Dell EMC VxBlock™ Systems Upgrade Guide

from VMware vSphere 6.5 or VMware vSphere 6.7 to VMware vSphere 7.0

November 2020
Rev. 1

Notes, cautions, and warnings

ⓘ **NOTE:** A NOTE indicates important information that helps you make better use of your product.

△ **CAUTION: A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.**

⚠ **WARNING: A WARNING indicates a potential for property damage, personal injury, or death.**

Revision history

Date	Document revision	Description of changes
November 2020	1	Initial version

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Introduction

Upgrade your VxBlock System from RCM releases that support VMware vSphere 6.5 and VMware vSphere 6.7 to VMware vSphere 7.0. Prerequisites and strategies to minimize system downtime are provided.

See the RCM Portal on the Dell EMC Technical Resource Center for supported RCM releases for the VxBlock Systems.

VMware does not support direct upgrades from VMware vSphere 6.0 to VMware vSphere 7.0. For VMware vSphere 6.0, see the upgrade instructions to upgrade to VMware vSphere 6.5 or 6.7 before you upgrade to VMware vSphere 7.0.

See the following table for additional upgrade instructions:

To upgrade this product	See this document
VMware vSphere 6.5 to 6.7	*Dell EMC Converged System Upgrade Guide from VMware vSphere 6.0 or VMware vSphere 6.5 to VMware vSphere 6.7*
VMware vSphere 6.0 to 6.5	*Dell EMC Converged System Upgrade Guide from VMware vSphere 6.0 or VMware vSphere 6.5*
VxBlock Central	*Dell EMC VxBlock Central Upgrade Guide*
One RCM release to another within the same RCM train.	Dell EMC upgrade guide for the Converged System you must upgrade

The upgrade procedures that are contained in this document apply for:

- VxBlock System 240, VxBlock System 340, VxBlock System 350, VxBlock System 540, VxBlock System 740, VxBlock System 1000
- VxBlock Systems that include VMware vSphere Distributed Switch (VDS)
- AMP-2V, AMP-2P, AMP-2S, AMP-3S, AMP Central, and AMP-VX

The target audience for this document includes build teams, deployment and installation personnel, sales engineers, field consultants, advanced services specialists, and customers. Use these instructions to upgrade VxBlock Systems.

The Glossary provides terms, definitions, and acronyms.

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Part I - Upgrade prerequisites

Support and requirements

This section describes the hardware, software, and license support and requirements to upgrade to VMware vSphere 7.0.

Support

VMware vSphere 7.0 supports the following servers:

- Stand-alone Cisco IMC-managed Cisco UCS C2xx M4 Rack Servers or higher
- Cisco UCS-managed Cisco UCS C2xx M4 Rack Servers or higher

VMware vSphere 7.0 does not support:

- Cisco UCS C2xx M3 Rack Servers and M3 blade servers
- VMware vCenter Server Appliance (vCSA) with External PSCs.

  NOTE: VMware vCenter Servers with External PSCs are converged to VMware vCSA with Embedded PSCs during the upgrade to VMware vSphere 7.0.
- VMware ESXi 7.0 on AMP-VX with VMware vSAN and VMware vSphere HA does not support IPv6

Requirements

One temporary IP address is required on the same subnet as the VMware vCenter Server that is accessed by the current VMware vCenter Server environment. The temporary IP address migrates configuration and services data from the source VMware vCSA.

Perform the following:

- Verify that the firmware version of the Cisco UCS B-Series Blade Servers and Cisco UCS C-Series Rack Servers VxBlock System is compatible with VMware vSphere 7.0. See the *VxBlock System Release Certification Matrix* and the *Dell EMC Converged Systems Release Certification Matrix 7.0 Release Notes* for the release to which you are upgrading.
- Verify the active/consumed memory to ensure that there is enough physical memory on the AMP hosts.
- See System Requirements for the New vCenter Server Appliance to verify that the VMware vCSA meets the hardware requirements, including the additional required disk storage and memory.
- Verify that all components are in a ready state and free from errors and alarms.
- Disable the host TPM attestation alarm definition to suppress attestation errors when TPM modules are installed but not in use.

If the environment has VMware NSX-T, upgrade to VMware NSX-T 3.0 before upgrading the VMware vCenter Server to 7.0. VMware NSX-T 2.5 is incompatible with VMware vCenter Server 7.0, but is compatible with NSX-T 3.0. See the NSX-T Data Center Upgrade Guide for VMware NSX-T Upgrade procedures. See the VMware Product Interoperability Matrices for compatibility between NSX and VMware vSphere. See the VMware Compatibility Guide for more information.

Upgrade best practices

Plan and prepare for the VMware vSphere 7.0 upgrade to ensure minimum impact on production traffic.

Review this entire guide and each referenced document before you begin the upgrade. Follow the practices of your company for performing upgrades. If possible, perform the upgrade during a scheduled maintenance windows.

Schedule adequate downtime for system maintenance. Downtime applies to all virtual infrastructure hosts and servers, including the VMs that are running in the environment. Power off the VMs before upgrading to the latest recommended virtual hardware version. Restart VMs after completing the VMware Tools upgrade.

Use the following guidelines as you prepare for the upgrade:

- See https://kb.vmware.com/s/article/78205 for VMware vSphere 7.0 upgrade best practices.
- Verify that the cluster where the target VMware vSphere ESXi host resides is not set to Fully Automated DRS during the upgrade process.
- For a VxBlock System with AMP-2V running with the production workload, plan and prepare for the upgrade to ensure minimum impact to production workload.
- For components in a cluster configuration, upgrade and verify the subordinate component before you upgrade the primary component. After you successfully upgrade the subordinate and primary components, verify the status of the components to ensure that there are no new alarms.
- Do not change the system configuration during the upgrade.
- Verify that NTP is properly configured and functioning on all upgrade-related components or services. Ensure that clocks (time, time zone, and dates) on all hosts and that AMP VMs are synchronized before beginning the upgrade.
- Verify that DNS (including type A and PTR records) and any local hosts files are properly configured for all upgrade-related components or services.
- Verify that the connection between the VMware vCSA and the domain controller is working.
- When upgrading the VNXe software used for management, check the lockdown status on all management VMware ESXi servers. If the lockdown status is enabled, disable it before upgrading and enable it after upgrading.
- Keep AMP-VX, AMP Central, and VxBlock System 1000 on same RCM version.

Required skills

Basic knowledge around Converged Systems, VMs and Microsoft Windows administration are required.

To perform the upgrade, you should understand Microsoft Windows administration of the system architecture and technical skills and VM technology and data center operations. Be familiar with Converged Systems concepts, terminology, and troubleshooting.

If there is a question regarding ability and skills, contact Software Deployment Services (SDS) to perform the upgrade.

Besides these skills, you must:

- Have a computer with network access to the Converged Systems and the management systems.
- Understand the entire upgrade process before you upgrade the Converged Systems.

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Part II - Pre-upgrade tasks

Increase the maximum LUN per target

Increase the maximum LUN value for FC Adapter policy to 1024.

Steps

1. In Cisco UCS Manager, select **SAN** > **Policies** > **root** > **Fibre Channel Adapter Policies**.
2. Select the adapter policy of the ESXi hosts and select **Options**.
3. Set the **MAX LUN per Target** to `1024`.

   ⓘ **NOTE:** Updating the MAX LUN may cause traffic disruption for all hosts, so update the MAX LUN before upgrading to ESXi 7.0.
4. After upgrading to ESXi 7.0, log in to VMware vCenter using the HTML5 client.
5. Select **Host** > **Manage** > **Advanced System Settings** > **Edit**.
6. In **Filter type**, set the **disk.maxLUN** to `1024` for each host.

Download VMware vSphere upgrade files

Download the files needed to upgrade to VMware vSphere 7.0. Each item is listed in the VxBlock System RCM 7.0.

Download the following files on a VxBlock System from the Dell EMC Download Center:

- VMware vCenter Server Appliance 7.0b ISO
- Dell EMC Custom ESXi 7.0b ISOs (AMP and compute)

For AMP Management VMware vSphere ESXi hosts only, verify that the image does not contain PowerPath modules.

Back up the system and hosts

Back up the VxBlock System configuration and hosts.

Steps

1. See the appropriate *Administration Guide* to back up the VxBlock System configuration and hosts.
2. To back up and restore options for the VMware vCenter Server, see https://kb.vmware.com/s/article/2149237 or the *VMware vCenter Server Installation and Setup Guide*.
3. (Optional) To back up VMware vCSA 6.5 or 6.7 certificates on the AMP, see https://kb.vmware.com/s/article/2091961.
4. Inspect all hardware components to verify that there are no visible faults (amber lights). All components should be in the ready state and free from errors and alarms.
5. Clone the management VMs during the maintenance window.

Take a snapshot of all VMware vSphere management VMs

Take a snapshot of VMware vSphere management VMs (VMware vCSA and VMware PSC).

To take a snapshot of all VMware vSphere management VMs, perform one of the following:

For VMware vSphere 6.5, see Taking a Snapshot.

For VMware vSphere 6.7, see Take a Snapshot of a Virtual Machine

Upgrade components to the minimum required RCM versions

Ensure the source VMware vCSA and ESXi are in the minimum supported build version to upgrade to VMware vSphere 7.0 and avoid back-in-time upgrade restrictions.

See the upgrade matrix outlined in the VMware KB article: https://kb.vmware.com/s/article/67077.

Upgrade all VxBlock System components, except the VMware components, to the required versions in the VxBlock System Release 7.0 RCM to which you are upgrading.

See the respective VxBlock System *Software and Firmware Upgrade Guides* for the process and order of upgrading these components.

Prepare for the VMware vCenter Server upgrade

To prepare for the VMware vCenter Server upgrade, address the configuration requirements.

Review system requirements for the VMware vCSA in the VMware vCenter Server Upgrade Guide.

Estimate upgrade time

Review the following considerations to ensure that you provide adequate scheduled maintenance windows to complete the upgrade.

Use the following table to calculate the time to upgrade the software and firmware on each component. If the VxBlock System that you are upgrading does not have a specific component in the table, skip that component.

- For cluster configurations, include both the primary and the subordinate components in the calculated time for the component.
- Plan your upgrade maintenance windows according to your environment. Do not upgrade all hosts at the same time. Retain an adequate number of hosts in a connected state to reduce impact to production traffic.
- For each upgrade task, record the total estimated upgrade time in the *Your Calculated Time* column of the following table.

The estimates do not include the time for preparation, configuration, backup, and download. Estimated times are may differ depending on applications running on your VxBlock System.

Order	Component	Minimum upgrade time (minutes)	Restart Required	Your Calculated Time
1	VMware vCSA	45	No	
2	VMware vCSA with VMware vCHA	60	No	
3	VMware ESXi hosts	35 per host	Yes	
4	VMs hardware version and VMware Tools	10	Yes	

Pre-upgrade considerations for Enhanced Link Mode

Consider the following before starting the Enhanced Link Mode (ELM) upgrade.

- Upgrading a VxBlock System in a VMware vSphere 6.x ELM configuration requires a corresponding upgrade for any other VxBlock System joined to the same VMware vSphere SSO domain.
- Create a backup of all PSCs configured in the ELM. Create simultaneous backups of all PSCs and VMware vCenter Servers participating in the ELM ring topology.

- Inventory and document all PSCs and VMware vCenter Servers participating in the same SSO domain before upgrade.
- Configure NTP for all VMware PSCs.
- Verify the current status of the PSC by logging into the web interface for each PSC at `https://<FQDN_PSC>:5480`. Use the username `root` and the Dell EMC standard password unless otherwise noted.

  1. Navigate to the **Summary** screen. Verify the following:
     - The build version is correct.
     - The **Overall Health** status is **Good**.
     - The SSO Domain Status is **RUNNING**.
  2. If the status does not meet the conditions, do not proceed with the upgrade until the PCSs meet these conditions.
  3. Enable SSH access to the PSC.

     ⓘ **NOTE:** Make sure the partner server is 0 changes behind. If any of the PSCs are not synchronized with each other, do not proceed with the upgrade until all PSCs display **Partner is 0 changes behind**.

Part III - Upgrade to VMware vSphere

Upgrade recommendations

Some VxBlock System components are optional or specific to environments. If the VxBlock System that you are upgrading does not have a specific component, skip that component. When the component is in a cluster configuration, upgrade the subordinate component before you upgrade the primary component.

Upgrade the AMP before upgrading the VxBlock System. You can upgrade the AMP in a separate maintenance window. Make sure your VxBlock System is upgraded according to the RCM. Refer to *Upgrade Converged System components to the minimum versions*.

VMware vCenter Server components upgrade considerations

Scenarios for upgrading VMware vCenter Server components.

You cannot upgrade and migrate VMware vCenter Server 6.x on Windows to VMware vCenter Server 7.0 on Windows.

As a part of the upgrade, these components are converted as noted in the **Destination VMware vSphere 7.0** column of the following table:

Scenario	VMware vSphere 6.x	VMware vSphere 7.0
VMware vCSA with Embedded PSC	VMware vCSA 6.x with: ● Embedded PSC ● Embedded database - vPostgres ● Internal VUM	VMware vCSA 7.0 with: ● Embedded PSC ● Embedded database - vPostgres ● Internal VMware vSphere Lifecycle Manager (vLCM)
VMware vCSA with External PSC	VMware vCSA 6.x with: ● External PSC ● Embedded database - vPostgres ● Internal VUM	VMware vCSA 7.0 with: ● Embedded PSC ● Embedded database - vPostgres ● Internal vLCM

NOTE:

1. If upgrading a system with multiple VMware vCenter Servers in the same domain, complete upgrade steps on each VMware vCenter Server.
2. If upgrading the AMP-VX or AMP Central components, first upgrade the management VMware vCSA and then upgrade all production VMware VCSAs.

If deploying, upgrading, migrating, or restoring to VMware vCenter Server Appliance 7.0 release fails, see Troubleshooting a vSphere Upgrade.

Upgrade sequence for VMware vSphere on the AMP

Upgrade AMP-VX and AMP Central before you upgrade the VxBlock System.

For AMP-VX or AMP Central, upgrade the VMware vSphere components in the following sequence:

1. AMP Management VMware vCenter Server
2. AMP ESXi host
3. AMP VMware vSAN cluster (AMP-VX)
4. Production VMware vCenter Server
5. Production VMware ESXi

Upgrade VMware vCSA 6.5 or 6.7 to 7.0

Upgrade VMware vCSA 6.5 or 6.7 to 7.0 with Embedded VMware PSC.

About this task

Perform this upgrade only if you can resolve the VMware vCSA FQDN using DNS. Ensure all the prerequisites of DNS with FQDN and NTP are configured according to VMware guidelines.

To upgrade the VMware vCSA, first deploy the OVA, then, set up the VMware vCSA.

Deploy the OVA

Deploy the OVA for the VMware vCSA.

Prerequisites

- See the VMware vCenter Server Upgrade Guide to verify that all required prerequisites are complete.
- Identify the IP address on same subnet as the existing VMware vCSA VM for temporary assignment during the upgrade process.

Steps

1. Download the VMware vCSA installer ISO file and mount it to a network VM or physical server for the image upgrade: **`VMware-VCSA-all-version_number-build_number.iso`**
2. Confirm that the **md5sum** is correct.
3. Mount or extract the ISO image to the Element Manager VM.
4. In the vCSA installation directory, go to the **vcsa-ui-installer\win32** folder, click **installer.exe**.
5. Click **Upgrade**.
6. On the **Introduction** page, click **Next**.
7. Accept the license agreement and click **Next**.
8. Connect to the VMware vCSA that you want to upgrade.
    a. Enter the information about the source VMware vCSA and click **Connect to Source**.
    b. Enter the information about the VMware SSO administrator and root user.
    c. Enter the information about the source VMware ESXi host or VMware vCenter Server instance with the vCSA and click **Next**.

    For VMware vCSA with VMware vCHA, specify the source VMware vCSA for VMware vCenter Server instance that manages the source.

    Use the information in the following table:

Connect to source appliance	Selection
Appliance FQDN or IP address	FQDN of vCenter Server
Appliance HTTPS port	443 (default)
VMware SSO User name	administrator@vsphere.local
VMware SSO Password	SSO Password
Appliance (operating system) root password	Root password
VMware ESXi host or VMware vCenter Server name	vCenter FQDN

Connect to source appliance	Selection
HTTPS port	443 (default)
User name	administrator@vsphere.local
Password	SSO password

9. Verify that the certificate warning displays the SHA1 thumbprints of the SSL certificates that are installed on the source appliance and source server. Click **Yes** to accept the certificate thumbprints.
10. For VMware vCSA with External PSC, click **Yes** to **Accept Convergence of External PSC to Embedded PSC**.
11. Connect to the target server on which you want to deploy the VMware vCSA using the following table:

Appliance deployment target	Selection
Temporary VMware ESXi host or VMware vCenter Server name	FQDN or IP address of the ESXi host
HTTPS port	443 (default)
ESXi host User name	root
SSO Password	root Password
SSL Cert	Accept SSL Cert warning

If your AMP has VMware VDS, deploying the VMware vCSA directly on an ESXi host with nonephemeral distributed virtual port groups is not supported. Port groups are not shown in the **Network** selection during OVA deployment stage. In such cases, specify the vCSA as the deployment target for upgrades. This option is recommended for VMware vCSA upgrades with VMware vCenter High Availability enabled.

12. Select **Virtual Datacenter**. At the select folder page, click **Next**.
13. On the **Setup target appliance VM** page, enter a VMware vCSA name and set the password for the root user. Click **Next**.
14. For your VMware vSphere inventory, select the **deployment size**.
15. Select the storage size and click **Next**.

ⓘ **NOTE:** If the configuration requires a VMware vCenter ESXi host with the following characteristics, set the appliance deploy size to large or extra large:

- More than 512 LUNs
- More than 2,048 paths to the vCSA

16. From the list of available datastores, select the location to store the VM configuration files and virtual drives.
17. Enable thin provisioning by selecting **Enable Thin Disk Mode**, and then click **Next**.
18. Configure the temporary network for communication between the vCSA that you want to upgrade and the new vCSA and click **Next**.

Configure network settings	Selection
Network	ESXi MGMT VLAN
IP Version	IPv4
IP Assignment	Static
Temporary IP Address	Temporary IP address on the ESX MGMT subnet
Subnet Mask or Prefix Length	Subnet mask
Default Gateway	Default GW on the ESX MGMT subnet
DNS Server	DNS server IP address

19. On the **Ready to complete stage 1** page, review the deployment settings for the new vCSA and then click **Finish** to start the OVA deployment process.
20. When the OVA deployment process finishes, click **Continue** and set up the VMware vCSA.

Set up the VMware vCSA

After the OVA is deployed, set up the VMware vCSA to transfer the data from the old appliance and start the services of the new appliance.

Steps

1. On the **Introduction** page, review the details of the upgrade process and click **Next**. Wait for the preupgrade check to finish.
2. On **Connect to Source vCenter Server** page, see following table to enter information:

Source vCenter Server	Description
Appliance FQDN or IP address	FQDN of vCenter Server
SSO User name	administrator@vsphere.local
SSO Password	SSO password
Appliance (operating system) root password	Root password
ESXi host or vCenter Server that manages the source vCenter Server	
ESXi host or VMware vCenter Server name	ESXi or vCenter FQDN
HTTPS port	443 (default)
User name	administrator@vsphere.local
Password	SSO password

NOTE: The username is `root` if ESXi is managing the source vCenter.

3. For VMware vCSA with External PSC, specify the replication topology for the VMware vCenter Server. Select **This is the first vCenter Server in the topology that I want to converge**. Click **Next**.
4. If the VMware vCenter Server is subsequent that is being upgraded for Enhanced Linked Mode, enter the IP address of its partner vCenter Server and its HTTPS port. Click **Next**.
5. On the **Select Upgrade data** page, choose the data that you want to copy from the old appliance to the upgraded appliance, and click **Next**.
6. On the **Configure CEIP** page, click **Next**.
7. On **Ready to Complete** screen check **I have backed up the source vCSA**. Click **Finish** to initiate the upgrade.
8. Click **OK** to acknowledge the shutdown warning.
9. After the upgrade is complete, log in to the VMware vCenter Server to verify that the upgrade was successful.
10. Repeat the VMware vCenter upgrade procedure for other VMware vCenter Servers in the same domain. Repeat each procedure on each VMware vCenter Server individually.
11. After the VMware vCSA upgrade is complete, log in to the VMware vSphere HTML5 Client to validate that the vCSA is operational. For example: `https://<vCenter_FQDN_or_IP>/ui`.
12. See Decommission External Platform Service Controllers to decommission External PSCs manually.
13. When upgrading multiple VMware vCenter Servers with External PSCs, replication partnerships are specified between the embedded VMware vCenter Servers during the upgrade configuration. These agreements form a consecutive ring topology. To create the agreement between the first and last VMware vCenter Servers, enter:

```
/usr/lib/vmware-vmdir/bin/vdcrepadmin -f createagreement -2 -h <FIRST_UPGRADED_VC> -H
<LAST_UPGRADED_VC> -u administrator
```

Upgrade VMware ESXi hosts

This section defines the workflow to upgrade AMP hosts and compute hosts for VMware vSphere.

Upgrade AMP VMware ESXi hosts

Upgrade VMware ESXi hosts in the AMPs using VMware vSphere Life Cycle Manager (vLCM).

About this task

This procedure does not apply to AMP-2V. If using AMP-2V, see Upgrade compute VMware ESXi hosts. To upgrade hosts interactively, see Upgrade hosts interactively.

Prerequisites

Consider the following:

- VMware provides several ways to upgrade VMware ESXi hosts. Use VMware vLCM and a custom VMware AMP-specific ESXi ISO image to upgrade the VxBlock System hosts.
- With VMware ESXi 7.0, upgrading from VMware ESXi 6.x to 7.0 with async driver VIBs, the `vmkapi DependencyError` may impact the upgrade. For more information, see https://kb.vmware.com/s/article/78389
- Remove any existing PowerPath modules.
- For VMware vSphere 6.5 systems, enable CDN in the Cisco IMC before performing the upgrade.
- To enable CDN support for VIC in the Cisco IMC:
    - For Cisco UCS C220 M4 servers, go to **Compute** > **BIOS** > **Advanced** > **LOM and PCIe Slots Configuration** > **CDN Support for VIC** for each host.
    - For Cisco UCS C220 M5 servers, go to **Compute > BIOS > Server Management > CDN Control**.

      ⚠ **CAUTION: An upgrade from VMware ESXi 6.5 to 7.0 may cause NIC enumeration order changes if CDN is disabled, which may disrupt VMware ESXi connectivity.**
- If upgrading a non-HA AMP with a single Cisco UCS C-Series Rack Server, shut down all the AMP VMs and upgrade the Cisco UCS C-Series Server interactively. Use the AMP-specific ESXi ISO image obtained in preupgrade tasks. See the *Upgrade Hosts Interactively*.

To ensure that remediation is successful, temporarily disable the following features in the **Remediation Cluster** Settings:

- VMware Distributed Power Management (DPM)
- VMware HA admission control
- VMware Fault Tolerance
- VMware DRS affinity and anti-affinity rules if there are rule conflicts

If the VMware vLCM displays a warning about incompatibility, confirm that the NTP client is configured. If not, configure NTP, reboot for each host and rescan against the AMP-specific VMware ESXi ISO upgrade image. See the Administration Guide to configure the NTP client. If any VMware VUM upgrade warnings cannot be resolved, upgrade the hosts interactively.

If upgrading an HA AMP, place one of the Cisco UCS C-Series Rack Servers in maintenance mode and upgrade the VMware ESXi host:

- Verify access to the AMP-specific VMware ESXi ISO image obtained in the preupgrade tasks.
- Use the VMware vLCM to complete the upgrade to VMware vSphere 7.0.

Steps

1. Log in to the VMware vCenter Server at **`https://`*`<fqdn_vCenter_or_IP_address>`*`/ui`**.
2. Record the VMware ESXi host and datastore locations of all management AMP VMs.
3. Under **Menu**, select **Life Cycle Manager**.
4. On the **LIfe Cycle Manager** page, select the **Imported ISO** tab and click **Import ISO** to upload the AMP ESXi Image.
5. On the **Import ISO** window, locate the AMP ESXi 7.0 ISO and click **Import**.

   For AMP-VX, use the custom Dell PowerEdge AMP-VX ESXi image only.
6. After the import completes, select the **Baselines** tab and click **NEW** > **New Baseline**.
7. On the **Create Baseline** page, perform the following:
    a. For the **Name**, enter **`AMP Upgrade`**.
    b. Under **Description**, enter optional text.
    c. For the **Content**, select **Upgrade** and click **Next**.
8. On the **Select ISO** page, select the AMP ESXi 7.0 ISO and click **Next**.
9. On the **Summary** page, validate the details and click **FINISH**.

10. To attach the baseline, under **Hosts and Clusters**, select **AMP Cluster**.
11. Select **Updates** > **Hosts** > **Baselines**.
12. In the **Baselines** page, scroll down to the attached baselines.
13. Under **Attached Baselines**, click **Attach Baseline** or **Baseline Group**, and then select **AMP Upgrade** baseline.
14. From the **Inventory**, select the first management host in the AMP cluster.
15. Place the selected AMP host in maintenance mode (a vMotion is performed on AMP VMs to the other hosts in AMP cluster). For AMP-VX VMware ESXi hosts, select **ENSURE ACCESSIBLITY for vSAN data migration** when entering maintenance mode.
16. Go to **Updates** > **Hosts** > **Baselines**.
17. In the **Baseline** page, click **Check Compliance**. If errors displayed due to VIBs missing dependencies:
    a. Use SSH to access the AMP.
    b. Run the esxcli software VIB list and record the VIB name reported in the compliance check.
    c. To remove the VIBs individually, enter:

    ```
    esxcli software vib remove --vibname=<vib_name>
    ```

18. Reboot the host to complete VIB removal.
19. Click **Check Compliance**. The baseline status changes to noncompatible to noncompliant.
20. Select the **AMP Upgrade** baseline and click **Remediate**.
21. Accept the VMware EULA and click **OK**.
22. Verify that the VMware ESXi host reconnects to VMware vCenter successfully, and then exit maintenance mode.
23. Enable the following features if they were temporarily disabled before upgrade:
    - Distributed Power Management
    - HA admission control
    - Fault Tolerance

24. Repeat Steps 14 to 22 for the other the AMP hosts.

Upgrade the compute VMware ESXi hosts

These instructions explain how to load ESXi ISO images are loaded into vSphere Lifecycle Manager, create baselines, and start ESXi upgrades on compute hosts.

Prerequisites

Consider the following:

- Although VMware provides several ways to upgrade vSphere ESXi hosts, use VMware vSphere Lifecycle Manager and custom VMware ESXi ISO image to upgrade the compute hosts in the VxBlock System.
- Do not upgrade all hosts simultaneously. Keep enough hosts online to reduce impact to production traffic.
- If you have VMware Distributed Power Management (DPM), VMware HA admission control, or VMware Fault Tolerance enabled, disable these features in the **Remediation Cluster Settings** to ensure that the remediation is successful.
- If the VMware vSphere Lifecycle Manager displays a warning about incompatibility, confirm that the NTP client is configured and clocks are synchronized. If the NTP client is not configured and the clocks are not synchronized for each host, configure NTP, reboot, and rescan against the custom ISO upgrade image. See the applicable Administration Guide for your VxBlock System to configure NTP.
- If the VMware vSphere Lifecycle Manager displays upgrade warnings that cannot be resolved, upgrade the hosts interactively. See *Upgrade or Migrate Hosts Interactively* in the VMware ESXi Upgrade Guide

Steps

1. Log in to the VMware vCenter Server at `https://<fqdn_vCenter_or_IP_address>/ui`.
2. Record the VMware ESXi host and datastore locations of all production compute VMs.
3. Under **Menu**, select **Life Cycle Manager**.
4. On the **LIfe Cycle Manager** page, select the **Imported ISO** tab and click **Import ISO** to upload the compute ESXi Image.
5. On the **Import ISO** window, locate the compute ESXi 7.0 ISO and click **Import**.
6. After the import completes, select the **Baselines** tab and click **NEW** > **New Baseline**.

7. On the **Create Baseline** page, perform the following:
    a. Under **Name**, enter `Compute Upgrade <RCM_version>`.
    b. Under **Description**, enter `Compute baseline`.
    c. Under **Content**, select **Upgrade** and click **Next**.
8. On the **Select ISO** page, select the ESXi 7.0 Block ISO and click **Next**.
9. On the **Summary** page, validate the details and click **FINISH**.
10. To attach the baseline, under **Hosts and Clusters**, select **Compute Cluster**.
11. Select **Updates** > **Baselines** and scroll to **Attached Baselines**.
12. Click **Attach Baseline** or **Baseline Group**, and then select **Compute Upgrade** baseline. Click **Attach**.
13. From the **Inventory**, select the first compute host in the compute cluster.
14. On the compute hosts selected for the upgrade, perform VMware vSphere vMotion on the production VMs to the other hosts in compute cluster.
15. Place the selected compute host in maintenance mode.
16. Go to **Updates** > **Hosts** > **Baselines**.
17. In the **Baseline** page, click **Check Compliance**. If errors display due to VIBs (for example, PowerPath, NENIC, nfnNFNICic) missing dependencies, perform the following to remove VIBs:
    a. Use SSH to access the compute hosts.
    b. Run the esxcli software VIB list and record the VIB name reported in the compliance check.
    c. To remove the VIBs individually on VMware vSphere 6.5, enter:

       Uninstall NENIC (vSphere 6.x) and NFNIC (vSphere 6.5) VIBs even if you do not see the missing dependency errors when upgrading to the first VMware vSphere 7.0 RCM release. This release supports VMware inbox drivers for compute blades. As VMware vSphere 6.x OEM (higher version) to 7.0 Inbox (lower version) upgrade leaves the higher OEM VIBs on the previous version after upgrade. This issue is not seen with lower OEM to higher inbox version upgrades.

       ```
       esxcli software vib remove --vibname=nenic

       esxcli software vib remove --vibname=powerpath.cim.esx

       esxcli software vib remove --vibname=powerpath.lib.esx

       esxcli software vib remove --vibname= powerpath.plugin.esx
       ```

    d. To remove the VIBs individually on VMware vSphere 6.7, enter:

       ```
       esxcli software vib remove --vibname=nfnic

       esxcli software vib remove --vibname=nenic

       esxcli software vib remove --vibname=powerpath.cim.esx

       esxcli software vib remove --vibname=powerpath.lib.esx

       esxcli software vib remove --vibname= powerpath.plugin.esx
       ```

18. Reboot the host to complete VIB removal.
19. Click **Check Compliance**. The baseline status changes to noncompatible from noncompliant.
20. Select the **Compute Upgrade** baseline and click **Remediate**.
21. In the **Remediate** window, select the host that is being upgraded and click **REMEDIATE**.
22. Accept the VMware EULA and click **OK**.
23. Verify that the VMware ESXi host reconnects to VMware vCenter successfully and exit maintenance mode.
24. Repeat Steps 13-23 for the other compute hosts.

Upgrade host interactively

Upgrade ESXi hosts interactively using custom VMware ESXi ISO images.

Prerequisites

See the OEM VIB removal process in *Upgrade AMP VMware ESXi hosts* or *Upgrade the compute VMware ESXi hosts* for the host that is being upgraded.

CDN is only required for VMware vSphere 6.5 ESXi hosts.

See the *Upgrade Hosts Interactively* in the VMware ESXi Upgrade Guide.

Upgrade the VMware vSphere Distributed Switch

Upgrade the VMware vSphere Distributed Switch (VDS) using VMware vSphere 7.0 documentation.

Steps

1. Log in to VMware vCenter Server using `https://<fqdn-vCenter>/ui` in the browser.
2. From the *VMware vSphere Networking* Guide, perform Upgrade a vSphere Distributed Switch to a Later Version for each VMware VDS.

Upgrade the VMware vSAN disk format on an AMP-VX cluster

About this task

Upgrade the VMware vCenter Server, VMware ESXi hosts, and the vSAN disk format, in that order, to upgrade the AMP-VX cluster.

⚠ **CAUTION: Failure to follow the sequence of upgrade tasks may lead to data loss and cluster failure.**

Prerequisites

- Ensure you have a full backup of all data that is stored on the vSAN.
- Ensure that enough free space is available. The space available must equal the logical consumed capacity of the largest disk group. You need a separate disk group with the available capacity from the one you are migrating.
- Verify that the disks are in a healthy state. Go to the **Disk Management** page to verify the object status.

Once you upgrade the on-disk format, you cannot roll back software on the hosts or add certain older hosts to the cluster. See About the vSAN Disk Format

Steps

1. Go to the VMware vSAN cluster.
2. Select the **Configure** tab.
3. Under **vSAN**, select **Disk Management**.
4. Click **Pre-check Upgrade**.

   ⓘ **NOTE:**

   The upgrade precheck analyzes the cluster to uncover any issues that might prevent a successful upgrade. Some of the items that are checked are host status, disk status, network status, and object status. Upgrade issues are displayed in the **Disk pre-check status** text box.

5. Click **Upgrade**.

   The disk groups are upgraded one at a time. For each disk group upgrade, all data from each device is evacuated and the disk group is removed from the vSAN cluster. The disk group is then added back to vSAN with the new on-disk format.

   ⚠ **WARNING: While the upgrade is in progress, do not remove or disconnect any host, and do not place a host in maintenance mode. When any member host of a vSAN cluster enters maintenance mode, the member host no longer contributes capacity to the cluster. The cluster capacity is reduced, and the cluster upgrade might fail.**

6. Click Yes on the **Upgrade** dialog box to perform the upgrade of the on-disk format. See Upgrade vSAN Disk Format Using vSphere Client

Verify VMware vSAN disk format and cluster upgrades

Before you complete the upgrade of the disk format and VMware vSAN cluster, verify that your VxBlock System is using latest version of VMware vSphere and vSAN.

Steps

1. Go to the vSAN cluster.
2. Select the **Configure** tab, verify that the vSAN is listed.

   ⓘ **NOTE:** You can also go to the ESXi host, and select **Summary** > **Configuration**. Verify that the latest version of the ESXi host is in use.

3. Under **vSAN**, click **Disk Management**. All disks should be running version 11.0.

Update VMware tools and virtual hardware version

Upgrade the VMware tools and virtual hardware version on the AMP management VM.

Prerequisites

Perform this task during an application maintenance window to power off and reboot the VM.

ⓘ **NOTE:** Before upgrading, back up each VM.

Steps

1. Upgrade the VMware tools for the Management VMs with Windows Server operating system (Element or Fabric Manager VMs). See *Upgrade Virtual Machines and VMware Tools* in the vCenter Server Upgrade Guide.
2. Upgrade the VM hardware to version 17 for the AMP management VMs with Windows Server operating system (Element or Fabric Manager VMs).

   See the *Upgrade the Compatibility of a Virtual Machine Manually* in the vCenter Server Upgrade Guide.

   ⓘ **NOTE:** If upgrading the Element Manager, launch the vCenter HTML5 client from an off-platform browser.

3. Power on the VM.

5

Part IV - Post-upgrade tasks

Decommission external VMware Platform Service Controllers

Decommission external VMware Platform Service Controllers (PSCs) after converging VMware vCenter upgrades with external VMware PSC. Unregister external VMware PSC services from VMware vCenter after converging to embedded VMware PSC during upgrade to vSphere 7.0.

About this task

Any products or solutions using the VMware PSC for authentication must be registered again. Register the products or solutions with the embedded VMware vCSA deployment before decommissioning the external VMware PSC.

Do not decommission an external VMware PSC until all VMware vCenter Server management nodes registered to that PSC have been converged.

Steps

1. Log in as root to the appliance shell of the upgraded VMware vCSA.
2. To identify the PSC that was managing the VMware vCSA, enter:

   ```
   /usr/lib/vmware-vmdir/bin/vdcrepadmin -f showservers -h <vCSA_FQDN> -u administrator -w
   <Administrator_Password>
   ```

3. See https://kb.vmware.com/s/article/75177 to decommission an external VMware PSC after successful converge and migration.
4. Repeat these steps to delete the remaining external VMware PSCs.

Change legacy boot mode to UEFI (optional)

Create a boot policy and attach to the existing service profile.

About this task

To modify the existing boot policy, go to *Modify an existing boot policy*. VMware vSphere 7.0 supports booting ESXi hosts from the Unified Extensible Firmware Interface (UEFI). Secure boot is part of the UEFI firmware standard. With secure boot enabled, any UEFI driver or application is not loaded unless the operating system bootloader is cryptographically signed. Starting with VMware vSphere 7.0, VMware ESXi supports secure boot if it is enabled in the hardware.

Prerequisites

- Verify that VMware ESXi hosts are in maintenance mode.
- Record the name of the attached service profile and boot policy.

Steps

1. Log in to the Cisco UCS Manager by entering `https://<fqdn_cisco_ucs_manager>/` in browser.
2. From the Cisco UCS Manager, click **Servers**.
3. Go to **Policies** > **Root** > **Boot Policies**. Click **Add** to create a new boot policy.
   a. Enter a boot policy name.
   b. Enter an optional description.

c. Set the **Owner** to **Local**.
d. Select **Reboot on Boot Order Change**.
e. Select **Enforce vNIC/vHBA/iSCSI/ Name**.
f. For **Boot Mode**, select **UEFI-Legacy/UEFI**.
g. Select **Boot Security**.
h. For **Boot Order**, select:

- CD/DVD
- SAN (SAN targets should be the same as the previous boot policy)
- LAN

4. From the Cisco UCS Manager, select servers. Go to the Service Profile and unbind from the template.
5. Select the **Boot Order** tab.
6. Click **Modify Boot Policy** and select the previously created boot policy. Click **OK**.
7. Click **Yes** after reading the pop-up message. Click **OK**.
8. Select the server, where this service profile is attached, and click the **Reboot Now** column. Click **Apply**, **OK** and **OK**.
   The **FSM** tab shows reboot progress. When the reboot is finished, the host reboots. Boot process is visible in the KVM console.
9. Log in to the VMware vCenter Server using the HTML5 client by entering `https://<fqdn_vcenter_IP>/` in browser.
10. Exit maintenance mode and verify that the VMware ESXi host is running and VMs are operational.

    If the server does not boot, perform the following:

    a. Go to SAN Primary controller and select **SAN Target Primary**.
    b. From the **Set UEFI Boot Parameters** window, enter the following values:

    - **BOOTX64.EFI** for **Boot Loader Name**
    - **\EFI\BOOT\** for **Boot Loader Path**
    - Description

    c. Repeat these steps for each boot target.

Modify an existing boot policy

Modify the boot policy in the Cisco UCS Manager.

Steps

1. Log in to the Cisco UCS Manager at: `https://<fqdn_cisco_ucs_manager>/`.
2. From the Cisco UCS Manager, click **Servers**.
3. Go to **Policies** > **Root** > **Boot Policies**.
4. Select the **Boot** policy attached to the service profile attached to the VMware ESXi host. Verify that you are on the correct boot policy.
5. Under the **Property** column, select UEFI under **Boot Order**.
6. Select **Boot Security** and click **Save Changes**.
7. Click **Yes** after reading the message and click **OK**.
8. Click Pending Activities Bell icon. Select the server for the service profile and click under the **Reboot Now** column.
9. Click **Apply**, **OK** and **OK**.
   The FSM tab shows reboot progress. When finished, the host reboots. Boot process is visible in the KVM console.
10. Log in to the VMware vCenter Server using the HTML5 client at: `https://<fqdn_vcenter_IP>/`.
11. Exit maintenance mode and verify that the VMware ESXi host is running and VMs are operational.

    If the server does not boot, perform the following:

    a. Go to SAN Primary controller and select **SAN Target Primary**.
    b. From the **Set Uefi Boot Parameters** window, enter the following values:

    - **BOOTX64.EFI** for **Boot Loader Name**
    - **\EFI\BOOT\** for **Boot Loader Path**
    - Description

c. Repeat these steps for each boot target.

Install the VMware Enhanced Authentication plug-in

Install the VMware Enhanced Authentication plug-in.

About this task

See Install the VMware Enhanced Authentication Plug-in to install the enhanced plug-in.

Register the solution in VMware vCenter Server after the upgrade or migration

After the certificate is regenerated during the upgrade or migration, register a previously registered solution and any third-party client plug-in packages with VMware vCenter Server.

About this task

Reregister VMware vCenter extensions after an upgrade. From the vCenter Server Upgrade, go to *After Upgrading or Migrating vCenter Server>Re-register Plug-In Solution in vCenter Server After Upgrade or Migration*

Consult the vendor documentation for any solution-based VMware vCenter extensions and client plug-ins for instructions to reregister after a VMware vCenter upgrade.

Verify VMware vCenter Server Appliance

Ensure that the VMware vCenter Server components are upgraded correctly.

About this task

If the VxBlock System does not have a specific component, skip that component and proceed with the next component.

Ensure that the VMware vCenter Server Appliance (vCSA) successfully upgraded for the AMP and Converged System by verifying the following:

- VMware vCSA instances are accessible.
- Inventory data is successfully migrated.
- VMware vCSA version comply with the supported versions in the VxBlock Systems Release Certification Matrix.
- All VMware licenses are applied and are not running in evaluation mode. The **Updates** tab in VMware vSphere vCenter Server is available on the HTML5 client.
- The updated versions comply with the supported versions in the VxBlock Systems Release Certification Matrix.
- VMware vSphere ESXi build numbers on the management environment and VMware ESXi hosts comply with the supported versions in the Converged Systems Release Certification Matrix.
- There is network connectivity to virtual machines, VLAN, and VSAN, if applicable.
- The time, date, and time zones are synchronized across all VMs and hosts.

Verify compliance with the RCM

Verify that the upgraded components match the versions that are listed in the RCM.

Confirm that the Converged System components match the versions of software, firmware, and hardware listed in the *Release Certification Matrix* for your Converged System.

See the appropriate *Release Notes* for information about installing necessary patches or updates.

Install VMware vCenter Server root certificates on the web browser

Verify that root certificates are installed. If not, follow the steps to install them.

About this task

Install the trusted root certificate authority (CA) certificates. Perform this procedure on Internet Explorer (IE) only. For browsers other than Internet Explorer, see the respective browser documentation.

Steps

1. Open web browser and go to **`https://<vcsa_fqdn>`**.
2. In the VMware vCenter **Getting Started** page, select **Download trusted root CA certificates** and save the file locally.
3. Unzip the downloaded files.
4. Go to the **win** folder inside the unzipped folder.
5. Right-click each `.crt` file and click **Open**.
6. In the dialog box, click **Install Certificate**.
7. Select **Local Machine** > **Next** > **Finish**.

Verify VMware ESXi advanced settings

Verify that the NFS settings are configured for optimal Converged System performance.

In VMware vSphere ESXi 7.0, the number of outstanding I/O requests with competing parameters is limited to the `MaxQueueDepth` of a device. Depending on the storage array, the system may require a change to the `Disk.SchedNumReqOutstanding` (DSNRO) on ESXi.

See the *Configure advanced settings* section of the *Administration Guide* for your Converged System.

The vStorage APIs for array integration (VAAI) primitives are enabled by default upon the initial installation of VMware vSphere ESXi. They should remain set to their current value (enabled or disabled) for all VMware ESXi hosts, except for the following conditions:

- If there is a specific reason for disabling primitives
- If there is a recall of a primitive based on outstanding issues in related software releases

The following table provides standalone array settings:

Setting	Default VMware vSphere 7.0	Dell EMC Unity	VMAX or PowerMAX	XtremIO X2
UCS FC Adapter Policy	256	default	default	1024
lun_queue_depth_per_path	32	default	default	128
Disk_SchedNumReqOutstanding	32	default	default	128
Disk_SchedQuantum	8	default	default	64
Disk_DiskMaxIOSize	32767	default	default	4 MB
XCOPY (Primitive)	4 MB	16 MB	16 MB	4 MB
XCOPY (Claim Rule)	4 MB	16 MB	240 MB	N/A
vCenter Concurrent Clones	8	default	default	Based on bricks in a cluster

The following table provides mixed array settings:

Setting	Default VMware vSphere 7.0	Dell EMC Unity with XtremIO X2	VMAX or PMAX with XtremIO X2	Dell EMC Unity and VMAX or PowerMAX with XtremIO X2
UCS FC Adapter Policy	256	default	default	default
lun_queue_depth_ per_path	32	default	default	default
Disk_SchedNumReq Outstanding	32	default	default	default
Disk_SchedQuantum	8	default	default	default
Disk_DiskMaxIOSize	32767	default	default	default
XCOPY (Primitive)	4 MB	4 MB	4 MB	4 MB
XCOPY (Claim Rule)	4 MB	16 MB	240 MB	240 MB
vCenter Concurrent Clones	8	default	default	default

Create Cisco UCS adapter settings

Review and verify that the Ethernet Adapter policy and Virtual Machine Queue (VMQ) connection policies are configured in the Cisco UCS Manager using standard practices. Verify that the service profiles are updated. Create VMQ policies and apply them to the Ethernet adapters.

About this task

Verify that the policies exist and values are set as described in this procedure. If they do not exist, create them using the steps in this procedure. The steps apply only to a VxBlock System with a Cisco UCS Ethernet Adapter Policy for compute Cisco UCS B-Series Blade Servers running VMware ESXi. A service-profile that is associated with the respective compute blades uses the policy.

Steps

1. From the UCS Manager, select **Servers**.
2. Select **Policies** > **root** > **Adapter Policies**.
3. Select **Add a new Ethernet Adapter Policy** to provide a name and description (for example: VMQ-Default).
4. Under **Resources**, enter the following settings:
    - **Transmit Queues = 8** (The number of transmit queue resources to allocate.)
    - **Receive Queues = 4** (The number of receive queue resources to allocate.)
    - **Completion Queues = 12** (The number of completion queue resources to allocate. In general, allocate the number of completion queue resources equal to the number of transmit queue resources plus the number of receive queue resources.)
    - **Interrupts = 14**
5. Under **Options**, select **Enabled** for **Receive Side Scaling (RSS)**. All other values remain as default.

Create the VMQ connection configuration settings

Verify that the VMQ policies exist. If not, create them using the steps in this procedure.

Steps

1. In the **UCSM Navigation** window, click **LAN**.

2. Expand **LAN** > **Policies**.
3. Expand the node for the organization where you want to create the policy.
4. If the system does not include multitenancy, expand the root node.
5. Right-click the **VMQ Connection Policies** node and select **Create VMQ Connection Policy**.
6. In the **Create VMQ Connection Policy** dialog box, complete the following fields:
   - **Name field**: The VMQ connection policy name
   - **Number of VMQs: 16** (The number of VMQs per adapter must be one more than the maximum number of VM NICs)
   - **Number of Interrupts: 34** (The number of CPU threads or logical processors available in the server)
7. Click **OK**.

Assign a virtualization preference to a vNIC

Assign the VMQ connection policy to a vNIC.

Steps

1. In the **UCSM Navigation** window, click **Servers**.
2. On the **Servers** tab, expand **Servers** > **target service profile** > **root** > **vNICs**.
3. Select the **vNIC** name.
4. In the **Connection Policies** section, click **VMQ** and select the **VMQ Connection Policy** from the drop-down.
   In the **Properties** area, the **Virtualization Preference** for the vNIC changes to **VMQ**.

Review system security

Ensure that the VxBlock System adheres to established security settings.

The *Dell EMC VxBlock System Security Configuration Guide* and the *Dell EMC AMP Security Configuration Guide* contains security hardening controls.

The upgrade does not change security for VxBlock System. See the following links for important security considerations:

- *Status of TLSv1.1/1.2 Enablement and TLSv1.0 Disablement across VMware products* : https://kb.vmware.com/s/article/2145796
- Managing TLS Protocol Configuration with the TLS Configurator Utility

VMware vSphere 6.7 and later disables the TLS 1.0 and TLS 1.1 protocols for improved security.

NOTE: Some applications only support the older protocols. To revert to the less secure TLS 1.0 and TLS 1.1 protocols, run the TLS Reconfigurator tool.

To run the tool, go the following locations:

- vCenter Server Appliance: `/usr/lib/vmware-TlsReconfigurator/VcTlsReconfigurator`
- vCenter Server on Windows: `%VMWARE_CIS_HOME%\TlsReconfigurator\VcTlsReconfigurator`

See the following KB article for more information: https://kb.vmware.com/kb/2147469

For security issues related to speculative execution in Intel processors, see https://kb.vmware.com/s/article/55806.

For a description of those security issues, see the following:

- *CVE-2018-3646 (L1 Terminal Fault - VMM)*
- *CVE-2018-3620 (L1 Terminal Fault - OS)*

Remove the management VMs

Power off and remove the VMs that are no longer needed.

Steps

1. Power off and remove the unused management VMs from the VMware vCenter.

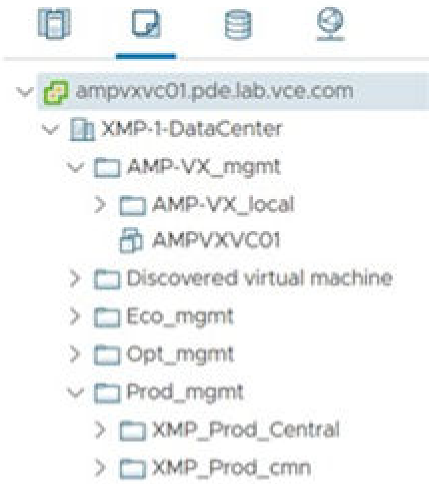
2. Rename the VMware vCSA from the temporary name to permanent names in VMware vSphere HTML5 client.

Validate folders for AMP-VX

Validate that the folder hierarchy is created for the placement of the VMs for the AMP-VX.

Steps

1. Log in to the management VMware vCenter using the VMware vSphere HTML5 client.
2. Select **VMs and Templates** tab.
3. Verify the following folder structure:



- ampvxvc01.pde.lab.vce.com
  - XMP-1-DataCenter
    - AMP-VX_mgmt
      - AMP-VX_local
      - AMPVXVC01
    - Discovered virtual machine
    - Eco_mgmt
    - Opt_mgmt
    - Prod_mgmt
      - XMP_Prod_Central
      - XMP_Prod_cmn

4. Edit the placement using the following information:

Host/VM	Primary folder	Secondary folder	Subfolder
M01VCSA01 or LCS equivalent	AMP-VX_mgmt	NA	NA
VxBlock 1000 V01VCProd01	PROD_mgmt	XMP_PROD_central	XMP_prod01

Perform a full backup of the system

After the VMware vSphere environment successfully upgrades, back up all VMware vSphere components. See the respective *Administration Guide* for your Converged System.

Update VMware tools and virtual hardware version for compute VMs

Upgrade the VMware tools and virtual hardware version on the compute VM.

About this task

Perform this task during an application maintenance window, because it requires powering off and rebooting the VM. When the upgrade is complete, power on the VM.

ⓘ **NOTE:** Before upgrading, back up each of the VMs.

Steps

1. See Upgrade the VMware Tools Version of Virtual Machines to upgrade the VMware tools for the management VMs with Windows Server operating system (compute VMs).
2. See Upgrade the VM Hardware Compatibility of Virtual Machines to upgrade the VM hardware to Version 17 for the management VMs with Windows Server operating system (compute VMs).

Upgrade the compute VM

Upgrade the VMware tools and virtual hardware version on the compute VM.

About this task

Update the compute VM during an application maintenance window.

Prerequisites

Before you upgrade the compute VM, perform the following:

- Back up each of the compute VMs.
- Power off the compute VMs.

Steps

1. To upgrade the VMware tools for the management VMs with Windows Server operating system (compute VMs), see Upgrade the VMware Tools Version of Virtual Machines.
2. To upgrade the VM hardware to Version 17 for the management VMs with Windows Server operating system (compute VMs), see Upgrade the VM Hardware Compatibility of Virtual Machines.
3. When the upgrade is complete, power on the compute VM.