NetApp Astra Control Center Overview

NetApp Solutions

NetApp
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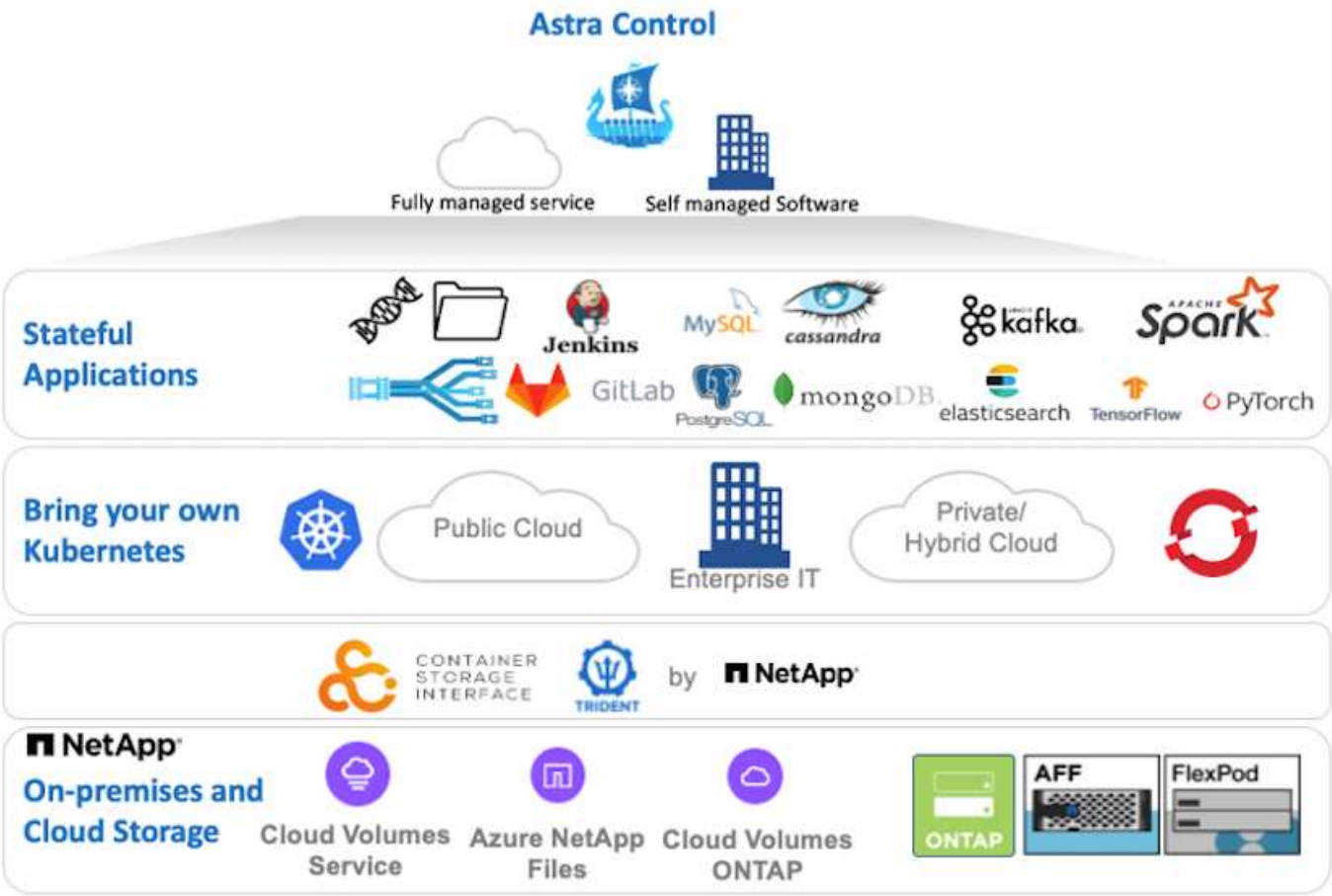
NetApp Astra Control overview

NetApp Astra Control Center offers a rich set of storage and application-aware data management services for stateful Kubernetes workloads, deployed in an on-prem environment, powered by trusted data protection technology from NetApp.

NetApp Astra Control Center offers a rich set of storage and application-aware data management services for stateful Kubernetes workloads deployed in an on-premises environment and powered by NetApp data protection technology.



NetApp Astra Control Center can be installed on a VMware Tanzu cluster that has the Astra Trident storage orchestrator deployed and configured with storage classes and storage backends to NetApp ONTAP storage systems.

For more information on Astra Trident, see this document here.

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 monitoring and telemetry (seven days worth of metrics) is available and exported to Kubernetes native monitoring tools (Prometheus and Grafana) through open metrics endpoints.

Astra Control Center is fully integrated into the NetApp AutoSupport and Active IQ Digital Advisor (also known as Digital Advisor) ecosystem to provide support for users, provide assistance with troubleshooting, and display usage statistics.

In addition to the paid version of Astra Control Center, a 90-day evaluation license is also available. The

evaluation version is supported through email and the community Slack channel. Customers have access to these resources, other knowledge-base articles, and documentation available from the in-product support dashboard.

To understand more about the Astra portfolio, visit the Astra website.

Astra Control Center automation

Astra Control Center has a fully functional REST API for programmatic access. Users can use any programming language or utility to interact with Astra Control REST API endpoints. To learn more about this API, see the documentation here.

If you are looking for a ready-made software development toolkit for interacting with Astra Control REST APIs, NetApp provides a toolkit with the Astra Control Python SDK that you can download here.

If programming is not appropriate for your situation and you would like to use a configuration management tool, you can clone and run the Ansible playbooks that NetApp publishes here.

Astra Control Center installation prerequisites

Astra Control Center installation requires the following prerequisites:

- One or more Tanzu Kubernetes clusters, managed either by a management cluster or TKGS or TKGI. TKG workload clusters 1.4+ and TKGI user clusters 1.12.2+ are supported.
- Astra Trident must already be installed and configured on each of the Tanzu Kubernetes clusters.
- One or more NetApp ONTAP storage systems running ONTAP 9.5 or greater.

> It's a best practice for each Tanzu Kubernetes install at a site to have a dedicated SVM for persistent storage. Multi-site deployments require additional storage systems.

- A Trident storage backend must be configured on each Tanzu Kubernetes cluster with an SVM backed by an ONTAP cluster.
- A default StorageClass configured on each Tanzu Kubernetes cluster with Astra Trident as the storage provisioner.
- A load balancer must be installed and configured on each Tanzu Kubernetes cluster for load balancing and exposing Astra Control Center if you are using ingressType `AccTraefik`.
- An ingress controller must be installed and configured on each Tanzu Kubernetes cluster for exposing Astra Control Center if you are using ingressType `Generic`.
- A private image registry must be configured to host the NetApp Astra Control Center images.
- You must have Cluster Admin access to the Tanzu Kubernetes cluster where Astra Control Center is being installed.
- You must have Admin access to NetApp ONTAP clusters.
- A RHEL or Ubuntu admin workstation.

Install Astra Control Center

This solution describes an automated procedure for installing Astra Control Center using Ansible playbooks. If you are looking for a manual procedure to install Astra Control Center, follow the detailed installation and

operations guide here.

1. To use the Ansible playbooks that deploy Astra Control Center, you must have an Ubuntu/RHEL machine with Ansible installed. Follow the procedures here for Ubuntu and RHEL.
2. Clone the GitHub repository that hosts the Ansible content.

```
git clone https://github.com/NetApp-
Automation/na_astra_control_suite.git
```

3. Log into the NetApp Support Site and download the latest version of NetApp Astra Control Center. To do so requires a license attached to your NetApp account. After you download the tarball, transfer it to the workstation.

   To get started with a trial license for Astra Control, visit the Astra registration site.

4. Create or obtain the kubeconfig file with admin access to the user or workload Tanzu Kubernetes cluster on which Astra Control Center is to be installed.
5. Change the directory to `na_astra_control_suite`.

```
cd na_astra_control_suite
```

6. Edit the `vars/vars.yml` file and fill the variables with the required information.

```
#Define whether or not to push the Astra Control Center images to your
private registry [Allowed values: yes, no]
push_images: yes

#The directory hosting the Astra Control Center installer
installer_directory: /home/admin/

#Specify the ingress type. Allowed values - "AccTraefik" or "Generic"
#"AccTraefik" if you want the installer to create a LoadBalancer type
service to access ACC, requires MetalLB or similar.
#"Generic" if you want to create or configure ingress controller
yourself, installer just creates a ClusterIP service for traefik.
ingress_type: "AccTraefik"

#Name of the Astra Control Center installer (Do not include the
extension, just the name)
astra_tar_ball_name: astra-control-center-22.04.0

#The complete path to the kubeconfig file of the kubernetes/openshift
cluster Astra Control Center needs to be installed to.
hosting_k8s_cluster_kubeconfig_path: /home/admin/cluster-kubeconfig.yml
```

```
#Namespace in which Astra Control Center is to be installed
astra_namespace: netapp-astra-cc

#Astra Control Center Resources Scaler. Leave it blank if you want to
accept the Default setting.
astra_resources_scaler: Default

#Storageclass to be used for Astra Control Center PVCs, it must be
created before running the playbook [Leave it blank if you want the PVCs
to use default storageclass]
astra_trident_storageclass: basic

#Reclaim Policy for Astra Control Center Persistent Volumes [Allowed
values: Retain, Delete]
storageclass_reclaim_policy: Retain

#Private Registry Details
astra_registry_name: "docker.io"

#Whether the private registry requires credentials [Allowed values: yes,
no]
require_reg_creds: yes

#If require_reg_creds is yes, then define the container image registry
credentials
#Usually, the registry namespace and usernames are same for individual
users
astra_registry_namespace: "registry-user"
astra_registry_username: "registry-user"
astra_registry_password: "password"

#Kuberenets/OpenShift secret name for Astra Control Center
#This name will be assigned to the K8s secret created by the playbook
astra_registry_secret_name: "astra-registry-credentials"

#Astra Control Center FQDN
acc_fqdn_address: astra-control-center.cie.netapp.com

#Name of the Astra Control Center instance
acc_account_name: ACC Account Name

#Administrator details for Astra Control Center
admin_email_address: admin@example.com
admin_first_name: Admin
admin_last_name: Admin
```

7. Run the playbook to deploy Astra Control Center. The playbook requires root privileges for certain configurations.

   Run the following command to run the playbook if the user running the playbook is root or has passwordless sudo configured.

   ```
   ansible-playbook install_acc_playbook.yml
   ```

   If the user has password-based sudo access configured, then run the following command to run the playbook and then enter the sudo password.

   ```
   ansible-playbook install_acc_playbook.yml -K
   ```

Post Install Steps

1. It might take several minutes for the installation to complete. Verify that all the pods and services in the `netapp-astra-cc` namespace are up and running.

   ```
   [netapp-user@rhel7 ~]$ kubectl get all -n netapp-astra-cc
   ```

2. Check the `acc-operator-controller-manager` logs to ensure that the installation is completed.

   ```
   [netapp-user@rhel7 ~]$ kubectl logs deploy/acc-operator-controller-
   manager -n netapp-acc-operator -c manager -f
   ```

   The following message indicates the successful installation of Astra Control Center.

   ```
   {"level":"info","ts":1624054318.029971,"logger":"controllers.AstraContro
   lCenter","msg":"Successfully Reconciled AstraControlCenter in
   [seconds]s","AstraControlCenter":"netapp-astra-
   cc/astra","ae.Version":"[22.04.0]"}
   ```

3. The username for logging into Astra Control Center is the email address of the administrator provided in the CRD file and the password is a string `ACC-` appended to the Astra Control Center UUID. Run the following command:

   ```
   [netapp-user@rhel7 ~]$ oc get astracontrolcenters -n netapp-astra-cc
   NAME    UUID
   astra   345c55a5-bf2e-21f0-84b8-b6f2bce5e95f
   ```

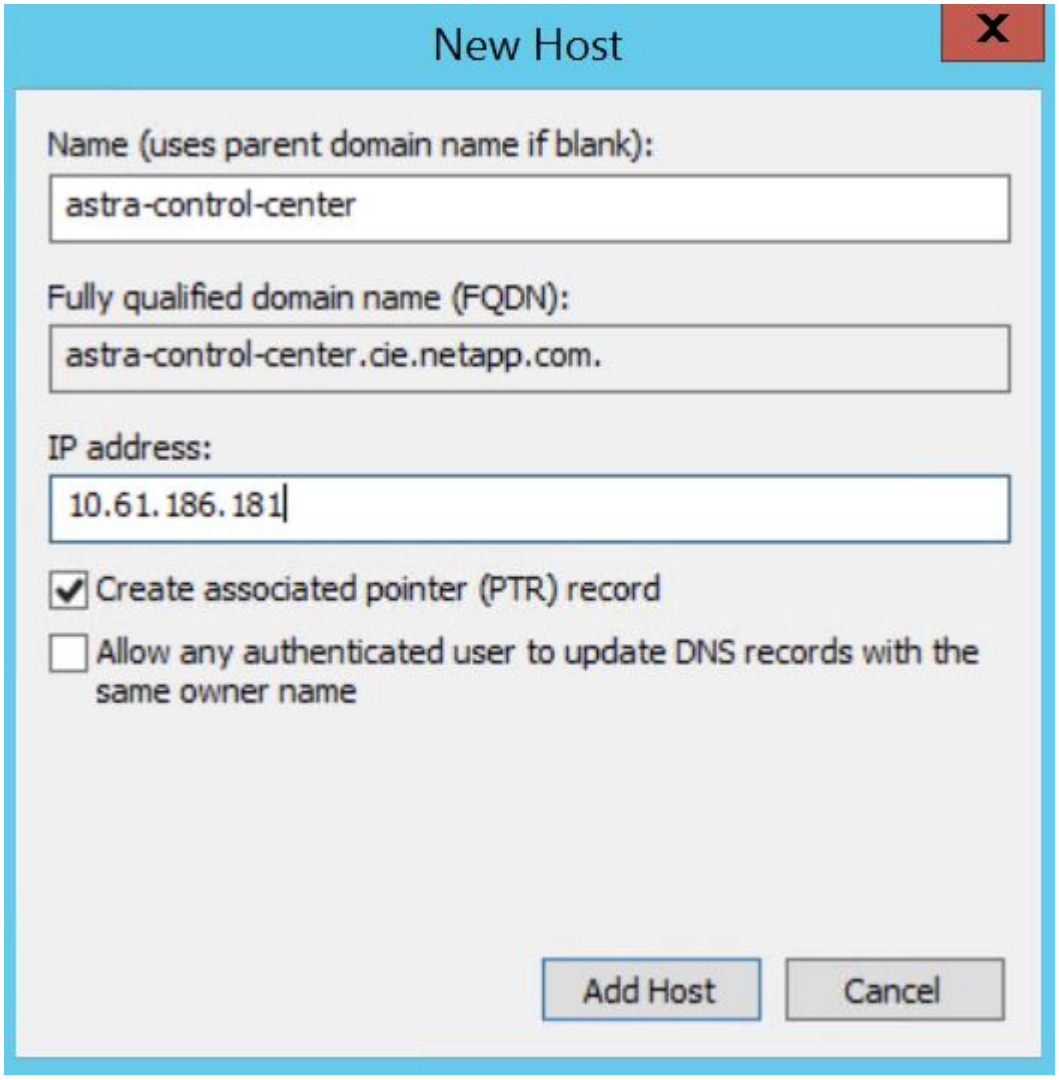
In this example, the password is `ACC-345c55a5-bf2e-21f0-84b8-b6f2bce5e95f`.

4. Get the traefik service load balancer IP if the ingressType is AccTraefik.

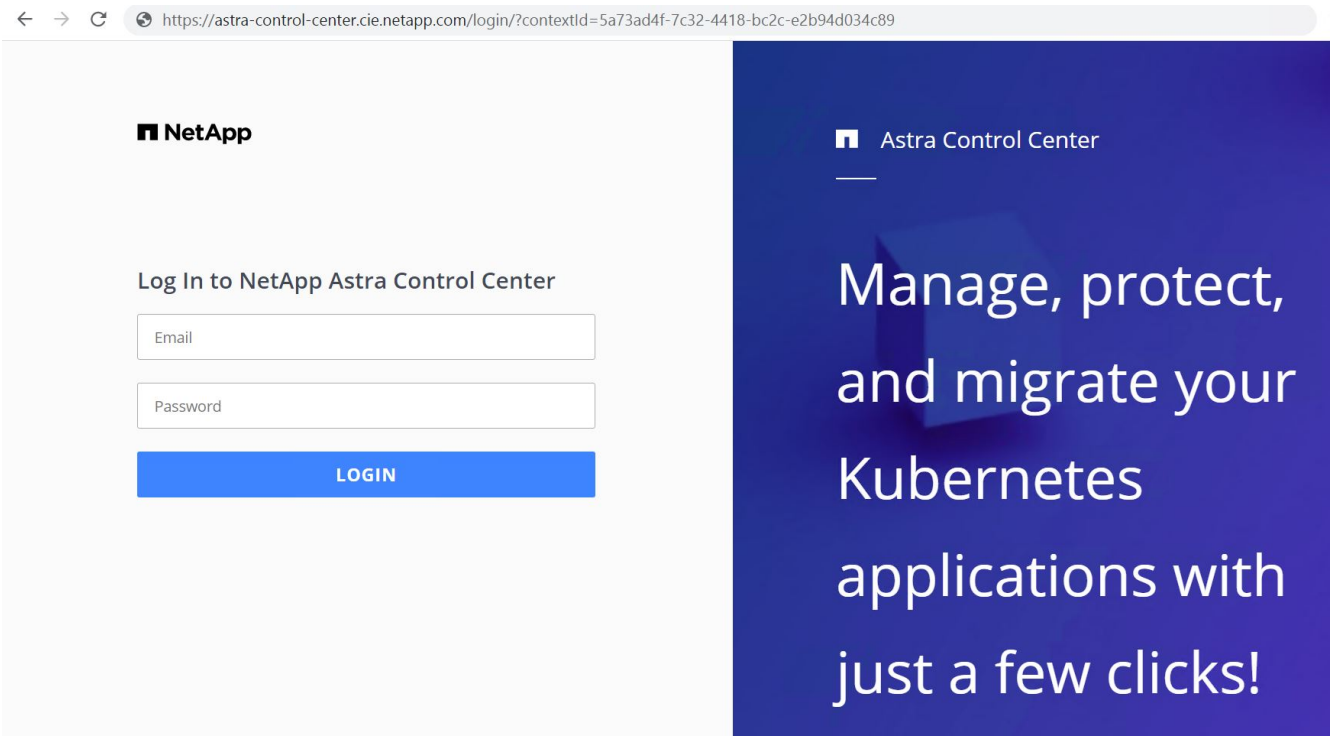
```
[netapp-user@rhel7 ~]$ oc get svc -n netapp-astra-cc | egrep
'EXTERNAL|traefik'

NAME                                        TYPE           CLUSTER-IP
EXTERNAL-IP     PORT(S)
AGE
traefik                                     LoadBalancer   172.30.99.142
10.61.186.181   80:30343/TCP,443:30060/TCP
16m
```

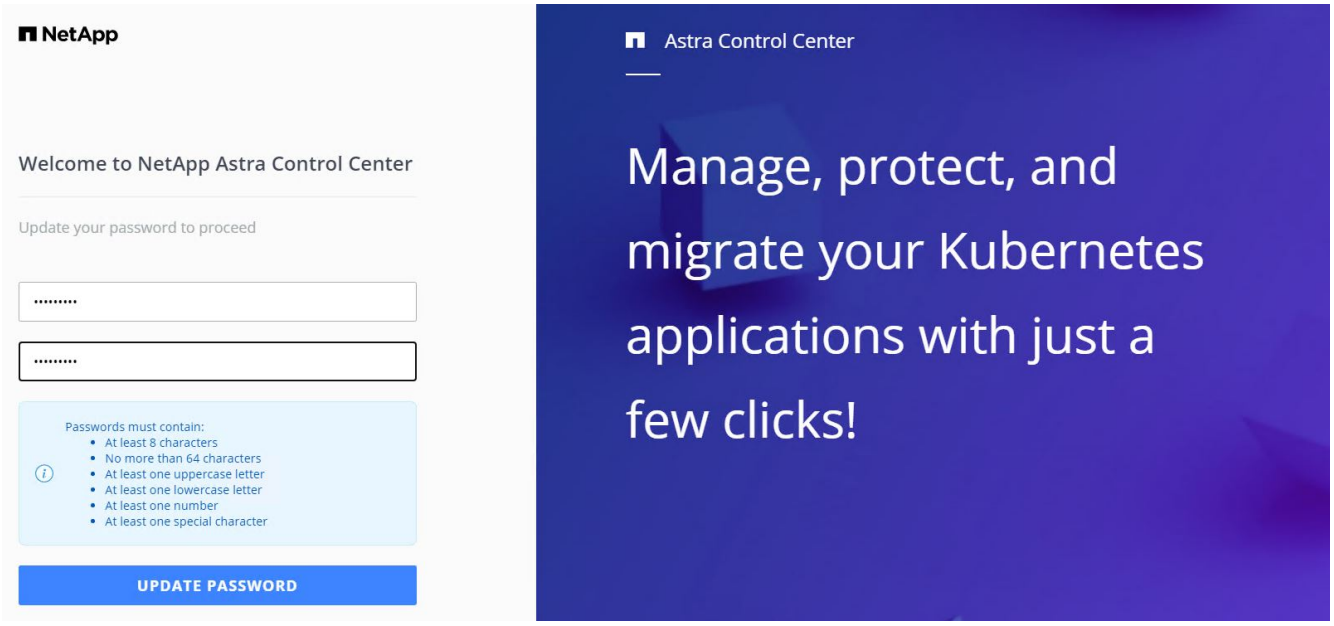
5. Add an entry in the DNS server pointing the FQDN provided in the Astra Control Center CRD file to the `EXTERNAL-IP` of the traefik service.



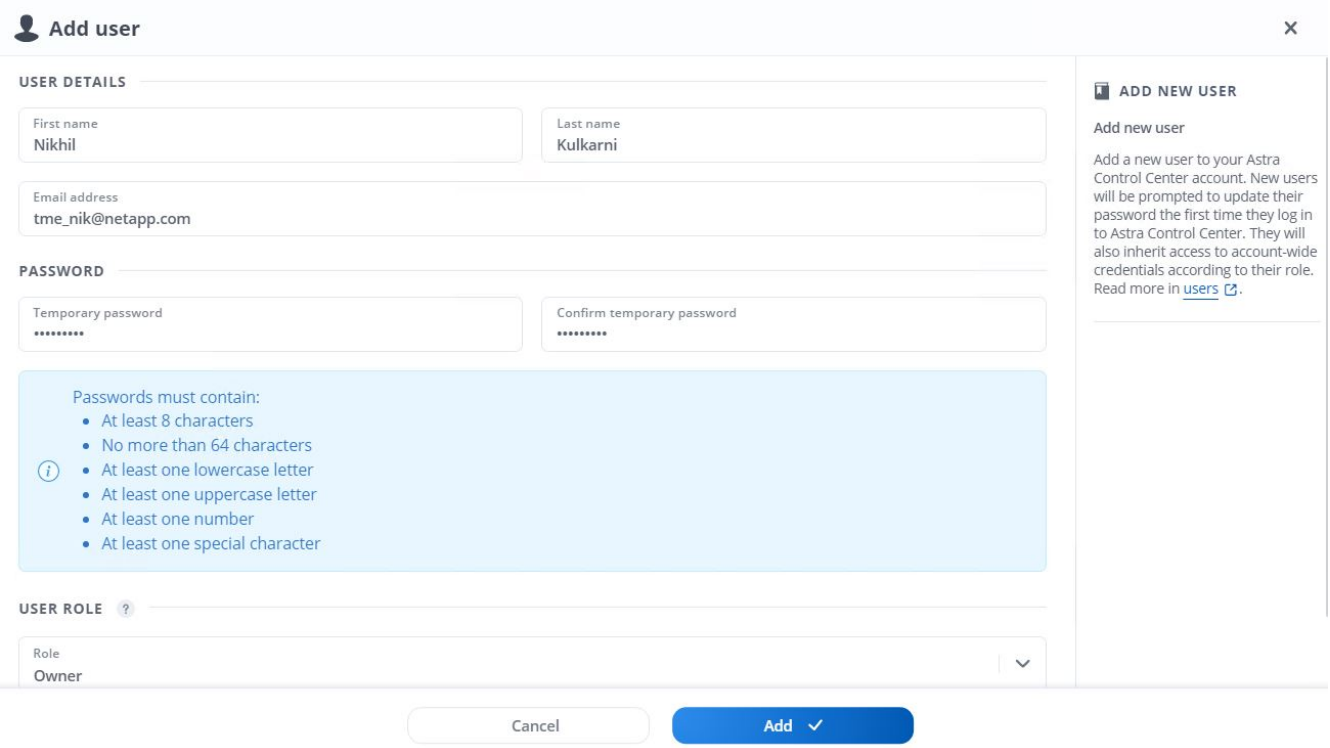
6. Log into the Astra Control Center GUI by browsing its FQDN.



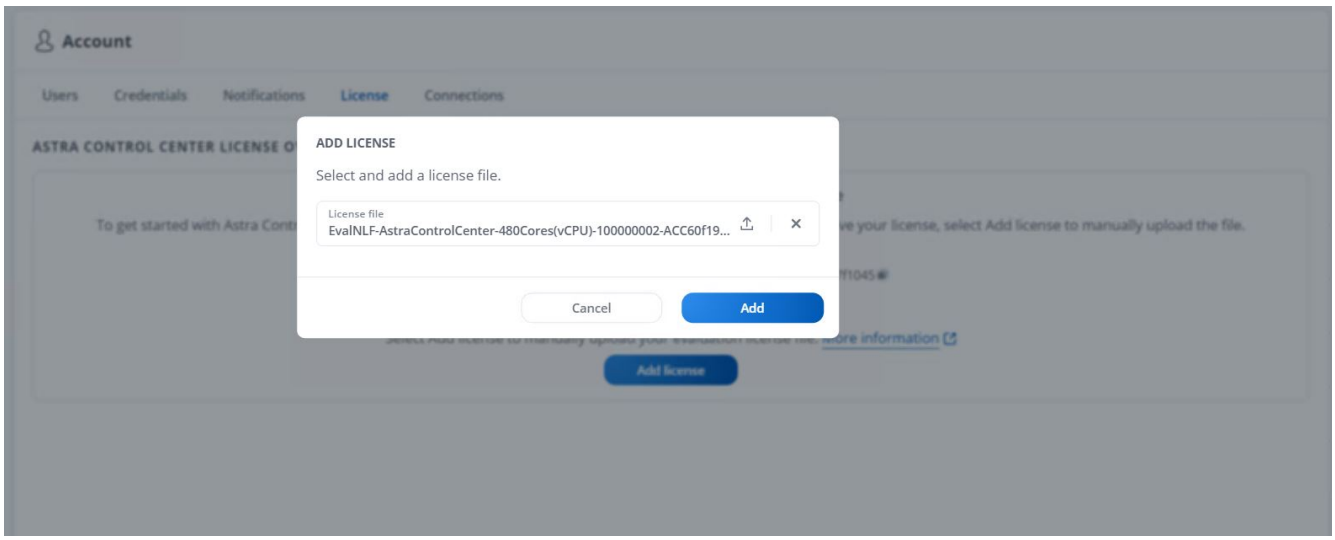
7. When you log into Astra Control Center GUI for the first time using the admin email address provided in CRD, you need to change the password.



8. If you wish to add a user to Astra Control Center, navigate to Account > Users, click Add, enter the details of the user, and click Add.



9. Astra Control Center requires a license for all of its functionalities to work. To add a license, navigate to Account > License, click Add License, and upload the license file.



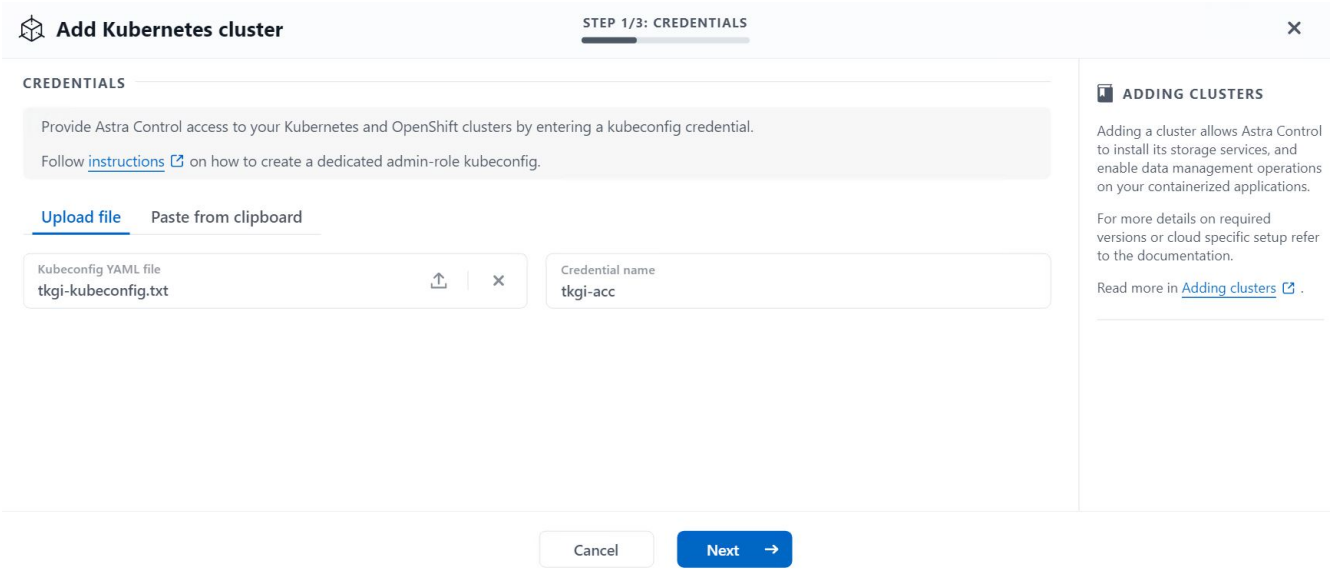
If you encounter issues with the install or configuration of NetApp Astra Control Center, the knowledge base of known issues is available here.

Register your VMware Tanzu Kubernetes Clusters with the Astra Control Center

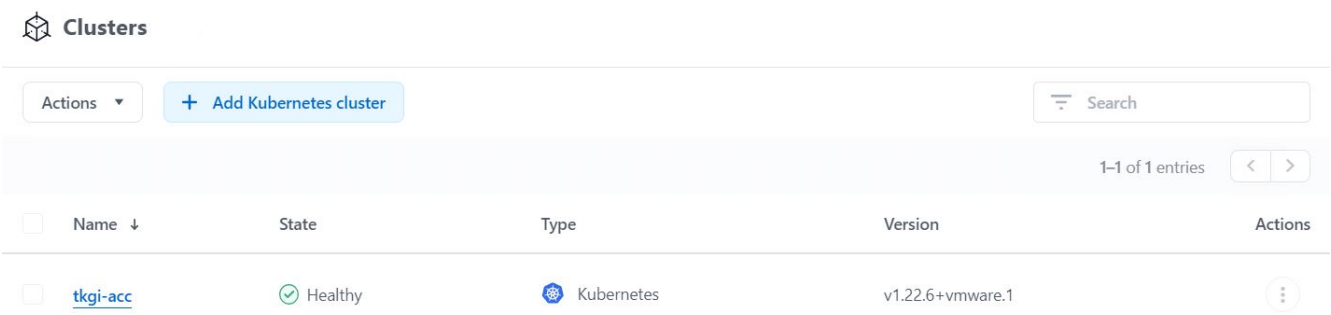
To enable the Astra Control Center to manage your workloads, you must first register your Tanzu Kubernetes clusters.

Register VMware Tanzu Kubernetes clusters

1. The first step is to add the Tanzu Kubernetes clusters to the Astra Control Center and manage them. Go to Clusters and click Add a Cluster, upload the kubeconfig file for the Tanzu Kubernetes cluster, and click Select Storage.

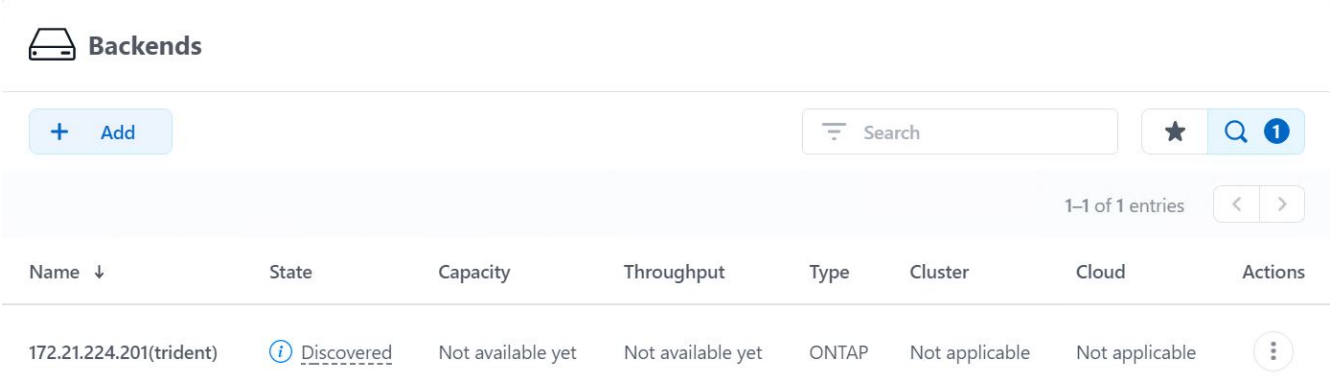


2. Astra Control Center detects the eligible storage classes. Now select the way that storageclass provisions volumes using Trident backed by an SVM on NetApp ONTAP and click Review. In the next pane, verify the details and click Add Cluster.
3. When the cluster is added, it moves to the Discovering status while Astra Control Center inspects it and installs the necessary agents. The cluster status changes to `Healthy` after it is successfully registered.

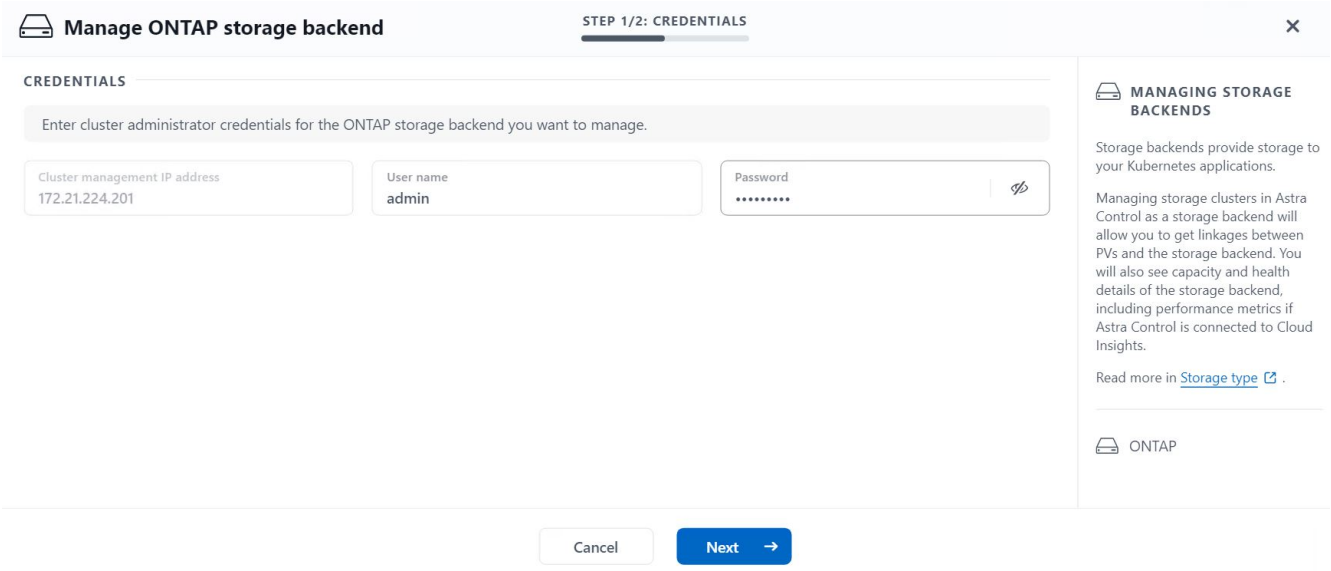


> All Tanzu Kubernetes clusters to be managed by Astra Control Center should have access to the image registry that was used for its installation as the agents installed on the managed clusters pull the images from that registry.

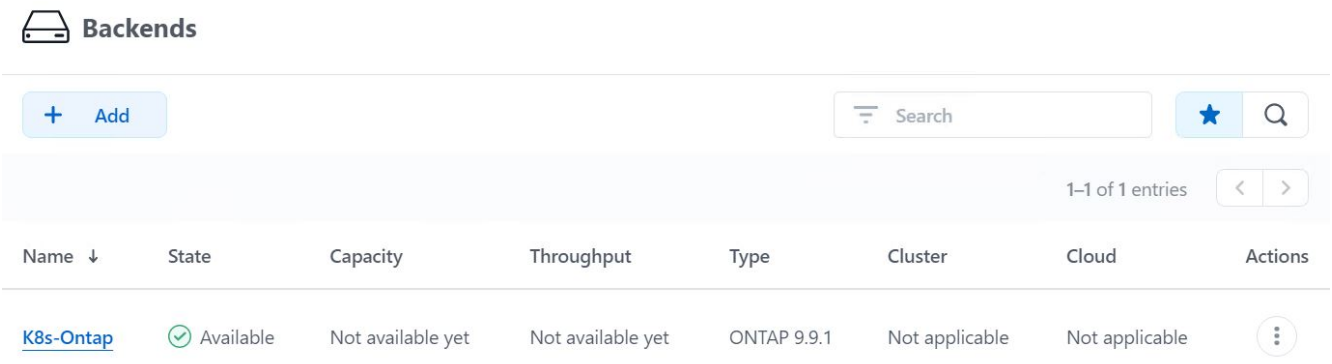
4. Import ONTAP clusters as storage resources to be managed as backends by Astra Control Center. When Tanzu Kubernetes clusters are added to Astra and a storageclass is configured, it automatically discovers and inspects the ONTAP cluster backing the storageclass but does not import it into the Astra Control Center to be managed.



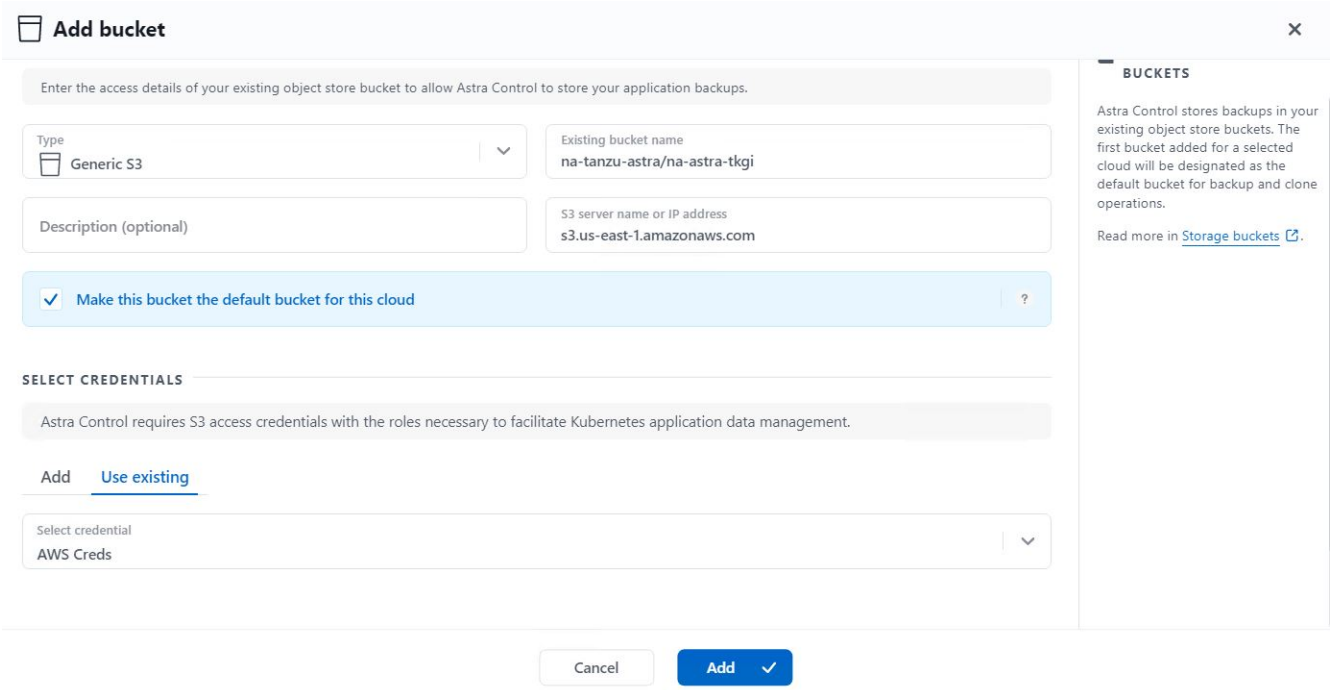
5. To import the ONTAP clusters, navigate to Backends, click the dropdown, and select Manage next to the ONTAP cluster to be managed. Enter the ONTAP cluster credentials, click Review Information, and then click Import Storage Backend.



6. After the backends are added, the status changes to Available. These backends now have the information about the persistent volumes in the Tanzu Kubernetes cluster and the corresponding volumes on the ONTAP system.



7. For backup and restore across Tanzu Kubernetes clusters using Astra Control Center, you must provision an object storage bucket that supports the S3 protocol. Currently supported options are ONTAP S3, StorageGRID, AWS S3, and Microsoft Azure Blob storage. For the purpose of this installation, we are going to configure an AWS S3 bucket. Go to Buckets, click Add bucket, and select Generic S3. Enter the details about the S3 bucket and credentials to access it, click the checkbox Make this Bucket the Default Bucket for the Cloud, and then click Add.

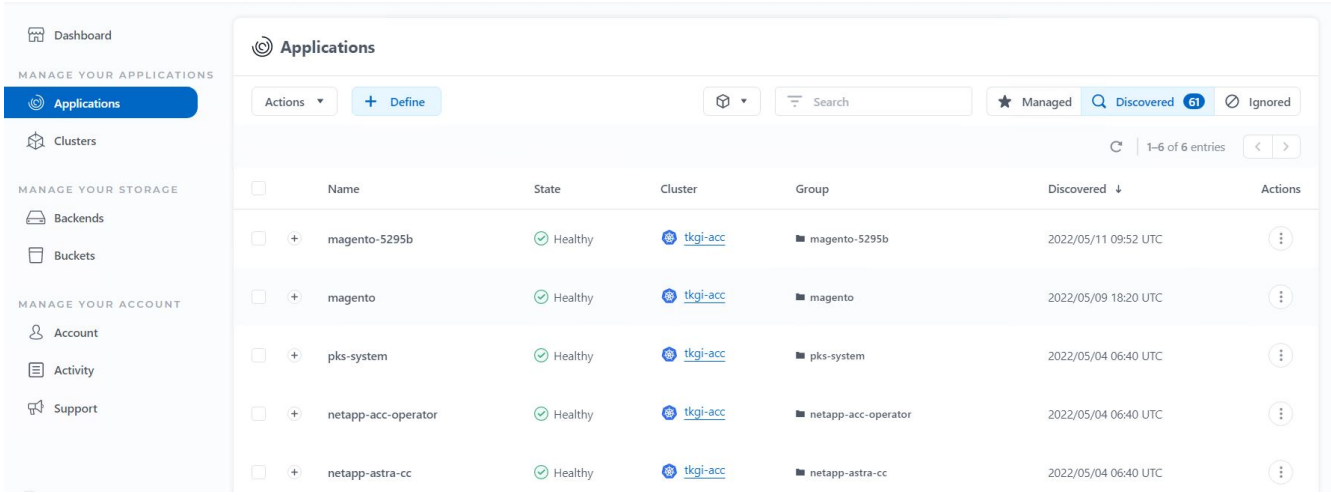


Choose the applications to protect

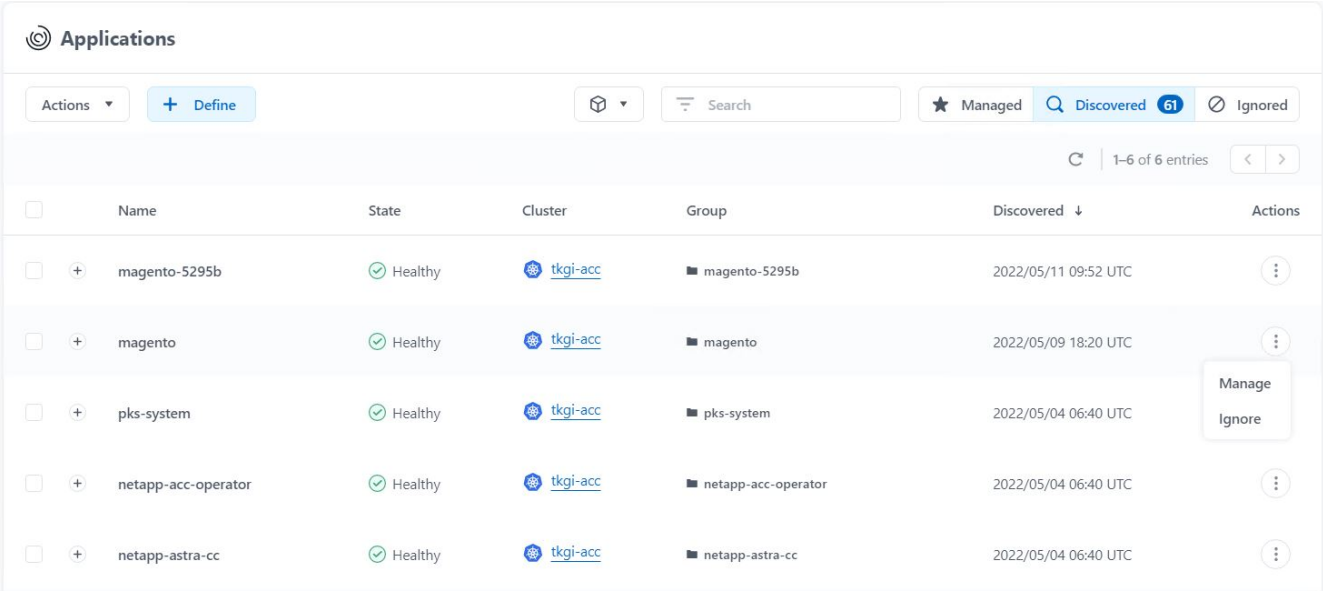
After you have registered your Tanzu Kubernetes clusters, you can discover the applications that are deployed and manage them via the Astra Control Center.

Manage applications

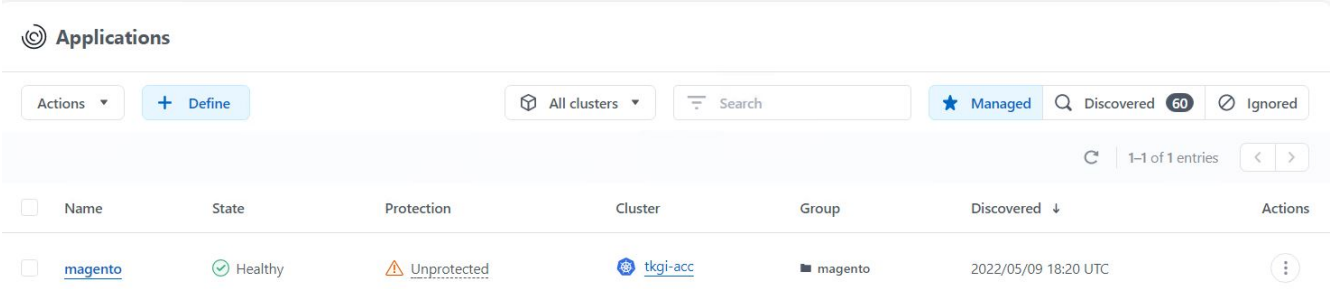
1. After the Tanzu Kubernetes clusters and ONTAP backends are registered with the Astra Control Center, the control center automatically starts discovering the applications in all the namespaces that are using the storageclass configured with the specified ONTAP backend.



2. Navigate to Apps > Discovered and click the dropdown menu next to the application you would like to manage using Astra. Then click Manage.



3. The application enters the Available state and can be viewed under the Managed tab in the Apps section.



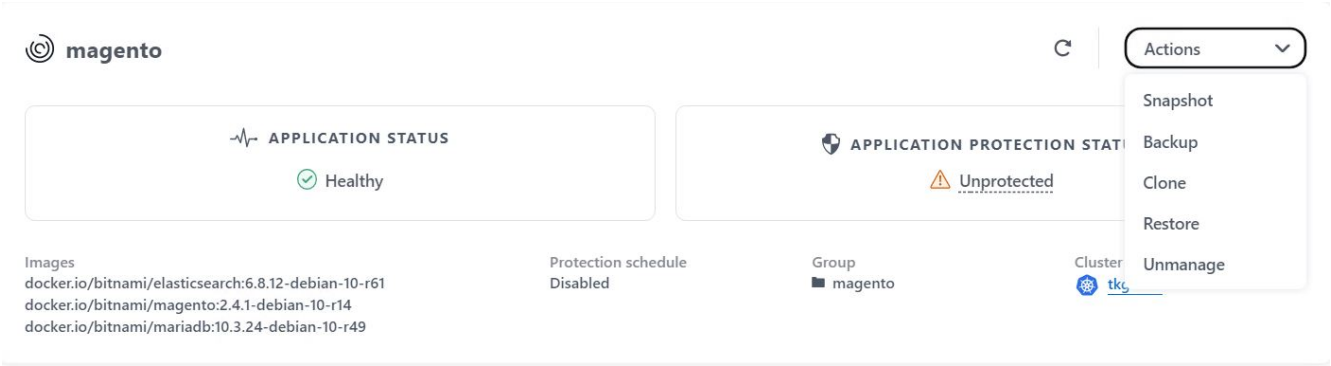
Protect your applications

After application workloads are managed by Astra Control Center, you can configure the protection settings for those workloads.

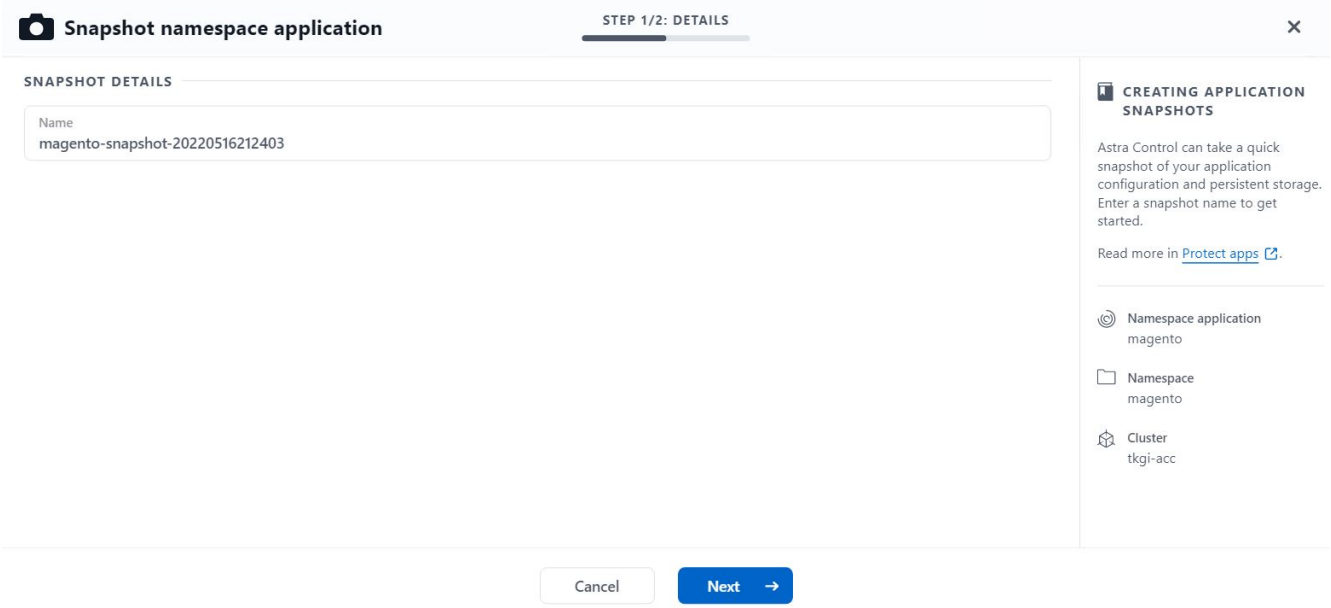
Create an application snapshot

A snapshot of an application creates an ONTAP Snapshot copy and a copy of the application metadata that can be used to restore or clone the application to a specific point in time based on that Snapshot copy.

1. To take a snapshot of the application, navigate to the Apps > Managed tab and click the application you would like to make a Snapshot copy of. Click the dropdown menu next to the application name and click Snapshot.



2. Enter the snapshot details, click Next, and then click Snapshot. It takes about a minute to create the snapshot, and the status becomes Available after the snapshot is successfully created.



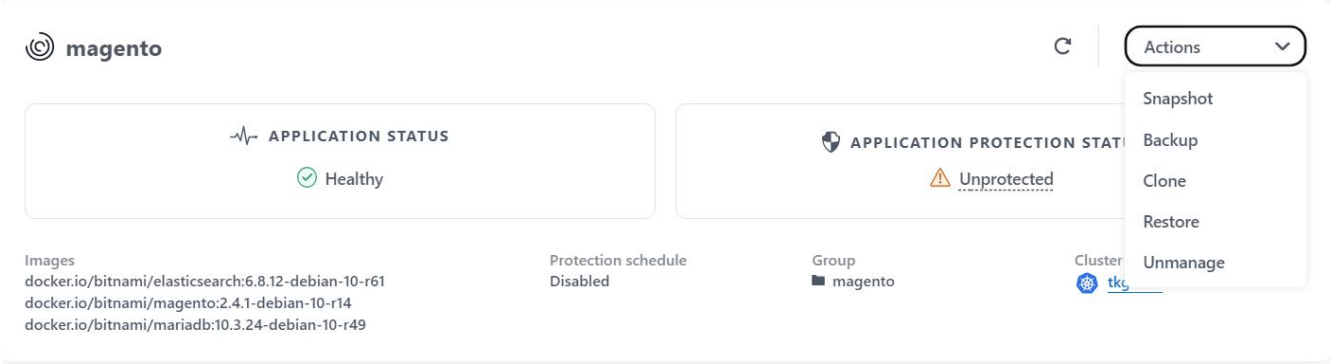
Create an application backup

A backup of an application captures the active state of the application and the configuration of it's resources, coverts them into files, and stores them in a remote object storage bucket.

1. For the backup and restore of managed applications in the Astra Control Center, you must configure superuser settings for the backing ONTAP systems as a prerequisite. To do so, enter the following commands.

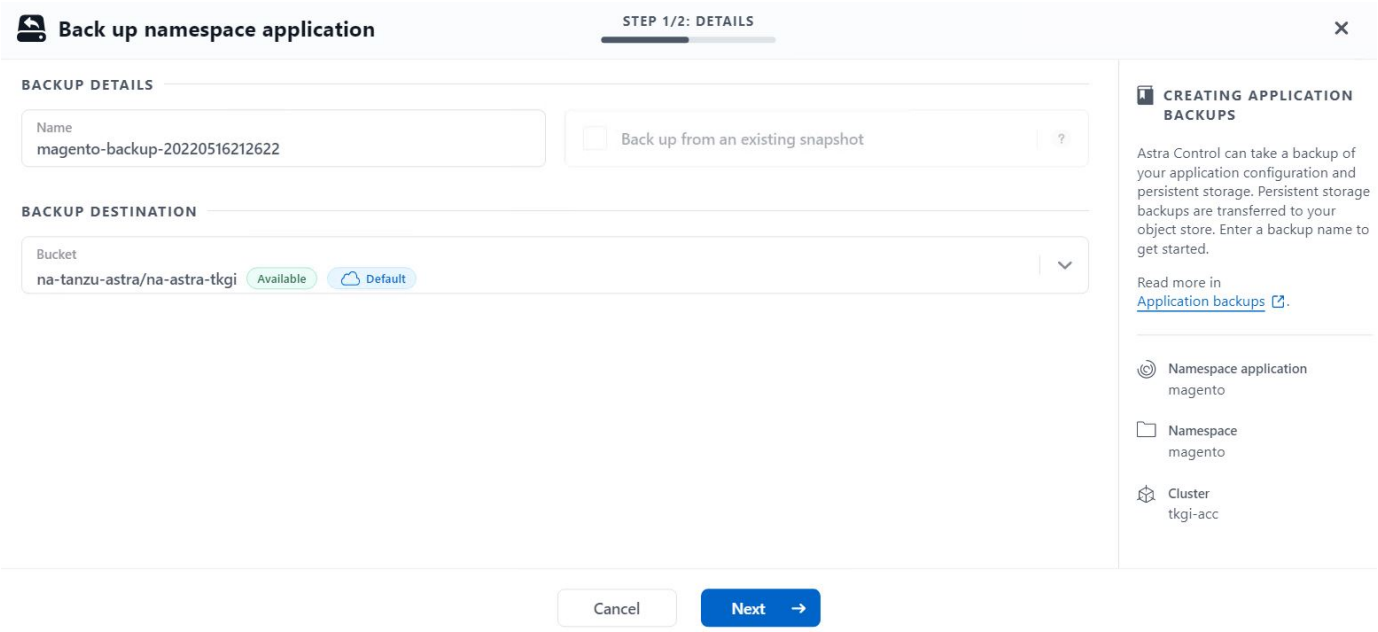
```
ONTAP::> export-policy rule modify -vserver ocp-trident -policyname
default -ruleindex 1 -superuser sys
ONTAP::> export-policy rule modify -policyname default -ruleindex 1
-anon 65534 -vserver ocp-trident
```

2. To create a backup of the managed application in the Astra Control Center, navigate to the Apps > Managed tab and click the application that you want to take a backup of. Click the dropdown menu next to the application name and click Backup.



3. Enter the backup details, select the object storage bucket to hold the backup files, click Next, and, after reviewing the details, click Backup. Depending on the size of the application and data, the backup can take several minutes, and the status of the backup becomes Available after the backup is completed

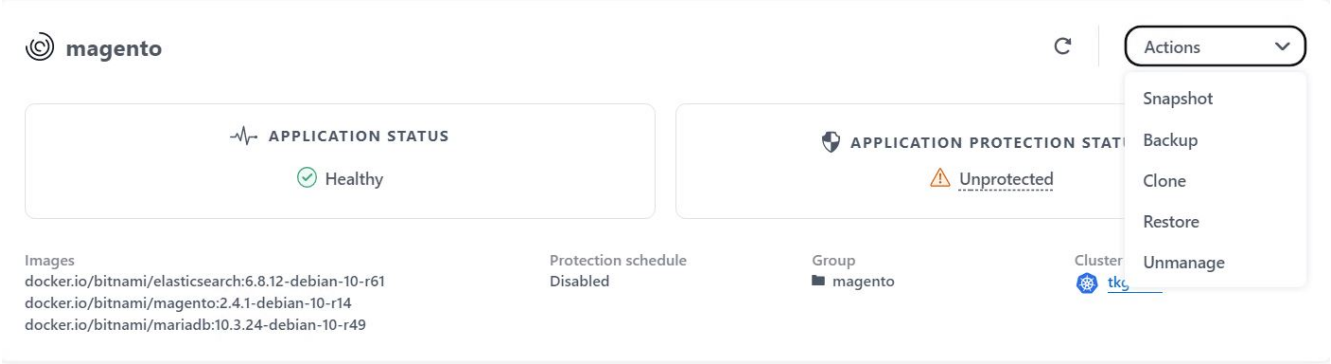
successfully.



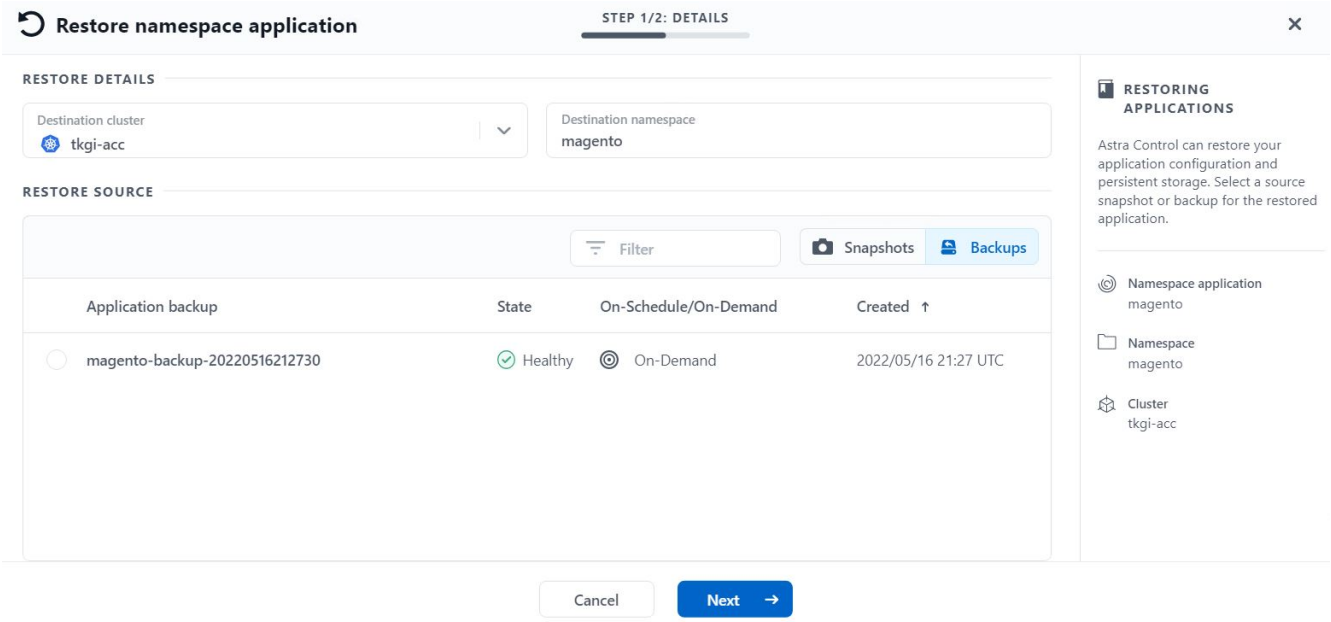
Restoring an application

At the push of a button, you can restore an application to the originating namespace in the same cluster or to a remote cluster for application protection and disaster recovery purposes.

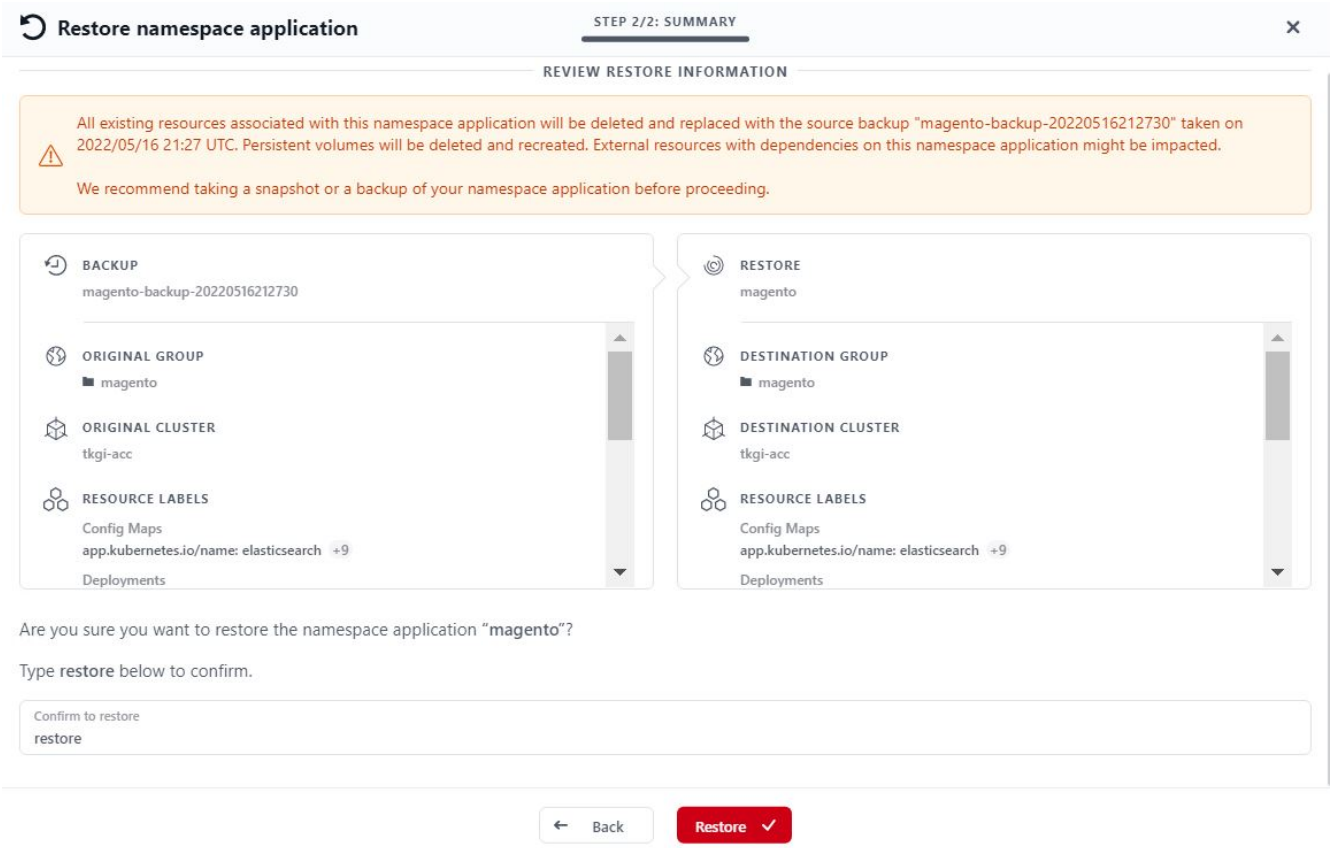
1. To restore an application, navigate to the Apps > Managed tab and click the app in question. Click the dropdown menu next to the application name and click Restore.



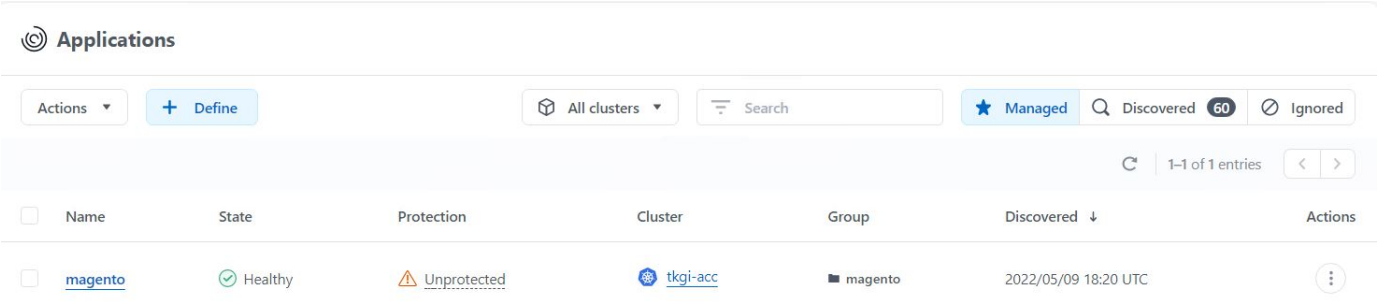
2. Enter the name of the restore namespace, select the cluster you want to restore it to, and choose if you want to restore it from an existing snapshot or from a backup of the application. Click Next.



3. On the review pane, enter `restore` and click Restore after you have reviewed the details.



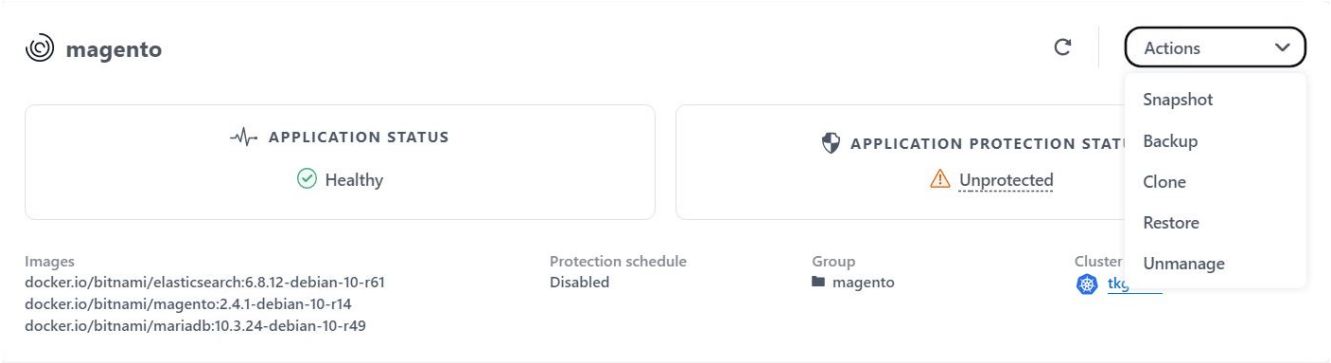
4. The new application goes to the Restoring state while Astra Control Center restores the application on the selected cluster. After all the resources of the application are installed and detected by Astra, the application goes to the Available state.



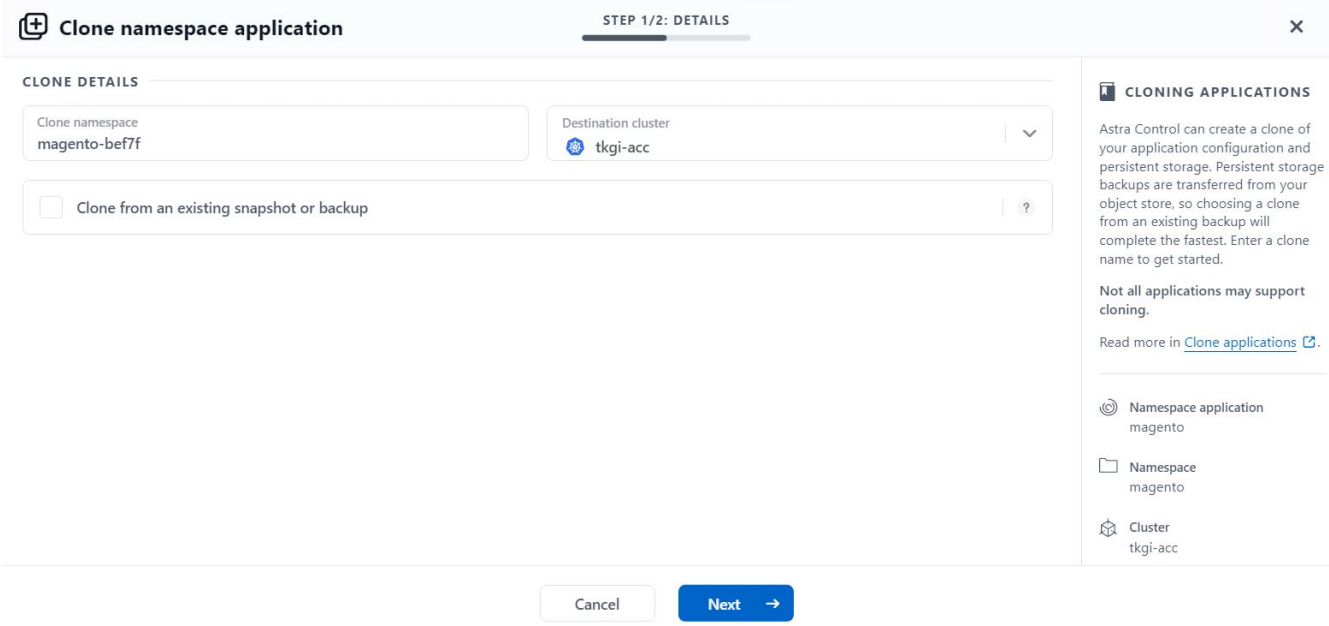
Cloning an application

You can clone an application to the originating cluster or to a remote cluster for dev/test or application protection and disaster recovery purposes. Cloning an application within the same cluster on the same storage backend uses NetApp FlexClone technology, which clones the PVCs instantly and saves storage space.

1. To clone an application, navigate to the Apps > Managed tab and click the app in question. Click the dropdown menu next to the application name and click Clone.



2. Enter the details of the new namespace, select the cluster you want to clone it to, and choose if you want to clone it from an existing snapshot, from a backup, or from the current state of the application. Click Next and then click Clone on the review pane after you have reviewed the details.



3. The new application goes to the Discovering state while Astra Control Center creates the application on the selected cluster. After all the resources of the application are installed and detected by Astra, the application goes to the Available state.