



## **Deploy ONTAP tools**

### **ONTAP tools for VMware vSphere 10**

NetApp  
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# Deploy ONTAP tools

## ONTAP tools for VMware vSphere Quick Start

ONTAP tools for VMware vSphere is a single vCenter Server plug-in that includes ONTAP tools and VASA Provider extensions. ONTAP tools are recommended for all ONTAP vSphere environments as it configures ESXi host settings and provisions ONTAP storage using best practices. The VASA Provider is required for virtual volumes (vVols) support.

### Preparing for installation

You deploy the plug-in as a virtual appliance, which reduces your effort of installing and registering each product separately with the vCenter Server.

### Deployment requirements

Before deploying the ONTAP tools for VMware vSphere, you should be familiar with the space requirements for the deployment package and some basic host system requirements.

You can use the ONTAP tools with either a Windows vCenter Server or with a VMware vCenter Server Virtual Appliance (vCSA). You must deploy the ONTAP tools on a supported vSphere that includes ESXi system.

- **Installation package space requirements per node**

- 10 GB for thin provisioned installations
- 200 GB for thick provisioned installations

- **Host system sizing requirements per node**

Recommended memory as per the size of deployment and per node is as shown in the table below:

Type of deployment	CPUs	Memory(GB)
Small (S)	8	16
Medium (M)	12	24
Large (L)	16	32

### Minimum storage and application requirements:

Storage, host, and applications	Version requirements
ONTAP	ONTAP 9.10.1 , 9.11 , 9.12, and 9.13
VMware vSphere	Minimum supported VMware version is 7.0.3.
ESXi hosts	ESXi 7.0.3 or later version
vCenter server	vCenter 7.0.3
VASA provider	3.0

Storage, host, and applications	Version requirements
OVA Application	10.0

For more information, see [Requirements for deploying the ONTAP tools](#)

## ONTAP tools requirements

- Configure and set up your vCenter Server environment.
- Download the .ova file.
- The login credentials for your vCenter Server instance.
- Delete the browser cache to avoid any browser cache issue during the deployment of the ONTAP tools.
- Configure the default gateway to be used by the virtual appliance to respond to ICMP pings.
- A valid DNS hostname for the virtual appliance.

## Deploying ONTAP tools

### Steps

1. Download .zip file that contains binaries and signed certificates from the [NetApp Support Site](#) to a vSphere Client system to deploy the ONTAP tools.
2. Extract the .zip file and deploy the .ova file.
3. Log in to the vSphere server.
4. Navigate to the resource pool or the host where you want to deploy the OVA.
5. Right-click the required datacenter, and select **Deploy OVF template....**
6. You can either enter the URL for the .ova file or browse to the folder where the .ova file is saved, and then select **Next**.
7. Enter the required details to complete the deployment.

You can view the progress of the deployment from the Tasks tab, and wait for deployment to complete.

## Requirements for deploying the ONTAP tools

Before deploying the ONTAP tools for VMware vSphere, you should be familiar with the space requirements for the deployment package and some basic host system requirements.

You can use the ONTAP tools with either a Windows vCenter Server or with a VMware vCenter Server Virtual Appliance (vCSA). You must deploy the ONTAP tools on a supported vSphere that includes ESXi system.

### • Installation package space requirements per node

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VMware vSphere	Minimum supported VMware version is 7.0.3.
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vCenter server	vCenter 7.0.3
VASA provider	3.0
OVA Application	10.0

The Interoperability Matrix Tool (IMT) contains the latest information about the supported versions of ONTAP, vCenter Server, ESXi hosts, and plug-in applications.

[Interoperability Matrix Tool](#)

## Additional deployment considerations

You must consider few requirements while customizing the deployment ONTAP tools.

### Application user password

This is the password assigned to the administrator account. For security reasons, it is recommended that the password length is eight to thirty characters long and contains a minimum of one upper, one lower, one digit, and one special character. Password expires after 90 days.

### Appliance maintenance console credentials

You must access the maintenance console by using the “maint” user name. You can set the password for the “maint” user during deployment. You can use the Application Configuration menu of the maintenance console of your ONTAP tools to change the password.

### vCenter Server IP address

- You should provide the IP address (IPv4) of the vCenter Server instance to which you want to register ONTAP tools.

The type of ONTAP tools and VASA certificates generated depends on the IP address (IPv4) that you have provided during deployment.

- The ONTAP tools IP address used to register with vCenter Server depends on the type of vCenter Server IP address (IPv4) entered in the deployment wizard.

Both the ONTAP tools and VASA certificates will be generated using the same type of IP address used

during vCenter Server registration.

- Ensure that VM's are not migrated during installation.



IPv6 is not supported in ONTAP tools for VMware vSphere 10.0 release.

### Appliance network properties

Specify a valid DNS hostname (unqualified) as well as the static IP address for the ONTAP tools and the other network parameters. DHCP is not supported in ONTAP tools for VMware vSphere 10.0 release. All of these parameters are required for proper installation and operation.

## How to download ONTAP tools

You can download the `.zip` file that contains binaries (`.ova`) and signed certificates for the ONTAP tools for VMware vSphere from the [NetApp Support Site](#).

The `.ova` file includes the ONTAP tools. When the deployment is complete, ONTAP tools and VASA products are installed in your environment. By default, ONTAP tools starts working as soon as you decide on the subsequent deployment model and choose whether to enable VASA Provider based on your requirements.

### Content library

Content library in VMware is a container object which stores VM templates, vApp templates, and other types of files. Deployment with content library provides you a seamless experience as it is not depended on the network connectivity.

You need to create a content library to store the OVA before deploying them in HA configuration. Do not select any security policy or set any password for the content library.

Create the content library using the following steps:

#### Steps

1. Login to VSphere client.
2. Select the horizontal ellipsis next to vSphere client and select **Content library**.
3. Select **Create** button on the right side of the page.
4. Provide a name for the library and create the content library.

## Deployment Checklist

The checklist here helps you to have all the information handy before you begin the deployment. Make sure to note down these values for your setup before deploying.

You should be aware of the basic storage backend requirements, application requirements, and license requirements before you begin deploying the ONTAP tools for VMware vSphere.

Before you deploy ONTAP tools for VMware vSphere, it is good practice to plan your deployment and decide how you want to configure ONTAP tools in your environment.

### First Node and other common fields

- ☐ VASA Provider Username(\*)

- ☐ Administrator Username(\*)
- ☐ NTP Servers (provided to the vCenter for time synchronization)

### **Certificate Details**

- ☐ Enable Custom CA Certificate
- ☐ Root and Intermediate certificates (ignore when self-signed is enabled)
- ☐ Leaf certificate and Private key (ignored when self-signed is enabled)
- ☐ Domain name(\*) (ignored when self-signed is enabled)

### **Load balancer and API server details**

- ☐ Load Balancer IP(\*)
- ☐ Virtual IP for K8s Control Plane(\*)

### **ONTAP Details**

- ☐ ONTAP Management LIF(\*) (Cluster management IP)
- ☐ ONTAP Data LIF(\*)
- ☐ Storage VM(\*)
- ☐ ONTAP Cluster Username(\*)
- ☐ Enable Migration
- ☐ Primary VM
- ☐ Content Library Name(\*)
- ☐ OVF Template Name(\*)
- ☐ Hostname(\*)
- ☐ Username(\*)

### **First Node Network details**

- ☐ HostName(\*)
- ☐ IPAddress(\*)
- ☐ Prefix length (Only for IPv6)
- ☐ Netmask (Only for IPv4)(\*)
- ☐ Gateway(\*)
- ☐ Primary DNS(\*)
- ☐ Secondary DNS(\*)
- ☐ Search Domains(\*)

### **Second Node - Node Network details**

- ☐ HostName(\*)
- ☐ IPAddress(\*)

### **Third Node - Node Network details**

☐ HostName(\*)

☐ IPAddress(\*)

## Prepare to deploy ONTAP tools

ONTAP tools for VMware vSphere supports multi vCenter Server that includes VASA Provider.

You should be aware of the basic storage backend requirements, application requirements, and license requirements before you begin deploying the ONTAP tools for VMware vSphere.

Before you deploy ONTAP tools for VMware vSphere, it is good practice to plan your deployment and decide how you want to configure ONTAP tools in your environment.

### Preparing for deployment

Following are the ONTAP tools requirements before proceeding with the deployment:

- Configure and set up your vCenter Server environment.
- Download the .ova file.
- Make sure the host or the resource pool where the OVA is deployed has the minimum resources mentioned in the **Requirements for deploying the ONTAP tools** section.
- Delete the browser cache.
- You need two Virtual IPs for Load Balancer and Kubernetes API Server. Get two free IPs in the VLAN, used for deployment, which is used to access the services post deployment.
- Procure CA certificates (root , Leaf, and Intermediate certificates) from the commercial CA.
- In case of multi-vCenter deployment where Custom CA certificates are mandatory, map the **Domain Name** on which the certificate is issued to the **Virtual IP**. Perform a ping check on the domain name to check whether the domain is getting resolved to the intended IP.
- A storage VM on ONTAP with NFS enabled is required. Follow the below steps to configure the storage VM:
  - Have both your ONTAP System Manager and ONTAP CLI open.
  - If you prefer to create a new storage VM, login to your ONTAP System Manager and create a storage VM with NFS enabled.
  - Add an aggregate with at least 100GB.
  - To verify if the aggregate is added successfully:
    - a) Login to your ONTAP CLI
    - b) Run the command, `vserver show -fields aggr-list`
    - c) If your aggregate has not been listed against your default storage VM, run the command: `vserver modify <storage VM name> -aggr-list <aggregate name>`

To find the name of the aggregate you want to add to your default storage VM, you can use the following command in the ONTAP CLI: *aggr show*

This command displays a list of aggregates on the storage system, and you can find the name of the aggregate you need to use in the **Aggregate** column.



- There are two options with deployment configuration, one is cluster credentials and the other is SVM credentials or direct SVM. For direct SVM, you need to configure the management LIF for the SVM before starting the deployment. Skip this for cluster credentials.
- Make sure network route exists, login to your ONTAP CLI and run the command, network route show -vserver <storage VM name>

If it does not exist then login to your ONTAP CLI and run the following commands, net route create -vserver <vserver name> -destination <destination IP> -gateway <gateway IP> -metric 20

- Make sure that an Export Policy exists for the storage VM. On your ONTAP System Manager, go to **Storage > Storage VMs > [storage VM name] > Settings > Export Policies**. If there is no export policy follow the next step.
- Create an export policy rule using the following commands from ONTAP CLI

```
vserver export-policy rule create -vserver <storage VM name> -policyname <export policy name>
-clientmatch <ESXI-IP> -rorule any -rwrule any -superuser any
```



Make sure that *superuser* value is not *none*.

## How to deploy Non-HA single node configuration

You can configure Non-HA single node in either small, medium, or large configurations.

- Small Non-HA configuration contains 8 CPUs and 16 GB RAM.
- Medium Non-HA configuration contains 12 CPUs and 24 GB RAM.
- Large Non-HA configuration contains 16 CPUs and 32 GB RAM.

Make sure network route is present.

Example: C1\_sti67-vsrm-ucs154k\_1679633108::> network route create -vserver <SVM> -destination 0.0.0.0/0 -gateway <gateway\_ip>

### About this task

This task gives you instructions on how to install Non-HA single node in small, medium, or high configurations.

### Steps

1. Log in to the vSphere server.
2. Navigate to the resource pool or the host where you want to deploy the OVA.
3. Right-click the required datacenter, and select **Deploy OVF template...**
4. You can either enter the URL for the .ova file or browse to the folder where the .ova file is saved, and then select **Next**.
5. Select a name and folder for the virtual machine and select **Next**.
6. Select the host and select **Next**
7. Review the summary of the template and select **Next**.
8. Read and accept the license agreement and select **Next**.
9. In the **Configuration window**, select **Non-HA single Node(small)**, **Non-HA single Node(Medium)**, or

## Non-HA single Node(large) configuration.

10. In the Configuration window choose the required size of Non-HA single Node configuration and select **Next**.
11. Select the datastore where you need to deploy the OVA and select **Next**.
12. Select the source and destination network and select **Next**.
13. Select **Customize template > system configuration** window. Enter the following details:
  - a. VASA provider username and password: This username and password is used for registering the VASA provider in the vCenter.
  - b. The **Enable ASUP** checkbox is selected by default.

The ASUP can be enabled or disabled only during deployment.
  - c. Administrator Username and Administrator Password: This is the password used to login to **ONTAP Tools Manager** UI.
  - d. Enter NTP server information in **NTP Servers** field.
  - e. Maintenance user password: This is used to grant access to 'Maint Console Options'.
14. In the **Customize template > VASA Provider Certificates** window, enter the following details:
  - a. Check Enable Custom CA certificate check box. This is required for multi-VC enablement. In case of non multi-VC environment, ignore the check box. There is no need to mention the certificates and domain name, you need to only provide the virtual IP details.
  - b. Copy and paste the Root and Intermediate certificates.
  - c. Copy and paste the Leaf certificates and Private key.
  - d. Enter the Domain name with which you generated the certificate.
  - e. Enter the Load Balance IP details..
15. In **Customize template > Deployment Configuration** window, enter the following details:
  - a. Enter a free IP Address in Virtual IP for K8s Control Plane. You need this for K8s API Server.
  - b. Select the checkbox against **Enable SVM scoping** option when you intend to use direct SVM. To use ONTAP cluster, do not select the checkbox.



When SVM scope is enabled you should have already enabled SVM support with management IP.

- c. Enter the details shown in the below image:

Enable SVM scoping	Ignore when cluster scoping is required <input type="checkbox"/>
ONTAP/SVM Management LIF(*)	Specify the Management LIF for trident <div><div></div><div>!</div></div>
ONTAP/SVM Data LIF(*)	Specify the Data LIF for trident <div><div></div><div>!</div></div>
Storage VM	Specify the storage VM Name <div><div>Ignored when SVM scop</div></div>
ONTAP/SVM Username(*)	Specify the OnTap Cluster Username <div><div></div><div>!</div></div>
ONTAP/SVM Password(*)	Specify the OnTap Cluster Password Password <div><div></div><div>!</div></div> <div>Enter a password to enable authentication.</div>

- d. Enter the ONTAP Cluster or the SVM Management IP in **ONTAP/SVM Management LIF**.
- e. Enter the ONTAP Cluster or the SVM **ONTAP/SVM Data LIF**.
- f. For Storage VM, you can choose to either provide your ONTAP's default storage VM details or you can create a new storage VM. Do not enter the value in **Storage VM** field when Enable SVM scoping is selected as this field is ignored.
- g. Enter the ONTAP/SVM Username.
- h. Enter the ONTAP/SVM Password.
- i. Enable Migration is disabled by default. Do not alter this choice.
- j. Primary VM is enabled by default. Do not alter this choice.

16. In **Customize template > Node Configuration** window enter the network properties of the OVA.



The information provided here will be validated for proper patterns during installation process. In case of discrepancy, an error message will be displayed on the web console and you will be prompted to correct any incorrect information provided.

- a. Enter the Host name.
- b. Enter the IP Address mapped to the host name.
- c. Prefix length (only for IPV6)
- d. Netmask (only for IPV4)
- e. Gateway
- f. Primary DNS
- g. Secondary DNS
- h. Search Domains

17. Review the details in the **Ready to complete** window, select **FINISH**.

As the task gets created, the progress is shown in the vSphere task bar.

18. Power on the VM after the completion of the task.

The installation begins. You can track the the installation progress in VM's web console.

As part of the installation, Node configurations are validated. The inputs provided under different sections under the **Customize template** in the OVF form are validated. In case of any discrepancies, a dialog prompts you to take corrective action.

19. To make necessary changes in the dialog prompt, follow the below steps:

- a. Double click on the web console to start interacting with the console.
- b. Use UP and DOWN arrow keys on your keyboard to navigate across the fields shown.
- c. Use RIGHT and LEFT arrow keys on your keyboard to navigate to the right or left end of the value provided to the field.
- d. Use TAB to navigate across the panel to enter your values, **OK** or **CANCEL**.
- e. Use ENTER to select either **OK** or **CANCEL**.

20. On selecting **OK** or **CANCEL**, the values provided would again be validated. You have the provision to correct any values for 3 times. If you fail to correct within the 3 attempts, the product installation stops and you are advised to try the installation on a fresh VM.

21. After successful installation, web console shows the message stating the ONTAP tools for VMware vSphere is in Healthy State.

## How to deploy HA three node configuration

You can configure HA three node in either small, medium, or large configurations.

- Small HA three node contains 8 CPUs and 16 GB RAM per node.
- Medium HA three node contains 12 CPUs and 24 GB RAM per node.
- Large HA three node contains 16 CPUs and 32 GB RAM per node.

### About this task

This task gives you instructions on how to install HA three node in small, medium, or high configurations.



Creating the content library is a mandatory step for deploying HA three node configuration. See [How to download ONTAP tools](#) for details.



Before proceeding with the deployment, set the cluster's Distributed Resource Scheduler (DRS) on the inventory to **Conservative** during the installation of ONTAP tools.

### Steps

1. Log in to the vSphere server.
2. Navigate to the content library and select your content library.
3. Select **Actions** in the right side of the page and select **Import item** and import the OVA file.
4. Navigate to the resource pool or the host where you want to deploy the OVA.
5. Right-click the required datacenter, and select **Deploy OVF template....**

6. Select the content library where the .ova file is saved, and then select **Next**.
7. Select a name and folder for the virtual machine and select **Next**.
8. Select the host and select **Next**
9. Review the summary of the template and select **Next**.
10. Read and accept the license agreement and select **Next**.
11. In the **Configuration window**, select **HA three Node(small)**, **HA three Node(Medium)**, or **HA three Node(large)** configuration, depending on your requirement.
12. Select the storage for the configuration and disk files, select **Next**.
13. Select the destination network for each source network, select **Next**.
14. Select **Customize template > system configuration** window. Enter the following details:
  - a. VASA provider username and password: This username and password is used for registering the VASA provider in the vCenter.
  - b. The **Enable ASUP** checkbox is selected by default.

The ASUP can be enabled or disabled only during deployment.
  - c. Administrator Username and Administrator Password: This is the password used to login to **ONTAP tools Manager** UI.
  - d. Enter NTP server information in **NTP Servers** field.
  - e. Maintenance user password: This is used to grant access to 'Maint Console Options'.
15. In the **Customize template > VASA Provider Certificates** window, enter the following details:
  - a. Check Enable Custom CA certificate check box. This is required for multi-VC enablement. In case of non multi-VC environment, ignore the check box. There is no need to mention the certificates and domain name, you need to only provide the virtual IP details.
  - b. Copy and paste the Root and Intermediate certificates.
  - c. Copy and paste the Leaf certificates and Private key.
  - d. Enter the Domain name with which you generated the certificate.
  - e. Enter the Load Balance IP details.
16. In **Customize template > Deployment Configuration** window, enter the following details:
  - a. Enter a free IP Address in Virtual IP for K8s Control Plane. You need this for K8s API Server.
  - b. Select the checkbox against **Enable SVM scoping** option when you intend to use direct SVM. To use ONTAP cluster, do not select the checkbox.



When SVM scope is enabled you should have already enabled SVM support with management IP.

- c. Enter the details shown in the below image:

Enable SVM scoping	Ignore when cluster scoping is required <input type="checkbox"/>
ONTAP/SVM Management LIF(*)	Specify the Management LIF for trident <div><div></div><div>!</div></div>
ONTAP/SVM Data LIF(*)	Specify the Data LIF for trident <div><div></div><div>!</div></div>
Storage VM	Specify the storage VM Name <div>Ignored when SVM scop</div>
ONTAP/SVM Username(*)	Specify the OnTap Cluster Username <div><div></div><div>!</div></div>
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- d. Enter the ONTAP Cluster or the SVM Management IP in **ONTAP/SVM Management LIF**.
  - e. Enter the ONTAP Cluster or the SVM **ONTAP/SVM Data LIF**.
  - f. For Storage VM, you can choose to either provide your ONTAP's default storage VM details or you can create a new storage VM. Do not enter the value in **Storage VM** field when Enable SVM scoping is selected as this field is ignored.
  - g. Enter the ONTAP/SVM Username.
  - h. Enter the ONTAP/SVM Password.
  - i. Enable Migration is disabled by default. Do not alter this choice.
  - j. Primary VM is enabled by default. Do not alter this choice.
17. In **Customize template > Content Library Details** window, enter the **Content Library Name** and the **OVF Template Name**.
  18. In **Customize template > vCenter Configuration** window, provide the details of the vCenter where the content library is hosted.
  19. In **Customize template > Node Configuration** window, enter the network properties of the OVA for all the three nodes.



The information provided here will be validated for proper patterns during installation process. In case of discrepancy, an error message will be displayed on the web console and you will be prompted to correct any incorrect information provided.

Enter the following details:

- a. Host name.
- b. IP Address mapped to the host name.
- c. Prefix length (only for IPV6)
- d. Netmask (only for IPV4)

- e. Gateway
- f. Primary DNS
- g. Secondary DNS
- h. Search Domains

20. In **Customize template > Node 2 Configuration** and **Node 3 Configuration** window, enter the following details:

- a. HostName
- b. IP Address

21. Review the details in the **Ready to complete** window, select **FINISH**.

As the task gets created, the progress is shown in the vSphere task bar.

22. Power on the VM after the completion of the task.

The installation begins. You can track the the installation progress in VM's web console.

As part of the installation, Node configurations are validated. The inputs provided under different sections under the **Customize template** in the OVF form are validated. In case of any discrepancies, a dialog prompts you to take corrective action.

23. To make necessary changes in the dialog prompt, follow the below steps:

- a. Double click on the web console to start interacting with the console.
- b. Use UP and DOWN arrow keys on your keyboard to navigate across the fields shown.
- c. Use RIGHT and LEFT arrow keys on your keyboard to navigate to the right or left end of the value provided to the field.
- d. Use TAB to navigate across the panel to enter your values, **OK** or **CANCEL**.
- e. Use ENTER to select either **OK** or **CANCEL**.

24. On selecting **OK** or **CANCEL**, the values provided would again be validated. You have the provision to correct any values for 3 times. If you fail to correct within the 3 attempts, the product installation stops and you are advised to try the installation on a fresh VM.

25. After successful installation, web console shows the message stating the ONTAP tools for VMware vSphere is in Healthy State.

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