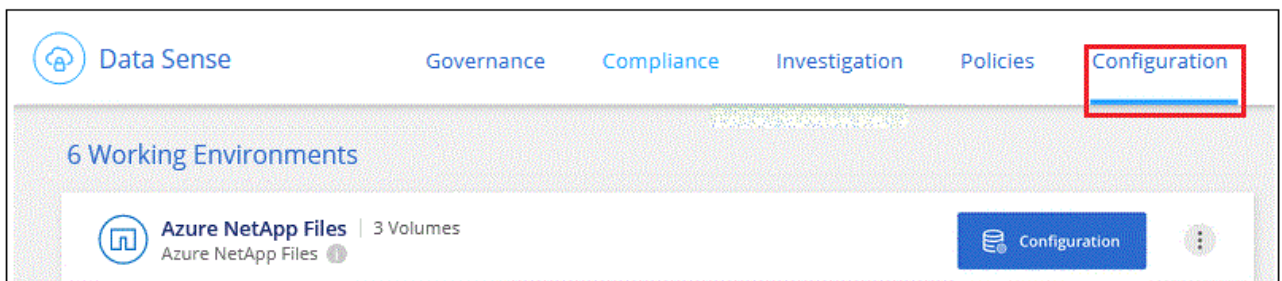
Make sure that Cloud Data Sense can access volumes by checking your networking, security groups, and export policies. You'll need to provide Data Sense with CIFS credentials so it can access CIFS volumes.

Steps

1. Make sure that there's a network connection between the Cloud Data Sense instance and each network that includes volumes for Cloud Volumes ONTAP or on-prem ONTAP clusters.
2. Ensure that the security group for Cloud Volumes ONTAP allows inbound traffic from the Data Sense instance.

You can either open the security group for traffic from the IP address of the Data Sense instance, or you can open the security group for all traffic from inside the virtual network.

3. Ensure the following ports are open to the Data Sense instance:
 - For NFS – ports 111 and 2049.
 - For CIFS – ports 139 and 445.
4. Ensure that NFS volume export policies include the IP address of the Data Sense instance so it can access the data on each volume.
5. If you use CIFS, provide Data Sense with Active Directory credentials so it can scan CIFS volumes.
 - a. At the top of Cloud Manager, click **Data Sense**.
 - b. Click the **Configuration** tab.

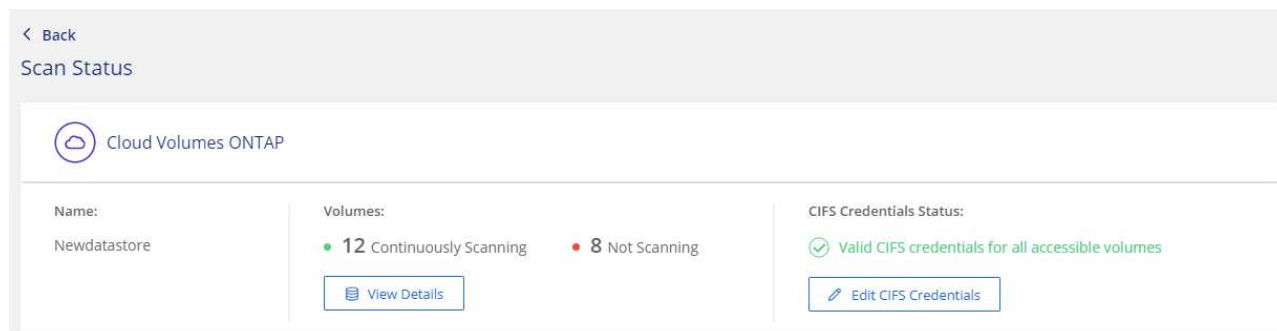


- c. For each working environment, click **Edit CIFS Credentials** and enter the user name and password that Data Sense needs to access CIFS volumes on the system.

The credentials can be read-only, but providing admin credentials ensures that Data Sense can read

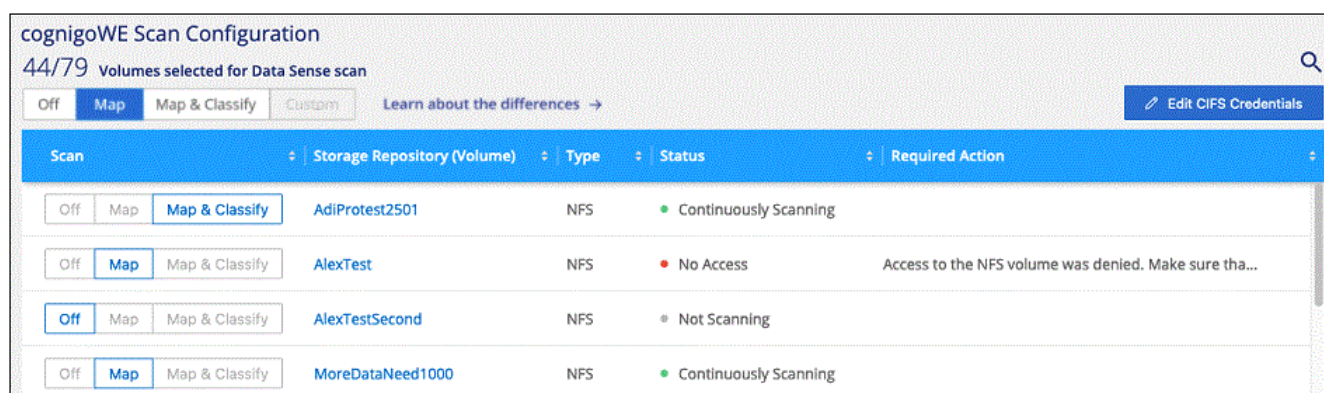
any data that requires elevated permissions. The credentials are stored on the Cloud Data Sense instance.

After you enter the credentials, you should see a message that all CIFS volumes were authenticated successfully.



6. On the *Configuration* page, click **View Details** to review the status for each CIFS and NFS volume and correct any errors.

For example, the following image shows four volumes; one of which Cloud Data Sense can't scan due to network connectivity issues between the Data Sense instance and the volume.



Enabling and disabling compliance scans on volumes

You can start or stop mapping-only scans, or mapping and classification scans, in a working environment at any time from the Configuration page. You can also change from mapping-only scans to mapping and classification scans, and vice-versa. We recommend that you scan all volumes.

cognitoWE Scan Configuration

44/79 Volumes selected for Data Sense scan

Off Map Map & Classify Custom Learn about the differences → Edit CIFS Credentials

Scan	Storage Repository (Volume)	Type	Status	Required Action
Off Map Map & Classify	AdiNFSVol_copy	NFS	No Access	Access to the NFS volume was denied. Make sure tha...
Off Map Map & Classify	AdiProtest2501	NFS	Continuously Scanning	
Off Map Map & Classify	AlexTest	NFS	No Access	Access to the NFS volume was denied. Make sure tha...
Off Map Map & Classify	AlexTestSecond	NFS	Not Scanning	
Off Map Map & Classify	MoreDataNeed1000	NFS	Continuously Scanning	

To:	Do this:
Enable mapping-only scans on a volume	In the volume area, click Map
Enable full scanning on a volume	In the volume area, click Map & Classify
Disable scanning on a volume	In the volume area, click Off
Enable mapping-only scans on all volumes	In the heading area, click Map
Enable full scanning on all volumes	In the heading area, click Map & Classify
Disable scanning on all volumes	In the heading area, click Off



New volumes added to the working environment are automatically scanned only when you have set the **Map** or **Map & Classify** setting in the heading area. When set to **Custom** or **Off** in the heading area, you'll need to activate mapping and/or full scanning on each new volume you add in the working environment.

Scanning data protection volumes

By default, data protection (DP) volumes are not scanned because they are not exposed externally and Cloud Data Sense cannot access them. These are the destination volumes for SnapMirror operations from an on-premises ONTAP system or from a Cloud Volumes ONTAP system.

Initially, the volume list identifies these volumes as *Type DP* with the *Status Not Scanning* and the *Required Action Enable Access to DP volumes*.

'Working Environment Name' Configuration

22/28 Volumes selected for compliance scan

Off Map Map & Classify Custom Learn about the differences → Enable Access to DP Volumes Edit CIFS Credentials

Scan	Storage Repository (Volume)	Type	Status	Required Action
Off Map Map & Classify	VolumeName1	DP	Not Scanning	Enable access to DP Volumes ⓘ
Off Map Map & Classify	VolumeName2	NFS	Continuously Scanning	
Off Map Map & Classify	VolumeName3	CIFS	Not Scanning	

Steps

If you want to scan these data protection volumes:

1. Click **Enable Access to DP volumes** at the top of the page.
2. Review the confirmation message and click **Enable Access to DP volumes** again.
 - Volumes that were initially created as NFS volumes in the source ONTAP system are enabled.
 - Volumes that were initially created as CIFS volumes in the source ONTAP system require that you enter CIFS credentials to scan those DP volumes. If you already entered Active Directory credentials so that Cloud Data Sense can scan CIFS volumes you can use those credentials, or you can specify a different set of Admin credentials.

Provide Active Directory Credentials

☒ Use existing CIFS Scanning Credentials (user1@domain2) ☐ Use Custom Credentials

Active Directory Domain [?] DNS IP Address [?]

DP Volumes, created from a SnapMirror relationship, do not allow external access by default. Continuing will create NFS shares from DP Volumes which have been activated for **Data Sense**. The shares' export policies will allow access only from the Cloud **Data Sense** instance. [Learn More](#)

Enable Access to DP Volumes Cancel

Provide Active Directory Credentials

☐ Use existing CIFS Scanning Credentials (user1@domain2) ☒ Use Custom Credentials

Username [?] Password

Active Directory Domain [?] DNS IP Address [?]

DP Volumes, created from a SnapMirror relationship, do not allow external access by default. Continuing will create NFS shares from DP Volumes which have been activated for **Data Sense**. The shares' export policies will allow access only from the Cloud **Data Sense** instance. [Learn More](#)

Enable Access to DP Volumes Cancel

3. Activate each DP volume that you want to scan [the same way you enabled other volumes](#).

Result

Once enabled, Cloud Data Sense creates an NFS share from each DP volume that was activated for scanning. The share export policies only allow access from the Data Sense instance.

Note: If you had no CIFS data protection volumes when you initially enabled access to DP volumes, and later add some, the button **Enable Access to CIFS DP** appears at the top of the Configuration page. Click this button and add CIFS credentials to enable access to these CIFS DP volumes.



Active Directory credentials are only registered in the storage VM of the first CIFS DP volume, so all DP volumes on that SVM will be scanned. Any volumes that reside on other SVMs will not have the Active Directory credentials registered, so those DP volumes won't be scanned.

Getting started with Cloud Data Sense for Azure NetApp Files

Complete a few steps to get started with Cloud Data Sense for Azure NetApp Files.

Quick start

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



Discover the Azure NetApp Files systems you want to scan

Before you can scan Azure NetApp Files volumes, [Cloud Manager must be set up to discover the configuration](#).

2

Deploy the Cloud Data Sense instance

[Deploy Cloud Data Sense in Cloud Manager](#) if there isn't already an instance deployed.

3

Enable Cloud Data Sense and select the volumes to scan

Click **Compliance**, select the **Configuration** tab, and activate compliance scans for volumes in specific working environments.

4

Ensure access to volumes

Now that Cloud Data Sense is enabled, ensure that it can access all volumes.

- The Cloud Data Sense instance needs a network connection to each Azure NetApp Files subnet.
- Make sure these ports are open to the Data Sense instance:
 - For NFS – ports 111 and 2049.
 - For CIFS – ports 139 and 445.
- NFS volume export policies must allow access from the Data Sense instance.
- Data Sense needs Active Directory credentials to scan CIFS volumes.

Click **Compliance > Configuration > Edit CIFS Credentials** and provide the credentials.

5

Manage the volumes you want to scan

Select or deselect the volumes that you want to scan and Cloud Data Sense will start or stop scanning them.

Discovering the Azure NetApp Files system that you want to scan

If the Azure NetApp Files system you want to scan is not already in Cloud Manager as a working environment, you can add it to the canvas at this time.

[See how to discover the Azure NetApp Files system in Cloud Manager.](#)

Deploying the Cloud Data Sense instance

[Deploy Cloud Data Sense](#) if there isn't already an instance deployed.

Data Sense must be deployed in the cloud when scanning Azure NetApp Files volumes, and it must be deployed in the same region as the volumes you wish to scan.

Note: Deploying Cloud Data Sense in an on-premises location is not currently supported when scanning Azure NetApp Files volumes.

Upgrades to Data Sense software is automated as long as the instance has internet connectivity.

Enabling Cloud Data Sense in your working environments

You can enable Cloud Data Sense on your Azure NetApp Files volumes.

1. At the top of Cloud Manager, click **Data Sense** and then select the **Configuration** tab.



2. Select how you want to scan the volumes in each working environment. [Learn about mapping and classification scans](#):
 - To map all volumes, click **Map all Volumes**.
 - To map and classify all volumes, click **Map & Classify all Volumes**.
 - To customize scanning for each volume, click **Or select scanning type for each volume**, and then choose the volumes you want to map and/or classify.

See [Enabling and disabling compliance scans on volumes](#) for details.

3. In the confirmation dialog box, click **Approve** to have Data Sense start scanning your volumes.

Result

Cloud Data Sense starts scanning the volumes you selected in the working environment. Results will be available in the Compliance dashboard as soon as Cloud Data Sense finishes the initial scans. The time that it takes depends on the amount of data—it could be a few minutes or hours.

Verifying that Cloud Data Sense has access to volumes

Make sure that Cloud Data Sense can access volumes by checking your networking, security groups, and export policies. You'll need to provide Data Sense with CIFS credentials so it can access CIFS volumes.

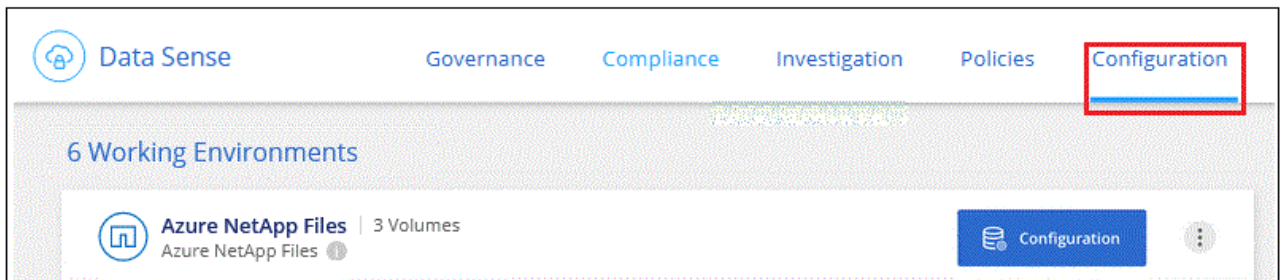
Steps

1. Make sure that there's a network connection between the Cloud Data Sense instance and each network that includes volumes for Azure NetApp Files.



For Azure NetApp Files, Cloud Data Sense can only scan volumes that are in the same region as Cloud Manager.

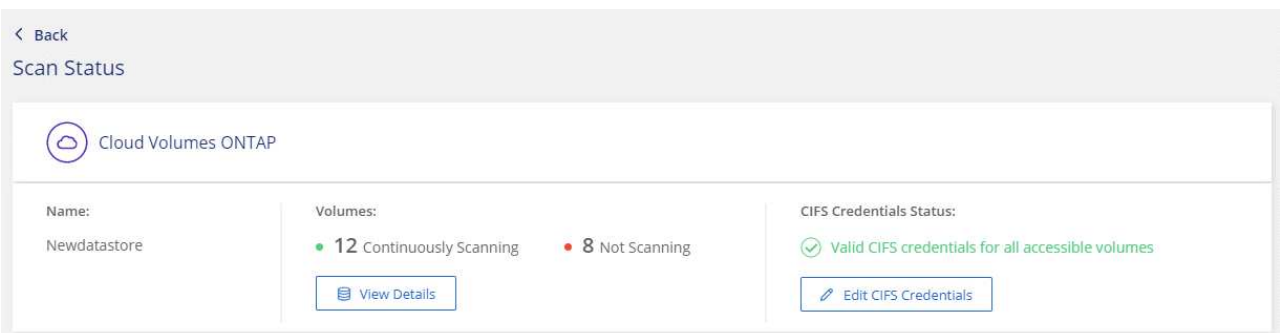
2. Ensure the following ports are open to the Data Sense instance:
 - For NFS – ports 111 and 2049.
 - For CIFS – ports 139 and 445.
3. Ensure that NFS volume export policies include the IP address of the Data Sense instance so it can access the data on each volume.
4. If you use CIFS, provide Data Sense with Active Directory credentials so it can scan CIFS volumes.
 - a. At the top of Cloud Manager, click **Data Sense**.
 - b. Click the **Configuration** tab.



- c. For each working environment, click **Edit CIFS Credentials** and enter the user name and password that Data Sense needs to access CIFS volumes on the system.

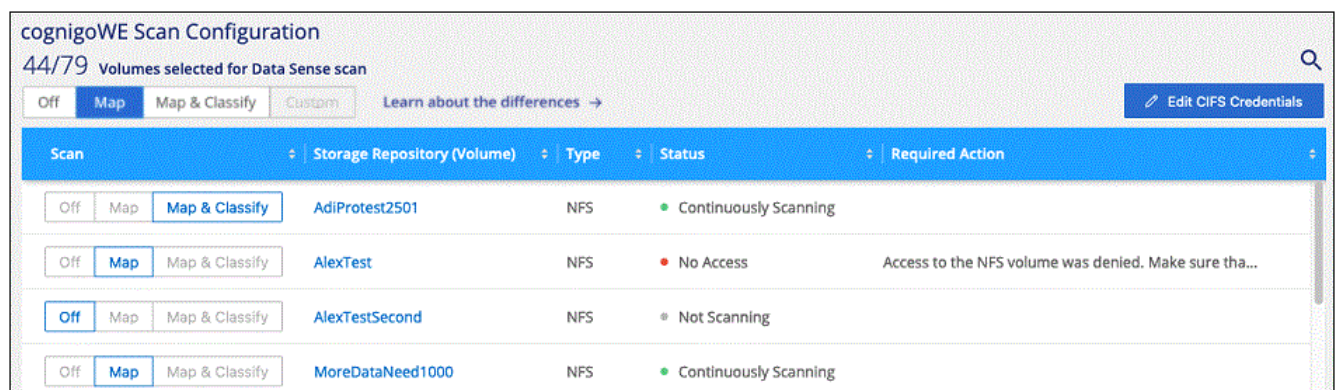
The credentials can be read-only, but providing admin credentials ensures that Data Sense can read any data that requires elevated permissions. The credentials are stored on the Cloud Data Sense instance.

After you enter the credentials, you should see a message that all CIFS volumes were authenticated successfully.



5. On the *Configuration* page, click **View Details** to review the status for each CIFS and NFS volume and correct any errors.

For example, the following image shows four volumes; one of which Cloud Data Sense can't scan due to network connectivity issues between the Data Sense instance and the volume.



Enabling and disabling compliance scans on volumes

You can start or stop mapping-only scans, or mapping and classification scans, in a working environment at any time from the Configuration page. You can also change from mapping-only scans to mapping and classification scans, and vice-versa. We recommend that you scan all volumes.

cognigoWE Scan Configuration
44/79 Volumes selected for Data Sense scan

Off

Map

Map & Classify

Custom

Learn about the differences →

Edit CIFS Credentials

Scan	Storage Repository (Volume)	Type	Status	Required Action
Off Map Map & Classify	AdiNFSVol_copy	NFS	No Access	Access to the NFS volume was denied. Make sure tha...
Off Map Map & Classify	AdiProtest2501	NFS	Continuously Scanning	
Off Map Map & Classify	AlexTest	NFS	No Access	Access to the NFS volume was denied. Make sure tha...
Off Map Map & Classify	AlexTestSecond	NFS	Not Scanning	
Off Map Map & Classify	MoreDataNeed1000	NFS	Continuously Scanning	

To:	Do this:
Enable mapping-only scans on a volume	In the volume area, click Map
Enable full scanning on a volume	In the volume area, click Map & Classify
Disable scanning on a volume	In the volume area, click Off
Enable mapping-only scans on all volumes	In the heading area, click Map
Enable full scanning on all volumes	In the heading area, click Map & Classify
Disable scanning on all volumes	In the heading area, click Off



New volumes added to the working environment are automatically scanned only when you have set the **Map** or **Map & Classify** setting in the heading area. When set to **Custom** or **Off** in the heading area, you'll need to activate mapping and/or full scanning on each new volume you add in the working environment.

Get started with Cloud Data Sense for Amazon FSx for ONTAP

Complete a few steps to get started scanning Amazon FSx for ONTAP volume with Cloud Data Sense.

Before you begin

- You need an active Connector in AWS to deploy and manage Data Sense.
- The security group you selected when creating the working environment must allow traffic from the Cloud Data Sense instance. You can find the associated security group using the ENI connected to the FSx for ONTAP file system and edit it using the AWS Management Console.

[AWS security groups for Linux instances](#)

[AWS security groups for Windows instances](#)

[AWS elastic network interfaces \(ENI\)](#)

Quick start

Get started quickly by following these steps or scroll down for full details.

1

Discover the FSx for ONTAP file systems you want to scan

Before you can scan FSx for ONTAP volumes, [you must have an FSx working environment with volumes configured](#).

2

Deploy the Cloud Data Sense instance

[Deploy Cloud Data Sense in Cloud Manager](#) if there isn't already an instance deployed.

3

Enable Cloud Data Sense and select the volumes to scan

Click **Data Sense**, select the **Configuration** tab, and activate compliance scans for volumes in specific working environments.

4

Ensure access to volumes

Now that Cloud Data Sense is enabled, ensure that it can access all volumes.

- The Cloud Data Sense instance needs a network connection to each FSx for ONTAP subnet.
- Make sure the following ports are open to the Data Sense instance:
 - For NFS – ports 111 and 2049.
 - For CIFS – ports 139 and 445.
- NFS volume export policies must allow access from the Data Sense instance.
- Data Sense needs Active Directory credentials to scan CIFS volumes.

Click **Compliance > Configuration > Edit CIFS Credentials** and provide the credentials.

5

Manage the volumes you want to scan

Select or deselect the volumes you want to scan and Cloud Data Sense will start or stop scanning them.

Discovering the FSx for ONTAP file system that you want to scan

If the FSx for ONTAP file system you want to scan is not already in Cloud Manager as a working environment, you can add it to the canvas at this time.

[See how to discover or create the FSx for ONTAP file system in Cloud Manager](#).

Deploying the Cloud Data Sense instance

[Deploy Cloud Data Sense](#) if there isn't already an instance deployed.

You should deploy Data Sense in the same AWS network as the Connector for AWS and the FSx volumes you wish to scan.

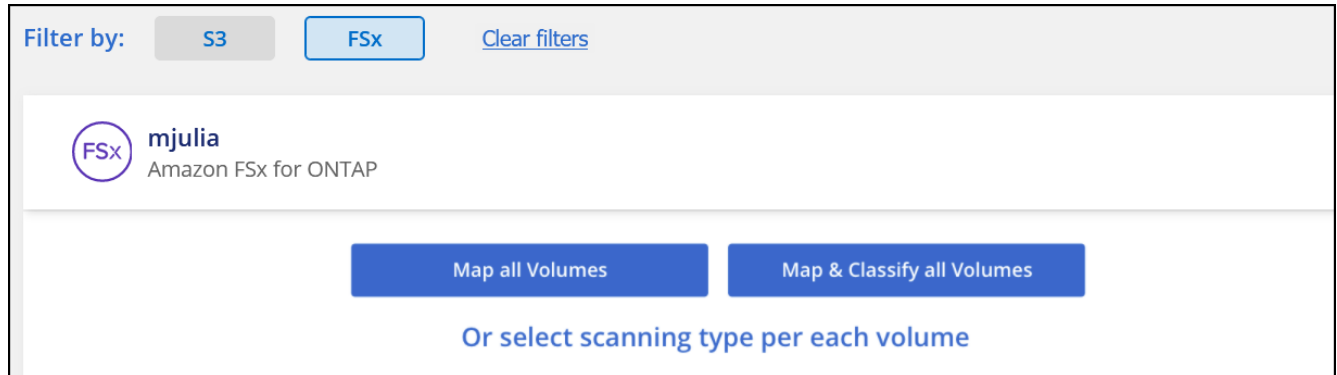
Note: Deploying Cloud Data Sense in an on-premises location is not currently supported when scanning FSx volumes.

Upgrades to Data Sense software is automated as long as the instance has internet connectivity.

Enabling Cloud Data Sense in your working environments

You can enable Cloud Data Sense for FSx for ONTAP volumes.

1. At the top of Cloud Manager, click **Data Sense** and then select the **Configuration** tab.



2. Select how you want to scan the volumes in each working environment. [Learn about mapping and classification scans](#):
 - To map all volumes, click **Map all Volumes**.
 - To map and classify all volumes, click **Map & Classify all Volumes**.
 - To customize scanning for each volume, click **Or select scanning type for each volume**, and then choose the volumes you want to map and/or classify.

See [Enabling and disabling compliance scans on volumes](#) for details.

3. In the confirmation dialog box, click **Approve** to have Data Sense start scanning your volumes.

Result

Cloud Data Sense starts scanning the volumes you selected in the working environment. Results will be available in the Compliance dashboard as soon as Cloud Data Sense finishes the initial scans. The time that it takes depends on the amount of data—it could be a few minutes or hours.

Verifying that Cloud Data Sense has access to volumes

Make sure Cloud Data Sense can access volumes by checking your networking, security groups, and export policies.

You'll need to provide Data Sense with CIFS credentials so it can access CIFS volumes.

Steps

1. On the *Configuration* page, click **View Details** to review the status and correct any errors.

For example, the following image shows a volume Cloud Data Sense can't scan due to network connectivity issues between the Data Sense instance and the volume.

Scan	Storage Repository (Volume)	Type	Status	Required Action
Off Map Map & Classify	jrmclone	NFS	No Access	Check network connectivity between the Data Sense ...

- Make sure there's a network connection between the Cloud Data Sense instance and each network that includes volumes for FSx for ONTAP.



For FSx for ONTAP, Cloud Data Sense can scan volumes only in the same region as Cloud Manager.

- Ensure the following ports are open to the Data Sense instance.
 - For NFS – ports 111 and 2049.
 - For CIFS – ports 139 and 445.
- Ensure NFS volume export policies include the IP address of the Data Sense instance so it can access the data on each volume.
- If you use CIFS, provide Data Sense with Active Directory credentials so it can scan CIFS volumes.
 - At the top of Cloud Manager, click **Data Sense**.
 - Click the **Configuration** tab.
 - For each working environment, click **Edit CIFS Credentials** and enter the user name and password that Data Sense needs to access CIFS volumes on the system.

The credentials can be read-only, but providing admin credentials ensures that Data Sense can read any data that requires elevated permissions. The credentials are stored on the Cloud Data Sense instance.

After you enter the credentials, you should see a message that all CIFS volumes were authenticated successfully.

Enabling and disabling compliance scans on volumes

You can start or stop mapping-only scans, or mapping and classification scans, in a working environment at any time from the Configuration page. You can also change from mapping-only scans to mapping and classification scans, and vice-versa. We recommend that you scan all volumes.

cognitoWE Scan Configuration

44/79 Volumes selected for Data Sense scan

Off

Map

Map & Classify

Custom

Learn about the differences →

Edit CIFS Credentials

Scan	Storage Repository (Volume)	Type	Status	Required Action
<div><div>Off</div><div>Map</div><div>Map & Classify</div></div>	AdiNFSVol_copy	NFS	No Access	Access to the NFS volume was denied. Make sure tha...
<div><div>Off</div><div>Map</div><div>Map & Classify</div></div>	AdiProtest2501	NFS	Continuously Scanning	
<div><div>Off</div><div>Map</div><div>Map & Classify</div></div>	AlexTest	NFS	No Access	Access to the NFS volume was denied. Make sure tha...
<div><div>Off</div><div>Map</div><div>Map & Classify</div></div>	AlexTestSecond	NFS	Not Scanning	
<div><div>Off</div><div>Map</div><div>Map & Classify</div></div>	MoreDataNeed1000	NFS	Continuously Scanning	

To:	Do this:
Enable mapping-only scans on a volume	In the volume area, click Map
Enable full scanning on a volume	In the volume area, click Map & Classify
Disable scanning on a volume	In the volume area, click Off
Enable mapping-only scans on all volumes	In the heading area, click Map
Enable full scanning on all volumes	In the heading area, click Map & Classify
Disable scanning on all volumes	In the heading area, click Off



New volumes added to the working environment are automatically scanned only when you have set the **Map** or **Map & Classify** setting in the heading area. When set to **Custom** or **Off** in the heading area, you'll need to activate mapping and/or full scanning on each new volume you add in the working environment.

Scanning data protection volumes

By default, data protection (DP) volumes are not scanned because they are not exposed externally and Cloud Data Sense cannot access them. These are the destination volumes for SnapMirror operations from an FSx for ONTAP file system.

Initially, the volume list identifies these volumes as *Type DP* with the *Status Not Scanning* and the *Required Action Enable Access to DP volumes*.

The screenshot shows the 'Working Environment Name' Configuration page. At the top, there's a search icon and a button 'Enable Access to DP Volumes' which is highlighted with a red box. Below it is a button 'Edit CIFS Credentials'. The main section has a header '22/28 Volumes selected for compliance scan' and a row of buttons: 'Off', 'Map', 'Map & Classify', and 'Custom'. Below this is a table with columns: 'Scan', 'Storage Repository (Volume)', 'Type', 'Status', and 'Required Action'. The table lists three volumes: 'VolumeName1' (Type DP, Status Not Scanning), 'VolumeName2' (Type NFS, Status Continuously Scanning), and 'VolumeName3' (Type CIFS, Status Not Scanning). Each volume row has its own set of 'Off', 'Map', and 'Map & Classify' buttons.

Steps

If you want to scan these data protection volumes:

1. Click **Enable Access to DP volumes** at the top of the page.
2. Review the confirmation message and click **Enable Access to DP volumes** again.
 - Volumes that were initially created as NFS volumes in the source FSx for ONTAP file system are enabled.
 - Volumes that were initially created as CIFS volumes in the source FSx for ONTAP file system require that you enter CIFS credentials to scan those DP volumes. If you already entered Active Directory credentials so that Cloud Data Sense can scan CIFS volumes you can use those credentials, or you can specify a different set of Admin credentials.

3. Activate each DP volume that you want to scan [the same way you enabled other volumes](#).

Result

Once enabled, Cloud Data Sense creates an NFS share from each DP volume that was activated for scanning. The share export policies only allow access from the Data Sense instance.

Note: If you had no CIFS data protection volumes when you initially enabled access to DP volumes, and later add some, the button **Enable Access to CIFS DP** appears at the top of the Configuration page. Click this button and add CIFS credentials to enable access to these CIFS DP volumes.



Active Directory credentials are only registered in the storage VM of the first CIFS DP volume, so all DP volumes on that SVM will be scanned. Any volumes that reside on other SVMs will not have the Active Directory credentials registered, so those DP volumes won't be scanned.

Getting started with Cloud Data Sense for Amazon S3

Cloud Data Sense can scan your Amazon S3 buckets to identify the personal and sensitive data that resides in S3 object storage. Cloud Data Sense can scan any bucket in the account, regardless if it was created for a NetApp solution.

Quick start

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

1

Set up the S3 requirements in your cloud environment

Ensure that your cloud environment can meet the requirements for Cloud Data Sense, including preparing an IAM role and setting up connectivity from Data Sense to S3. [See the complete list](#).

2

Deploy the Cloud Data Sense instance

[Deploy Cloud Data Sense](#) if there isn't already an instance deployed.

3

Activate Data Sense on your S3 working environment

Select the Amazon S3 working environment, click **Enable**, and select an IAM role that includes the required

permissions.

4

Select the buckets to scan

Select the buckets that you'd like to scan and Cloud Data Sense will start scanning them.

Reviewing S3 prerequisites

The following requirements are specific to scanning S3 buckets.

Set up an IAM role for the Cloud Data Sense instance

Cloud Data Sense needs permissions to connect to the S3 buckets in your account and to scan them. Set up an IAM role that includes the permissions listed below. Cloud Manager prompts you to select an IAM role when you enable Data Sense on the Amazon S3 working environment.

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Effect": "Allow",
      "Action": [
        "s3:Get*",
        "s3:List*",
        "s3:PutObject"
      ],
      "Resource": "*"
    },
    {
      "Effect": "Allow",
      "Action": [
        "iam:GetPolicyVersion",
        "iam:GetPolicy",
        "iam:ListAttachedRolePolicies"
      ],
      "Resource": [
        "arn:aws:iam::*:policy/*",
        "arn:aws:iam::*:role/*"
      ]
    }
  ]
}
```

Provide connectivity from Cloud Data Sense to Amazon S3

Cloud Data Sense needs a connection to Amazon S3. The best way to provide that connection is through a VPC Endpoint to the S3 service. For instructions, see [AWS Documentation: Creating a Gateway Endpoint](#).

When you create the VPC Endpoint, be sure to select the region, VPC, and route table that corresponds to

the Cloud Data Sense instance. You must also modify the security group to add an outbound HTTPS rule that enables traffic to the S3 endpoint. Otherwise, Data Sense can't connect to the S3 service.

If you experience any issues, see [AWS Support Knowledge Center: Why can't I connect to an S3 bucket using a gateway VPC endpoint?](#)

An alternative is to provide the connection by using a NAT Gateway.



You can't use a proxy to get to S3 over the internet.

Deploying the Cloud Data Sense instance

[Deploy Cloud Data Sense in Cloud Manager](#) if there isn't already an instance deployed.

You need to deploy the instance using a Connector deployed in AWS so that Cloud Manager automatically discovers the S3 buckets in this AWS account and displays them in an Amazon S3 working environment.

Note: Deploying Cloud Data Sense in an on-premises location is not currently supported when scanning S3 buckets.

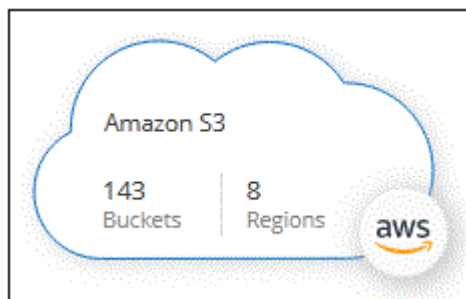
Upgrades to Data Sense software is automated as long as the instance has internet connectivity.

Activating Data Sense on your S3 working environment

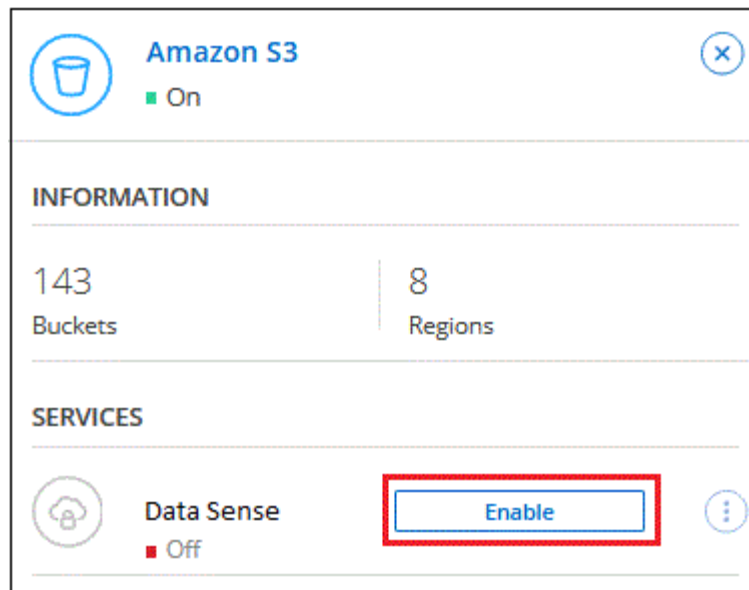
Enable Cloud Data Sense on Amazon S3 after you verify the prerequisites.

Steps

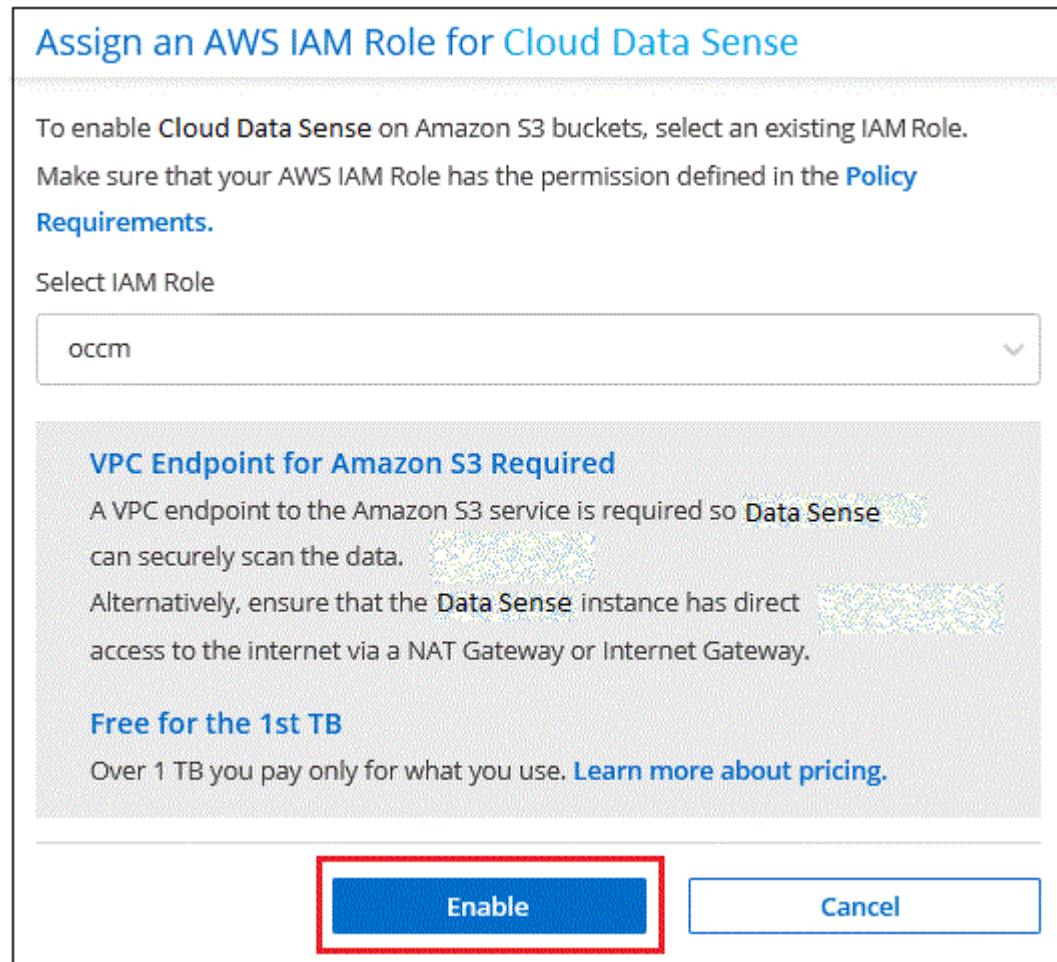
1. At the top of Cloud Manager, click **Canvas**.
2. Select the Amazon S3 working environment.



3. In the Data Sense pane on the right, click **Enable**.




4. When prompted, assign an IAM role to the Cloud Data Sense instance that has [the required permissions](#).



5. Click **Enable**.



You can also enable compliance scans for a working environment from the Configuration page by clicking the  button and selecting **Activate Data Sense**.

Result

Cloud Manager assigns the IAM role to the instance.

Enabling and disabling compliance scans on S3 buckets

After Cloud Manager enables Cloud Data Sense on Amazon S3, the next step is to configure the buckets that you want to scan.

When Cloud Manager is running in the AWS account that has the S3 buckets you want to scan, it discovers those buckets and displays them in an Amazon S3 working environment.

Cloud Data Sense can also [scan S3 buckets that are in different AWS accounts](#).

Steps

- 1. Select the Amazon S3 working environment.
- 2. In the pane on the right, click **Configure Buckets**.



- 3. Enable mapping-only scans, or mapping and classification scans, on your buckets.

Amazon S3 Configuration			
15/28 Buckets in Scan Scope.			
Scan	Bucket Name	Status	Required Action
<div>OffMapMap & Classify</div>	BucketName1	● Not Scanning	Add Credentials
<div>OffMapMap & Classify</div>	BucketName2	● Continuosly Scanning	
<div>OffMapMap & Classify</div>	BucketName3	● Not Scanning	

To:	Do this:
Enable mapping-only scans on a bucket	Click Map
Enable full scans on a bucket	Click Map & Classify

To:	Do this:
Disable scanning on a bucket	Click Off

Result

Cloud Data Sense starts scanning the S3 buckets that you enabled. If there are any errors, they'll appear in the Status column, alongside the required action to fix the error.

Scanning buckets from additional AWS accounts

You can scan S3 buckets that are under a different AWS account by assigning a role from that account to access the existing Cloud Data Sense instance.

Steps

1. Go to the target AWS account where you want to scan S3 buckets and create an IAM role by selecting **Another AWS account**.

Create role



Select type of trusted entity



Allows entities in other accounts to perform actions in this account. [Learn more](#)

Specify accounts that can use this role

Account ID* ⓘ

- Options**
- ☐ Require external ID (Best practice when a third party will assume this role)
 - ☐ Require MFA ⓘ

Be sure to do the following:

- Enter the ID of the account where the Cloud Data Sense instance resides.
- Change the **Maximum CLI/API session duration** from 1 hour to 12 hours and save that change.
- Attach the Cloud Data Sense IAM policy. Make sure it has the required permissions.


```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Effect": "Allow",
      "Action": [
        "s3:Get*",
        "s3:List*",
        "s3:PutObject"
      ],
      "Resource": "*"
    }
  ]
}
```

2. Go to the source AWS account where the Data Sense instance resides and select the IAM role that is attached to the instance.
 - a. Change the **Maximum CLI/API session duration** from 1 hour to 12 hours and save that change.
 - b. Click **Attach policies** and then click **Create policy**.
 - c. Create a policy that includes the "sts:AssumeRole" action and specify the ARN of the role that you created in the target account.

```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Effect": "Allow",
      "Action": "sts:AssumeRole",
      "Resource": "arn:aws:iam::<ADDITIONAL-ACCOUNT-ID>:role/<ADDITIONAL_ROLE_NAME>"
    },
    {
      "Effect": "Allow",
      "Action": [
        "iam:GetPolicyVersion",
        "iam:GetPolicy",
        "iam:ListAttachedRolePolicies"
      ],
      "Resource": [
        "arn:aws:iam::*:policy/*",
        "arn:aws:iam::*:role/*"
      ]
    }
  ]
}
```

The Cloud Data Sense instance profile account now has access to the additional AWS account.

3. Go to the **Amazon S3 Configuration** page and the new AWS account is displayed. Note that it can take a few minutes for Cloud Data Sense to sync the new account's working environment and show this information.



4. Click **Activate Data Sense & Select Buckets** and select the buckets you want to scan.

Result

Cloud Data Sense starts scanning the new S3 buckets that you enabled.

Scanning database schemas

Complete a few steps to start scanning your database schemas with Cloud Data Sense.

Quick start

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

1

Review database prerequisites

Ensure that your database is supported and that you have the information necessary to connect to the database.

2

Deploy the Cloud Data Sense instance

[Deploy Cloud Data Sense](#) if there isn't already an instance deployed.

3

Add the database server

Add the database server that you want to access.

4

Select the schemas

Select the schemas that you want to scan.

Reviewing prerequisites

Review the following prerequisites to make sure that you have a supported configuration before you enable Cloud Data Sense.

Supported databases

Cloud Data Sense can scan schemas from the following databases:

- Amazon Relational Database Service (Amazon RDS)
- MongoDB
- MySQL
- Oracle
- PostgreSQL
- SAP HANA
- SQL Server (MSSQL)



The statistics gathering feature **must be enabled** in the database.

Database requirements

Any database with connectivity to the Cloud Data Sense instance can be scanned, regardless of where it is hosted. You just need the following information to connect to the database:

- IP Address or host name
- Port

- Service name (only for accessing Oracle databases)
- Credentials that allow read access to the schemas

When choosing a user name and password, it's important to choose one that has full read permissions to all the schemas and tables you want to scan. We recommend that you create a dedicated user for the Cloud Data Sense system with all the required permissions.

Note: For MongoDB, a read-only Admin role is required.

Deploying the Cloud Data Sense instance

Deploy Cloud Data Sense if there isn't already an instance deployed.

If you are scanning database schemas that are accessible over the internet, you can [deploy Cloud Data Sense in the cloud](#) or [deploy Data Sense in an on-premises location that has internet access](#).

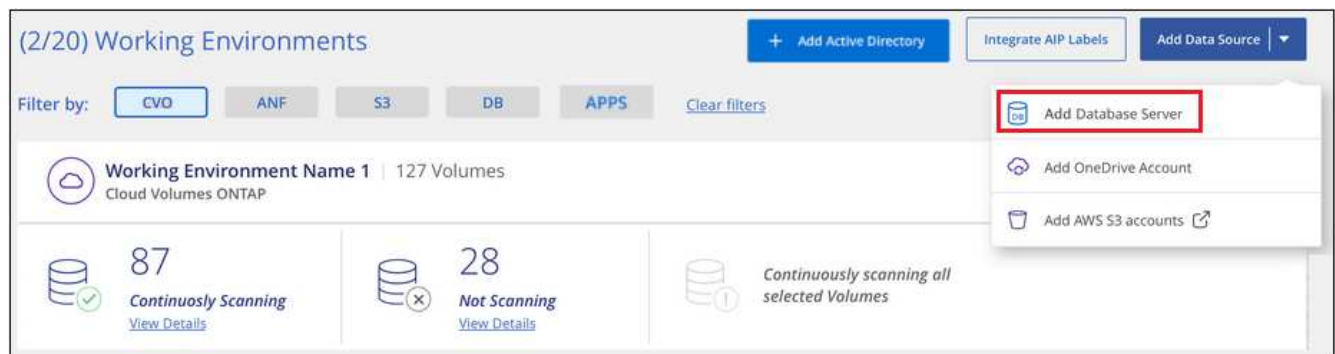
If you are scanning database schemas that have been installed in a dark site that has no internet access, you need to [deploy Cloud Data Sense in the same on-premises location that has no internet access](#). This also requires that the Cloud Manager Connector is deployed in that same on-premises location.

Upgrades to Data Sense software is automated as long as the instance has internet connectivity.

Adding the database server

Add the database server where the schemas reside.

1. From the Working Environments Configuration page, click **Add Data Source > Add Database Server**.



2. Enter the required information to identify the database server.
 - a. Select the database type.
 - b. Enter the port and the host name or IP address to connect to the database.
 - c. For Oracle databases, enter the Service name.
 - d. Enter the credentials so that Cloud Data Sense can access the server.
 - e. Click **Add DB Server**.

Add DB Server

To activate Compliance on Databases, first add a Database Server. After this step, you'll be able to select which Database Schemas you would like to activate Compliance for.

Database

Database Type	Host Name or IP Address
<input type="text"/>	<input type="text"/>
Port	Service Name
<input type="text"/>	<input type="text"/>

Credentials

Username	Password
<input type="text"/>	<input type="text"/>

The database is added to the list of working environments.

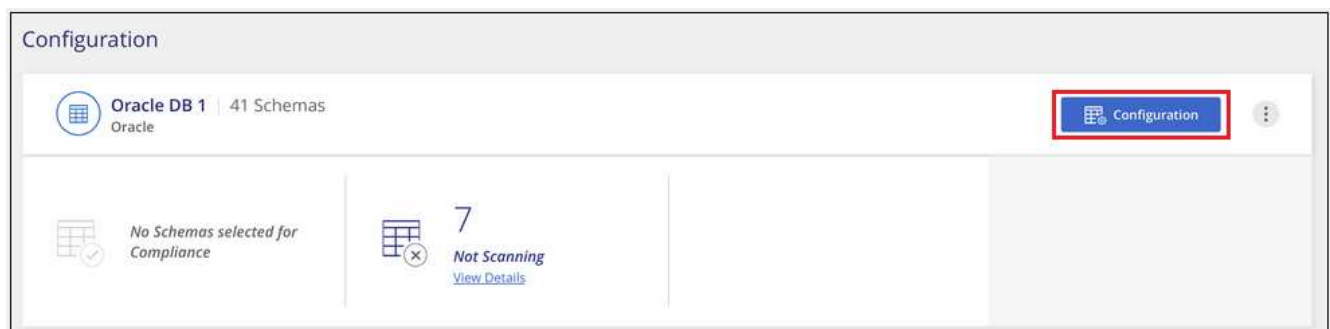
Enabling and disabling compliance scans on database schemas

You can stop or start full scanning of your schemas at any time.



There is no option to select mapping-only scans for database schemas.

1. From the *Configuration* page, click the **Configuration** button for the database you want to configure.



2. Select the schemas that you want to scan by moving the slider to the right.

'Working Environment Name' Configuration			
28/28 Schemas selected for compliance scan		<input type="text"/> Edit Credentials	
Scan	Schema Name	Status	Required Action
<input type="checkbox"/>	DB1 - SchemaName1	Not Scanning	Add Credentials ⓘ
<input type="checkbox"/>	DB1 - SchemaName2	Continuously Scanning	
<input type="checkbox"/>	DB1 - SchemaName3	Continuously Scanning	
<input type="checkbox"/>	DB1 - SchemaName4	Continuously Scanning	

Result

Cloud Data Sense starts scanning the database schemas that you enabled. If there are any errors, they'll appear in the Status column, alongside the required action to fix the error.

Scanning OneDrive accounts

Complete a few steps to start scanning files in your user's OneDrive folders with Cloud Data Sense.

Quick start

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

1

Review OneDrive prerequisites

Ensure that you have the Admin credentials to log into the OneDrive account.

2

Deploy the Cloud Data Sense instance

[Deploy Cloud Data Sense](#) if there isn't already an instance deployed.

3

Add the OneDrive account

Using Admin user credentials, log into the OneDrive account that you want to access so that it is added as a new working environment.

4

Add the users and select the type of scanning

Add the list of users from the OneDrive account that you want to scan and select the type of scanning. You can add up to 100 users at time.

Reviewing OneDrive requirements

Review the following prerequisites to make sure that you have a supported configuration before you enable Cloud Data Sense.

- You must have the Admin login credentials for the OneDrive for Business account that provides read access to the user's files.
- You'll need a line-separated list of the email addresses for all the users whose OneDrive folders you want to scan.

Deploying the Cloud Data Sense instance

Deploy Cloud Data Sense if there isn't already an instance deployed.

Data Sense can be [deployed in the cloud](#) or [in an on-premises location that has internet access](#).

Upgrades to Data Sense software is automated as long as the instance has internet connectivity.

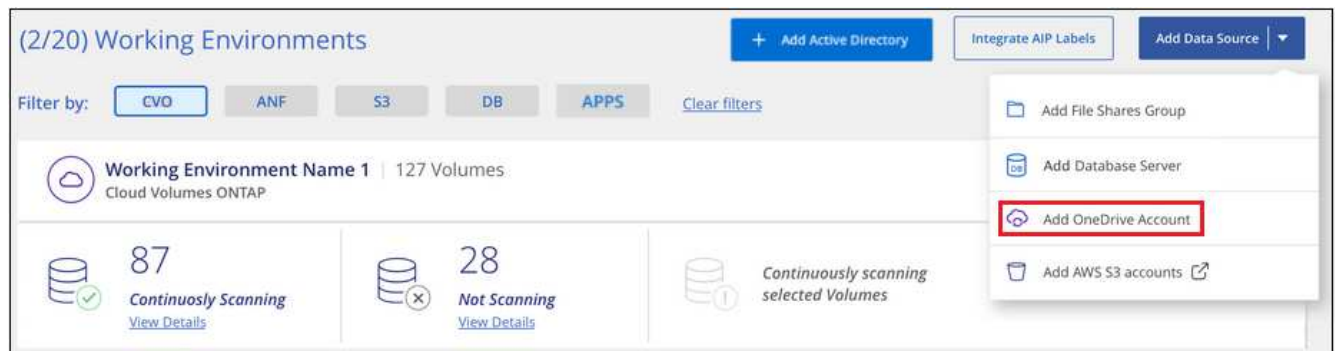
Data Sense can also be [deployed in an on-premises location that has no internet access](#). However, you'll need to provide internet access to a few select endpoints to scan your local OneDrive files. [See the list of required endpoints here](#).

Adding the OneDrive account

Add the OneDrive account where the user files reside.

Steps

1. From the Working Environments Configuration page, click **Add Data Source > Add OneDrive Account**.



2. In the Add a OneDrive account dialog, click **Sign in to OneDrive**.
3. In the Microsoft page that appears, select the OneDrive account and enter the required Admin user and password, then click **Accept** to allow Cloud Data Sense to read data from this account.

The OneDrive account is added to the list of working environments.

Adding OneDrive users to compliance scans

You can add individual OneDrive users, or all of your OneDrive users, so that their files will be scanned by Cloud Data Sense.

Steps

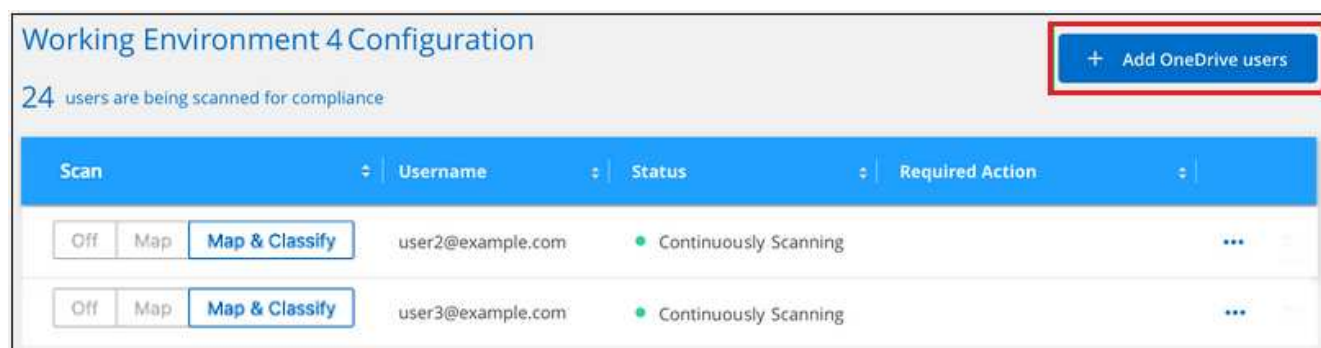
1. From the *Configuration* page, click the **Configuration** button for the OneDrive account.



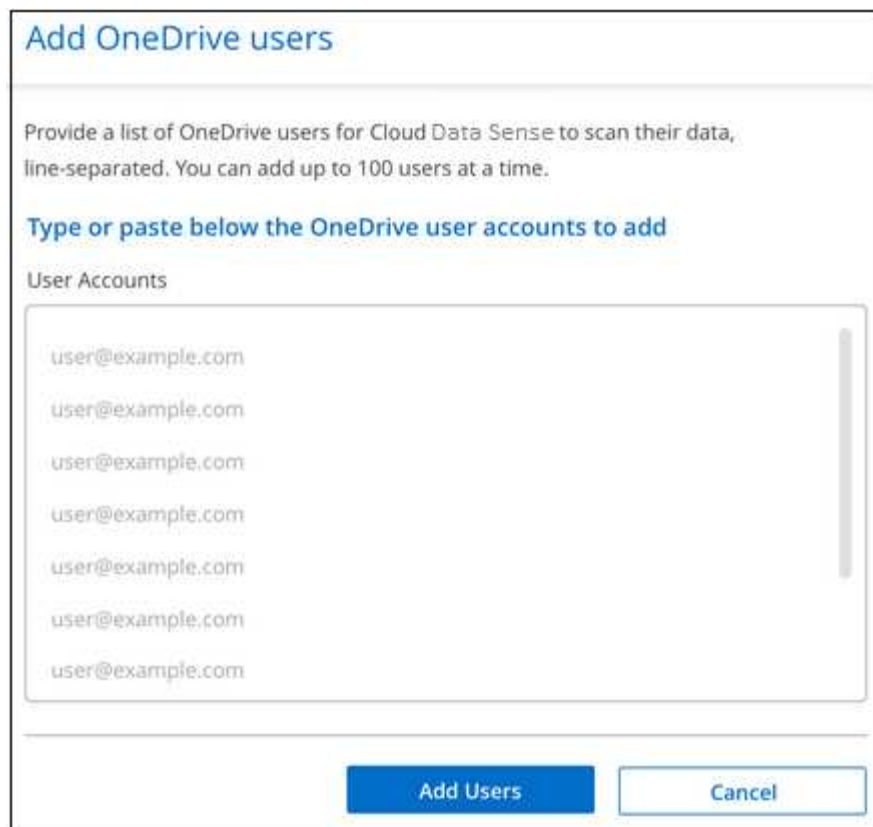
- If this is the first time adding users for this OneDrive account, click **Add your first OneDrive users**.



If you are adding additional users from a OneDrive account, click **Add OneDrive users**.



- Add the email addresses for the users whose files you want to scan - one email address per line (up to 100 maximum per session) - and click **Add Users**.



Add OneDrive users

Provide a list of OneDrive users for Cloud Data Sense to scan their data, line-separated. You can add up to 100 users at a time.

[Type or paste below the OneDrive user accounts to add](#)

User Accounts

user@example.com
 user@example.com
 user@example.com
 user@example.com
 user@example.com
 user@example.com
 user@example.com

Add Users **Cancel**

A confirmation dialog displays the number of users who were added.

If the dialog lists any users who could not be added, capture this information so that you can resolve the issue. In some cases you can re-add the user with a corrected email address.

4. Enable mapping-only scans, or mapping and classification scans, on user files.

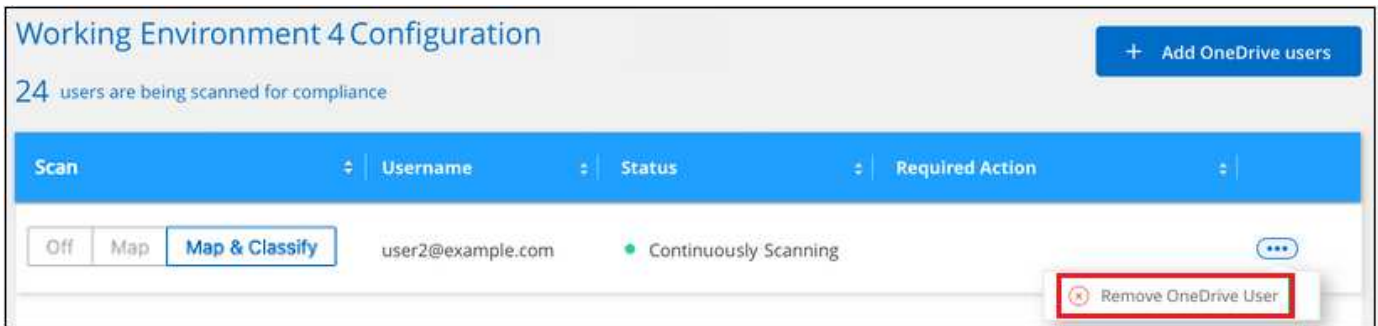
To:	Do this:
Enable mapping-only scans on user files	Click Map
Enable full scans on user files	Click Map & Classify
Disable scanning on user files	Click Off

Result

Cloud Data Sense starts scanning the files for the users you added, and the results are displayed in the Dashboard and in other locations.

Removing a OneDrive user from compliance scans

If users leave the company or if their email address changes, you can remove individual OneDrive users from having their files scanned at any time. Just click **Remove OneDrive User** from the Configuration page.



Note that you can [delete the entire OneDrive account from Data Sense](#) if you no longer want to scan any user data from the OneDrive account.

Scanning SharePoint accounts

Complete a few steps to start scanning files in your SharePoint accounts with Cloud Data Sense.

Quick start

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

1

Review SharePoint prerequisites

Ensure that you have the Admin credentials to log into the SharePoint account, and that you have the URLs for the SharePoint sites that you want to scan.

2

Deploy the Cloud Data Sense instance

[Deploy Cloud Data Sense](#) if there isn't already an instance deployed.

3

Log into the SharePoint account

Using Admin user credentials, log into the SharePoint account that you want to access so that it is added as a new data source/working environment.

4

Add the SharePoint site URLs to scan

Add the list of SharePoint site URLs that you want to scan in the SharePoint account, and select the type of scanning. You can add up to 100 URLs at time.

Reviewing SharePoint requirements

Review the following prerequisites to make sure you are ready to enable Cloud Data Sense on a SharePoint account.

- You must have the Admin login credentials for the SharePoint account that provides read access to all SharePoint sites.
- You will need a line-separated list of the SharePoint site URLs for all the data you want to scan.

Deploying the Cloud Data Sense instance

Deploy Cloud Data Sense if there isn't already an instance deployed.

Data Sense can be [deployed in the cloud](#) or [in an on-premises location that has internet access](#).

Upgrades to Data Sense software is automated as long as the instance has internet connectivity.

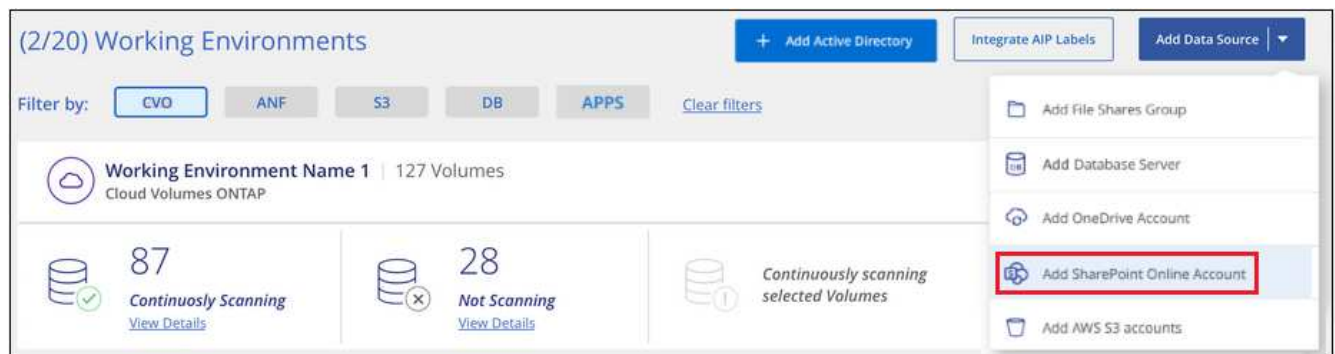
Data Sense can also be [deployed in an on-premises location that has no internet access](#). However, you'll need to provide internet access to a few select endpoints to scan your local SharePoint files. [See the list of required endpoints here](#).

Adding the SharePoint account

Add the SharePoint account where the user files reside.

Steps

1. From the Working Environments Configuration page, click **Add Data Source > Add SharePoint Online Account**.



2. In the Add a SharePoint Online Account dialog, click **Sign in to SharePoint**.
3. In the Microsoft page that appears, select the SharePoint account and enter the required Admin user and password, then click **Accept** to allow Cloud Data Sense to read data from this account.

The SharePoint account is added to the list of working environments.

Adding SharePoint sites to compliance scans

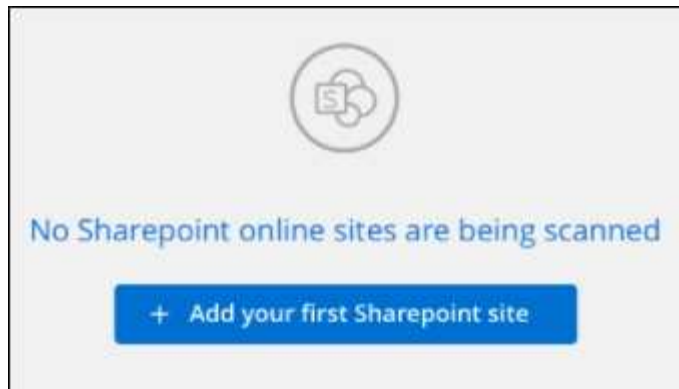
You can add individual SharePoint sites, or all of the SharePoint sites in the account, so that the associated files will be scanned by Cloud Data Sense.

Steps

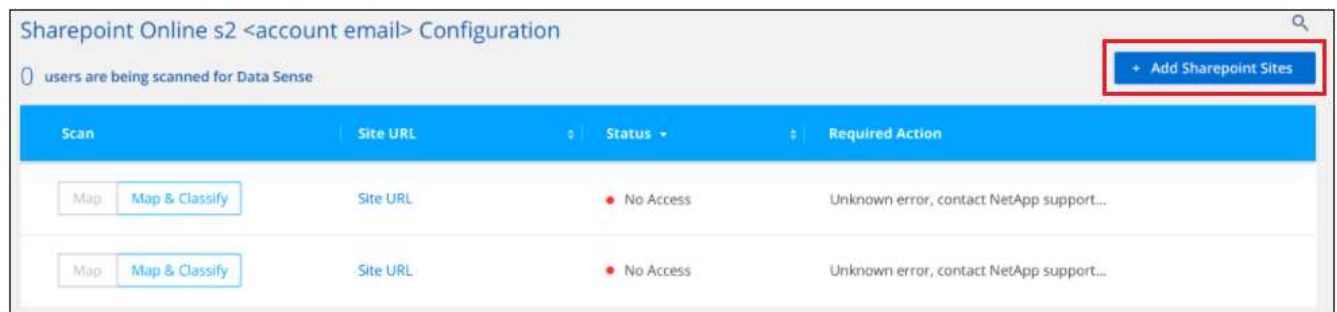
1. From the *Configuration* page, click the **Configuration** button for the SharePoint account.



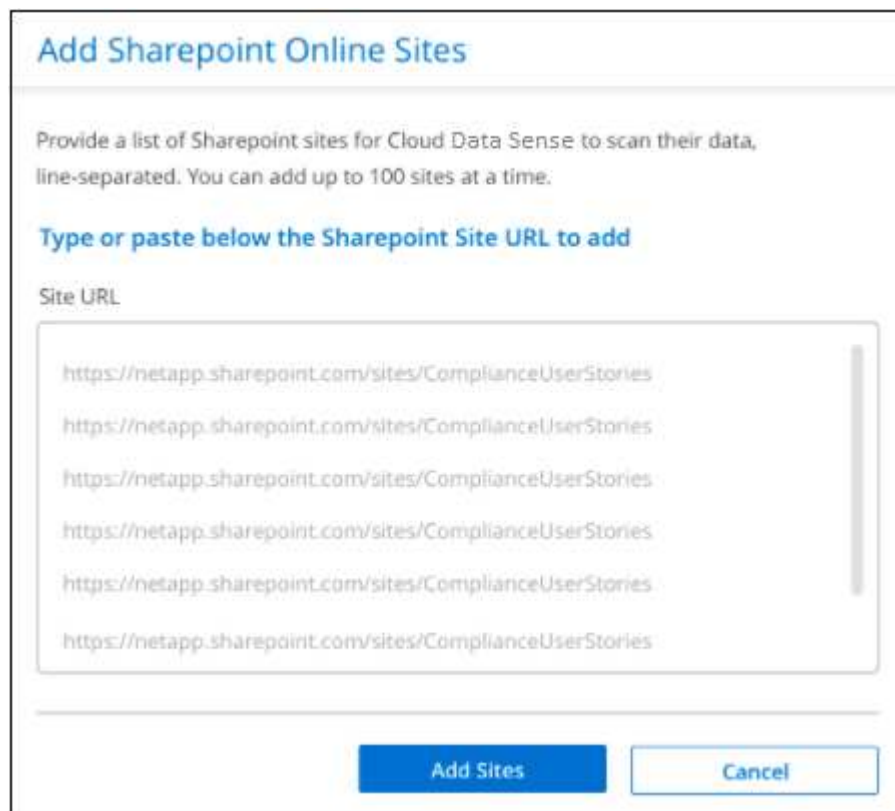
2. If this is the first time adding sites for this SharePoint account, click **Add your first SharePoint site**.



If you are adding additional users from a SharePoint account, click **Add SharePoint Sites**.



3. Add the URLs for the sites whose files you want to scan - one URL per line (up to 100 maximum per session) - and click **Add Sites**.



A confirmation dialog displays the number of sites that were added.

If the dialog lists any sites that could not be added, capture this information so that you can resolve the issue. In some cases you can re-add the site with a corrected URL.

4. Enable mapping-only scans, or mapping and classification scans, on the files in the SharePoint sites.

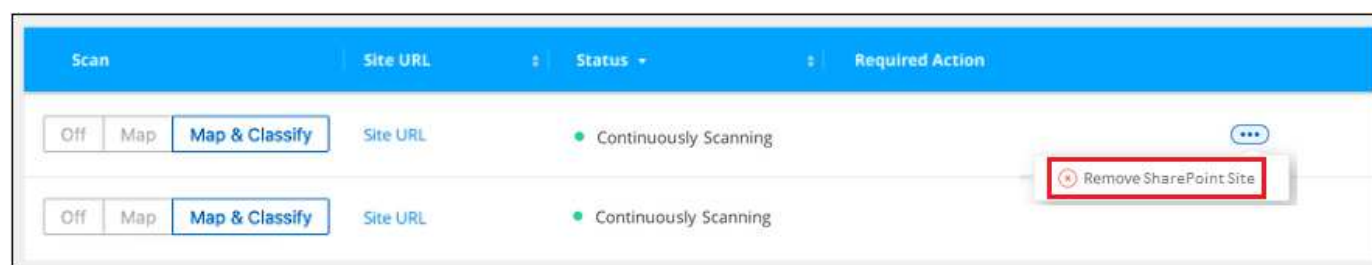
To:	Do this:
Enable mapping-only scans on files	Click Map
Enable full scans on files	Click Map & Classify
Disable scanning on files	Click Off

Result

Cloud Data Sense starts scanning the files in the SharePoint sites you added, and the results are displayed in the Dashboard and in other locations.

Removing a SharePoint site from compliance scans

If you remove a SharePoint site in the future, or decide not to scan files in a SharePoint site, you can remove individual SharePoint sites from having their files scanned at any time. Just click **Remove SharePoint Site** from the Configuration page.



Note that you can [delete the entire SharePoint account from Data Sense](#) if you no longer want to scan any user data from the SharePoint account.

Scanning Google Drive accounts

Complete a few steps to start scanning user files in your Google Drive accounts with Cloud Data Sense.

Quick start

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

1

Review Google Drive prerequisites

Ensure that you have the Admin credentials to log into the Google Drive account.

2

Deploy Cloud Data Sense

[Deploy Cloud Data Sense](#) if there isn't already an instance deployed.

3

Log into the Google Drive account

Using Admin user credentials, log into the Google Drive account that you want to access so that it is added as a new data source.

4

Select the type of scanning for the user files

Select the type of scanning you want to perform on the user files; mapping or mapping and classifying.

Reviewing Google Drive requirements

Review the following prerequisites to make sure you are ready to enable Cloud Data Sense on a Google Drive account.

- You must have the Admin login credentials for the Google Drive account that provides read access to the user's files

Current restrictions

The following Data Sense features are not currently supported with Google Drive files:

- When viewing files in the Data Investigation page, the actions in the button bar aren't active. You can't copy, move, delete, etc. any files.
- Permissions can't be identified within files in Google Drive, so no permission information is displayed in the Investigation page.

Deploying Cloud Data Sense

Deploy Cloud Data Sense if there isn't already an instance deployed.

Data Sense can be [deployed in the cloud](#) or [in an on-premises location that has internet access](#).

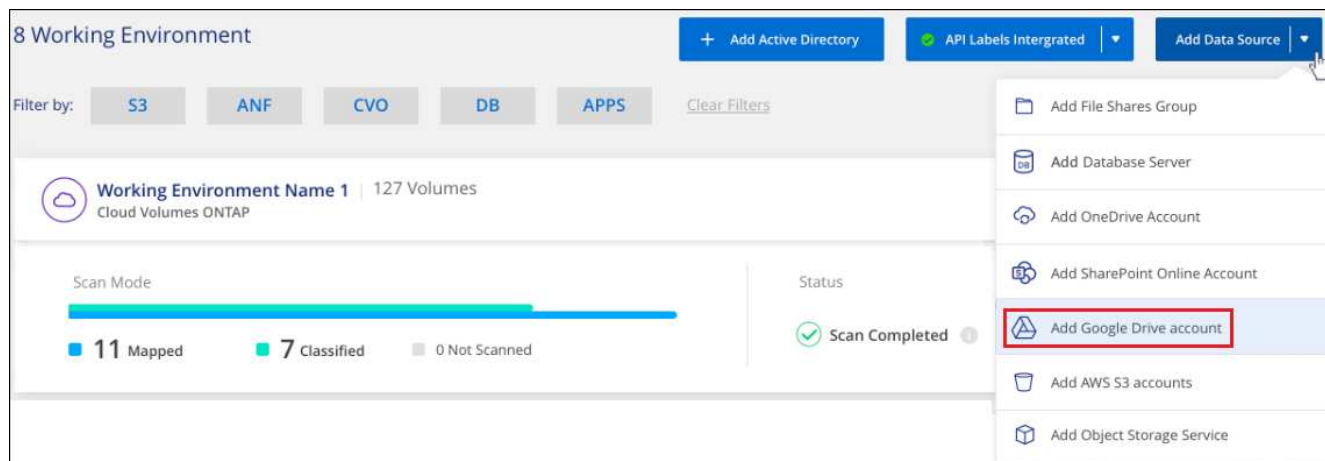
Upgrades to Data Sense software is automated as long as the instance has internet connectivity.

Adding the Google Drive account

Add the Google Drive account where the user files reside.

Steps

1. From the Working Environments Configuration page, click **Add Data Source > Add Google Drive Account**.



2. In the Add a Google Drive Account dialog, click **Sign in to Google Drive**.
3. In the Google page that appears, select the Google Drive account and enter the required Admin user and password, then click **Accept** to allow Cloud Data Sense to read data from this account.

The Google Drive account is added to the list of working environments.

Selecting the type of scanning for user data

Select the type of scanning that Cloud Data Sense will perform on the user's data.

Steps

1. From the *Configuration* page, click the **Configuration** button for the Google Drive account.



2. Enable mapping-only scans, or mapping and classification scans, on the files in the Google Drive account.



To:	Do this:
Enable mapping-only scans on files	Click Map
Enable full scans on files	Click Map & Classify
Disable scanning on files	Click Off

Result

Cloud Data Sense starts scanning the files in the Google Drive account you added, and the results are

displayed in the Dashboard and in other locations.

Removing a Google Drive account from compliance scans

Since only a single user's Google Drive files are part of a single Google Drive account, if you want to stop scanning files from a user's Google Drive account, then you should [delete the Google Drive account from Data Sense](#).

Scanning file shares

Complete a few steps to start scanning non-NetApp NFS or CIFS file shares directly with Cloud Data Sense. These file shares can reside on-premises or in the cloud.

Quick start

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

1

Review file share prerequisites

For CIFS (SMB) shares, ensure that you have credentials to access the shares.

2

Deploy the Cloud Data Sense instance

[Deploy Cloud Data Sense](#) if there isn't already an instance deployed.

3

Create a group to hold the file shares

The group is a container for the file shares that you want to scan, and it is used as the working environment name for those file shares.

4

Add the file shares and select the shares to scan

Add the list of file shares that you want to scan and select the type of scanning. You can add up to 100 file shares at a time.

Reviewing file share requirements

Review the following prerequisites to make sure that you have a supported configuration before you enable Cloud Data Sense.

- The shares can be hosted anywhere, including in the cloud or on-premises. These are file shares that reside on non-NetApp storage systems.
- There needs to be network connectivity between the Data Sense instance and the shares.
- Make sure these ports are open to the Data Sense instance:
 - For NFS – ports 111 and 2049.
 - For CIFS – ports 139 and 445.
- You will need the list of shares you want to add in the format `<host_name>:/<share_path>`. You can enter the shares individually, or you can supply a line-separated list of the file shares you want to scan.

- For CIFS (SMB) shares, ensure that you have Active Directory credentials that provide read access to the shares. Admin credentials are preferred in case Cloud Data Sense needs to scan any data that requires elevated permissions.

Deploying the Cloud Data Sense instance

Deploy Cloud Data Sense if there isn't already an instance deployed.

If you are scanning non-NetApp NFS or CIFS file shares that are accessible over the internet, you can [deploy Cloud Data Sense in the cloud](#) or [deploy Data Sense in an on-premises location that has internet access](#).

If you are scanning non-NetApp NFS or CIFS file shares that have been installed in a dark site that has no internet access, you need to [deploy Cloud Data Sense in the same on-premises location that has no internet access](#). This also requires that the Cloud Manager Connector is deployed in that same on-premises location.

Upgrades to Data Sense software is automated as long as the instance has internet connectivity.

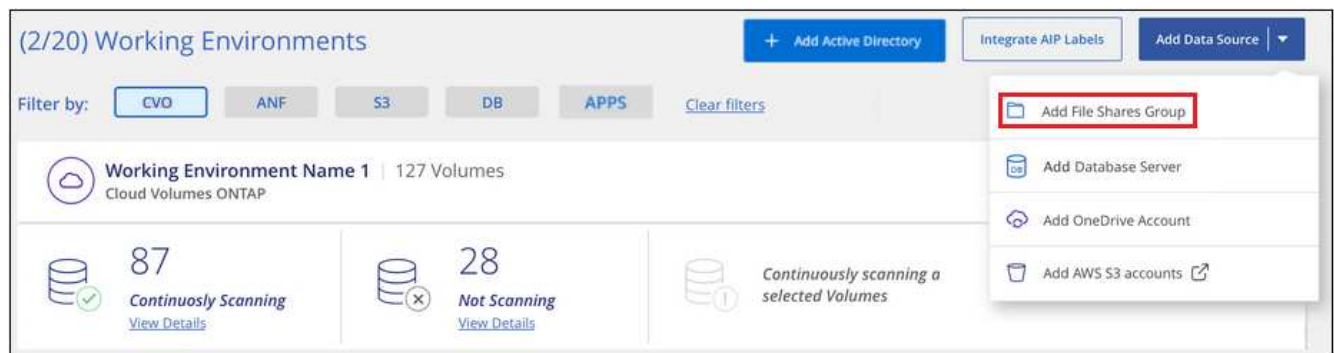
Creating the group for the file shares

You must add a files shares "group" before you can add your file shares. The group is a container for the file shares that you want to scan, and the group name is used as the working environment name for those file shares.

You can mix NFS and CIFS shares in the same group, however, all CIFS file shares in a group need to be using the same Active Directory credentials. If you plan to add CIFS shares that use different credentials, you must make a separate group for each unique set of credentials.

Steps

1. From the Working Environments Configuration page, click **Add Data Source > Add File Shares Group**.



2. In the Add Files Shares Group dialog, enter the name for the group of shares and click **Continue**.

The new File Shares Group is added to the list of working environments.

Adding file shares to a group

You add file shares to the File Shares Group so that the files in those shares will be scanned by Cloud Data Sense. You add the shares in the format `<host_name>:/<share_path>`.

You can add individual file shares, or you can supply a line-separated list of the file shares you want to scan. You can add up to 100 shares at a time.

When adding both NFS and CIFS shares in a single group, you'll need to run through the process twice - once

adding NFS shares, and then again adding the CIFS shares.

Steps

- 1. From the *Working Environments* page, click the **Configuration** button for the File Shares Group.



- 2. If this is the first time adding file shares for this File Shares Group, click **Add your first Shares**.



If you are adding file shares to an existing group, click **Add Shares**.



- 3. Select the protocol for the file shares you are adding, add the file shares that you want to scan - one file share per line - and click **Continue**.

When adding CIFS (SMB) shares, you need to enter the Active Directory credentials that provide read access to the shares. Admin credentials are preferred.

Adding Shares

Directly add any NFS or CIFS (SMB) File Shares, located in the cloud or on-premises.

Select Protocol

You'll be able to add additional shares from the other protocol later.

☒ NFS ☐ CIFS (SMB)

Type or paste below the Shares to add

Provide a list of shares, line-separated. You can add up to 100 at a time (you can add more later).

Hostname:/SHAREPATH
 Hostname:/SHAREPATH
 Hostname:/SHAREPATH

Continue **Cancel**

Provide CIFS Credentials

☐ NFS ☒ CIFS (SMB)

Username **Password**

[Input fields for Username and Password]

A confirmation dialog displays the number of shares that were added.

If the dialog lists any shares that could not be added, capture this information so that you can resolve the issue. In some cases you can re-add the share with a corrected host name or share name.

4. Enable mapping-only scans, or mapping and classification scans, on each file share.

To:	Do this:
Enable mapping-only scans on file shares	Click Map
Enable full scans on file shares	Click Map & Classify
Disable scanning on file shares	Click Off

Result

Cloud Data Sense starts scanning the files in the file shares you added, and the results are displayed in the Dashboard and in other locations.

Removing a file share from compliance scans

If you no longer need to scan certain file shares, you can remove individual file shares from having their files scanned at any time. Just click **Remove Share** from the Configuration page.



Scanning object storage that uses S3 protocol

Complete a few steps to start scanning data within object storage directly with Cloud Data Sense. Data Sense can scan data from any Object Storage service which uses the Simple Storage Service (S3) protocol. This includes NetApp StorageGRID, IBM Cloud Object Store, Azure Blob (using MinIO), Linode, B2 Cloud Storage, Amazon S3, and more.

Quick start

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

1

Review object storage prerequisites

You need to have the endpoint URL to connect with the object storage service.

You need to have the Access Key and Secret Key from the object storage provider so that Cloud Data Sense can access the buckets.

2

Deploy the Cloud Data Sense instance

[Deploy Cloud Data Sense](#) if there isn't already an instance deployed.

3

Add the Object Storage Service

Add the object storage service to Cloud Data Sense.

4

Select the buckets to scan

Select the buckets that you'd like to scan and Cloud Data Sense will start scanning them.

Reviewing object storage requirements

Review the following prerequisites to make sure that you have a supported configuration before you enable Cloud Data Sense.

- You need to have the endpoint URL to connect with the object storage service.

- You need to have the Access Key and Secret Key from the object storage provider so that Data Sense can access the buckets.
- Support for Azure Blob requires that you use the [MinIO service](#).

Deploying the Cloud Data Sense instance

Deploy Cloud Data Sense if there isn't already an instance deployed.

If you are scanning data from S3 object storage that is accessible over the internet, you can [deploy Cloud Data Sense in the cloud](#) or [deploy Data Sense in an on-premises location that has internet access](#).

If you are scanning data from S3 object storage that has been installed in a dark site that has no internet access, you need to [deploy Cloud Data Sense in the same on-premises location that has no internet access](#). This also requires that the Cloud Manager Connector is deployed in that same on-premises location.

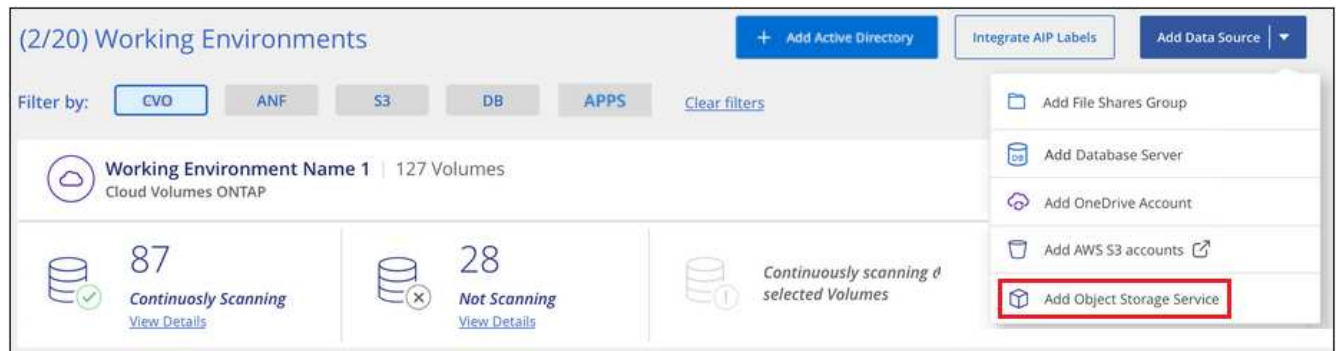
Upgrades to Data Sense software is automated as long as the instance has internet connectivity.

Adding the object storage service to Cloud Data Sense

Add the object storage service.

Steps

1. From the Working Environments Configuration page, click **Add Data Source > Add Object Storage Service**.



2. In the Add Object Storage Service dialog, enter the details for the object storage service and click **Continue**.
 - a. Enter the name you want to use for the Working Environment. This name should reflect the name of the object storage service to which you are connecting.
 - b. Enter the Endpoint URL to access the object storage service.
 - c. Enter the Access Key and Secret Key so that Cloud Data Sense can access the buckets in the object storage.

Add Object Storage Service

Cloud Data Sense can scan data from any Object Storage service which uses the S3 protocol. This includes NetApp StorageGRID, IBM Object Store, and more.

To continue, enter the following information. In the next steps you'll need to select the buckets you want to scan.

Name the Working Environment	Endpoint URL
<input type="text" value="object_myIBM"/>	<input type="text" value="http://my.endpoint.com"/>
Access Key	Secret Key
<input type="text" value="AJUKD0574NDJG86795"/>	<input type="password" value="....."/>

Result

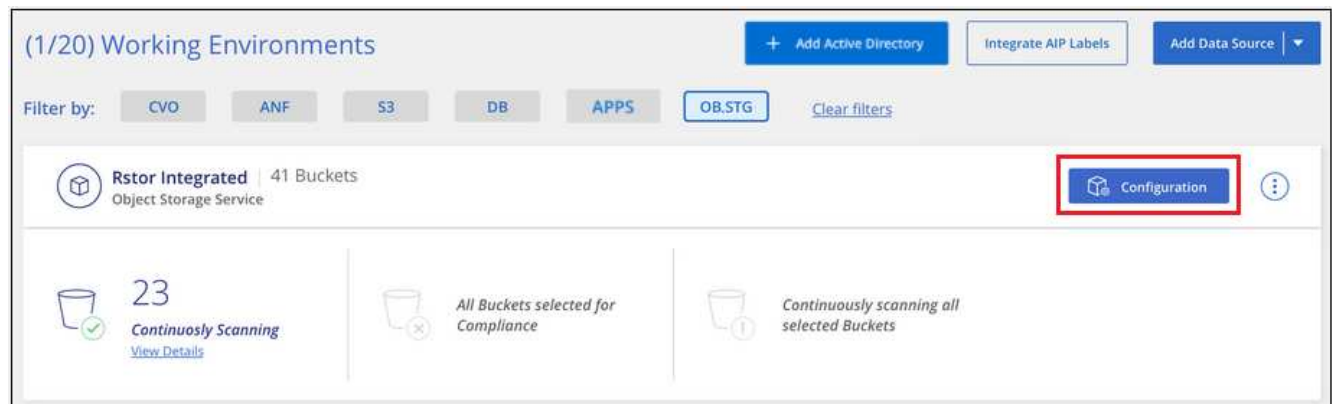
The new Object Storage Service is added to the list of working environments.

Enabling and disabling compliance scans on object storage buckets

After you enable Cloud Data Sense on your Object Storage Service, the next step is to configure the buckets that you want to scan. Data Sense discovers those buckets and displays them in the working environment you created.

Steps

1. In the Configuration page, click **Configuration** from the Object Storage Service working environment.



2. Enable mapping-only scans, or mapping and classification scans, on your buckets.

Rstor Integrated Configuration
3/55 Buckets selected for Compliance scan

Scan		Storage Repository (Bucket) ↓↑	Status ↓↑	Required Action ↓↑
Off	Map	Map & Classify	logs-759995470648-us-east-1	● Not Scanning
Off	Map	Map & Classify	logs-759995470648-us-west-2	● Not Scanning
Off	Map	Map & Classify	carstock	● Continuously Scanning

To:	Do this:
Enable mapping-only scans on a bucket	Click Map
Enable full scans on a bucket	Click Map & Classify
Disable scanning on a bucket	Click Off

Result

Cloud Data Sense starts scanning the buckets that you enabled. If there are any errors, they'll appear in the Status column, alongside the required action to fix the error.

Integrate your Active Directory with Cloud Data Sense

You can integrate a global Active Directory with Cloud Data Sense to enhance the results that Data Sense reports about file owners and which users and groups have access to your files.

When you set up certain data sources (listed below), you need to enter Active Directory credentials in order for Data Sense to scan CIFS volumes. This integration provides Data Sense with file owner and permissions details for the data that resides in those data sources. The Active Directory entered for those data sources may be different than the global Active Directory credentials you enter here. Data Sense will look in all integrated Active Directories for user and permission details.

This integration provides additional information in the following locations in Data Sense:

- You can use the "File Owner" [filter](#) and see results in the file's metadata in the Investigation pane. Instead of the file owner containing the SID (Security IDentifier), it is populated with the actual user name.
- You can see [full file permissions](#) for each file when you click the "View all Permissions" button.
- In the [Governance dashboard](#), the Open Permissions panel will show a greater level of detail about your data.



Local user SIDs, and SIDs from unknown domains, are not translated to the actual user name.

Supported data sources

An Active Directory integration with Cloud Data Sense can identify data from within the following data sources:

- On-premises ONTAP systems
- Cloud Volumes ONTAP
- Azure NetApp Files
- FSx for ONTAP
- Non-NetApp CIFS file shares (not for NFS file shares)

There is no support for identifying user and permission information from Database schemas, OneDrive accounts, SharePoint accounts, Google Drive accounts, Amazon S3 accounts, or Object Storage that uses the Simple Storage Service (S3) protocol.

Connecting to your Active Directory server

After you've deployed Data Sense and have activated scanning on your data sources, you can integrate Data Sense with your Active Directory. Active Directory can be accessed using a DNS Server IP address or an LDAP Server IP address.

The Active Directory credentials can be read-only, but providing admin credentials ensures that Data Sense can read any data that requires elevated permissions. The credentials are stored on the Cloud Data Sense instance.

Requirements

- You must have an Active Directory already set up for the users in your company.
- You must have the information for the Active Directory:
 - DNS Server IP address, or multiple IP addresses
 - or
 - LDAP Server IP address, or multiple IP addresses
 - User Name and Password to access 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)
- The following ports must be open for outbound communication by the Data Sense instance:

Protocol	Port	Destination	Purpose
TCP & UDP	389	Active Directory	LDAP
TCP	636	Active Directory	LDAP over SSL
TCP	3268	Active Directory	Global Catalog
TCP	3269	Active Directory	Global Catalog over SSL

Steps

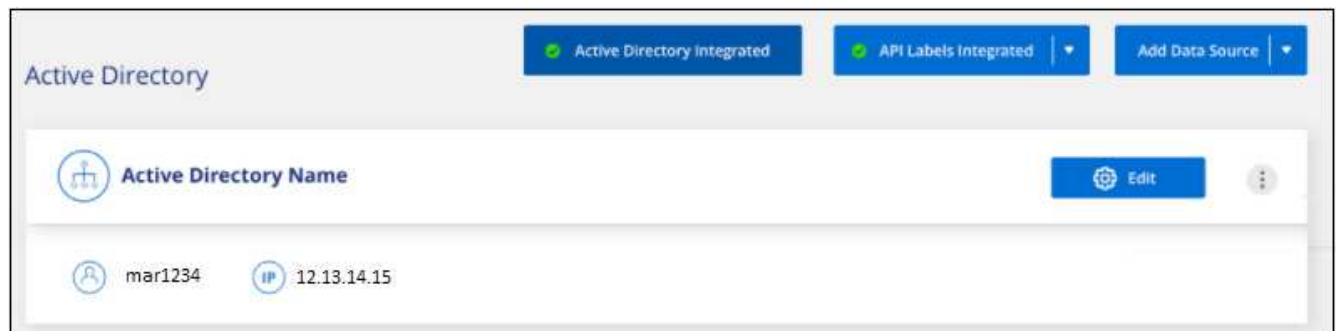
1. From the Cloud Data Sense Configuration page, click **Add Active Directory**.



2. In the Connect to Active Directory dialog, enter the Active Directory details and click **Connect**.


You can add multiple IP addresses, if required, by clicking **Add IP**.

Data Sense integrates to the Active Directory, and a new section is added to the Configuration page.



Managing your Active Directory integration

If you need to modify any values in your Active Directory integration, click the **Edit** button and make the changes.

You can also delete the integration if you no longer need it by clicking the  button and then **Remove Active Directory**.

Set up licensing for Cloud Data Sense

The first 1 TB of data that Cloud Data Sense scans in a Cloud Manager workspace is free. A BYOL license from NetApp, or a Cloud Manager subscription from your cloud provider's marketplace, is required to continue scanning data after that point.

A few notes before you read any further:

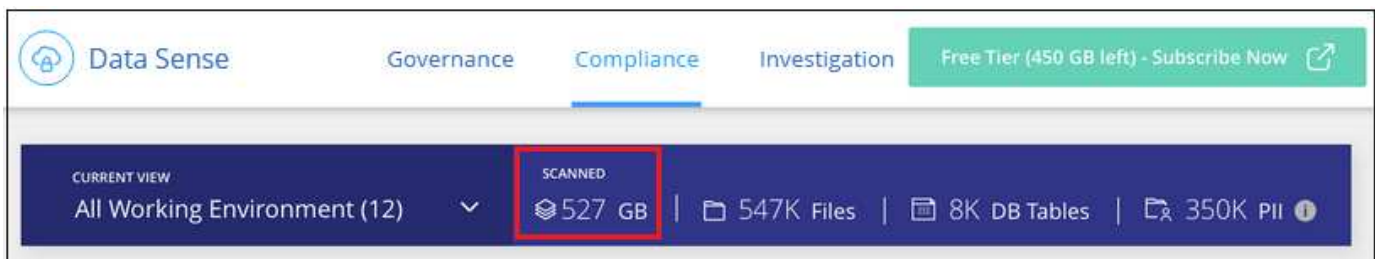
- If you've already subscribed to the Cloud Manager pay-as-you-go (PAYGO) subscription in your cloud provider's marketplace, then you're automatically subscribed to Cloud Data Sense as well. You won't need to subscribe again.
- The Cloud Data Sense bring-your-own-license (BYOL) is a *floating* license that you can use across all the working environments and data sources in the workspace that you plan to scan. You'll see an active subscription in the Digital Wallet.

[Learn more about the licensing and costs related to Cloud Data Sense.](#)

Use a Cloud Data Sense PAYGO subscription

Pay-as-you-go subscriptions from your cloud provider's marketplace enable you to license the use of Cloud Volumes ONTAP systems and many Cloud Data Services, such as Cloud Data Sense.

You can subscribe at any time and you will not be charged until the amount of data exceeds 1 TB. You can always see the total amount of data that is being scanned from the Data Sense Dashboard. And the *Subscribe Now* button makes it easy to subscribe when you are ready.



Steps

These steps must be completed by a user who has the *Account Admin* role.

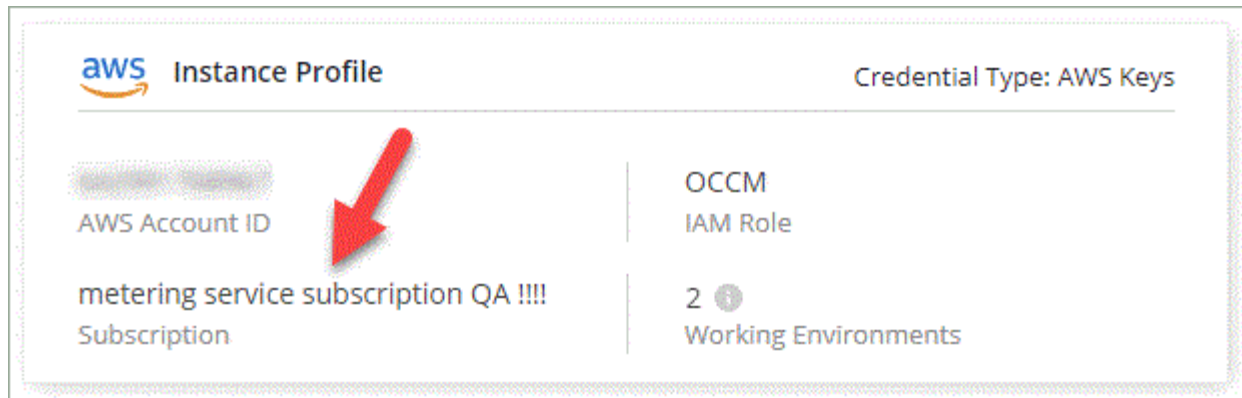
1. In the upper right of the Cloud Manager console, click the Settings icon, and select **Credentials**.



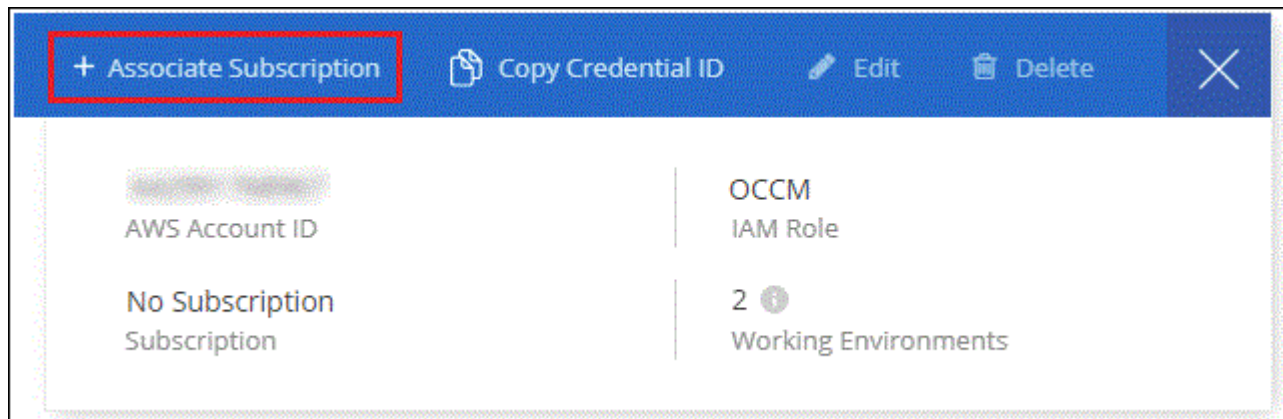
2. Find the credentials for the AWS Instance Profile, Azure Managed Service Identity, or Google Project.

The subscription must be added to the Instance Profile, Managed Service Identity, or Google Project. Charging won't work otherwise.

If you already have a subscription (shown below for AWS), then you're all set—there's nothing else that you need to do.



3. If you don't have a subscription yet, hover over the credentials, click the action menu, and click **Associate Subscription**.



4. Select an existing subscription and click **Associate**, or click **Add Subscription** and follow the steps.

The following video shows how to associate an [AWS Marketplace](#) subscription to an AWS subscription:

► https://docs.netapp.com/us-en/cloud-manager-data-sense//media/video_subscribing_aws.mp4 (video)

The following video shows how to associate an [Azure Marketplace](#) subscription to an Azure subscription:

► https://docs.netapp.com/us-en/cloud-manager-data-sense//media/video_subscribing_azure.mp4 (video)

The following video shows how to associate a [GCP Marketplace](#) subscription to a GCP subscription:

► https://docs.netapp.com/us-en/cloud-manager-data-sense//media/video_subscribing_gcp.mp4 (video)

Use a Cloud Data Sense BYOL license

Bring-your-own licenses from NetApp provide 1-, 2-, or 3-year terms. The BYOL **Cloud Data Sense** license is a *floating* license where the total capacity is shared among **all** of your working environments and data sources, making initial licensing and renewal easy.

If you don't have a Cloud Data Sense license, contact us to purchase one:

- [Send email to purchase a license](#).
- Click the chat icon in the lower-right of Cloud Manager to request a license.

Optionally, if you have an unassigned node-based license for Cloud Volumes ONTAP that you won't be using, you can convert it to a Cloud Data Sense license with the same dollar-equivalence and the same expiration date. [Go here for details](#).

You use the Digital Wallet page in Cloud Manager to manage Cloud Data Sense BYOL licenses. You can add new licenses and update existing licenses.

Obtain your Cloud Data Sense license file

After you have purchased your Cloud Data Sense license, you activate the license in Cloud Manager by entering the Cloud Data Sense serial number and NSS account, or by uploading the NLF license file. The steps below show how to get the NLF license file if you plan to use that method.

If you've deployed Cloud Data Sense on a host in an on-premises site that doesn't have internet access, you'll need to obtain the license file from an internet-connected system. Activating the license using the serial number and NSS account is not available for dark site installations.

Steps

- 1. Sign in to the [NetApp Support Site](#) and click **Systems > Software Licenses**.
- 2. Enter your Cloud Data Sense license serial number.

Software Licenses

Serial Number

481*

Serial #	Cluster SN	License Name	License Key	Host ID	Value	End Date
4810		SUBS-CLD-DAT-SENSE-TB-2Y	Get NetApp License File		100	12/31/9998

- 3. Under **License Key**, click **Get NetApp License File**.
- 4. Enter your Cloud Manager Account ID (this is called a Tenant ID on the support site) and click **Submit** to download the license file.

Get License

SERIAL NUMBER:

4810

LICENSE:

SUBS-CLD-DAT-SENSE-TB-2Y

SALES ORDER:

3005

TENANT ID:

Enter Tenant ID

Example: account-xxxxxxxx

Cancel

Submit

You can find your Cloud Manager Account ID by selecting the **Account** drop-down from the top of Cloud Manager, and then clicking **Manage Account** next to your account. Your Account ID is in the Overview tab.

Add Cloud Data Sense BYOL licenses to your account

After you purchase a Cloud Data Sense license for your Cloud Manager account, you need to add the license to Cloud Manager to use the Data Sense service.

Steps

1. Click **All Services > Digital Wallet > Data Services Licenses**.
2. Click **Add License**.
3. In the *Add License* dialog, enter the license information and click **Add License**:
 - If you have the Data Sense license serial number and know your NSS account, select the **Enter Serial Number** option and enter that information.

If your NetApp Support Site account isn't available from the drop-down list, [add the NSS account to Cloud Manager](#).

- If you have the Data Sense license file (required when installed in a dark site), select the **Upload License File** option and follow the prompts to attach the file.

The image shows two screenshots of the 'Add License' dialog in Cloud Manager. The left screenshot shows the 'Enter Serial Number' option selected, with fields for 'Serial Number' and 'NetApp Support Site Account'. The right screenshot shows the 'Upload License File' option selected, with instructions and an 'Upload' button.

Result

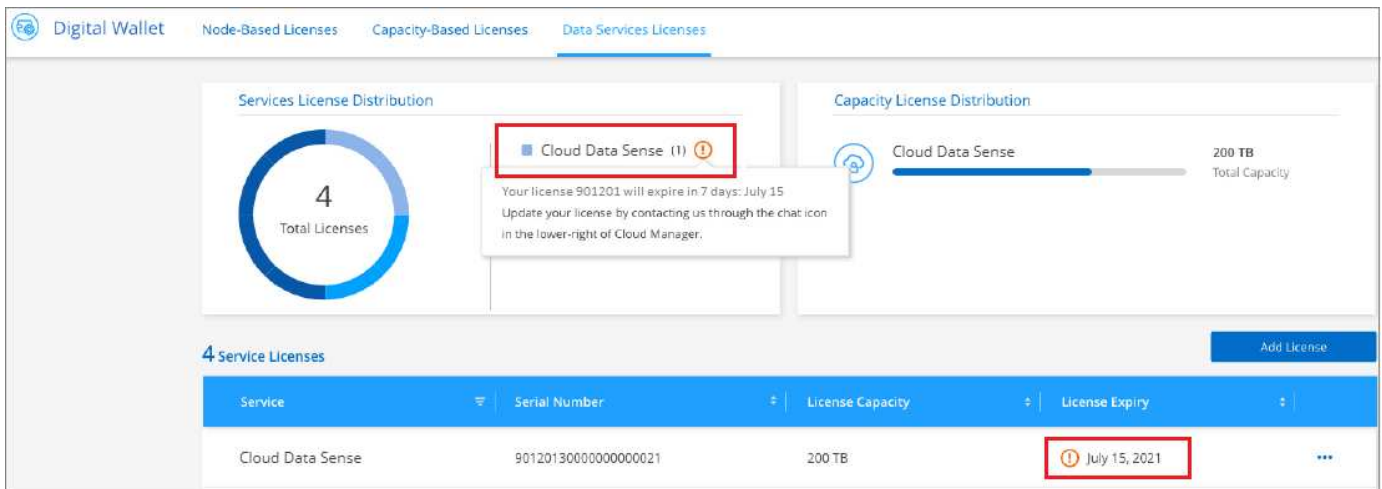
Cloud Manager adds the license so that your Cloud Data Sense service is active.

Update a Cloud Data Sense BYOL license

If your licensed term is nearing the expiration date, or if your licensed capacity is reaching the limit, you'll be notified in Cloud Data Sense.



This status also appears in the Digital Wallet.



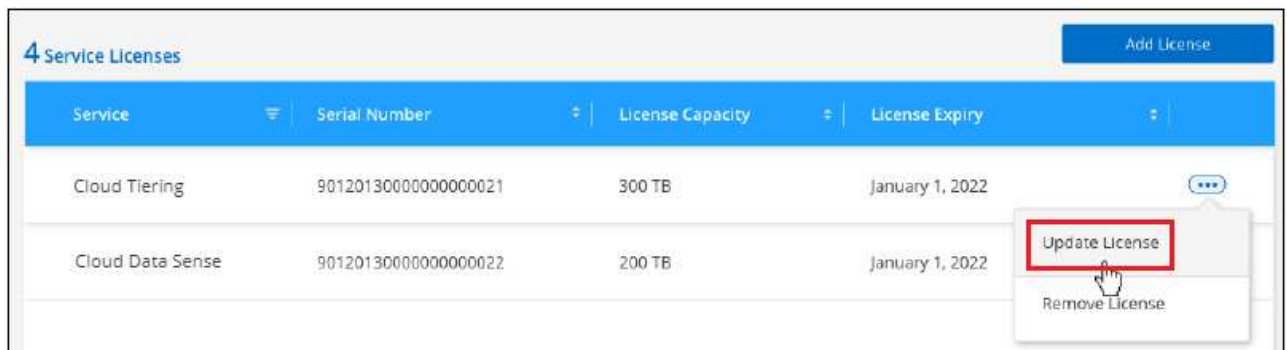
You can update your Cloud Data Sense license before it expires so that there is no interruption in your ability to access your scanned data.

Steps

1. Click the chat icon in the lower-right of Cloud Manager to request an extension to your term or additional capacity to your Cloud Data Sense license for the particular serial number. You can also [send an email to request an update to your license](#).

After you pay for the license and it is registered with the NetApp Support Site, Cloud Manager automatically updates the license in the Digital Wallet and the Data Services Licenses page will reflect the change in 5 to 10 minutes.

2. If Cloud Manager can't automatically update the license (for example, when installed in a dark site), then you'll need to manually upload the license file.
 - a. You can [obtain the license file from the NetApp Support Site](#).
 - b. On the Digital Wallet page in the *Data Services Licenses* tab, click **...** for the service serial number you are updating, and click **Update License**.



- c. In the *Update License* page, upload the license file and click **Update License**.

Result

Cloud Manager updates the license so that your Cloud Data Sense service continues to be active.

BYOL license considerations

When using a Cloud Data Sense BYOL license, Cloud Manager displays a warning in the Data Sense UI and in the Digital Wallet UI when the size of all the data you are scanning is nearing the capacity limit or nearing the

license expiration date. You receive these warnings:

- When the amount of data you are scanning has reached 80% of licensed capacity, and again when you have reached the limit
- 30 days before a license is due to expire, and again when the license expires

Use the chat icon in the lower right of the Cloud Manager interface to renew your license when you see these warnings.

If your license expires, Data Sense continues to run, but access to the Dashboards is blocked so that you can't view information about any of your scanned data. Only the *Configuration* page is available in case you want to reduce the number of volumes being scanned to potentially bring your capacity usage under the license limit.

Once you renew your BYOL license, Cloud Manager automatically updates the license in the Digital Wallet and provides full access to all Dashboards. If Cloud Manager can't access the license file over the secure internet connection (for example, when installed in a dark site), you can obtain the file yourself and manually upload it to Cloud Manager. For instructions, see [how to update a Cloud Data Sense license](#).



If the account you are using has both a BYOL license and a PAYGO subscription, Data Sense *will not* shift over to the PAYGO subscription when the BYOL license expires. You must renew the BYOL license.

Frequently asked questions about Cloud Data Sense

This FAQ can help if you're just looking for a quick answer to a question.

Cloud Data Sense service

The following questions provide a general understanding of Cloud Data Sense.

What is Cloud Data Sense?

Cloud Data Sense is a cloud offering that uses Artificial Intelligence (AI) driven technology to help you understand data context and identify sensitive data across your storage systems. The systems can be working environments that you've added to the Cloud Manager Canvas and many types of data sources that Data Sense can access over your networks. [See the full list below](#).

Cloud Data Sense provides pre-defined parameters (such as sensitive information types and categories) to address new data compliance regulations for data privacy and sensitivity, such as GDPR, CCPA, HIPAA, and more.

Why should I use Cloud Data Sense?

Cloud Data Sense can empower you with data to help you:

- Comply with data compliance and privacy regulations.
- Migrate data from legacy systems to the cloud.
- Comply with data retention policies.
- Easily locate and report on specific data in response to data subjects, as required by GDPR, CCPA, HIPAA, and other data privacy regulations.

What are the common use cases for Cloud Data Sense?

- Identify Personal Identifiable Information (PII).
- Identify a wide scope of sensitive information as required by GDPR and CCPA privacy regulations.
- Comply with new and upcoming data privacy regulations.

[Learn more about the use cases for Cloud Data Sense.](#)

How does Cloud Data Sense work?

Cloud Data Sense deploys another layer of Artificial Intelligence alongside your Cloud Manager system and storage systems. It then scans the data on volumes, buckets, databases, and other storage accounts and indexes the data insights that are found. Data Sense leverages both artificial intelligence and natural language processing, as opposed to alternative solutions that are commonly built around regular expressions and pattern matching. Cloud Data Sense uses AI to provide contextual understanding of data for accurate detection and classification. It is driven by AI because it is designed for modern data types and scale. It also understands data context in order to provide strong, accurate, discovery and classification.

[Learn more about how Cloud Data Sense works.](#)

How often does Cloud Data Sense scan my data?

Data changes frequently, so Cloud Data Sense scans your data continuously with no impact to your data. While the initial scan of your data might take longer, subsequent scans only scan the incremental changes, which reduces system scan times.

[Learn how scans work.](#)

Data scans have a negligible impact on your storage systems and on your data. However, if you are concerned with even a very small impact, you can configure Data Sense to perform "slow" scans. [See how to reduce the scan speed.](#)

What deployment models does Cloud Data Sense support?

Cloud Data Sense is normally deployed using a SaaS model, in which the service is enabled via the Cloud Manager interface. Cloud Data Sense can be deployed to scan and report on systems virtually anywhere, including on-premises, cloud, and hybrid environments. For secure installations, Cloud Manager and Cloud Data Sense can be deployed in a "dark site" model, which is installed as a package on premises and requires no external network connections.

Can anyone access the private data sent between my browser and Data Sense?

No. The private data sent between your browser and the Data Sense instance are secured with end-to-end encryption, which means NetApp and third parties can't read it. Data Sense won't share any data or results with NetApp unless you request and approve access.

Does Cloud Data Sense offer reports?

Yes. The information offered by Cloud Data Sense can be relevant to other stakeholders in your organizations, so we enable you to generate reports to share the insights. The following reports are available for Data Sense:

Privacy Risk Assessment report

Provides privacy insights from your data and a privacy risk score. [Learn more.](#)

Data Subject Access Request report

Enables you to extract a report of all files that contain information regarding a data subject's specific name or personal identifier. [Learn more.](#)

PCI DSS report

Helps you identify the distribution of credit card information across your files. [Learn more.](#)

HIPAA report

Helps you identify the distribution of health information across your files. [Learn more.](#)

Data Mapping report

Provides information about the size and number of files in your working environments. This includes usage capacity, age of data, size of data, and file types. [Learn more.](#)

Reports on a specific information type

Reports are available that include details about the identified files that contain personal data and sensitive personal data. You can also see files broken down by category and file type. [Learn more.](#)

Does scan performance vary?

Scan performance can vary based on the network bandwidth and the average file size in your environment. It can also depend on the size characteristics of the host system (either in the cloud or on-premises). See [The Cloud Data Sense instance](#) and [Deploying Cloud Data Sense](#) for more information.

When initially adding new data sources you can also choose to only perform a "mapping" scan instead of a full "classification" scan. Mapping can be done on your data sources very quickly because it does not access files to see the data inside. [See the difference between a mapping and classification scan.](#)

How do I enable Cloud Data Sense?

First you need to deploy an instance of Cloud Data Sense in Cloud Manager. Once the instance is running, you can enable the service on existing working environments, databases, and other data sources from the **Data Sense** tab or by selecting a specific working environment.

[Learn how to get started.](#)



Activating Cloud Data Sense on a data source results in an immediate initial scan. Scan results display shortly after.

How do I disable Cloud Data Sense?

You can disable Cloud Data Sense from scanning an individual working environment, database, file share group, OneDrive account, or SharePoint account from the Data Sense Configuration page.

[Learn more.](#)



To completely remove the Cloud Data Sense instance, you can manually remove the Data Sense instance from your cloud provider's portal or on-prem location.

What happens if data tiering is enabled on your ONTAP volumes?

You might want to enable Cloud Data Sense on ONTAP systems that tier cold data to object storage. If data tiering is enabled, Data Sense scans all of the data—data that's on disks and cold data tiered to object storage.

The compliance scan doesn't heat up the cold data—it stays cold and tiered to object storage.

Can Cloud Data Sense send notifications to my organization?

Yes. In conjunction with the Policies feature, you can send email alerts to Cloud Manager users (daily, weekly, or monthly) when a Policy returns results so you can get notifications to protect your data. Learn more about [Policies](#).

You can also download status reports from the Governance page and Investigation page that you can share internally in your organization.

Can I customize the service to my organization's needs?

Cloud Data Sense provides out-of-the-box insights to your data. These insights can be extracted and used for your organization's needs.

Additionally, you can use the **Data Fusion** capability to have Data Sense scan all your data based on criteria found in specific columns in databases you are scanning — essentially allowing you to make your own custom personal data types.

[Learn more.](#)

Can Cloud Data Sense work with the AIP labels I have embedded in my files?

Yes. You can manage AIP labels in the files that Cloud Data Sense is scanning if you have subscribed to [Azure Information Protection \(AIP\)](#). You can view the labels that are already assigned to files, add labels to files, and change existing labels.

[Learn more.](#)

Can I limit Cloud Data Sense information to specific users?

Yes, Cloud Data Sense is fully integrated with Cloud Manager. Cloud Manager users can only see information for the working environments they are eligible to view according to their workspace privileges.

Additionally, if you want to allow certain users to just view Data Sense scan results without having the ability to manage Data Sense settings, you can assign those users the *Cloud Compliance Viewer* role.

[Learn more.](#)

Which cloud providers are supported?

Cloud Data Sense operates as part of Cloud Manager and supports AWS, Azure, and GCP. This provides your organization with unified privacy visibility across different cloud providers.

Types of source systems and data types

The following questions relate to the types of storage that can be scanned, and the types of data that is scanned.

What sources of data can be scanned with Data Sense?

Cloud Data Sense can scan data from working environments that you've added to the Cloud Manager Canvas and from many types of data sources that Data Sense can access over your networks.

Working environments:

- Cloud Volumes ONTAP (deployed in AWS, Azure, or GCP)
- On-premises ONTAP clusters
- Azure NetApp Files
- Amazon FSx for ONTAP
- Amazon S3

Data sources:

- Non-NetApp file shares
- Object storage (that uses S3 protocol)
- Databases (Amazon RDS, MongoDB, MySQL, Oracle, PostgreSQL, SAP HANA, SQL Server)
- OneDrive accounts
- SharePoint accounts
- Google Drive accounts

Data Sense supports NFS versions 3.x, 4.0, and 4.1, and CIFS versions 1.x, 2.0, 2.1, and 3.0.

What data sources can I scan if I install Data Sense in a site without internet access?

Data Sense can only scan data from data sources that are local to the on-premises site. At this time, Data Sense can scan the following local data sources in a "dark" site:

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

Which file types are supported?

Cloud Data Sense scans all files for category and metadata insights, and displays all file types in the file types section of the dashboard.

When Data Sense detects Personal Identifiable Information (PII), or when it performs a DSAR search, only the following file formats are supported:

.CSV, .DCM, .DICOM, .DOC, .DOCX, .JSON, .PDF, .PPTX, .RTF, .TXT, .XLS, .XLSX,
Docs, Sheets, and Slides

What kinds of data and metadata does Cloud Data Sense capture?

Cloud Data Sense enables you to run a general "mapping" scan or a full "classification" scan on your data sources. Mapping provides only a high-level overview of your data, whereas Classification provides deep-level scanning of your data. Mapping can be done on your data sources very quickly because it does not access files to see the data inside.

- Data mapping scan.

Data Sense scans the metadata only. This is useful for overall data management and governance, quick project scoping, very large estates, and prioritization. Data mapping is based on metadata and is considered a **fast** scan.

After a fast scan, you can generate a Data Mapping Report. This report is an overview of the data stored in your corporate data sources to assist you with decisions about resource utilization, migration, backup, security, and compliance processes.

- Data classification (deep) scan.

Data Sense scans using standard protocols and read-only permission throughout the customer's environment. Select files are opened and scanned for sensitive business-related data, private information, and issues related to ransomware.

After a full scan there are many additional Data Sense features you can apply to your data, such as view and refine data in the Data Investigation page, search for names within files, copy, move, and delete source files, and more.

Licenses and costs

The following questions relate to licensing and costs to use Cloud Data Sense.

How much does Cloud Data Sense cost?

The cost to use Cloud Data Sense depends on the amount of data that you're scanning. The first 1 TB of data that Data Sense scans in a Cloud Manager workspace is free. After reaching that limit, you'll need one of the following to continue scanning data over 1 TB:

- A subscription to the Cloud Manager Marketplace listing from your cloud provider, or
- A Bring-your-own-license (BYOL) from NetApp

See [pricing](#) for details.

What happens if I have reached the BYOL capacity limit?

If you reach a BYOL capacity limit, Data Sense continues to run, but access to the Dashboards is blocked so that you can't view information about any of your scanned data. Only the Configuration page is available in case you want to reduce the number of volumes being scanned to potentially bring your capacity usage under the license limit. You must renew your BYOL license to regain full access to Data Sense.

Connector deployment

The following questions relate to the Cloud Manager Connector.

What is the Connector?

The Connector is software running on a compute instance either within your cloud account, or on-premises, that enables Cloud Manager to securely manage cloud resources. You must deploy a Connector to use Cloud Data Sense.

Where does the Connector need to be installed?

- 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.
- When scanning data in Cloud Volumes ONTAP in GCP, you use a Connector in GCP.
- When scanning data in on-premises ONTAP systems, non-NetApp file shares, generic S3 Object storage, databases, OneDrive folders, SharePoint accounts, and Google Drive accounts, you can use a connector in any of these cloud locations.

So if you have data in many of these locations, you may need to use [multiple Connectors](#).

Can I deploy the Connector on my own host?

Yes. You can [deploy the Connector on-premises](#) on a Linux host in your network or in the cloud. If you're planning to deploy Data Sense on-premises, then you may want to install the Connector on-premises as well; but it's not required.

What about secure sites without internet access?

Yes, that is also supported. You can [deploy the Connector on an on-premises Linux host that doesn't have internet access](#). Then you can discover on-premises ONTAP clusters and other local data sources and scan the data using Data Sense.

Data Sense deployment

The following questions relate to the separate Data Sense instance.

What type of instance or VM is required for Cloud Data Sense?

When [deployed in the cloud](#):

- In AWS, Cloud Data Sense runs on an m5.4xlarge instance with a 500 GB GP2 disk.
- In Azure, Cloud Data Sense runs on a Standard_D16s_v3 VM with a 512 GB disk.
- In GCP, Cloud Data Sense runs on an n2-standard-16 VM with a 512 GB Standard persistent disk.

Note that you can deploy Data Sense on a system with fewer CPUs and less RAM, but there are limitations when using these systems. See [Using a smaller instance type](#) for details.

[Learn more about how Cloud Data Sense works.](#)

Can I deploy the Data Sense on my own host?

Yes. You can install Data Sense software on a Linux host that has internet access in your network or in the cloud. Everything works the same and you continue to manage your scan configuration and results through Cloud Manager. See [Deploying Cloud Data Sense on premises](#) for system requirements and installation details.

What about secure sites without internet access?

Yes, that is also supported. You can [deploy Data Sense in an on-premises site that doesn't have internet access](#) for completely secure sites.

Copyright Information

Copyright © 2022 NetApp, Inc. All rights reserved. Printed in the U.S. No part of this document covered by copyright may be reproduced in any form or by any means-graphic, electronic, or mechanical, including photocopying, recording, taping, or storage in an electronic retrieval system-without prior written permission of the copyright owner.

Software derived from copyrighted NetApp material is subject to the following license and disclaimer:

THIS SOFTWARE IS PROVIDED BY NETAPP "AS IS" AND WITHOUT ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WHICH ARE HEREBY DISCLAIMED. IN NO EVENT SHALL NETAPP BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

NetApp reserves the right to change any products described herein at any time, and without notice. NetApp assumes no responsibility or liability arising from the use of products described herein, except as expressly agreed to in writing by NetApp. The use or purchase of this product does not convey a license under any patent rights, trademark rights, or any other intellectual property rights of NetApp.

The product described in this manual may be protected by one or more U.S. patents, foreign patents, or pending applications.

RESTRICTED RIGHTS LEGEND: Use, duplication, or disclosure by the government is subject to restrictions as set forth in subparagraph (c)(1)(ii) of the Rights in Technical Data and Computer Software clause at DFARS 252.277-7103 (October 1988) and FAR 52-227-19 (June 1987).

Trademark Information

NETAPP, the NETAPP logo, and the marks listed at <http://www.netapp.com/TM> are trademarks of NetApp, Inc. Other company and product names may be trademarks of their respective owners.