

Dell EMC UnityVSA Installation Guide

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CHAPTER 1

Requirements for deploying a UnityVSA

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Overview of UnityVSA

UnityVSA (Virtual Storage Appliance) is a software-defined storage platform that provides users with agility and flexibility. UnityVSA is deployed on a VMware ESXi host and is available in two editions - Professional Edition (PE) and Community Edition (CE). Professional Edition is a licensed product available at capacity levels of 10 TB, 25 TB, and 50 TB. Community Edition is a free downloadable 4 TB solution that is recommended for nonproduction use.

UnityVSA HA

UnityVSA HA is an enhanced version of single-SP UnityVSA. By adding dual-SP functionality, UnityVSA HA can recover from one SP failure, which significantly increases the applicable use case scenarios of the system. Unlike the single-SP UnityVSA, UnityVSA HA version is only available in Professional Edition (PE). It offers three capacity choices: 10 TB, 25 TB, and 50 TB.

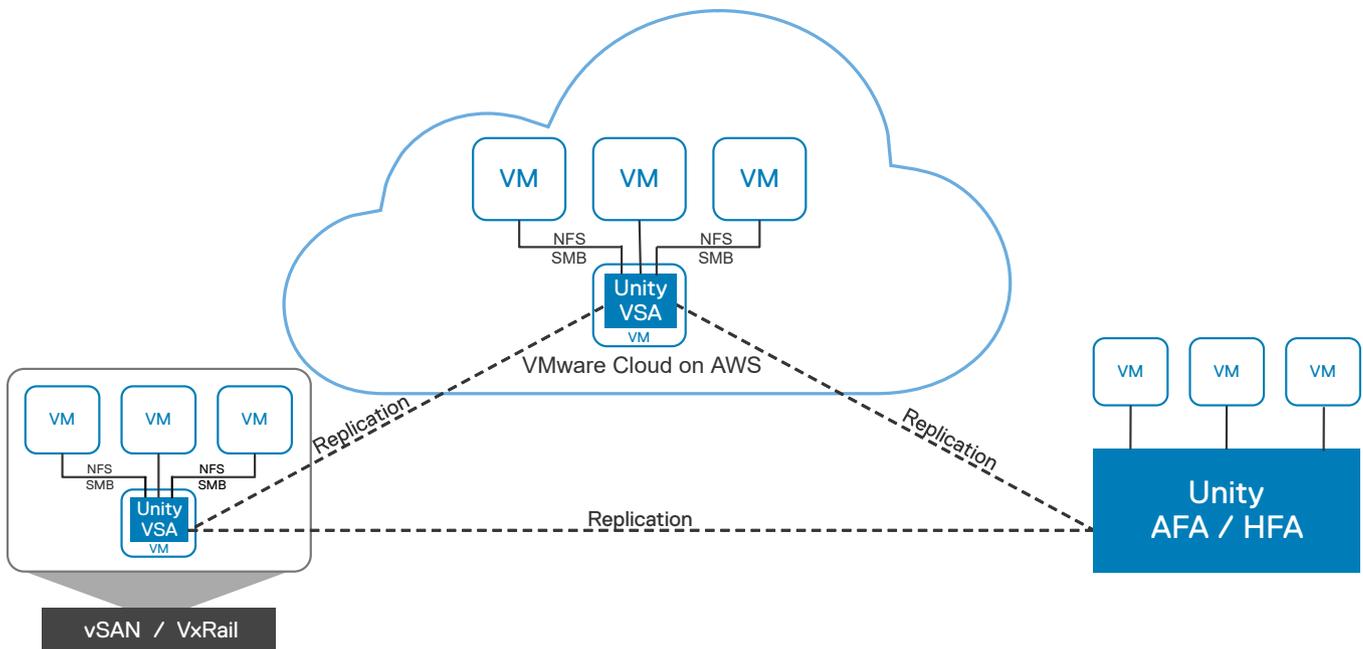
Unity Cloud Edition

Deploying Unity Cloud Edition with VMware Cloud on AWS (VMC) provides benefits to both cloud and on-premises storage resources.

Unity Cloud Edition enables your cloud resources to use UnityVSA features and file management in the cloud storage environment.

Data mobility between Unity Cloud Edition and on-premises Unity and UnityVSA appliances is the same as data mobility between on-premises appliances. As a result, Unity Cloud Edition enables cloud-based data protection for block and file resources hosted on-premises.

Figure 1 Unity Cloud Edition integration with VMware Cloud on AWS (VMC)



Unity Cloud Edition HA can be upgraded without disrupting workloads.

This document describes how to deploy UnityVSA, UnityVSA HA, Unity Cloud Edition, Unity Cloud Edition HA, and the Tie Breaker Node (TBN) for UnityVSA HA. For information about using UnityVSA or Unity Cloud Edition, see *Dell EMC UnityVSA Frequently Asked Questions*, which is available from the [UnityVSA Info Hub](#), and see the UnityVSA online help.

Additional resources

As part of an improvement effort, revisions of the software and hardware are periodically released. Therefore, some functions described in this document might not be supported by all versions of the software or hardware currently in use. The product release notes provide the most up-to-date information on product features. Contact your technical support professional if a product does not function properly or does not function as described in this document.

Where to get help

Support, product, and licensing information can be obtained as follows:

Product information

For product and feature documentation or release notes, go to Unity Technical Documentation at: www.emc.com/en-us/documentation/unity-family.htm.

Troubleshooting

For information about products, software updates, licensing, and service, go to Online Support (registration required) at: <https://Support.EMC.com>. After logging in, locate the appropriate **Support by Product** page.

Technical support

For technical support and service requests, go to Online Support at: <https://Support.EMC.com>. After logging in, locate **Create a service request**. To open a service request, you must have a valid support agreement. Contact your Sales Representative for details about obtaining a valid support agreement or to answer any questions about your account.

Special notice conventions used in this document

 **DANGER** Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

 **WARNING** Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

 **CAUTION** Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

 **NOTICE** Addresses practices not related to personal injury.

 **Note:** Presents information that is important, but not hazard-related.

General installation requirements and considerations

These installation requirements and considerations apply to both the single-SP UnityVSA and UnityVSA HA. For requirements specific to the single-SP models, see [Requirements for installing a single-SP UnityVSA](#) on page 9. For requirements specific to the UnityVSA HA models, see [Requirements for installing UnityVSA HA](#) on page 9.

ESXi host requirements

A 64-bit ESXi host running 6.0 or later is required for installing UnityVSA. For UnityVSA HA, separate ESXi hosts for SPA, SPB, and the Tie Breaker Node (TBN) are recommended. The use of vCenter to manage ESXi hosts is optional for a single-SP deployment and mandatory for a UnityVSA HA deployment.

Although you can use nested ESXi with a single-SP UnityVSA, deployment, it is not recommended unless it guarantees the exclusive reservation of computing and network resources. Do not use nested ESXi with a UnityVSA HA deployment, because it does not work with HA.

UnityVSA deployment is also supported on VMware Cloud on AWS.

VM environment for on-premises deployment

The ESXi host provides the storage virtualization, which abstracts the physical storage layer from the VM. Datastores are the logical containers that are created on physical storage. Datastores contain the virtual disks that are used by a VM to store its operating system, program files, and other data associated with its activities. You can configure VMs with multiple virtual disks.

From the standpoint of the VM, each virtual disk looks like a SCSI drive that is connected to a SCSI controller. Whether the actual physical storage is being accessed through local storage or network adapters on the host is typically transparent to the VM.

A VM is connected to a virtual network by assigning the VM's network adapters to that network's port group. A vSphere switch detects which virtual machines are connected to each of its virtual ports and uses that information to forward traffic to the correct VM.

For information about configuring and managing a VM environment, see the VMware vSphere documentation.

Network configuration

To deploy and configure UnityVSA, you must provide network configuration information. Contact your network administrator to gather network settings information before you install UnityVSA.

UnityVSA can be configured to use:

- One IPv4 address (static or dynamic)
- One IPv6 address (static or dynamic)
- Both an IPv4 address and an IPv6 address

To use dynamic addressing, your network environment must include a DHCP server (DHCPv4 for an IPv4 address and DHCPv6 or SLAAC for an IPv6 address). If the network environment is not dynamic, you must assign the management IP address manually.

If UnityVSA is configured with a single IP address, a DNS server is optional but highly recommended. If UnityVSA is configured with both an IPv4 and IPv6 address, a DNS configuration is required.

Heartbeat mechanism requirements

UnityVSA HA and the TBN use Layer 2 Ethernet broadcasts to monitor the heartbeats of connected systems. For UnityVSA HA and the TBN to function, each heartbeat network (HB0 and HB1) must reside on the same Layer 2 broadcast domain and VLAN and have Layer 2 broadcast traffic enabled.

Considerations for server hardware platforms that do not support CPU instruction set SSE 4.2

Starting in the UnityVSA 4.3 release, server hardware platforms that do not support CPU instruction set SSE 4.2 are no longer supported. You might encounter an error that prevents you from deploying your new 4.3 or later OVA under the following circumstances:

- You are running in an ESXi cluster environment.
- The Enhanced vMotion Compatibility (EVC) settings are set to strict.
- There is a nonsupported server in your cluster.

This error can occur even if the server on which you intend to install the UnityVSA supports SSE 4.2. If you deploy a 4.3 or later UnityVSA on a single server and receive this error, choose a newer server platform on which to run ESXi. If you deploy or upgrade a previously running 4.0, 4.1, or 4.2

version of UnityVSA within an ESXi cluster, update your EVC settings so that the UnityVSA can only run on the servers in the cluster whose CPUs support SSE 4.2. Otherwise, you must remove the older, nonsupported servers from your cluster environment.

For instructions on modifying the EVC setting within an ESXi cluster, see the VMware documentation.

Note: Changes to your EVC control require you to power cycle UnityVSA within VMWare. A shutdown, restart, or a reboot of UnityVSA is not sufficient to correct this issue after modifying the EVC settings. Power cycling a UnityVSA is a disruptive operation that should be scheduled in advance.

Requirements for installing a single-SP UnityVSA

Installing and configuring a single-SP UnityVSA environment requires a 64-bit ESXi host running version 6.0 or later. The use of vCenter to manage ESXi hosts is optional.

The following requirements also apply:

ESXi requirements	
Hardware processor	Xeon E5 Series Dual Core CPU 64-bit x86 Intel 2 GHz+ (or equivalent)
Hardware memory	<ul style="list-style-type: none"> 18 GB minimum for ESXi 6.0 20 GB minimum for ESXi 6.5/6.7
Hardware network	4x1 GbE or 4x10 GbE (recommended) Note: You can deploy the UnityVSA on a VxRail appliance that has 2 or 4 physical ports. VxRail uses a shared port architecture that may result in lower performance during high traffic windows.
Hardware RAID	RAID card 512 MB NV cache, battery backed (recommended)
UnityVSA SP requirements	
Virtual processor cores	2 (2 GHz+)
Virtual system memory	12 GB
Virtual network adapters	6 (4 ports for I/O, 1 for Unisphere, 1 for support use)

Requirements for installing UnityVSA HA

Installing and configuring a UnityVSA HA requires a 64-bit ESXi host running version 6.0 or later and a VMware vSphere Enterprise Plus license. The use of vCenter to manage ESXi hosts is mandatory. The hosts should have two unused vmnic ports per ESXi host (if deploying on two different hosts and no existing distributed switch).

Dell EMC highly recommends that you deploy each UnityVSA HA SP on a separate ESXi host. Single ESXi host configurations are allowed if high availability is not a primary concern. Depending on your choice, the installation requirements are different:

	Both SPs on one ESXi host	Both SPs on separate ESXi hosts
ESXi requirements		

	Both SPs on one ESXi host	Both SPs on separate ESXi hosts
Hardware processor	Xeon E5 Series Dual Core CPU 64-bit x86 Intel 2 GHz+ (or equivalent)	Xeon E5 Series Dual Core CPU 64-bit x86 Intel 2 GHz+ (or equivalent)
Hardware memory	<ul style="list-style-type: none"> • 30 GB minimum for ESXi 6.0 • 32 GB minimum for ESXi 6.5/6.7 	<ul style="list-style-type: none"> • 18 GB minimum for ESXi 6.0 for each host • 20 GB minimum for ESXi 6.5/6.7 for each host
Hardware network	4x1 GbE, 4x10 GbE, or higher if supported by ESX (recommended)	4 x 1 GbE, 10 GbE, or higher for I/O and 2 x 10 GbE or higher for the inter-SP network (recommended)
Hardware RAID	RAID card 512 MB NV cache, battery backed recommended	RAID card 512 MB NV cache, battery backed recommended
Switch requirements		
Hardware switch	VLAN support is not required.	VLAN support is required.
Datastore requirements		
Can be VMware NFS datastores, VMware VMFS datastores, or both	No shared datastore is required.	<p>At least 1 datastore shared by both ESXi hosts is required, but it is recommended that you configure 6 or more datastores, as follows:</p> <ul style="list-style-type: none"> • 1 datastore for private system data on SPA, with a minimum free capacity of 60GB. • 1 datastore for private system data on SPB, with a minimum free capacity of 60GB. • 1 datastore for shared system data, with a minimum free capacity of 40GB. • 2 datastores for the storage heartbeat. Each datastore needs to have at least 2MB capacity. • 1 or more datastores for storage capacity. The minimum supported capacity is 10GB. For more information, see Add virtual disks to a UnityVSA HA deployment on page 25.

	Both SPs on one ESXi host	Both SPs on separate ESXi hosts
UnityVSA SP requirements		
Virtual processor cores	2 (2GHz+) for each SP	2 (2GHz+) for each SP
Virtual system memory	12 GB for each SP	12 GB for each SP
Virtual network adapters	9 for each SP (4 ports for I/O, 1 for Unisphere, 1 for system use, and 3 for internal communication)	9 for each SP (4 ports for I/O, 1 for Unisphere, 1 for system use, and 3 for internal communication)
vCenter	Required	Required
VLANs	3 (1 for Common Messaging Interface (CMI) SP-to-SP communication, 1 for Heartbeat 0, and 1 for Heartbeat 1). The VLANs must be unique and not used elsewhere on the network.	3 (1 for Common Messaging Interface (CMI) SP-to-SP communication, 1 for Heartbeat 0, and 1 for Heartbeat 1). The VLANs must be unique and not used elsewhere on the network.
vmnic ports	VM NIC ports are not required.	2 unused VM NIC ports if deploying on two separate ESXi hosts with no existing distributed switch.

Requirements for installing a tie breaker node

Installing a Tie Breaker Node (TBN) on UnityVSA HA requires a host with at least:

- 2 GB memory
- 500 MHz x 2 cores CPU
- 12 GB disk space
- 2x1 GbE for the network with UnityVSA HA

 **Note:** These requirements are in addition to those required by UnityVSA HA.

It is recommended that you deploy the TBN VM on a third ESXi host; that is, a host that is not supporting the UnityVSA SPs.

CHAPTER 2

Deploying a single-SP UnityVSA

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Set up the VM environment for a single-SP UnityVSA

Procedure

1. Verify that the selected ESXi host meets the required configuration, as outlined in [Requirements for installing a single-SP UnityVSA](#) on page 9.
2. Verify, and if necessary configure, the host network configuration.
3. Verify that a vSphere switch has been created.
 - a. Determine which port groups are associated with which subnets so you can ensure that the VM's network adapters are assigned to the correct subnet.
 - Ethernet port 0 is associated with network adapter 3.
 - Ethernet port 1 is associated with network adapter 4.
 - Ethernet port 2 is associated with network adapter 5.
 - Ethernet port 3 is associated with network adapter 6.

You can verify which VM network adapter is mapped to which UnityVSA Ethernet port by comparing the MAC address displayed for the network adapter in the vSphere VM Hardware summary to the MAC address displayed for the Ethernet port in Unisphere.

To display the MAC address in Unisphere, select **System > System View > Enclosures**. Select the rear view of the Disk Processor Enclosure (DPE) and click on an Ethernet port to display detailed information about the port, including its MAC address. It is important to take note of the Ethernet port name, for example, SPA Ethernet Port 3, since this is the port name used when creating iSCSI and replication network interfaces.

- b. If the network environment supports jumbo frames, verify that the MTU value for the switch on the ESXi host is set to the same value as the UnityVSA Ethernet ports.

If the UnityVSA VM sets an MTU value that is higher than the MTU value set on ESXi, the UnityVSA VM MTU value defaults to the smaller value. In vSphere, select **Edit Settings** on the Virtual switch to check the MTU value.

In Unisphere, select the **Settings** icon, and then select **Access > Ethernet**. MTU is not displayed by default so you must select the **Customize** icon, select **Columns** and then click on **MTU**.

The VMware Knowledge Base article, *iSCSI and Jumbo Frames configuration on VMware ESXi/ESX (1007654)*, provides more information.

NOTICE

Do not make any changes to the VM, such as changing the virtual hardware configuration (CPU, memory, NICs, and so on), as this causes UnityVSA to boot in service mode in order to prevent invalid configurations.

Download the OVA file for a single-SP UnityVSA

Before you begin

To download the UnityVSA Professional Edition, you must set up a product support account. If you do not already have an account, go to your product support site to set one up. To download the UnityVSA Community Edition, go to the EMC Community Network website.

Procedure

1. Using a web browser, go to your product support or community site.
2. Select UnityVSA.
3. Locate the available downloads.
4. Select the UnityVSA Open Virtualization Appliance (OVA) file.
5. Save the OVA file to your computer.

Deploy a single-SP UnityVSA directly to an ESXi host

Procedure

1. Access the ESXi server by using its IP address.
2. Select **Virtual Machines > Create / Register VM** to launch the wizard. Using the wizard, complete the following steps.
3. Select **Deploy a virtual machine from an OVF or OVA file**.
4. Enter a name for the new VM and select the OVA file to deploy.
5. Verify the OVF template details, including that the OVA image is signed by Dell EMC.
6. Select a datastore from the list of datastores accessible from the resource you selected in which to create the virtual disks used to store the VM configuration files.

For optimal performance, if you are **not** deploying UnityVSA on a VxRail appliance, deploy the UnityVSA VM on a datastore comprised of different physical disks than the datastore that will contain the virtual disks that provide user data storage to UnityVSA. Failure to follow this recommendation can lead to system and I/O performance degradation. If you are deploying UnityVSA on a VxRail appliance, vSAN selects the physical disks.

7. Select the network mapping, disk provision type, and power on option for the VM.
8. Enter the system name and configure the management IP (IPv4 or IPv6).
9. Review the deployment settings and finish the wizard.
10. Select the UnityVSA VM. Select the Summary tab to view information about the VM.
11. To determine when the UnityVSA VM is fully up and running, monitor the DNS Name field on the Summary tab. When the DNS Name field displays a system name, the UnityVSA VM is ready.

 **Note:** The system name displayed is either the name you specified during deployment or the serial number of the system (format is VIRTXXXXXXXXXX).

12. If you are running the UnityVSA VM on a dynamic network using DHCP or SLAAC, the management IP address is assigned automatically.

You can find the assigned IP by logging into the UnityVSA.

13. If you are not running the UnityVSA VM on a dynamic network using DHCP or SLAAC and you did not configure the management interface when you deployed the OVF template, you must do the following:
 - a. Open the vSphere Console.
 - b. Log in using the service account username and password service/service
 - c. Run the `svc_initial_config` command to assign an IP address.

For an IPv4 address, enter:

```
svc_initial_config -4 "<ipv4_address> <ipv4_netmask> <ipv4_gateway>"
```

For an IPv6 address, enter:

```
svc_initial_config -6 "<ipv6_address> <ipv6_prefix_length>  
<ipv6_default_gateway>"
```

For full usage, enter:

```
svc_initial_config -h
```

Note: Alternatively, you can run the `svc_diag` command from the vSphere Console and identify the UnityVSA system serial number from the output. Then you can use the Connection Utility to discover a list of systems, find the UnityVSA serial number in the list, and assign an IP address.

14. Enter the UnityVSA management IP address in your browser to open Unisphere.

Deploy a single-SP UnityVSA through a vCenter server

Procedure

1. Access vCenter using this URL: `https://<vCenter_address>/ui`.
2. Select the host, select **Actions** and select **Deploy OVF template** to launch the Deploy OVF Template wizard. Using the wizard, complete the following steps.
3. To select the source from which to deploy, select **Local File** and then click the **Choose Files**.
4. Select a folder or datacenter location for the new VM.
5. Optionally, change the compute resource to a different host. By default, the host on which you invoked the wizard is selected.
6. Verify the OVF template details, including that the OVA image is signed by Dell EMC.
7. Select a datastore from the list of datastores accessible from the resource you selected in which to create the virtual disks used to store the VM configuration files.

For optimal performance, if you are **not** deploying UnityVSA on a VxRail appliance, deploy the UnityVSA VM on a datastore comprised of different physical disks than the datastore that will contain the virtual disks that provide user data storage to UnityVSA. Failure to follow this recommendation can lead to system and I/O performance degradation. If you are deploying UnityVSA on a VxRail appliance, vSAN selects the physical disks.

8. Select a disk format for provisioning the VM's virtual disks.

Note: For better performance, it is recommended that you select **Thick Provision Eager Zeroed**.

9. Select a VM storage policy, if applicable.

10. Configure the networks the deployed VM should use, making sure that:
 - The management network is on a network accessible by the workstation used to access Unisphere.
 - The data networks are on networks accessible by the host that will attach to the UnityVSA.

Note: If you are deploying the UnityVSA on a VxRail appliance, it is recommended that you deploy the UnityVSA on the same port group used by the client VMs that reside on the VxRail appliance.

11. Customize the settings for the UnityVSA VM, including the system name and the network:
 - a. Enter a user friendly name for the UnityVSA. Leave this field blank to use the default name: an automatically generated serial number for UnityVSA.
 - b. If you want to use static IP addresses, enter the IPv4 and IPv6 management settings.
 - c. If you want to use dynamic IP addresses, leave these fields blank for automatic configuration using DHCP.
 - d. If you do not have a dynamic network and you do not specify a static IP address, you must specify the IP address after the OVF template is deployed.
12. Confirm the settings, and then click **Finish** to deploy the OVF template.
13. Select the UnityVSA VM. Select the Summary tab to view information about the VM. If it is not already powered on, select **Power On** to start the VM.
14. To determine when the UnityVSA VM is fully up and running log in to UnityVSA to check.

Note: The system name displayed is either the name you specified during deployment or the serial number of the system (format is VIRTXXXXXXXXXX).
15. If you are not running the UnityVSA VM on a dynamic network using DHCP or SLAAC and you did not configure the management interface when you deployed the OVF template, you must open the vSphere Console and login using the service account service/service and run the `svc_initial_config` command to assign an IP address.

For an IPv4 address, enter:

```
svc_initial_config -4 "<ipv4_address> <ipv4_netmask> <ipv4_gateway>"
```

For an IPv6 address, enter:

```
svc_initial_config -6 "<ipv6_address> <ipv6_prefix_length> <ipv6_default_gateway>"
```

For full usage, enter:

```
svc_initial_config -h
```

Note: Alternatively, you can run the `svc_diag` command from the vSphere Console and, from the output, identify the UnityVSA system serial number. Then use the EMC

Connection Utility to discover a list of systems, find the UnityVSA serial number in the list, and assign an IP address.

16. Enter the UnityVSA management IP address in your browser to open Unisphere.

Add virtual disks to a single-SP UnityVSA deployment

About this task

When you create the UnityVSA VM, three virtual disks (vmdks) are automatically created for the VM's system data. These are the virtual disks identified as 1-3. **Do not modify or delete these disks.**

You must add at least one virtual disk for user data. You can add more virtual disks, up to the system limit (16), when additional storage for user data is needed. The minimum virtual disk size is 10 GB. A disk appears as faulted if it is smaller than 10 GB and larger than the storage size allowed by the UnityVSA edition and version. To view your system's limits, in Unisphere select the **Settings** icon, and then select **Software and Licenses > System Limits**

The following considerations apply to virtual disks in a single-SP UnityVSA deployment:

- For optimal performance, it is recommended that you create the virtual disks used to provide user data on a different datastore than the one where UnityVSA is deployed. Failure to follow this recommendation can lead to system and I/O performance degradation.
- You can only connect 12 virtual disks for user data to the first VMware paravirtual SCSI controller provided with the UnityVSA. If you add a 13th virtual disk, select the second controller. Make sure this controller is of type **VMware paravirtual**. If the SCSI controller is a different type, UnityVSA can have boot problems and can fail to recognize the new virtual disks attached to it.
- Allow up to 60 seconds for UnityVSA to recognize and display the newly attached virtual disks.
- Using vSphere to modify the physical configuration of a UnityVSA VM (such as adding or removing network interfaces or modifying the VM's cache size) is not supported, except for adding virtual disks to store user data.

Procedure

1. In vSphere, right-click on the UnityVSA SPA VM, and select **Edit > Settings**.
2. On the Virtual Hardware tab, select **Add New Device > Hard Disk**.
3. Enter the size and provisioning method of the disk you want to add.
4. Finish stepping through the wizard, and select **Finish**.

After you finish

Note: Resizing a virtual disk through VMware is not supported in UnityVSA. However, if the virtual disk is **not** part of a storage pool, you can remove it from UnityVSA and add a new one of the preferred size. Resizing virtual disks that are already part of a storage pool can result in a failed, unrecoverable pool.

CHAPTER 3

Deploying UnityVSA HA

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Set up the VM environment for UnityVSA HA

Procedure

1. Log into vCenter as a user with administrative privileges.
2. Verify that the selected ESXi host meets the required configuration, as outlined in [Requirements for installing UnityVSA HA](#) on page 9.
3. (On-premises only) Verify, and if necessary, configure the host network configuration.
4. Check whether there are three available, unused VLANs in the network environment to use for deploying the CMI, HB0, and HB1 networks.
5. (Unity Cloud Edition only) If you are deploying to VMC, verify that four network segments have been created.

Three network segments are for deploying the CMI, HB0, and HB1 networks. One network segment is for I/O.

6. (Optional, on-premises only) Verify that a vSphere switch has been created.

You can create a switch later using the Deployment Utility. If you choose to create a switch before deployment, observe the following guidelines:

- a. Determine which port groups are associated with which subnets so you can ensure that the VM's network adapters are assigned to the correct subnet.
 - Ethernet port 0 is associated with network adapter 6.
 - Ethernet port 1 is associated with network adapter 7.
 - Ethernet port 2 is associated with network adapter 8.
 - Ethernet port 3 is associated with network adapter 9.

To verify which VM network adapter is mapped to which UnityVSA Ethernet port, compare the MAC address for the network adapter in the vSphere VM Hardware summary to the MAC address for the Ethernet port in Unisphere.

To display the MAC address in Unisphere, select **System > System View > Enclosures**. Select the rear view of the Disk Processor Enclosure (DPE) and click an Ethernet port to display information about the port, including its MAC address. Take note of the Ethernet port name, for example, *SPA Ethernet Port 3*, since the port name is used when creating iSCSI and replication network interfaces.

- b. If the network environment supports jumbo frames, verify that the MTU value for the switch on the ESXi host is set to the same value as the UnityVSA Ethernet ports.

If the UnityVSA VM sets an MTU value higher than the MTU value set on ESXi, the UnityVSA VM MTU value defaults to the smaller value. In vSphere, select **Edit Settings** on the Virtual switch to check the MTU value.

In Unisphere, select the **Settings** icon, and then select **Access > Ethernet**. MTU is not displayed by default so you must select the **Customize** icon, select **Columns**, and then click **MTU**.

The VMware Knowledge Base article *iSCSI and Jumbo Frames configuration on VMware ESXi/ESX (1007654)* provides more information.



Do not modify the VM, such as changing the virtual hardware configuration (CPU, memory, NICs, and so on). Modifying the VM causes UnityVSA to boot in service mode to prevent invalid configurations.

Download the UnityVSA HA files

Before you begin

To obtain a UnityVSA Professional Edition license and download UnityVSA HA files, you must set up a product support account. If you do not already have an account, go to your product support site to set one up.

Procedure

1. Using a web browser, go to your product support site.
The files for Unity Cloud Edition are available from the VMware Cloud Marketplace website.
2. Select UnityVSA.
3. Locate the available downloads.
4. Select each of these files and save them to your computer: UnityVSA OVA file, TBN OVA file (as necessary), and the UnityVSA HA Deployment Utility.

Deploy UnityVSA HA on an on-premises ESXi host with the UnityVSA Deployment Utility

Before you begin

1. Follow the directions for setting up the VM environment in [Set up the VM environment for UnityVSA HA](#) on page 20.
2. Install and launch the UnityVSA Deployment Utility.
3. Select **Deployment Utility for UnityVSA in On-premise VMware Data Center**.

About this task

When you deploy UnityVSA HA on an ESXi host, you can choose whether to deploy with or without a Tie Breaker Node (TBN). A TBN provides increased protection from network failures, because it resolves situations where one SP cannot detect the other SP. For UnityVSA HA, the TBN is a minimal VM running a network heartbeat client, which exchanges heartbeat messages with both SPA and SPB.

Procedure

1. Select whether to deploy the new UnityVSA with or without a TBN. If you choose not to deploy the new UnityVSA with a TBN now, you can add a TBN to the UnityVSA after it is created. For information, see [Deploy a tie breaker node to an existing UnityVSA HA using the GUI](#) on page 28.
2. Provide the login credentials and IP details for the vCenter service. When you deploy UnityVSA with HA, the hosts must be managed under the same vCenter datacenter.
3. Select the UnityVSA OVA file to use for the deployment.
4. Select a separate ESXi host for each SP deployment. For high availability reasons, Dell EMC does not recommend deploying both SPs to a single ESXi host.
5. On the **System Datastores** page:
 - Select one datastore for each SP to create its private system drive. Each SP needs at least 60 GB space for private system data.

- Select one shared datastore for a shared system drive between both SPs. The shared datastore needs at least 40 GB free space.
- Note:** It is a best practice to select three different datastores in this step.
6. Select two other shared datastores for storage-based heartbeats between the two SPs.

Note: The virtual disks that are created from the heartbeat datastores are only 2 MB in size.
 7. Select the network mappings for the management and data networks, making sure that:
 - The management network is on a network accessible by the workstation that is used to access Unisphere.
 - The data networks are on networks accessible by the host that will attach to the UnityVSA.
 8. Configure the internal network. To deploy UnityVSA HA, both SPs must communicate over a distributed switch. You can either create a switch, or select an existing one:
 - If creating a switch, you must provide two uplink ports for each ESXi host for redundancy. Each uplink port should also connect to a different network infrastructure switch. Enter the VLAN IDs for the HBO, HBI, and CMI networks.
 - If selecting an existing switch, each ESXi host must provide for two uplink ports for redundancy. Enter the VLAN IDs for the HBO, HB1, and CMI networks.

Whether you use an existing switch or create one, three port groups are created, which are for HBO (Heartbeat 0), HB1 (Heartbeat 1), and the Common Messaging Interface (CMI). Each of them needs a nonzero unique VLAN ID. If you leave the VLAN input empty, the deployment utility automatically chooses an unused VLAN ID for each port group.

If you deploy the SPs on different ESXi hosts, the physical switches must support VLAN and be configured as trunking mode instead of access mode. Access mode enables only specific VLANs to pass.
 9. Enter the UnityVSA system name and IP address information.
 10. (Applies to deploying UnityVSA HA with a TBN) On the **Configure Tie Breaker Node Properties** page, enter the name of the TBN VM, and then select the OVA file, host, and datastore to use for the TBN. You must also select two ports for the TBN.

Note: It is a best practice to select a host for the TBN that has not been used for other purposes. It is also recommended that you choose two separate ports for the TBN.
 11. Review the settings, and select **Deploy**.
 12. If you deployed the UnityVSA HA with a TBN, use the Unisphere GUI to enable the TBN function. You can do this in the Initial Configuration Wizard or by accessing the **Tie Breaker Node** page in the Management settings. For information, see [Enable or change the tie breaker node on a UnityVSA HA](#) on page 33.

Deploy Unity Cloud Edition with the UnityVSA Deployment Utility

Before you begin

1. Obtain the template file for your deployment type and upload it to the VMC content library. You can also add the template file directly to your VMC content library from the VMware Cloud Marketplace website.

2. Verify that at least four network segments have been created. Three network segments are for deploying the CMI, HBO, and HB1 networks. One network segment is for I/O.
3. Install and launch the UnityVSA Deployment Utility.
4. Select **Deployment Utility for UnityVSA in VMware Cloud for AWS**.

About this task

The deployment process for Unity Cloud Edition differs from the deployment process for on-premises ESXi servers.

Procedure

1. Provide the login credentials and FQDN for the vCenter service.
 -  **Note:** When you deploy Unity Cloud Edition HA, the hosts are managed under the same vCenter datacenter.
2. Select the cluster on which to deploy Unity Cloud Edition.
3. Select the Unity Cloud Edition template that you uploaded to the library and model type to use for the deployment.
4. Configure the external network mappings for the management and data networks, making sure that:
 - The management network is on a network accessible by the workstation that is used to access Unisphere.
 - The data networks are on networks accessible by the host that will attach to the Unity Cloud Edition.
 - The user account that you are using has `Network.Assign` privileges on the selected network segment.
5. Configure the internal network mappings for Common Messaging Interface (CMI) and network-based heartbeat connections.
 - The internal network mappings cannot use the same network segments as the external network.
 - Each of the three mappings must be unique.
 - The mappings cannot be in use by another VM.
 - The user account that you are using should have `Network.Assign` privileges on the selected network segment.
6. Enter the Unity Cloud Edition system name and management IP address.
7. Review the settings and click **Deploy**.

After you finish

-  **Note:** To guarantee HA capability, the SPA and SPB VMs must remain on separate hosts. To keep the VMs separated, you must create an anti-affinity policy in the VMC GUI.
 1. Log in to the VMC GUI.
 2. Create a VM-VM anti-affinity policy that separates the two SP VMs. For more information about creating a VM-VM anti-affinity policy, see VMware documentation.
 3. If the SP VMs are powered off, power them on.
 4. Ensure the two SP VMs move to separate hosts before you start provisioning.

Deploy a UnityVSA HA on an on-premises ESXi host using the UnityVSA HA Deployment Utility CLI

You can deploy a UnityVSA HA using the UnityVSA HA Deployment Utility CLI instead of the GUI. To access the CLI:

1. Follow the directions for setting up the VM environment in [Set up the VM environment for UnityVSA HA](#) on page 20.
2. Download the UnityVSA HA Deployment Utility CLI from your support website.
3. Perform the following based on your operating system:
 - On Windows, double-click the installer executable and follow the prompts. The default installation location is as follows:
 - For the x86-64 package, C:\Program Files\EMC\UnityVSA Deploy Utility CLI.
 - For the i586 package, C:\Program Files (x86)\EMC\UnityVSA Deploy Utility CLI.
 - On Linux, type: `rpm -ihv <filename>`, where `filename` is the name of the installer executable. The default installation location is: `/opt/EMC/UnityVSA Deploy Utility CLI/`
4. To launch the UnityVSA client and see the options and examples, perform the following in a command prompt based on your operating system:
 - From a Windows operating system, type:

```
UnityVSA Deploy Utility CLI-<arch>-<version>.exe --h
```

where `<version>` is the version of the client installed.

- From a Unix operating system, type:

```
UnityVSA Deploy Utility CLI --h
```

Manage virtual disks for Unity Cloud Edition

Before you begin

1. Install and launch the UnityVSA Deployment Utility.
2. Select **UnityVSA Disk Management Utility**.

About this task

Unity Cloud Edition HA requires the SPA and SPB VMs to connect to and share each disk file. To share a disk file in VMware, you must provision it as a thick eager zeroed disk.

The VMC GUI does not support provisioning thick eager zeroed disks. The UnityVSA Disk Management Utility provides a graphical interface to add and manage disks for Unity Cloud Edition HA without requiring the SDK or PowerCLI.

Procedure

1. Provide the vCenter FQDN and login credentials.

2. Select the Unity Cloud Edition HA for which you want to manage storage.
 -  **Note:** The first five disks on the Unity Cloud Edition are system disks and are not listed in the **Manage Disk** table.
3. Choose the management action that you want to perform:
 - To add a disk, choose the size of the disk and then click **Add**.
 - To fix a disk that is not connected to both SPs, select the disk and click **Fix Disconnected Disks**.
A disk file that is not attached to both SPs is marked with a red **X** icon.
4. When you have finished managing your disks, close the Disk Management Utility.

Add virtual disks to a UnityVSA HA deployment

About this task

When you create the UnityVSA VM, five virtual disks (vmdks) are automatically created for the VM's system data. These are the virtual disks identified as 1-5. **Do not modify or delete these disks.**

You must add at least one virtual disk for user data. You can add more virtual disks, up to the system limit (16), when additional storage for user data is needed. The minimum virtual disk size is 10 GB. A disk appears as faulted if it is smaller than 10 GB and larger than the storage size allowed by the UnityVSA edition and version. To view your system's limits, in Unisphere select the **Settings** icon, and then select **Software and Licenses > System Limits**.

The following considerations apply to virtual disks in a UnityVSA HA deployment:

- For optimal performance, it is recommended that you create the virtual disks used to provide user data on a different datastore than the one where UnityVSA is deployed. Failure to follow this recommendation can lead to system and I/O performance degradation.
- When you add a virtual disk, you must add it to both SPA and SPB.
- You can only connect ten virtual disks for user data to the first VMware paravirtual SCSI controller provided with the UnityVSA. If you add an 11th virtual disk, select the second controller. Make sure this controller is of type **VMware paravirtual**. If the SCSI controller is a different type, UnityVSA can have boot problems and can fail to recognize the new virtual disks attached to it.
- Allow up to 60 seconds for UnityVSA to recognize and display the newly attached virtual disks.
- Using vSphere to modify the physical configuration of a UnityVSA VM (such as adding or removing network interfaces or modifying the VM's cache size) is not supported, except for adding virtual disks to store user data.
- Although resizing a virtual disk through VMware is not supported in UnityVSA, if the virtual disk **is not** part of a storage pool, you can remove it from UnityVSA and add a new one of the preferred size. Resizing virtual disks that are already part of a storage pool can result in a failed, unrecoverable pool.
- **Important:** Never add a virtual disk to an SP VM that already has a disk with the same UUID. This can happen when a virtual disk has been added to a SP VM and you mistakenly trying to add it again. This will make the SP VM hang and have undetermined consequences, such as an SP panic and data unavailability.

Procedure

1. In vSphere, right-click on the UnityVSA SPA VM, and select **Edit > Settings**.
2. In the **New Device** field on the **Virtual Hardware** tab, select **Add New Device**, and then select **Hard Disk**.

3. Enter the size of the disk you want to add, and select **Thick Provision Eager Zeroed** as the provisioning method.
4. Finish stepping through the wizard, and select **Finish**.
5. When the disk creation process completes, return to the home page.
6. Right-click on the UnityVSA SPB VM, and select **Edit > Settings**
7. On the **Virtual Hardware** tab, select **Add New Device > Existing Hard Disk**.
8. Select the existing `vmdk` file created in step 5.
9. Finish stepping through the wizard, and select **Finish**.

CHAPTER 4

Deploying a tie breaker node to an existing UnityVSA HA

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- [Deploy a tie breaker node to an existing UnityVSA HA using the CLI](#) 28

Deploy a tie breaker node to an existing UnityVSA HA using the GUI

Procedure

1. Launch the UnityVSA HA Deployment Utility, and select **Deploy a new Tie Breaker Node to an existing Dual-SP UnityVSA deployment**.
2. Provide the IP address and login credentials for the vCenter service.
The deployment utility automatically discovers the UnityVSA HA managed by the specified vCenter.
3. Select the UnityVSA for which to deploy a Tie Breaker Node (TBN).
4. Enter the name of the TBN VM, and then select the template, host, and datastore to use for the TBN.
5. Review your choices and click **Deploy**.

Deploy a tie breaker node to an existing UnityVSA HA using the CLI

You can deploy a tie breaker node to an existing UnityVSA HA using the deployment tool CLI instead of the GUI.

Format

```
UnityVSAdeployUtilityCLI --hypervisor <value> --username <value>
--password value --tbnfile value --tbname <value> --hosttbn value
--datastoreprivatetbn value --hb0net value --hblnet value
```

Action qualifiers

Qualifier	Description
--hypervisor	IP address or hostname of the vCenter service.
--username	Username used to log in to the vCenter service.
--password	Password used to log in to the vCenter service.
--file	Path to the OVA or OVF file to deploy.
--tbnfile	Path to the TBN file to deploy.
--tbname	Name of the TBN file to deploy.
--hosttbn	Host on which to deploy the TBN.
--datastoreprivatetbn	Datastore that the TBN will reside on. The SPA and SPB hosts must be able to access this datastore.
--hb0net	Heartbeat 0 port group to which the TBN will connect.
--hblnet	Heartbeat 1 port group to which the TBN will connect.

Deploying a TBN on an existing UnityVSA HA using an existing switch

The following example deploys a TBN called tbn1 on an existing UnityVSA:

```
UnityVSA DeployUtilityCLI
--hypervisor 10.244.236.244
--username admin
--password admin123
--file unityvsa/tbn.ova
--tbnfile tbn1
--tbname vvx-dual-test
--hostspa vvx-esx1.usd.lab.emc.com
--hostspb vvx-esx3.usd.lab.emc.com
--hosttbn vvx-esx1.usd.lab.emc.com
--datastoreprivatespa datastore3_esx1
--datastoreprivatespb datastore3_esx3
--datastoreshared obsim_nfs_ds
--datastoreprivatetbn datastore3_esx1
--hb0net vsa-hb0-pg
--hb1net vsa-hb1-pg
```


CHAPTER 5

Configuring UnityVSA in Unisphere

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- [Enable or change the tie breaker node on a UnityVSA HA](#).....33

Launch UnityVSA Unisphere

Procedure

1. Launch Unisphere. To do so, enter the management IP address in your browser.
2. Log in with the default username and password.

Note: UnityVSA ships with a default username, admin, and password. You must change the administrator password during this first login. You can also change the service password at this time, either making it the same as the administrator password or creating a separate service password.

Configure UnityVSA in Unisphere

Configure initial settings

The Initial Configuration Wizard runs when you log in to Unisphere for the first time.

For the UnityVSA Professional Edition, obtain your license file online using the System UUID.

For the UnityVSA Community Edition, see the *Obtaining a license for UnityVSA Community Edition* post on the Dell EMC Community Network website for instructions.

Note: Use the License Activation Key instead of the UUID to configure ESRS and obtain support (professional editions).

The Unisphere online help describes the Configuration Wizard and the initial settings you need to configure, including pools and DNS and NTP servers. To create storage resources or NAS servers, you must create at least one pool.

Note: You can also create pools on the Unisphere Pools page.

Unisphere scans for the virtual disks available to the UnityVSA VM that can be used in a pool. You add virtual disks to the UnityVSA VM using vSphere.

When you create a pool, you must specify pool tiering information (Capacity, Performance, or Extreme Performance). Contact your storage system environment administrator to learn what tier should be assigned to each virtual disk since the virtualized environment hides this information. If the back-end storage is flash-based, use the Extreme Performance tier to fully take advantage of the performance capabilities of flash storage.

Note: Once a disk has been added to a pool, the tier type cannot be changed.

UnityVSA supports the Fully Automated Storage Tiering for Virtual Pool (FAST VP) feature for both block and file data. FAST VP optimizes storage utilization by automatically moving data between and within the storage tiers.

The maximum space available for all pools is 4, 10, 25, or 50 TB depending on the UnityVSA edition and version. The maximum number of pools per system is 16. To view your system's limits, select the **Settings** icon, and then select **Software and Licenses > System Limits**.

If your environment uses DHCP, typically the DNS servers are populated automatically. If not, configure the DNS servers.

The accuracy of the time on your UnityVSA server is important to the proper function of UnityVSA. If the time is inconsistent, features of the UnityVSA that interface with VMWare software or plugins, such as the VMWare VASA provider, may not function correctly. If you configure NTP, it is recommended that the UnityVSA, ESXi host, and vCenter (if applicable) use the same NTP server. If you do not configure NTP, UnityVSA gets its time from the ESXi host.

Further configuration

The Unisphere online help describes more configuration procedures and management tasks for your UnityVSA.

Enable or change the tie breaker node on a UnityVSA HA

If you deployed a UnityVSA HA with a TBN or added a TBN to an existing UnityVSA HA deployment, you must enable it in Unisphere to make it active. Enable a TBN by using the Unisphere Initial Configuration wizard or the **Tie Breaker Node** page in the Unisphere settings.

To enable a TBN using the **Tie Breaker Node** page:

1. Select the Settings icon, and then select **Management > Tie Breaker Node**.
2. Select **Enable TBN**, and select the TBN to enable.

You can also change the active TBN on this page.

You can verify the UUID of the TBN VM in vCenter by browsing to the **Virtual Machines** tab and locating the VM.

