Astra Control Center documentation

Astra Control Center

NetApp
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Astra Control Center documentation

Release notes

We're pleased to announce the 21.12 release of Astra Control Center.

- What's in this release of Astra Control Center
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- Known limitations

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What's new in this release of Astra Control Center

We're pleased to announce the latest 21.12 release of Astra Control Center.

14 December 2021 (21.12)

Updated release of Astra Control Center.

New features and support

- Application restore
- Execution hooks
- Support for applications deployed with namespace-scoped operators
- Additional support for upstream Kubernetes and Rancher
- Astra Data Store preview backend management and monitoring
- Astra Control Center upgrades
- Red Hat OperatorHub option for installation

Resolved issues

- Resolved issues for this release

Known issues and limitations

- Known issues for this release
- Known issues with Astra Data Store preview and this Astra Control Center release
- Known limitations for this release

5 August 2021 (21.08)

Initial release of Astra Control Center.

- What it is
- Understand architecture and components
- What it takes to get started

- Install and setup
- Manage and protect apps
- Manage buckets and storage backends
- Manage accounts
- Automate with API

Find more information

- Known issues for this release
- Known limitations for this release
- Astra Data Store documentation
- Earlier versions of Astra Control Center documentation

Resolved issues

These issues have been corrected in this release of the product.

Extra backups are retained as part of scheduled backup

Sometimes one or more backups in Astra Control Center are retained beyond the number specified to be retained in the backup schedule. These extra backups should be deleted as part of a scheduled backup but are not deleted and are stuck in a `pending` state.

Backup or clone fails for apps using PVCs with decimal units in Astra Control Center

Volumes created with decimal units fail using the Astra Control Center backup or clone process.

Astra Control Center UI slow to show changes to app resources such as persistent volume changes

After a data protection operation (clone, backup, restore) and subsequent persistent volume resize, there is up to a twenty-minute delay before the new volume size is shown in the UI. This delay in the UI can also occur when any app resources are added or modified. In this case, a data protection operation is successful within minutes and you can use the management software for the storage backend to confirm the change in volume size.

Incorrect cluster role binding created by Astra Control Center custom resource definition during installation

The patch to correct cluster role binding during installation is no longer required in this release.

ASUP collection stuck in a generating or uploading state

If an ASUP pod is stopped or restarted, an ASUP collection might become stuck in a generating or uploading state.

Operator-deployed apps and namespaces

An operator and the app it deploys must use the same namespace. Astra Control supports only one operator-deployed app per namespace.

Find more information

- Known issues
- Known limitations
- Known issues with Astra Data Store preview and this Astra Control Center release

Known issues with Astra Data Store preview and this Astra Control Center release

Known issues identify problems that might prevent you from using this release of the product successfully.

The following known issues affect the management of Astra Data Store with this current release of the Astra Control Center:

Astra Data Store preview cannot be used as a storage class for Astra Control Center due to MongoDB pod liveness probe failure

When you attempt to use Astra Data Store preview as the storage class provisioner during an Astra Control Center deployment, the MongoDB pod liveness probe fails, resulting in a deployment that will not complete.

To correct this issue, make the following changes in addition to the standard YAML changes when completing the Astra Control Center installation process:

1. Edit the Astra Control Center operator deployment YAML (astra_control_center_operator_deploy.yaml) to change the Helm install timeout:

   ```
   - name: ACCOP_HELM_INSTALLTIMEOUT
     value: 20m
   ```

2. Edit the Astra Control Center custom resource (CR) file (astra_control_center_min.yaml) and include the highlighted additional values under `spec`:

```
apiVersion: astra.netapp.io/v1
kind: AstraControlCenter
metadata:
  name: astra
spec:
  accountName: "Example"
  astraVersion: "ASTRA_VERSION"
  astraAddress: "astra.example.com"
  autoSupport:
    enrolled: true
  email: "[admin@example.com]"
  firstName: "SRE"
  lastName: "Admin"
  imageRegistry:
    name: "[your_registry_path]"
    secret: "astra-registry-cred"
  storageClass: "ontap-gold"
  additionalValues:
    polaris-mongodb:
      mongodb:
        livenessProbe:
          initialDelaySeconds: 400
      metrics:
        livenessProbe:
          initialDelaySeconds: 400
```

Astra Control Center shows Astra Data Store preview storage backend in `Unknown` state

Astra Control Center shows the Astra Data Store preview storage backend in an `Unknown` state from the Backends page in the UI. In this condition, the storage backend is actually available and can be communicated with. A component within the storage backend is likely in an unhealthy state and needs to be returned to a healthy state for the storage backend to show as `available`.

Find more information

- Resolved issues
- Known issues
- Known limitations
- Astra Data Store documentation

Known issues

Known issues identify problems that might prevent you from using this release of the product successfully.

The following known issues affect the current release:

App with user-defined label goes into "removed" state

If you define an app with a non-existent k8s label, Astra Control Center will create, manage, and then immediately remove the app. To avoid this, add the k8s label to pods and resources after the app is managed by Astra Control Center.

Unable to stop running app backup

There is no way to stop a running backup. If you need to delete the backup, wait until it has completed and then use the instructions in Delete backups. To delete a failed backup, use the Astra Control API.

During app restore from backup Trident creates a larger PV than the original PV

If you resize a persistent volume after creating a backup and then restore from that backup, the persistent volume size will match the new size of the PV instead of using the size of the backup.

Clone performance impacted by large persistent volumes

Clones of very large and consumed persistent volumes might be intermittently slow, dependent on cluster access to the object store. If the clone is hung and no data has been copied for more than 30 minutes, Astra Control terminates the clone action.

App clones fail using a specific version of PostgreSQL

App clones within the same cluster consistently fail with the Bitnami PostgreSQL 11.5.0 chart. To clone successfully, use an earlier or later version of the chart.

App clones fail when using Service Account level OCP Security Context Constraints (SCC)

An application clone might fail if the original security context constraints are configured at the service account level within the namespace on the OCP cluster. When the application clone fails, it appears in the Managed Applications area in Astra Control Center with status `Removed`. See the knowledgebase article for more information.

App clones fail after an application is deployed with a set storage class

After an application is deployed with a storage class explicitly set (for example, `helm install …-set global.storageClass=netapp-cvs-perf-extreme`), subsequent attempts to clone the application require that the target cluster have the originally specified storage class.
Cloning an application with an explicitly set storage class to a cluster that does not have the same storage class will fail. There are no recovery steps in this scenario.

Reusing buckets between instances of Astra Control Center causes failures

If you try to reuse a bucket used by another or previous installation of Astra Control Center, backup and restore operations will fail. You must use a different bucket or completely clean out the previously used bucket. You can't share buckets between instances of Astra Control Center.

Selecting a bucket provider type with credentials for another type causes data protection failures

When you add a bucket, select the correct bucket provider and enter the right credentials for that provider. For example, the UI accepts NetApp ONTAP S3 as the type and accepts StorageGRID credentials; however, this will cause all future app backups and restores using this bucket to fail.

Backups and snapshots might not be retained during removal of an Astra Control Center instance

If you have an evaluation license, be sure you store your account ID to avoid data loss in the event of Astra Control Center failure if you are not sending ASUPs.

Clone operation can't use other buckets besides the default

During an app backup or app restore, you can optionally specify a bucket ID. An app clone operation, however, always uses the default bucket that has been defined. There is no option to change buckets for a clone. If you want control over which bucket is used, you can either change the bucket default or do a backup followed by a restore separately.

Managing a cluster with Astra Control Center fails when default kubeconfig file contains more than one context

You cannot use a kubeconfig with more than one cluster and context in it. See the knowledgebase article for more information.

500 internal service error when attempting Trident app data management

If Trident on an app cluster goes offline (and is brought back online) and 500 internal service errors are encountered when attempting app data management, restart all of the Kubernetes nodes in the app cluster to restore functionality.

Custom app execution hook scripts time out and cause post-snapshot scripts not to execute

If an execution hook takes longer than 25 minutes to run, the hook will fail, creating an event log entry with a return code of "N/A". Any affected snapshot will timeout and be marked as failed, with a resulting event log entry noting the timeout.

Because execution hooks often reduce or completely disable the functionality of the application they are running against, you should always try to minimize the time your custom execution hooks take to run.

Can’t determine ASUP tar bundle status in scaled environment

During ASUP collection, the status of the bundle in the UI is reported as either `collecting` or `done`. Collection can take up to an hour for large environments. During ASUP download, the network file transfer speed for the bundle might be insufficient, and the download might time out after 15 minutes without any indication in the UI. Download issues depend on the size of the ASUP, the scaled cluster size, and if collection time goes beyond the seven-day limit.

Snapshots eventually begin to fail when using external-snapshotter version 4.2.0

When you use Kubernetes snapshot-controller (also known as external-snapshotter) version 4.2.0 with Kubernetes 1.20 or 1.21, snapshots can eventually begin to fail. To prevent this, use a different supported version of external-snapshotter, such as version 4.2.1, with Kubernetes versions 1.20 or 1.21.

Simultaneous app restore operations in the same namespace can fail

If you try to restore one or more individually managed apps within a namespace simultaneously, the restore operations can fail after a long period of time. As a workaround, restore each app one at a time.

Upgrade fails if source version uses a container image registry that does not require authentication and target version uses a container image registry that requires authentication

If you upgrade an Astra Control Center system that uses a registry that doesn’t require authentication to a newer version that uses a registry that requires authentication, the upgrade fails. As a workaround, perform the following steps:

1. Log in to a host that has network access to the Astra Control Center cluster.
2. Ensure that the host has the following configuration:
    - `kubectl` version 1.19 or later is installed
    - The KUBECONFIG environment variable is set to the kubeconfig file for the Astra Control Center cluster
3. Execute the following script:

```
namespace="<netapp-acc>"
statefulsets=("polaris-vault" "polaris-mongodb" "influxdb2" "nats"
"loki")
for ss in ${statefulsets[@]}; do
    existing=$(kubectl get -n ${namespace} statefulsets.apps ${ss} -o
jsonpath='{.spec.template.spec.imagePullSecrets}')
    if [ "${existing}" = "[{}]" ] || [ "${existing}" = "[{},{},{}]" ];
then
        kubectl patch -n ${namespace} statefulsets.apps ${ss} --type
merge --patch '{"spec": {"template": {"spec": {"imagePullSecrets":
[]}}}}'
    else
        echo "${ss} not patched"
    fi
done
```

You should see output similar to the following:

```
statefulset.apps/polaris-vault patched
statefulset.apps/polaris-mongodb patched
statefulset.apps/influxdb2 patched
statefulset.apps/nats patched
statefulset.apps/loki patched
```

4. Proceed with the upgrade using the Astra Control Center upgrade instructions.

Uninstall of Astra Control Center fails to clean up the monitoring-operator pod on the managed cluster

If you did not unmanage your clusters before you uninstalled Astra Control Center, you can manually delete the pods in the netapp-monitoring namespace and the namespace with the following commands:

Steps

1. Delete `acc-monitoring` agent:

```
oc delete agents acc-monitoring -n netapp-monitoring
```

Result:

```
agent.monitoring.netapp.com "acc-monitoring" deleted
```

2. Delete the namespace:

```
oc delete ns netapp-monitoring
```

Result:

```
namespace "netapp-monitoring" deleted
```

3. Confirm resources removed:

```
oc get pods -n netapp-monitoring
```

Result:

```
No resources found in netapp-monitoring namespace.
```

4. Confirm monitoring agent removed:

```
oc get crd|grep agent
```

Sample result:

```
agents.monitoring.netapp.com                    2021-07-21T06:08:13Z
```

5. Delete custom resource definition (CRD) information:

```
oc delete crds agents.monitoring.netapp.com
```

Result:

```
customresourcedefinition.apiextensions.k8s.io
"agents.monitoring.netapp.com" deleted
```

Uninstall of Astra Control Center fails to clean up Traefik CRDs

You can manually delete the Traefik CRDs. CRDs are global resources, and deleting them might impact other applications on the cluster.

Steps

1. List Traefik CRDs installed on the cluster:

```
kubectl get crds |grep -E 'traefik'
```

Response

```
ingressroutes.traefik.containo.us             2021-06-23T23:29:11Z
ingressroutetcps.traefik.containo.us          2021-06-23T23:29:11Z
ingressrouteudps.traefik.containo.us          2021-06-23T23:29:12Z
middlewares.traefik.containo.us               2021-06-23T23:29:12Z
middlewaretcps.traefik.containo.us            2021-06-23T23:29:12Z
serverstransports.traefik.containo.us         2021-06-23T23:29:13Z
tlsoptions.traefik.containo.us                2021-06-23T23:29:13Z
tlsstores.traefik.containo.us                 2021-06-23T23:29:14Z
traefikservices.traefik.containo.us           2021-06-23T23:29:15Z
```

2. Delete the CRDs:

```
kubectl delete crd ingressroutes.traefik.containo.us
ingressroutetcps.traefik.containo.us
ingressrouteudps.traefik.containo.us middlewares.traefik.containo.us
serverstransports.traefik.containo.us tlsoptions.traefik.containo.us
tlsstores.traefik.containo.us traefikservices.traefik.containo.us
middlewaretcps.traefik.containo.us
```

Find more information

- Resolved issues
- Known issues with Astra Data Store prreview and this Astra Control Center release
- Known limitations

Known limitations

Known limitations identify platforms, devices, or functions that are not supported by this release of the product, or that do not interoperate correctly with it. Review these limitations carefully.

The same cluster cannot be managed by two Astra Control Center instances

If you want to manage a cluster on another Astra Control Center instance, you should first unmanage the cluster from the instance on which it is managed before you manage it on another instance. After you remove the cluster from management, verify that the cluster is unmanaged by executing this command:

```
oc get pods n -netapp-monitoring
```

There should be no pods running in that namespace or the namespace should not exist. If either of those are true, the cluster is unmanaged.

Astra Control Center cannot manage two identically named clusters in the same cloud

If you try to add a cluster with the same name of a cluster that already exists in your cloud, the operation will fail. This issue most often occurs in a standard Kubernetes environment if you have not changed the cluster name default in Kubernetes configuration files.

As a workaround, do the following:

1. Edit your kubeadm-config ConfigMap:

```
kubectl edit configmaps -n kube-system kubeadm-config
```

2. Change the `clusterName` field value from `kubernetes` (the Kubernetes default name) to a unique custom name.
3. Edit kubeconfig (`.kube/config`).
4. Update cluster name from `kubernetes` to a unique custom name (`xyz-cluster` is used in the examples below). Make the update in both `clusters` and `contexts` sections as shown in this example:

```
apiVersion: v1
clusters:
- cluster:
    certificate-authority-data:
ExAmPLERb2tCcjZ5K3E2Njk4eQotLExAMpLEORCBDRVJUSUZJQ0FURS0txxxxXX==
    server: https://x.x.x.x:6443
  name: xyz-cluster
contexts:
- context:
    cluster: xyz-cluster
    namespace: default
    user: kubernetes-admin
  name: kubernetes-admin@kubernetes
current-context: kubernetes-admin@kubernetes
```

Clones of apps installed using pass by reference operators can fail

Astra Control supports apps installed with namespace-scoped operators. These operators are generally designed with a "pass-by-value" rather than "pass-by-reference" architecture. The following are some operator apps that follow these patterns:

- Apache K8ssandra
- Jenkins CI

- Percona XtraDB Cluster

Note that Astra Control might not be able to clone an operator that is designed with a “pass-by-reference” architecture (for example, the CockroachDB operator). During these types of cloning operations, the cloned operator attempts to reference Kubernetes secrets from the source operator despite having its own new secret as part of the cloning process. The clone operation might fail because Astra Control is unaware of the Kubernetes secrets in the source operator.

Cluster is in `removed` state although cluster and network are otherwise working as expected

If a cluster is in `removed` state yet cluster and network connectivity appears healthy (external attempts to access the cluster using Kubernetes APIs are successful), the kubeconfig you provided to Astra Control might no longer be valid. This can be due to certificate rotation or expiration on the cluster. To correct this issue, update the credentials associated with the cluster in Astra Control using the Astra Control API:

1. Run a POST call to add an updated kubeconfig file to the `/credentials` endpoint and retrieve the assigned `id` from the response body.
2. Run a PUT call from the `/clusters` endpoint using the appropriate cluster ID and set the `credentialID` to the `id` value from the previous step.

After you complete these steps, the credential associated with the cluster is updated and the cluster should reconnect and update its state to `available`.

OLM-enabled and cluster-scoped operator deployed apps not supported

Astra Control Center does not support apps that are deployed with Operator Lifecycle Manager (OLM)-enabled operators or cluster-scoped operators.

Cloning apps can only be done with same K8s distribution

If you clone an app between clusters, the source and destination clusters must be the same distribution of Kubernetes. For example, if you clone an app from an OpenShift 4.7 cluster, use a destination cluster that is also OpenShift 4.7.

S3 buckets in Astra Control Center do not report available capacity

Before backing up or cloning apps managed by Astra Control Center, check bucket information in the ONTAP or StorageGRID management system.

metalLB 0.11.0 is not supported

metalLB 0.11.0 is not a supported load balancer for Astra Control Center. For more information regarding supported load balancers, see Astra Control Center requirements.

Apps deployed with Helm 2 are not supported

If you use Helm to deploy apps, Astra Control Center requires Helm version 3. Managing and cloning apps deployed with Helm 3 (or upgraded from Helm 2 to Helm 3) is fully supported. For more information, see Astra Control Center requirements.

Astra Control Center does not validate the details you enter for your proxy server

Ensure that you enter the correct values when establishing a connection.

Data protection for Astra Control Center as app not yet available

This release does not support the ability to manage Astra as an app using snapshot, backup, or restore options.

Unhealthy pods affect app management

If a managed app has pods in an unhealthy state, Astra Control can't create new backups and clones.

Existing connections to a Postgres pod causes failures

When you perform operations on Postgres pods, you shouldn't connect directly within the pod to use the psql command. Astra Control requires psql access to freeze and thaw the databases. If there is a pre-existing connection, the snapshot, backup, or clone will fail.

Trident isn't uninstalled from a cluster

When you unmanage a cluster from Astra Control Center, Trident isn't automatically uninstalled from the cluster. To uninstall Trident, you'll need to follow these steps in the Trident documentation.

Find more information

- Resolved issues
- Known issues
- Known issues with Astra Data Store preview and this Astra Control Center release

Concepts

Intro to Astra Control

Astra Control is a Kubernetes application data lifecycle management solution that simplifies operations for stateful applications. Easily protect, back up, and migrate Kubernetes workloads, and instantly create working application clones.

Features

Astra Control offers critical capabilities for Kubernetes application data lifecycle management:

- Automatically manage persistent storage
- Create application-aware, on-demand snapshots and backups
- Automate policy-driven snapshot and backup operations
- Migrate applications and data from one Kubernetes cluster to another
- Easily clone an application from production to staging
- Visualize application health and protection status
- Use a user interface or an API to implement your backup and migration workflows

Astra Control continually watches your compute for state changes, so it's aware of any new apps that you add along the way.

Deployment models

Astra Control is available in two deployment models:

- **Astra Control Service**: A NetApp-managed service that provides application-aware data management of Kubernetes clusters in Google Kubernetes Engine (GKE) and Azure Kubernetes Service (AKS).
- **Astra Control Center**: Self-managed software that provides application-aware data management of Kubernetes clusters running in your on-premises environment.

	Astra Control Service	Astra Control Center
How is it offered?	As a fully managed cloud service from NetApp	As software that you download, install, and manage
Where is it hosted?	On a public cloud of NetApp's choice	On your provided Kubernetes cluster
How is it updated?	Managed by NetApp	You manage any updates
What are the app data management capabilities?	Same capabilities on both platforms with exceptions to storage backend or to external services	Same capabilities on both platforms with exceptions to storage backend or to external services

	Astra Control Service	Astra Control Center
What is the storage backend support?	NetApp cloud service offerings	• NetApp ONTAP AFF and FAS systems • Astra Data Store as storage backend

Supported apps

NetApp has validated some apps to ensure the safety and consistency of the snapshots and backups.

- Learn the difference between a validated app and a standard app in Astra Control Service.
- Learn the difference between a validated app and a standard app in Astra Control Center.

No matter which type of app that you use with Astra Control, you should always test the backup and restore workflow yourself to ensure that you can meet your disaster recovery requirements.

How Astra Control Service works

Astra Control Service is a NetApp-managed cloud service that is always on and updated with the latest capabilities. It utilizes several components to enable application data lifecycle management.

At a high level, Astra Control Service works like this:

- You get started with Astra Control Service by setting up your cloud provider and by registering for an Astra account.
  - For GKE clusters, Astra Control Service uses NetApp Cloud Volumes Service for Google Cloud or Google Persistent Disks as the storage backend for your persistent volumes.
  - For AKS clusters, Astra Control Service uses Azure NetApp Files or Azure Disk Storage as the storage backend for your persistent volumes.
- You add your first Kubernetes compute to Astra Control Service. Astra Control Service then does the following:
  - Creates an object store in your cloud provider account, which is where backup copies are stored.

    In Azure, Astra Control Service also creates a resource group, a storage account, and keys for the Blob container.

  - Creates a new admin role and Kubernetes service account on the cluster.
  - Uses that new admin role to install Astra Trident on the cluster and to create one or more storage classes.
  - If you use Azure NetApp Files or NetApp Cloud Volumes Service for Google Cloud as your storage backend, Astra Control Service uses Astra Trident to provision persistent volumes for your apps.
- At this point, you can add apps to your cluster. Persistent volumes will be provisioned on the new default storage class.
- You then use Astra Control Service to manage these apps, and start creating snapshots, backups, and clones.

  Astra Control Service continually watches your compute for state changes, so it's aware of any new apps that you add along the way.

Astra Control's Free Plan enables you to manage up to 10 apps in your account. If you want to manage more than 10 apps, then you'll need to set up billing by upgrading from the Free Plan to the Premium Plan.

How Astra Control Center works

Astra Control Center runs locally in your own private cloud.

Astra Control Center supports OpenShift Kubernetes clusters with:

- Trident storage backends with ONTAP 9.5 and above
- Astra Data Store storage backends

In a cloud connected environment Astra Control Center uses Cloud Insights to provide advanced monitoring and telemetry. In the absence of a Cloud Insights connection, limited (7-days of metrics) monitoring and telemetry is available in Astra Control Center and also exported to Kubernetes native monitoring tools (such as Prometheus and Grafana) through open metrics end points.

Astra Control Center is fully integrated into the AutoSupport and Active IQ ecosystem to provide users and NetApp support with troubleshooting and usage information.

You can try Astra Control Center out using a 90-day evaluation license. The evaluation version is supported through email and community (Slack channel) options. Additionally, you have access to Knowledgebase articles and documentation from the in-product support dashboard.

To install and use Astra Control Center, you'll need to meet certain requirements.

At a high level, Astra Control Center works like this:

- You install Astra Control Center in your local environment. Learn more about how to install Astra Control Center.
- You complete some setup tasks such as these:
  - Set up licensing.
  - Add your first cluster.
  - Add storage backend that is discovered when you added the cluster.
  - Add an object store bucket that will store your app backups.

Learn more about how to set up Astra Control Center.

Astra Control Center does this:

- Discovers details about the managed Kubernetes clusters.
- Discovers your Astra Trident or Astra Data Store configuration on the clusters that you choose to manage and lets you monitor the storage backends.
- Discovers apps on those clusters and enables you to manage and protect the apps.

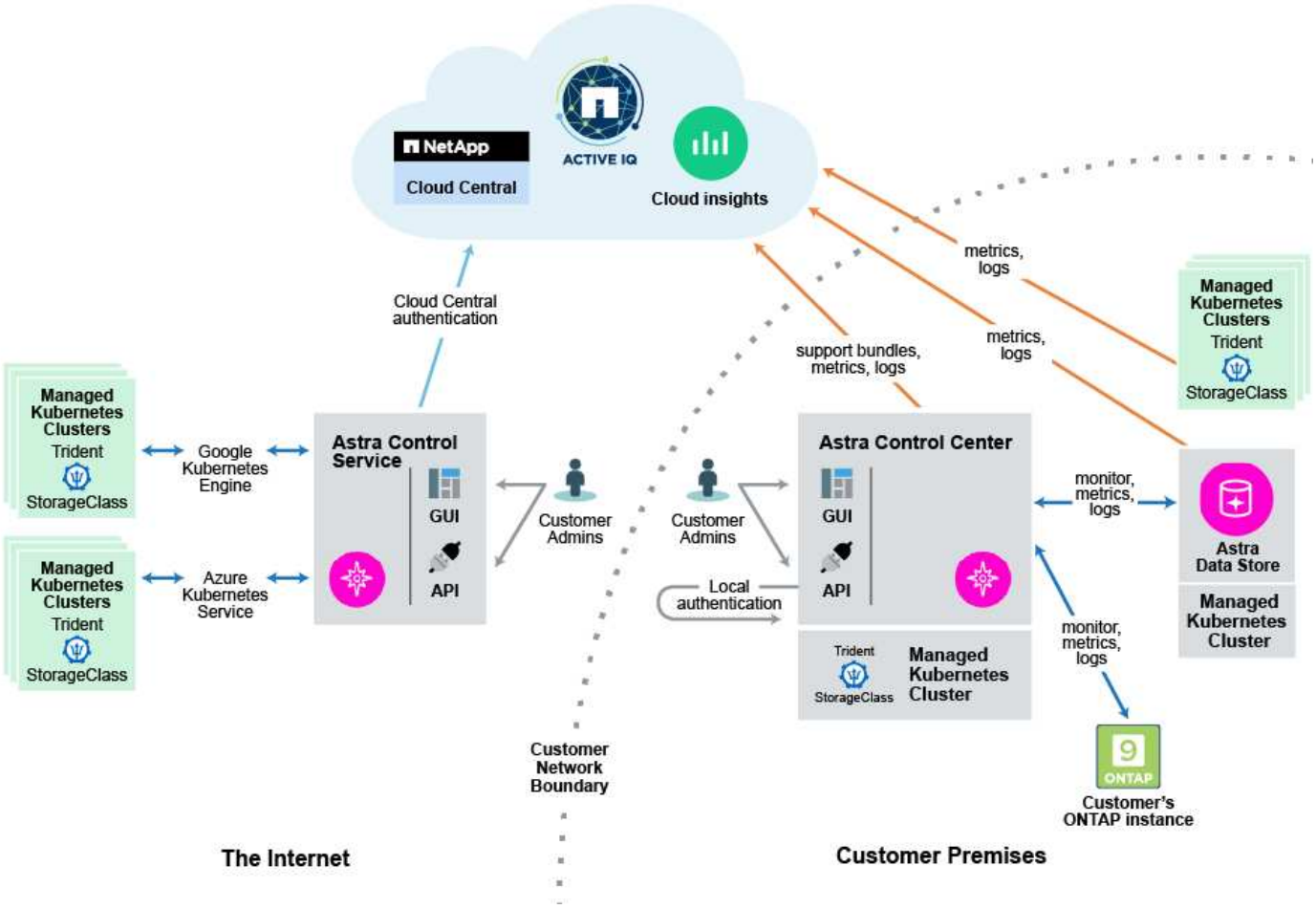
You can add apps to your cluster. Or, if you have some apps already in the cluster being managed, you can use Astra Control Center to discover and manage them. Then, use Astra Control Center to create snapshots, backups, and clones.

For more information

- Astra Control Service documentation
- Astra Control Center documentation
- Astra Data Store documentation
- Astra Trident documentation
- Use the Astra Control API
- Cloud Insights documentation
- ONTAP documentation

Architecture and components

Here is an overview of the various components of the Astra Control environment.



Astra Control components

- **Kubernetes clusters**: Kubernetes is a portable, extensible, open-source platform for managing containerized workloads and services, that facilitates both declarative configuration and automation. Astra provides management services for applications hosted in a Kubernetes cluster.
- **Astra Trident**: As a fully supported open source storage provisioner and orchestrator maintained by NetApp, Trident enables you to create storage volumes for containerized applications managed by Docker

and Kubernetes. When deployed with Astra Control Center, Trident includes a configured ONTAP storage backend, and also supports Astra Data Store as a storage backend.

- **Storage backend**:
  - Astra Control Service uses NetApp Cloud Volumes Service for Google Cloud as the storage backend for GKE clusters and Azure NetApp Files as the storage backend for AKS clusters.
  - Astra Control Center uses the following storage backends:
    - Astra Data Store storage backend
    - ONTAP AFF and FAS storage backend. As a storage software and hardware platform, ONTAP provides core storage services, support for multiple storage access protocols, and storage management functionality, such as snapshots and mirroring.
- **Cloud Insights**: A NetApp cloud infrastructure monitoring tool, Cloud Insights enables you to monitor performance and utilization for your Kubernetes clusters managed by Astra Control Center. Cloud Insights correlates storage usage to workloads. When you enable the Cloud Insights connection in Astra Control Center, telemetry information shows in Astra Control Center UI pages.

Astra Control interfaces

You can complete tasks using different interfaces:

- **Web user interface (UI)**: Both Astra Control Service and Astra Control Center use the same web-based UI where you can manage, migrate and protect apps. Use the UI also to manage user accounts and configuration settings.
- **API**: Both Astra Control Service and Astra Control Center use the same Astra Control API. Using the API, you can perform the same tasks that you would using the UI.

Astra Control Center also enables you to manage, migrate, and protect Kubernetes clusters running within VM environments.

For more information

- Astra Control Service documentation
- Astra Control Center documentation
- Astra Trident documentation
- Use the Astra Control API
- Cloud Insights documentation
- ONTAP documentation

Data protection

Learn about the available types of data protection in Astra Control Center, and how best to use them to protect your apps.

Snapshots, backups, and protection policies

A *snapshot* is a point-in-time copy of an app that's stored on the same provisioned volume as the app. They are usually fast. You can use local snapshots to restore the application to an earlier point in time. Snapshots are useful for fast clones; snapshots include all of the Kubernetes objects for the app, including configuration files.

A *backup* is stored in the external object store, and can be slower to take compared to local snapshots. You can restore an app backup to the same cluster, or you can migrate an app by restoring its backup to a different cluster. You can also choose a longer retention period for backups. Because they are stored in the external object store, backups generally offer you better protection than snapshots in cases of server failure or data loss.

A *protection policy* is a way to protect an app by automatically creating snapshots, backups, or both according to a schedule that you define for that app. A protection policy also enables you to choose how many snapshots and backups to retain in the schedule. Automating your backups and snapshots with a protection policy is the best way to ensure each app is protected according to the needs of your organization.

You can't be fully protected until you have a recent backup. This is important because backups are stored in an object store away from the persistent volumes. If a failure or accident wipes out the cluster and its associated persistent storage, then you need a backup to recover. A snapshot would not enable you to recover.

Clones

A *clone* is an exact duplicate of an app, its configuration, and its persistent storage. You can manually create a clone on either the same Kubernetes cluster or on another cluster. Cloning an app can be useful if you need to move applications and storage from one Kubernetes cluster to another.

Validated vs standard apps

There are two types of applications you can bring to Astra Control: validated and standard. Learn the difference between these two categories and the potential impacts on your projects and strategy.

It's tempting to think of these two categories as "supported" and "unsupported." But as you will see, there is no such thing as an "unsupported" app in Astra Control. You can add any app to Astra Control, although validated apps have more infrastructure built around their Astra Control workflows compared to standard apps.

Validated apps

Validated apps for Astra Control include the following:

- MySQL 8.0.25
- MariaDB 10.5.9
- PostgreSQL 11.12
- Jenkins 2.277.4 LTS and 2.289.1 LTS

The list of validated apps represents applications that Astra Control recognizes. The Astra Control team has analyzed and confirmed these apps to be fully tested to restore. Astra Control executes custom workflows to help ensure application-level consistency of snapshots and backups.

If an app is validated, the Astra Control team has identified and implemented steps that can be taken to quiesce the app before taking a snapshot in order to obtain an application-consistent snapshot. For example, when Astra Control takes a backup of a PostgreSQL database, it first quiesces the database. After the backup is complete, Astra Control restores the database to normal operation.

No matter which type of app you use with Astra Control, always test the backup and restore workflow yourself

to ensure that you can meet your disaster recovery requirements.

Standard apps

Other apps, including custom programs, are considered standard apps. You can add and manage standard apps through Astra Control. You can also create basic, crash-consistent snapshots and backups of a standard app. However, these have not been fully tested to restore the app to its original state.

Astra Control itself is not a standard app; it is a "system app." Astra Control itself isn't shown by default for management. You should not try to manage Astra Control itself.

Storage classes and persistent volume size

Astra Control Center supports ONTAP or Astra Data Store as the storage backend. You should understand how storage class and persistent volume (PV) size can help you meet your performance objectives.

Overview

Astra Control Center supports the following:

- **Trident storage classes backed by Astra Data Store storage**: If you installed one or more Astra Data Store clusters manually, Astra Control Center offers the ability to import these and retrieve their topology (nodes, disks) as well as various statuses.

  Astra Control Center displays the underlying Kubernetes cluster from the Astra Data Store configuration, the cloud that the Kubernetes cluster belongs to, any persistent volumes provisioned by Astra Data Store, the name of the corresponding internal volume, the application using the persistent volume, and the cluster containing the app.

- **Trident storage classes backed by ONTAP storage**: If you are using an ONTAP backend, Astra Control Center offers the ability to import the ONTAP backend to report various monitoring information.

Trident storage classes should be preconfigured outside of Astra Control Center.

Storage classes

When you add a cluster to Astra Control Center, you're prompted to select one previously configured storage class on that cluster as the default storage class. This storage class will be used when no storage class is specified in a persistent volume claim (PVC). The default storage class can be changed at any time within Astra Control Center and any storage class can be used at any time by specifying the name of the storage class within the PVC or Helm chart. Ensure that you have only a single default storage class defined for your Kubernetes cluster.

When you use Astra Control Center integrated with an Astra Data Store storage backend, after the installation, no storage classes are defined. You will need to create the Trident default storage class and apply it to the storage backend. See Astra Data Store getting started to create a default Astra Data Store storage class.

For more information

- Astra Trident documentation

Get started

Astra Control Center requirements

Get started by verifying the readiness of your operational environment, application clusters, applications, licenses, and web browser.

Operational environment requirements

Astra Control Center requires one of the following types of operational environments:

- Red Hat OpenShift Container Platform 4.6.8, 4.7, or 4.8
- Rancher 2.5
- Kubernetes 1.19 to 1.21 (including 1.21.x)

Ensure that the operating environment you choose to host Astra Control Center meets the basic resource requirements outlined in the environment's official documentation. Astra Control Center requires the following resources in addition to the environment's resource requirements:

Component	Requirement
Backend ONTAP storage capacity	At least 300GB available
Worker nodes	At least 3 worker nodes total, with 4 CPU cores and 12GB RAM each
Load balancer	Service type "LoadBalancer" available for ingress traffic to be sent to services in the operational environment cluster
FQDN resolution	A method for pointing the FQDN of Astra Control Center to the load balanced IP address
Astra Trident	• Astra Trident 21.04 or newer installed and configured if NetApp ONTAP version 9.5 or newer will be used as a storage backend • Astra Trident 21.10.1 or newer installed and configured if Astra Data Store preview will be used as a storage backend

These requirements assume that Astra Control Center is the only application running in the operational environment. If the environment is running additional applications, adjust these minimum requirements accordingly.

- **Image registry**: You must have an existing private Docker image registry to which you can push Astra Control Center build images. You need to provide the URL of the image registry where you will upload the images.
- **Astra Trident / ONTAP configuration**: Astra Control Center requires that a storage class be created and set as the default storage class. Astra Control Center supports the following ONTAP drivers provided by Astra Trident:
  - ontap-nas

- ontap-nas-flexgroup
- ontap-san
- ontap-san-economy

> During app cloning in OpenShift environments, Astra Control Center needs to allow OpenShift to mount volumes and change the ownership of files. Because of this, you need to configure an ONTAP volume export policy to allow these operations. You can do so with the following commands:
>
> 1. `export-policy rule modify -vserver <storage virtual machine name> -policyname <policy name> -ruleindex 1 -superuser sys`
> 2. `export-policy rule modify -vserver <storage virtual machine name> -policyname <policy name> -ruleindex 1 -anon 65534`

> If you plan to add a second OpenShift operational environment as a managed compute resource, you need to ensure that the Astra Trident Volume Snapshot feature is enabled. To enable and test volume snapshots with Astra Trident, see the official Astra Trident instructions.

Application cluster requirements

Astra Control Center has the following requirements for clusters that you plan to manage from Astra Control Center. These requirements also apply if the cluster you plan to manage is the operational environment cluster that hosts Astra Control Center.

- The most recent version of the Kubernetes snapshot-controller component is installed
- An Astra Trident volumesnapshotclass object has been defined by an administrator
- A default Kubernetes storage class exists on the cluster
- At least one storage class is configured to use Astra Trident

> Your application cluster should have a `kubeconfig.yaml` file that defines only one *context* element. Visit the Kubernetes documentation for information about creating kubeconfig files.

> When managing application clusters in a Rancher environment, modify the application cluster's default context in the `kubeconfig` file provided by Rancher to use a control plane context instead of the Rancher API server context. This reduces load on the Rancher API server and improves performance.

Application management requirements

Astra Control has the following application management requirements:

- **Licensing**: To manage applications using Astra Control Center, you need an Astra Control Center license.
- **Namespaces**: Astra Control requires that an app not span more than a single namespace, but a namespace can contain more than one app.
- **StorageClass**: If you install an application with a StorageClass explicitly set and you need to clone the app, the target cluster for the clone operation must have the originally specified StorageClass. Cloning an application with an explicitly set StorageClass to a cluster that does not have the same StorageClass will fail.

- **Kubernetes resources**: Applications that use Kubernetes resources not collected by Astra Control might not have full app data management capabilities. Astra Control collects the following Kubernetes resources:
  - ClusterRole
  - ClusterRoleBinding
  - ConfigMap
  - CustomResourceDefinition
  - CustomResource
  - DaemonSet
  - Deployment
  - DeploymentConfig
  - Ingress
  - MutatingWebhook
  - PersistentVolumeClaim
  - Pod
  - ReplicaSet
  - RoleBinding
  - Role
  - Route
  - Secret
  - Service
  - ServiceAccount
  - StatefulSet
  - ValidatingWebhook

Supported application installation methods

Astra Control supports the following application installation methods:

- **Manifest file**: Astra Control supports apps installed from a manifest file using kubectl. For example:

```
kubectl apply -f myapp.yaml
```

- **Helm 3**: If you use Helm to install apps, Astra Control requires Helm version 3. Managing and cloning apps installed with Helm 3 (or upgraded from Helm 2 to Helm 3) is fully supported. Managing apps installed with Helm 2 is not supported.
- **Operator-deployed apps**: Astra Control supports apps installed with namespace-scoped operators. The following are some apps that have been validated for this installation model:
  - Apache K8ssandra
  - Jenkins CI
  - Percona XtraDB Cluster

An operator and the app it installs must use the same namespace; you might need to modify the deployment .yaml file for the operator to ensure this is the case.

Access to the internet

You should determine whether you have outside access to the internet. If you do not, some functionality might be limited, such as receiving monitoring and metrics data from NetApp Cloud Insights, or sending support bundles to the NetApp Support Site.

License

Astra Control Center requires an Astra Control Center license for full functionality. Obtain an evaluation license or full license from NetApp. Without a license, you will be unable to:

- Define custom apps
- Create snapshots or clones of existing apps
- Configure data protection policies

If you want to try Astra Control Center, you can use a 90-day evaluation license.

Service type "LoadBalancer" for on-premises Kubernetes clusters

Astra Control Center uses a service of the type "LoadBalancer" (svc/traefik in the Astra Control Center namespace), and requires that it be assigned an accessible external IP address. If load balancers are permitted in your environment and you don't already have one configured, you can use MetalLB to automatically assign an external IP address to the service. In the internal DNS server configuration, you should point the chosen DNS name for Astra Control Center to the load-balanced IP address.

Networking requirements

The operational environment that hosts Astra Control Center communicates using the following TCP ports. You should ensure that these ports are allowed through any firewalls, and configure firewalls to allow any HTTPS egress traffic originating from the Astra network. Some ports require connectivity both ways between the environment hosting Astra Control Center and each managed cluster (noted where applicable).

Source	Destination	Port	Protocol	Purpose
Client PC	Astra Control Center	443	HTTPS	UI / API access - Ensure this port is open both ways between the cluster hosting Astra Control Center and each managed cluster

Source	Destination	Port	Protocol	Purpose
Metrics consumer	Astra Control Center worker node	9090	HTTPS	Metrics data communication - ensure each managed cluster can access this port on the cluster hosting Astra Control Center (two-way communication required)
Astra Control Center	Hosted Cloud Insights service (https://cloudinsights.netapp.com)	443	HTTPS	Cloud Insights communication
Astra Control Center	Amazon S3 storage bucket provider (https://my-bucket.s3.us-west-2.amazonaws.com/)	443	HTTPS	Amazon S3 storage communication
Astra Control Center	NetApp ActiveIQ (https://activeiq.solidfire.com)	443	HTTPS	NetApp ActiveIQ communication

Supported web browsers

Astra Control Center supports recent versions of Firefox, Safari, and Chrome with a minimum resolution of 1280 x 720.

What's next

View the quick start overview.

Quick start for Astra Control Center

This page provides a high-level overview of the steps needed to get started with Astra Control Center. The links within each step take you to a page that provides more details.

Try it out! If you want to try Astra Control Center, you can use a 90-day evaluation license. See licensing information for details.

1 **Review Kubernetes cluster requirements**

- Astra works with Kubernetes clusters with a Trident-configured ONTAP storage backend or an Astra Data Store preview storage backend.
- Clusters must be running in a healthy state, with at least three online worker nodes.
- The cluster must be running Kubernetes.

Learn more about the Astra Control Center requirements.

Download and install Astra Control Center

- Download Astra Control Center from the NetApp Support Site Astra Control Center Downloads page.
- Install Astra Control Center in your local environment.

  Optionally, install Astra Control Center using Red Hat OperatorHub.

- Discover your Trident configuration backed by the ONTAP storage backend. Or, discover your Astra Data Store preview clusters as your storage backend.

  You install the images on an OpenShift registry or use your local registry.

Learn more about installing Astra Control Center.

Complete some initial setup tasks

- Add a license.
- Add a Kubernetes cluster and Astra Control Center discovers details.
- Add an ONTAP or Astra Data Store preview storage backend.
- Optionally, add an object store bucket that will store your app backups.

Learn more about the initial setup process.

Use Astra Control Center

After you finish setting up Astra Control Center, here's what you might do next:

- Manage an app. Learn more about how to manage apps.
- Optionally, connect to NetApp Cloud Insights to display metrics on the health of your system, capacity, and throughput inside the Astra Control Center UI. Learn more about connecting to Cloud Insights.

Continue from this Quick Start

Install Astra Control Center.

Find more information

- Use the Astra Control API

Installation overview

Choose and complete one of the following Astra Control Center installation procedures:

- Install Astra Control Center using the standard process
- (If you use Red Hat OpenShift) Install Astra Control Center using OpenShift OperatorHub

Install Astra Control Center using the standard process

To install Astra Control Center, download the installation bundle from the NetApp Support Site and perform the following steps to install Astra Control Center Operator and Astra Control Center in your environment. You can use this procedure to install Astra Control Center in internet-connected or air-gapped environments.

For Red Hat OpenShift environments, you can also use an alternative procedure to install Astra Control Center using OpenShift OperatorHub.

What you'll need

- Before you begin installation, prepare your environment for Astra Control Center deployment.
- Ensure all cluster operators are in a healthy state and available.

  OpenShift example:

  ```
  oc get clusteroperators
  ```

- Ensure all API services are in a healthy state and available:

  OpenShift example:

  ```
  oc get apiservices
  ```

- You have created an FQDN address for Astra Control Center in your data center.

About this task

The Astra Control Center installation process does the following:

- Installs the Astra components into the `netapp-acc` (or custom named) namespace.
- Creates a default account.
- Establishes a default administrative user email address and default one-time password of `ACC-<UUID_of_installation>` for this instance of Astra Control Center. This user is assigned the Owner role in the system and is needed for first time login to the UI.
- Helps you determine that all Astra Control Center pods are running.
- Installs the Astra UI.

Podman commands can be used in place of Docker commands if you are using Red Hat's Podman instead of Docker Engine.

Do not execute the following command during the entirety of the installation process to avoid deleting all Astra Control Center pods: `kubectl delete -f astra_control_center_operator_deploy.yaml`

Steps

To install Astra Control Center, do the following steps:

- Download the Astra Control Center bundle

- Unpack the bundle and change directory
- Add the images to your local registry
- Set up namespace and secret for registries with auth requirements
- Install the Astra Control Center operator
- Configure Astra Control Center
- Complete Astra Control Center and operator installation
- Verify system status
- Log in to the Astra Control Center UI

Complete the deployment by performing setup tasks.

Download the Astra Control Center bundle

1. Download the Astra Control Center bundle (`astra-control-center-[version].tar.gz`) from the NetApp Support Site.
2. Download the zip of Astra Control Center certificates and keys from the NetApp Support Site.
3. (Optional) Use the following command to verify the signature of the bundle:

```
openssl dgst -sha256 -verify astra-control-center[version].pub
-signature <astra-control-center[version].sig astra-control-
center[version].tar.gz
```

Unpack the bundle and change directory

1. Extract the images:

```
tar -vxzf astra-control-center-[version].tar.gz
```

2. Change to the Astra directory.

```
cd astra-control-center-[version]
```

Add the images to your local registry

1. Add the files in the Astra Control Center image directory to your local registry.

   See sample scripts for the automatic loading of images below.

   a. Log in to your registry:

      Docker:

```
docker login [your_registry_path]
```

Podman:

```
podman login [your_registry_path]
```

b. Use the appropriate script to load the images, tag the images, and push the images to your local registry:

Docker:

```
export REGISTRY=[Docker_registry_path]
for astraImageFile in $(ls images/*.tar) ; do
  # Load to local cache. And store the name of the loaded image
trimming the 'Loaded images: '
  astraImage=$(docker load --input ${astraImageFile} | sed 's/Loaded
image: //')
  astraImage=$(echo ${astraImage} | sed 's!localhost/!!')
  # Tag with local image repo.
  docker tag ${astraImage} ${REGISTRY}/${astraImage}
  # Push to the local repo.
  docker push ${REGISTRY}/${astraImage}
done
```

Podman:

```
export REGISTRY=[Registry_path]
for astraImageFile in $(ls images/*.tar) ; do
  # Load to local cache. And store the name of the loaded image
trimming the 'Loaded images: '
  astraImage=$(podman load --input ${astraImageFile} | sed 's/Loaded
image(s): //')
  astraImage=$(echo ${astraImage} | sed 's!localhost/!!')
  # Tag with local image repo.
  podman tag ${astraImage} ${REGISTRY}/${astraImage}
  # Push to the local repo.
  podman push ${REGISTRY}/${astraImage}
done
```

Set up namespace and secret for registries with auth requirements

1. If you use a registry that requires authentication, you need to do the following:

a. Create the `netapp-acc-operator` namespace:

```
kubectl create ns netapp-acc-operator
```

Response:

```
namespace/netapp-acc-operator created
```

b. Create a secret for the `netapp-acc-operator` namespace. Add Docker information and run the following command:

```
kubectl create secret docker-registry astra-registry-cred -n netapp-
acc-operator --docker-server=[your_registry_path] --docker
-username=[username] --docker-password=[token]
```

Sample response:

```
secret/astra-registry-cred created
```

c. Create the `netapp-acc` (or custom named) namespace.

```
kubectl create ns [netapp-acc or custom namespace]
```

Sample response:

```
namespace/netapp-acc created
```

d. Create a secret for the `netapp-acc` (or custom named) namespace. Add Docker information and run the following command:

```
kubectl create secret docker-registry astra-registry-cred -n [netapp-
acc or custom namespace] --docker-server=[your_registry_path]
--docker-username=[username] --docker-password=[token]
```

Response

```
secret/astra-registry-cred created
```

Install the Astra Control Center operator

1. Edit the Astra Control Center operator deployment YAML (`astra_control_center_operator_deploy.yaml`) to refer to your local registry and secret.

```
vim astra_control_center_operator_deploy.yaml
```

   a. If you use a registry that requires authentication, replace the default line of `imagePullSecrets: []` with the following:

```
imagePullSecrets:
- name: <name_of_secret_with_creds_to_local_registry>
```

   b. Change `[your_registry_path]` for the `kube-rbac-proxy` image to the registry path where you pushed the images in a previous step.

   c. Change `[your_registry_path]` for the `acc-operator-controller-manager` image to the registry path where you pushed the images in a previous step.

   d. (For installations using Astra Data Store preview) See this known issue regarding storage class provisioners and additional changes you will need to make to the YAML.

```
apiVersion: apps/v1
kind: Deployment
metadata:
  labels:
    control-plane: controller-manager
  name: acc-operator-controller-manager
  namespace: netapp-acc-operator
spec:
  replicas: 1
  selector:
    matchLabels:
      control-plane: controller-manager
  template:
    metadata:
      labels:
        control-plane: controller-manager
    spec:
      containers:
      - args:
        - --secure-listen-address=0.0.0.0:8443
        - --upstream=http://127.0.0.1:8080/
        - --logtostderr=true
        - --v=10
        image: [your_registry_path]/kube-rbac-proxy:v4.8.0
        name: kube-rbac-proxy
        ports:
        - containerPort: 8443
          name: https
      - args:
        - --health-probe-bind-address=:8081
        - --metrics-bind-address=127.0.0.1:8080
        - --leader-elect
        command:
        - /manager
        env:
        - name: ACCOP_LOG_LEVEL
          value: "2"
        image: [your_registry_path]/acc-operator:[version x.y.z]
        imagePullPolicy: IfNotPresent
      imagePullSecrets: []
```

2. Install the Astra Control Center operator:

```
kubectl apply -f astra_control_center_operator_deploy.yaml
```

Sample response:

```
namespace/netapp-acc-operator created
customresourcedefinition.apiextensions.k8s.io/astracontrolcenters.astra.
netapp.io created
role.rbac.authorization.k8s.io/acc-operator-leader-election-role created
clusterrole.rbac.authorization.k8s.io/acc-operator-manager-role created
clusterrole.rbac.authorization.k8s.io/acc-operator-metrics-reader
created
clusterrole.rbac.authorization.k8s.io/acc-operator-proxy-role created
rolebinding.rbac.authorization.k8s.io/acc-operator-leader-election-
rolebinding created
clusterrolebinding.rbac.authorization.k8s.io/acc-operator-manager-
rolebinding created
clusterrolebinding.rbac.authorization.k8s.io/acc-operator-proxy-
rolebinding created
configmap/acc-operator-manager-config created
service/acc-operator-controller-manager-metrics-service created
deployment.apps/acc-operator-controller-manager created
```

Configure Astra Control Center

1. Edit the Astra Control Center custom resource (CR) file (`astra_control_center_min.yaml`) to make account, autoSupport, registry, and other necessary configurations:

   If additional customizations are required for your environment, you can use `astra_control_center.yaml` as an alternative CR. `astra_control_center_min.yaml` is the default CR and is suitable for most installations.

   ```
   vim astra_control_center_min.yaml
   ```

   Properties configured by the CR cannot be changed after initial Astra Control Center deployment.

   If you are using a registry that does not require authorization, you must delete the `secret` line within `imageRegistry` or the installation will fail.

   a. Change `[your_registry_path]` to the registry path where you pushed the images in the previous step.

   b. Change the `accountName` string to the name you want to associate with the account.

   c. Change the `astraAddress` string to the FQDN you want to use in your browser to access Astra. Do not use `http://` or `https://` in the address. Copy this FQDN for use in a later step.

d. Change the `email` string to the default initial administrator address. Copy this email address for use in a later step.

e. Change `enrolled` for AutoSupport to `false` for sites without internet connectivity or retain `true` for connected sites.

f. (Optional) Add a first name `firstName` and last name `lastName` of the user associated with the account. You can perform this step now or later within the UI.

g. (Optional) Change the `storageClass` value to another Astra Trident StorageClass resource if required by your installation.

h. (For installations using Astra Data Store preview) See this known issue for additional required changes to the YAML.

```
apiVersion: astra.netapp.io/v1
kind: AstraControlCenter
metadata:
  name: astra
spec:
  accountName: "Example"
  astraVersion: "ASTRA_VERSION"
  astraAddress: "astra.example.com"
  autoSupport:
    enrolled: true
  email: "[admin@example.com]"
  firstName: "SRE"
  lastName: "Admin"
  imageRegistry:
    name: "[your_registry_path]"
    secret: "astra-registry-cred"
  storageClass: "ontap-gold"
```

Complete Astra Control Center and operator installation

1. If you didn't already do so in a previous step, create the `netapp-acc` (or custom) namespace:

```
kubectl create ns [netapp-acc or custom namespace]
```

Sample response:

```
namespace/netapp-acc created
```

2. Install Astra Control Center in the `netapp-acc` (or your custom) namespace:

```
kubectl apply -f astra_control_center_min.yaml -n [netapp-acc or custom
namespace]
```

Sample response:

```
astracontrolcenter.astra.netapp.io/astra created
```

Verify system status

If you prefer to use OpenShift, you can use comparable oc commands for verification steps.

1. Verify that all system components installed successfully.

```
kubectl get pods -n [netapp-acc or custom namespace]
```

Each pod should have a status of `Running`. It may take several minutes before the system pods are deployed.

Sample response:

```
NAME                                    READY   STATUS    RESTARTS
AGE
acc-helm-repo-5f75c5f564-bzqmt          1/1     Running   0
11m
activity-6b8f7cccb9-mlrn4               1/1     Running   0
9m2s
api-token-authentication-6hznt          1/1     Running   0
8m50s
api-token-authentication-qpfgb          1/1     Running   0
8m50s
api-token-authentication-sqnb7          1/1     Running   0
8m50s
asup-5578bbdd57-dxkbp                   1/1     Running   0
9m3s
authentication-56bff4f95d-mspmq         1/1     Running   0
7m31s
bucketservice-6f7968b95d-9rrrl          1/1     Running   0
8m36s
cert-manager-5f6cf4bc4b-82khn           1/1     Running   0
6m19s
cert-manager-cainjector-76cf976458-sdrbc   1/1     Running   0
6m19s
cert-manager-webhook-5b7896bfd8-2n45j   1/1     Running   0
```

```
6m19s
cloud-extension-749d9f684c-8bdhq           1/1     Running   0
9m6s
cloud-insights-service-7d58687d9-h5tzw     1/1     Running   2
8m56s
composite-compute-968c79cb5-nv7l4          1/1     Running   0
9m11s
composite-volume-7687569985-jg9gg          1/1     Running   0
8m33s
credentials-5c9b75f4d6-nx9cz               1/1     Running   0
8m42s
entitlement-6c96fd8b78-zt7f8               1/1     Running   0
8m28s
features-5f7bfc9f68-gsjnl                  1/1     Running   0
8m57s
fluent-bit-ds-h88p7                        1/1     Running   0
7m22s
fluent-bit-ds-krhnj                        1/1     Running   0
7m23s
fluent-bit-ds-l5bjj                        1/1     Running   0
7m22s
fluent-bit-ds-lrclb                        1/1     Running   0
7m23s
fluent-bit-ds-s5t4n                        1/1     Running   0
7m23s
fluent-bit-ds-zpr6v                        1/1     Running   0
7m22s
graphql-server-5f5976f4bd-vbb4z            1/1     Running   0
7m13s
identity-56f78b8f9f-8h9p9                  1/1     Running   0
8m29s
influxdb2-0                                1/1     Running   0
11m
krakend-6f8d995b4d-5khkl                   1/1     Running   0
7m7s
license-5b5db87c97-jmxzc                   1/1     Running   0
9m
login-ui-57b57c74b8-6xtv7                  1/1     Running   0
7m10s
loki-0                                     1/1     Running   0
11m
monitoring-operator-9dbc9c76d-8znck        2/2     Running   0
7m33s
nats-0                                     1/1     Running   0
11m
nats-1                                     1/1     Running   0
```

```
10m
nats-2                                      1/1     Running   0
10m
nautilus-6b9d88bc86-h8kfb                   1/1     Running   0
8m6s
nautilus-6b9d88bc86-vn68r                   1/1     Running   0
8m35s
openapi-b87d77dd8-5dz9h                     1/1     Running   0
9m7s
polaris-consul-consul-5ljfb                 1/1     Running   0
11m
polaris-consul-consul-s5d5z                 1/1     Running   0
11m
polaris-consul-consul-server-0              1/1     Running   0
11m
polaris-consul-consul-server-1              1/1     Running   0
11m
polaris-consul-consul-server-2              1/1     Running   0
11m
polaris-consul-consul-twmpq                 1/1     Running   0
11m
polaris-mongodb-0                           2/2     Running   0
11m
polaris-mongodb-1                           2/2     Running   0
10m
polaris-mongodb-2                           2/2     Running   0
10m
polaris-ui-84dc87847f-zrg8w                 1/1     Running   0
7m12s
polaris-vault-0                             1/1     Running   0
11m
polaris-vault-1                             1/1     Running   0
11m
polaris-vault-2                             1/1     Running   0
11m
public-metrics-657698b66f-67pgt             1/1     Running   0
8m47s
storage-backend-metrics-6848b9fd87-w7x8r    1/1     Running   0
8m39s
storage-provider-5ff5868cd5-r9hj7           1/1     Running   0
8m45s
telegraf-ds-dw4hg                           1/1     Running   0
7m23s
telegraf-ds-k92gn                           1/1     Running   0
7m23s
telegraf-ds-mmxjl                           1/1     Running   0
```

```
7m23s
telegraf-ds-nhs8s                              1/1     Running   0
7m23s
telegraf-ds-rj7lw                              1/1     Running   0
7m23s
telegraf-ds-tqrkb                              1/1     Running   0
7m23s
telegraf-rs-9mwgj                              1/1     Running   0
7m23s
telemetry-service-56c49d689b-ffrzx             1/1     Running   0
8m42s
tenancy-767c77fb9d-g9ctv                       1/1     Running   0
8m52s
traefik-5857d87f85-7pmx8                       1/1     Running   0
6m49s
traefik-5857d87f85-cpxgv                       1/1     Running   0
5m34s
traefik-5857d87f85-lvmlb                       1/1     Running   0
4m33s
traefik-5857d87f85-t2xlk                       1/1     Running   0
4m33s
traefik-5857d87f85-v9wpf                       1/1     Running   0
7m3s
trident-svc-595f84dd78-zb8l6                   1/1     Running   0
8m54s
vault-controller-86c94fbf4f-krttq              1/1     Running   0
9m24s
```

2. (Optional) To ensure the installation is completed, you can watch the `acc-operator` logs using the following command.

```
kubectl logs deploy/acc-operator-controller-manager -n netapp-acc-
operator -c manager -f
```

3. When all the pods are running, verify installation success by retrieving the `AstraControlCenter` instance installed by the Astra Control Center Operator.

```
kubectl get acc -o yaml -n [netapp-acc or custom namespace]
```

4. Check the `status.deploymentState` field in the response for the `Deployed` value. If deployment was unsuccessful, an error message appears instead.

> You will use the `uuid` in the next step.

```
name: astra
   namespace: netapp-acc
   resourceVersion: "104424560"
   selfLink: /apis/astra.netapp.io/v1/namespaces/netapp-
acc/astracontrolcenters/astra
   uid: 9aa5fdae-4214-4cb7-9976-5d8b4c0ce27f
 spec:
   accountName: Example
   astraAddress: astra.example.com
   astraVersion: 21.12.60
   autoSupport:
     enrolled: true
     url: https://support.netapp.com/asupprod/post/1.0/postAsup
   crds: {}
   email: admin@example.com
   firstName: SRE
   imageRegistry:
     name: registry_name/astra
     secret: astra-registry-cred
   lastName: Admin
 status:
   accConditionHistory:
     items:
     - astraVersion: 21.12.60
       condition:
         lastTransitionTime: "2021-11-23T02:23:59Z"
         message: Deploying is currently in progress.
         reason: InProgress
         status: "False"
         type: Ready
       generation: 2
       observedSpec:
         accountName: Example
         astraAddress: astra.example.com
         astraVersion: 21.12.60
         autoSupport:
           enrolled: true
           url: https://support.netapp.com/asupprod/post/1.0/postAsup
         crds: {}
         email: admin@example.com
         firstName: SRE
         imageRegistry:
           name: registry_name/astra
           secret: astra-registry-cred
         lastName: Admin
       timestamp: "2021-11-23T02:23:59Z"
```

```
  - astraVersion: 21.12.60
    condition:
      lastTransitionTime: "2021-11-23T02:23:59Z"
      message: Deploying is currently in progress.
      reason: InProgress
      status: "True"
      type: Deploying
    generation: 2
    observedSpec:
      accountName: Example
      astraAddress: astra.example.com
      astraVersion: 21.12.60
      autoSupport:
        enrolled: true
        url: https://support.netapp.com/asupprod/post/1.0/postAsup
      crds: {}
      email: admin@example.com
      firstName: SRE
      imageRegistry:
        name: registry_name/astra
        secret: astra-registry-cred
      lastName: Admin
    timestamp: "2021-11-23T02:23:59Z"
  - astraVersion: 21.12.60
    condition:
      lastTransitionTime: "2021-11-23T02:29:41Z"
      message: Post Install was successful
      observedGeneration: 2
      reason: Complete
      status: "True"
      type: PostInstallComplete
    generation: 2
    observedSpec:
      accountName: Example
      astraAddress: astra.example.com
      astraVersion: 21.12.60
      autoSupport:
        enrolled: true
        url: https://support.netapp.com/asupprod/post/1.0/postAsup
      crds: {}
      email: admin@example.com
      firstName: SRE
      imageRegistry:
        name: registry_name/astra
        secret: astra-registry-cred
      lastName: Admin
```

```
    timestamp: "2021-11-23T02:29:41Z"
  - astraVersion: 21.12.60
    condition:
      lastTransitionTime: "2021-11-23T02:29:41Z"
      message: Deploying succeeded.
      reason: Complete
      status: "False"
      type: Deploying
    generation: 2
    observedGeneration: 2
    observedSpec:
      accountName: Example
      astraAddress: astra.example.com
      astraVersion: 21.12.60
      autoSupport:
        enrolled: true
        url: https://support.netapp.com/asupprod/post/1.0/postAsup
      crds: {}
      email: admin@example.com
      firstName: SRE
      imageRegistry:
        name: registry_name/astra
        secret: astra-registry-cred
      lastName: Admin
    observedVersion: 21.12.60
    timestamp: "2021-11-23T02:29:41Z"
  - astraVersion: 21.12.60
    condition:
      lastTransitionTime: "2021-11-23T02:29:41Z"
      message: Astra is deployed
      reason: Complete
      status: "True"
      type: Deployed
    generation: 2
    observedGeneration: 2
    observedSpec:
      accountName: Example
      astraAddress: astra.example.com
      astraVersion: 21.12.60
      autoSupport:
        enrolled: true
        url: https://support.netapp.com/asupprod/post/1.0/postAsup
      crds: {}
      email: admin@example.com
      firstName: SRE
      imageRegistry:
```

```
        name: registry_name/astra
        secret: astra-registry-cred
      lastName: Admin
    observedVersion: 21.12.60
    timestamp: "2021-11-23T02:29:41Z"
  - astraVersion: 21.12.60
    condition:
      lastTransitionTime: "2021-11-23T02:29:41Z"
      message: Astra is deployed
      reason: Complete
      status: "True"
      type: Ready
    generation: 2
    observedGeneration: 2
    observedSpec:
      accountName: Example
      astraAddress: astra.example.com
      astraVersion: 21.12.60
      autoSupport:
        enrolled: true
        url: https://support.netapp.com/asupprod/post/1.0/postAsup
      crds: {}
      email: admin@example.com
      firstName: SRE
      imageRegistry:
        name: registry_name/astra
        secret: astra-registry-cred
      lastName: Admin
    observedVersion: 21.12.60
    timestamp: "2021-11-23T02:29:41Z"
certManager: deploy
cluster:
  type: OCP
  vendorVersion: 4.7.5
  version: v1.20.0+bafe72f
conditions:
- lastTransitionTime: "2021-12-08T16:19:55Z"
  message: Astra is deployed
  reason: Complete
  status: "True"
  type: Ready
- lastTransitionTime: "2021-12-08T16:19:55Z"
  message: Deploying succeeded.
  reason: Complete
  status: "False"
  type: Deploying
```

```
    - lastTransitionTime: "2021-12-08T16:19:53Z"
      message: Post Install was successful
      observedGeneration: 2
      reason: Complete
      status: "True"
      type: PostInstallComplete
    - lastTransitionTime: "2021-12-08T16:19:55Z"
      message: Astra is deployed
      reason: Complete
      status: "True"
      type: Deployed
    deploymentState: Deployed
    observedGeneration: 2
    observedSpec:
      accountName: Example
      astraAddress: astra.example.com
      astraVersion: 21.12.60
      autoSupport:
        enrolled: true
        url: https://support.netapp.com/asupprod/post/1.0/postAsup
      crds: {}
      email: admin@example.com
      firstName: SRE
      imageRegistry:
        name: registry_name/astra
        secret: astra-registry-cred
      lastName: Admin
    observedVersion: 21.12.60
    postInstall: Complete
    uuid: 9aa5fdae-4214-4cb7-9976-5d8b4c0ce27f
kind: List
metadata:
 resourceVersion: ""
 selfLink: ""
```

5. To get the one-time password you will use when you log in to Astra Control Center, copy the `status.uuid` value from the response in the previous step. The password is `ACC-` followed by the UUID value (`ACC-[UUID]` or, in this example, `ACC-c49008a5-4ef1-4c5d-a53e-830daf994116`).

Log in to the Astra Control Center UI

After installing Astra Control Center, you will change the password for the default administrator and log in to the Astra Control Center UI dashboard.

Steps

1. In a browser, enter the FQDN you used in the `astraAddress` in the `astra_control_center_min.yaml` CR when you installed Astra Control Center.

2. Accept the self-signed certificates when prompted.

   > You can create a custom certificate after login.

3. At the Astra Control Center login page, enter the value you used for `email` in `astra_control_center_min.yaml` CR when you installed Astra Control Center, followed by the one-time password (`ACC-[UUID]`).

   > If you enter an incorrect password three times, the admin account will be locked for 15 minutes.

4. Select **Login**.
5. Change the password when prompted.

   > If this is your first login and you forget the password and no other administrative user accounts have yet been created, contact NetApp Support for password recovery assistance.

6. (Optional) Remove the existing self-signed TLS certificate and replace it with a custom TLS certificate signed by a Certificate Authority (CA).

Troubleshoot the installation

If any of the services are in `Error` status, you can inspect the logs. Look for API response codes in the 400 to 500 range. Those indicate the place where a failure happened.

Steps

1. To inspect the Astra Control Center operator logs, enter the following:

```
kubectl logs --follow -n netapp-acc-operator $(kubectl get pods -n
netapp-acc-operator -o name)  -c manager
```

What's next

Complete the deployment by performing setup tasks.

Install Astra Control Center using OpenShift OperatorHub

If you use Red Hat OpenShift, you can install Astra Control Center using the Red Hat certified operator. Use this procedure to install Astra Control Center from the Red Hat Ecosystem Catalog or using the Red Hat OpenShift Container Platform.

After you complete this procedure, you must return to the installation procedure to complete the remaining steps to verify installation success and log on.

What you'll need

- Before you begin installation, prepare your environment for Astra Control Center deployment.
- From your OpenShift cluster, ensure all cluster operators are in a healthy state (`available` is `true`):

```
oc get clusteroperators
```

- From your OpenShift cluster, ensure all API services are in a healthy state (`available` is `true`):

```
oc get apiservices
```

- You have created an FQDN address for Astra Control Center in your data center.
- You have the necessary permissions and access to the Red Hat OpenShift Container Platform to perform the installation steps described.

Steps

- Download the Astra Control Center bundle
- Unpack the bundle and change directory
- Add the images to your local registry
- Find the operator install page
- Install the operator
- Install Astra Control Center

Download the Astra Control Center bundle

1. Download the Astra Control Center bundle (`astra-control-center-[version].tar.gz`) from the NetApp Support Site.
2. Download the zip of Astra Control Center certificates and keys from NetApp Support Site.
3. (Optional) Use the following command to verify the signature of the bundle:

```
openssl dgst -sha256 -verify astra-control-center[version].pub
-signature <astra-control-center[version].sig astra-control-
center[version].tar.gz
```

Unpack the bundle and change directory

1. Extract the images:

```
tar -vxzf astra-control-center-[version].tar.gz
```

2. Change to the Astra directory.

```
cd astra-control-center-[version]
```

Add the images to your local registry

1. Add the files in the Astra Control Center image directory to your local registry.

   See sample scripts for the automatic loading of images below.

   a. Log in to your registry:

      Docker:

      ```
      docker login [your_registry_path]
      ```

      Podman:

      ```
      podman login [your_registry_path]
      ```

   b. Use the appropriate script to load the images, tag the images, and push the images to your local registry:

      Docker:

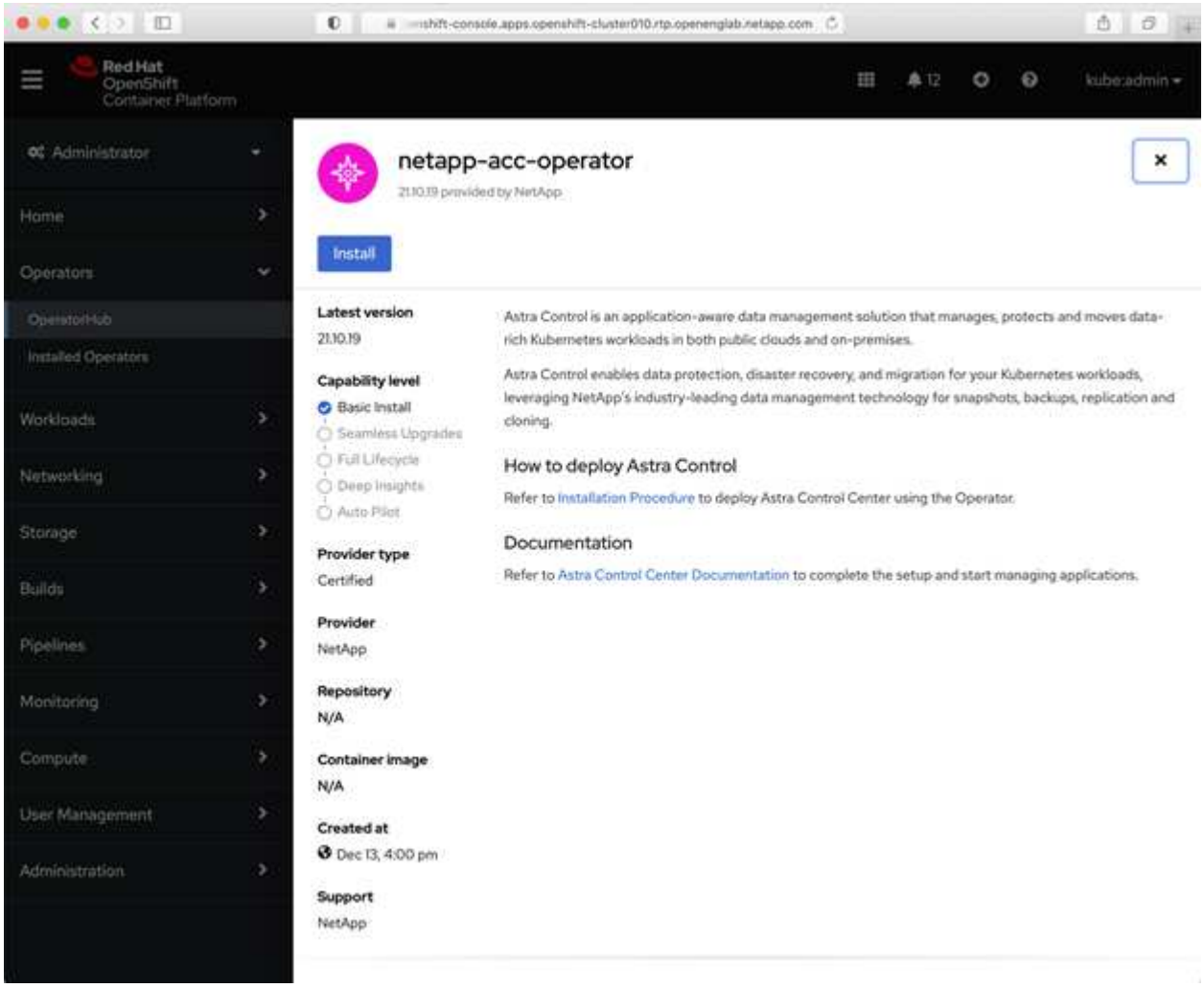
      ```
      export REGISTRY=[Docker_registry_path]
      for astraImageFile in $(ls images/*.tar) ; do
        # Load to local cache. And store the name of the loaded image
      trimming the 'Loaded images: '
        astraImage=$(docker load --input ${astraImageFile} | sed 's/Loaded
      image: //')
        astraImage=$(echo ${astraImage} | sed 's!localhost/!!')
        # Tag with local image repo.
        docker tag ${astraImage} ${REGISTRY}/${astraImage}
        # Push to the local repo.
        docker push ${REGISTRY}/${astraImage}
      done
      ```

      Podman:

```
export REGISTRY=[Registry_path]
for astraImageFile in $(ls images/*.tar) ; do
  # Load to local cache. And store the name of the loaded image
trimming the 'Loaded images: '
  astraImage=$(podman load --input ${astraImageFile} | sed 's/Loaded
image(s): //')
  astraImage=$(echo ${astraImage} | sed 's!localhost/!!')
  # Tag with local image repo.
  podman tag ${astraImage} ${REGISTRY}/${astraImage}
  # Push to the local repo.
  podman push ${REGISTRY}/${astraImage}
done
```

Find the operator install page

1. Complete one of the following procedures to access the operator install page:
   - From Red Hat Openshift web console:



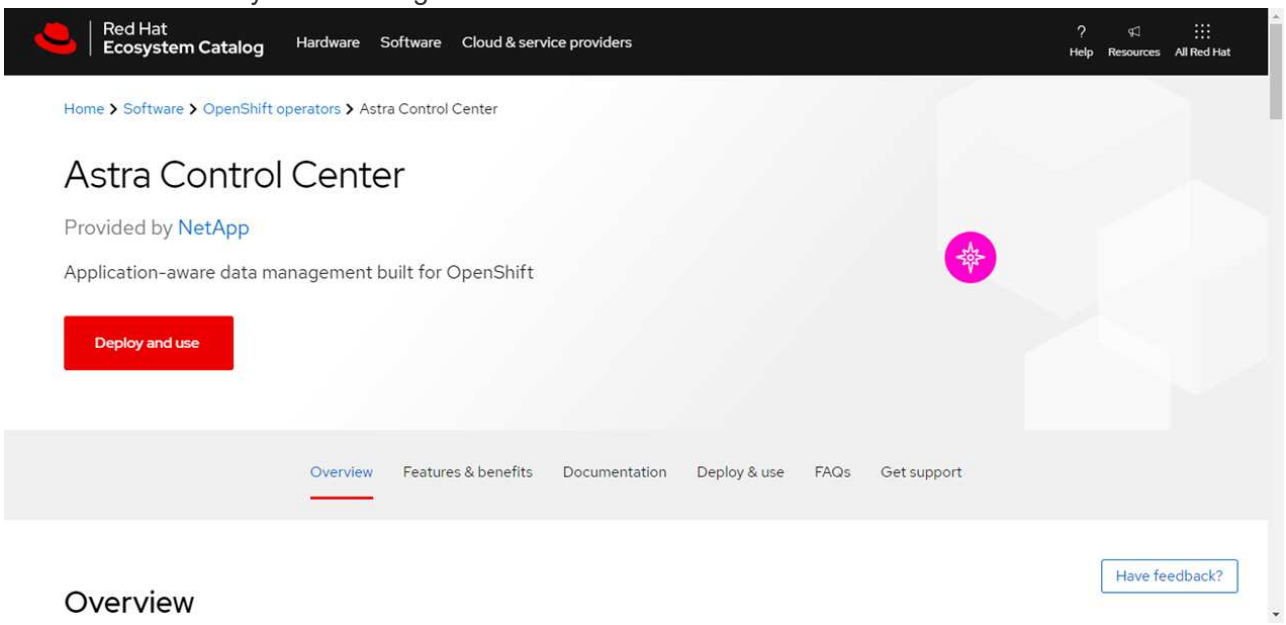
     a. Log in to the OpenShift Container Platform UI.

b. From the side menu, select **Operators > OperatorHub**.

c. Select the NetApp Astra Control Center operator.

d. Select **Install**.

- From Red Hat Ecosystem Catalog:



a. Select the NetApp Astra Control Center operator.

b. Select **Deploy and Use**.

Install the operator

1. Complete the **Install Operator** page and install the operator:

   The operator will be available in all cluster namespaces.

   a. Select the operator namespace or `netapp-acc-operator` namespace will be created automatically as part of the operator installation.

   b. Select a manual or automatic approval strategy.

   Manual approval is recommended. You should only have a single operator instance running per cluster.

   c. Select **Install**.

   If you selected a manual approval strategy, you will be prompted to approve the manual install plan for this operator.

2. From the console, go to the OperatorHub menu and confirm that the operator installed successfully.

Install Astra Control Center

1. From the console within the details view of the Astra Control Center operator, select `Create instance` in the Provided APIs section.

2. Complete the `Create AstraControlCenter` form field:
    a. Keep or adjust the Astra Control Center name.
    b. (Optional) Enable or disable Auto Support. Retaining Auto Support functionality is recommended.
    c. Enter the Astra Control Center address. Do not enter `http://` or `https://` in the address.
    d. Enter the Astra Control Center version; for example, 21.12.60.
    e. Enter an account name, email address, and admin last name.
    f. Retain the default volume reclaim policy.
    g. In **Image Registry**, enter your local container image registry path. Do not enter `http://` or `https://` in the address.
    h. If you use a registry that requires authentication, enter the secret.
    i. Enter the admin first name.
    j. Configure resources scaling.
    k. Retain the default storage class.
    l. Define CRD handling preferences.
3. Select `Create`.

What's next

Verify the successful installation of Astra Control Center and complete the remaining steps to log in. Additionally, you will complete the deployment by also performing setup tasks.

Set up Astra Control Center

Astra Control Center supports and monitors ONTAP and Astra Data Store as the storage backend. After you install Astra Control Center, log in to the UI, and change your password, you'll want to set up a license, add clusters, manage storage, and add buckets.

Tasks

- Add a license for Astra Control Center
- Add cluster
- Add a storage backend
- Add a bucket

Add a license for Astra Control Center

You can add a new license using the UI or API to gain full Astra Control Center functionality. Without a license, your usage of Astra Control Center is limited to managing users and adding new clusters.

What you'll need

When you downloaded Astra Control Center from the NetApp Support Site, you also downloaded the NetApp license file (NLF). Ensure you have access to this license file.

To update an existing evaluation or full license, see Update an existing license.

Add a full or evaluation license

Astra Control Center licenses measure CPU resources using Kubernetes CPU units. The license needs to account for the CPU resources assigned to the worker nodes of all the managed Kubernetes clusters. Before you add a license, you need to obtain the license file (NLF) from the NetApp Support Site.

You can also try Astra Control Center with an evaluation license, which lets you use Astra Control Center for 90 days from the date you download the license. You can sign up for a free trial by registering here.

If your installation grows to exceed the licensed number of CPU units, Astra Control Center prevents you from managing new applications. An alert is displayed when capacity is exceeded.

Steps

1. Log in to the Astra Control Center UI.
2. Select **Account** > **License**.
3. Select **Add License**.
4. Browse to the license file (NLF) that you downloaded.
5. Select **Add License**.

The **Account** > **License** page displays the license information, expiration date, license serial number, account ID, and CPU units used.

If you have an evaluation license, be sure you store your account ID to avoid data loss in the event of Astra Control Center failure if you are not sending ASUPs.

Add cluster

To begin managing your apps, add a Kubernetes cluster and manage it as a compute resource. You have to add a cluster for Astra Control Center to discover your Kubernetes applications. For Astra Data Store preview, you want to add the Kubernetes app cluster that contains applications that are using volumes provisioned by Astra Data Store preview.

We recommend that Astra Control Center manage the cluster it is deployed on first before you add other clusters to Astra Control Center to manage. Having the initial cluster under management is necessary to send Kubemetrics data and cluster-associated data for metrics and troubleshooting. You can use the **Add Cluster** feature to manage a cluster with Astra Control Center.

When Astra Control manages a cluster, it keeps track of the cluster's default StorageClass. If you change the StorageClass using `kubectl` commands, Astra Control reverts the change. To change the default StorageClass in a cluster managed by Astra Control, use one of the following methods:

- Use the Astra Control API `PUT /managedClusters` endpoint, and assign a different default StorageClass with the `DefaultStorageClass` parameter
- Remove the cluster from Astra Control management and re-add it with a different default StorageClass selected

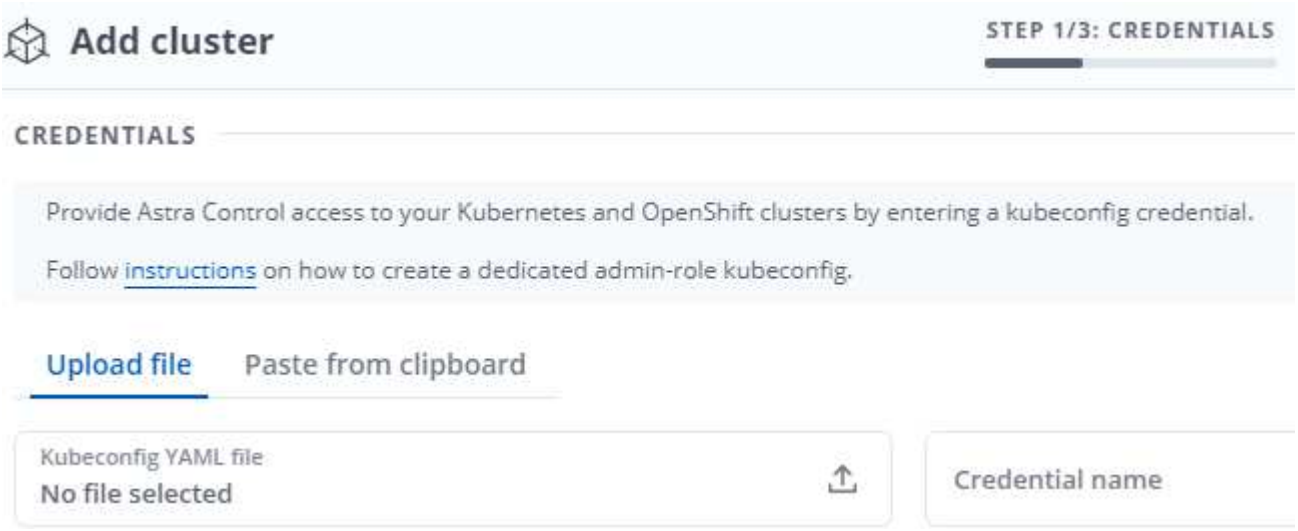
What you'll need

Before you add a cluster, review and perform the necessary prerequisite tasks.

Steps

1. From the **Dashboard** in the Astra Control Center UI, select **Add** in the Clusters section.
2. In the **Add Cluster** window that opens, upload a `kubeconfig.yaml` file or paste the contents of a `kubeconfig.yaml` file.

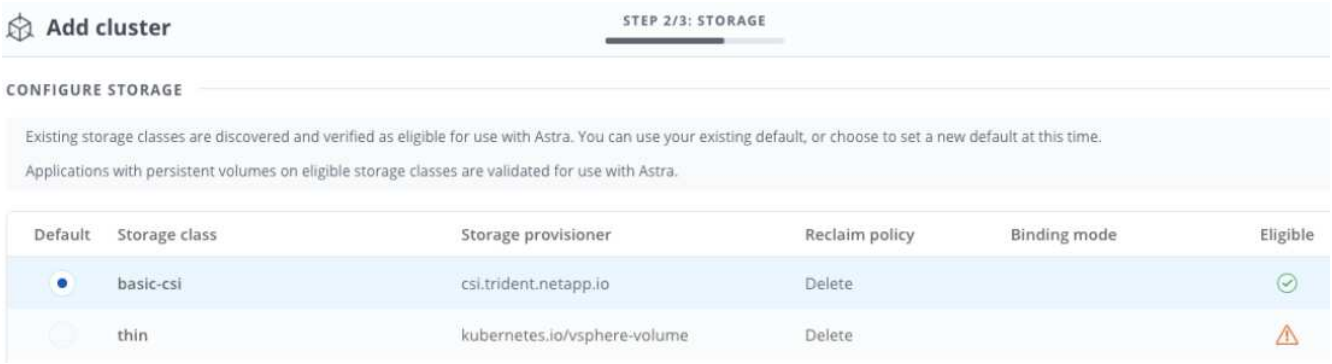
   The `kubeconfig.yaml` file should include **only the cluster credential for one cluster**.



   If you create your own `kubeconfig` file, you should define only **one** context element in it. See Kubernetes documentation for information about creating `kubeconfig` files.

3. Provide a credential name. By default, the credential name is auto-populated as the name of the cluster.
4. Select **Configure storage**.
5. Select the storage class to be used for this Kubernetes cluster, and select **Review**.

   You should select a Trident storage class backed by ONTAP storage or Astra Data Store.



6. Review the information, and if everything looks good, select **Add cluster**.

Result

The cluster enters the **Discovering** status and then changes to **Running**. You have successfully added a Kubernetes cluster and are now managing it in Astra Control Center.

> After you add a cluster to be managed in Astra Control Center, it might take a few minutes to deploy the monitoring operator. Until then, the Notification icon turns red and logs a **Monitoring Agent Status Check Failed** event. You can ignore this, because the issue resolves when Astra Control Center obtains the correct status. If the issue does not resolve in a few minutes, go to the cluster, and run `oc get pods -n netapp-monitoring` as the starting point. You will need to look into the monitoring operator logs to debug the problem.

Add a storage backend

You can add a storage backend so that Astra Control can manage its resources. Managing storage clusters in Astra Control as a storage backend enables you to get linkages between persistent volumes (PVs) and the storage backend as well as additional storage metrics.

You can add a discovered storage backend by navigating prompts from the Dashboard or the Backends menu.

What you'll need

- You have added a cluster and it is managed by Astra Control.

> The managed cluster has a supported backend attached to it that can be discovered by Astra Control.

- For Astra Data Store preview installations: You have added your Kubernetes app cluster.

> After you add your Kubernetes app cluster for Astra Data Store, the cluster appears as `unmanaged` in the list of discovered backends. You must next add the compute cluster that contains Astra Data Store and underlies the Kubernetes app cluster. You can do this from **Backends** in the UI. Select the Actions menu for the cluster, select `Manage`, and add the cluster. After the cluster state of `unmanaged` changes to the name of the Kubernetes cluster, you can proceed with adding a backend.

Steps

1. Do one of the following:
   - From **Dashboard**:
     a. From the Dashboard Storage backend section, select **Manage**.
     b. From the Dashboard Resource Summary > Storage backends section, select **Add**.
   - From **Backends**:
     a. In the left navigation area, select **Backends**.
     b. Select **Manage**.
2. Do one of the following depending on your backend type:
   - **Astra Data Store**:
     i. Select the **Astra Data Store** tab.
     ii. Select the managed compute cluster and select **Next**.
     iii. Confirm the backend details and select **Manage storage backend**.

- **ONTAP**:
  i. Enter the ONTAP admin credentials and select **Review**.
  ii. Confirm the backend details and select **Manage**.

The backend appears in `available` state in the list with summary information.

> You might need to refresh the page for the backend to appear.

Add a bucket

Adding object store bucket providers is essential if you want to back up your applications and persistent storage or if you want to clone applications across clusters. Astra Control stores those backups or clones in the object store buckets that you define.

When you add a bucket, Astra Control marks one bucket as the default bucket indicator. The first bucket that you create becomes the default bucket.

You don't need a bucket if you are cloning your application configuration and persistent storage to the same cluster.

Use any of the following bucket types:

- NetApp ONTAP S3
- NetApp StorageGRID S3
- Generic S3

> Although Astra Control Center supports Amazon S3 as a Generic S3 bucket provider, Astra Control Center might not support all object store vendors that claim Amazon's S3 support.

For instructions on how to add buckets using the Astra Control API, see Astra Automation and API information.

Steps

1. In the left navigation area, select **Buckets**.
   a. Select **Add**.
   b. Select the bucket type.

   > When you add a bucket, select the correct bucket provider and provide the right credentials for that provider. For example, the UI accepts NetApp ONTAP S3 as the type and accepts StorageGRID credentials; however, this will cause all future app backups and restores using this bucket to fail.

   c. Create a new bucket name or enter an existing bucket name and optional description.

   > The bucket name and description appear as a backup location that you can choose later when you're creating a backup. The name also appears during protection policy configuration.

   d. Enter the name or IP address of the S3 endpoint.
   e. If you want this bucket to be the default bucket for all backups, check the `Make this bucket the`

`default bucket for this private cloud` option.

> This option does not appear for the first bucket you create.

f. Continue by adding credential information.

Add S3 access credentials

Add S3 access credentials at any time.

Steps

1. From the Buckets dialog, select either the **Add** or **Use existing** tab.
   a. Enter a name for the credential that distinguishes it from other credentials in Astra Control.
   b. Enter the access ID and secret key by pasting the contents from your clipboard.

What's next?

Now that you've logged in and added clusters to Astra Control Center, you're ready to start using Astra Control Center's application data management features.

- Manage users
- Start managing apps
- Protect apps
- Clone apps
- Manage notifications
- Connect to Cloud Insights
- Add a custom TLS certificate

Find more information

- Use the Astra Control API
- Known issues

Prerequisites for adding a cluster

You should ensure that the prerequisite conditions are met before you add a cluster. You should also run the eligibility checks to ensure that your cluster is ready to be added to Astra Control Center.

What you'll need before you add a cluster

- One of the following types of clusters:
  - Clusters running OpenShift 4.6, 4.7, or 4.8, which has Astra Trident StorageClasses backed by Astra Data Store or ONTAP 9.5 or later
  - Clusters running Rancher 2.5
  - Clusters running Kubernetes 1.19 to 1.21 (including 1.21.x)

    Make sure your clusters have one or more worker nodes with at least 1GB RAM available for running telemetry services.

If you plan to add a second OpenShift 4.6, 4.7, or 4.8 cluster as a managed compute resource, you should ensure that the Astra Trident Volume Snapshot feature is enabled. See the official Astra Trident instructions to enable and test Volume Snapshots with Astra Trident.

- The superuser and user ID set on the backing ONTAP system to back up and restore apps with Astra Control Center. Run the following command in the ONTAP command line:
  `export-policy rule modify -vserver <storage virtual machine name> -policyname <policy name> -ruleindex 1 -superuser sysm --anon 65534`
- An Astra Trident `volumesnapshotclass` object that has been defined by an administrator. See the Astra Trident instructions to enable and test Volume Snapshots with Astra Trident.
- Ensure that you have only a single default storage class defined for your Kubernetes cluster.

Run eligibility checks

Run the following eligibility checks to ensure that your cluster is ready to be added to Astra Control Center.

Steps

1. Check the Trident version.

   ```
   kubectl get tridentversions -n trident
   ```

   If Trident exists, you see output similar to the following:

   ```
   NAME      VERSION
   trident   21.04.0
   ```

   If Trident does not exist, you see output similar to the following:

   ```
   error: the server doesn't have a resource type "tridentversions"
   ```

   If Trident is not installed or the installed version is not the latest, you need to install the latest version of Trident before proceeding. See the Trident documentation for instructions.

2. Check if the storage classes are using the supported Trident drivers. The provisioner name should be `csi.trident.netapp.io`. See the following example:

```
kubectl get sc
NAME                   PROVISIONER                    RECLAIMPOLICY
VOLUMEBINDINGMODE   ALLOWVOLUMEEXPANSION   AGE
ontap-gold (default)   csi.trident.netapp.io          Delete
Immediate           true                   5d23h
thin                   kubernetes.io/vsphere-volume   Delete
Immediate           false                  6d
```

Create an admin-role kubeconfig

Ensure that you have the following on your machine before you do the steps:

- `kubectl` v1.19 or later installed
- An active kubeconfig with cluster admin rights for the active context

Steps

1. Create a service account as follows:
   a. Create a service account file called `astracontrol-service-account.yaml`.

      Adjust the name and namespace as needed. If changes are made here, you should apply the same changes in the following steps.

      ```
      <strong>astracontrol-service-account.yaml</strong>
      ```

      ```
      apiVersion: v1
      kind: ServiceAccount
      metadata:
        name: astracontrol-service-account
        namespace: default
      ```

   b. Apply the service account:

      ```
      kubectl apply -f astracontrol-service-account.yaml
      ```

2. Grant cluster admin permissions as follows:
   a. Create a `ClusterRoleBinding` file called `astracontrol-clusterrolebinding.yaml`.

      Adjust any names and namespaces modified when creating the service account as needed.

      ```
      <strong>astracontrol-clusterrolebinding.yaml</strong>
      ```

```
apiVersion: rbac.authorization.k8s.io/v1
kind: ClusterRoleBinding
metadata:
  name: astracontrol-admin
roleRef:
  apiGroup: rbac.authorization.k8s.io
  kind: ClusterRole
  name: cluster-admin
subjects:
- kind: ServiceAccount
  name: astracontrol-service-account
  namespace: default
```

b. Apply the cluster role binding:

```
kubectl apply -f astracontrol-clusterrolebinding.yaml
```

3. List the service account secrets, replacing `<context>` with the correct context for your installation:

```
kubectl get serviceaccount astracontrol-service-account --context
<context> --namespace default -o json
```

The end of the output should look similar to the following:

```
"secrets": [
{ "name": "astracontrol-service-account-dockercfg-vhz87"},
{ "name": "astracontrol-service-account-token-r59kr"}
]
```

The indices for each element in the `secrets` array begin with 0. In the above example, the index for `astracontrol-service-account-dockercfg-vhz87` would be 0 and the index for `astracontrol-service-account-token-r59kr` would be 1. In your output, make note of the index for the service account name that has the word "token" in it.

4. Generate the kubeconfig as follows:

a. Create a `create-kubeconfig.sh` file. Replace `TOKEN_INDEX` in the beginning of the following script with the correct value.

```
<strong>create-kubeconfig.sh</strong>
```

```
# Update these to match your environment.
```

```
# Replace TOKEN_INDEX with the correct value
# from the output in the previous step. If you
# didn't change anything else above, don't change
# anything else here.

SERVICE_ACCOUNT_NAME=astracontrol-service-account
NAMESPACE=default
NEW_CONTEXT=astracontrol
KUBECONFIG_FILE='kubeconfig-sa'

CONTEXT=$(kubectl config current-context)

SECRET_NAME=$(kubectl get serviceaccount ${SERVICE_ACCOUNT_NAME} \
  --context ${CONTEXT} \
  --namespace ${NAMESPACE} \
  -o jsonpath='{.secrets[TOKEN_INDEX].name}')
TOKEN_DATA=$(kubectl get secret ${SECRET_NAME} \
  --context ${CONTEXT} \
  --namespace ${NAMESPACE} \
  -o jsonpath='{.data.token}')

TOKEN=$(echo ${TOKEN_DATA} | base64 -d)

# Create dedicated kubeconfig
# Create a full copy
kubectl config view --raw > ${KUBECONFIG_FILE}.full.tmp

# Switch working context to correct context
kubectl --kubeconfig ${KUBECONFIG_FILE}.full.tmp config use-context
${CONTEXT}

# Minify
kubectl --kubeconfig ${KUBECONFIG_FILE}.full.tmp \
  config view --flatten --minify > ${KUBECONFIG_FILE}.tmp

# Rename context
kubectl config --kubeconfig ${KUBECONFIG_FILE}.tmp \
  rename-context ${CONTEXT} ${NEW_CONTEXT}

# Create token user
kubectl config --kubeconfig ${KUBECONFIG_FILE}.tmp \
  set-credentials ${CONTEXT}-${NAMESPACE}-token-user \
  --token ${TOKEN}

# Set context to use token user
kubectl config --kubeconfig ${KUBECONFIG_FILE}.tmp \
  set-context ${NEW_CONTEXT} --user ${CONTEXT}-${NAMESPACE}-token-
```

```
user

# Set context to correct namespace
kubectl config --kubeconfig ${KUBECONFIG_FILE}.tmp \
  set-context ${NEW_CONTEXT} --namespace ${NAMESPACE}

# Flatten/minify kubeconfig
kubectl config --kubeconfig ${KUBECONFIG_FILE}.tmp \
  view --flatten --minify > ${KUBECONFIG_FILE}

# Remove tmp
rm ${KUBECONFIG_FILE}.full.tmp
rm ${KUBECONFIG_FILE}.tmp
```

b. Source the commands to apply them to your Kubernetes cluster.

```
source create-kubeconfig.sh
```

5. (**Optional**) Rename the kubeconfig to a meaningful name for your cluster. Protect your cluster credential.

```
chmod 700 create-kubeconfig.sh
mv kubeconfig-sa.txt YOUR_CLUSTER_NAME_kubeconfig
```

What's next?

Now that you've verified that the prerequisites are met, you're ready to add a cluster.

Find more information

- Trident documentation
- Use the Astra Control API

Add a custom TLS certificate

You can remove the existing self-signed TLS certificate and replace it with a TLS certificate signed by a Certificate Authority (CA).

What you'll need

- Kubernetes cluster with Astra Control Center installed
- Administrative access to a command shell on the cluster to run `kubectl` commands
- Private key and certificate files from the CA

Remove the self-signed certificate

Remove the existing self-signed TLS certificate.

1. Using SSH, log in to the Kubernetes cluster that hosts Astra Control Center as an administrative user.
2. Find the TLS secret associated with the current certificate using the following command, replacing `<ACC-deployment-namespace>` with the Astra Control Center deployment namespace:

```
kubectl get certificate -n <ACC-deployment-namespace>
```

3. Delete the currently installed secret and certificate using the following commands:

```
kubectl delete cert cert-manager-certificates -n <ACC-deployment-
namespace>
kubectl delete secret secure-testing-cert -n <ACC-deployment-namespace>
```

Add a new certificate

Add a new TLS certificate that is signed by a CA.

1. Use the following command to create the new TLS secret with the private key and certificate files from the CA, replacing the arguments in brackets <> with the appropriate information:

```
kubectl create secret tls <secret-name> --key <private-key-filename>
--cert <certificate-filename> -n <ACC-deployment-namespace>
```

2. Use the following command and example to edit the cluster Custom Resource Definition (CRD) file and change the `spec.selfSigned` value to `spec.ca.secretName` to refer to the TLS secret you created earlier:

```
kubectl edit clusterissuers.cert-manager.io/cert-manager-certificates -n
<ACC-deployment-namespace>
....

#spec:
#  selfSigned: {}

spec:
  ca:
    secretName: <secret-name>
```

3. Use the following command and example output to validate that the changes are correct and the cluster is ready to validate certificates, replacing `<ACC-deployment-namespace>` with the Astra Control Center deployment namespace:

```
kubectl describe clusterissuers.cert-manager.io/cert-manager-
certificates -n <ACC-deployment-namespace>
....

Status:
  Conditions:
    Last Transition Time:  2021-07-01T23:50:27Z
    Message:               Signing CA verified
    Reason:                KeyPairVerified
    Status:                True
    Type:                  Ready
Events:                    <none>
```

4. Create the `certificate.yaml` file using the following example, replacing the placeholder values in brackets <> with appropriate information:

```
apiVersion: cert-manager.io/v1
kind: Certificate
metadata:
  name: <certificate-name>
  namespace: <ACC-deployment-namespace>
spec:
  secretName: <certificate-secret-name>
  duration: 2160h # 90d
  renewBefore: 360h # 15d
  dnsNames:
  - <astra.dnsname.example.com> #Replace with the correct Astra Control
Center DNS address
  issuerRef:
    kind: ClusterIssuer
    name: cert-manager-certificates
```

5. Create the certificate using the following command:

```
kubectl apply -f certificate.yaml
```

6. Using the following command and example output, validate that the certificate has been created correctly and with the arguments you specified during creation (such as name, duration, renewal deadline, and DNS names).

```
kubectl describe certificate -n <ACC-deployment-namespace>
....

Spec:
  Dns Names:
    astra.example.com
  Duration:  125h0m0s
  Issuer Ref:
    Kind:        ClusterIssuer
    Name:        cert-manager-certificates
  Renew Before:  61h0m0s
  Secret Name:   <certificate-secret-name>
Status:
  Conditions:
    Last Transition Time:  2021-07-02T00:45:41Z
    Message:               Certificate is up to date and has not expired
    Reason:                Ready
    Status:                True
    Type:                  Ready
  Not After:               2021-07-07T05:45:41Z
  Not Before:              2021-07-02T00:45:41Z
  Renewal Time:            2021-07-04T16:45:41Z
  Revision:                1
Events:                    <none>
```

7. Edit the ingress CRD TLS option to point to your new certificate secret using the following command and example, replacing the placeholder values in brackets <> with appropriate information:

```
kubectl edit ingressroutes.traefik.containo.us -n <ACC-deployment-
namespace>
....

# tls:
#    options:
#      name: default
#    secretName: secure-testing-cert
#    store:
#      name: default

 tls:
    options:
      name: default
    secretName: <certificate-secret-name>
    store:
      name: default
```

8. Using a web browser, browse to the deployment IP address of Astra Control Center.
9. Verify that the certificate details match the details of the certificate you installed.
10. Export the certificate and import the result into the certificate manager in your web browser.

Frequently asked questions for Astra Control Center

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

Overview

The following sections provide answers to some additional questions that you might come across as you use Astra Control Center. For additional clarifications, please reach out to astra.feedback@netapp.com

Access to Astra Control Center

What's the Astra Control URL?

Astra Control Center uses local authentication and a URL specific to each environment.

For the URL, in a browser, enter the Fully Qualified Domain Name (FQDN) you set in the spec.astraAddress field in the astra_control_center_min.yaml custom resource definition (CRD) file when you installed Astra Control Center. The email is the value that you set in the spec.email field in the astra_control_center_min.yaml CRD.

I am using the Evaluation license. How to I change to the full license?

You can easily change to a full license by obtaining the NetApp license file (NLF).

Steps

- From the left navigation, select **Account** > **License**.
- Select **Add license**.
- Browse to the license file you downloaded and select **Add**.

I am using the Evaluation license. Can I still manage apps?

Yes, you can test out the managing apps functionality with the Evaluation license.

Registering Kubernetes clusters

I need to add worker nodes to my Kubernetes cluster after adding to Astra Control. What should I do?

New worker nodes can be added to existing pools. These will be automatically discovered by Astra Control. If the new nodes are not visible in Astra Control, check if the new worker nodes are running the supported image type. You can also verify the health of the new worker nodes by using the `kubectl get nodes` command.

How do I properly unmanage a cluster?

1. Unmanage the applications from Astra Control.
2. Unmanage the cluster from Astra Control.

What happens to my applications and data after removing the Kubernetes cluster from Astra Control?

Removing a cluster from Astra Control will not make any changes to the cluster's configuration (applications and persistent storage). Any Astra Control snapshots or backups taken of applications on that cluster will be unavailable to restore. Persistent storage backups created by Astra Control remain within Astra Control, but they are unavailable for restore.

Always remove a cluster from Astra Control before you delete it through any other methods. Deleting a cluster using another tool while it's still being managed by Astra Control can cause problems for your Astra Control account.

Will NetApp Trident be uninstalled when I remove a Kubernetes cluster from Astra Control?

Trident will not be uninstalled from a cluster when you remove it from Astra Control.

Managing applications

Can Astra Control deploy an application?

Astra Control doesn't deploy applications. Applications must be deployed outside of Astra Control.

What happens to applications after I stop managing them from Astra Control?

Any existing backups or snapshots will be deleted. Applications and data remain available. Data management operations will not be available for unmanaged applications or any backups or snapshots that belong to it.

Can Astra Control manage an application that is on non-NetApp storage?

No. While Astra Control can discover applications that are using non-NetApp storage, it can't manage an application that's using non-NetApp storage.

Should I manage Astra Control itself?

No, you should not manage Astra Control itself because it is a "system app."

Data management operations

There are snapshots in my account that I didn’t create. Where did they come from?

In some situations, Astra Control will automatically create a snapshot as part of a backup, clone or restore process.

My application uses several PVs. Will Astra Control take snapshots and backups of all these PVCs?

Yes. A snapshot operation on an application by Astra Control includes snapshot of all the PVs that are bound to the application’s PVCs.

Can I manage snapshots taken by Astra Control directly through a different interface or object storage?

No. Snapshots and backups taken by Astra Control can only be managed with Astra Control.

Use Astra

Manage apps

Start managing apps

After you add a cluster to Astra Control management, you can install apps on the cluster (outside of Astra Control), and then go to the Apps page in Astra Control to start managing the apps and their resources.

App management requirements

Astra Control has the following app management requirements:

- **Licensing**: To manage apps using Astra Control Center, you need an Astra Control Center license.
- **Namespaces**: Astra Control requires that an app not span more than a single namespace, but a namespace can contain more than one app.
- **StorageClass**: If you install an app with a StorageClass explicitly set and you need to clone the app, the target cluster for the clone operation must have the originally specified StorageClass. Cloning an application with an explicitly set StorageClass to a cluster that does not have the same StorageClass will fail.
- **Kubernetes resources**: Apps that use Kubernetes Resources not collected by Astra Control might not have full app data management capabilities. Astra Control collects the following Kubernetes resources:
  - ClusterRole
  - ClusterRoleBinding
  - ConfigMap
  - CustomResourceDefinition
  - CustomResource
  - DaemonSet
  - Deployment
  - DeploymentConfig
  - Ingress
  - MutatingWebhook
  - PersistentVolumeClaim
  - Pod
  - ReplicaSet
  - RoleBinding
  - Role
  - Route
  - Secret
  - Service
  - ServiceAccount
  - StatefulSet

- ValidatingWebhook

Supported app installation methods

Astra Control supports the following application installation methods:

- **Manifest file**: Astra Control supports apps installed from a manifest file using kubectl. For example:

```
kubectl apply -f myapp.yaml
```

- **Helm 3**: If you use Helm to install apps, Astra Control requires Helm version 3. Managing and cloning apps installed with Helm 3 (or upgraded from Helm 2 to Helm 3) are fully supported. Managing apps installed with Helm 2 is not supported.
- **Operator-deployed apps**: Astra Control supports apps installed with namespace-scoped operators. These operators are generally designed with a "pass-by-value" rather than "pass-by-reference" architecture. The following are some operator apps that follow these patterns:
  - Apache K8ssandra
  - Jenkins CI
  - Percona XtraDB Cluster

Note that Astra Control might not be able to clone an operator that is designed with a “pass-by-reference” architecture (for example, the CockroachDB operator). During these types of cloning operations, the cloned operator attempts to reference Kubernetes secrets from the source operator despite having its own new secret as part of the cloning process. The clone operation might fail because Astra Control is unaware of the Kubernetes secrets in the source operator.

> An operator and the app it installs must use the same namespace; you might need to modify the deployment .yaml file for the operator to ensure this is the case.

Install apps on your cluster

Now that you’ve added your cluster to Astra Control, you can install apps or manage existing apps on the cluster. Any app that is scoped to a namespace can be managed. After the pods are online, you can manage the app with Astra Control.

For help with deploying validated apps from Helm charts, refer to the following:

- Deploy MariaDB from a Helm chart
- Deploy MySQL from a Helm chart
- Deploy Postgres from a Helm chart
- Deploy Jenkins from a Helm chart

Manage apps

Astra Control enables you to manage your apps at the namespace level or by Kubernetes label.

> Apps installed with Helm 2 are not supported.

You can perform the following activities to manage apps:

- Manage apps
  - Manage apps by namespace
  - Manage apps by Kubernetes label
- Ignore apps
- Unmanage apps

Astra Control itself is not a standard app; it is a "system app." You should not try to manage Astra Control itself. Astra Control itself isn't shown by default for management. To see system apps, use the "Show system apps" filter.

For instructions on how to manage apps using the Astra Control API, see the Astra Automation and API information.

After a data protection operation (clone, backup, restore) and subsequent persistent volume resize, there is up to a twenty-minute delay before the new volume size is shown in the UI. The data protection operation is successful within minutes, and you can use the management software for the storage backend to confirm the change in volume size.

Manage apps by namespace

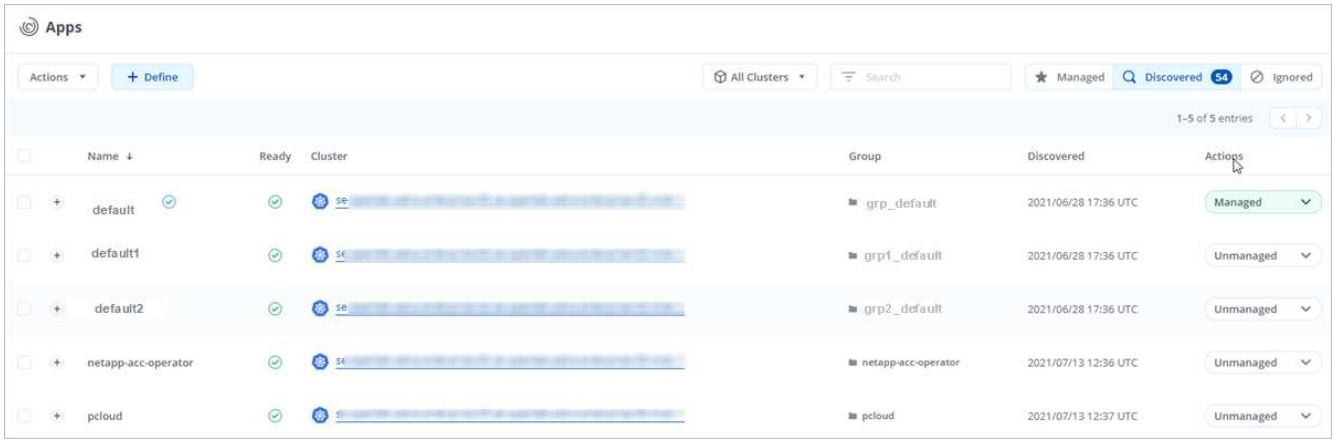
The **Discovered** section of the Apps page shows namespaces and any Helm-installed apps or custom-labeled apps in those namespaces. You can choose to manage each app individually or at the namespace level. It all comes down to the level of granularity that you need for data protection operations.

For example, you might want to set a backup policy for "maria" that has a weekly cadence, but you might need to back up "mariadb" (which is in the same namespace) more frequently than that. Based on those needs, you would need to manage the apps separately and not under a single namespace.

While Astra Control enables you to separately manage both levels of the hierarchy (the namespace and the apps in that namespace), the best practice is to choose one or the other. Actions that you take in Astra Control can fail if the actions take place at the same time at both the namespace and app level.

Steps

1. From the left navigation bar, select **Applications**.
2. Select **Discovered**.



3. View the list of discovered namespaces. Expand the namespace to view the apps and associated

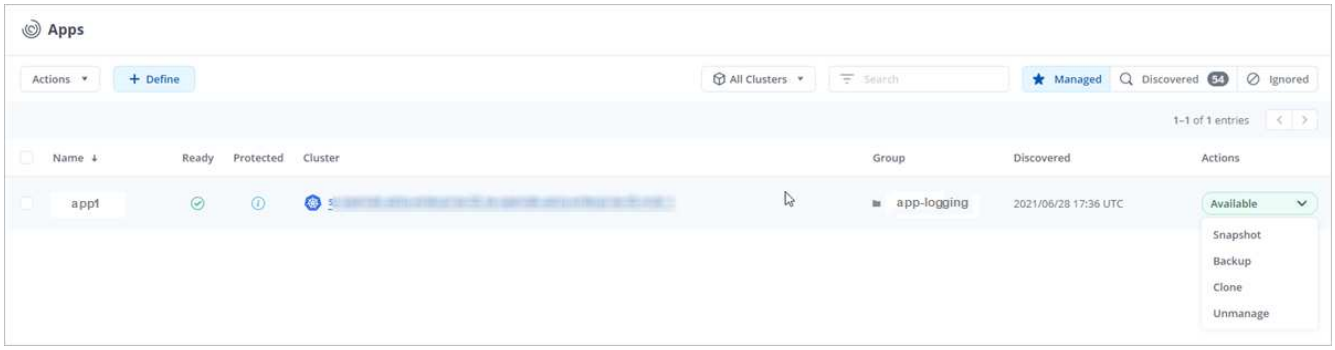
resources.

Astra Control shows you the Helm apps and custom-labeled apps in the namespace. If Helm labels are available, they're designated with a tag icon.

4. Look at the **Group** column to see which namespace the application is running in (it's designated with the folder icon).
5. Decide whether you want to manage each app individually or at the namespace level.
6. Find the app you want at the desired level in the hierarchy, and from the Actions menu, select **Manage**.
7. If you don't want to manage an app, from the Actions menu next to the app, select **Ignore**.

   For example, if you want to manage all apps under the "maria" namespace together so that they have the same snapshot and backup policies, you would manage the namespace and ignore the apps in the namespace.

8. To see the list of managed apps, select **Managed** as the display filter.



   Notice the app you just added has a warning icon under the Protected column, indicating that it is not backed up and not scheduled for backups yet.

9. To see details of a particular app, select the app name.

Result

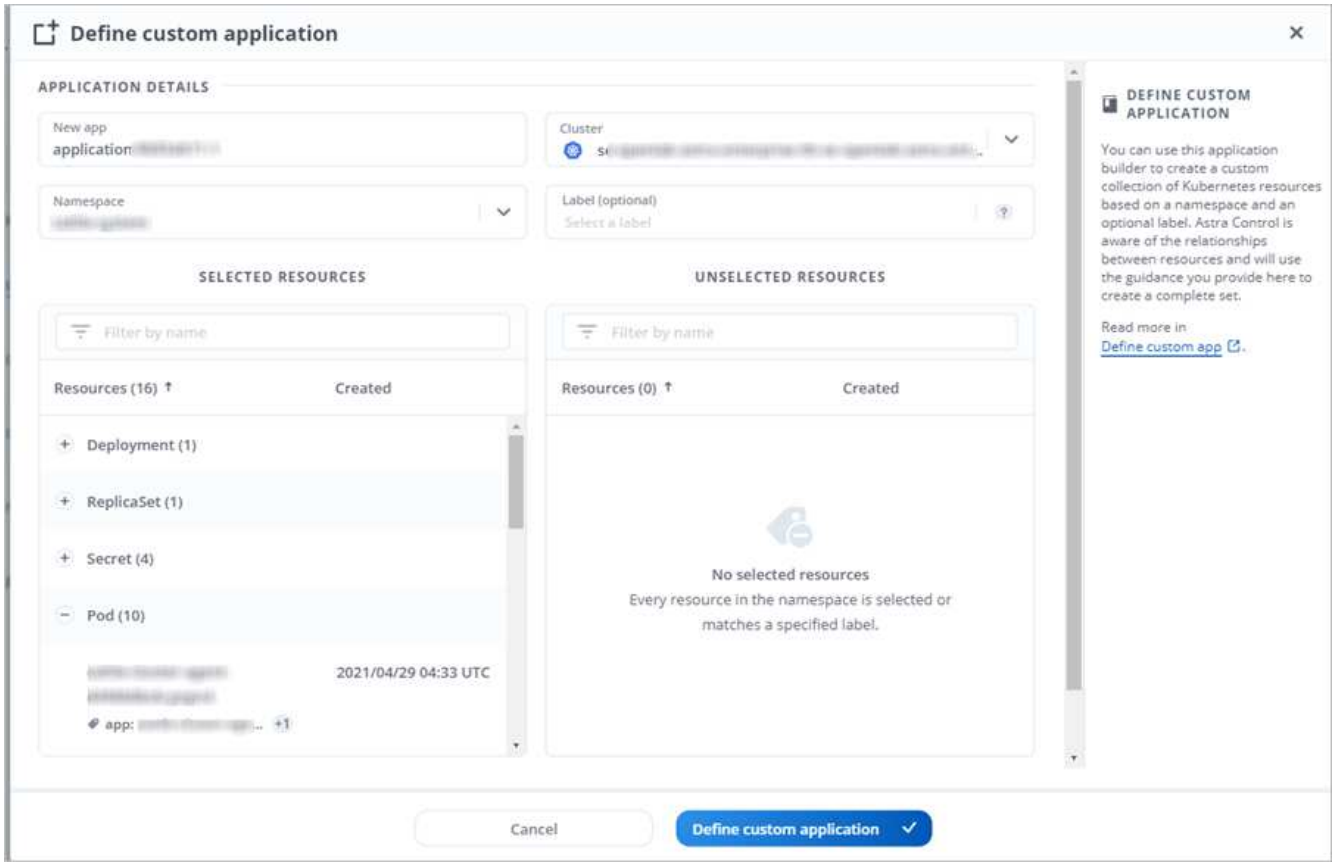
Apps that you chose to manage are now available from the **Managed** tab. Any ignored apps will move to the **Ignored** tab. Ideally, the Discovered tab will show zero apps, so that as new apps are installed, they are easier to find and manage.

Manage apps by Kubernetes label

Astra Control includes an action at the top of the Apps page named **Define custom app**. You can use this action to manage apps that are identified with a Kubernetes label. Learn more about defining custom apps by Kubernetes label.

Steps

1. From the left navigation bar, select **Applications**.
2. Select **Define**.



3. In the **Define custom application** dialog box, provide the required information to manage the app:
   a. **New App**: Enter the display name of the app.
   b. **Cluster**: Select the cluster where the app resides.
   c. **Namespace:** Select the namespace for the app.
   d. **Label:** Enter a label or select a label from the resources below.
   e. **Selected Resources**: View and manage the selected Kubernetes resources that you'd like to protect (pods, secrets, persistent volumes, and more).
      - View the available labels by expanding a resource and selecting the number of labels.
      - Select one of the labels.

        After you choose a label, it displays in the **Label** field. Astra Control also updates the **Unselected Resources** section to show the resources that don't match the selected label.
   f. **Unselected Resources**: Verify the app resources that you don't want to protect.
4. Select **Define custom application**.

Result

Astra Control enables management of the app. You can now find it in the **Managed** tab.

Ignore apps

If an app has been discovered, it appears in the Discovered list. In this case, you can clean up the Discovered list so that new apps that are newly installed are easier to find. Or, you might have apps that you are managing and later decide you no longer want to manage them. If you don't want to manage these apps, you can indicate that they should be ignored.

Also, you might want to manage apps under one namespace together (Namespace-managed). You can ignore apps that you want to exclude from the namespace.

Steps

1. From the left navigation bar, select **Applications**.
2. Select **Discovered** as the filter.
3. Select the app.
4. From the Actions menu, select **Ignore**.
5. To unignore, from the Actions menu, select **Unignore**.

Unmanage apps

When you no longer want to back up, snapshot, or clone an app, you can stop managing it.

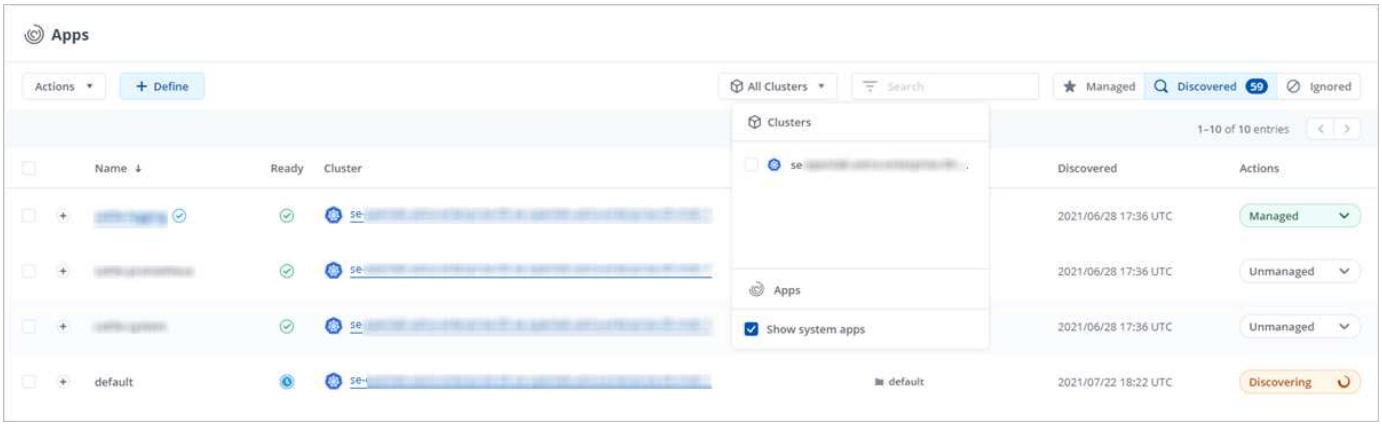
If you unmanage an app, any backups or snapshots that were created earlier will be lost.

Steps

1. From the left navigation bar, select **Applications**.
2. Select **Managed** as the filter.
3. Select the app.
4. From the Actions menu, select **Unmanage**.
5. Review the information.
6. Type "unmanage" to confirm.
7. Select **Yes, Unmanage Application**.

What about system apps?

Astra Control also discovers the system apps running on a Kubernetes cluster. You can display system apps by selecting the **Show system apps** checkbox under the Cluster filter in the toolbar.



We don’t show you these system apps by default because it’s rare that you’d need to back them up.

Astra Control itself is not a standard app; it is a "system app." You should not try to manage Astra Control itself. Astra Control itself isn’t shown by default for management. To see system apps, use the “Show system apps” filter.

Find more information

- Use the Astra Control API

Define a custom app example

Creating a custom app lets you group elements of your Kubernetes cluster into a single app.

A custom app gives you more granular control over what to include in an Astra Control operation, including:

- Clone
- Snapshot
- Backup
- Protection Policy

In most cases you will want to use Astra Control's features on your entire app. However, you can also create a custom app to use these features by the labels you assign to Kubernetes objects in a namespace.

To create a custom app, go to the Apps page and select **+ Define**.

As you make your selections, the Custom App window shows you which resources will be included or excluded from your custom app. This helps you make sure you are choosing the correct criteria for defining your custom app.

Custom apps can be created only within a specified namespace on a single cluster. Astra Control does not support the ability for a custom app to span multiple namespaces or clusters.

A label is a key/value pair you can assign to Kubernetes objects for identification. Labels make it easier to sort, organize, and find your Kubernetes objects. To learn more about Kubernetes labels, see the official Kubernetes documentation.

Overlapping policies for the same resource under different names can cause data conflicts. If you create a custom app for a resource, be sure it's not being cloned or backed up under any other policies.

Example: Separate Protection Policy for canary release

In this example, the devops team is managing a canary release deployment. Their cluster has three pods running NginX. Two of the pods are dedicated to the stable release. The third pod is for the canary release.

The devops team's Kubernetes admin adds the label `deployment=stable` to the stable release pods. The team adds the label `deployment=canary` to the canary release pod.

The team's stable release includes a requirement for hourly snapshots and daily backups. The canary release is more ephemeral, so they want to create a less aggressive, short-term Protection Policy for anything labeled `deployment=canary`.

In order to avoid possible data conflicts, the admin will create two custom apps: one for the canary release, and one for the stable release. This keeps the backups, snapshots, and clone operations separate for the two groups of Kubernetes objects.

Steps

1. After the team adds the cluster to Astra Control, the next step is to define a custom app. To do this, the team selects the **+ Define** button on the Apps page.
2. In the pop-up window which appears, the team sets `devops-canary-deployment` as the app name. The team chooses the cluster in the **Cluster** drop-down, then the app's namespace from the **Namespace** drop-down.
3. The team can either type `deployment=canary` in the **Labels** field, or select that label from the resources listed below.
4. After defining the custom app for the canary deployment, the team repeats the process for the stable deployment.

When the team has finished creating the two custom apps, they can treat these resources as any other Astra Control application. They can clone them, create backups and snapshots, and create a custom Protection Policy for each group of resources based on the Kubernetes labels.

Protect apps

Protection overview

You can create backups, clones, snapshots, and protection policies for your apps using Astra Control Center. Backing up your apps helps your services and associated data be as available as possible; during a disaster scenario, restoring from backup can ensure full recovery of an app and its associated data with minimal disruption. Backups, clones, and snapshots can help protect against common threats such as ransomware, accidental data loss, and environmental disasters. Learn about the available types of data protection in Astra Control Center, and when to use them.

App protection workflow

You can use the following example workflow to get started protecting your apps.

[One] Back up all apps

To make sure that your apps are immediately protected, create a manual backup of all apps.

[Two] Configure a protection policy for each app

To automate future backups and snapshots, configure a protection policy for each app. As an example, you can start with weekly backups and daily snapshots, with one month retention for both. Automating backups and snapshots with a protection policy is strongly recommended over manual backups and snapshots.

[Three] Optional: Adjust the protection policies

As apps and their usage patterns change, adjust the protection policies as needed to provide the best protection.

[Four] In case of a disaster, restore your apps

If data loss occurs, you can recover by restoring the latest backup first for each app. You can then restore the latest snapshot (if available).

Protect apps with snapshots and backups

Protect your apps by taking snapshots and backups using an automated protection policy or on an ad-hoc basis. You can use the Astra UI or the Astra Control API to protect apps.

If you use Helm to deploy apps, Astra Control Center requires Helm version 3. Managing and cloning apps deployed with Helm 3 (or upgraded from Helm 2 to Helm 3) are fully supported. Apps deployed with Helm 2 are not supported.

When you create a project for hosting an app on an OpenShift cluster, the project (or Kubernetes namespace) is assigned a SecurityContext UID. To enable Astra Control Center to protect your app and move the app to another cluster or project in OpenShift, you need to add policies that enable the app to run as any UID. As an example, the following OpenShift CLI commands grant the appropriate policies to a WordPress app.

```
oc new-project wordpress
oc adm policy add-scc-to-group anyuid system:serviceaccounts:wordpress
oc adm policy add-scc-to-user privileged -z default -n wordpress
```

Configure a protection policy

A protection policy protects an app by creating snapshots, backups, or both at a defined schedule. You can choose to create snapshots and backups hourly, daily, weekly, and monthly, and you can specify the number of copies to retain. As an example, a protection policy might create weekly backups and daily snapshots, and retain the backups and snapshots for one month. How often you create snapshots and backups and how long you retain them depends on the needs of your organization.

Steps

1. Select **Applications** and then select the name of an app.
2. Select **Data Protection**.
3. Select **Configure Protection Policy**.
4. Define a protection schedule by choosing the number of snapshots and backups to keep hourly, daily, weekly, and monthly.

   You can define the hourly, daily, weekly, and monthly schedules concurrently. A schedule won't turn active until you set a retention level.

   The following example sets four protection schedules: hourly, daily, weekly, and monthly for snapshots and backups.

5. Select **Review**.
6. Select **Set Protection Policy.**

Result

Astra Control Center implements the data protection policy by creating and retaining snapshots and backups using the schedule and retention policy that you defined.

Create a snapshot

You can create an on-demand snapshot at any time.

Steps

1. Select **Applications**.
2. Select the drop-down list in the **Actions** column for the desired app.
3. Select **Snapshot**.
4. Customize the name of the snapshot and then select **Review**.
5. Review the snapshot summary and select **Snapshot**.

Result

The snapshot process begins. A snapshot is successful when the status is **Available** in the **Actions** column on the **Data protection** > **Snapshots** page.

Create a backup

You can also back up an app at any time.

> S3 buckets in Astra Control Center do not report available capacity. Before backing up or cloning apps managed by Astra Control Center, check bucket information in the ONTAP or StorageGRID management system.

Steps

1. Select **Applications**.
2. Select the drop-down list in the **Actions** column for the desired app.
3. Select **Backup**.
4. Customize the name of the backup.
5. Choose whether to back up the app from an existing snapshot. If you select this option, you can choose from a list of existing snapshots.
6. Choose a destination for the backup by selecting from the list of storage buckets.
7. Select **Review**.
8. Review the backup summary and select **Backup**.

Result

Astra Control Center creates a backup of the app.

> If your network has an outage or is abnormally slow, a backup operation might time out. This causes the backup to fail.

> There is no way to stop a running backup. If you need to delete the backup, wait until it has completed and then use the instructions in Delete backups. To delete a failed backup, use the Astra Control API.

After a data protection operation (clone, backup, restore) and subsequent persistent volume resize, there is up to a twenty-minute delay before the new volume size is shown in the UI. The data protection operation is successful within minutes, and you can use the management software for the storage backend to confirm the change in volume size.

View snapshots and backups

You can view the snapshots and backups of an app from the Data Protection tab.

Steps

1. Select **Applications** and then select the name of an app.
2. Select **Data Protection**.

   The snapshots display by default.

3. Select **Backups** to see the list of backups.

Delete snapshots

Delete the scheduled or on-demand snapshots that you no longer need.

Steps

1. Select **Applications** and then select the name of an app.
2. Select **Data Protection**.
3. Select the drop-down list in the **Actions** column for the desired snapshot.
4. Select **Delete snapshot**.
5. Type the word "delete" to confirm deletion and then select **Yes, Delete snapshot**.

Result

Astra Control Center deletes the snapshot.

Delete backups

Delete the scheduled or on-demand backups that you no longer need.

There is no way to stop a running backup. If you need to delete the backup, wait until it has completed and then use these instructions. To delete a failed backup, use the Astra Control API.

1. Select **Applications** and then select the name of an app.
2. Select **Data Protection**.
3. Select **Backups**.
4. Select the drop-down list in the **Actions** column for the desired backup.
5. Select **Delete backup**.
6. Type the word "delete" to confirm deletion and then select **Yes, Delete backup**.

Result

Astra Control Center deletes the backup.

Restore apps

Astra Control can restore your application from a snapshot or backup. Restoring from an existing snapshot will be faster when restoring the application to the same cluster. You can use the Astra Control UI or the Astra Control API to restore apps.

If you use Helm to deploy apps, Astra Control Center requires Helm version 3. Managing and cloning apps deployed with Helm 3 (or upgraded from Helm 2 to Helm 3) are fully supported. Apps deployed with Helm 2 are not supported.

If you restore to a different cluster, ensure that the cluster is using the same persistent volume access mode (for example, ReadWriteMany). The restore operation will fail if the destination persistent volume access mode is different.

When you create a project for hosting an app on an OpenShift cluster, the project (or Kubernetes namespace) is assigned a SecurityContext UID. To enable Astra Control Center to protect your app and move the app to another cluster or project in OpenShift, you need to add policies that enable the app to run as any UID. As an example, the following OpenShift CLI commands grant the appropriate policies to a WordPress app.

```
oc new-project wordpress
oc adm policy add-scc-to-group anyuid system:serviceaccounts:wordpress
oc adm policy add-scc-to-user privileged -z default -n wordpress
```

Steps

1. Select **Applications** and then select the name of an app.
2. Select **Data protection**.
3. If you want to restore from a snapshot, keep the **Snapshots** icon selected. Otherwise, select the **Backups** icon to restore from a backup.
4. Select the drop-down list in the **Actions** column for the snapshot or backup from which you want to restore.
5. Select **Restore application**.
6. **Restore details**: Specify details for the restored app. By default, the current cluster and namespace appear. Leave these values intact to restore an app in-place, which reverts the app to an earlier version of itself. Change these values if you want to restore to a different cluster or namespace.
   - Enter a name and namespace for the app.
   - Choose the destination cluster for the app.
   - Select **Review**.

1. **Restore Summary**: Review details about the restore action, type "restore", and select **Restore**.

Result

Astra Control Center restores the app based on the information that you provided. If you restored the app in-place, the contents of any existing persistent volumes are replaced with the contents of persistent volumes from the restored app.

After a data protection operation (clone, backup, restore) and subsequent persistent volume resize, there is up to a twenty-minute delay before the new volume size is shown in the UI. The data protection operation is successful within minutes, and you can use the management software for the storage backend to confirm the change in volume size.

Clone and migrate apps

Clone an existing app to create a duplicate app on the same Kubernetes cluster or on another cluster. Cloning can help if you need to move applications and storage from one Kubernetes cluster to another. For example, you might want to move workloads through a CI/CD pipeline and across Kubernetes namespaces. You can use the Astra UI or the Astra Control API to clone and migrate apps.

If you deploy an app with a StorageClass explicitly set and you need to clone the app, the target cluster must have the originally specified StorageClass. Cloning an application with an explicitly set StorageClass to a cluster that does not have the same StorageClass will fail.

If you clone an operator-deployed instance of Jenkins CI, you need to manually restore the persistent data. This is a limitation of the app's deployment model.

If you clone an app between clusters, the source and destination clusters must be the same distribution of OpenShift. For example, if you clone an app from an OpenShift 4.7 cluster, use a destination cluster that is also OpenShift 4.7.

When Astra Control Center clones an app, it creates a clone of your application configuration and persistent storage.

S3 buckets in Astra Control Center do not report available capacity. Before backing up or cloning apps managed by Astra Control Center, check bucket information in the ONTAP or StorageGRID management system.

When you create a project for hosting an app on an OpenShift cluster, the project (or Kubernetes namespace) is assigned a SecurityContext UID. To enable Astra Control Center to protect your app and move the app to another cluster or project in OpenShift, you need to add policies that enable the app to run as any UID. As an example, the following OpenShift CLI commands grant the appropriate policies to a WordPress app.

```
oc new-project wordpress
oc adm policy add-scc-to-group anyuid system:serviceaccounts:wordpress
oc adm policy add-scc-to-user privileged -z default -n wordpress
```

What you'll need

To clone apps to a different cluster, you need a default bucket. When you add your first bucket, it becomes the default bucket.

Steps

1. Select **Applications**.
2. Do one of the following:

- Select the drop-down list in the **Actions** column for the desired app.
- Select the name of the desired app, and select the status drop-down list at the top right of the page.

3. Select **Clone**.
4. **Clone details**: Specify details for the clone:
   - Enter a name.
   - Enter a namespace for the clone.
   - Choose a destination cluster for the clone.
   - Choose whether you want to create the clone from an existing snapshot or backup. If you don't select this option, Astra Control Center creates the clone from the app's current state.
5. **Source**: If you chose to clone from an existing snapshot or backup, choose the snapshot or backup that you'd like to use.
6. Select **Review**.
7. **Clone Summary**: Review the details about the clone and select **Clone**.

Result

Astra Control Center clones that app based on the information that you provided. The clone operation is successful when the new app clone is in the `Available` state on the **Applications** page.

> After a data protection operation (clone, backup, restore) and subsequent persistent volume resize, there is up to a twenty-minute delay before the new volume size is shown in the UI. The data protection operation is successful within minutes, and you can use the management software for the storage backend to confirm the change in volume size.

Manage app execution hooks

An execution hook is a custom script that you can run before or after a snapshot of a managed app. For example, if you have a database app, you can use execution hooks to pause all database transactions before a snapshot, and resume transactions after the snapshot is complete. This ensures application-consistent snapshots.

Default execution hooks and regular expressions

For some apps, Astra Control comes with default execution hooks, provided by NetApp, that handle freeze and thaw operations before and after snapshots. Astra Control uses regular expressions to match an app's container image to these apps:

- MariaDB
  - Matching regular expression: \bmariadb\b
- MySQL
  - Matching regular expression: \bmysql\b
- PostgreSQL
  - Matching regular expression: \bpostgresql\b

If there is a match, the NetApp-provided default execution hooks for that app appear in the app's list of active execution hooks, and those hooks run automatically when snapshots of that app are taken. If one of your

custom apps has a similar image name that happens to match one of the regular expressions (and you don't want to use the default execution hooks), you can either change the image name, or disable the default execution hook for that app and use a custom hook instead.

You cannot delete or modify the default execution hooks.

Important notes about custom execution hooks

Consider the following when planning execution hooks for your apps.

- Astra Control requires execution hooks to be written in the format of executable shell scripts.
- Script size is limited to 128KB.
- Astra Control uses execution hook settings and any matching criteria to determine which hooks are applicable to a snapshot.
- All execution hook failures are soft failures; other hooks and the snapshot are still attempted even if a hook fails. However, when a hook fails, a warning event is recorded in the **Activity** page event log.
- To create, edit, or delete execution hooks, you must be a user with Owner, Admin, or Member permissions.
- If an execution hook takes longer than 25 minutes to run, the hook will fail, creating an event log entry with a return code of "N/A". Any affected snapshot will time out and be marked as failed, with a resulting event log entry noting the timeout.

Since execution hooks often reduce or completely disable the functionality of the application they are running against, you should always try to minimize the time your custom execution hooks take to run.

When a snapshot is run, execution hook events take place in the following order:

1. Any applicable NetApp-provided default pre-snapshot execution hooks are run on the appropriate containers.
2. Any applicable custom pre-snapshot execution hooks are run on the appropriate containers. You can create and run as many custom pre-snapshot hooks as you need, but the order of execution of these hooks before the snapshot is neither guaranteed nor configurable.
3. The snapshot is performed.
4. Any applicable custom post-snapshot execution hooks are run on the appropriate containers. You can create and run as many custom post-snapshot hooks as you need, but the order of execution of these hooks after the snapshot is neither guaranteed nor configurable.
5. Any applicable NetApp-provided default post-snapshot execution hooks are run on the appropriate containers.

You should always test your execution hook scripts before enabling them in a production environment. You can use the 'kubectl exec' command to conveniently test the scripts. After you enable the execution hooks in a production environment, test the resulting snapshots to ensure they are consistent. You can do this by cloning the app to a temporary namespace, restoring the snapshot, and then testing the app.

View existing execution hooks

You can view existing custom or NetApp-provided default execution hooks for an app.

Steps

1. Go to **Applications** and then select the name of a managed app.
2. Select the **Execution hooks** tab.

   You can view all enabled or disabled execution hooks in the resulting list. You can see a hook's status, source, and when it runs (pre- or post-snapshot). To view event logs surrounding execution hooks, go to the **Activity** page in the left-side navigation area.

Create a custom execution hook

You can create a custom execution hook for an app. See Execution hook examples for hook examples. You need to have Owner, Admin, or Member permissions to create execution hooks.

> When you create a custom shell script to use as an execution hook, remember to specify the appropriate shell at the beginning of the file, unless you are running linux commands or providing the full path to an executable.

Steps

1. Select **Applications** and then select the name of a managed app.
2. Select the **Execution hooks** tab.
3. Select **Add a new hook**.
4. In the **Hook Details** area, depending on when the hook should run, choose **Pre-Snapshot** or **Post-Snapshot**.
5. Enter a unique name for the hook.
6. (Optional) Enter any arguments to pass to the hook during execution, pressing the Enter key after each argument you enter to record each one.
7. In the **Container Images** area, if the hook should run against all container images contained within the application, enable the **Apply to all container images** check box. If instead the hook should act only on one or more specified container images, enter the container image names in the **Container image names to match** field.
8. In the **Script** area, do one of the following:
   - Upload a custom script.
     a. Select the **Upload file** option.
     b. Browse to a file and upload it.
     c. Give the script a unique name.
     d. (Optional) Enter any notes other administrators should know about the script.
   - Paste in a custom script from the clipboard.
     a. Select the **Paste from clipboard** option.
     b. Select the text field and paste the script text into the field.
     c. Give the script a unique name.
     d. (Optional) Enter any notes other administrators should know about the script.
9. Select **Add hook**.

Disable an execution hook

You can disable an execution hook if you want to temporarily prevent it from running before or after a snapshot of an app. You need to have Owner, Admin, or Member permissions to disable execution hooks.

Steps

1. Select **Applications** and then select the name of a managed app.
2. Select the **Execution hooks** tab.
3. Select the **Actions** dropdown for a hook that you wish to disable.
4. Select **Disable**.

Delete an execution hook

You can remove an execution hook entirely if you no longer need it. You need to have Owner, Admin, or Member permissions to delete execution hooks.

Steps

1. Select **Applications** and then select the name of a managed app.
2. Select the **Execution hooks** tab.
3. Select the **Actions** dropdown for a hook that you wish to delete.
4. Select **Delete**.

Execution hook examples

Use the following examples to get an idea of how to structure your execution hooks. You can use these hooks as templates, or as test scripts.

Simple success example

This is an example of a simple hook that succeeds and writes a message to standard output and standard error.

```
#!/bin/sh

# success_sample.sh
#
# A simple noop success hook script for testing purposes.
#
# args: None
#


#
# Writes the given message to standard output
#
# $* - The message to write
#
msg() {
```

```
    echo "$*"
}


#
# Writes the given information message to standard output
#
# $* - The message to write
#
info() {
    msg "INFO: $*"
}

#
# Writes the given error message to standard error
#
# $* - The message to write
#
error() {
    msg "ERROR: $*" 1>&2
}


#
# main
#

# log something to stdout
info "running success_sample.sh"

# exit with 0 to indicate success
info "exit 0"
exit 0
```

Simple success example (bash version)

This is an example of a simple hook that succeeds and writes a message to standard output and standard error, written for bash.

```
#!/bin/bash

# success_sample.bash
#
# A simple noop success hook script for testing purposes.
#
# args: None
```

```
#
# Writes the given message to standard output
#
# $* - The message to write
#
msg() {
    echo "$*"
}


#
# Writes the given information message to standard output
#
# $* - The message to write
#
info() {
    msg "INFO: $*"
}

#
# Writes the given error message to standard error
#
# $* - The message to write
#
error() {
    msg "ERROR: $*" 1>&2
}


#
# main
#

# log something to stdout
info "running success_sample.bash"

# exit with 0 to indicate success
info "exit 0"
exit 0
```

Simple success example (zsh version)

This is an example of a simple hook that succeeds and writes a message to standard output and standard error, written for Z shell.

```
#!/bin/zsh

# success_sample.zsh
#
# A simple noop success hook script for testing purposes.
#
# args: None
#


#
# Writes the given message to standard output
#
# $* - The message to write
#
msg() {
    echo "$*"
}


#
# Writes the given information message to standard output
#
# $* - The message to write
#
info() {
    msg "INFO: $*"
}

#
# Writes the given error message to standard error
#
# $* - The message to write
#
error() {
    msg "ERROR: $*" 1>&2
}

#
# main
#

# log something to stdout
info "running success_sample.zsh"

# exit with 0 to indicate success
```

```
info "exit 0"
exit 0
```

Success with arguments example

The following example demonstrates how you can use args in a hook.

```
#!/bin/sh

# success_sample_args.sh
#
# A simple success hook script with args for testing purposes.
#
# args: Up to two optional args that are echoed to stdout

#
# Writes the given message to standard output
#
# $* - The message to write
#
msg() {
    echo "$*"
}


#
# Writes the given information message to standard output
#
# $* - The message to write
#
info() {
    msg "INFO: $*"
}

#
# Writes the given error message to standard error
#
# $* - The message to write
#
error() {
    msg "ERROR: $*" 1>&2
}


#
# main
```

```
#

# log something to stdout
info "running success_sample_args.sh"


# collect args
arg1=$1
arg2=$2

# output args and arg count to stdout
info "number of args: $#"
info "arg1 ${arg1}"
info "arg2 ${arg2}"

# exit with 0 to indicate success
info "exit 0"
exit 0
```

Pre-snapshot / post-snapshot hook example

The following example demonstrates how the same script can be used for both a pre-snapshot and a post-snapshot hook.

```
#!/bin/sh

# success_sample_pre_post.sh
#
# A simple success hook script example with an arg for testing purposes
# to demonstrate how the same script can be used for both a prehook and
posthook
#
# args: [pre|post]

# unique error codes for every error case
ebase=100
eusage=$((ebase+1))
ebadstage=$((ebase+2))
epre=$((ebase+3))
epost=$((ebase+4))


#
# Writes the given message to standard output
#
# $* - The message to write
```

```
#
msg() {
    echo "$*"
}


#
# Writes the given information message to standard output
#
# $* - The message to write
#
info() {
    msg "INFO: $*"
}

#
# Writes the given error message to standard error
#
# $* - The message to write
#
error() {
    msg "ERROR: $*" 1>&2
}


#
# Would run prehook steps here
#
prehook() {
    info "Running noop prehook"
    return 0
}

#
# Would run posthook steps here
#
posthook() {
    info "Running noop posthook"
    return 0
}


#
# main
#
```

```
# check arg
stage=$1
if [ -z "${stage}" ]; then
    echo "Usage: $0 <pre|post>"
    exit ${eusage}
fi

if [ "${stage}" != "pre" ] && [ "${stage}" != "post" ]; then
    echo "Invalid arg: ${stage}"
    exit ${ebadstage}
fi

# log something to stdout
info "running success_sample_pre_post.sh"

if [ "${stage}" = "pre" ]; then
    prehook
    rc=$?
    if [ ${rc} -ne 0 ]; then
        error "Error during prehook"
    fi
fi

if [ "${stage}" = "post" ]; then
    posthook
    rc=$?
    if [ ${rc} -ne 0 ]; then
        error "Error during posthook"
    fi
fi

exit ${rc}
```

Failure example

The following example demonstrates how you can handle failures in a hook.

```
#!/bin/sh

# failure_sample_arg_exit_code.sh
#
# A simple failure hook script for testing purposes.
#
# args: [the exit code to return]
#
```

```
#
# Writes the given message to standard output
#
# $* - The message to write
#
msg() {
    echo "$*"
}


#
# Writes the given information message to standard output
#
# $* - The message to write
#
info() {
    msg "INFO: $*"
}

#
# Writes the given error message to standard error
#
# $* - The message to write
#
error() {
    msg "ERROR: $*" 1>&2
}


#
# main
#

# log something to stdout
info "running failure_sample_arg_exit_code.sh"

argexitcode=$1

# log to stderr
error "script failed, returning exit code ${argexitcode}"

# exit with specified exit code
exit ${argexitcode}
```

Verbose failure example

The following example demonstrates how you can handle failures in a hook, with more verbose logging.

```
#!/bin/sh

# failure_sample_verbose.sh
#
# A simple failure hook script with args for testing purposes.
#
# args: [The number of lines to output to stdout]


#
# Writes the given message to standard output
#
# $* - The message to write
#
msg() {
    echo "$*"
}


#
# Writes the given information message to standard output
#
# $* - The message to write
#
info() {
    msg "INFO: $*"
}

#
# Writes the given error message to standard error
#
# $* - The message to write
#
error() {
    msg "ERROR: $*" 1>&2
}


#
# main
#

# log something to stdout
```

```
info "running failure_sample_verbose.sh"


# output arg value to stdout
linecount=$1
info "line count ${linecount}"

# write out a line to stdout based on line count arg
i=1
while [ "$i" -le ${linecount} ]; do
    info "This is line ${i} from failure_sample_verbose.sh"
    i=$(( i + 1 ))
done

error "exiting with error code 8"
exit 8
```

Failure with an exit code example

The following example demonstrates a hook failing with an exit code.

```
#!/bin/sh

# failure_sample_arg_exit_code.sh
#
# A simple failure hook script for testing purposes.
#
# args: [the exit code to return]
#


#
# Writes the given message to standard output
#
# $* - The message to write
#
msg() {
    echo "$*"
}


#
# Writes the given information message to standard output
#
# $* - The message to write
#
```

```
info() {
    msg "INFO: $*"
}

#
# Writes the given error message to standard error
#
# $* - The message to write
#
error() {
    msg "ERROR: $*" 1>&2
}


#
# main
#

# log something to stdout
info "running failure_sample_arg_exit_code.sh"

argexitcode=$1

# log to stderr
error "script failed, returning exit code ${argexitcode}"

# exit with specified exit code
exit ${argexitcode}
```

Success after failure example

The following example demonstrates a hook failing the first time it is run, but succeeding after the second run.

```
#!/bin/sh

# failure_then_success_sample.sh
#
# A hook script that fails on initial run but succeeds on second run for
testing purposes.
#
# Helpful for testing retry logic for post hooks.
#
# args: None
#

#
```

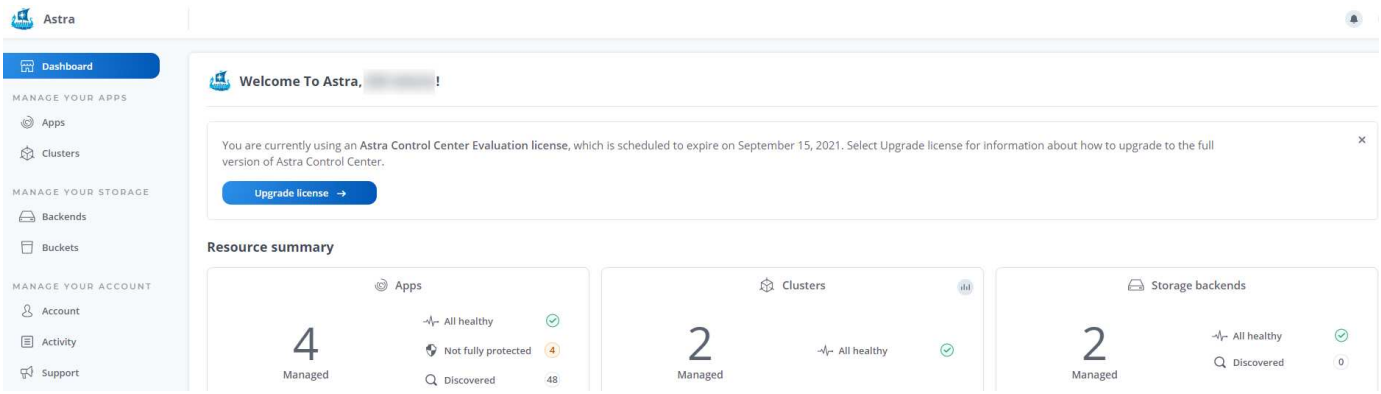
```
# Writes the given message to standard output
#
# $* - The message to write
#
msg() {
    echo "$*"
}


#
# Writes the given information message to standard output
#
# $* - The message to write
#
info() {
    msg "INFO: $*"
}

#
# Writes the given error message to standard error
#
# $* - The message to write
#
error() {
    msg "ERROR: $*" 1>&2
}


#
# main
#

# log something to stdout
info "running failure_success sample.sh"


if [ -e /tmp/hook-test.junk ] ; then
    info "File does exist.  Removing /tmp/hook-test.junk"
    rm /tmp/hook-test.junk
    info "Second run so returning exit code 0"
    exit 0
else
    info "File does not exist.  Creating /tmp/hook-test.junk"
    echo "test" > /tmp/hook-test.junk
    error "Failed first run, returning exit code 5"
    exit 5
```

```
fi
```

View app and cluster health

View a summary of app and cluster health

Select the **Dashboard** to see a high-level view of your apps, clusters, storage backends, and their health.



These aren't just static numbers or statuses—you can drill down from each of these. For example, if apps aren't fully protected, you can hover over the icon to identify which apps aren't fully protected, which includes a reason why.

Applications tile

The **Applications** tile helps you identify the following:

- How many apps you're currently managing with Astra.
- Whether those managed apps are healthy.
- Whether the apps are fully protected (they're protected if recent backups are available).
- The number of apps that were discovered, but are not yet managed.

  Ideally, this number would be zero because you would either manage or ignore apps after they're discovered. And then you would monitor the number of discovered apps on the Dashboard to identify when developers add new apps to a cluster.

Clusters tile

The **Clusters** tile provides similar details about the health of the clusters that you are managing by using Astra Control Center, and you can drill down to get more details just like you can with an app.

Storage backends tile

The **Storage backends** tile provides information to help you identify the health of storage backends including:

- How many storage backends are managed
- Whether these managed backends are healthy

- Whether the backends are fully protected
- The number of backends that are discovered, but are not yet managed.

View the health and details of clusters

After you add clusters to be managed by Astra Control Center, you can view details about the cluster, such as its location, the worker nodes, persistent volumes, and storage classes.

Steps

1. In the Astra Control Center UI, select **Clusters**.
2. On the **Clusters** page, select the cluster whose details you want to view.
3. View the information on the **Overview**, **Storage**, and **Activity** tabs to find the information that you're looking for.
   - **Overview**: Details about the worker nodes, including their state.
   - **Storage**: The persistent volumes associated with the compute, including the storage class and state.
   - **Activity**: Shows the activities related to the cluster.

> ⓘ You can also view cluster information starting from the Astra Control Center **Dashboard**. On the **Clusters** tab under **Resource summary**, you can select the managed clusters, which takes you to the **Clusters** page. After you get to the **Clusters** page, follow the steps outlined above.

View the health and details of an app

After you start managing an app, Astra provides details about the app that enables you to identify its status (whether it's healthy), its protection status (whether it's fully protected in case of failure), the pods, persistent storage, and more.

Steps

1. In the Astra Control Center UI, select **Applications** and then select the name of an app.
2. Find the information that you're looking for:

App Status

Provides a status that reflects the app's state in Kubernetes. For example, are pods and persistent volumes online? If an app is unhealthy, you'll need to go and troubleshoot the issue on the cluster by looking at Kubernetes logs. Astra doesn't provide information to help you fix a broken app.

App Protection Status

Provides a status of how well the app is protected:

- **Fully protected**: The app has an active backup schedule and a successful backup that's less than a week old
- **Partially protected**: The app has an active backup schedule, an active snapshot schedule, or a successful backup or snapshot
- **Unprotected**: Apps that are neither fully protected or partially protected.

You can't be fully protected until you have a recent backup. This is important because backups are

stored in an object store away from the persistent volumes. If a failure or accident wipes out the cluster and it's persistent storage, then you need a backup to recover. A snapshot wouldn't enable you to recover.

Overview
Information about the state of the pods that are associated with the app.

Data protection
Enables you to configure a data protection policy and to view the existing snapshots and backups.

Storage
Shows you the app-level persistent volumes. The state of a persistent volume is from the perspective of the Kubernetes cluster.

Resources
Enables you to verify which resources are being backed up and managed.

Activity
Shows the activities related to the app.

You can also view app information starting from the Astra Control Center **Dashboard**. On the **Applications** tab under **Resource summary**, you can select the managed apps, which takes you to the **Applications** page. After you get to the **Applications** page, follow the steps outlined above.

Manage your account

Manage users

You can add, remove, and edit users of your Astra Control Center installation using the Astra Control Center UI. You can use the Astra UI or the Astra Control API to manage users.

Add users

Account Owners and Admins can add more users to the Astra Control Center installation.

Steps

1. In the **Manage Your Account** navigation area, select **Account**.
2. Select the **Users** tab.
3. Select **Add User**.
4. Enter the user's name, email address, and a temporary password.

   The user will need to change the password upon first login.

5. Select a user role with the appropriate system permissions.

   Each role provides the following permissions:

   - A **Viewer** can view resources.

- A **Member** has Viewer role permissions and can manage apps and clusters, but cannot unmanage apps or clusters, or delete snapshots or backups.
- An **Admin** has Member role permissions and can add and remove any other users except the Owner.
- An **Owner** has Admin role permissions and can add and remove any user accounts.

6. Select **Add**.

Manage passwords

You can manage passwords for user accounts in Astra Control Center.

Change your password

You can change the password of your user account at any time.

Steps

1. Select the User icon at the top right of the screen.
2. Select **Profile**.
3. Select the **Actions** drop-down list, and select **Change Password**.
4. Enter a password that conforms to the password requirements.
5. Enter the password again to confirm.
6. Select **Change password**.

Reset another user's password

If your account has Admin or Owner role permissions, you can reset passwords for other user accounts as well as your own. When you reset a password, you assign a temporary password that the user will have to change upon logging in.

Steps

1. In the **Manage Your Account** navigation area, select **Account**.
2. In the **Users** tab, select the drop-down list in the **State** column for the user.
3. Select **Reset Password**.
4. Enter a temporary password that conforms to the password requirements.
5. Enter the password again to confirm.

   Next time the user logs in, the user will be prompted to change the password.

6. Select **Reset password**.

Change a user's role

Users with the Owner role can change the role of all users, while users with the Admin role can change the role of users who have the Admin, Member, or Viewer role.

Steps

1. In the **Manage Your Account** navigation area, select **Account**.
2. In the **Users** tab, select the drop-down list in the **Role** column for the user.

3. Select a new role and then select **Change Role** when prompted.

Result

Astra Control Center updates the user's permissions based on the new role that you selected.

Remove users

Users with the Owner or Admin role can remove other users from the account at any time.

Steps

1. In the **Manage Your Account** navigation area, select **Account**.
2. In the **Users** tab, select the checkbox in the row of each user that you want to remove.
3. Select **Actions** and select **Remove user/s**.
4. When you're prompted, confirm deletion by typing the word "remove" and then select **Yes, Remove User**.

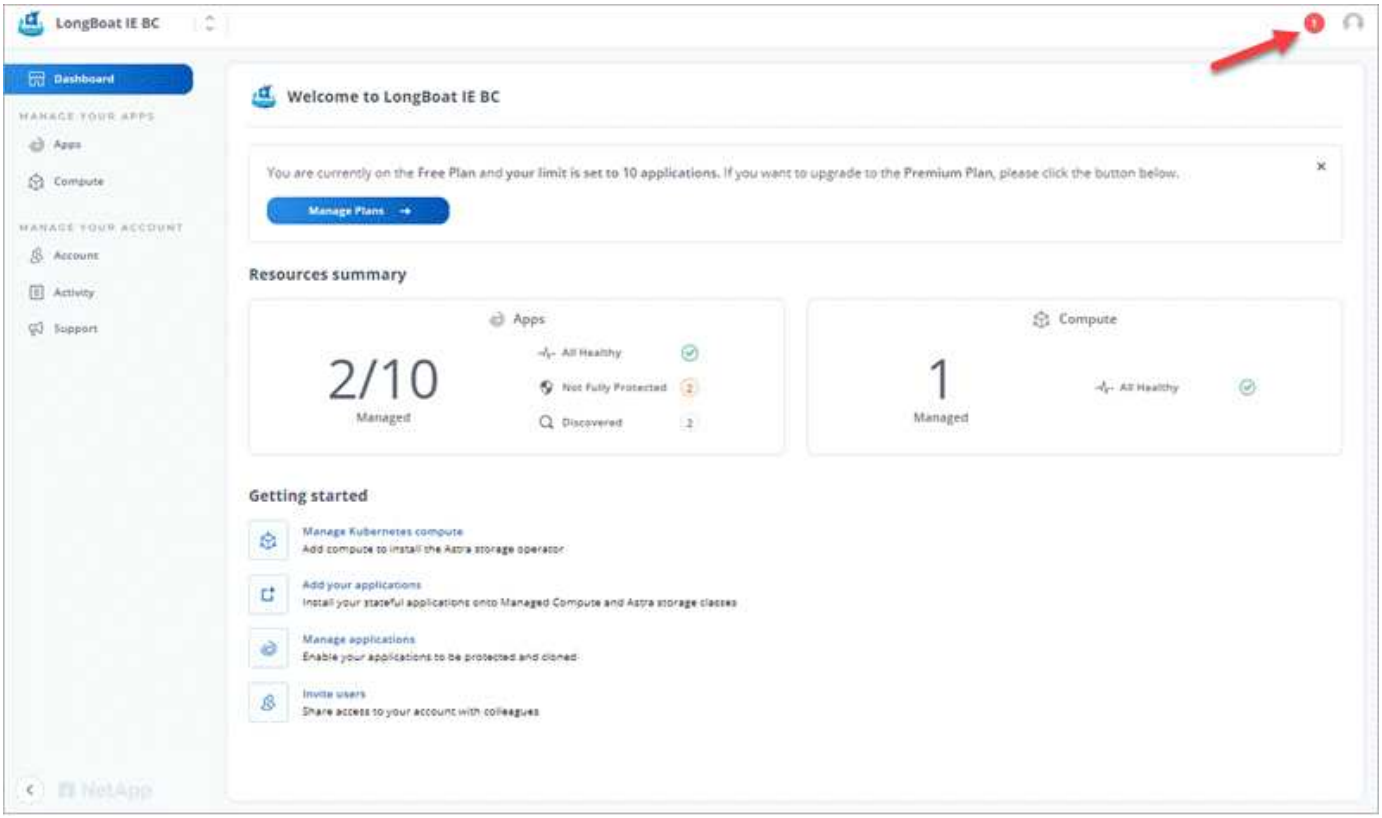
Result

Astra Control Center removes the user from the account.

View and manage notifications

Astra notifies you when actions have completed or failed. For example, you'll see a notification if a backup of an app completed successfully.

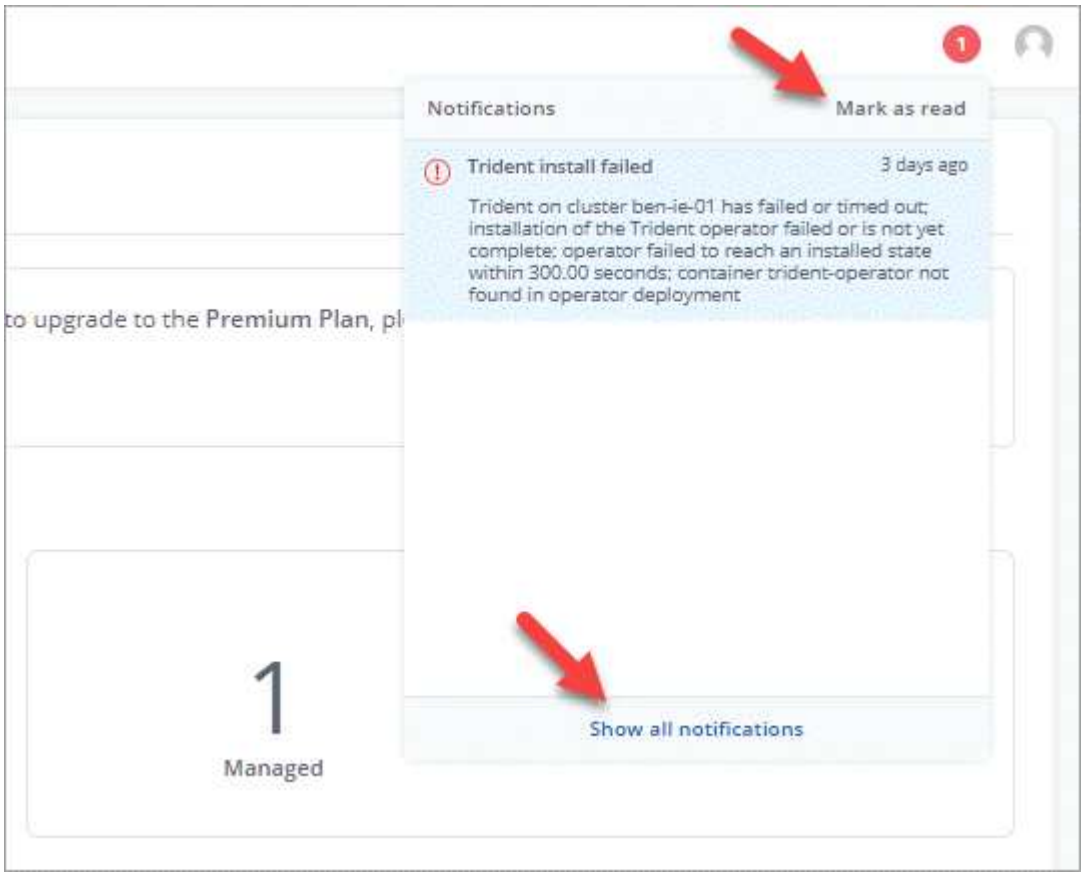
The number of unread notifications is available in the top right of the interface:



You can view these notifications and mark them as read (this can come in handy if you like to clear unread notifications like we do).

Steps

1. Select the number of unread notifications in the top right.



2. Review the notifications and then select **Mark as read** or **Show all notifications**.

   If you selected **Show all notifications**, the Notifications page loads.

3. On the **Notifications** page, view the notifications, select the ones that you want to mark as read, select **Action** and select **Mark as read**.

Add and remove credentials

Add and remove credentials for local private cloud providers such as ONTAP S3, Kubernetes clusters managed with OpenShift, or unmanaged Kubernetes clusters from your account at any time. Astra Control Center uses these credentials to discover Kubernetes clusters and the apps on the clusters, and to provision resources on your behalf.

Note that all users in Astra Control Center share the same sets of credentials.

Add credentials

You can add credentials to Astra Control Center when you manage clusters. To add credentials by adding a new cluster, see Add a Kubernetes cluster.

If you create your own `kubeconfig` file, you should define only **one** context element in it. See Kubernetes documentation for information about creating `kubeconfig` files.

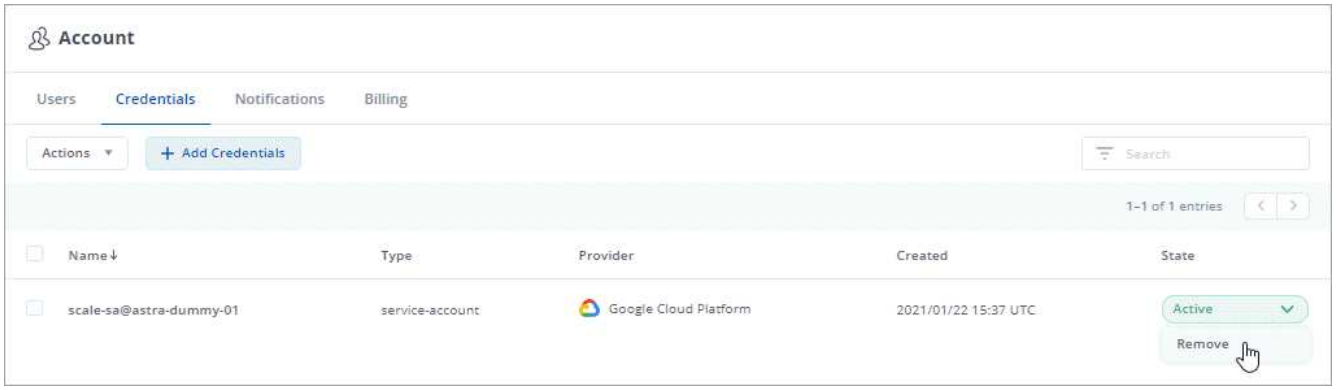
Remove credentials

Remove credentials from an account at any time. You should only remove credentials after unmanaging all associated clusters.

> The first set of credentials that you add to Astra Control Center is always in use because Astra Control Center uses the credentials to authenticate to the backup bucket. It's best not to remove these credentials.

Steps

1. Select **Account > Credentials**.
2. Select the drop-down list in the **State** column for the credentials that you want to remove.
3. Select **Remove**.



4. Type the word "remove" to confirm deletion and then select **Yes, Remove Credential**.

Result

Astra Control Center removes the credentials from the account.

Monitor account activity

You can view details about the activities in your Astra Control account. For example, when new users were invited, when a cluster was added, or when a snapshot was taken. You also have the ability to export your account activity to a CSV file.

View all account activity in Astra Control

1. Select **Activity**.
2. Use the filters to narrow down the list of activities or use the search box to find exactly what you're looking for.
3. Select **Export to CSV** to download your account activity to a CSV file.

View account activity for a specific app

1. Select **Applications** and then select the name of an app.
2. Select **Activity**.

View account activity for clusters

1. Select **Clusters** and then select the name of the cluster.

2. Select **Activity**.

Take action to resolve events that require attention

1. Select **Activity**.
2. Select an event that requires attention.
3. Select the **Take action** drop-down option.

   From this list, you can view possible corrective actions that you can take, view documentation related to the issue, and get support to help resolve the issue.

Update an existing license

You can convert an evaluation license to a full license, or you can update an existing evaluation or full license with a new license. If you don't have a full license, work with your NetApp sales contact to obtain a full license and serial number. You can use the Astra UI or the Astra Control API to update an existing license.

Steps

1. Log in to the NetApp Support Site.
2. Access the Astra Control Center Download page, enter the serial number, and download the full NetApp license file (NLF).
3. Log in to the Astra Control Center UI.
4. From the left navigation, select **Account** > **License**.
5. In the **Account** > **License** page, select the status drop-down menu for the existing license and select **Replace**.
6. Browse to the license file that you downloaded.
7. Select **Add**.

The **Account** > **Licenses** page displays the license information, expiration date, license serial number, account ID, and CPU units used.

Manage buckets

An object store bucket provider is essential if you want to back up your applications and persistent storage or if you want to clone applications across clusters. Using Astra Control Center, add an object store provider as your off-cluster, backup destination for your apps.

You don't need a bucket if you are cloning your application configuration and persistent storage to the same cluster.

Use any of the following bucket providers:

- NetApp ONTAP S3
- NetApp StorageGRID S3
- Generic S3

> Although Astra Control Center supports Amazon S3 as a Generic S3 bucket provider, Astra Control Center might not support all object store vendors that claim Amazon's S3 support.

You cannot delete a bucket; however, you can edit it.

A bucket can be in one of these states:

- pending: The bucket is scheduled for discovery.
- available: The bucket is available for use.
- removed: The bucket is not currently accessible.

For instructions on how to manage buckets using the Astra Control API, see the Astra Automation and API information.

You can do these tasks related to managing buckets:

- Add a bucket
- Edit a bucket

S3 buckets in Astra Control Center do not report available capacity. Before backing up or cloning apps managed by Astra Control Center, check bucket information in the ONTAP or StorageGRID management system.

Remove credentials

Remove S3 credentials from an account at any time using the Astra Control API.

For details, see Use the Astra Control API.

The first set of credentials that you add to Astra Control is always in use because Astra Control uses the credentials to authenticate the backup bucket. It's best not to remove these credentials.

Edit a bucket

You can change the access credential information for a bucket and change whether a selected bucket is the default bucket.

When you add a bucket, select the correct bucket provider and provide the right credentials for that provider. For example, the UI accepts NetApp ONTAP S3 as the type and accepts StorageGRID credentials; however, this will cause all future app backups and restores using this bucket to fail. See the Release Notes.

Steps

1. From left navigation, select **Buckets**.
2. From the Actions menu, select **Edit**.
3. Change any information other than the bucket type.

   You can't modify the bucket type.

4. Select **Update**.

Find more information

- Use the Astra Control API

Manage the storage backend

Managing storage clusters in Astra Control as a storage backend enables you to get linkages between persistent volumes (PVs) and the storage backend as well as additional storage metrics. You can monitor storage capacity and health details, including performance if Astra Control Center is connected to Cloud Insights.

For instructions on how to manage storage backends using the Astra Control API, see the Astra Automation and API information.

You can complete the following tasks related to managing a storage backend:

- Add a storage backend
- View storage backend details
- Unmanage a storage backend

View storage backend details

You can view storage backend information from the Dashboard or from the Backends option.

View storage backend details from the Dashboard

Steps

1. From the left navigation, select **Dashboard**.
2. Review the Storage backend section that shows the state:
    - **Unhealthy**: The storage is not in an optimal state. This could be due to a latency issue or an app is degraded due to a container issue, for example.
    - **All healthy**: The storage has been managed and is in an optimal state.
    - **Discovered**: The storage has been discovered, but not managed by Astra Control.

View storage backend details from the Backends option

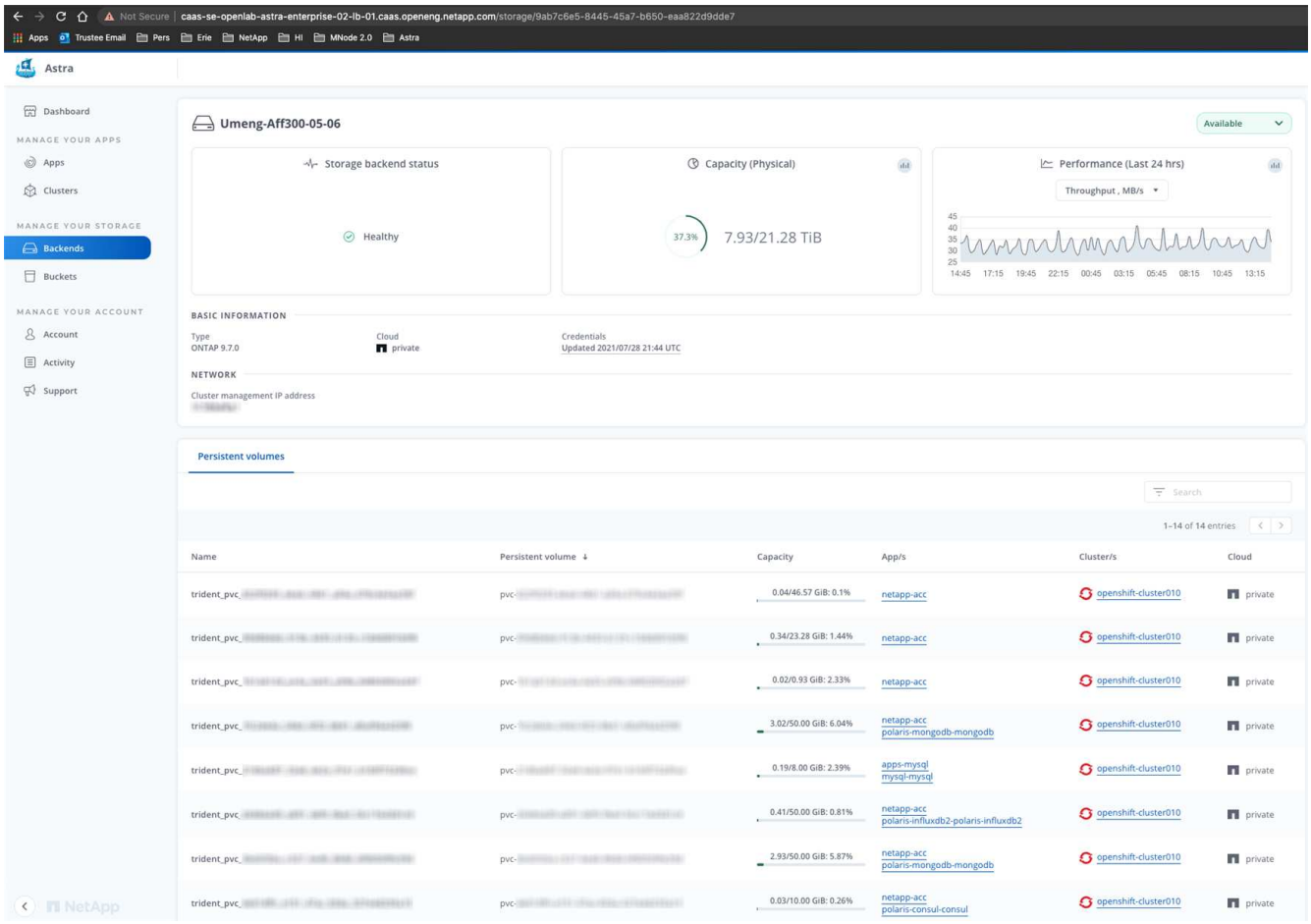
View information about the backend health, capacity, and performance (IOPS throughput and/or latency).

With a connection to Cloud Insights, you can see the volumes that the Kubernetes apps are using, which are stored on a selected storage backend.

Steps

1. In the left navigation area, select **Backends**.
2. Select the storage backend.

If you connected to NetApp Cloud Insights, excerpts of data from Cloud Insights appear on the Backends page.



3. To go directly to Cloud Insights, select the **Cloud Insights** icon next to the metrics image.

Unmanage a storage backend

You can unmanage the backend.

Steps

1. From left navigation, select **Backends**.
2. Select the storage backend.
3. From the Actions menu, select **Unmanage**.
4. Type "unmanage" to confirm the removal.
5. Select **Yes, remove storage backend**.

Find more information

- Use the Astra Control API

Monitor and protect infrastructure

You can configure several optional settings to enhance your Astra Control Center experience. If the network where you're running Astra Control Center requires a proxy for connecting to the Internet (to upload support bundles to NetApp Support Site or establish a connection to Cloud Insights), you should configure a proxy server in Astra Control Center. To monitor and gain insight into your complete infrastructure, create a

connection to NetApp Cloud Insights. To collect Kubernetes events from systems monitored by Astra Control Center, add a Fluentd connection.

Add a proxy server

If the network where you're running Astra Control Center requires a proxy for connecting to the Internet (to upload support bundles to NetApp Support Site or establish a connection to Cloud Insights), you should configure a proxy server in Astra Control Center.

Astra Control Center does not validate the details you enter for your proxy server. Ensure that you enter the correct values.

Steps

1. Log in to Astra Control Center using an account with **admin**/**owner** privilege.
2. Select **Account** > **Connections**.
3. Select **Connect** from the drop-down list to add a proxy server.

4. Enter the proxy server name or IP address and the proxy port number.
5. If your proxy server requires authentication, select the checkbox, and enter the username and password.
6. Select **Connect**.

Result

If the proxy information you entered was saved, the **HTTP Proxy** section of the **Account** > **Connections** page indicates that it is connected, and displays the server name.

Edit proxy server settings

You can edit the proxy server settings.

Steps

1. Log in to Astra Control Center using an account with **admin**/**owner** privilege.
2. Select **Account** > **Connections**.

3. Select **Edit** from the drop-down list to edit the connection.
4. Edit the server details and authentication information.
5. Select **Save**.

Disable proxy server connection

You can disable the proxy server connection. You will be warned before you disable that potential disruption to other connections might occur.

Steps

1. Log in to Astra Control Center using an account with **admin**/**owner** privilege.
2. Select **Account** > **Connections**.
3. Select **Disconnect** from the drop-down list to disable the connection.
4. In the dialog box that opens, confirm the operation.

Connect to Cloud Insights

To monitor and gain insight into your complete infrastructure, connect NetApp Cloud Insights with your Astra Control Center instance. Cloud Insights is included in your Astra Control Center license.

Cloud Insights should be accessible from the network that Astra Control Center uses, or indirectly via a proxy server.

When Astra Control Center is connected to Cloud Insights, an Acquisition Unit pod gets created. This pod collects data from the storage backends that are managed by Astra Control Center and pushes it to Cloud Insights. This pod requires 8 GB RAM and 2 CPU cores.

After you enable the Cloud Insights connection, you can view throughput information on the **Backends** page as well as connect to Cloud Insights from here after selecting a storage backend. You can also find the information on the **Dashboard** in the Cluster section, and also connect to Cloud Insights from there.

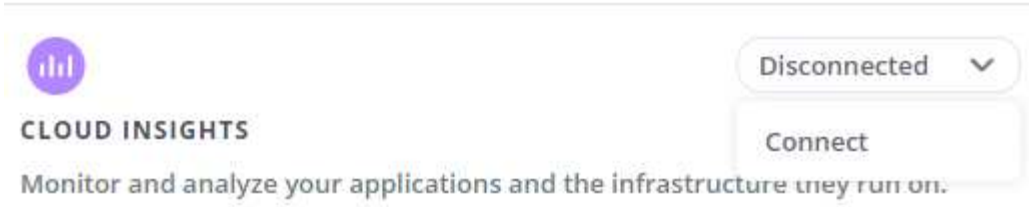
What you'll need

- An Astra Control Center account with **admin**/**owner** privileges.
- A valid Astra Control Center license.
- A proxy server if the network where you're running Astra Control Center requires a proxy for connecting to the Internet.

If you are new to Cloud Insights, familiarize yourself with the features and capabilities. See Cloud Insights documentation.

Steps

1. Log in to Astra Control Center using an account with **admin**/**owner** privilege.
2. Select **Account** > **Connections**.
3. Select **Connect** where it shows **Disconnected** in the drop-down list to add the connection.



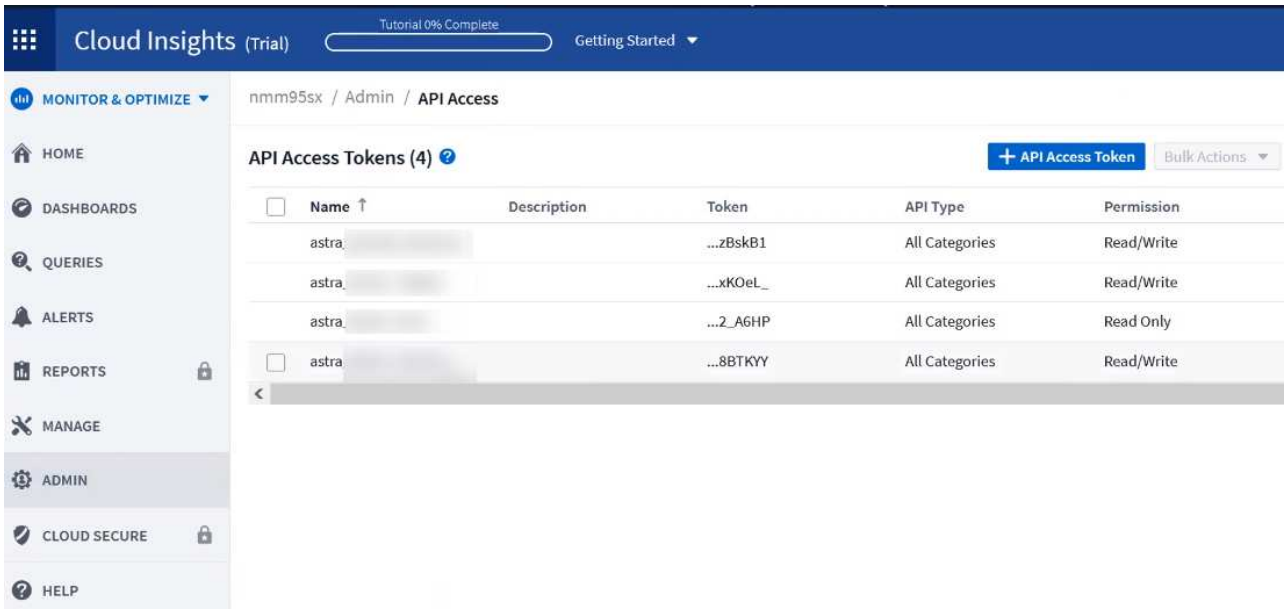
4. Enter the Cloud Insights API tokens and the tenant URL. The tenant URL has the following format, as an example:

```
https://<environment-name>.c01.cloudinsights.netapp.com/
```

You get the tenant URL when you get the Cloud Insights license. If you do not have the tenant URL, see the Cloud Insights documentation.

a. To get the API token, log in to your Cloud Insights tenant URL.

b. In Cloud Insights, generate both a **Read/Write** and a **Read only** API Access token by clicking **Admin** > **API Access**.



c. Copy the **Read only** key. You will need to paste it into the Astra Control Center window for enabling the Cloud Insights connection. For the Read API Access Token key permissions, select: Assets, Alerts, Acquisition Unit, and Data Collection.

d. Copy the **Read/Write** key. You will need to paste it into the Astra Control Center **Connect Cloud Insights** window. For the Read/Write API Access Token key permissions, select: Assets, Data Ingestion, Log Ingestion, Acquisition Unit, and Data Collection.

> We recommend that you generate a **Read only** key and a **Read/Write** key, and not use the same key for both purposes. By default, the token expiry period is set to one year. We recommend that you keep the default selection to give the token the maximum duration before it expires. If your token expires, the telemetry will stop.

e. Paste the keys that you copied from Cloud Insights into Astra Control Center.

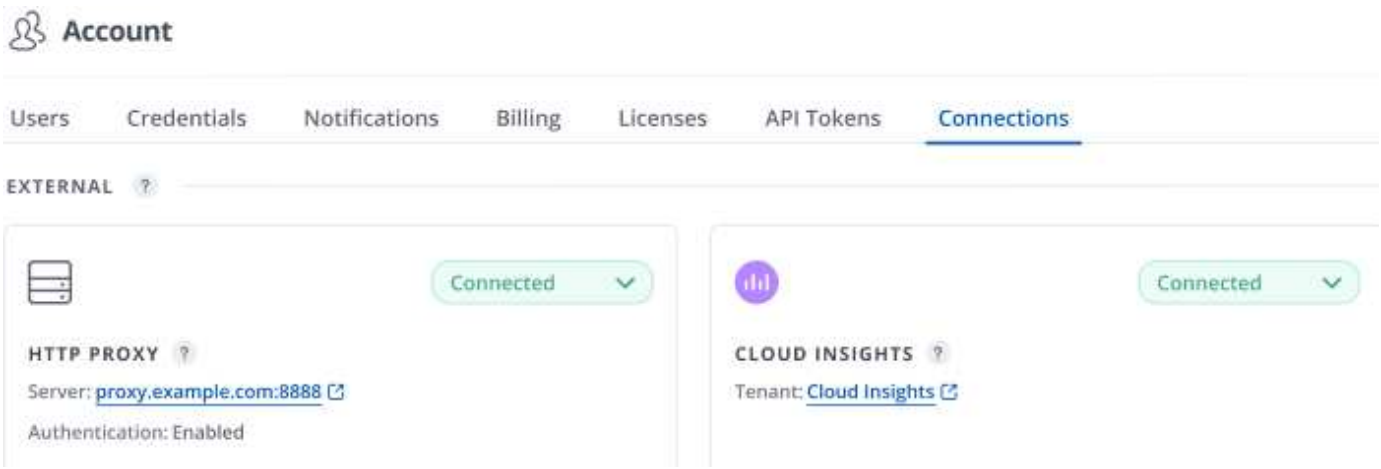
5. Select **Connect**.

After you select **Connect,** the status of the connection changes to **Pending** in the **Cloud Insights** section of the **Account** > **Connections** page. It can a few minutes for the connection to be enabled and the status to change to **Connected**.

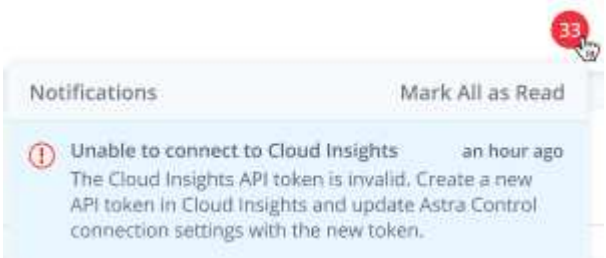
To go back and forth easily between the Astra Control Center and Cloud Insights UIs, ensure that you are logged into both.

View data in Cloud Insights

If the connection was successful, the **Cloud Insights** section of the **Account** > **Connections** page indicates that it is connected, and displays the tenant URL. You can visit Cloud Insights to see data being successfully received and displayed.

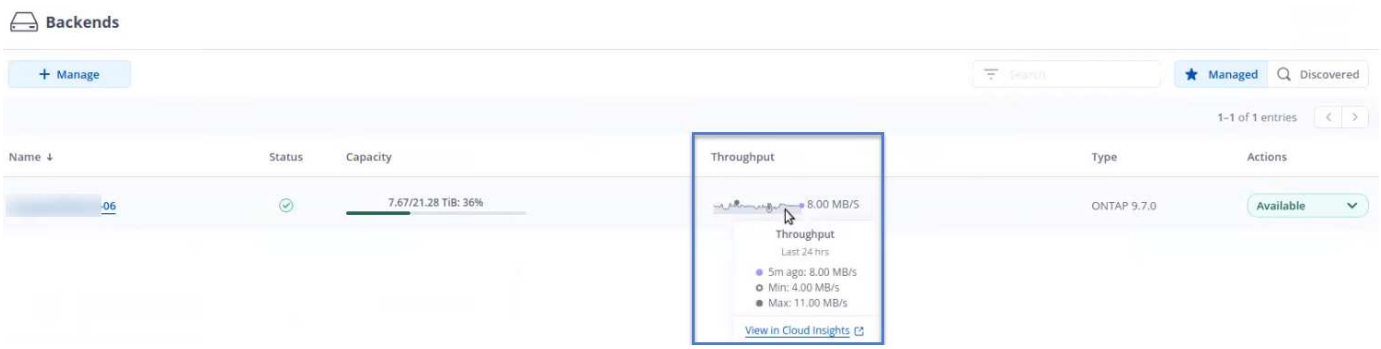


If the connection failed for some reason, the status shows **Failed**. You can find the reason for failure under **Notifications** at the top-right side of the UI.



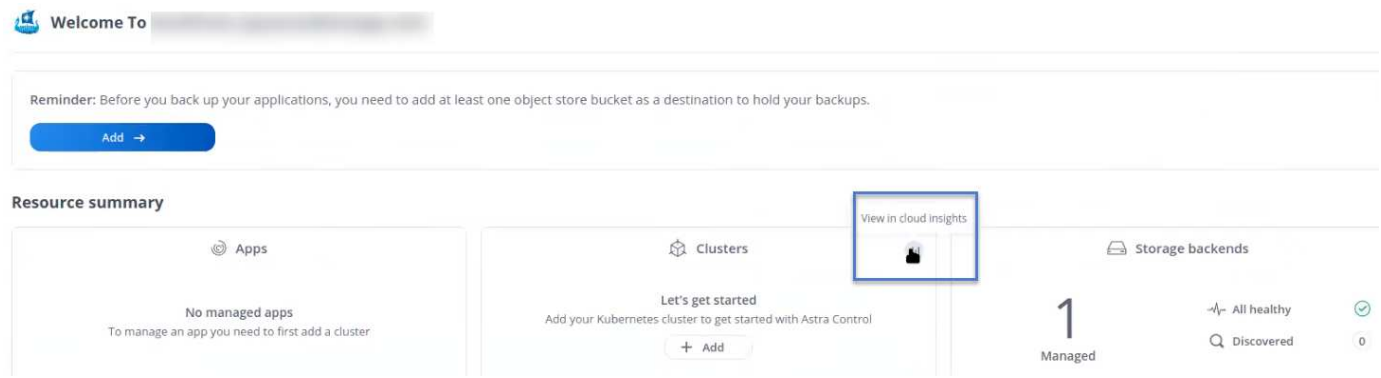
You can also find the same information under **Account** > **Notifications**.

From Astra Control Center, you can view throughput information on the **Backends** page as well as connect to Cloud Insights from here after selecting a storage backend.



To go directly to Cloud Insights, select the **Cloud Insights** icon next to the metrics image.

You can also find the information on the **Dashboard**.



> After enabling the Cloud Insights connection, if you remove the backends that you added in Astra Control Center, the backends stop reporting to Cloud Insights.

Edit Cloud Insights connection

You can edit the Cloud Insights connection.

> You can only edit the API keys. To change the Cloud Insights tenant URL, we recommended that you disconnect the Cloud Insights connection, and connect with the new URL.

Steps

1. Log in to Astra Control Center using an account with **admin**/**owner** privilege.
2. Select **Account** > **Connections**.
3. Select **Edit** from the drop-down list to edit the connection.
4. Edit the Cloud Insights connection settings.
5. Select **Save**.

Disable Cloud Insights connection

You can disable the Cloud Insights connection for a Kubernetes cluster managed by Astra Control Center. Disabling the Cloud Insights connection does not delete the telemetry data already uploaded to Cloud Insights.

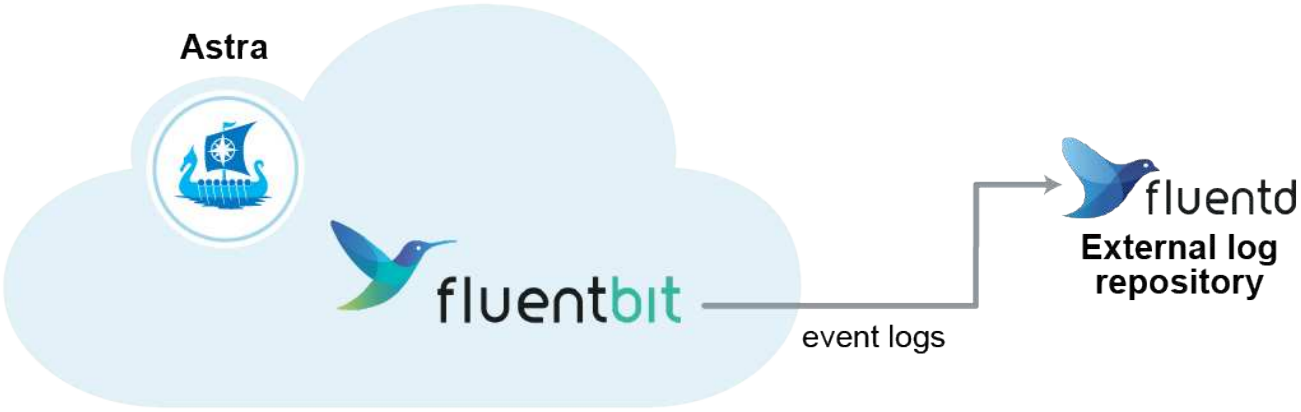
Steps

1. Log in to Astra Control Center using an account with **admin**/**owner** privilege.

2. Select **Account** > **Connections**.
3. Select **Disconnect** from the drop-down list to disable the connection.
4. In the dialog box that opens, confirm the operation.
   After you confirm the operation, on the **Account** > **Connections** page, the Cloud Insights status changes to **Pending**. It take a few minutes for the status to change to **Disconnected**.

Connect to Fluentd

You can send logs (Kubernetes events) from Astra Control Center to your Fluentd endpoint. The Fluentd connection is disabled by default.



Only the event logs from managed clusters are forwarded to Fluentd.

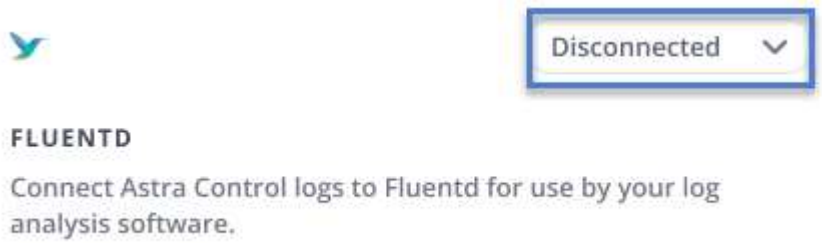
What you'll need

- An Astra Control Center account with **admin**/**owner** privileges.
- Astra Control Center installed and running on a Kubernetes cluster.

Astra Control Center does not validate the details you enter for your Fluentd server. Ensure that you enter the correct values.

Steps

1. Log in to Astra Control Center using an account with **admin**/**owner** privilege.
2. Select **Account** > **Connections**.
3. Select **Connect** from the drop-down list where it shows **Disconnected** to add the connection.



4. Enter the host IP address, the port number, and shared key for your Fluentd server.

5. Select **Connect**.

Result

If the details you entered for your Fluentd server were saved, the **Fluentd** section of the **Account** > **Connections** page indicates that it is connected. Now you can visit the Fluentd server that you connected and view the event logs.

If the connection failed for some reason, the status shows **Failed**. You can find the reason for failure under **Notifications** at the top-right side of the UI.

You can also find the same information under **Account** > **Notifications**.

> If you are having trouble with log collection, you should log in to your worker node and ensure that your logs are available in `/var/log/containers/`.

Edit the Fluentd connection

You can edit the Fluentd connection to your Astra Control Center instance.

Steps

1. Log in to Astra Control Center using an account with **admin**/**owner** privilege.
2. Select **Account** > **Connections**.
3. Select **Edit** from the drop-down list to edit the connection.
4. Change the Fluentd endpoint settings.
5. Select **Save**.

Disable the Fluentd connection

You can disable the Fluentd connection to your Astra Control Center instance.

Steps

1. Log in to Astra Control Center using an account with **admin**/**owner** privilege.
2. Select **Account** > **Connections**.
3. Select **Disconnect** from the drop-down list to disable the connection.
4. In the dialog box that opens, confirm the operation.

Update an existing license

You can convert an evaluation license to a full license, or you can update an existing evaluation or full license with a new license. If you don't have a full license, work with your NetApp sales contact to obtain a full license and serial number. You can use the Astra UI or the Astra Control API to update an existing license.

Steps

1. Log in to the NetApp Support Site.
2. Access the Astra Control Center Download page, enter the serial number, and download the full NetApp license file (NLF).
3. Log in to the Astra Control Center UI.

4. From the left navigation, select **Account** > **License**.
5. In the **Account** > **License** page, select the status drop-down menu for the existing license and select **Replace**.
6. Browse to the license file that you downloaded.
7. Select **Add**.

The **Account** > **Licenses** page displays the license information, expiration date, license serial number, account ID, and CPU units used.

Unmanage apps and clusters

Remove any apps or clusters that you no longer want to manage from Astra Control Center.

Unmanage an app

Stop managing apps that you no longer want to back up, snapshot, or clone from Astra Control Center.

- Any existing backups and snapshots will be deleted.
- Applications and data remain available.

Steps

1. From the left navigation bar, select **Applications**.
2. Select the checkbox for the apps that you no longer want to manage.
3. From the **Action** menu, select **Unmanage**.
4. Type "unmanage" to confirm.
5. Confirm that you want to unmanage the apps and then select **Yes, unmanage Application**.

Result

Astra Control Center stops managing the app.

Unmanage a cluster

Unmanage the cluster that you no longer want to manage from Astra Control Center.

- This action stops your cluster from being managed by Astra Control Center. It doesn't make any changes to the cluster's configuration and it doesn't delete the cluster.
- Trident won't be uninstalled from the cluster. Learn how to uninstall Trident.

Before you unmanage the cluster, you should unmanage the apps associated with the cluster.

Steps

1. From the left navigation bar, select **Clusters**.
2. Select the checkbox for the cluster that you no longer want to manage in Astra Control Center.
3. From the **Actions** menu, select **Unmanage**.
4. Confirm that you want to unmanage the cluster and then select **Yes, unmanage cluster**.

Result

The status of the cluster changes to **Removing** and after that the cluster will be removed from the **Clusters** page, and it is no longer managed by Astra Control Center.

> **If Astra Control Center and Cloud Insights are not connected**, unmanaging the cluster removes all the resources that were installed for sending telemetry data. **If Astra Control Center and Cloud Insights are connected**, unmanaging the cluster deletes only the `fluentbit` and `event-exporter` pods.

Upgrade Astra Control Center

To upgrade Astra Control Center, download the installation bundle from the NetApp Support Site and complete these instructions to upgrade the Astra Control Center components in your environment. You can use this procedure to upgrade Astra Control Center in internet-connected or air-gapped environments.

What you'll need

- Before you begin upgrade, ensure your environment still meets the minimum requirements for Astra Control Center deployment.
- Ensure all cluster operators are in a healthy state and available.

  OpenShift example:

  ```
  oc get clusteroperators
  ```

- Ensure all API services are in a healthy state and available.

  OpenShift example:

  ```
  oc get apiservices
  ```

- Log out of your Astra Control Center.

About this task

The Astra Control Center upgrade process guides you through the following high-level steps:

- Download the Astra Control Center bundle
- Unpack the bundle and change directory
- Add the images to your local registry
- Install the updated Astra Control Center operator
- Upgrade Astra Control Center
- Upgrade third-party services
- Verify system status

> Do not execute the following command during the entirety of the upgrade process to avoid deleting all Astra Control Center pods: `kubectl delete -f astra_control_center_operator_deploy.yaml`

Perform upgrades in a maintenance window when schedules, backups, and snapshots are not running.

Podman commands can be used in place of Docker commands if you are using Red Hat's Podman instead of Docker Engine.

Download the Astra Control Center bundle

1. Download the Astra Control Center upgrade bundle (`astra-control-center-[version].tar.gz`) from the NetApp Support Site.
2. (Optional) Use the following command to verify the signature of the bundle:

```
openssl dgst -sha256 -verify astra-control-center[version].pub
-signature <astra-control-center[version].sig astra-control-
center[version].tar.gz
```

Unpack the bundle and change directory

1. Extract the images:

```
tar -vxzf astra-control-center-[version].tar.gz
```

2. Change to the Astra directory.

```
cd astra-control-center-[version]
```

Add the images to your local registry

1. Add the files in the Astra Control Center image directory to your local registry.

   See a sample script for the automatic loading of images below.

   a. Log in to your Docker registry:

   ```
   docker login [your_registry_path]
   ```

   b. Load the images into Docker.

   c. Tag the images.

   d. Push the images to your local registry.

```
export REGISTRY=[your_registry_path]
for astraImageFile in $(ls images/*.tar)
  # Load to local cache. And store the name of the loaded image
trimming the 'Loaded images: '
  do astraImage=$(docker load --input ${astraImageFile} | sed
's/Loaded image: //')
  astraImage=$(echo ${astraImage} | sed 's!localhost/!!')
  # Tag with local image repo.
  docker tag ${astraImage} ${REGISTRY}/${astraImage}
  # Push to the local repo.
  docker push ${REGISTRY}/${astraImage}
done
```

Install the updated Astra Control Center operator

1. Edit the Astra Control Center operator deployment yaml (`astra_control_center_operator_deploy.yaml`) to refer to your local registry and secret.

```
vim astra_control_center_operator_deploy.yaml
```

   a. If you use a registry that requires authentication, replace the default line of `imagePullSecrets: []` with the following:

```
imagePullSecrets:
- name: <name_of_secret_with_creds_to_local_registry>
```

   b. Change `[your_registry_path]` for the `kube-rbac-proxy` image to the registry path where you pushed the images in a previous step.

   c. Change `[your_registry_path]` for the `acc-operator-controller-manager` image to the registry path where you pushed the images in a previous step.

```
apiVersion: apps/v1
kind: Deployment
metadata:
  labels:
    control-plane: controller-manager
  name: acc-operator-controller-manager
  namespace: netapp-acc-operator
spec:
  replicas: 1
  selector:
    matchLabels:
      control-plane: controller-manager
  template:
    metadata:
      labels:
        control-plane: controller-manager
    spec:
      containers:
      - args:
        - --secure-listen-address=0.0.0.0:8443
        - --upstream=http://127.0.0.1:8080/
        - --logtostderr=true
        - --v=10
        image: [your_registry_path]/kube-rbac-proxy:v4.8.0
        name: kube-rbac-proxy
        ports:
        - containerPort: 8443
          name: https
      - args:
        - --health-probe-bind-address=:8081
        - --metrics-bind-address=127.0.0.1:8080
        - --leader-elect
        command:
        - /manager
        env:
        - name: ACCOP_LOG_LEVEL
          value: "2"
        image: [your_registry_path]/acc-operator:[version x.y.z]
        imagePullPolicy: IfNotPresent
      imagePullSecrets: []
```

2. Install the updated Astra Control Center operator:

```
kubectl apply -f astra_control_center_operator_deploy.yaml
```

Sample response:

```
namespace/netapp-acc-operator unchanged
customresourcedefinition.apiextensions.k8s.io/astracontrolcenters.astra.
netapp.io configured
role.rbac.authorization.k8s.io/acc-operator-leader-election-role
unchanged
clusterrole.rbac.authorization.k8s.io/acc-operator-manager-role
configured
clusterrole.rbac.authorization.k8s.io/acc-operator-metrics-reader
unchanged
clusterrole.rbac.authorization.k8s.io/acc-operator-proxy-role unchanged
rolebinding.rbac.authorization.k8s.io/acc-operator-leader-election-
rolebinding unchanged
clusterrolebinding.rbac.authorization.k8s.io/acc-operator-manager-
rolebinding configured
clusterrolebinding.rbac.authorization.k8s.io/acc-operator-proxy-
rolebinding unchanged
configmap/acc-operator-manager-config unchanged
service/acc-operator-controller-manager-metrics-service unchanged
deployment.apps/acc-operator-controller-manager configured
```

Upgrade Astra Control Center

1. Edit the Astra Control Center custom resource (CR) and change the Astra version (`astraVersion` inside of `Spec`) number to the latest:

```
kubectl edit acc -n [netapp-acc or custom namespace]
```

> Changing the Astra version is the only requirement for an Astra Control Center upgrade. Your registry path must match the registry path where you pushed the images in a previous step.

2. Verify that the pods terminate and become available again:

```
watch kubectl get pods -n [netapp-acc or custom namespace]
```

3. Verify that all system components upgraded successfully.

```
kubectl get pods -n [netapp-acc or custom namespace]
```

Each pod should have a status of `Running` and `Age` that is recent. It may take several minutes before the system pods are deployed.

Sample response:

```
NAME                                        READY   STATUS    RESTARTS
AGE
acc-helm-repo-5f75c5f564-bzqmt              1/1     Running   0
11m
activity-6b8f7cccb9-mlrn4                   1/1     Running   0
9m2s
api-token-authentication-6hznt              1/1     Running   0
8m50s
api-token-authentication-qpfgb              1/1     Running   0
8m50s
api-token-authentication-sqnb7              1/1     Running   0
8m50s
asup-5578bbdd57-dxkbp                       1/1     Running   0
9m3s
authentication-56bff4f95d-mspmq             1/1     Running   0
7m31s
bucketservice-6f7968b95d-9rrrl              1/1     Running   0
8m36s
cert-manager-5f6cf4bc4b-82khn               1/1     Running   0
6m19s
cert-manager-cainjector-76cf976458-sdrbc    1/1     Running   0
6m19s
cert-manager-webhook-5b7896bfd8-2n45j       1/1     Running   0
6m19s
cloud-extension-749d9f684c-8bdhq            1/1     Running   0
9m6s
cloud-insights-service-7d58687d9-h5tzw      1/1     Running   2
8m56s
composite-compute-968c79cb5-nv7l4           1/1     Running   0
9m11s
composite-volume-7687569985-jg9gg           1/1     Running   0
8m33s
credentials-5c9b75f4d6-nx9cz                1/1     Running   0
8m42s
entitlement-6c96fd8b78-zt7f8                1/1     Running   0
8m28s
features-5f7bfc9f68-gsjnl                   1/1     Running   0
8m57s
fluent-bit-ds-h88p7                         1/1     Running   0
7m22s
fluent-bit-ds-krhnj                         1/1     Running   0
7m23s
fluent-bit-ds-l5bjj                         1/1     Running   0
7m22s
```

```
fluent-bit-ds-lrclb                          1/1     Running   0
7m23s
fluent-bit-ds-s5t4n                          1/1     Running   0
7m23s
fluent-bit-ds-zpr6v                          1/1     Running   0
7m22s
graphql-server-5f5976f4bd-vbb4z              1/1     Running   0
7m13s
identity-56f78b8f9f-8h9p9                    1/1     Running   0
8m29s
influxdb2-0                                  1/1     Running   0
11m
krakend-6f8d995b4d-5khkl                     1/1     Running   0
7m7s
license-5b5db87c97-jmxzc                     1/1     Running   0
9m
login-ui-57b57c74b8-6xtv7                    1/1     Running   0
7m10s
loki-0                                       1/1     Running   0
11m
monitoring-operator-9dbc9c76d-8znck          2/2     Running   0
7m33s
nats-0                                       1/1     Running   0
11m
nats-1                                       1/1     Running   0
10m
nats-2                                       1/1     Running   0
10m
nautilus-6b9d88bc86-h8kfb                    1/1     Running   0
8m6s
nautilus-6b9d88bc86-vn68r                    1/1     Running   0
8m35s
openapi-b87d77dd8-5dz9h                      1/1     Running   0
9m7s
polaris-consul-consul-5ljfb                  1/1     Running   0
11m
polaris-consul-consul-s5d5z                  1/1     Running   0
11m
polaris-consul-consul-server-0               1/1     Running   0
11m
polaris-consul-consul-server-1               1/1     Running   0
11m
polaris-consul-consul-server-2               1/1     Running   0
11m
polaris-consul-consul-twmpq                  1/1     Running   0
11m
```

```
polaris-mongodb-0                          2/2     Running   0
11m
polaris-mongodb-1                          2/2     Running   0
10m
polaris-mongodb-2                          2/2     Running   0
10m
polaris-ui-84dc87847f-zrg8w                1/1     Running   0
7m12s
polaris-vault-0                            1/1     Running   0
11m
polaris-vault-1                            1/1     Running   0
11m
polaris-vault-2                            1/1     Running   0
11m
public-metrics-657698b66f-67pgt            1/1     Running   0
8m47s
storage-backend-metrics-6848b9fd87-w7x8r   1/1     Running   0
8m39s
storage-provider-5ff5868cd5-r9hj7          1/1     Running   0
8m45s
telegraf-ds-dw4hg                          1/1     Running   0
7m23s
telegraf-ds-k92gn                          1/1     Running   0
7m23s
telegraf-ds-mmxjl                          1/1     Running   0
7m23s
telegraf-ds-nhs8s                          1/1     Running   0
7m23s
telegraf-ds-rj7lw                          1/1     Running   0
7m23s
telegraf-ds-tqrkb                          1/1     Running   0
7m23s
telegraf-rs-9mwgj                          1/1     Running   0
7m23s
telemetry-service-56c49d689b-ffrzx         1/1     Running   0
8m42s
tenancy-767c77fb9d-g9ctv                   1/1     Running   0
8m52s
traefik-5857d87f85-7pmx8                   1/1     Running   0
6m49s
traefik-5857d87f85-cpxgv                   1/1     Running   0
5m34s
traefik-5857d87f85-lvmlb                   1/1     Running   0
4m33s
traefik-5857d87f85-t2xlk                   1/1     Running   0
4m33s
```

```
traefik-5857d87f85-v9wpf                  1/1     Running   0
7m3s
trident-svc-595f84dd78-zb8l6              1/1     Running   0
8m54s
vault-controller-86c94fbf4f-krttq         1/1     Running   0
9m24s
```

4. Verify that the Astra status conditions indicate that the upgrade is complete and ready:

```
kubectl get -o yaml -n [netapp-acc or custom namespace]
astracontrolcenters.astra.netapp.io astra
```

Response:

```
conditions:
  - lastTransitionTime: "2021-10-25T18:49:26Z"
    message: Astra is deployed
    reason: Complete
    status: "True"
    type: Ready
  - lastTransitionTime: "2021-10-25T18:49:26Z"
    message: Upgrading succeeded.
    reason: Complete
    status: "False"
    type: Upgrading
```

Upgrade third-party services

The third-party services Traefik and Cert-manager are not upgraded during earlier upgrade steps. You can optionally upgrade them using the procedure described here or retain existing service versions if your system requires it. The following is the recommended Traefik and Certs-manager upgrade sequence:

1. Set up acc-helm-repo to upgrade Traefik and Cert-manager
2. Update Traefik service using acc-helm-repo
3. Update the Cert-manager service

Set up acc-helm-repo to upgrade Traefik and Cert-manager

1. Find the `enterprise-helm-repo` that is loaded to your local Docker cache:

```
docker images enterprise-helm-repo
```

Response:

```
REPOSITORY              TAG          IMAGE ID       CREATED         SIZE
enterprise-helm-repo    21.10.218    7a182d6b30f3   20 hours ago    464MB
```

2. Start a container using the tag from the previous step:

```
docker run -dp 8082:8080 enterprise-helm-repo:21.10.218
```

Response:

```
940436e67fa86d2c4559ac4987b96bb35588313c2c9ddc9cec195651963f08d8
```

3. Add the Helm repo to your local host repositories:

```
helm repo add acc-helm-repo http://localhost:8082/
```

Response:

```
"acc-helm-repo" has been added to your repositories
```

4. Save the following Python script as a file, for example, `set_previous_values.py`:

This Python script creates two files that are used in later upgrade steps to retain helm values.

```
#!/usr/bin/env python3
import json
import os

NAMESPACE = "netapp-acc"

os.system(f"helm get values traefik -n {NAMESPACE} -o json >
traefik_values.json")
os.system(f"helm get values cert-manager -n {NAMESPACE} -o json >
cert_manager_values.json")

# reformat traefik values
f = open("traefik_values.json", "r")
traefik_values = {'traefik': json.load(f)}
f.close()

with open('traefik_values.json', 'w') as output_file:
    json.dump(traefik_values, output_file)

# reformat cert-manager values
f = open("cert_manager_values.json", "r")
cm_values = {'cert-manager': json.load(f)}
f.close()

cm_values['global'] = cm_values['cert-manager']['global']
del cm_values['cert-manager']['global']

with open('cert_manager_values.json', 'w') as output_file:
    json.dump(cm_values, output_file)

print('Done')
```

5. Run the script:

```
python3.7 ./set_previous_values.py
```

Update Traefik service using acc-helm-repo

You must already have set up acc-helm-repo before completing the following procedure.

1. Download the Traefik bundle using a secure, file-transfer tool, such as GNU wget:

```
wget http://localhost:8082/traefik-0.2.0.tgz
```

2. Extract the images:

```
tar -vxzf traefik-0.2.0.tgz
```

3. Apply the Traefik CRDs:

```
kubectl apply -f ./traefik/charts/traefik/crds/
```

4. Find the Helm chart version to use with your upgraded Traefik:

```
helm search repo acc-helm-repo/traefik
```

Response:

```
NAME                                    CHART VERSION   APP VERSION
DESCRIPTION
acc-helm-repo/traefik                   0.2.0           2.5.3       Helm
chart for Traefik Ingress controller
acc-helm-repo/traefik-ingressroutes   0.2.0           2.5.3       A Helm
chart for Kubernetes
```

5. Validate the traefik_values.json file for upgrade:
   a. Open the traefik_values.json file.
   b. Check if there is a value for the `imagePullSecret` field. If it is empty, remove the following text from the file:

```
"imagePullSecrets": [{"name": ""}],
```

   c. Ensure that the traefik image is directed to the correct location and has the correct name:

```
image: [your_registry_path]/traefik
```

6. Upgrade your Traefik configuration:

```
helm upgrade --version 0.2.0 --namespace netapp-acc -f
traefik_values.json traefik acc-helm-repo/traefik
```

Response:

```
Release "traefik" has been upgraded. Happy Helming!
NAME: traefik
LAST DEPLOYED: Mon Oct 25 22:53:19 2021
NAMESPACE: netapp-acc
STATUS: deployed
REVISION: 2
TEST SUITE: None
```

Update the Cert-manager service

You must already have completed the Traefik update and added acc-helm-repo in Helm before completing the following procedure.

1. Find the helm chart version to use with your upgraded Cert-manager:

```
helm search repo acc-helm-repo/cert-manager
```

Response:

```
NAME CHART VERSION APP VERSION DESCRIPTION
acc-helm-repo/cert-manager 0.3.0 v1.5.4 A Helm chart for cert-manager
acc-helm-repo/cert-manager-certificates 0.1.0 1.16.0 A Helm chart for
Kubernetes
```

2. Validate the cert_manager_values.json file for upgrade:
   a. Open the cert_manager_values.json file.
   b. Check if there is a value for the `imagePullSecret` field. If it is empty, remove the following text from the file:

```
"imagePullSecrets": [{"name": ""}],
```

   c. Ensure that the three cert-manager images are directed to the correct location and have the correct names.
3. Upgrade your Cert-manager configuration:

```
helm upgrade --version 0.3.0 --namespace netapp-acc -f
cert_manager_values.json cert-manager acc-helm-repo/cert-manager
```

Response:

```
Release "cert-manager" has been upgraded. Happy Helming!
NAME: cert-manager
LAST DEPLOYED: Tue Nov 23 11:20:05 2021
NAMESPACE: netapp-acc
STATUS: deployed
REVISION: 2
TEST SUITE: None
```

Verify system status

1. Log in to Astra Control Center.
2. Verify that all your managed clusters and apps are still present and protected.

Uninstall Astra Control Center

You might need to remove Astra Control Center components if you are upgrading from a trial to a full version of the product. To remove Astra Control Center and the Astra Control Center Operator, run the commands described in this procedure in sequence.

What you'll need

- Use Astra Control Center UI to unmanage all clusters.

Steps

1. Delete Astra Control Center. The following sample command is based upon a default installation. Modify the command if you made custom configurations.

   ```
   kubectl delete -f astra_control_center_min.yaml -n netapp-acc
   ```

   Result:

   ```
   astracontrolcenter.astra.netapp.io "astra" deleted
   ```

2. Use the following command to delete the `netapp-acc` namespace:

   ```
   kubectl delete ns netapp-acc
   ```

   Result:

   ```
   namespace "netapp-acc" deleted
   ```

3. Use the following command to delete Astra Control Center operator system components:

```
kubectl delete -f astra_control_center_operator_deploy.yaml
```

Result:

```
namespace "netapp-acc-operator" deleted
customresourcedefinition.apiextensions.k8s.io
"astracontrolcenters.astra.netapp.io" deleted
role.rbac.authorization.k8s.io "acc-operator-leader-election-role"
deleted
clusterrole.rbac.authorization.k8s.io "acc-operator-manager-role"
deleted
clusterrole.rbac.authorization.k8s.io "acc-operator-metrics-reader"
deleted
clusterrole.rbac.authorization.k8s.io "acc-operator-proxy-role" deleted
rolebinding.rbac.authorization.k8s.io "acc-operator-leader-election-
rolebinding" deleted
clusterrolebinding.rbac.authorization.k8s.io "acc-operator-manager-
rolebinding" deleted
clusterrolebinding.rbac.authorization.k8s.io "acc-operator-proxy-
rolebinding" deleted
configmap "acc-operator-manager-config" deleted
service "acc-operator-controller-manager-metrics-service" deleted
deployment.apps "acc-operator-controller-manager" deleted
```

Find more information

- Known issues for uninstall

Automate with REST API

Automation using the Astra Control REST API

Astra Control has a REST API that enables you to directly access the Astra Control functionality using a programming language or utility such as Curl. You can also manage Astra Control deployments using Ansible and other automation technologies.

To set up and manage your Kubernetes apps, you can use either the Astra UI or the Astra Control API.

To learn more, go to the Astra automation docs.

Deploy apps

Deploy Jenkins from a Helm chart

Learn how to deploy Jenkins from the Bitnami Helm chart. After you deploy Jenkins on your cluster, you can register the application with Astra Control.

Jenkins is a validated app for Astra Control.

- Learn the difference between a validated app and a standard app in Astra Control Service.
- Learn the difference between a validated app and a standard app in Astra Control Center.

These instructions apply to both Astra Control Service and Astra Control Center.

> Applications deployed from Google Marketplace have not been validated. Some users report issues with discovery and/or backup with Google Marketplace deployments of Postgres, MariaDB, and MySQL.

Requirements

- A cluster that has been added to Astra Control.

> For Astra Control Center, you can add the cluster to Astra Control Center first or add the app first.

- Updated versions of Helm (version 3.2+) and Kubectl installed on a local machine with the proper kubeconfig for the cluster

Astra Control does not currently support the Kubernetes plugin for Jenkins. You can run Jenkins in a Kubernetes cluster without the plugin. The plugin provides scalability to your Jenkins cluster.

Install Jenkins

Two important notes on this process:

- You must deploy your app after the cluster is added to Astra Control Service, not before. Astra Control Center will accept applications before or after the cluster is added to Astra Control Center.
- You must deploy the Helm chart in a namespace other than the default.

Steps

1. Add the Bitnami chart repo:

```
helm repo add bitnami https://charts.bitnami.com/bitnami
```

2. Create the `jenkins` namespace and deploy Jenkins into it with the command:

```
Helm install <name> --namespace <namespace> --create-namespace --set
persistence.storageClass=<storage_class>
```

If the volume size is changed, use Kibibyte (Ki), Mebibyte (Mi) or Gibibyte (Gi) units.

You need to define the storage class only in these situations:

- You are using Astra Control Service and you don't want to use the default storage class.
- You are using Astra Control Center and haven't yet imported the cluster into Astra Control Center. Or, you have imported the cluster, but don't want to use the default storage class.

Result

This does the following:

- Creates a namespace.
- Sets the correct storage class.

After the pods are online, you can manage the app with Astra Control. Astra Control enables you to manage an app at the namespace level or by using a helm label.

Deploy MariaDB from a Helm chart

Learn how to deploy MariaDB from the Bitnami Helm chart. After you deploy MariaDB on your cluster, you can manage the application with Astra Control.

MariaDB is a validated app for Astra.

- Learn the difference between a validated app and a standard app in Astra Control Service.
- Learn the difference between a validated app and a standard app in Astra Control Center.

These instructions apply to both Astra Control Service and Astra Control Center.

Applications deployed from Google Marketplace have not been validated. Some users report issues with discovery and/or backup with Google Marketplace deployments of Postgres, MariaDB, and MySQL.

Requirements

- A cluster that has been added to Astra Control.

For Astra Control Center, you can add the cluster to Astra Control Center first or add the app first.

- Updated versions of Helm (version 3.2+) and Kubectl installed on a local machine with the proper kubeconfig for the cluster

Install MariaDB

Two important notes on this process:

- You must deploy your app after the cluster is added to Astra Control Service, not before. Astra Control Center will accept applications before or after the cluster is added to Astra Control Center.
- You must deploy the Helm chart in a namespace other than the default.

Steps

1. Add the Bitnami chart repo:

```
helm repo add bitnami https://charts.bitnami.com/bitnami
```

2. Deploy MariaDB with the command:

```
Helm install <name> --namespace <namespace> --create-namespace --set
persistence.storageClass=<storage_class>
```

   If the volume size is changed, use Kibibyte (Ki), Mebibyte (Mi) or Gibibyte (Gi) units.

   You need to define the storage class only in these situations:

   - You are using Astra Control Service and you don't want to use the default storage class.
   - You are using Astra Control Center and haven't yet imported the cluster into Astra Control Center. Or, you have imported the cluster, but don't want to use the default storage class.

Result

This does the following:

- Creates a namespace.
- Deploys MariaDB on the namespace.
- Creates a database.

This method of setting the password at deployment is insecure. We do not recommend this for a production environment.

After the pods are online, you can manage the app with Astra Control. Astra Control enables you to manage an app at the namespace level or by using a helm label.

Deploy MySQL from a Helm chart

Learn how to deploy MySQL from the Bitnami Helm chart. After you deploy MySQL on your Kubernetes cluster, you can manage the application with Astra Control.

MySQL is a validated app for Astra Control.

- Learn the difference between a validated app and a standard app in Astra Control Service.

- Learn the difference between a validated app and a standard app in Astra Control Center.

These instructions apply to both Astra Control Service and Astra Control Center.

> Applications deployed from Google Marketplace have not been validated. Some users report issues with discovery and/or backup with Google Marketplace deployments of Postgres, MariaDB, and MySQL.

Requirements

- A cluster that has been added to Astra Control.

> For Astra Control Center, you can add the cluster to Astra Control Center first or add the app first.

- Updated versions of Helm (version 3.2+) and Kubectl installed on a local machine with the proper kubeconfig for the cluster

Install MySQL

Two important notes on this process:

- You must deploy your app after the cluster is added to Astra Control Service, not before. Astra Control Center will accept applications before or after the cluster is added to Astra Control Center.
- We recommend that you deploy the Helm chart in a namespace other than the default.

Steps

1. Add the Bitnami chart repo:

```
helm repo add bitnami https://charts.bitnami.com/bitnami
```

2. Deploy MySQL with the command:

```
Helm install <name> --namespace <namespace> --create-namespace --set
persistence.storageClass=<storage_class>
```

> If the volume size is changed, use Kibibyte (Ki), Mebibyte (Mi) or Gibibyte (Gi) units.

You need to define the storage class only in these situations:

- You are using Astra Control Service and you don’t want to use the default storage class.
- You are using Astra Control Center and haven’t yet imported the cluster into Astra Control Center. Or, you have imported the cluster, but don’t want to use the default storage class.

Result

This does the following:

- Creates a namespace.
- Deploys MySQL on the namespace.

After the pods are online, you can manage the app with Astra Control. Astra Control allows you to manage an app with its name, at the namespace level, or by using a helm label.

Deploy Postgres from a Helm chart

Learn how to deploy Postgres from the Bitnami Helm chart. After you deploy Postgres on your cluster, you can register the application with Astra Control.

Postgres is a validated app for Astra.

- Learn the difference between a validated app and a standard app in Astra Control Service.
- Learn the difference between a validated app and a standard app in Astra Control Center.

These instructions apply to both Astra Control Service and Astra Control Center.

> Applications deployed from Google Marketplace have not been validated. Some users report issues with discovery and/or backup with Google Marketplace deployments of Postgres, MariaDB, and MySQL.

Requirements

- A cluster that has been added to Astra Control.

  > For Astra Control Center, you can add the cluster to Astra Control Center first or add the app first.

- Updated versions of Helm (version 3.2+) and Kubectl installed on a local machine with the proper kubeconfig for the cluster

Install Postgres

Two important notes on this process:

- You must deploy your app after the cluster is added to Astra Control Service, not before. Astra Control Center will accept applications before or after the cluster is added to Astra Control Center.
- You must deploy the Helm chart in a namespace other than the default.

Steps

1. Add the Bitnami chart repo:

   ```
   helm repo add bitnami https://charts.bitnami.com/bitnami
   ```

2. Deploy Postgres with the command:

```
Helm install <name> --namespace <namespace> --create-namespace --set
persistence.storageClass=<storage_class>
```

If the volume size is changed, use Kibibyte (Ki), Mebibyte (Mi) or Gibibyte (Gi) units.

You need to define the storage class only in these situations:

- You are using Astra Control Service and you don’t want to use the default storage class.
- You are using Astra Control Center and haven’t yet imported the cluster into Astra Control Center. Or, you have imported the cluster, but don’t want to use the default storage class.

Result

This does the following:

- Creates a namespace.
- Deploys Postgres on the namespace.

After the pods are online, you can manage the app with Astra Control. Astra Control enables you to manage an app at the namespace level or by using a helm label.

Knowledge and support

Troubleshooting

Learn how to work around some common problems you might encounter.

https://kb.netapp.com/Advice_and_Troubleshooting/Cloud_Services/Astra

Find more information

- How to upload a file to NetApp (login required)
- How to manually upload a file to NetApp (login required)

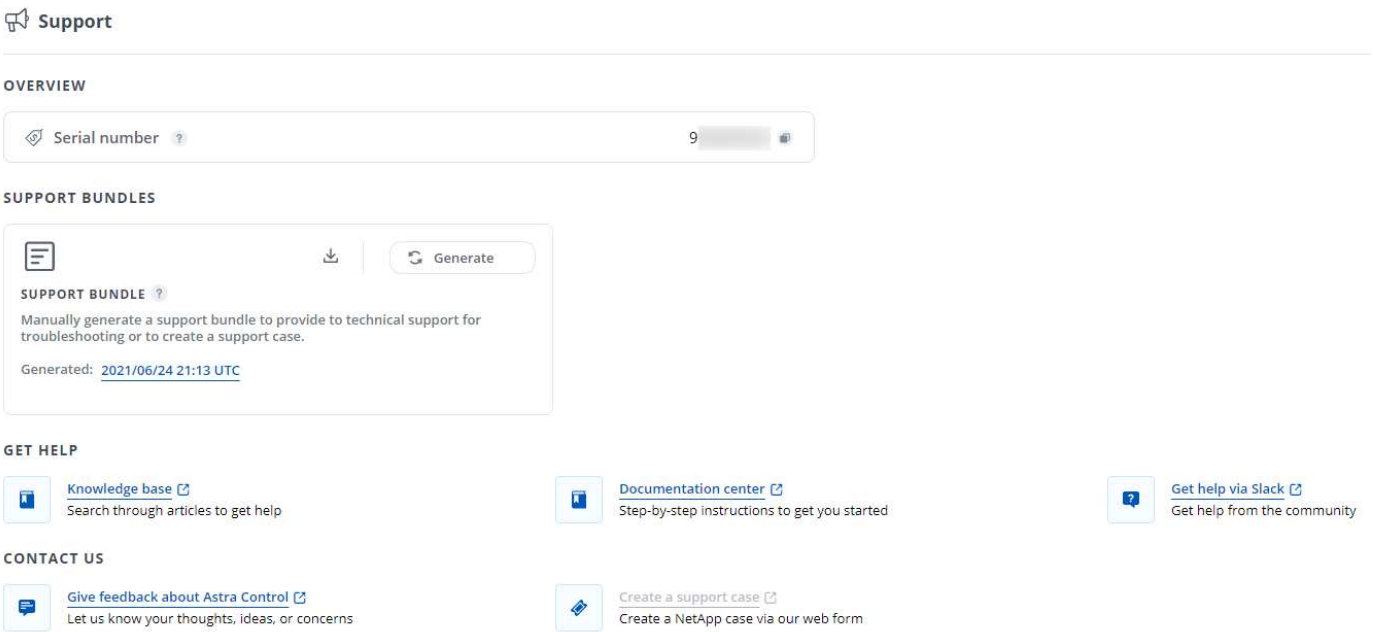
Get help

NetApp provides support for Astra Control in a variety of ways. Extensive free self-support options are available 24x7, such as knowledgebase (KB) articles and a Slack channel. Your Astra Control account includes remote technical support via web ticketing.

If you have an evaluation license for Astra Control Center, you can get technical support. However, case creation via NetApp Support Site (NSS) is not available. You can get in touch with Support via the feedback option or use the Slack channel for self service.

You must first activate support for your NetApp serial number in order to use these non self-service support options. A NetApp Support Site (NSS) SSO account is required for chat and web ticketing along with case management.

You can access support options from the Astra Control Center UI by selecting the **Support** tab from the main menu.



Self-support options

These options are available for free 24x7:

- Knowledge base (login required)

  Search for articles, FAQs, or Break Fix information related to Astra Control.

- Documentation

  This is the doc site that you're currently viewing.

- Slack

  Go to the containers channel in thePub workspace to connect with peers and experts.

- Generate support bundles to provide to NetApp Support for troubleshooting
- Feedback email

  Send an email to astra.feedback@netapp.com to let us know your thoughts, ideas, or concerns.

Enable daily scheduled support bundle upload to NetApp Support

During Astra Control Center installation, if you specify `enrolled: true` for `autoSupport` in the Astra Control Center Custom Resource Definition (CRD) file (`astra_control_center_min.yaml`), daily support bundles are automatically uploaded to the NetApp Support Site.

Generate support bundle to provide to NetApp Support

Astra Control Center enables the admin user to generate bundles, which include information useful to NetApp Support, including logs, events for all the components of the Astra deployment, metrics, and topology information about the clusters and apps under management. If you are connected to the Internet, you can upload support bundles to NetApp Support Site (NSS) directly from the Astra Control Center UI.

> The time taken by Astra Control Center to generate the bundle depends on the size of your Astra Control Center installation as well as the parameters of the requested support bundle. The time duration that you specified when requesting a support bundle dictates the time it takes for the bundle to be generated (for example, a shorter time period results in faster bundle generation).

Before you begin, determine whether a proxy connection will be required to upload bundles to NSS. If a proxy connection is needed, verify that Astra Control Center has been configured to use a proxy server.

1. Select **Accounts** > **Connections**.
2. Check the proxy settings in **Connection settings**.

Steps

1. Create a case on the NSS portal using the license serial number listed on the **Support** page of the Astra Control Center UI.
2. Perform the following steps for generating the support bundle by using the Astra Control Center UI:
   a. On the **Support** page, in the Support bundle tile, select **Generate**.

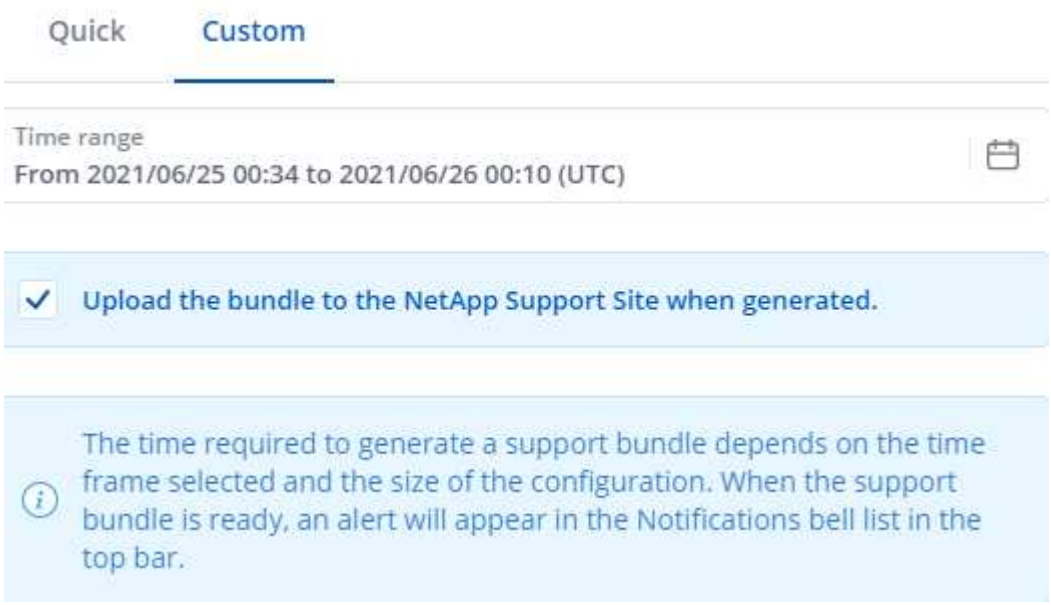
b. In the **Generate a Support Bundle** window, select the timeframe.

   You can choose between quick or custom timeframes.

   > You can choose a custom date range as well as specify a custom time period during the date range.

c. After you make the selections, select **Confirm**.

d. Check the **Upload the bundle to the NetApp Support Site when generated**.



e. Select **Generate Bundle**.

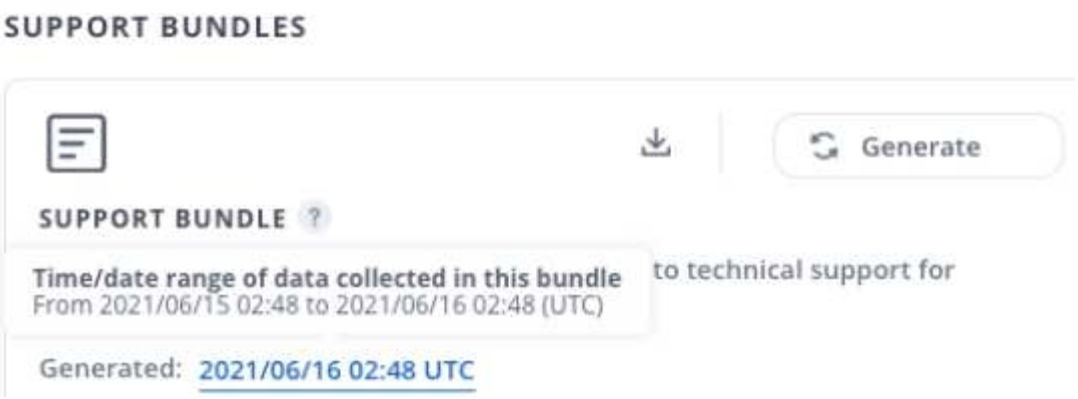
   When the support bundle is ready, a notification appears on the **Accounts** > **Notification** page in the Alerts area, on the **Activity** page, and also in the notifications list (accessible by selecting the icon in the top-right side of the UI).

   If the generation failed, an icon appears on the Generate Bundle page. Select the icon to see the message.

> The notifications icon at the top-right side of the UI provides information about events related to the support bundle, such as when the bundle is successfully created, when the bundle creation fails, when the bundle could not be uploaded, when the bundle could not be downloaded, and so on.

If you have an air-gapped installation

If you have an air-gapped installation, perform the following steps after the Support bundle is generated. When the bundle is available for download, it appears next to **Generated** in the **Support Bundles** section of the **Support** page as shown:



1. Select the **Download** icon to download the bundle locally.
2. Manually upload the bundle to NSS.

   You can use one of the following methods to do this:

   - Use NetApp Authenticated File Upload (login required).
   - Attach the bundle to the case directly on NSS.
   - Use NetApp AIQ.

Find more information

- How to upload a file to NetApp (login required)
- How to manually upload a file to NetApp (login required)

Earlier versions of Astra Control Center documentation

Documentation for previous releases is available.

- Astra Control Center 21.08 documentation

Legal notices

Legal notices provide access to copyright statements, trademarks, patents, and more.

Copyright

http://www.netapp.com/us/legal/copyright.aspx

Trademarks

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http://www.netapp.com/us/legal/netapptmlist.aspx

Patents

A current list of NetApp owned patents can be found at:

https://www.netapp.com/us/media/patents-page.pdf

Privacy policy

https://www.netapp.com/us/legal/privacypolicy/index.aspx

Open source

Notice files provide information about third-party copyright and licenses used in NetApp software.

- Notice for Astra Control Center
- Notice for Astra Data Store preview

Astra Control API license

https://docs.netapp.com/us-en/astra-automation/media/astra-api-license.pdf