



# **NetApp Astra Control Center Overview**

NetApp Solutions

NetApp  
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# NetApp Astra Control Center 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-premises environment and powered by NetApp data protection technology.



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

For the installation and configuration of Astra Trident to support Astra Control Center, 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 (7-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 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 available. The evaluation version is supported through the email and community (Slack channel). Customers have access to these and other knowledge-base articles and the documentation available from the in-product support dashboard.

To get started with NetApp Astra Control Center, visit the [Astra website](#).

# Astra Control Center installation prerequisites

1. One or more Red Hat OpenShift clusters. Versions 4.6 EUS and 4.7 are currently supported.
2. Astra Trident must already be installed and configured on each Red Hat OpenShift cluster.
3. One or more NetApp ONTAP storage systems running ONTAP 9.5 or greater.



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

4. A Trident storage backend must be configured on each OpenShift cluster with an SVM backed by an ONTAP cluster.
5. A default StorageClass configured on each OpenShift cluster with Astra Trident as the storage provisioner.
6. A load balancer must be installed and configured on each OpenShift cluster for load balancing and exposing OpenShift Services.



See the link [here](#) for information about load balancers that have been validated for this purpose.

7. A private image registry must be configured to host the NetApp Astra Control Center images.



See the link [here](#) to install and configure an OpenShift private registry for this purpose.

8. You must have Cluster Admin access to the Red Hat OpenShift cluster.
9. You must have Admin access to NetApp ONTAP clusters.
10. An admin workstation with docker or podman, tridentctl, and oc or kubectl tools installed and added to your \$PATH.



Docker installations must have docker version greater than 20.10 and Podman installations must have podman version greater than 3.0.

## Install Astra Control Center

## Using OperatorHub

1. 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 admin workstation.



To get started with a trial license for Astra Control, visit the [Astra registration site](#).

2. Unpack the tar ball and change the working directory to the resulting folder.

```
[netapp-user@rhel7 ~]$ tar -vxzf astra-control-center-  
21.12.60.tar.gz  
[netapp-user@rhel7 ~]$ cd astra-control-center-21.12.60
```

3. Before starting the installation, push the Astra Control Center images to an image registry. You can choose to do this with either Docker or Podman, instructions for both are provided in this step.

## Podman

- a. Export the registry FQDN with the organization/namespace/project name as a environment variable 'registry'.

```
[netapp-user@rhel7 ~]$ export REGISTRY=astra-registry.apps.ocp-vmw.cie.netapp.com/netapp-astra
```

- b. Log into the registry.

```
[netapp-user@rhel7 ~]$ podman login -u ocp-user -p password --tls-verify=false astra-registry.apps.ocp-vmw.cie.netapp.com
```



If you are using kubeadmin user to log into the private registry, then use token instead of password - `podman login -u ocp-user -p token --tls-verify=false astra-registry.apps.ocp-vmw.cie.netapp.com`.



Alternatively, you can create a service account, assign registry-editor and/or registry-viewer role (based on whether you require push/pull access) and log into the registry using service account's token.

- c. Create a shell script file and paste the following content in it.

```
[netapp-user@rhel7 ~]$ vi push-images-to-registry.sh

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
```



If you are using untrusted certificates for your registry, edit the shell script and use `--tls-verify=false` for the podman push command `podman push $REGISTRY/$(echo $astraImage | sed 's/[\\/]\\+\\///') --tls-verify=false`.

- d. Make the file executable.

```
[netapp-user@rhel7 ~]$ chmod +x push-images-to-registry.sh
```

e. Execute the shell script.

```
[netapp-user@rhel7 ~]$ ./push-images-to-registry.sh
```

## Docker

- a. Export the registry FQDN with the organization/namespace/project name as a environment variable 'registry'.

```
[netapp-user@rhel7 ~]$ export REGISTRY=astra-registry.apps.ocp-vmw.cie.netapp.com/netapp-astra
```

- b. Log into the registry.

```
[netapp-user@rhel7 ~]$ docker login -u ocp-user -p password astra-registry.apps.ocp-vmw.cie.netapp.com
```



If you are using kubeadmin user to log into the private registry, then use token instead of password - `docker login -u ocp-user -p token astra-registry.apps.ocp-vmw.cie.netapp.com`.



Alternatively, you can create a service account, assign registry-editor and/or registry-viewer role (based on whether you require push/pull access) and log into the registry using service account's token.

- c. Create a shell script file and paste the following content in it.

```
[netapp-user@rhel7 ~]$ vi push-images-to-registry.sh

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
```

- d. Make the file executable.

```
[netapp-user@rhel7 ~]$ chmod +x push-images-to-registry.sh
```

- e. Execute the shell script.



```
[netapp-user@rhel7 ~]$ ./push-images-to-registry.sh
```

4. When using private image registries that are not publicly trusted, upload the image registry TLS certificates to the OpenShift nodes. To do so, create a configmap in the openshift-config namespace using the TLS certificates and patch it to the cluster image config to make the certificate trusted.

```
[netapp-user@rhel7 ~]$ oc create configmap default-ingress-ca -n  
openshift-config --from-file=astra-registry.apps.ocp  
-vmw.cie.netapp.com=tls.crt  
  
[netapp-user@rhel7 ~]$ oc patch image.config.openshift.io/cluster  
--patch '{"spec":{"additionalTrustedCA":{"name":"default-ingress-  
ca"}}}' --type=merge
```



If you are using an OpenShift internal registry with default TLS certificates from the ingress operator with a route, you still need to follow the previous step to patch the certificates to the route hostname. To extract the certificates from ingress operator, you can use the command `oc extract secret/router-ca --keys=tls.crt -n openshift-ingress-operator`.

5. Create a namespace netapp-acc-operator for Astra Control Center.

```
[netapp-user@rhel7 ~]$ oc create ns netapp-acc-operator  
  
namespace/netapp-acc-operator created
```

6. Create a secret with credentials to log into the image registry in netapp-acc-operator namespace.

```
[netapp-user@rhel7 ~]$ oc create secret docker-registry astra-  
registry-cred --docker-server=astra-registry.apps.ocp  
-vmw.cie.netapp.com --docker-username=ocp-user --docker  
-password=password -n netapp-acc-operator  
  
secret/astra-registry-cred created
```

7. Log into the Red Hat OpenShift GUI console with cluster-admin access.
8. Select Administrator from the Perspective drop down.
9. Navigate to Operators > OperatorHub and search for Astra.



10. Select `netapp-acc-operator` tile and click `Install`.



**netapp-acc-operator**  
21.12.63-1 provided by NetApp

✕

Install

---

**Latest version**  
21.12.63-1

**Capability level**  
☒ Basic Install  
☐ Seamless Upgrades  
☐ Full Lifecycle  
☐ Deep Insights  
☐ Auto Pilot

**Provider type**  
Certified

**Provider**  
NetApp

Astra Control is an application-aware data management solution that manages, protects and moves data-rich Kubernetes workloads in both public clouds and on-premises.

Astra Control enables data protection, disaster recovery, and migration for your Kubernetes workloads, leveraging NetApp's industry-leading data management technology for snapshots, backups, replication and cloning.

### How to deploy Astra Control

Refer to [Installation Procedure](#) to deploy Astra Control Center using the Operator.

### Documentation

Refer to [Astra Control Center Documentation](#) to complete the setup and start managing applications.

11. On the Install Operator screen, accept all default parameters and click `Install`.

## Install Operator

Install your Operator by subscribing to one of the update channels to keep the Operator up to date. The strategy determines either manual or automatic updates.

### Update channel \*

- ☐ alpha
- ☒ stable

### Installation mode \*

- ☒ All namespaces on the cluster (default)  
Operator will be available in all Namespaces.
- ☐ A specific namespace on the cluster  
This mode is not supported by this Operator

### Installed Namespace \*

PR netapp-acc-operator (Operator recommended)

#### ⚠ Namespace already exists

Namespace **netapp-acc-operator** already exists and will be used. Other users can already have access to this namespace.

### Approval strategy \*

- ☒ Automatic
- ☐ Manual

Install

Cancel

 **netapp-acc-operator**  
provided by NetApp

#### Provided APIs

 **Astra Control Center**

AstraControlCenter is the Schema for the astracontrolcenters API

12. Wait for the operator installation to complete.



**netapp-acc-operator**  
21.12.63-1 provided by NetApp



## Installing Operator

InstallWaiting: installing; waiting for deployment acc-operator-controller-manager to become ready; Waiting for rollout to finish: 0 of 1 updated replicas are available...

The Operator is being installed. This may take a few minutes.

[View installed Operators in Namespace netapp-acc-operator](#)

13. Once the operator installation succeeds, navigate to click on View Operator.



netapp-acc-operator  
21.12.63-1 provided by NetApp



## Installed operator - ready for use

[View Operator](#)[View installed Operators in Namespace netapp-acc-operator](#)

14. Then click on `Create Instance` in Astra Control Center tile in the operator.

[Installed Operators](#) > [Operator details](#)



netapp-acc-operator  
21.12.63-1 provided by NetApp

[Details](#)

[YAML](#)

[Subscription](#)

[Events](#)

[Astra Control Center](#)

## Provided APIs

**ACC** Astra Control Center

AstraControlCenter is the Schema for  
the astracontrolcenters API

[+ Create instance](#)

15. Fill the `Create AstraControlCenter` form fields and click `Create`.
- Optionally edit the Astra Control Center instance name.
  - Optionally enable or disable Auto Support. Retaining Auto Support functionality is recommended.
  - Enter the FQDN for Astra Control Center.
  - Enter the Astra Control Center version; the latest is displayed by default.
  - Enter an account name for Astra Control Center and admin details like first name, last name and

email address.

- f. Enter the volume reclaim policy, default is Retain.
- g. In Image Registry, enter the FQDN for your registry along with the organization name as it was given while pushing the images to the registry (in this example, `astra-registry.apps.ocp-vmw.cie.netapp.com/netapp-astra`)
- h. If you use a registry that requires authentication, enter the secret name in Image Registry section.
- i. Configure scaling options for Astra Control Center resource limits.
- j. Enter the storage class name if you want to place PVCs on a non-default storage class.
- k. Define CRD handling preferences.

Project: netapp-acc-operator ▼

---

**Name \***

**Labels**

**Account Name \***

Astra Control Center account name

**Astra Address \***

AstraAddress defines how Astra will be found in the data center. This IP address and/or DNS A record must be created prior to provisioning Astra Control Center. Example - "astra.example.com" The A record and its IP address must be allocated prior to provisioning Astra Control Center

**Astra Version \***

Version of AstraControlCenter to deploy. You are provided a Helm repository with a corresponding version. Example - 1.5.2, 1.4.2-patch

**Email \***

EmailAddress will be notified by Astra as events warrant.

**Auto Support \*** >

AutoSupport indicates willingness to participate in NetApp's proactive support application, NetApp Active IQ. The default election is true and indicates support data will be sent to NetApp. An empty or blank election is the same as a default election. Air gapped installations should enter false.

**First Name**

The first name of the SRE supporting Astra.

**Last Name**

Admin

The last name of the SRE supporting Astra.

**Image Registry**

The container image registry that is hosting the Astra application images, ACC Operator and ACC Helm Repository.

**Name**

astra-registry.apps.ocp-vmw.cie.netapp.com/netapp-astra

The name of the image registry. For example "example.registry/astra". Do not prefix with protocol.

**Secret**

astra-registry-cred

The name of the Kubernetes secret that will authenticate with the image registry.

**Volume Reclaim Policy**

Retain

Reclaim policy to be set for persistent volumes

**Astra Resources Scaler**

Default

Scaling options for AstraControlCenter Resource limits.

**Storage Class**

The storage class to be used for PVCs. If not set, default storage class will be used.

**Crds**

Options for how ACC should handle CRDs.

Create

Cancel

**Automated [Ansible]**

1. To use Ansible playbooks to deploy Astra Control Center, you need 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 OpenShift cluster on which Astra Control Center is to be installed.
5. Change the directory to the na\_astra\_control\_suite.

```
cd na_astra_control_suite
```

6. Edit the `vars/vars.yml` file, and fill in 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"

#Kubereneets/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.

If the user running the playbook is root or has passwordless sudo configured, then run the following command to run the playbook.

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

If the user has password-based sudo access configured, 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 ~]$ oc get all -n netapp-astra-cc
```

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

```
[netapp-user@rhel7 ~]$ oc 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.AstraControlCenter","msg":"Successfully Reconciled AstraControlCenter in [seconds]s","AstraControlCenter":"netapp-astra-cc/astra","ae.Version":"[21.12.60]"}
```

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



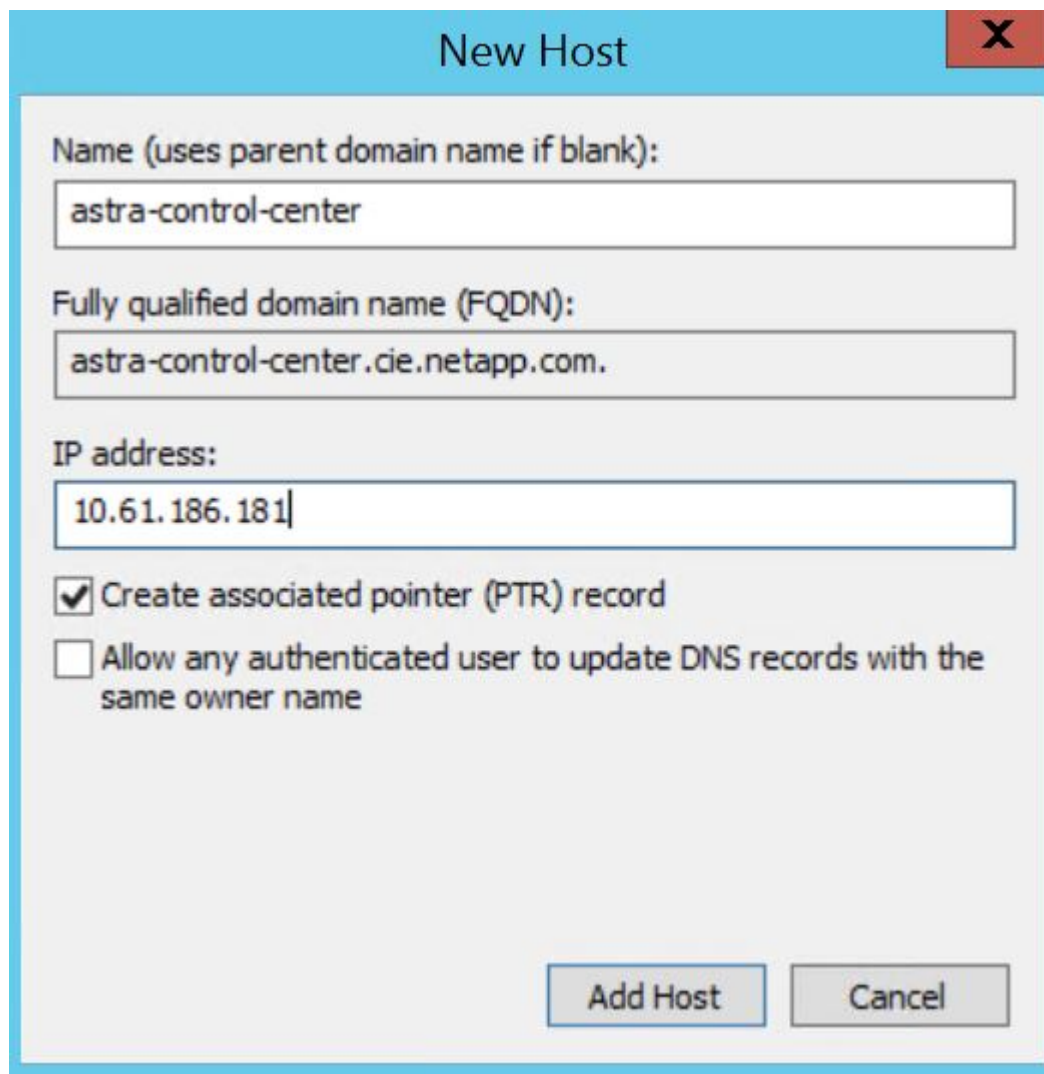
In this example, the password is `ACC-345c55a5-bf2e-21f0-84b8-b6f2bce5e95f`.

4. Get the `traefik` service load balancer IP.

```
[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.



The image shows a 'New Host' dialog box with a light blue header and a red close button in the top right corner. The dialog contains three text input fields and two checkboxes. The first field, labeled 'Name (uses parent domain name if blank):', contains the text 'astra-control-center'. The second field, labeled 'Fully qualified domain name (FQDN):', contains 'astra-control-center.cie.netapp.com.'. The third field, labeled 'IP address:', contains '10.61.186.181'. Below the fields are two checkboxes: the first is checked and labeled 'Create associated pointer (PTR) record', and the second is unchecked and labeled 'Allow any authenticated user to update DNS records with the same owner name'. At the bottom right are two buttons: 'Add Host' and 'Cancel'.

**New Host**

Name (uses parent domain name if blank):  
astra-control-center

Fully qualified domain name (FQDN):  
astra-control-center.cie.netapp.com.

IP address:  
10.61.186.181

☒ Create associated pointer (PTR) record

☐ Allow any authenticated user to update DNS records with the same owner name

Add Host Cancel

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.

**Add user**

**USER DETAILS**

First name: Nikhil

Last name: Kulkarni

Email address: tme\_nik@netapp.com

**PASSWORD**

Temporary password: \*\*\*\*\*

Confirm temporary password: \*\*\*\*\*

Passwords must contain:

- At least 8 characters
- No more than 64 characters
- At least one lowercase letter
- At least one uppercase letter
- At least one number
- At least one special character

**USER ROLE**

Role: Owner

Buttons: Cancel, Add ✓

**ADD NEW USER**

Add new user

Add a new user to your Astra Control Center account. New users will be prompted to update their password the first time they log in to Astra Control Center. They will also inherit access to account-wide credentials according to their role. Read more in [users](#).

- 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.

**Account**

Users | Credentials | Notifications | **License** | Connections

**ASTRA CONTROL CENTER LICENSE**

To get started with Astra Control Center, select Add license to manually upload the file.

**ADD LICENSE**

Select and add a license file.

License file: EvalNLF-AstraControlCenter-480Cores(vCPU)-100000002-ACC60f19...

Buttons: Cancel, Add

Background button: Add license



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


Next: [Register your Red Hat OpenShift Clusters: Red Hat OpenShift with NetApp.](#)

## Register your Red Hat OpenShift Clusters with the Astra Control Center


To enable the Astra Control Center to manage your workloads, you must first register your Red Hat OpenShift cluster.

## Register Red Hat OpenShift clusters

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

 **Add cluster**

STEP 1/3: CREDENTIALS





**CREDENTIALS**

Provide Astra Control access to your Kubernetes and OpenShift clusters by entering a kubeconfig credential.


Follow [instructions](#) on how to create a dedicated admin-role kubeconfig.

[Upload file](#) [Paste from clipboard](#)

Kubeconfig YAML file  
ocp-vmw kubeconfig.txt


 

Credential name  
ocp-vmw

 **ADDING A CLUSTER**

Adding a cluster is needed for Astra Control to discover your Kubernetes applications.

Select a cloud provider and input credentials to get started.

Read more in [Clusters](#) .

Cancel

Configure storage →



The kubeconfig file can be generated to authenticate with a username and password or a token. Tokens expire after a limited amount of time and might leave the registered cluster unreachable. NetApp recommends using a kubeconfig file with a username and password to register your OpenShift clusters to Astra Control Center.

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.

**Add cluster**

STEP 2/3: STORAGE

×

STORAGE

Existing storage classes are discovered and verified as eligible for use with Astra Control. You can use your existing default, or choose to set a new default at this time.

Applications with persistent volumes on eligible storage classes are validated for use with Astra Control.

Set default	Storage class	Storage provisioner	Reclaim policy	Binding mode	Eligible
<input checked="" type="radio"/>	ocp-trident <small>Default</small>	csi.trident.netapp.io	Delete	Immediate	
<input type="radio"/>	ocp-trident-iscsi	csi.trident.netapp.io	Delete	Immediate	
<input type="radio"/>	project-1-sc	csi.trident.netapp.io	Delete	Immediate	
<input type="radio"/>	thin	kubernetes.io/vsphere-volume	Delete	Immediate	

← Select credentials

Review →

- Register both OpenShift clusters as described in step 1. When added, the clusters move to the Discovering status while Astra Control Center inspects them and installs the necessary agents. Cluster status changes to Running after they are successfully registered.

admin

10

Dashboard

MANAGE YOUR APPS

Apps

**Clusters**

MANAGE YOUR STORAGE

Backends

Buckets

MANAGE YOUR ACCOUNT

Account

Activity

Support

Clusters

Actions

+ Add

Search

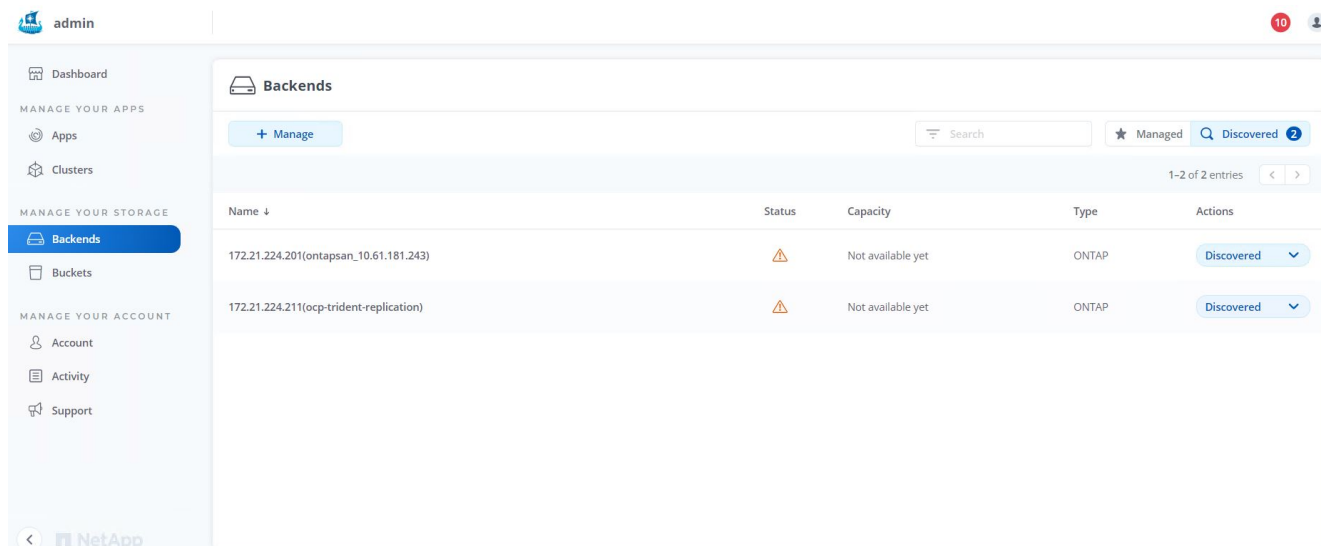
1-2 of 2 entries

<input type="checkbox"/>	Name ↓	Ready	Type	Version	Actions
<input type="checkbox"/>	<a href="#">ocp-vmw</a>		Red Hat OpenShift	v1.20.0+df9c838	Running
<input type="checkbox"/>	<a href="#">ocp-vmware2</a>		Red Hat OpenShift	v1.20.0+c8905da	Running



All Red Hat OpenShift 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.

- Import ONTAP clusters as storage resources to be managed as backends by Astra Control Center. When OpenShift 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.



- To import the ONTAP clusters, go 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.

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



- For backup and restore across OpenShift clusters using Astra Control Center, you must provision an object storage bucket that supports the S3 protocol. Currently supported options are ONTAP S3, StorageGRID, and AWS S3. 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.

**Add bucket**
✕

**STORAGE BUCKET**

Enter the access details of your existing object store bucket to allow Astra Control to store your application backups.

Type

Generic S3

Existing bucket name

ocp-vmware2-astra-cc

Description (optional)

S3 server name or IP address

s3.us-east-1.amazonaws.com

☒ Make this bucket the default bucket for this cloud

**SELECT CREDENTIALS**

Astra Control requires S3 access credentials with the roles necessary to facilitate Kubernetes application data management.

Add

Use existing

Access ID

AMW5TCKFDSU6HWSZXABD

Secret key

.....

Credential name

AWS-S3

Cancel

Add ✓

**ADDING STORAGE BUCKETS**

Astra Control stores backups in your existing object store buckets. The first bucket added for a selected cloud will be designated as the default bucket for backup and clone operations.

Read more in [storage buckets](#).

Next: [Choose the Applications To Protect.](#)

## Choose the applications to protect

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



## Manage applications

1. After the OpenShift 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.



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

<div> <div>Apps</div> <div> <div>Actions</div> <div>+ Define</div> <div>All Clusters</div> <div>Search</div> <div>Managed</div> <div>Discovered 175</div> <div>Ignored</div> </div> </div>							
1-1 of 1 entries							
<input type="checkbox"/>	Name ↓	Ready	Protected	Cluster	Group	Discovered	Actions
<input type="checkbox"/>	<a href="#">wordpress-astra-ff4f9</a>				■ wordpress-astra-ff4f9	2021/07/29 11:09 UTC	Available

Next: [Protect Your applications.](#)

## Protect your applications

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

### Creating an application snapshot

A snapshot of an application creates an ONTAP Snapshot copy 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.

wp

Running

APPLICATION STATUS

Healthy

APPLICATION PROTECTION STATUS

Unprotected

Images

docker.io/bitnami/mariadb:10.5.13-debian-10-r58

docker.io/bitnami/wordpress:5.9.0-debian-10-r1

Protection schedule

Disabled

Group

■ wp

Cluster

Snapshot

Backup

Clone

Restore

Unmanage

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.

**Snapshot application**

STEP 1/2: DETAILS

X

SNAPSHOT DETAILS

Name

wp-snapshot-20220228185949

CREATING APPLICATION SNAPSHOTS

Astra Control can take a quick snapshot of your application configuration and persistent storage. Enter a snapshot name to get started.

Read more in [Protect apps](#).

Application

wp

Namespace

wp

Cluster

ocp-vmw

Cancel

Next →

## Creating an application backup

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

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
```

1. 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.

**wp**

Running

Snapshot

Backup

Clone

Restore

Unmanage

APPLICATION STATUS

Healthy

APPLICATION PROTECTION STATUS

Unprotected

Images

docker.io/bitnami/mariadb:10.5.13-debian-10-r58

docker.io/bitnami/wordpress:5.9.0-debian-10-r1

Protection schedule

Disabled

Group

wp

Cluster

ocp-vmw

2. 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.

Backup application

STEP 1/2: DETAILS

X

BACKUP DETAILS

Name

wp-backup

☐ Backup from an existing snapshot

BACKUP DESTINATION

Bucket

na-ocp-astra/na-ocp-acc Available

CREATING APPLICATION BACKUPS

Astra Control can take a backup of your application configuration and persistent storage. Persistent storage backups are transferred to your object store. Enter a backup name to get started.

Read more in [Application backups](#).

Application

wp

Namespace

wp

Cluster

ocp-vmw

Cancel

Next →

## 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 Apps > Managed tab and click the app in question. Click the dropdown menu next to the application name and click **Restore**.

wp

Running

APPLICATION STATUS

Healthy

APPLICATION PROTECTION STATUS

Partially protected

Images

docker.io/bitnami/mariadb:10.5.13-debian-10-r58  
 docker.io/bitnami/wordpress:5.9.0-debian-10-r1

Protection schedule

Disabled

Group

wp

Cluster

ocp-vmw

Snapshot

Backup

Clone

Restore

Unmanage

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**.

Restore application

STEP 1/2: DETAILS

RESTORE DETAILS

Destination cluster

ocp-vmw

Destination namespace

wp

RESTORE SOURCE

Filter

Snapshots

Backups

Application backup	Ready	On-Schedule/On-Demand	Created ↑
wp-backup	✓	On-Demand	2022/02/28 18:54 UTC

RESTORING APPLICATIONS

Astra Control can restore your application configuration and persistent storage. Select a source snapshot or backup for the restored application.

- Application wp
- Namespace wp
- Cluster ocp-vmw

Cancel

Next →

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

Restore application

STEP 2/2: SUMMARY

REVIEW RESTORE INFORMATION

⚠️

All existing resources associated with this application will be deleted and replaced with the source backup "wp-backup" taken on 2022/02/28 18:54 UTC. Persistent volumes will be deleted and recreated. External resources with dependencies on this application may be impacted.

We recommend taking a snapshot or a backup of your application before proceeding.

BACKUP

wp-backup

ORIGINAL GROUP

wp

ORIGINAL CLUSTER

ocp-vmw

RESOURCE LABELS

ClusterRole

kubernetes.io/bootstrapping: rbac-defaults +1

ClusterRoleBinding

RESTORE

wp

DESTINATION GROUP

wp

DESTINATION CLUSTER

ocp-vmw

RESOURCE LABELS

ClusterRole

kubernetes.io/bootstrapping: rbac-defaults +1

ClusterRoleBinding

Are you sure you want to restore the application "wp"?

Type **restore** below to confirm.

Confirm to restore

restore

← Back

Restore ✓

- 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.

Actions ▾

+ Define

▾

Search

★

🔍

110

🔄

🔄

1-1 of 1 entries

<

>

<input type="checkbox"/>	Name ↓	Ready	Protected	Cluster	Group	Discovered	Actions
<input type="checkbox"/>	<a href="#">wp</a>	✔	<div>📘</div>	<div>🔄</div> <a href="#">ocp-vmw</a>	<div>■</div> wp	2022/02/28 18:34 UTC	<div>Available</div> ▾

## 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.

 **wp**

 Running


 Snapshot


 Backup


 Clone


 Restore

 Unmanage

 APPLICATION STATUS


 Healthy


 APPLICATION PROTECTION STATUS

 Partially protected

**Images**  
 docker.io/bitnami/mariadb:10.5.13-debian-10-r58  
 docker.io/bitnami/wordpress:5.9.0-debian-10-r1

**Protection schedule**  
 Disabled

**Group**  
 wp

**Cluster**  
 ocp-vmw

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 or a backup or the current state of the application. Then click Next and click Clone on review pane once you have reviewed the details.

 **Clone application**

STEP 1/2: DETAILS

✕

CLONE DETAILS

Clone name  
 wp-clone

Clone namespace  
 wp-clone

Destination cluster  
 ocp-vmw

☐ Clone from an existing snapshot or backup

CLONING APPLICATIONS

Astra Control can create a clone of your application configuration and persistent storage. Persistent storage backups are transferred from your object store, so choosing a clone from an existing backup will complete the fastest. Enter a clone name to get started.

Read more in [Clone applications](#)

 Application  
wp

 Namespace  
wp

 Cluster  
ocp-vmw



Cancel

Next →

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.

## Applications

<div>Actions <span>▼</span> <span>+ Define</span> <span>📦 ▼</span> <span>🔍 Search</span> <span>★</span> <span>🔍 110</span> <span>🗑️</span></div>							
<div>🔄 1-2 of 2 entries <span>&lt;</span> <span>&gt;</span></div>							
<input type="checkbox"/>	Name ↓	Ready	Protected	Cluster	Group	Discovered	Actions
<input type="checkbox"/>	<a href="#">wp</a>	✓	<span>ℹ️</span>	 <a href="#">ocp-vmw</a>	■ wp	2022/02/28 18:34 UTC	Available <span>▼</span>
<input type="checkbox"/>	<a href="#">wp-clone</a>	✓	<span>⚠️</span>	 <a href="#">ocp-vmw</a>	■ wp-clone	2022/02/28 19:21 UTC	Available <span>▼</span>

Next: [Solution Validation/Use Cases](#).

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