

# vCenter Server Upgrade

Update 3

VMware vSphere 7.0

vCenter Server 7.0

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# About vCenter Server Upgrade

# 1

*vCenter Server Upgrade* describes how to upgrade VMware vCenter Server™ to the current version.

To move to the current version of vCenter Server by performing a fresh installation that does not preserve the existing configuration of your environment, see the *vCenter Server Installation and Setup* documentation.

At VMware, we value inclusion. To foster this principle within our customer, partner, and internal community, we create content using inclusive language.

## Intended Audience

*vCenter Server Upgrade* is for anyone who must upgrade from earlier versions of vSphere. These topics are for experienced Microsoft Windows or Linux system administrators who are familiar with virtual machine technology and data center operations.

# vCenter Server Upgrade Options

# 2

vCenter Server 7.0 provides many options for upgrading your vCenter Server deployment. For a successful vCenter Server upgrade, you must understand the upgrade options, the configuration details that impact the upgrade process, and the sequence of tasks.

The two core components of vSphere are VMware ESXi™ and VMware vCenter Server™. ESXi is the virtualization platform on which you can create and run virtual machines and virtual appliances. vCenter Server is a service that acts as a central administrator for ESXi hosts connected in a network. You use the vCenter Server system to pool and manage the resources of multiple hosts. vCenter Server appliance is a preconfigured virtual machine optimized to run vCenter Server.

You can upgrade existing vCenter Server deployments that include either an embedded or an external Platform Services Controller to a deployment consisting of a vCenter Server appliance.

This chapter includes the following topics:

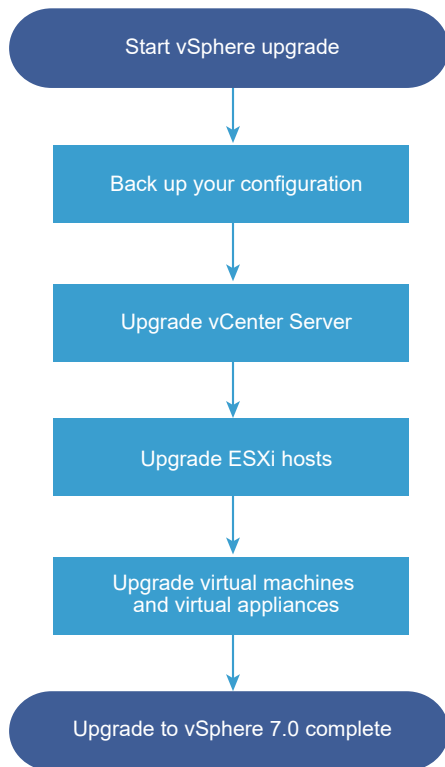
- [Overview of the vSphere Upgrade Process](#)
- [vCenter Server 7.0 Component Behavior Changes That Affect Upgrade](#)
- [Moving from a Deprecated to a Supported vCenter Server Deployment Topology Before Upgrade or Migration](#)
- [Example Upgrade Paths from vCenter Server 6.5 and 6.7 to vCenter Server 7.0](#)
- [Example Migration Paths from vCenter Server for Windows to vCenter Server 7.0](#)

## Overview of the vSphere Upgrade Process

vSphere is a sophisticated product with multiple components to upgrade. Understanding the required sequence of tasks is vital for a successful vSphere upgrade.



Figure 2-1. Overview of vSphere Upgrade Tasks



Upgrading vSphere includes the following tasks:

- 1 Read the vSphere release notes.
- 2 Verify that you have backed up your configuration.
- 3 If your vSphere system includes VMware solutions or plug-ins, verify that they are compatible with the vCenter Server appliance version to which you are upgrading. See *VMware Product Interoperability Matrix* at [http://www.vmware.com/resources/compatibility/sim/interop\\_matrix.php](http://www.vmware.com/resources/compatibility/sim/interop_matrix.php).
- 4 Upgrade vCenter Server.  
See [Overview of the vCenter Server Upgrade Process](#).
- 5 To ensure sufficient disk storage for log files, consider setting up a syslog server for remote logging. Setting up logging on a remote host is especially important for hosts with a limited amount of local storage.  
For detailed instructions, see *ESXi Upgrade*.
- 6 Upgrade your VMs manually or by using Update Manager to perform an orchestrated upgrade.  
For detailed instructions, see *Installing and Administering VMware vSphere Update Manager*.

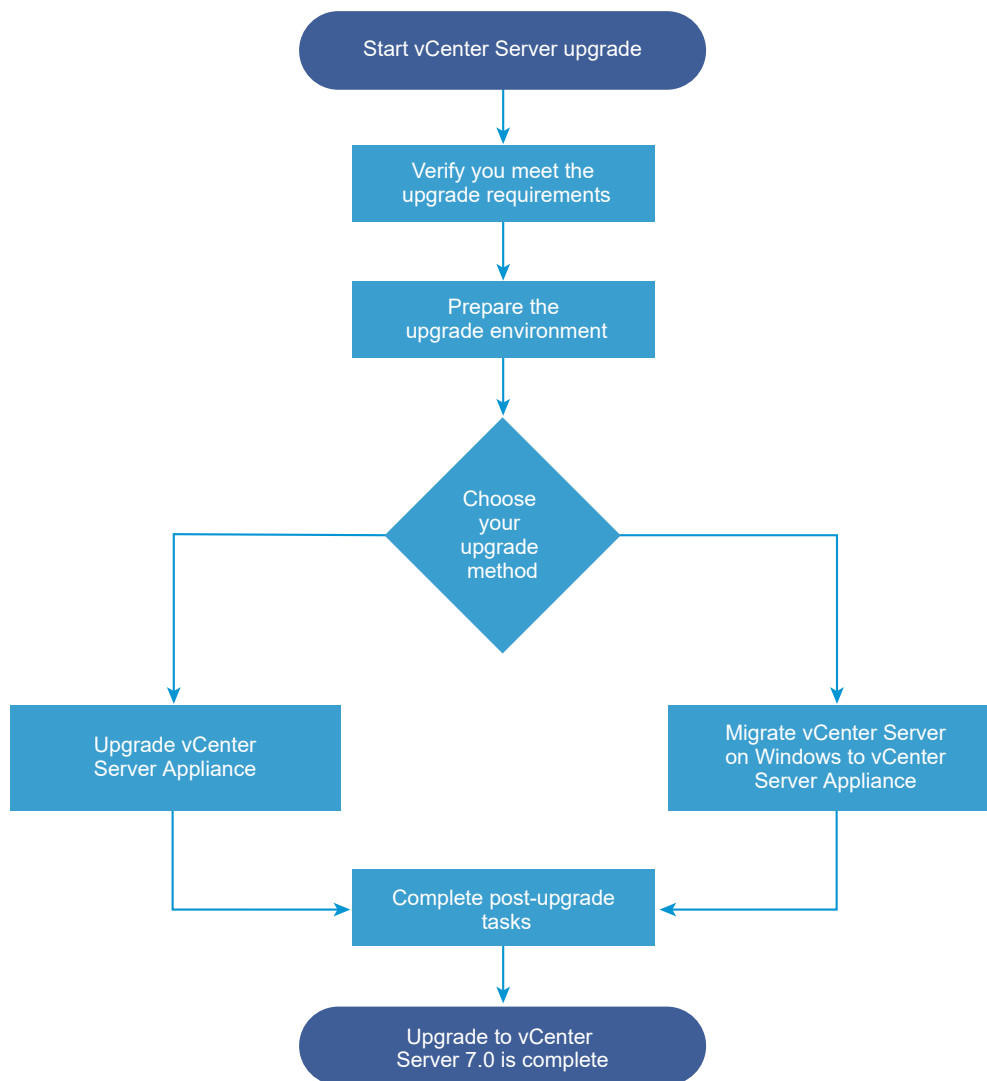
When you upgrade vSphere, you must perform all procedures in the specified sequence to avoid possible data loss and to minimize downtime. You can perform the upgrade process for each component in only one direction. For example, after you upgrade to vCenter Server 7.0, you cannot revert to vCenter Server 6.5 or 6.7. With backups and some planning, however, you can restore your original vCenter Server environment.

## Overview of the vCenter Server Upgrade Process

VMware provides many options to upgrade to vCenter Server 7.0.

You can upgrade or migrate your vCenter Server version 6.5 or version 6.7 installation to version 7.0 .

Figure 2-2. Overview of vCenter Server Upgrade Tasks



High-level steps for upgrading or migrating vCenter Server:

- 1 Select your upgrade goal.
  - [Chapter 3 Upgrading the vCenter Server Appliance](#)
  - [Chapter 4 Migrating vCenter Server for Windows to vCenter Server Appliance](#)
- 2 Verify that your system meets the hardware and software requirements.
- 3 Prepare your environment for the upgrade or migration.
- 4 Upgrade or migrate your vCenter Server for Windows or vCenter Server appliance deployment.
- 5 Finish any required post-upgrade or post-migration tasks.

Concurrent upgrades are not supported and upgrade order matters. For information on the order in which to upgrade transitional environments, see [Example Upgrade Paths from vCenter Server 6.5 and 6.7 to vCenter Server 7.0](#) .

## vCenter Server Supported Upgrade Methods

### Graphical User Interface (GUI) Installer

The GUI installer provides a two-step upgrade method using an OVA file that you deploy, and the vCenter Server appliance Management GUI. The first step deploys vCenter Server appliance as an OVA file. The second step uses the vCenter Server Management GUI to configure the new appliance using the source deployment data.

### Command Line Interface (CLI) Installer

The CLI installer provides advanced users with a CLI method for upgrading the vCenter Server appliance or migrating vCenter Server for Windows to an appliance. You can upgrade or migrate to a vCenter Server appliance using customized CLI templates.

### Migration Assistant Interface for Migrating vCenter Server for Windows to vCenter Server appliance

When you migrate a legacy Platform Services Controller or vCenter Server for Windows to an appliance using the Migration Assistant interface. You can use either the GUI method or the CLI method to migrate the legacy Windows installation data to a target appliance. See [Overview of Migration from vCenter Server on Windows to vCenter Server Appliance](#).

### Deprecated vCenter Server Deployment Models

When upgrading or migrating from deprecated deployment models, you must first migrate your deployment to a currently supported deployment model before attempting to upgrade or migrate it to a vCenter Server 7.0 deployment. For more information, see [Moving from a Deprecated to a Supported vCenter Server Deployment Topology Before Upgrade or Migration](#)

### Patching and Updating vCenter Server

A patch or update brings the vCenter Server 7.0 software up to the current, minor version. You can use the patching process to make minor upgrades to your 7.0 deployment. See [Differences Between vSphere Upgrades, Patches, Updates, and Migrations](#) and [Chapter 7 Patching and Updating vCenter Server 7.0 Deployments](#).

## vCenter Server Upgrade Compatibility

The upgrade to vCenter Server 7.0 affects other software components of the data center.

[Table 2-1. Upgrading vCenter Server and Related VMware Products and Components](#) summarizes how upgrading vCenter Server can affect your data center components.

vCenter Server 7.0 can manage ESXi version 6.5 hosts in the same cluster with ESXi 7.0 hosts. vCenter Server 7.0 cannot manage ESXi 6.0 or earlier hosts.

vSphere supports upgrades from vCenter Server 6.5 and later to vCenter Server 7.0. To upgrade from vCenter Server 5.0, 5.1, 5.5, or 6.0 you must first upgrade the vCenter Server instance to version 6.5 or later releases, and then upgrade to vCenter Server 7.0. For information about upgrading vCenter Server 5.0, 5.1, 5.5, or 6.0 to version 6.5 or 6.7, see the *VMware vSphere 6.5 Documentation* or *VMware vSphere 6.7 Documentation*.

**Table 2-1. Upgrading vCenter Server and Related VMware Products and Components**

Product or Component	Compatibility
vCenter Server	Verify support for the upgrade path from your current version of vCenter Server to your planned upgrade version. See the VMware Product Interoperability Matrix at <a href="http://www.vmware.com/resources/compatibility/sim/interop_matrix.php">http://www.vmware.com/resources/compatibility/sim/interop_matrix.php</a> .
vCenter Server database	Verify that your database is supported for the vCenter Server version that you are upgrading to. Upgrade the database if necessary. See the VMware Product Interoperability Matrix at <a href="http://www.vmware.com/resources/compatibility/sim/interop_matrix.php">http://www.vmware.com/resources/compatibility/sim/interop_matrix.php</a> .  <b>Note</b> vCenter Server 7.0 uses PostgreSQL for the embedded database. vCenter Server 7.0 does not support external databases.
ESX and ESXi hosts	Verify that your ESX or ESXi host works with the vCenter Server version that you are upgrading to. vCenter Server 7.0 requires ESXi host version 6.5 or later. Upgrade if necessary. See the VMware Product Interoperability Matrix at <a href="http://www.vmware.com/resources/compatibility/sim/interop_matrix.php">http://www.vmware.com/resources/compatibility/sim/interop_matrix.php</a> .
VMware Host Profiles	Host Profiles is a vCenter Server tool for designing and deploying ESX and ESXi hosts. Ensure that you are using Host Profiles version 6.0 or later. See Knowledge Base article <a href="#">KB 52932</a> .  For more information on upgrade problems related to Host Profiles, see <a href="#">Upgrade Issues with vCenter Server Containing Host Profiles</a> and the sections on Host Profiles upgrade workflows in the <i>vSphere Host Profiles</i> documentation.
VMFS3 volumes	ESXi and vCenter Server supports VMFS3, VMFS5, and VMFS6 datastores. You can continue to use existing VMFS3 datastores, but you cannot create new VMFS3 datastores. If you have VMFS3 datastores, upgrade them to VMFS6. For more information on VMFS datastores, see the <i>vSphere Storage</i> documentation.
Virtual machines	Upgrade options depend on your current version. See the information about upgrading virtual machines in the <i>ESXi Upgrade</i> documentation.

**Table 2-1. Upgrading vCenter Server and Related VMware Products and Components (continued)**

Product or Component	Compatibility
VMware Tools	Upgrade options depend on your current version. See the information about upgrading VMware Tools in the <i>ESXi Upgrade</i> documentation.
Auto Deploy	To ensure compatibility and best performance, when you upgrade to vCenter Server 7.0, use Auto Deploy to upgrade ESXi hosts to the same version.
vSphere Distributed Virtual Switch (DVS)	You must upgrade to DVS version 6.5 or later before you upgrade to vCenter Server 7.0. See Knowledge Base article <a href="#">KB 52826</a> .
vSphere Network I/O Control	DVS version 6.0 or later supports only Network I/O Control version 3. If you are using an earlier version of Network I/O Control you must upgrade to Network I/O Control version 3. For more information, see the <i>vSphere Networking</i> documentation.
vSAN	To avoid potential faults because of differences in the vSAN support in vCenter Server and ESXi, synchronize versions of vCenter Server and ESXi. For the best integration between vSAN components on vCenter Server and ESXi, deploy the latest version of these two vSphere components. For more information, see the <i>ESXi Installation and Setup</i> , <i>vCenter Server Installation and Setup</i> , <i>ESXi Upgrade</i> , and <i>vCenter Server Upgrade</i> documentation.
vSAN disk version	vSAN has several different on-disk format versions available depending on the version and upgrade history of the cluster. Some on-disk format versions are transient while others are intended for long-term production. As certain vSAN features are tied to the on-disk format version, the format version must be accounted for when determining interoperability. See Knowledge Base article <a href="#">KB 2148493</a> .
Legacy Fault Tolerance	If the vCenter Server inventory contains a VM on which legacy VMware Fault Tolerance (FT) is in use, upgrade or migration will be blocked until you turn off this feature. For information about legacy FT, see Knowledge Base article <a href="#">KB 2143127</a> . For information on disabling or turning off FT, see Knowledge Base article <a href="#">KB 1008026</a> .

## vCenter Server 7.0 Component Behavior Changes That Affect Upgrade

When upgrading to vCenter Server 7.0, it is important to understand changes in component behavior for version 7.0 that can affect the upgrade process.

Understanding changes from previous versions of vSphere can help in your upgrade planning. For a complete list of new features in vSphere 7.0, see the Release Notes for version 7.0 releases.

## vCenter Server Upgrade Methods

There are multiple methods for upgrading vCenter Server to version 7.0.

### Supported Migration Path from vCenter Server for Windows to vCenter Server

You can migrate from an existing vCenter Server for Windows to a vCenter Server 7.0 deployment using a graphical user interface-based installer or a command-line interface-

based installer. See [Chapter 4 Migrating vCenter Server for Windows to vCenter Server Appliance](#).

### **Support for Graphical User Interface (GUI) Deployments of vCenter Server**

You can upgrade an existing vCenter Server appliance version 6.5 or 6.7 deployment to vCenter Server 7.0 using the GUI. See [GUI Upgrade of the vCenter Server Appliance](#).

### **Support for Command Line Interface (CLI) Deployments of vCenter Server Appliance**

You can upgrade an existing vCenter Server appliance version 6.5 or 6.7 deployment to vCenter Server 7.0 using the CLI. See [CLI Upgrade of the vCenter Server Appliance](#).

### **VMware Update Manager Changes**

You can use a graphical user interface (GUI) when upgrading vCenter Server deployments using VMware Update Manager.

## **Changes in Supported Deployment Types**

Changes from previous versions of vSphere can affect your deployment type.

### **Mixed IPv4 and IPv6 Upgrade and Migration**

- Upgrade and migration from vCenter Server 6.5 or 6.7 to 7.0 is supported for pure IPv4 or pure IPv6 management networks only.
- Using dual IP stacks (IPv4 and IPv6) is not supported.

## **Removal of Platform Services Controller**

Beginning in vSphere 7.0, deploying or upgrading vCenter Server in vSphere 7.0 requires the use of vCenter Server appliance, a preconfigured virtual machine optimized for running vCenter Server.

The new vCenter Server contains all Platform Services Controller services, preserving the functionality and workflows, including authentication, certificate management, and licensing. It is no longer necessary nor possible to deploy and use an external Platform Services Controller. All Platform Services Controller services are consolidated into vCenter Server, and deployment and administration are simplified.

As these services are now part of vCenter Server, they are no longer described as a part of Platform Services Controller. In vSphere 7.0, the *vSphere Authentication* publication replaces the *Platform Services Controller Administration* publication. The new publication contains complete information about authentication and certificate management.

## **Upgrade or Migration for vCenter Server Instances with an External Platform Services Controller**

When you upgrade or migrate a vCenter Server deployment using an external Platform Services Controller, you converge the Platform Services Controller into a vCenter Server appliance.

When you converge the Platform Services Controller into a vCenter Server appliance, you must identify the management node to use for your deployment's vSphere SSO domain. In domains with multiple vCenter Server instances, you must specify the SSO replication partner to use for each subsequent vCenter Server.

The method you use to upgrade or migrate determines how you specify the management node to use for your deployment's vSphere SSO domain.

- If you upgrade or migrate using the GUI-based installer, the Upgrade wizard prompts you to specify the replication topology for the vCenter Server deployment.

To learn about upgrading using the GUI-based installer, see [Upgrade a vCenter Server Appliance 6.5 or 6.7 with an External Platform Services Controller Instance by Using the GUI](#). To learn about migrating using the GUI-based installer, see [GUI Migration of vCenter Server with an External Platform Services Controller to an Appliance](#).

- If you upgrade or migrate using the CLI-based installer, you specify the replication topology for the vCenter Server deployment using the JSON templates. The JSON files contain the configuration parameters and their values for your upgrade or migration specification.

To learn about upgrading using the CLI-based installer, see [About Upgrading a vCenter Server with an External Platform Services Controller Using the CLI](#). To learn about migrating using the CLI-based installer, see [About Migrating a vCenter Server for Windows with an External Platform Services Controller Using the CLI](#).

When the upgrade or migration process finishes, the newly deployed vCenter Server 7.0 appliance incorporates the former Platform Services Controller services. You can then decommission the external Platform Services Controller in your environment. See [Decommission the Platform Services Controller](#).

To learn more about converging a vCenter Server deployment using an external Platform Services Controller into a vCenter Server appliance, see Knowledge Base article [KB 68137](#).

## Upgrading or Migrating to vSphere License Service

The License Service provides common license inventory and management capabilities to the vCenter Server systems. When upgrading or migrating your vCenter Server deployment, licensing data is transferred to the License Service in the vCenter Server appliance.

When upgrading vCenter Server versions 6.5 or 6.7 that are connected to a Platform Services Controller, their licensing data is transferred to the License Service in the vCenter Server appliance. The licensing data includes the available licenses and license assignments for hosts, vCenter Server systems, vSAN clusters, and other products that you use with vSphere.

After the upgrade or migration of the vCenter Server systems finishes, the License Services stores the available licenses and manages the license assignments for the entire vSphere environment.

For more information about the License Service and managing licenses in vSphere, see *vCenter Server and Host Management*.

## Upgrading the Trust Authority vCenter Server

Upgrade the Trust Authority vCenter Server and Trust Authority Hosts.

Starting with vSphere 7.0, you can take advantage of VMware® vSphere Trust Authority™. vSphere Trust Authority is a foundational technology that enhances workload security. vSphere Trust Authority establishes a greater level of trust in your organization by associating an ESXi host's hardware root of trust to the workload itself.

The best practice for upgrading a vSphere Trust Authority infrastructure is to upgrade the Trust Authority vCenter Server and Trust Authority Hosts first. In this way, you get the most benefit from the latest vSphere Trust Authority features. However, you can perform separate, standalone upgrades of vCenter Server and ESXi hosts to fit specific business reasons. To learn about upgrading the Trust Authority Cluster vCenter Server see "vSphere Trust Authority Life Cycle" in the *vSphere Security* guide.

## Differences Between vSphere Upgrades, Patches, Updates, and Migrations

vSphere products distinguish between upgrades, which make major changes to the software, patches and updates, which make smaller changes to the software, and migrations, which make changes to the software platform.

VMware product versions are numbered with two digits, for example, vSphere 7.0. A release that changes either digit, for example, from 6.5 to 6.7, or from 6.7 to 7.0, involves major changes in the software, and requires an upgrade from the previous version. A release that makes a smaller change, requiring only a patch or update, is indicated by an update number, for example, vSphere 6.7 Update 1.

For information about upgrading vCenter Server installations, see [Chapter 3 Upgrading the vCenter Server Appliance](#).

For information about patching or updating vCenter Server, see [Chapter 7 Patching and Updating vCenter Server 7.0 Deployments](#)

When you upgrade an ESXi host, some host configuration information is preserved in the upgraded version, and the upgraded host, after rebooting, can join a vCenter Server instance that has been upgraded to the same level. Because updates and patches do not involve major changes to the software, host configuration is not affected. For more information, see the *ESXi Upgrade* documentation.

When you upgrade a vCenter Server for Windows instance and convert it to a vCenter Server appliance instance, it is a migration.

For information about migrating a vCenter Server installation to a, see [Chapter 4 Migrating vCenter Server for Windows to vCenter Server Appliance](#).



## Support for Upgrading a vCenter Server with Multi-Homing

When upgrading a vCenter Server appliance with two or more network interface cards (NICs), the upgrade transfers the IP addresses from each network interface from the source vCenter Server to the target vCenter Server.

During the upgrade process, the Upgrade installer performs a pre-check of the source vCenter Server and records the network settings. When this information is transferred to the target vCenter Server appliance, the network settings are transferred as part of the configuration. When the upgrade process finishes, you can log in to the vCenter Server appliance using the vSphere ClientvSphere Client, and verify that the IP addresses have been successfully transferred to the newly upgraded vCenter Server appliance.

With two or more NICs per vCenter Server appliance, you can better manage network traffic in your environment. For example, with multiple network interfaces you can:

- Configure backup traffic to use a different network than management traffic.
- Keep ESXi hosts on a physically different LAN segment from your management traffic. You can connect one network interface to the network with your ESXi hosts, and connect the other to a network from which administrative clients connect to vCenter Server.

## Support for Federal Information Processing Standard 140-2

vCenter Server 7.0 supports Federal Information Processing Standard (FIPS) 140-2.

FIPS 140-2 is a U.S. and Canadian government standard that specifies security requirements for cryptographic modules. By default, FIPS 140-2 is always enabled after installation or upgrade of vCenter Server 7.0.

To learn more about support for FIPS 140-2 in VMware products, see <https://www.vmware.com/security/certifications/fips.html>.

To learn how to enable or disable FIPS 140-2 support, see the *vSphere Security* documentation.

## Support for Transport Security Layer 1.2

By default, vSphere supports the Transport Security Layer (TLS) 1.2 encryption protocol. The upgrade or migration from earlier releases disables the TLS 1.0 and TLS 1.1 encryption protocols, and you might need to reconfigure other VMware products and third-party products to use TLS 1.2.

During both upgrade and migration from, a notification message informs you that only the TLS 1.2 protocol is enabled. If you must use the TLS 1.0 and TLS 1.1 protocols to support products or services that do not support TLS 1.2, use the TLS Configurator Utility to enable or disable different TLS protocol versions. You can disable TLS 1.0, or you can disable both TLS 1.0 and TLS 1.1.

For a list of VMware products that support disabling TLS 1.0 and TLS 1.1, see VMware Knowledge Base article [2145796](#). To learn how to manage TLS protocol configuration and use the TLS Configurator Utility, see the *VMware Security* documentation.

## Moving from a Deprecated to a Supported vCenter Server Deployment Topology Before Upgrade or Migration

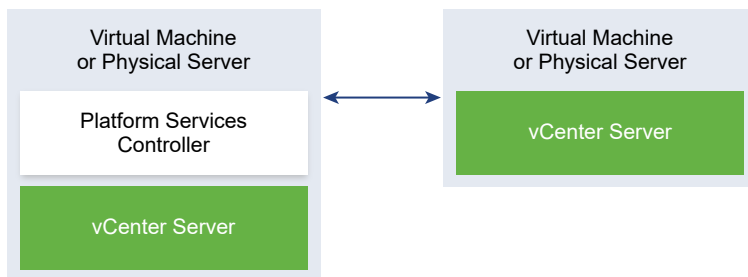
Before you upgrade or migrate your environment to vSphere 7.0, you must move any deprecated deployment topology to a supported deployment topology.

When you first install vCenter Server 6.5 or 6.7, your deployment includes either an embedded Platform Services Controller or an external Platform Services Controller.

The installer does not validate whether the Platform Services Controller is external or embedded with vCenter Server. Although many types of join operations are possible, not all resulting topologies are supported. Before you upgrade or migrate your environment to vSphere 7.0, you must move any deprecated deployment topology to a supported deployment topology.

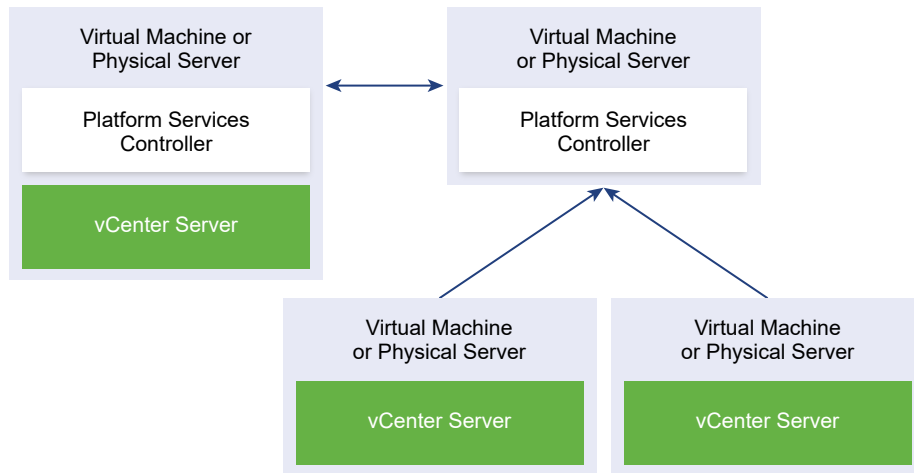
### Moving to a Supported Topology from a vCenter Server Pointing to an Embedded Platform Services Controller

Figure 2-3. Deprecated topology of a vCenter Server Pointing to an Embedded Platform Services Controller



## Moving to a Supported Topology from an Embedded Platform Services Controller and an External Platform Services Controller in Replication

Figure 2-4. Deprecated Topology of an Embedded Platform Services Controller and an External Platform Services Controller in Replication



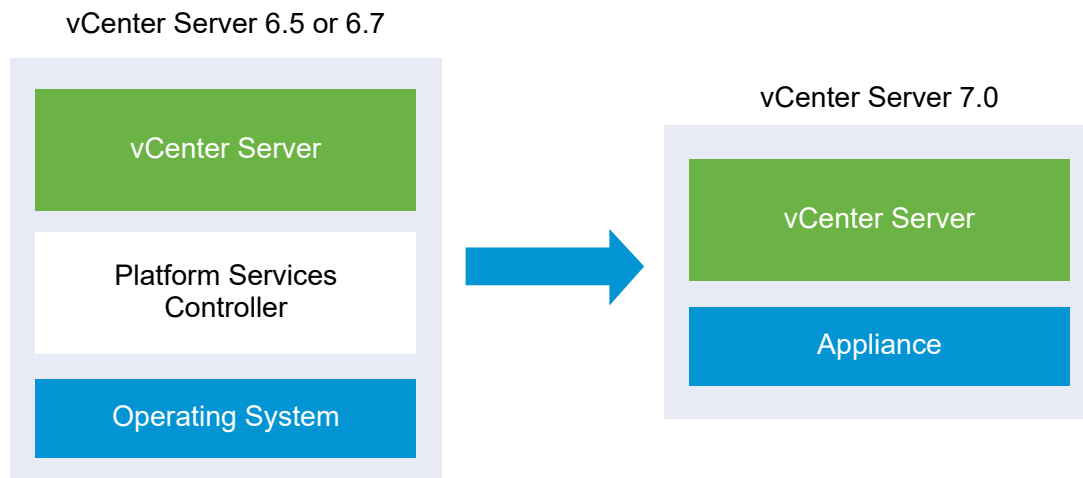
## Example Upgrade Paths from vCenter Server 6.5 and 6.7 to vCenter Server 7.0

vCenter Server 6.5 and 6.7 deployments upgrade to 7.0.

The vCenter Server example upgrade paths demonstrate vCenter Server 6.5 or 6.7 upgrade outcomes.

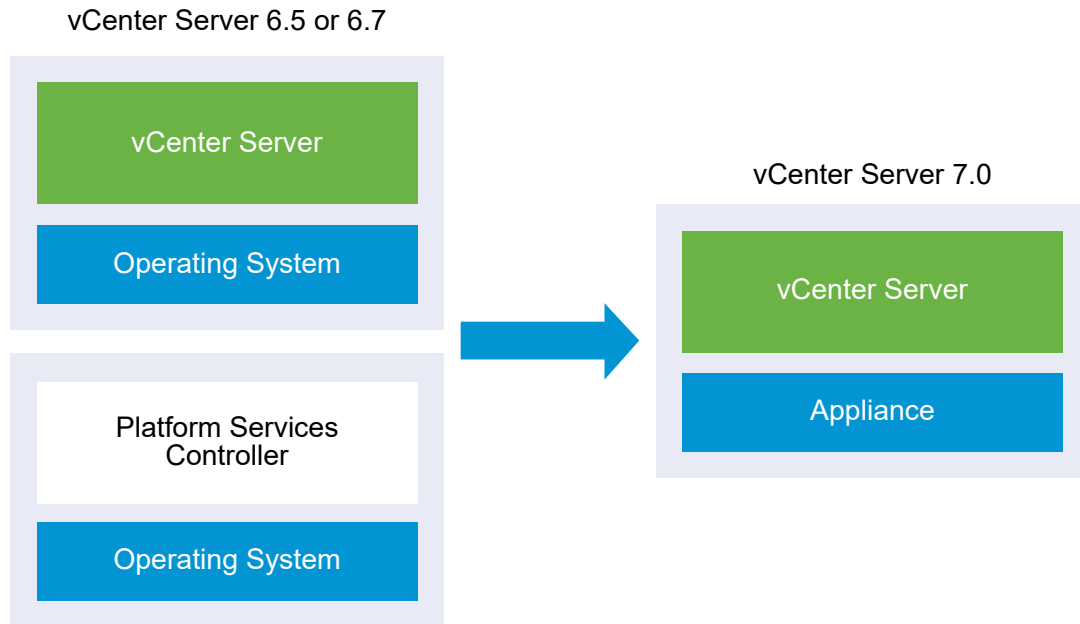
The installer upgrades vCenter Server 6.5 and 6.7 with an embedded Platform Services Controller instance to vCenter Server 7.0.

Figure 2-5. vCenter Server 6.5 or 6.7 with Embedded Platform Services Controller Before and After Upgrade



The installer upgrades a vCenter Server 6.5 and 6.7 instance with an external Platform Services Controller to a vCenter Server 7.0 instance.

Figure 2-6. vCenter Server 6.5 or 6.7 with External Platform Services Controller Before and After Upgrade



## Example Migration Paths from vCenter Server for Windows to vCenter Server 7.0

You can migrate a vCenter Server for Windows instance to a vCenter Server 7.0 instance.

You can migrate a vCenter Server for Windows version 6.5 or 6.7 to a vCenter Server 7.0 appliance.

The vCenter Server example migration paths demonstrate supported migration outcomes.

You can migrate a vCenter Server 6.5 or 6.7 instance with an embedded Platform Services Controller to a 7.0. In this case the software migrates the vCenter Server instance and the embedded Platform Services Controller instance at the same time.

Figure 2-7. vCenter Server 6.5 or 6.7 with Embedded Platform Services Controller Installation Before and After Migration

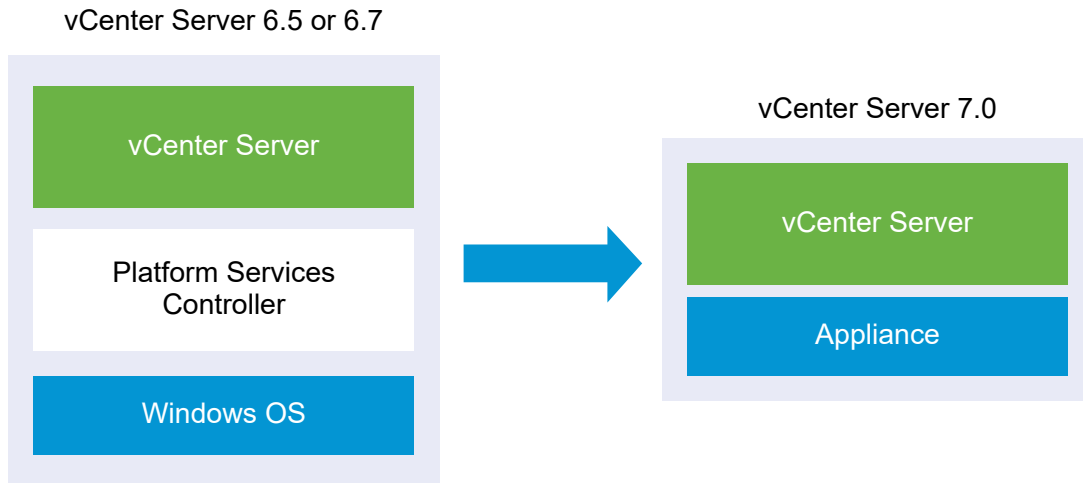
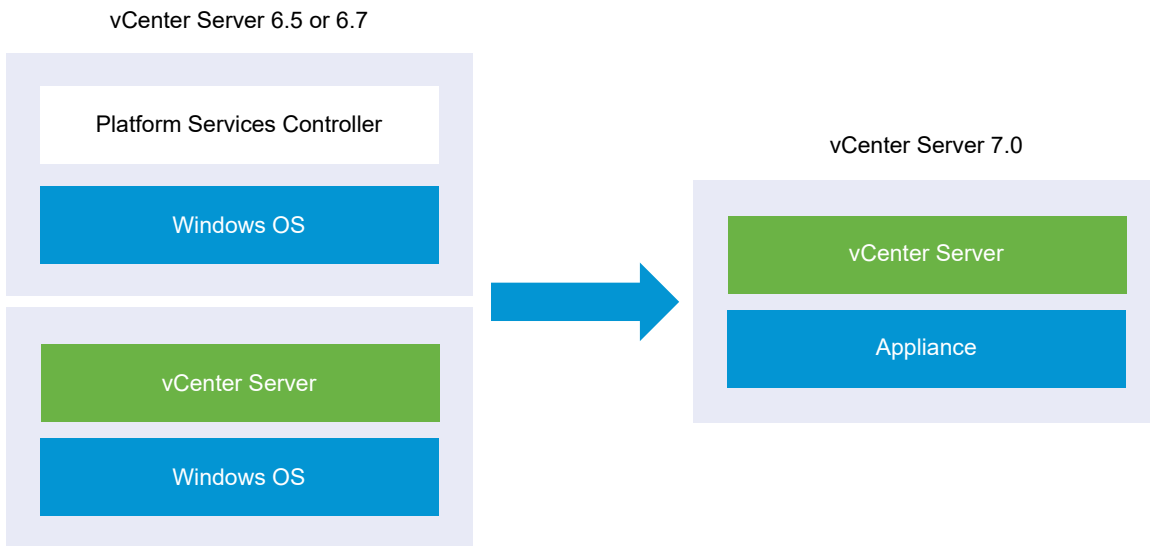


Figure 2-8. vCenter Server 6.5 or 6.7 with External Platform Services Controller Installation Before and After Migration



You can migrate a vCenter Server 6.5 or 6.7 instance with an external Platform Services Controller to a vCenter Server 7.0 instance.

# Upgrading the vCenter Server Appliance

# 3

You can upgrade vCenter Server appliance 6.5 or 6.7 to version 7.0. All the installation files that are necessary for the upgrade are included in the vCenter Server installer, which you can download from the VMware website.

The upgrade of the vCenter Server appliance is a migration of the old version to the new version, which includes deploying a new vCenter Server appliance of version 7.0. You can deploy the new appliance on an ESXi host 6.5 or later, or on the inventory of a vCenter Server instance 6.5 or later. You assign a temporary IP address to the new appliance to facilitate the configuration and services data migration from the old appliance to the newly deployed appliance. After the migration, the IP address and host name of the old appliance are applied to the new upgraded appliance of version 7.0. At the end of the upgrade, the temporary IP address is released and the old appliance is powered off.

Version 7.0 of vCenter Server uses an embedded PostgreSQL database. During the upgrade, you must select a storage size for the new appliance that is suitable for the database size.

vCenter Server 7.0 uses an embedded vSphere Lifecycle Manager service that allows you to perform centralized and simplified lifecycle management of clusters with ESXi 7.0 hosts. vSphere Lifecycle Manager in vSphere 7.0 includes the functionality that Update Manager provided in earlier vSphere releases for host upgrade and patching operations, as well as upgrade of virtual machine hardware and VMware Tools.

If you are upgrading a vCenter Server appliance or migrating a vCenter Server that use an external Update Manager instance that runs on Windows, in vSphere 7.0 the external Update Manager instance is migrated to the embedded vSphere Lifecycle Manager extension service of the new, upgraded vCenter Server appliance.

If you are upgrading a vCenter Server appliance that uses an embedded VMware Update Manager instance, in vSphere 7.0 the embedded VMware Update Manager instance is upgraded to the embedded vSphere Lifecycle Manager extension service of the new upgraded vCenter Server appliance. The embedded VMware vSphere Update Manager Extension uses the embedded PostgreSQL database. Before the upgrade, you must run the Migration Assistant on the source Update Manager instance.

For information about the software included in the vCenter Server 7.0, see *vCenter Server Installation and Setup*.

---

**Note** For topologies with external Platform Services Controller instances, the Platform Services Controller will be converged during the upgrade process to vCenter Server 7.0. After a successful upgrade, the external Platform Services Controller is powered off and can be removed from your vSphere inventory. See [Decommission the Platform Services Controller](#).

---

The vCenter Server installer contains executable files for both GUI and CLI upgrades which you can use alternatively.

---

**Note** vCenter Server deployments using an external Platform Services Controller will not be supported in a future vSphere release. Deploy or upgrade to a vCenter Server deployment using an embedded Platform Services Controller. For more information, see Knowledge Base article [KB 60229](#).

---

- The GUI upgrade is a two stage process. The first stage is a Deployment wizard that deploys the OVA file of the new appliance on the target ESXi host or vCenter Server instance. After the OVA deployment finishes, you are redirected to the second stage of the process that sets up and transfers the services and configuration data from the old appliance to the newly deployed appliance.
- The CLI upgrade method involves running a CLI command against a JSON file that you previously prepared. The CLI installer parses the configuration parameters and their values from the JSON file and generates an OVF Tool command that deploys the new appliance. The OVF Tool command also transfers services and configuration data and from the old appliance to the new appliance.

For information about the vCenter Server and Platform Services Controller appliance upgrade requirements, see [System Requirements for the New vCenter Server Appliance](#).

---

**Important** If the appliance that you are upgrading is configured in a mixed IPv4 and IPv6 environment, only the IPv4 settings are preserved. For information on the transfer of networking configuration settings for mixed mode IPv4 and IPv6 deployments, see [Mixed IPv4 and IPv6 Upgrade and Migration](#).

If you are deploying the vCenter Server appliance directly on an ESXi host, non-ephemeral distributed virtual port groups are not supported and are not shown. After the upgrade, you can manually connect the appliance to the original non-ephemeral distributed virtual port group. This is not a limitation when deploying the appliance through a vCenter Server, and you can deploy to ephemeral or non-ephemeral distributed virtual port groups.

---

To upgrade vCenter Server appliance version 6.0 or earlier, you must first upgrade to version 6.5 or 6.7 and then upgrade to version 7.0. For information about upgrading vCenter Server appliance 6.0 to version 6.5, see the *VMware vSphere 6.5* documentation. For information about upgrading vCenter Server appliance 6.0 to version 6.7, see the *VMware vSphere 6.7* documentation. For information on the upgrade compatibility of vCenter Server, see the [VMware Compatibility Guide](#).

For information about deploying the vCenter Server, see *vCenter Server Installation and Setup*.

For information about configuring the vCenter Server, see *vCenter Server Configuration*.

This chapter includes the following topics:

- [About the Upgrade Process of the vCenter Server Appliance](#)
- [System Requirements for the New vCenter Server Appliance](#)
- [Preparing to Upgrade the vCenter Server Appliance](#)
- [Prerequisites for Upgrading the vCenter Server Appliance](#)
- [GUI Upgrade of the vCenter Server Appliance](#)
- [Upgrading vCenter Server in High Availability Environments](#)
- [CLI Upgrade of the vCenter Server Appliance](#)

## About the Upgrade Process of the vCenter Server Appliance

You can upgrade the vCenter Server appliance from version 6.5 or 6.7 to version 7.0.

---

**Important** If your current vCenter Server appliance is version 6.0 or earlier, you must upgrade to version 6.5 or 6.7 before upgrading to version 7.0.

---

**Important** In environments with multiple instances of vCenter Server appliance, you cannot perform parallel upgrades. Each vCenter Server instance must be upgraded separately. The reason for this is that VMware Directory Services (`vmmdir`) encounters replication problems with single-sign on and certificate information.

---

When you run the GUI or CLI upgrade, the process includes:

- 1 Deploying a new vCenter Server 7.0 with a temporary network configuration.

If you are upgrading a vCenter Server, you must select a deployment size for the new appliance that is suitable for your vSphere environment size. You must also select a storage size for the new appliance that is suitable for the vCenter Server database. If the source vCenter Server uses an external database, see [Determine the Oracle Database Size and the Storage Size for the New Appliance](#).

- 2 Exporting the services and configuration data from the source appliance of version 6.5 or 6.7 that you want to upgrade.



You must select the data types that you want to transfer to the new appliance.

If you are upgrading a vCenter Server appliance that uses an external Update Manager instance, you must ensure that the Migration Assistant is running on the Update Manager computer. Migration Assistant facilitates the export of the Update Manager configuration and database.

### 3 Transferring the exported data to the newly deployed appliance

If you are deploying the appliance directly on an ESXi host, non-ephemeral distributed virtual port groups are not supported and do not appear as options during the upgrade. After the upgrade, you can manually connect the appliance to the original non-ephemeral distributed virtual port group. This process is not a limitation when deploying the appliance through a vCenter Server, and you can deploy to ephemeral or non-ephemeral distributed virtual port groups.

If you are upgrading a vCenter Server appliance that uses a Update Manager instance, the Update Manager instance is migrated to the vSphere Lifecycle Manager of the new upgraded appliance. To learn more about vSphere Lifecycle Manager, see the *Managing Host and Cluster Lifecycle* documentation.

### 4 If you are upgrading a vCenter Server appliance that uses an external Platform Services Controller, it is converted to a vCenter Server instance with those services embedded in the appliance.

The new vCenter Server appliance contains all Platform Services Controller services, preserving the functionality and workflows, including authentication, certificate management, and licensing. It is no longer necessary nor possible to deploy and use an external Platform Services Controller. All Platform Services Controller services are consolidated into vCenter Server during the upgrade.

### 5 Powering off the source appliance. The new upgraded vCenter Server appliance assumes the network configuration of the source appliance.

- For the new appliance requirements, see [System Requirements for the New vCenter Server Appliance](#).
- For the appliance upgrade preparation, see [Preparing to Upgrade the vCenter Server Appliance](#).
- For the appliance upgrade procedures, see [Chapter 3 Upgrading the vCenter Server Appliance](#).
- For the appliance post-upgrade procedures, see [Chapter 5 After Upgrading or Migrating vCenter Server](#).

## System Requirements for the New vCenter Server Appliance

The upgrade of the appliance is a migration of the old version to the new version, which includes deploying a new appliance of version 7.0. You can deploy the new vCenter Server appliance on an ESXi host 6.5 or later, or on a vCenter Server instance 6.5 or later. Your system must also meet specific software and hardware requirements.

When you use Fully Qualified Domain Names, verify that the client machine from which you are deploying the appliance and the network on which you are deploying the appliance use the same DNS server.

Before you deploy the new appliance, synchronize the clocks of the target server and all vCenter Server instances on the vSphere network. Unsynchronized clocks might result in authentication problems and can cause the installation to fail or prevent the appliance services from starting. See [Synchronizing Clocks on the vSphere Network](#).

## Hardware Requirements for the vCenter Server Appliance

When you deploy the vCenter Server appliance, you can select to deploy an appliance that is suitable for the size of your vSphere environment. The option that you select determines the number of CPUs and the amount of memory for the appliance.

### Hardware Requirements for the vCenter Server Appliance

The hardware requirements for a vCenter Server appliance depend on the size of your vSphere inventory.

**Table 3-1. Hardware Requirements for a vCenter Server Appliance**

	Number of vCPUs	Memory
Tiny environment (up to 10 hosts or 100 virtual machines)	2	12 GB
Small environment (up to 100 hosts or 1,000 virtual machines)	4	19 GB
Medium environment (up to 400 hosts or 4,000 virtual machine)	8	28 GB
Large environment (up to 1,000 hosts or 10,000 virtual machines)	16	37 GB
X-Large environment (up to 2,000 hosts or 35,000 virtual machines)	24	56 GB

**Note** If you want to add an ESXi host with more than 512 LUNs and 2,048 paths to the vCenter Server inventory, you must deploy a vCenter Server appliance for a large or x-large environment.

## Storage Requirements for the vCenter Server Appliance

When you deploy the vCenter Server appliance, the ESXi host or DRS cluster on which you deploy the appliance must meet minimum storage requirements. The required storage depends not only on the size of the vSphere environment and the storage size, but also on the disk provisioning mode.

### Storage Requirements for the vCenter Server Appliance

The storage requirements are different for each vSphere environment size and depend on your database size requirements.

**Table 3-2. Storage Requirements for a vCenter Server Appliance**

	Default Storage Size	Large Storage Size	X-Large Storage Size
Tiny environment (up to 10 hosts or 100 virtual machines)	579 GB	1992 GB	4279 GB
Small environment (up to 100 hosts or 1,000 virtual machines)	694 GB	2046 GB	4304 GB
Medium environment (up to 400 hosts or 4,000 virtual machine)	908 GB	2140 GB	4468 GB
Large environment (up to 1,000 hosts or 10,000 virtual machines)	1358 GB	1958 GB	4518 GB
X-Large environment (up to 2,000 hosts or 35,000 virtual machines)	2283 GB	2383 GB	4620 GB

**Note** The storage requirements include the requirements for the vSphere Lifecycle Manager that runs as a service in the vCenter Server appliance.

## Software Requirements for the vCenter Server Appliance

The VMware vCenter Server appliance can be deployed on ESXi 6.5 hosts or later, or on vCenter Server instances 6.5 or later.

You can deploy the vCenter Server appliance using the GUI or CLI installer. You run the installer from a network client machine that you use to connect to the target server and deploy the appliance on the server. You can connect directly to an ESXi 6.5 host on which to deploy the appliance. You can also connect to a vCenter Server 6.5 instance to deploy the appliance on an ESXi host or DRS cluster that resides in the vCenter Server inventory.

For information about the requirements for network client machine, see [System Requirements for the vCenter Server Installer](#).

## Required Ports for vCenter Server

The vCenter Server system must be able to send data to every managed host and receive data from the vSphere Client. To enable migration and provisioning activities between managed hosts, the source and destination hosts must be able to receive data from each other through predetermined TCP and UDP ports.

vCenter Server is accessed through predetermined TCP and UDP ports. If you manage network components from outside a firewall, you might be required to reconfigure the firewall to allow access on the appropriate ports. For the list of all supported ports and protocols in vSphere, see the VMware Ports and Protocols Tool™ at <https://ports.vmware.com>.

During installation, if a port is in use or is blocked using a denylist, the vCenter Server installer displays an error message. You must use another port number to proceed with the installation. There are internal ports that are used only for inter-process communication.

VMware uses designated ports for communication. Additionally, the managed hosts monitor designated ports for data from vCenter Server. If a built-in firewall exists between any of these elements, the installer opens the ports during the installation or upgrade process. For custom firewalls, you must manually open the required ports. If you have a firewall between two managed hosts and you want to perform source or target activities, such as migration or cloning, you must configure a means for the managed hosts to receive data.

To configure the vCenter Server system to use a different port to receive vSphere Client data, see the *vCenter Server and Host Management* documentation.

## DNS Requirements for the vCenter Server Appliance

When you deploy the new vCenter Server appliance, in the temporary network settings, you can assign a static IP address and an FQDN that is resolvable by a DNS server. After the upgrade, the appliance frees this static IP address and assumes the network settings of the old appliance.

When you deploy the vCenter Server appliance with a static IP address, you ensure that in case of system restart, the IP address of the appliance remains the same.

Before you deploy the vCenter Server appliance with a static IP address, you must verify that this IP address has a valid internal domain name system (DNS) registration.

When you deploy the vCenter Server appliance, the installation of the web server component that supports the vSphere Client fails if the installer cannot look up the fully qualified domain name (FQDN) for the appliance from its IP address. Reverse lookup is implemented using PTR records.

If you plan to use an FQDN for the appliance system name, you must verify that the FQDN is resolvable by a DNS server, by adding forward and reverse DNS A records.

You can use the `nslookup` command to verify that the DNS reverse lookup service returns an FQDN when queried with the IP address and to verify that the FQDN is resolvable.

```
nslookup -nosearch -nodefname FQDN_or_IP_address
```

If you use DHCP instead of a static IP address for the vCenter Server appliance, verify that the appliance name is updated in the domain name service (DNS). If you can ping the appliance name, the name is updated in DNS.

Ensure that the ESXi host management interface has a valid DNS resolution from the vCenter Server and all vSphere Client instances. Ensure that the vCenter Server has a valid DNS resolution from all ESXi hosts and vSphere Client.

## vSphere Client Software Requirements

Use of the vSphere Client requires a supported web browser.

VMware has tested and supports the following guest operating systems and browser versions for the vSphere Client.

### Supported Guest Operating Systems

- Windows 32-bit and 64-bit
- Mac OS

### Supported Browser Versions

- Google Chrome 89 or later
- Mozilla Firefox 80 or later
- Microsoft Edge 90 or later

---

**Note** Later versions of these browsers are likely to work, but have not been tested.

---

## Preparing to Upgrade the vCenter Server Appliance

Before you upgrade the vCenter Server appliance, you must download the vCenter Server installer ISO file and mount it to a network virtual machine or physical server from which you want to perform the upgrade.

The computer from which you upgrade the appliance must run on a Windows, Linux, or Mac operating system that meets the operating system requirements. See [System Requirements for the vCenter Server Installer](#).

Before upgrading a vCenter Server appliance, you must prepare the ESXi hosts in the inventory.

If the vCenter Server appliance uses an external Oracle database, you must determine the size of the existing database.

If vCenter Server appliance uses an external Update Manager instance, you must run the Migration Assistant on the computer running Update Manager.

## System Requirements for the vCenter Server Installer

You can run the vCenter Server GUI or CLI installer from a network client machine that is running on a Windows, Linux, or Mac operating system of a supported version.

To ensure optimal performance of the GUI and CLI installers, use a client machine that meets the minimum hardware requirements.

**Table 3-3. System Requirements for the GUI and CLI Installers**

Operating System	Supported Versions	Minimum Hardware Configuration for Optimal Performance
Windows	<ul style="list-style-type: none"> <li>■ Windows 8, 8.1, 10</li> <li>■ Windows 2012 x64 bit</li> <li>■ Windows 2012 R2 x64 bit</li> <li>■ Windows 2016 x64 bit</li> <li>■ Windows 2019 x64</li> </ul>	4 GB RAM, 2 CPU having 4 cores with 2.3 GHz, 32 GB hard disk, 1 NIC
Linux	<ul style="list-style-type: none"> <li>■ SUSE 15</li> <li>■ Ubuntu 16.04 and 18.04</li> </ul>	4 GB RAM, 1 CPU having 2 cores with 2.3 GHz, 16 GB hard disk, 1 NIC <b>Note</b> The CLI installer requires 64-bit OS.
Mac	<ul style="list-style-type: none"> <li>■ macOS v10.13, 10.14, 10.15</li> <li>■ macOS High Sierra, Mojave, Catalina</li> </ul>	8 GB RAM, 1 CPU having 4 cores with 2.4 GHz, 150 GB hard disk, 1 NIC

**Note** For client machines that run on Mac 10.13 or later, concurrent GUI deployments of multiple appliances are unsupported. You must deploy the appliances in a sequence.

**Note** Visual C++ redistributable libraries need to be installed to run the CLI installer on versions of Windows older than Windows 10. The Microsoft installers for these libraries are located in the `vcsa-cli-installer/win32/vcredist` directory.

**Note** Deploying the vCenter Server appliance with the GUI requires a minimum resolution of 1024x768 to properly display. Lower resolutions can truncate the UI elements.

## Download and Mount the vCenter Server Installer

VMware releases the vCenter Server appliance ISO image, which contains GUI and CLI installers for the vCenter Server appliance.

With the GUI and CLI executable files that are included in the vCenter Server installer, you can:

- Deploy the vCenter Server appliance.
- Upgrade the vCenter Server appliance.

- Converge older versions of vCenter Server with an external Platform Services Controller to the current version of vCenter Server.
- Restore a vCenter Server appliance from a file-based backup.

### Prerequisites

- Create a Customer Connect account at <https://my.vmware.com/web/vmware/>.
- Verify that your client machine meets the system requirements for the vCenter Server installer. See [System Requirements for the vCenter Server Installer](#).

### Procedure

- 1 From the VMware Web site at <https://my.vmware.com/web/vmware/downloads>, download the vCenter Server appliance ISO image.

```
VMware-VCSA-all-version_number-build_number.iso
```

vCenter Server is part of VMware vCloud Suite and VMware vSphere, listed under Datacenter & Cloud Infrastructure.

- 2 Confirm that the md5sum is correct.

See the VMware Web site topic *Using MD5 Checksums* at <http://www.vmware.com/download/md5.html>.

- 3 Mount the ISO image to the client machine from which you want to deploy, upgrade, migrate, or restore the appliance.

---

**Note** ISO mounting software that does not allow more than eight directory levels, for example, MagicISO Maker on Windows, is unsupported.

For Linux OS and Mac OS, Archive Manager is unsupported.

---

For Mac OS, you can use DiskImageMounter.

For Ubuntu 14.04, you can use Disk Image Mounter.

For SUSE 12 OS, you can use the terminal.

```
$ sudo mkdir mount_dir
$ sudo mount -o loop VMware-vCSA-all-version_number-build_number.iso mount_dir
```

---

**Important** Due to a security change in MacOS Catalina, you must modify the security settings on your computer until the vCenter Server deployment completes. If you attempt to run the installer under MacOS Catalina without modifying the security settings, the vCenter Server installer reports the error: `ovftool cannot be opened because the developer cannot be verified`. For more information, see [KB 79416](#).

---

### What to do next

Open the `readme.txt` file and review the information about the other files and directories in the vCenter Server appliance ISO image.

## Synchronizing Clocks on the vSphere Network

Verify that all components on the vSphere network have their clocks synchronized. If the clocks on the physical machines in your vSphere network are not synchronized, SSL certificates and SAML Tokens, which are time-sensitive, might not be recognized as valid in communications between network machines.

Unsynchronized clocks can result in authentication problems, which can cause the installation to fail or prevent the vCenter Server `vmware-vpxd` service from starting.

Time inconsistencies in vSphere can cause firstboot to fail at different services depending on where in the environment time is not accurate and when the time is synchronized. Problems most commonly occur when the target ESXi host for the destination vCenter Server is not synchronized with NTP or PTP. Similarly, issues can arise if the destination vCenter Server migrates to an ESXi host set to a different time due to fully automated DRS.

To avoid time synchronization issues, ensure that the following is correct before installing, migrating, or upgrading a vCenter Server.

- The target ESXi host where the destination vCenter Server is to be deployed is synchronized to NTP or PTP.
- The ESXi host running the source vCenter Server is synchronized to NTP or PTP.
- When upgrading or migrating from vSphere 6.5 or 6.7 to vSphere 7.0, if the vCenter Server appliance is connected to an external Platform Services Controller, ensure the ESXi host running the external Platform Services Controller is synchronized to NTP or PTP.
- If you are upgrading or migrating from vSphere 6.5 or 6.7 to vSphere 7.0, verify that the source vCenter Server or vCenter Server appliance and external Platform Services Controller have the correct time.
- When you upgrade a vCenter Server 6.5 or 6.7 instance with an external Platform Services Controller to vSphere 7.0, the upgrade process converts to a vCenter Server instance with an embedded Platform Services Controller.

Verify that any Windows host machine on which vCenter Server runs is synchronized with the Network Time Server (NTP) server. See the VMware knowledge base article at <https://kb.vmware.com/s/article/1318>.

To synchronize ESXi clocks with an NTP server or a PTP server, you can use the VMware Host Client. For information about editing the time configuration of an ESXi host, see *vSphere Single Host Management - VMware Host Client*.

To learn how to change time synchronization settings for vCenter Server, see "Configure the System Time Zone and Time Synchronization Settings" in *vCenter Server Configuration*.

To learn how to edit time configuration for a host by using the vSphere Client, see "Editing Time Configuration for a Host" in *vCenter Server and Host Management*.



## Transferring Data from an Existing vCenter Server Appliance

You can transfer data from an existing vCenter Server appliance external database to the embedded PostgreSQL database in use by vCenter Server 7.0.

Both the Windows-based vCenter Server upgrade and vCenter Server appliance migration allow you to copy the minimum amount of data necessary to be operational, minimizing downtime. You can then copy the remaining data from the external database to the embedded PostgreSQL database in the background, preserving your deployment's historical event and performance data.

You can migrate the following types of data from an external database to the embedded PostgreSQL database in use by version 7.0 of the vCenter Server appliance.

### Configuration data

The minimum type of data you must transfer from your existing vCenter Server appliance external database to upgrade or migrate to a functioning vCenter Server appliance. This data can be transferred in a reasonably short amount of time, minimizing downtime during the upgrade to vCenter Server 7.0.

### Configuration and historical data

In addition to the configuration data, you can choose to transfer historical data such as usage statistics, events, and tasks. The vCenter Server installer gives you the option to copy both the configuration and historical data at one time, or to copy only the configuration data during the upgrade process. You can then choose to copy the historical data in the background after you start your new vCenter Server.

---

**Attention** If you choose to copy all data at one time, you cannot start vCenter Server until all the data has been transferred to the embedded PostgreSQL database within vCenter Server 7.0.

---

### Configuration, historical, and performance metrics data

The largest amount of data you can choose to transfer to vCenter Server. You can copy only the configuration data during the upgrade process, and then copy the historical and performance data in the background after the upgrade or migration to vCenter Server 7.0 finishes.

You can transfer historical data after the upgrade or migration from the following vCenter Server versions using external databases to the embedded PostgreSQL database within the vCenter Server appliance.

---

**Note** You can only transfer data from external databases to the embedded PostgreSQL database in the background after upgrade or migration. Transferring data from an embedded PostgreSQL database to another embedded PostgreSQL database after upgrade or migration is not supported.

---

Table 3-4. vCenter Server Database Support for Data Transfer After Upgrade or Migration

vCenter Server Versions	Databases	vCenter Server Appliance 7.0 Support for Data Transfer
vCenter Server appliance 6.5	Embedded PostgreSQL database	Not Supported
vCenter Server for Windows 6.5	External Oracle or MS SQL database	Supported
	Embedded PostgreSQL database	Not supported
vCenter Server appliance 6.7	Embedded PostgreSQL database	Not supported
	External Oracle or MS SQL database	Supported
vCenter Server for Windows 6.7	Embedded PostgreSQL database	Not supported

## Monitor and Manage Historical Data Migration

You can monitor and manage the background migration of historical data using the vCenter Server Management Interface. You can perform the following data management tasks:

- Monitor the progress of the data migration.
- Pause the data import.
- Cancel the data import.

---

**Important** If you cancel the data import, the historical data is not imported to the embedded PostgreSQL database. If you cancel the data import operation, you cannot recover the data. If you do cancel the data import, and want to import the historical data later, you must restart the upgrade or migration process from Stage 1 of the GUI installer.

---

See [Monitor and Manage Historical Data Migration](#).

## Prepare ESXi Hosts for vCenter Server Appliance Upgrade

Before upgrading to vCenter Server 7.0, you must prepare your ESXi hosts.

### Prerequisites

To upgrade vCenter Server appliance, your ESXi hosts must meet the requirements for upgrade.

- ESXi hosts must be at version 6.5 or later. For information on ESXi compatibility, see the [VMware Compatibility Guide](#).
- Your source and target ESXi hosts must not be in lockdown or maintenance mode, and not part of fully automated DRS clusters.
- Review your environment's Certificate Authority (CA) signed SSL certificates. To learn about manually reviewing CA signed SSL certificates in a vSphere environment, see Knowledge Base article [KB 2111411](#).

## Procedure

1 If you have Custom or Thumbprint certificates, see [Host Upgrades and Certificates](#) to determine your preparatory steps.

2 If you have vSphere HA clusters, SSL certificate checking must be enabled.

If certificate checking is not enabled when you upgrade ESXi hosts, vSphere HA fails to configure on the hosts.

a Select the vCenter Server appliance instance in the vSphere Client inventory tree.

b Select the **Configure** tab, and then under **Settings** select **General**.

c Click **Edit**.

d Select **SSL settings**.

Verify that **vCenter Server requires verified host SSL certificates** is selected.

## Results

Your ESXi hosts are ready for the vCenter Server appliance upgrade.

## Host Upgrades and Certificates

If you upgrade an ESXi host to ESXi 6.5 or later, the upgrade process replaces the self-signed (thumbprint) certificates with VMCA-signed certificates. If the ESXi host uses custom certificates, the upgrade process retains those certificates even if those certificates are expired or invalid.

The recommended upgrade workflow depends on the current certificates.

### Host Provisioned with Thumbprint Certificates

If your host is currently using thumbprint certificates, it is automatically assigned VMCA certificates as part of the upgrade process.

---

**Note** You cannot provision legacy hosts with VMCA certificates. You must upgrade those hosts to ESXi 6.5 later.

---

### Host Provisioned with Custom Certificates

If your host is provisioned with custom certificates, usually third-party CA-signed certificates, those certificates remain in place during upgrade. Change the certificate mode to **Custom** to ensure that the certificates are not replaced accidentally during a certificate refresh later.

---

**Note** If your environment is in VMCA mode, and you refresh the certificates from the vSphere Client, any existing certificates are replaced with certificates that are signed by VMCA.

---

Going forward, vCenter Server monitors the certificates and displays information, for example, about certificate expiration, in the vSphere Client.

### Hosts Provisioned with Auto Deploy

Hosts that are being provisioned by Auto Deploy are always assigned new certificates when they are first booted with ESXi 6.5 or later software. When you upgrade a host that is provisioned by Auto Deploy, the Auto Deploy server generates a certificate signing request (CSR) for the host and submits it to VMCA. VMCA stores the signed certificate for the host. When the Auto Deploy server provisions the host, it retrieves the certificate from VMCA and includes it as part of the provisioning process.

You can use Auto Deploy with custom certificates.

## Change the Certificate Mode

Use VMCA to provision the ESXi hosts in your environment unless corporate policy requires that you use custom certificates. To use custom certificates with a different root CA, you can edit the vCenter Server `vpzd.certmgmt.mode` advanced option. After the change, the hosts are no longer automatically provisioned with VMCA certificates when you refresh the certificates. You are responsible for the certificate management in your environment.

You can use the vCenter Server advanced settings to change to thumbprint mode or to custom CA mode. Use thumbprint mode only as a fallback option.

### Procedure

- 1 In the vSphere Client, select the vCenter Server system that manages the hosts.
- 2 Click **Configure**, and under Settings, click **Advanced Settings**.
- 3 Click **Edit Settings**.
- 4 Click the **Filter** icon in the Name column, and in the Filter box, enter `vpzd.certmgmt` to display only certificate management parameters.
- 5 Change the value of `vpzd.certmgmt.mode` to **custom** if you intend to manage your own certificates, and to **thumbprint** if you temporarily want to use thumbprint mode, and click **Save**.
- 6 Restart the vCenter Server service.

## Determine the Oracle Database Size and the Storage Size for the New Appliance

Before upgrading a vCenter Server appliance or migrating a vCenter Server on Windows that uses an external Oracle database, you must determine the size of the existing database. Based on the size of the existing database, you can calculate the minimum storage size for the new vCenter Server appliance database using an embedded PostgreSQL database.

You run scripts to determine the Oracle core table size, the events and tasks table size, and the statistics table size. The Oracle core table corresponds to the database (`/storage/db`) partition of the PostgreSQL database. The Oracle events and tasks and statistics tables correspond to the statistics, events, alarms, and tasks (`/storage/seat`) partition of the PostgreSQL database.

During the upgrade of the appliance, you must select a storage size for the new appliance that is at least twice the size of the Oracle tables size.

During the upgrade of the appliance, you can select the types of data to transfer to the new appliance. To minimize upgrade time and storage requirements for the new appliance, you can choose to transfer only the configuration data.

### Prerequisites

You must have the vCenter Server database login credentials.

### Procedure

- 1 Log in to a SQL\*Plus session with the vCenter Server database user.
- 2 Determine the core table size by running the following script.

```
SELECT ROUND(SUM(s.bytes)/(1024*1024)) SIZE_MB
FROM   user_segments s
WHERE  (s.segment_name,s.segment_type)
        IN (SELECT seg_name, seg_type FROM
              (SELECT t.table_name seg_name, t.table_name tname,
                    'TABLE' seg_type
               FROM   user_tables t
              UNION
               SELECT i.index_name, i.table_name,
                    'INDEX'
               FROM   user_indexes i
              ) ti
         WHERE (ti.tname LIKE 'VPX_%'
              OR ti.tname LIKE 'CL_%'
              OR ti.tname LIKE 'VDC_%')
              AND ti.tname NOT LIKE 'VPX_SAMPLE_TIME%'
              AND ti.tname NOT LIKE 'VPX_HIST_STAT%'
              AND ti.tname NOT LIKE 'VPX_TOPN%'
              AND ti.tname NOT LIKE 'VPX_SDRS_STATS_VM%'
              AND ti.tname NOT LIKE 'VPX_SDRS_STATS_DATASTORE%'
              AND ti.tname NOT LIKE 'VPX_TASK%'
              AND ti.tname NOT LIKE 'VPX_EVENT%'
              AND ti.tname NOT LIKE 'VPX_PROPERTY_BULLETIN%');
```

The script returns the database storage size in MB.

- 3 Determine the events and tasks table size by running the following script.

```
SELECT ROUND(SUM(s.bytes)/(1024*1024)) SIZE_MB
FROM   user_segments s
WHERE  (s.segment_name,s.segment_type)
        IN (SELECT seg_name, seg_type FROM
              (SELECT t.table_name seg_name, t.table_name tname,
                    'TABLE' seg_type
               FROM   user_tables t
              UNION
               SELECT i.index_name, i.table_name,
                    'INDEX'
```

```

        FROM    user_indexes i
      ) ti
WHERE
      ti.tname LIKE 'VPX_TASK%'
OR ti.tname LIKE 'VPX_EVENT%');

```

The script returns the events and tasks storage size in MB.

#### 4 Determine the statistics table size by running the following script.

```

SELECT ROUND(SUM(s.bytes)/(1024*1024)) SIZE_MB
FROM    user_segments s
WHERE   (s.segment_name,s.segment_type)
        IN (SELECT seg_name, seg_type FROM
            (SELECT t.table_name seg_name, t.table_name tname,
                'TABLE' seg_type
             FROM    user_tables t
             UNION
             SELECT i.index_name, i.table_name,
                'INDEX'
             FROM    user_indexes i
            ) ti
        WHERE
            ti.tname LIKE 'VPX_SAMPLE_TIME%'
OR ti.tname LIKE 'VPX_TOPN%'
OR ti.tname LIKE 'VPX_TASK%'
OR ti.tname LIKE 'VPX_EVENT%'
OR ti.tname LIKE 'VPX_HIST_STAT%');

```

The script returns the statistics storage size in MB.

#### 5 Calculate the minimum storage size for the new appliance that you are going to deploy during the upgrade.

- a The size of the database (`/storage/db`) partition of the embedded PostgreSQL database must be at least twice the size of the Oracle core table returned in [Step 2](#).
- b The size of the statistics, events, alarms, and tasks (`/storage/seat`) partition of the embedded PostgreSQL database must be at least twice the sum of the sizes of the Oracle events and tasks and statistics tables returned in [Step 3](#) and [Step 4](#).

For example, if the Oracle core table is 100 MB, the events and tasks table is 1,000 MB, and the statistics table is 2,000 MB, then the Postgres `/storage/db` partition must be at least 200 MB and the `/storage/seat` partition must be at least 6,000 MB.

## Download and Run VMware Migration Assistant on the Source Update Manager Machine

During the upgrade of a vCenter Server appliance that uses an external Update Manager, the Migration Assistant must be running on the source Update Manager machine. This procedure describes how to download and run the Migration Assistant manually before the upgrade.

The Migration Assistant facilitates the migration of the Update Manager server and database to the new upgraded vCenter Server appliance. The Migration Assistant uses port 9123 by default. If port 9123 is used by another service on your Update Manager machine, the Migration Assistant automatically finds a different free port to use.

Alternatively, if you plan to upgrade the vCenter Server appliance by using the CLI installer, you can add the `source.vum` section and `run.migration.assistant` subsection to your JSON template. For information about the CLI upgrade configuration parameters, see [Upgrade Configuration Parameters for CLI Upgrade of vCenter Server Appliance](#).

### Prerequisites

- [Download and Mount the vCenter Server Installer](#).
- Log in to the source Update Manager machine as an administrator.

### Procedure

- 1 From the vCenter Server appliance installer package, copy the `migration-assistant` directory to the source Update Manager machine.
- 2 From the `migration-assistant` directory, double-click `VMware-Migration-Assistant.exe` and provide the vCenter Single Sign-On administrator password.
- 3 Leave the Migration Assistant window open until the upgrade of the vCenter Server appliance finishes.

### Results

When the pre-checks are finished and any errors are addressed, your source Update Manager system is ready for the upgrade.

---

**Caution** Closing the Migration Assistant window causes the upgrade process to stop.

---

## Prerequisites for Upgrading the vCenter Server Appliance

To ensure a successful upgrade of the vCenter Server appliance, you must perform the following required tasks and pre-checks before beginning the upgrade process.

### General Prerequisites

- [Download and Mount the vCenter Server Installer](#).
- Verify that the clocks of all computers on the vSphere network are synchronized. See [Synchronizing Clocks on the vSphere Network](#).

### Target System Prerequisites

- Verify that your system meets the minimum software and hardware requirements. See [System Requirements for the New vCenter Server Appliance](#).

- If you plan to deploy the new appliance on an ESXi host, verify that the target ESXi host is not in lockdown or maintenance mode.
- If you plan to deploy the new appliance on an ESXi host managed by vCenter Server, review the Distributed Resource Scheduler (DRS) settings on the cluster. Ensure that the DRS settings for the cluster on which the target ESXi host resides are not configured for Full Automation. Set the Automation Level to Manual or Partially Automated. This Automation Level ensures that the target ESXi host does not reboot during the upgrade process.
- If you plan to deploy the new appliance on a DRS cluster of the inventory of a vCenter Server instance, verify that the cluster contains at least one ESXi host that is not in lockdown or maintenance mode.
- If you plan to deploy the new appliance on a DRS cluster of the inventory of a vCenter Server instance, verify that the cluster is not fully automated.

## Source System Prerequisites

- Ensure that DRS is set to manual for the cluster temporarily so that the VMs for the Source and Target do not get moved during the upgrade.
- Verify that port 22 is open on the vCenter Server appliance that you want to upgrade. The upgrade process establishes an inbound SSH connection to download the exported data from the source vCenter Server appliance.
- If you are upgrading a vCenter Server appliance that is configured with an external Update Manager, run the Migration Assistant on the source Update Manager computer.

For a GUI upgrade, you must run Migration Assistant manually. See [Download and Run VMware Migration Assistant on the Source Update Manager Machine](#).

For a CLI upgrade, you can run Migration Assistant manually or automatically. To run Migration Assistant automatically, add the `source.vum` section and `run.migration.assistant` subsection to your JSON template. See [Upgrade Configuration Parameters for CLI Upgrade of vCenter Server Appliance](#).

- Verify that port 443 is open on the source ESXi host on which the appliance that you want to upgrade resides. The upgrade process establishes an HTTPS connection to the source ESXi host to verify that the source appliance is ready for upgrade and to set up an SSH connection between the new and the existing appliance.

---

**Note** When upgrading, the temporary vCenter Server instance requires the same access rights as the permanent vCenter Server instance to port 443. Ensure that any firewalls in your environment allow both the temporary and permanent vCenter Server instances to access port 443.

---

- Verify that you have sufficient free disk space on the appliance that you want to upgrade so that you can accommodate the data for the upgrade.



- Create an image-based backup of the vCenter Server appliance you are upgrading as a precaution in case there is a failure during the upgrade process. If you are upgrading a vCenter Server appliance with an external Platform Services Controller, take a image-based backup of the Platform Services Controller appliance as well.

---

**Important** To take a pre-upgrade image-based backup, power off all the vCenter Server and Platform Services Controller nodes in your environment, and take a backup of each node. After you have taken backups of all the nodes, you can restart them and proceed with the upgrade procedure.

---

If the upgrade fails, delete the newly deployed vCenter Server appliance, and restore the vCenter Server and Platform Services Controller nodes from their respective backups. You must restore all the nodes in the environment from their backups. Failing to do so will cause the replication partners to be out of synchronization with the restored node.

To learn about image-based back, see "Image-Based Backup and Restore of a vCenter Server Environment" in *vCenter Server Installation and Setup*.

- If you use an external database, determine the database size and the minimum storage size for the new appliance. See [Determine the Oracle Database Size and the Storage Size for the New Appliance](#).
- If your deployment uses an external database, you must back up the external vCenter Server appliance database.

## Network Prerequisites

- Verify that the new appliance can connect to the source ESXi host or vCenter Server instance on which resides the appliance that you want to upgrade.
- If you plan to assign a static IP address and an FQDN as a system name in the temporary network settings of the appliance, verify that you have configured the forward and reverse DNS records for the IP address.
- If you plan to assign a DHCP IP address in the temporary network settings of the new vCenter Server appliance, verify that the ESXi host on which you want to deploy the new appliance is in the same network as the ESXi host on which the existing vCenter Server appliance runs.
- If you plan to assign a DHCP IPv4 address in the temporary network settings of the new vCenter Server appliance, verify that the ESXi host on which you want to deploy the new appliance is connected to at least one network that is associated with a port group which accepts MAC address changes. Consider the default security policy of a distributed virtual switch, which is to reject MAC address changes. For information about how to configure the security policy for a switch or port group, see *vSphere Networking*.

## GUI Upgrade of the vCenter Server Appliance

You can use the GUI installer to perform an interactive upgrade of a vCenter Server appliance.

To perform the GUI upgrade, download the vCenter Server appliance installer on a network client machine, run the Upgrade Wizard from the client machine, and provide the inputs for the deployment and setup of the new upgraded appliance.

---

**Note** When you upgrade vCenter Server 6.5 or 6.7 with an external Platform Services Controller to vCenter Server 7.0, the upgrade process converges the external Platform Services Controller into the new vCenter Server appliance. The new vCenter Server contains all Platform Services Controller services, preserving the functionality and workflows, including authentication, certificate management, and licensing. It is no longer necessary nor possible to upgrade and use an external Platform Services Controller.

After successfully upgrading your environment to vCenter Server 7.0, the pre-existing Platform Services Controller will be powered off, and you can remove it from your vSphere inventory. See [Decommission the Platform Services Controller](#).

---

The GUI upgrade process includes a series of two stages.

### Figure 3-1. Stage 1 - OVA Deployment



The first stage walks you through the deployment wizard to get the deployment type of the source appliance that you want to upgrade and configure the new appliance settings. During this stage, you deploy the new appliance with temporary network settings. This stage finishes the deployment of the OVA file on the target server with the same deployment type as the source appliance and the appliance settings that you provide.

As an alternative to performing the first stage of the upgrade with the GUI installer, you can deploy the OVA file of the new vCenter Server appliance using the vSphere Client or VMware Host Client. To deploy the OVA file on an ESXi host or vCenter Server instance 6.5 or later, you can also use the vSphere Client. After the OVA deployment, you must log in to the appliance management interface of the newly deployed appliance to proceed with the second stage of the upgrade process.

### Figure 3-2. Stage 2 - Appliance Setup



The second stage walks you through the setup wizard to select the data types to transfer from the old to the new appliance. The new appliance uses the temporary network settings until the data transfer finishes. After the data transfer finishes, the new appliance assumes the network settings of the old appliance. This stage finishes the data transfer, starts the services of the new upgraded appliance, and powers off the old appliance.

As an alternative to performing the second stage of the upgrade with the GUI installer, you can log in to the vCenter Server Management Interface of the newly deployed appliance, [https://FQDN\\_or\\_IP\\_address:5480](https://FQDN_or_IP_address:5480).

## Required Information for Upgrading a vCenter Server Appliance 6.5 or 6.7

The GUI upgrade wizard prompts you for information about the vCenter Server appliance that you want to upgrade, deployment information for the new vCenter Server appliance 7.0. It is a best practice to keep a record of the values that you enter.

You can use this worksheet to record the information that you need for upgrading a vCenter Server appliance with an embedded Platform Services Controller or a vCenter Server appliance with an external Platform Services Controller.

**Table 3-5. Required Information During Stage 1 of the Upgrade**

Required for Upgrade of	Required Information	Default	Your Entry
All deployment types	FQDN or IP address of the source appliance that you want to upgrade.	-	
	HTTPS port of the source appliance.	443	
	vCenter Single Sign-On administrator user name of the source appliance.	administrator@vsp here.local	
	<b>Important</b> The user must be administrator@your_domain_name.		
	Password of the vCenter Single Sign-On administrator user.	-	
All deployment types	Password of the root user of the source appliance	-	
	FQDN or IP address of the source server on which resides that appliance that you want to upgrade.  The source server can be either an ESXi host or a vCenter Server instance.	-	
	<b>Note</b> The source server cannot be the vCenter Server appliance that you want to upgrade. In such cases, use the source ESXi host.		
	HTTPS port of the source server.	443	

Table 3-5. Required Information During Stage 1 of the Upgrade (continued)

Required for Upgrade of	Required Information	Default	Your Entry
	User name with administrative privileges on the source server. <ul style="list-style-type: none"> <li>■ If your source server is an ESXi host, use root.</li> <li>■ If your source server is a vCenter Server instance, use <i>user_name@your_domain_name</i>, for example, administrator@vsphere.local.</li> </ul>	-	
	Password of the user with administrative privileges on the source server.	-	
All deployment types	FQDN or IP address of the target server on which you want to deploy the new appliance. The target server can be either an ESXi host or a vCenter Server instance.  <b>Note</b> The target server cannot be the vCenter Server appliance that you want to upgrade. In such cases, use an ESXi host as a target server.	-	
	HTTPS port of the target server.	443	
	User name with administrative privileges on the target server <ul style="list-style-type: none"> <li>■ If your target server is an ESXi host, use root.</li> <li>■ If your target server is a vCenter Server instance, use <i>user_name@your_domain_name</i>, for example, administrator@vsphere.local.</li> </ul>	-	
	Password of the user with administrative privileges on the target server.	-	
All deployment types Only if your target server is a vCenter Server instance.	Data center from the vCenter Server inventory on which you want to deploy the new appliance. Optionally you can provide a data center folder.	-	
	ESXi host or DRS cluster from the data center inventory on which you want to deploy the new appliance .	-	
All deployment types	The virtual machine name for the new appliance. <ul style="list-style-type: none"> <li>■ Must not contain a percent sign (%), backslash (\), or forward slash (/).</li> <li>■ Must be no more than 80 characters in length.</li> </ul>	VMware vCenter Server Appliance	

Table 3-5. Required Information During Stage 1 of the Upgrade (continued)

Required for Upgrade of	Required Information	Default	Your Entry
All deployment types	<p>Password for the root user of the appliance operating system.</p> <ul style="list-style-type: none"> <li>■ Must contain only the lower ASCII character set without spaces.</li> <li>■ Must be at least 8 characters, but no more than 20 characters in length.</li> <li>■ Must contain at least one uppercase letter.</li> <li>■ Must contain at least one lowercase letter.</li> <li>■ Must contain at least one number.</li> <li>■ Must contain at least one special character, for example, a dollar sign (\$), hash key (#), at sign (@), period (.), or exclamation mark (!).</li> </ul>	-	
<ul style="list-style-type: none"> <li>■ vCenter Server appliance 6.5 with an embedded Platform Services Controller</li> <li>■ vCenter Server appliance 6.7 with an external Platform Services Controller</li> <li>■ vCenter Server appliance 6.5 with an embedded Platform Services Controller</li> <li>■ vCenter Server appliance 6.7 with an external Platform Services Controller</li> </ul>	<p>Deployment size of the new vCenter Server appliance for your vSphere environment.</p> <ul style="list-style-type: none"> <li>■ Tiny <ul style="list-style-type: none"> <li>Deploys an appliance with 2 CPUs and 12 GB of memory.</li> <li>Suitable for environments with up to 10 hosts or 100 virtual machines.</li> </ul> </li> <li>■ Small <ul style="list-style-type: none"> <li>Deploys an appliance with 4 CPUs and 19 GB of memory.</li> <li>Suitable for environments with up to 100 hosts or 1,000 virtual machines.</li> </ul> </li> <li>■ Medium <ul style="list-style-type: none"> <li>Deploys an appliance with 8 CPUs and 28 GB of memory.</li> <li>Suitable for environments with up to 400 hosts or 4,000 virtual machines.</li> </ul> </li> <li>■ Large <ul style="list-style-type: none"> <li>Deploys an appliance with 16 CPUs and 37 GB of memory.</li> <li>Suitable for environments with up to 1,000 hosts or 10,000 virtual machines.</li> </ul> </li> <li>■ X-Large <ul style="list-style-type: none"> <li>Deploys an appliance with 24 CPUs and 56 GB of memory.</li> <li>Suitable for environments with up to 2,000 hosts or 35,000 virtual machines.</li> </ul> </li> </ul>	The size of the source vCenter Server appliance and Platform Services Controller determines the default deployment size. Using this information, the upgrade installer calculates the best size to use for your environment, which might be the same as your existing deployment, or calculated to the next largest size.	

Table 3-5. Required Information During Stage 1 of the Upgrade (continued)

Required for Upgrade of	Required Information	Default	Your Entry
<ul style="list-style-type: none"> <li>■ vCenter Server appliance 6.5 with an external Platform Services Controller</li> <li>■ vCenter Server appliance 6.7 with an external Platform Services Controller</li> </ul>	<p>Storage size of the new vCenter Server appliance for your vSphere environment. Increase the default storage size if you want larger volume for SEAT data (stats, events, alarms, and tasks).</p> <hr/> <p><b>Note</b> Consider the database size of the appliance that you want to upgrade and the types of the data that you want transfer to the new appliance. For an external database, see <a href="#">Determine the Oracle Database Size and the Storage Size for the New Appliance</a>.</p> <hr/> <ul style="list-style-type: none"> <li>■ Default <ul style="list-style-type: none"> <li>For tiny deployment size, deploys the appliance with 415 GB of storage.</li> <li>For small deployment size, deploys the appliance with 480 GB of storage.</li> <li>For medium deployment size, deploys the appliance with 700 GB of storage.</li> <li>For large deployment size, deploys the appliance with 1065 GB of storage.</li> <li>For x-large deployment size, deploys the appliance with 1805 GB of storage.</li> </ul> </li> <li>■ Large <ul style="list-style-type: none"> <li>For tiny deployment size, deploys the appliance with 1490 GB of storage.</li> <li>For small deployment size, deploys the appliance with 1535 GB of storage.</li> <li>For medium deployment size, deploys the appliance with 1700 GB of storage.</li> <li>For large deployment size, deploys the appliance with 1765 GB of storage.</li> <li>For x-large deployment size, deploys the appliance with 1905 GB of storage.</li> </ul> </li> <li>■ X-Large <ul style="list-style-type: none"> <li>For tiny deployment size, deploys the appliance with 3245 GB of storage.</li> <li>For small deployment size, deploys the appliance with 3295 GB of storage.</li> <li>For medium deployment size, deploys the appliance with 3460 GB of storage.</li> <li>For large deployment size, deploys the appliance with 3525 GB of storage.</li> </ul> </li> </ul>	<p>Default</p> <hr/> <p><b>Note</b> The sizing algorithm in use by the upgrade installer might select a larger storage size for your environment. Items that might affect the storage size selected by the installer include modifications to the vCenter Server appliance disks (for example, changing the size of the logging partition), or databases having a database table that the installer determines to be exceptionally large and requiring additional hard disk space.</p> <hr/>	

Table 3-5. Required Information During Stage 1 of the Upgrade (continued)

Required for Upgrade of	Required Information	Default	Your Entry
	For x-large deployment size, deploys the appliance with 3665 GB of storage.		
All deployment types	Name of the datastore on which you want to store the configuration files and virtual disks of the new appliance.  <b>Note</b> The installer displays a list of datastores that are accessible from your target server.	-	
	Enable or disable Thin Disk Mode.	Disabled	
All deployment types	Name of the network to which to connect the new appliance.  <b>Note</b> The installer displays a drop-down menu with networks that depend on the network settings of your target server. If you are deploying the appliance directly on an ESXi host, non-ephemeral distributed virtual port groups are not supported and are not displayed in the drop-down menu.  The network must be accessible from the source server on which resides that appliance that you want to upgrade.  The network must be accessible from the physical client machine from which you perform the deployment.	-	
	IP version for the appliance temporary address Can be either IPv4 or IPv6.	IPv4	
	IP assignment for the appliance temporary address Can be either static or DHCP.	static	
All deployment types Only if you use a static assignment for the temporary IP address.	Temporary system name (FQDN or IP address)  The system name is used for managing the local system. The system name must be FQDN. If a DNS server is not available, provide a static IP address.	-	
	Temporary IP address	-	
	For IPv4 version, a subnet mask as a dot decimal notation or a network prefix as an integer between 0 and 32.  For IPv6 version, a network prefix as an integer between 0 and 128.	-	
	Default gateway.	-	

Table 3-5. Required Information During Stage 1 of the Upgrade (continued)

Required for Upgrade of	Required Information	Default	Your Entry
	DNS servers separated by commas.	-	
All deployment types Only if you use a DHCP assignment with IPv4 version for the temporary IP address and a DDNS server is available in your environment.	Temporary system name (FQDN).	-	

Table 3-6. Required Information During Stage 2 of the Upgrade

Required for	Required Information	Default	Your Entry
<ul style="list-style-type: none"> <li>■ vCenter Server appliance 6.5 with an embedded or external Platform Services Controller</li> <li>■ vCenter Server appliance 6.7 with an embedded or external Platform Services Controller</li> </ul>	<p>Data types to transfer from the old appliance to the new appliance.</p> <p>In addition to the configuration data, you can transfer the events, tasks, and, performance metrics.</p> <hr/> <p><b>Note</b> For minimum upgrade time and storage requirement for the new appliance, select to transfer only the configuration data.</p>	-	
<ul style="list-style-type: none"> <li>■ vCenter Server appliance 6.5 with an embedded Platform Services Controller</li> <li>■ Platform Services Controller 6.5 appliance</li> <li>■ vCenter Server appliance 6.7 with an embedded Platform Services Controller</li> </ul>	<p>Join or do not participate in the VMware Customer Experience Improvement Program (CEIP).</p> <p>For information about the CEIP, see the Configuring Customer Experience Improvement Program section in <i>vCenter Server and Host Management</i>.</p>	Join the CEIP.	

## Upgrade a vCenter Server Appliance 6.5 or 6.7 with an Embedded Platform Services Controller by Using the GUI

You can use the GUI installer to perform an interactive upgrade of a vCenter Server appliance 6.5 or 6.7 that uses an embedded Platform Services Controller to vCenter Server appliance 7.0. You must run the GUI upgrade from a Windows, Linux, or Mac OS X machine that is in the same network as the appliance that you want to upgrade.

### Prerequisites

- See [Prerequisites for Upgrading the vCenter Server Appliance](#).



- See [Required Information for Upgrading a vCenter Server Appliance 6.5 or 6.7](#).

## Procedure

### 1 Stage 1 - Deploy the OVA File of the New vCenter Server Appliance

With stage 1 of the upgrade process, you deploy the OVA file, which is included in the vCenter Server appliance installer, for the new vCenter Server appliance.

### 2 Stage 2 - Transfer the Data and Set up the Newly Deployed vCenter Server Appliance With an Embedded Platform Services Controller

When the OVA deployment finishes, you are redirected to stage 2 of the upgrade process to transfer the data from the old appliance and start the services of the newly deployed vCenter Server appliance 7.0.

## Stage 1 - Deploy the OVA File of the New vCenter Server Appliance

With stage 1 of the upgrade process, you deploy the OVA file, which is included in the vCenter Server appliance installer, for the new vCenter Server appliance.

## Procedure

- 1 In the vCenter Server installer, navigate to the `vcsa-ui-installer` directory, go to the subdirectory for your operating system, and run the installer executable file.
  - For Windows OS, go to the `win32` subdirectory, and run the `installer.exe` file.
  - For Linux OS, go to the `lin64` subdirectory, and run the `installer` file.
  - For Mac OS, go to the `mac` subdirectory, and run the `Installer.app` file.
- 2 On the Home page, click **Upgrade**.
- 3 Review the Introduction page to understand the upgrade process and click **Next**.
- 4 Read and accept the license agreement, and click **Next**.

## 5 Connect to the source appliance that you want to upgrade.

- a Enter the information about the source vCenter Server appliance that you want to upgrade, and click **Connect to Source**.

Option	Action
<b>Appliance FQDN or IP address</b>	Enter the IP address or FQDN of the vCenter Server appliance that you want to upgrade.
<b>Appliance HTTPS port</b>	If the source appliance uses a custom HTTPS port, change the default value to that of the custom port. The default port value is 443. Custom port values are supported beginning with vCenter Server appliance version 6.5 Update 2. If you are upgrading from earlier versions, you cannot specify a custom port.

- b Enter the information about the vCenter Single Sign-On administrator and root user.

Option	Action
<b>SSO user name</b>	Enter the vCenter Single Sign-On administrator user name. <b>Important</b> The user must be <code>administrator@your_domain_name</code> .
<b>SSO password</b>	Enter the password of the vCenter Single Sign-On administrator.
<b>Appliance (OS) root password</b>	Enter the password of the root user.

- c Enter the information about the source ESXi host or vCenter Server instance on which resides the vCenter Server appliance that you want to upgrade and click **Next**.

Option	Description
<b>Source server or host name</b>	IP address or FQDN of the source ESXi host or vCenter Server instance on which the vCenter Server appliance that you want to upgrade resides. <b>Note</b> The source vCenter Server instance cannot be the vCenter Server appliance that you want to upgrade. In such cases, use the source ESXi host.
<b>HTTPS port</b>	If the ESXi host or vCenter Server instance uses a custom HTTPS port, change the default value. The default value is 443.
<b>User name</b>	User name of a user with administrative privileges on the ESXi host or vCenter Server instance.
<b>Password</b>	Password of the user with administrative privileges on the ESXi host or vCenter Server instance.

- 6 Verify that the certificate warning displays the SHA1 thumbprints of the SSL certificates that are installed on the source appliance and its source server, and click **Yes** to accept the certificate thumbprints.

## 7 Connect to the target server on which you want to deploy the new vCenter Server appliance.

Option	Steps
You can connect to an ESXi host on which to deploy the new appliance.	<ol style="list-style-type: none"> <li>1 Enter the FQDN or IP address of the ESXi host.</li> <li>2 Enter the HTTPS port of the ESXi host.</li> <li>3 Enter the user name and password of a user with administrative privileges on the ESXi host, for example, the root user.</li> <li>4 Click <b>Next</b>.</li> <li>5 Accept the certificate warning, if any, by clicking <b>Yes</b>.</li> </ol>
You can connect to a vCenter Server instance and browse the inventory to select an ESXi host or DRS cluster on which to deploy the new appliance.	<ol style="list-style-type: none"> <li>1 Enter the FQDN or IP address of the vCenter Server instance.</li> <li>2 Enter the HTTPS port of the vCenter Server instance.</li> <li>3 Enter the user name and password of a vCenter Single Sign-On user with administrative privileges on the vCenter Server instance, for example, the administrator@your_domain_name user.</li> <li>4 Click <b>Next</b>.</li> <li>5 Accept the certificate warning, if any, by clicking <b>Yes</b>.</li> <li>6 Select the data center or data center folder that contains the ESXi host or DRS cluster on which you want to deploy the new appliance, and click <b>Next</b></li> </ol>
<b>Note</b> The target server cannot be the vCenter Server appliance that you want to upgrade. In such cases, use an ESXi host as a target server.	<p><b>Note</b> You must select a data center or data center folder that contains at least one ESXi host that is not in lockdown or maintenance mode.</p> <ol style="list-style-type: none"> <li>7 Select the ESXi host or DRS cluster on which you want to deploy the new appliance, and click <b>Next</b>.</li> </ol>

## 8 On the Set up target appliance VM page, enter a name for the new vCenter Server appliance, set the password for the root user, and click **Next**.

The appliance name must not contain a percent sign (%), backslash (\), or forward slash (/) and must be no more than 80 characters in length.

The password must contain only lower ASCII characters without spaces, at least eight characters, a number, uppercase and lowercase letters, and a special character, for example, an exclamation mark (!), hash key (#), at sign (@), or brackets (()).

**Note** The root password of the old appliance is not transferred to the new upgraded appliance.

## 9 Select the deployment size for the new vCenter Server appliance for your vSphere inventory.

Deployment Size Option	Description
<b>Tiny</b>	Deploys an appliance with 2 vCPUs and 12 GB of memory. Suitable for environments with up to 10 hosts or 100 virtual machines
<b>Small</b>	Deploys an appliance with 4 CPUs and 19 GB of memory. Suitable for environments with up to 100 hosts or 1,000 virtual machines
<b>Medium</b>	Deploys an appliance with 8 CPUs and 28 GB of memory. Suitable for environments with up to 400 hosts or 4,000 virtual machines

Deployment Size Option	Description
<b>Large</b>	Deploys an appliance with 16 CPUs and 37 GB of memory. Suitable for environments with up to 1,000 hosts or 10,000 virtual machines
<b>X-Large</b>	Deploys an appliance with 24 CPUs and 56 GB of memory. Suitable for environments with up to 2,500 hosts or 45,000 virtual machines

- 10 Select the storage size for the new vCenter Server appliance and click **Next**.

**Important** You must consider the storage size of the appliance that you are upgrading and the database size if external.

Storage Size Option	Description for Tiny Deployment Size	Description for Small Deployment Size	Description for Medium Deployment Size	Description for Large Deployment Size	Description for X-Large Deployment Size
<b>Default</b>	Deploys an appliance with 315 GB of storage.	Deploys an appliance with 380 GB of storage.	Deploys an appliance with 600 GB of storage.	Deploys an appliance with 965 GB of storage.	Deploys an appliance with 1705 GB of storage.
<b>Large</b>	Deploys an appliance with 1390 GB of storage.	Deploys an appliance with 1435 GB of storage.	Deploys an appliance with 1600 GB of storage.	Deploys an appliance with 1665 GB of storage.	Deploys an appliance with 1805 GB of storage.
<b>X-Large</b>	Deploys an appliance with 3145 GB of storage.	Deploys an appliance with 3195GB of storage.	Deploys an appliance with 3360 GB of storage.	Deploys an appliance with 3425 GB of storage.	Deploys an appliance with 3565 GB of storage.

- 11 From the list of available datastores, select the location where all the virtual machine configuration files and virtual disks will be stored and, optionally, enable thin provisioning by selecting **Enable Thin Disk Mode**. NFS datastores are thin provisioned by default.

- 12** Configure the temporary network for communication between the vCenter Server appliance that you want to upgrade and the new vCenter Server appliance, and click **Next**.

Option	Action
<b>Choose a network</b>	<p>Select the network to which to connect the new appliance temporarily.</p> <p>The networks displayed in the drop-down menu depend on the network settings of the target server. If you are deploying the appliance directly on an ESXi host, non-ephemeral distributed virtual port groups are unsupported and are not displayed in the drop-down menu.</p> <hr/> <p><b>Important</b> If you want to assign a temporary IPv4 address with DHCP allocation, you must select a network that is associated with a port group which accepts MAC address changes.</p>
<b>IP Address family</b>	<p>Select the version for the temporary IP address of the new appliance.</p> <p>Can be either IPv4 or IPv6.</p>
<b>Network type</b>	<p>Select the allocation method for the temporary IP address of the appliance.</p> <ul style="list-style-type: none"> <li>■ <b>Static</b> <p>The wizard prompts you to enter the temporary IP address, subnet mask or prefix length, default gateway, and DNS servers.</p> </li> <li>■ <b>DHCP</b> <p>A DHCP server is used to allocate the temporary IP address. Select this option only if a DHCP server is available in your environment. Optionally, you can provide a temporary system name (FQDN) if a DDNS server is available in your environment.</p> </li> </ul>

- 13** On the Ready to complete stage 1 page, review the deployment settings for the new vCenter Server appliance and click **Finish** to start the OVA deployment process.
- 14** Wait for the OVA deployment process to finish and click **Continue** to proceed with stage 2 of the upgrade process to transfer the data from the old appliance and start the services of the new appliance.

**Note** If you exit the wizard by clicking **Close**, you must log in to the vCenter Server Management Interface of the newly deployed vCenter Server appliance to transfer the data from the old appliance and set up the services.

## Results

The newly deployed vCenter Server appliance 7.0 is running on the target server but is not configured.

**Important** The data from the old appliance is not transferred and the services of the new appliance are not started.

## Stage 2 - Transfer the Data and Set up the Newly Deployed vCenter Server Appliance With an Embedded Platform Services Controller

When the OVA deployment finishes, you are redirected to stage 2 of the upgrade process to transfer the data from the old appliance and start the services of the newly deployed vCenter Server appliance 7.0.

## Prerequisites

Understand the data migration options available to you when upgrading or migrating to a vCenter Server appliance with an embedded PostgreSQL database. See [Transferring Data from an Existing vCenter Server Appliance](#).

## Procedure

- 1 Review the introduction to stage 2 of the upgrade process and click **Next**.
- 2 Wait for the pre-upgrade check to finish and read the pre-upgrade check result if any.
  - If the pre-upgrade check result contains error messages, read the messages and click **Logs** to export and download a support bundle for troubleshooting.

You cannot proceed with the upgrade until you have corrected the errors.

---

**Important** If you have provided incorrect vCenter Single Sign-On user name and password of the source appliance during stage 1, the pre-upgrade check fails with an authentication error.

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- If the pre-upgrade check result contains warning messages, read the messages and click **Close**.

After you have verified that your system meets the requirements from the warning message, you can proceed with the upgrade.

### 3 Connect to the source appliance that you want to upgrade.

- a Enter the information about the source vCenter Server appliance that you want to upgrade, and click **Connect to Source**.

Option	Action
<b>Appliance FQDN or IP address</b>	Enter the IP address or FQDN of the vCenter Server appliance that you want to upgrade.
<b>Appliance HTTPS port</b>	If the source appliance uses a custom HTTPS port, change the default value to that of the custom port. The default port value is 443. Custom port values are supported beginning with vCenter Server appliance version 6.5 Update 2. If you are upgrading from earlier versions, you cannot specify a custom port.

- b Enter the information about the vCenter Single Sign-On administrator and root user.

Option	Action
<b>SSO user name</b>	Enter the vCenter Single Sign-On administrator user name. <b>Important</b> The user must be <code>administrator@your_domain_name</code> .
<b>SSO password</b>	Enter the password of the vCenter Single Sign-On administrator.
<b>Appliance (OS) root password</b>	Enter the password of the root user.

- c Enter the information about the source ESXi host or vCenter Server instance on which resides the vCenter Server appliance that you want to upgrade and click **Next**.

Option	Description
<b>Source server or host name</b>	IP address or FQDN of the source ESXi host or vCenter Server instance on which the vCenter Server appliance that you want to upgrade resides. <b>Note</b> The source vCenter Server instance cannot be the vCenter Server appliance that you want to upgrade. In such cases, use the source ESXi host.
<b>HTTPS port</b>	If the ESXi host or vCenter Server instance uses a custom HTTPS port, change the default value. The default value is 443.
<b>User name</b>	User name of a user with administrative privileges on the ESXi host or vCenter Server instance.
<b>Password</b>	Password of the user with administrative privileges on the ESXi host or vCenter Server instance.

- 4 On the **Select migration data** page, choose the types of data that you want to transfer from the old appliance to the new, upgraded appliance.

A large amount of data requires more time to be transferred to the new appliance. For the minimum upgrade time and storage requirements for the new appliance, select to transfer only the configuration data. If you are using an external Oracle database, you can also choose to migrate historical and performance metrics data in the background after you deploy and start the new vCenter Server appliance.

- 5 Review the VMware Customer Experience Improvement Program (CEIP) page and choose if you want to join the program.

For information about the CEIP, see the Configuring Customer Experience Improvement Program section in *vCenter Server and Host Management*.

- 6 On the Ready to complete page, review the upgrade settings, accept the backup acknowledgment, and click **Finish**.

- 7 Read the shutdown warning message and click **OK**.

- 8 Wait for the data transfer and setup process to finish and click **OK** to go to the vCenter Server Getting Started page.

## Results

The vCenter Server appliance is upgraded. The old vCenter Server appliance is powered off and the new appliance starts.

## What to do next

- [Verify Your vCenter Server Upgrade or Migration Is Successful](#).
- If the old vCenter Server appliance uses a non-ephemeral distributed virtual port group, to preserve the port group setting, you can manually connect the new appliance to the original non-ephemeral distributed virtual port group. For information about configuring virtual machine networking on a vSphere distributed switch, see *vSphere Networking*.
- You can configure high availability for the vCenter Server appliance. For information about providing vCenter Server appliance high availability, see *vSphere Availability*.

## Upgrade a vCenter Server Appliance 6.5 or 6.7 with an External Platform Services Controller Instance by Using the GUI

You can use the GUI installer to perform an interactive upgrade of a vCenter Server appliance 6.5 or 6.7 that uses an external Platform Services Controller instance to vCenter Server appliance 7.0. You must run the GUI upgrade from a Windows, Linux, or Mac OS X computer that is in the same network as the appliance that you want to upgrade.



## Prerequisites

- The new vCenter Server appliance contains all Platform Services Controller services. It is no longer necessary nor possible to deploy and use an external Platform Services Controller, as all Platform Services Controller services are consolidated into vCenter Server. To learn more about this change to vCenter Server, see [Removal of Platform Services Controller](#).
- See [Prerequisites for Upgrading the vCenter Server Appliance](#).
- See [Required Information for Upgrading a vCenter Server Appliance 6.5 or 6.7](#).

## Procedure

### 1 Stage 1 - Deploy the OVA File of the New vCenter Server Appliance 7.0

With stage 1 of the upgrade process, you deploy the OVA file of the new vCenter Server appliance 7.0.

### 2 Stage 2 - Transfer the Data and Set up the Newly Deployed vCenter Server Appliance

When the OVA deployment finishes, you are redirected to stage 2 of the upgrade process to transfer the data from the old appliance and start the services of the newly deployed vCenter Server appliance 7.0.

## Stage 1 - Deploy the OVA File of the New vCenter Server Appliance 7.0

With stage 1 of the upgrade process, you deploy the OVA file of the new vCenter Server appliance 7.0.

### Procedure

- 1 In the vCenter Server installer, navigate to the `vcasa-ui-installer` directory, go to the subdirectory for your operating system, and run the installer executable file.
  - For Windows OS, go to the `win32` subdirectory, and run the `installer.exe` file.
  - For Linux OS, go to the `lin64` subdirectory, and run the `installer` file.
  - For Mac OS, go to the `mac` subdirectory, and run the `Installer.app` file.
- 2 On the Home page, click **Upgrade**.
- 3 Review the Introduction page to understand the upgrade process and click **Next**.
- 4 Read and accept the license agreement, and click **Next**.

## 5 Connect to the source appliance that you want to upgrade.

- a Enter the information about the source vCenter Server appliance that you want to upgrade, and click **Connect to Source**.

Option	Action
<b>Appliance FQDN or IP address</b>	Enter the IP address or FQDN of the vCenter Server appliance that you want to upgrade.
<b>Appliance HTTPS port</b>	If the source appliance uses a custom HTTPS port, change the default value to that of the custom port. The default port value is 443. Custom port values are supported beginning with vCenter Server appliance version 6.5 Update 2. If you are upgrading from earlier versions, you cannot specify a custom port.

- b Enter the information about the vCenter Single Sign-On administrator and root user.

Option	Action
<b>SSO user name</b>	Enter the vCenter Single Sign-On administrator user name. <b>Important</b> The user must be <code>administrator@your_domain_name</code> .
<b>SSO password</b>	Enter the password of the vCenter Single Sign-On administrator.
<b>Appliance (OS) root password</b>	Enter the password of the root user.

- c Enter the information about the source ESXi host or vCenter Server instance on which resides the vCenter Server appliance that you want to upgrade and click **Next**.

Option	Description
<b>Source server or host name</b>	IP address or FQDN of the source ESXi host or vCenter Server instance on which the vCenter Server appliance that you want to upgrade resides. <b>Note</b> The source vCenter Server instance cannot be the vCenter Server appliance that you want to upgrade. In such cases, use the source ESXi host.
<b>HTTPS port</b>	If the ESXi host or vCenter Server instance uses a custom HTTPS port, change the default value. The default value is 443.
<b>User name</b>	User name of a user with administrative privileges on the ESXi host or vCenter Server instance.
<b>Password</b>	Password of the user with administrative privileges on the ESXi host or vCenter Server instance.

- 6 Verify that the certificate warning displays the SHA1 thumbprints of the SSL certificates that are installed on the source appliance and its source server, and click **Yes** to accept the certificate thumbprints.

- 7 Confirm that the vCenter Server appliance using an external Platform Services Controller will be converged to a vCenter Server appliance with the Platform Services Controller services consolidated within vCenter Server, and click **Yes** to accept and continue with the upgrade.
- 8 Connect to the target server on which you want to deploy the new vCenter Server appliance.

Option	Steps
You can connect to an ESXi host on which to deploy the new appliance.	<ol style="list-style-type: none"> <li>1 Enter the FQDN or IP address of the ESXi host.</li> <li>2 Enter the HTTPS port of the ESXi host.</li> <li>3 Enter the user name and password of a user with administrative privileges on the ESXi host, for example, the root user.</li> <li>4 Click <b>Next</b>.</li> <li>5 Accept the certificate warning, if any, by clicking <b>Yes</b>.</li> </ol>
You can connect to a vCenter Server instance and browse the inventory to select an ESXi host or DRS cluster on which to deploy the new appliance.	<ol style="list-style-type: none"> <li>1 Enter the FQDN or IP address of the vCenter Server instance.</li> <li>2 Enter the HTTPS port of the vCenter Server instance.</li> <li>3 Enter the user name and password of a vCenter Single Sign-On user with administrative privileges on the vCenter Server instance, for example, the administrator@your_domain_name user.</li> <li>4 Click <b>Next</b>.</li> <li>5 Accept the certificate warning, if any, by clicking <b>Yes</b>.</li> <li>6 Select the data center or data center folder that contains the ESXi host or DRS cluster on which you want to deploy the new appliance, and click <b>Next</b></li> </ol>
<b>Note</b> The target server cannot be the vCenter Server appliance that you want to upgrade. In such cases, use an ESXi host as a target server.	<p><b>Note</b> You must select a data center or data center folder that contains at least one ESXi host that is not in lockdown or maintenance mode.</p> <ol style="list-style-type: none"> <li>7 Select the ESXi host or DRS cluster on which you want to deploy the new appliance, and click <b>Next</b>.</li> </ol>

- 9 On the Set up target appliance VM page, enter a name for the new vCenter Server appliance, set the password for the root user, and click **Next**.

The appliance name must not contain a percent sign (%), backslash (\), or forward slash (/) and must be no more than 80 characters in length.

The password must contain only lower ASCII characters without spaces, at least eight characters, a number, uppercase and lowercase letters, and a special character, for example, an exclamation mark (!), hash key (#), at sign (@), or brackets (()).

**Note** The root password of the old appliance is not transferred to the new upgraded appliance.

- 10 Select the deployment size for the new vCenter Server appliance for your vSphere inventory.

Deployment Size Option	Description
<b>Tiny</b>	Deploys an appliance with 2 vCPUs and 12 GB of memory. Suitable for environments with up to 10 hosts or 100 virtual machines
<b>Small</b>	Deploys an appliance with 4 CPUs and 19 GB of memory. Suitable for environments with up to 100 hosts or 1,000 virtual machines

Deployment Size Option	Description
<b>Medium</b>	Deploys an appliance with 8 CPUs and 28 GB of memory. Suitable for environments with up to 400 hosts or 4,000 virtual machines
<b>Large</b>	Deploys an appliance with 16 CPUs and 37 GB of memory. Suitable for environments with up to 1,000 hosts or 10,000 virtual machines
<b>X-Large</b>	Deploys an appliance with 24 CPUs and 56 GB of memory. Suitable for environments with up to 2,500 hosts or 45,000 virtual machines

- 11 Select the storage size for the new vCenter Server appliance and click **Next**.

**Important** You must consider the storage size of the appliance that you are upgrading and the database size if external.

Storage Size Option	Description for Tiny Deployment Size	Description for Small Deployment Size	Description for Medium Deployment Size	Description for Large Deployment Size	Description for X-Large Deployment Size
<b>Default</b>	Deploys an appliance with 315 GB of storage.	Deploys an appliance with 380 GB of storage.	Deploys an appliance with 600 GB of storage.	Deploys an appliance with 965 GB of storage.	Deploys an appliance with 1705 GB of storage.
<b>Large</b>	Deploys an appliance with 1390 GB of storage.	Deploys an appliance with 1435 GB of storage.	Deploys an appliance with 1600 GB of storage.	Deploys an appliance with 1665 GB of storage.	Deploys an appliance with 1805 GB of storage.
<b>X-Large</b>	Deploys an appliance with 3145 GB of storage.	Deploys an appliance with 3195GB of storage.	Deploys an appliance with 3360 GB of storage.	Deploys an appliance with 3425 GB of storage.	Deploys an appliance with 3565 GB of storage.

- 12 From the list of available datastores, select the location where all the virtual machine configuration files and virtual disks will be stored and, optionally, enable thin provisioning by selecting **Enable Thin Disk Mode**. NFS datastores are thin provisioned by default.

- 13** Configure the temporary network for communication between the vCenter Server appliance that you want to upgrade and the new vCenter Server appliance, and click **Next**.

Option	Action
<b>Choose a network</b>	<p>Select the network to which to connect the new appliance temporarily.</p> <p>The networks displayed in the drop-down menu depend on the network settings of the target server. If you are deploying the appliance directly on an ESXi host, non-ephemeral distributed virtual port groups are unsupported and are not displayed in the drop-down menu.</p> <hr/> <p><b>Important</b> If you want to assign a temporary IPv4 address with DHCP allocation, you must select a network that is associated with a port group which accepts MAC address changes.</p>
<b>IP Address family</b>	<p>Select the version for the temporary IP address of the new appliance.</p> <p>Can be either IPv4 or IPv6.</p>
<b>Network type</b>	<p>Select the allocation method for the temporary IP address of the appliance.</p> <ul style="list-style-type: none"> <li>■ <b>Static</b> <p>The wizard prompts you to enter the temporary IP address, subnet mask or prefix length, default gateway, and DNS servers.</p> </li> <li>■ <b>DHCP</b> <p>A DHCP server is used to allocate the temporary IP address. Select this option only if a DHCP server is available in your environment. Optionally, you can provide a temporary system name (FQDN) if a DDNS server is available in your environment.</p> </li> </ul>

- 14** On the Ready to complete stage 1 page, review the deployment settings for the new vCenter Server appliance and click **Finish** to start the OVA deployment process.
- 15** Wait for the OVA deployment process to finish and click **Continue** to proceed with stage 2 of the upgrade process to transfer the data from the old appliance and start the services of the new appliance.

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**Note** If you exit the wizard by clicking **Close**, you must log in to the vCenter Server Management Interface of the newly deployed vCenter Server appliance to transfer the data from the old appliance and set up the services.

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## Results

The newly deployed target vCenter Server appliance 7.0 is running on the target server but is not configured.

## What to do next

Proceed to stage 2 of the upgrade process to transfer the data from the source vCenter Server appliance and start the services of the newly deployed vCenter Server appliance. See [Stage 2 - Transfer the Data and Set up the Newly Deployed vCenter Server Appliance](#).

## Stage 2 - Transfer the Data and Set up the Newly Deployed vCenter Server Appliance

When the OVA deployment finishes, you are redirected to stage 2 of the upgrade process to transfer the data from the old appliance and start the services of the newly deployed vCenter Server appliance 7.0.

### Prerequisites

Understand the data migration options available to you when upgrading or migrating to a vCenter Server appliance with an embedded PostgreSQL database. See [Transferring Data from an Existing vCenter Server Appliance](#).

### Procedure

- 1 Review the introduction to stage 2 of the upgrade process and click **Next**.
- 2 Wait for the pre-upgrade check to finish and read the pre-upgrade check result if any.
  - If the pre-upgrade check result contains error messages, read the messages and click **Logs** to export and download a support bundle for troubleshooting.

You cannot proceed with the upgrade until you have corrected the errors.

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**Important** If you have provided incorrect vCenter Single Sign-On user name and password of the source appliance during stage 1, the pre-upgrade check fails with an authentication error.

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- If the pre-upgrade check result contains warning messages, read the messages and click **Close**.

After you have verified that your system meets the requirements from the warning message, you can proceed with the upgrade.
- 3 Specify the replication topology for the vCenter Server. When converging vCenter Server instance with an external Platform Services Controller you must specify the replication topology.

Convergence is the process of converting a vCenter Server instance with an external Platform Services Controller to a vCenter Server instance with those services embedded in the appliance.

- This is the first vCenter Server in the topology that I want to converge.
- This is a subsequent vCenter Server.

If this is a subsequent vCenter Server, provide the IP address of its partner vCenter Server and its HTTPS port.

- 4 On the **Select upgrade data** page, choose the types of data that you want to transfer from the old vCenter Server appliance to the new, upgraded vCenter Server appliance.

A large amount of data requires more time to be transferred to the new appliance. For the minimum upgrade time and storage requirements for the new appliance, select to transfer only the configuration data.

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**Note** If you are using an external Oracle database, you can also choose to migrate historical and performance metrics data in the background after you deploy and start the new vCenter Server appliance.

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- 5 Review the VMware Customer Experience Improvement Program (CEIP) page and choose if you want to join the program.

For information about the CEIP, see the Configuring Customer Experience Improvement Program section in *vCenter Server and Host Management*.

- 6 On the Ready to complete page, review the upgrade settings, accept the backup acknowledgment, and click **Finish**.
- 7 Read the shutdown warning message and click **OK**.
- 8 Wait for the data transfer and setup process to finish and click **OK** to go to the vCenter Server Getting Started page.

## Results

The vCenter Server appliance is upgraded. The old vCenter Server appliance is powered off and the new appliance starts.

## What to do next

- [Verify Your vCenter Server Upgrade or Migration Is Successful](#).
- If the old vCenter Server appliance uses a non-ephemeral distributed virtual port group, to preserve the port group setting, you can manually connect the new appliance to the original non-ephemeral distributed virtual port group. For information about configuring virtual machine networking on a vSphere distributed switch, see *vSphere Networking*.
- Upgrade all vCenter Server instances in the vCenter Single Sign-On domain.
- After converging a vCenter Server with external Platform Services Controller to a vCenter Server appliance, you must decommission the original external Platform Services Controller. Decommissioning a Platform Services Controller shuts it down and removes it from the single sign-on domain. See [Decommission the Platform Services Controller](#).
- You can configure high availability for the vCenter Server appliance. For information about providing vCenter Server appliance high availability, see *vSphere Availability*.

# Upgrading vCenter Server in High Availability Environments

You can use the GUI installer to perform an interactive upgrade of a vCenter Server appliance in a high availability (HA) environment.

- [Prerequisites for Upgrading vCenter Server High Availability Environments](#)

To ensure a successful upgrade of vCenter Server in a high availability (HA) environment, your environment must meet certain prerequisites before running the upgrade.

- [Upgrade a vCenter Server Appliance 6.5 or 6.7 HA Cluster with an Embedded Platform Services Controller by Using the GUI](#)

You can use the GUI installer to perform an interactive upgrade of a vCenter Server appliance 6.5 or 6.7 in a High Availability (HA) cluster that uses an embedded vCenter Single Sign-On or Platform Services Controller to vCenter Server appliance 7.0. You must run the GUI upgrade from a Windows, Linux, or Macintosh computer that is in the same network as the appliance that you want to upgrade.

- [Upgrade a vCenter 6.5 or 6.7 HA Cluster with an External Platform Services Controller by Using the GUI](#)

You can use the GUI installer to perform an interactive upgrade of a vCenter HA cluster 6.5 or 6.7 that uses an external Platform Services Controller instance to vCenter Server appliance 7.0. You must run the GUI upgrade from a Windows, Linux, or Macintosh computer that is in the same network as the appliance that you want to upgrade.

## Prerequisites for Upgrading vCenter Server High Availability Environments

To ensure a successful upgrade of vCenter Server in a high availability (HA) environment, your environment must meet certain prerequisites before running the upgrade.

### General Prerequisites

Ensure that your environment meets the prerequisites for upgrading vCenter Server appliance. See [Prerequisites for Upgrading the vCenter Server Appliance](#).

### High Availability Prerequisites

In addition to the prerequisites for upgrading a standard vCenter Server appliance, the vCenter High Availability (vCenter HA) upgrade has the following prerequisites.

- A vCenter HA cluster consists of three vCenter Server appliances that act as Active, Passive, and Witness nodes. The Active node must be configured as the vCenter HA node.
- The Active node is part of the vCenter HA cluster.
- All nodes must be present in the cluster.
- The vCenter HA cluster must be in a healthy state.
- The vCenter HA cluster must be in enabled mode.



- The host that has the vCenter Server virtual machine (VM) must be managed by a container vCenter Server. It must not be standalone.
- The target vCenter Server must have the same placement as the source vCenter Server.
- vCenter HA cannot be set up on a vCenter Server that has disks on more than one datastore.

To learn more about vCenter HA configuration, see *vSphere Availability*.

## Upgrade a vCenter Server Appliance 6.5 or 6.7 HA Cluster with an Embedded Platform Services Controller by Using the GUI

You can use the GUI installer to perform an interactive upgrade of a vCenter Server appliance 6.5 or 6.7 in a High Availability (HA) cluster that uses an embedded vCenter Single Sign-On or Platform Services Controller to vCenter Server appliance 7.0. You must run the GUI upgrade from a Windows, Linux, or Macintosh computer that is in the same network as the appliance that you want to upgrade.

You can deploy version 7.0 of the vCenter Server appliance on hosts that are running ESXi 6.5 or later and on vCenter Server instances 6.5 or later.

A vCenter HA cluster consists of three vCenter Server appliances that act as Active, Passive, and Witness nodes. The Active vCenter HA node is upgraded using a migration-based upgrade while preserving the existing configuration.

### Prerequisites

- See [Prerequisites for Upgrading vCenter Server High Availability Environments](#).
- See [Required Information for Upgrading a vCenter Server Appliance 6.5 or 6.7](#).

### Procedure

#### 1 Stage 1 - Deploy the OVA File of the New vCenter High Availability Cluster

In stage 1 of the upgrade process, you deploy the OVA file for the new vCenter Server appliance.

#### 2 Stage 2 - Transfer Data and Set-Up the Newly Deployed vCenter High Availability Cluster

When the OVA deployment finishes, you are redirected to stage 2 of the upgrade process to transfer the data from the old appliance and start the services of the newly deployed vCenter Server appliance. When the deployment finishes, vCenter Server has high availability protection.

### Stage 1 - Deploy the OVA File of the New vCenter High Availability Cluster

In stage 1 of the upgrade process, you deploy the OVA file for the new vCenter Server appliance.

### Prerequisites

Ensure that your environment meets the prerequisites for upgrading a vCenter HA cluster. See [Prerequisites for Upgrading vCenter Server High Availability Environments](#).

## Procedure

- 1 In the vCenter Server installer, navigate to the `vcasa-ui-installer` directory, go to the subdirectory for your operating system, and run the installer executable file.
  - For Windows OS, go to the `win32` subdirectory, and run the `installer.exe` file.
  - For Linux OS, go to the `lin64` subdirectory, and run the `installer` file.
  - For Mac OS, go to the `mac` subdirectory, and run the `Installer.app` file.
- 2 On the Home page, click **Upgrade**.
- 3 Review the Introduction page to understand the upgrade process and click **Next**.
- 4 Connect to the source appliance that you want to upgrade. This appliance is the Active vCenter HA node.
  - a Enter the information about the source vCenter Server appliance that you want to upgrade, and click **Connect to Source**.

Option	Action
<b>Appliance FQDN or IP address</b>	Enter the IP address or FQDN of the Active vCenter HA node that you want to upgrade.
<b>Appliance HTTPS port</b>	The default value (443) is displayed and cannot be edited.

- b Enter the information about the vCenter Single Sign-On administrator and root user.

Option	Action
<b>SSO user name</b>	Enter the vCenter Single Sign-On administrator user name. <b>Important</b> The user must be <code>administrator@your_domain_name</code> .
<b>SSO password</b>	Enter the password of the vCenter Single Sign-On administrator.
<b>Appliance (OS) root password</b>	Enter the password of the root user.

- c Enter the information about the source vCenter Server instance on which resides the vCenter Server appliance that you want to upgrade and click **Next**.

Option	Description
<b>Source server or host name</b>	IP address or FQDN of the Active node. The Active node must be configured as the vCenter HA node.
<b>HTTPS port</b>	If the vCenter Server instance uses a custom HTTPS port, change the default value. The default value is 443.
<b>User name</b>	User name of a user with administrative privileges on the ESXi host or vCenter Server instance.
<b>Password</b>	Password of the user with administrative privileges on the ESXi host or vCenter Server instance.

- 5 Verify that the certificate warning displays the SHA1 thumbprints of the SSL certificates that are installed on the source appliance and its source server, and click **Yes** to accept the certificate thumbprints.
- 6 If vCenter HA is successfully detected, the target appliance is set to the manager of the source appliance. Click **OK**.

The appliance deployment target information is populated.

- 7 On the Set up target appliance VM page, enter a name for the target vCenter Server appliance, set the password for the root user, and click **Next**.

The password must contain at least eight characters, a number, uppercase and lowercase letters, and a special character, for example, an exclamation mark (!), hash key (#), at sign (@), or brackets (()).

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**Note** The root password of the source is not transferred to the target appliance.

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- 8 Select the deployment size for the new vCenter Server appliance for your vSphere inventory.

Deployment Size Option	Description
<b>Tiny</b>	Deploys an appliance with 2 vCPUs and 12 GB of memory. Suitable for environments with up to 10 hosts or 100 virtual machines
<b>Small</b>	Deploys an appliance with 4 CPUs and 19 GB of memory. Suitable for environments with up to 100 hosts or 1,000 virtual machines
<b>Medium</b>	Deploys an appliance with 8 CPUs and 28 GB of memory. Suitable for environments with up to 400 hosts or 4,000 virtual machines
<b>Large</b>	Deploys an appliance with 16 CPUs and 37 GB of memory. Suitable for environments with up to 1,000 hosts or 10,000 virtual machines
<b>X-Large</b>	Deploys an appliance with 24 CPUs and 56 GB of memory. Suitable for environments with up to 2,500 hosts or 45,000 virtual machines

- 9 Select the storage size for the new vCenter Server appliance and click **Next**.

---

**Important** You must consider the storage size of the appliance that you are upgrading and the database size if external.

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Storage Size Option	Description for Tiny Deployment Size	Description for Small Deployment Size	Description for Medium Deployment Size	Description for Large Deployment Size	Description for X-Large Deployment Size
<b>Default</b>	Deploys an appliance with 315 GB of storage.	Deploys an appliance with 380 GB of storage.	Deploys an appliance with 600 GB of storage.	Deploys an appliance with 965 GB of storage.	Deploys an appliance with 1705 GB of storage.
<b>Large</b>	Deploys an appliance with 1390 GB of storage.	Deploys an appliance with 1435 GB of storage.	Deploys an appliance with 1600 GB of storage.	Deploys an appliance with 1665 GB of storage.	Deploys an appliance with 1805 GB of storage.
<b>X-Large</b>	Deploys an appliance with 3145 GB of storage.	Deploys an appliance with 3195GB of storage.	Deploys an appliance with 3360 GB of storage.	Deploys an appliance with 3425 GB of storage.	Deploys an appliance with 3565 GB of storage.

- 10 From the list of available datastores, select the location to store the virtual machine (VM) configuration files and virtual disks, and, optionally, enable thin provisioning by selecting **Enable Thin Disk Mode**. NFS datastores are thin provisioned by default.

**Note** vCenter HA cannot be set up on a vCenter Server that has disks on more than one datastore.

- 11 Configure the temporary network for communication between the vCenter Server appliance that you want to upgrade and the new vCenter Server appliance, and click **Next**.

Option	Action
<b>Choose a network</b>	<p>Select the network to which to connect the new appliance temporarily.</p> <p>The networks displayed in the drop-down menu depend on the network settings of the target server. If you are deploying the appliance directly on an ESXi host, non-ephemeral distributed virtual port groups are unsupported and are not displayed in the drop-down menu.</p> <p><b>Important</b> If you want to assign a temporary IPv4 address with DHCP allocation, you must select a network that is associated with a port group which accepts MAC address changes.</p>
<b>IP Address family</b>	<p>Select the version for the temporary IP address of the new appliance.</p> <p>Can be either IPv4 or IPv6.</p>
<b>Network type</b>	<p>Select the allocation method for the temporary IP address of the appliance.</p> <ul style="list-style-type: none"> <li>■ <b>Static</b> <p>The wizard prompts you to enter the temporary IP address, subnet mask or prefix length, default gateway, and DNS servers.</p> </li> <li>■ <b>DHCP</b> <p>A DHCP server is used to allocate the temporary IP address. Select this option only if a DHCP server is available in your environment. Optionally, you can provide a temporary system name (FQDN) if a DDNS server is available in your environment.</p> </li> </ul>

- 12 On the Ready to complete stage 1 page, review the deployment settings for the new vCenter Server appliance and click **Finish** to start the OVA deployment process.

- 13 Wait for the OVA deployment process to finish and click **Continue** to proceed with stage 2 of the upgrade process to transfer the data from the old appliance and start the services of the new appliance.

---

**Note** If you exit the wizard by clicking **Close**, you must log in to the vCenter Server Management Interface of the newly deployed vCenter Server appliance to transfer the data from the old appliance and set up the services.

---

## Results

The newly deployed vCenter Server appliance 7.0 is running on the target server but is not configured.

---

**Important** The data from the old appliance is not transferred and the services of the new appliance are not started.

---

## Stage 2 - Transfer Data and Set-Up the Newly Deployed vCenter High Availability Cluster

When the OVA deployment finishes, you are redirected to stage 2 of the upgrade process to transfer the data from the old appliance and start the services of the newly deployed vCenter Server appliance. When the deployment finishes, vCenter Server has high availability protection.

### Prerequisites

Understand the data migration options available to you when upgrading or migrating to a vCenter Server appliance with an embedded PostgreSQL database. You can select to migrate historical and other types of data in the background after deploying and starting vCenter Server. See [Transferring Data from an Existing vCenter Server Appliance](#).

### Procedure

- 1 Review the introduction to stage 2 of the deployment process and click **Next**.
- 2 Wait for the pre-upgrade check to finish and read the pre-upgrade check result if any.
  - If the pre-upgrade check result contains error messages, read the messages and click **Logs** to export and download a support bundle for troubleshooting.

You cannot proceed with the upgrade until you have corrected the errors.

---

**Important** If you have provided incorrect vCenter Single Sign-On user name and password of the source appliance during stage 1, the pre-upgrade check fails with an authentication error.

---

- If the pre-upgrade check result contains warning messages, read the messages and click **Close**.

After you have verified that your system meets the requirements from the warning message, you can proceed with the upgrade.

- 3 On the **Select migration data** page, choose the types of data that you want to transfer from the old appliance to the new, upgraded appliance.

A large amount of data requires more time to be transferred to the new appliance. For the minimum upgrade time and storage requirements for the new appliance, select to transfer only the configuration data. If you are using an external Oracle database, you can also choose to migrate historical and performance metrics data in the background after you deploy and start the new vCenter Server appliance.

- 4 Review the VMware Customer Experience Improvement Program (CEIP) page and choose if you want to join the program.

For information about the CEIP, see the Configuring Customer Experience Improvement Program section in *vCenter Server and Host Management*.

- 5 On the Ready to complete page, review the upgrade settings, accept the backup acknowledgment, and click **Finish**.

- 6 Read the shutdown warning message and click **OK**.

- 7 Wait for the data transfer and setup process to finish and click **OK** to go to the vCenter Server Getting Started page.

## Results

The vCenter Server appliance is upgraded. The old vCenter Server appliance is powered off and the new appliance starts.

After the Active node is upgraded, Auto Deployment automatically creates new Passive and Witness nodes using a clone operation. For Manual Deployment, nodes are not created automatically. You must clone the Passive and Witness virtual machines, and set the cluster mode to **Enabled**.

When the deployment finishes, vCenter Server has high availability protection. You can click **Edit** to enter Maintenance Mode, Disable, or Remove vCenter HA. You can also Initiate vCenter HA failover.

## What to do next

For information about configuring and managing vCenter HA, see *vSphere Availability*.

## Upgrade a vCenter 6.5 or 6.7 HA Cluster with an External Platform Services Controller by Using the GUI

You can use the GUI installer to perform an interactive upgrade of a vCenter HA cluster 6.5 or 6.7 that uses an external Platform Services Controller instance to vCenter Server appliance 7.0. You must run the GUI upgrade from a Windows, Linux, or Macintosh computer that is in the same network as the appliance that you want to upgrade.

A vCenter HA cluster consists of three vCenter Server appliances that act as Active, Passive, and Witness nodes. The Active vCenter HA node is upgraded using a migration-based upgrade while preserving the existing configuration.

## Prerequisites

- The new vCenter Server appliance contains all Platform Services Controller services. It is no longer necessary nor possible to deploy and use an external Platform Services Controller, as all Platform Services Controller services are consolidated into vCenter Server. To learn more about this change to vCenter Server, see [Removal of Platform Services Controller](#).
- Ensure that your environment meets the prerequisites for upgrading a vCenter HA cluster. See [Prerequisites for Upgrading vCenter Server High Availability Environments](#).
- See [Required Information for Upgrading a vCenter Server Appliance 6.5 or 6.7](#).

## Procedure

### 1 Stage 1 - Deploy the OVA File of the New vCenter High Availability Cluster

With stage 1 of the upgrade process, you deploy the OVA file of the new vCenter Server appliance 7.0.

### 2 Stage 2 - Transfer Data and Set-Up the Newly Deployed vCenter High Availability Cluster

When the OVA deployment finishes, you are redirected to stage 2 of the upgrade process to transfer the data from the old appliance and start the services of the newly deployed vCenter Server appliance. When the deployment finishes, vCenter Server has high availability protection.

## Stage 1 - Deploy the OVA File of the New vCenter High Availability Cluster

With stage 1 of the upgrade process, you deploy the OVA file of the new vCenter Server appliance 7.0.

### Prerequisites

Ensure that your environment meets the prerequisites for upgrading a vCenter HA cluster. See [Prerequisites for Upgrading vCenter Server High Availability Environments](#).

### Procedure

- 1 In the vCenter Server installer, navigate to the `vcsa-ui-installer` directory, go to the subdirectory for your operating system, and run the installer executable file.
  - For Windows OS, go to the `win32` subdirectory, and run the `installer.exe` file.
  - For Linux OS, go to the `lin64` subdirectory, and run the `installer` file.
  - For Mac OS, go to the `mac` subdirectory, and run the `Installer.app` file.
- 2 On the Home page, click **Upgrade**.
- 3 Review the Introduction page to understand the upgrade process and click **Next**.
- 4 Read and accept the license agreement, and click **Next**.

- 5 Connect to the source appliance that you want to upgrade. This appliance is the Active vCenter HA node.

- a Enter the information about the source vCenter Server appliance that you want to upgrade, and click **Connect to Source**.

Option	Action
<b>Appliance FQDN or IP address</b>	Enter the IP address or FQDN of the Active vCenter HA node that you want to upgrade.
<b>Appliance HTTPS port</b>	The default value (443) is displayed and cannot be edited.

- b Enter the information about the vCenter Single Sign-On administrator and root user.

Option	Action
<b>SSO user name</b>	Enter the vCenter Single Sign-On administrator user name. <b>Important</b> The user must be administrator@your_domain_name.
<b>SSO password</b>	Enter the password of the vCenter Single Sign-On administrator.
<b>Appliance (OS) root password</b>	Enter the password of the root user.

- c Enter the information about the source vCenter Server instance on which resides the vCenter Server appliance that you want to upgrade and click **Next**.

Option	Description
<b>Source server or host name</b>	IP address or FQDN of the Active node. The Active node must be configured as the vCenter HA node.
<b>HTTPS port</b>	If the vCenter Server instance uses a custom HTTPS port, change the default value. The default value is 443.
<b>User name</b>	User name of a user with administrative privileges on the ESXi host or vCenter Server instance.
<b>Password</b>	Password of the user with administrative privileges on the ESXi host or vCenter Server instance.

- 6 Verify that the certificate warning displays the SHA1 thumbprints of the SSL certificates that are installed on the source appliance and its source server, and click **Yes** to accept the certificate thumbprints.
- 7 Confirm that the vCenter Server appliance using an external Platform Services Controller will be converged to a vCenter Server appliance with the Platform Services Controller services consolidated within vCenter Server, and click **Yes** to accept and continue with the upgrade.
- 8 If vCenter Server HA is successfully detected, the target appliance is set to the manager of the source appliance. Click OK.

The appliance deployment target information is populated.



## 9 Connect to the target server on which you want to deploy the new vCenter Server appliance.

Option	Steps
You can connect to an ESXi host on which to deploy the new appliance.	<ol style="list-style-type: none"> <li>1 Enter the FQDN or IP address of the ESXi host.</li> <li>2 Enter the HTTPS port of the ESXi host.</li> <li>3 Enter the user name and password of a user with administrative privileges on the ESXi host, for example, the root user.</li> <li>4 Click <b>Next</b>.</li> <li>5 Accept the certificate warning, if any, by clicking <b>Yes</b>.</li> </ol>
You can connect to a vCenter Server instance and browse the inventory to select an ESXi host or DRS cluster on which to deploy the new appliance.	<ol style="list-style-type: none"> <li>1 Enter the FQDN or IP address of the vCenter Server instance.</li> <li>2 Enter the HTTPS port of the vCenter Server instance.</li> <li>3 Enter the user name and password of a vCenter Single Sign-On user with administrative privileges on the vCenter Server instance, for example, the <code>administrator@your_domain_name</code> user.</li> <li>4 Click <b>Next</b>.</li> <li>5 Accept the certificate warning, if any, by clicking <b>Yes</b>.</li> <li>6 Select the data center or data center folder that contains the ESXi host or DRS cluster on which you want to deploy the new appliance, and click <b>Next</b></li> </ol>
<b>Note</b> The target server cannot be the vCenter Server appliance that you want to upgrade. In such cases, use an ESXi host as a target server.	<p><b>Note</b> You must select a data center or data center folder that contains at least one ESXi host that is not in lockdown or maintenance mode.</p> <ol style="list-style-type: none"> <li>7 Select the ESXi host or DRS cluster on which you want to deploy the new appliance, and click <b>Next</b>.</li> </ol>

## 10 On the Set up target appliance VM page, enter a name for the new vCenter Server appliance, set the password for the root user, and click **Next**.

The appliance name must not contain a percent sign (%), backslash (\), or forward slash (/) and must be no more than 80 characters in length.

The password must contain only lower ASCII characters without spaces, at least eight characters, a number, uppercase and lowercase letters, and a special character, for example, an exclamation mark (!), hash key (#), at sign (@), or brackets (()).

**Note** The root password of the old appliance is not transferred to the new upgraded appliance.

## 11 Select the deployment size for the new vCenter Server appliance for your vSphere inventory.

Deployment Size Option	Description
<b>Tiny</b>	Deploys an appliance with 2 vCPUs and 12 GB of memory. Suitable for environments with up to 10 hosts or 100 virtual machines
<b>Small</b>	Deploys an appliance with 4 CPUs and 19 GB of memory. Suitable for environments with up to 100 hosts or 1,000 virtual machines
<b>Medium</b>	Deploys an appliance with 8 CPUs and 28 GB of memory. Suitable for environments with up to 400 hosts or 4,000 virtual machines

Deployment Size Option	Description
<b>Large</b>	Deploys an appliance with 16 CPUs and 37 GB of memory. Suitable for environments with up to 1,000 hosts or 10,000 virtual machines
<b>X-Large</b>	Deploys an appliance with 24 CPUs and 56 GB of memory. Suitable for environments with up to 2,500 hosts or 45,000 virtual machines

- 12 Select the storage size for the new vCenter Server appliance, and click **Next**.

**Important** You must consider the storage size of the appliance that you are upgrading and the database size if external.

Storage Size Option	Description for Tiny Deployment Size	Description for Small Deployment Size	Description for Medium Deployment Size	Description for Large Deployment Size	Description for X-Large Deployment Size
<b>Default</b>	Deploys an appliance with 315 GB of storage.	Deploys an appliance with 380 GB of storage.	Deploys an appliance with 600 GB of storage.	Deploys an appliance with 965 GB of storage.	Deploys an appliance with 1705 GB of storage.
<b>Large</b>	Deploys an appliance with 1390 GB of storage.	Deploys an appliance with 1435 GB of storage.	Deploys an appliance with 1600 GB of storage.	Deploys an appliance with 1665 GB of storage.	Deploys an appliance with 1805 GB of storage.
<b>X-Large</b>	Deploys an appliance with 3145 GB of storage.	Deploys an appliance with 3195GB of storage.	Deploys an appliance with 3360 GB of storage.	Deploys an appliance with 3425 GB of storage.	Deploys an appliance with 3565 GB of storage.

- 13 From the list of available datastores, select the location to store the virtual machine (VM) configuration files and virtual disks, and, optionally, enable thin provisioning by selecting **Enable Thin Disk Mode**. NFS datastores are thin provisioned by default.

**Note** vCenter HA cannot be set up on a vCenter Server that has disks on more than one datastore.

- 14** Configure the temporary network for communication between the vCenter Server appliance that you want to upgrade and the new vCenter Server appliance, and click **Next**.

Option	Action
<b>Choose a network</b>	<p>Select the network to which to connect the new appliance temporarily.</p> <p>The networks displayed in the drop-down menu depend on the network settings of the target server. If you are deploying the appliance directly on an ESXi host, non-ephemeral distributed virtual port groups are unsupported and are not displayed in the drop-down menu.</p> <hr/> <p><b>Important</b> If you want to assign a temporary IPv4 address with DHCP allocation, you must select a network that is associated with a port group which accepts MAC address changes.</p>
<b>IP Address family</b>	<p>Select the version for the temporary IP address of the new appliance.</p> <p>Can be either IPv4 or IPv6.</p>
<b>Network type</b>	<p>Select the allocation method for the temporary IP address of the appliance.</p> <ul style="list-style-type: none"> <li>■ <b>Static</b> <p>The wizard prompts you to enter the temporary IP address, subnet mask or prefix length, default gateway, and DNS servers.</p> </li> <li>■ <b>DHCP</b> <p>A DHCP server is used to allocate the temporary IP address. Select this option only if a DHCP server is available in your environment. Optionally, you can provide a temporary system name (FQDN) if a DDNS server is available in your environment.</p> </li> </ul>

- 15** On the Ready to complete stage 1 page, review the deployment settings for the new vCenter Server appliance and click **Finish** to start the OVA deployment process.
- 16** Wait for the OVA deployment process to finish and click **Continue** to proceed with stage 2 of the upgrade process to transfer the data from the old appliance and start the services of the new appliance.

**Note** If you exit the wizard by clicking **Close**, you must log in to the vCenter Server Management Interface of the newly deployed vCenter Server appliance to transfer the data from the old appliance and set up the services.

## Results

The newly deployed target vCenter Server appliance 7.0 is running on the target server but is not configured.

**Important** The data from the source vCenter Server is not transferred and the services of the target appliance are not started.

## What to do next

Transfer the data from the old appliance and start the services of the newly deployed vCenter Server Appliance. See [Stage 2 - Transfer Data and Set-Up the Newly Deployed vCenter High Availability Cluster](#).

## Stage 2 - Transfer Data and Set-Up the Newly Deployed vCenter High Availability Cluster

When the OVA deployment finishes, you are redirected to stage 2 of the upgrade process to transfer the data from the old appliance and start the services of the newly deployed vCenter Server appliance. When the deployment finishes, vCenter Server has high availability protection.

### Prerequisites

Understand the data migration options available to you when upgrading or migrating to a vCenter Server appliance with an embedded PostgreSQL database. You can select to migrate historical and other types of data in the background after deploying and starting vCenter Server. See [Transferring Data from an Existing vCenter Server Appliance](#).

### Procedure

- 1 Review the introduction to stage 2 of the upgrade process and click **Next**.
- 2 Wait for the pre-upgrade check to finish and read the pre-upgrade check result if any.
  - If the pre-upgrade check result contains error messages, read the messages and click **Logs** to export and download a support bundle for troubleshooting.

You cannot proceed with the upgrade until you have corrected the errors.

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**Important** If you have provided incorrect vCenter Single Sign-On user name and password of the source appliance during stage 1, the pre-upgrade check fails with an authentication error.

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- If the pre-upgrade check result contains warning messages, read the messages and click **Close**.
 

After you have verified that your system meets the requirements from the warning message, you can proceed with the upgrade.
- 3 Specify the replication topology for the vCenter Server. When converging vCenter Server instance with an external Platform Services Controller you must specify the replication topology.

Convergence is the process of converting a vCenter Server instance with an external Platform Services Controller to a vCenter Server instance with those services embedded in the appliance.

- This is the first vCenter Server in the topology that I want to converge.
- This is a subsequent vCenter Server.

If this is a subsequent vCenter Server, provide the IP address of its partner vCenter Server and its HTTPS port.

- 4 On the **Select migration data** page, choose the types of data that you want to transfer from the old appliance to the new, upgraded appliance.

A large amount of data requires more time to be transferred to the new appliance. For the minimum upgrade time and storage requirements for the new appliance, select to transfer only the configuration data. If you are using an external Oracle database, you can also choose to migrate historical and performance metrics data in the background after you deploy and start the new vCenter Server appliance.

- 5 On the Ready to complete page, review the upgrade settings, accept the backup acknowledgment, and click **Finish**.
- 6 Read the shutdown warning message and click **OK**.
- 7 Wait for the data transfer and setup process to finish and click **OK** to go to the vCenter Server Getting Started page.

### Results

The vCenter Server appliance is upgraded. The old vCenter Server appliance is powered off and the new appliance starts.

After the Active node is upgraded, a new Passive and Witness node is created using a clone operation. These nodes are created automatically for Auto Deployment. For Manual Deployment, nodes are not created automatically. You must clone the Passive and Witness VMs and set the cluster mode to **enabled**.

When the deployment finishes, vCenter Server has high availability protection. You can click **Edit** to enter Maintenance Mode, Disable, or Remove vCenter HA. You can also Initiate vCenter HA failover.

### What to do next

- [Verify Your vCenter Server Upgrade or Migration Is Successful](#).
- If the old vCenter Server appliance uses a non-ephemeral distributed virtual port group, to preserve the port group setting, you can manually connect the new appliance to the original non-ephemeral distributed virtual port group. For information about configuring virtual machine networking on a vSphere distributed switch, see *vSphere Networking*.
- Upgrade all vCenter Server instances in the vCenter Single Sign-On domain.
- After converging a vCenter Server with external Platform Services Controller node to vCenter Server Appliance, you must decommission the original external Platform Services Controller. Decommissioning a Platform Services Controller shuts it down and removes it from the single sign-on domain. See [Decommission the Platform Services Controller](#).
- You can configure high availability for the vCenter Server appliance. For information about providing vCenter Server appliance high availability, see *vSphere Availability*.

## CLI Upgrade of the vCenter Server Appliance

You can use the CLI installer to perform an unattended upgrade of a vCenter Server appliance on an ESXi host or vCenter Server instance.

The CLI upgrade process includes downloading the vCenter Server appliance installer on a network virtual machine or physical server from which you want to perform the upgrade, preparing a JSON configuration file with the upgrade information, and running the upgrade command.

---

**Important** The user name that you use to log in to the machine from which you want to run the CLI upgrade, the path to the vCenter Server appliance ISO file, the path to your JSON configuration file, and the string values in your JSON configuration file, including the passwords, must contain only ASCII characters. Extended ASCII and non-ASCII characters are unsupported.

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The vCenter Server appliance ISO file contains templates of JSON files that contain the minimum configuration parameters that are required for upgrading a vCenter Server appliance. For information about preparing JSON templates for CLI upgrade of the vCenter Server appliance, see [Prepare Your JSON Configuration File for CLI Upgrade](#).

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### Note

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**Note** When you upgrade vCenter Server 6.5 or 6.7 with an external Platform Services Controller to vCenter Server 7.0, the upgrade process converges the external Platform Services Controller into the new vCenter Server appliance. The new vCenter Server contains all Platform Services Controller services, preserving the functionality and workflows, including authentication, certificate management, and licensing. It is no longer necessary nor possible to upgrade and use an external Platform Services Controller.

After successfully upgrading your environment to vCenter Server 7.0, the pre-existing Platform Services Controller will be powered off, and you can remove it from your vSphere inventory. See [Decommission the Platform Services Controller](#).

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## Prepare Your JSON Configuration File for CLI Upgrade

Before you run the CLI command to upgrade a vCenter Server appliance, you must prepare a JSON file with configuration parameters and their values for your upgrade specification.

The vCenter Server installer contains JSON templates for all upgrade types. For information about the templates, see [JSON Templates for CLI Upgrade of the vCenter Server Appliance](#).

You can upgrade an appliance with minimum configurations by setting values to the configuration parameters in the JSON template for your specification. You can edit the preset values, remove configuration parameters, and add configuration parameters for custom configurations.

For a complete list of the configuration parameters and their descriptions, navigate to the installer subdirectory for your operating system and run the `vcsa-deploy upgrade --template-help` command or see [Upgrade Configuration Parameters for CLI Upgrade of vCenter Server Appliance](#) .

### Prerequisites

- You must be familiar with the JSON syntax.
- [Download and Mount the vCenter Server Installer](#).

### Procedure

- 1 In the vCenter Server Appliance installer, navigate to the `vcsa-cli-installer` directory, and open the `templates` subfolder.
- 2 Copy the upgrade templates from the `upgrade` subfolder to your workspace.

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**Important** The path to the JSON configuration files must contain only ASCII characters. Extended ASCII and non-ASCII characters are unsupported.

---

- 3 Open the template file for your use case in a text editor.

To ensure the correct syntax of your JSON configuration file, use a JSON editor.

- 4 Fill in the values for the required configuration parameters and, optionally, enter additional parameters and their values.

For example, if you want to use an IPv4 DHCP assignment for the temporary network of the new appliance, in the `temporary_network` subsection of the template, change the value of the `mode` parameter to `dhcp` and remove the default configuration parameters that are for a static assignment.

```
"temporary_network": {
  "ip_family": "ipv4",
  "mode": "dhcp"
},
```

---

**Important** The string values, including the passwords, must contain only ASCII characters. Extended ASCII and non-ASCII characters are unsupported.

To set a value that contains a backslash (\) or quotation mark (") character, you must precede the character with the backslash (\) character. For example, `"password": "my\"password"` sets the password `my"password`, `"image": "G:\vcsa\VMware-vCenter-Server-Appliance-6.7.0.XXXX-YYYYYYY_OVF10.ova"` sets the path `G:\vcsa\VMware-vCenter-Server-Appliance-6.7.0.XXXX-YYYYYYY_OVF10.ova`.

The Boolean values must contain only lowercase characters, that is, a value can be either `true` or `false`. For example, `"ssh_enable": false`.

---

- 5 (Optional) Use a JSON editor of your choice to validate the JSON file.

## 6 Save in UTF-8 format and close the file.

### What to do next

You can create and save additional templates if needed for your upgrade specification.

## JSON Templates for CLI Upgrade of the vCenter Server Appliance

The vCenter Server appliance installer contains JSON templates that are located in the `vcsa-cli-installer/templates` directory. In the `upgrade` subfolder, you can find the JSON templates with the minimum configuration parameters for all upgrade types.

For each upgrade type, there is one template for deploying the new appliance on an ESXi host and another template for deploying the new appliance on a vCenter Server instance.

**Table 3-7. Upgrade JSON Templates Included in the vCenter Server Appliance Installer**

Location	Template	Description
<code>vcsa-cli-installer/templates/upgrade/vcsa/6.5</code>	<code>embedded_vCSA_on_ESXi.json</code>	Contains the minimum configuration parameters that are required for upgrade of a vCenter Server appliance 6.5 with an embedded Platform Services Controller to vCenter Server appliance 7.0 on an ESXi host.
	<code>embedded_vCSA_on_VC.json</code>	Contains the minimum configuration parameters that are required for upgrade of a vCenter Server appliance 6.5 with an embedded Platform Services Controller vCenter Server appliance 7.0 on a vCenter Server instance.
	<code>vCSA_on_ESXi.json</code>	Contains the minimum configuration parameters that are required for upgrade of a vCenter Server appliance 6.5 with an external Platform Services Controller to vCenter Server appliance 7.0 on an ESXi host.
	<code>vCSA_on_VC.json</code>	Contains the minimum configuration parameters that are required for upgrade of a vCenter Server appliance 6.5 with an external Platform Services Controller to vCenter Server appliance 7.0 on a vCenter Server instance.



**Table 3-7. Upgrade JSON Templates Included in the vCenter Server Appliance Installer (continued)**

Location	Template	Description
vcsa-cli-installer\templates\upgrade\vc sa\6.7	embedded_vCSA_on_ESXi.json	Contains the minimum configuration parameters that are required for upgrade of a vCenter Server appliance 6.7 with an embedded Platform Services Controller to vCenter Server appliance 7.0 on an ESXi host.
	embedded_vCSA_on_VC.json	Contains the minimum configuration parameters that are required for upgrade of a vCenter Server appliance 6.7 with an embedded Platform Services Controller to vCenter Server Appliance 7.0 on a vCenter Server instance.
	vCSA_on_ESXi.json	Contains the minimum configuration parameters that are required for upgrade of a vCenter Server appliance 6.7 with an external Platform Services Controller to vCenter Server appliance 7.0 on an ESXi host.
	vCSA_on_VC.json	Contains the minimum configuration parameters that are required for upgrade of a vCenter Server appliance 6.7 with an external Platform Services Controller to vCenter Server appliance 7.0 on a vCenter Server instance.

## About Upgrading a vCenter Server with an External Platform Services Controller Using the CLI

When upgrading a vCenter Server appliance that uses an external Platform Services Controller, it is converted to a vCenter Server instance with those services embedded in the appliance. For this reason, you must specify replication partner parameters in the JSON upgrade templates.

When upgrading a vCenter Server appliance that uses an external Platform Services Controller, you must specify replication partner parameters in the JSON upgrade template. These parameters indicate if the upgrade is for one of the following vCenter Server and Platform Services Controller upgrade scenarios.

- A single vCenter Server and a single Platform Services Controller instance within an SSO domain.
- The first vCenter Server and Platform Services Controller instance within an SSO domain containing more than one vCenter Server.

- Replicating vCenter Server and Platform Services Controller instances within an SSO domain, which you must point to an existing vCenter Server 7.0 instance as the replication partner.

---

**Important** It is not possible to upgrade an external Platform Services Controller. The upgrade process converges the Platform Services Controller services into the vCenter Server appliance. For more information, see [Removal of Platform Services Controller](#).

---

Deployments using an external Platform Services Controller are often called an  $M \times N$  deployment, where  $M$  represents the vCenter Server, and  $N$  represents the external Platform Services Controller. When representing multiple instances of vCenter Server and Platform Services Controller in a domain, this is expressed as  $Mn \times Nn$ , where  $n$  is the number of instances. For example,  $M2 \times N2$  indicates two vCenter Server instances and two Platform Services Controller instances within the same domain. When upgrading such a deployment, you first upgrade one instance to version 7.0, and then upgrade the second instance to 7.0, specifying the first of the two instances as the replicating partner.

The replication parameters in the JSON upgrade template are located in the `SSO` section of the template, and are `first_instance` and `replication_partner_hostname`.

Parameter Name	Description
<code>first_instance</code>	The <code>first_instance</code> parameter identifies the vCenter Server as either the first instance in your vCenter Server SSO domain, or as a replicating partner.  If it is the first vCenter Server instance, set <code>first_instance</code> to <code>true</code> . For additional instances of vCenter Server in the same SSO domain, set <code>first_instance</code> to <code>false</code> .
<code>replication_partner_hostname*</code>	If you set <code>first_instance</code> to <code>false</code> , you must specify the FQDN or IP address of a vCenter Server that has already been upgraded to version 7.0, and whose external PSC has been converged into the vCenter Server appliance.

When you perform the CLI upgrade of a single vCenter Server appliance that uses an external Platform Services Controller, the process is as follows:

- 1 Upgrade the vCenter Server instance in your topology using the `vCSA_on_ESXi.json` template when upgrading on ESXi, or the `vCSA_on_VC.json` template when upgrading on a vCenter Server deployment.

- For a deployment topology consisting of a single vCenter Server and a Platform Services Controller (an M1xN1 deployment), edit the `sso` section of the template such that the `first_instance` parameter is set to `true`, and remove the `replication_partner_hostname` parameter.

```
"sso": {
  "__comments": [ This is the first instance (M1) vCenter Server management node, with
  "first_instance" set to "true" and "replication_partner_hostname" removed.
  ],
  "first_instance": true
}
```

- Specify the remaining upgrade configuration parameters in the JSON template, and upgrade vCenter Server to version 7.0 using the CLI. See [Upgrade a vCenter Server Appliance by Using the CLI](#).
- After successfully upgrading vCenter Server, decommission the Platform Services Controller. See [Decommission the Platform Services Controller](#).

---

**Important** Decommission the Platform Services Controller instances only after upgrading and converging all vCenter Server instances in your topology.

---

For a deployment consisting of two or more vCenter Server and Platform Services Controller instances (an M2xN2 deployment), you first upgrade the M1 vCenter Server instance to version 7.0, and then upgrade the second, replicating vCenter Server instance.

- Upgrade the vCenter Server instances in your deployment using the `vCSA_on_ESXi.json` template when upgrading on ESXi, or the `vCSA_on_VC.json` template when upgrading on a vCenter Server deployment.
- For the first vCenter Server instance (M1), edit the `sso` section of the template such that the `first_instance` parameter is set to `true`, and remove the `replication_partner_hostname` parameter.

```
"sso": {
  "__comments": [ This is the first instance (M1) vCenter Server management node, with
  "first_instance" set to "true" and "replication_partner_hostname" removed.
  ],
  "first_instance": true
}
```

- For the remaining vCenter Server instance (M2), edit the `sso` section of the template such that the `first_instance` parameter is set to `false`, and provide the FQDN or IP address of the vCenter Server instance to which you want to replicate the second node. The replication partner is the first vCenter Server instance (M1) you upgraded to version 7.0, which has been converged with its Platform Services Controller instance.

```
"sso": {
  "__comments": [ This is the second instance (M2) vCenter Server management node, with
  "first_instance" set to "false" and "replication_partner_hostname" set to the hostname of
  the replication partner.],
  "first_instance": false,
  "replication_partner_hostname": "FQDN_or_IP_address"
```

- Specify the remaining upgrade configuration parameters in the JSON templates, and finish the upgrade using the CLI. See [Upgrade a vCenter Server Appliance by Using the CLI](#).
- After successfully upgrading all vCenter Server instances in the topology, decommission the Platform Services Controller instances. See [Decommission the Platform Services Controller](#).

---

**Important** Decommission the Platform Services Controller instances only after upgrading and converging all vCenter Server instances in your topology.

---

## Upgrade Configuration Parameters for CLI Upgrade of vCenter Server Appliance

When you prepare your JSON configuration files for CLI upgrade, you must set parameters and values to provide input data for the upgrade of a vCenter Server appliance.

### Sections and Subsections of Configuration Parameters in the JSON Upgrade Files

The configuration parameters in the JSON configuration files for CLI upgrade are organized in sections and subsections.

Table 3-8. Sections and Subsections of Configuration Parameters in the JSON Upgrade Files

Section	Subsection	Description
new_vcsa - describes the new appliance that you want to deploy.	esxi	<p>Use only if you want to deploy the new appliance directly on an ESXi host.</p> <p>Contains the configuration parameters that describe the target ESXi host. See <a href="#">Table 3-9. Configuration Parameters in the new_vcsa Section, esxi Subsection</a>.</p> <hr/> <p><b>Note</b> You must fill in either this subsection or the <code>vc</code> subsection.</p>
	vc	<p>Use only if you want to deploy the new appliance on the inventory of a vCenter Server instance.</p> <p>Contains the configuration parameters that describe the target ESXi host or DRS cluster from the vCenter Server inventory. See <a href="#">Table 3-10. Configuration Parameters in the new_vcsa Section, vc Subsection</a>.</p> <hr/> <p><b>Note</b> You must fill in either this subsection or the <code>esxi</code> subsection.</p> <p>The target vCenter Server instance cannot be the vCenter Server Appliance that you want to upgrade. In such cases, use the <code>esxi</code> subsection.</p>
	appliance	<p>Contains the configuration parameters that describe the new appliance. See <a href="#">Table 3-11. Configuration Parameters in the new_vcsa Section, appliance Subsection</a></p>
	os	<p>Contains only the <code>ssh_enable</code> configuration parameter to set the SSH administrator login to the new appliance.</p>
	ovftool_arguments	<p>Optional. Use this subsection for adding arbitrary arguments and their values to the OVF Tool command that the installer generates.</p> <hr/> <p><b>Important</b> The vCenter Server appliance installer does not validate the configuration parameters in the <code>ovftool_arguments</code> subsection. If you set arguments that the OVF Tool does not recognize, the deployment might fail.</p>
	temporary_network	<p>Contains the configuration parameters that describe the temporary network settings for the new appliance. See <a href="#">Table 3-12. Configuration Parameters in the new_vcsa Section, temporary_network Subsection</a></p>
	user_options	<p>Contains only the <code>vcdb_migrateSet</code> configuration parameter to set the types of data that you want to transfer from the old appliance to the new appliance. See <a href="#">Table 3-13. Configuration Parameters in the new_vcsa Section, user_options Subsection</a></p>
source_vc - describes the existing appliance that you want to upgrade.	managing_esxi_or_vc	<p>Contains the configuration parameters that describe the source ESXi host or vCenter Server appliance instance on which resides the appliance that you want to upgrade. See <a href="#">Table 3-15. Configuration Parameters in the source_vc Section, managing_esxi_or_vc Subsection</a>.</p>
	vc_vcsa	<p>Contains the configuration parameters that describe the source appliance that you want to upgrade. See <a href="#">Table 3-16. Configuration Parameters in the source_vc Section, vc_vcsa Subsection</a>.</p>

**Table 3-8. Sections and Subsections of Configuration Parameters in the JSON Upgrade Files (continued)**

Section	Subsection	Description
source_vum - describes the source VMware Update Manager instance. Use if you want to automatically run Migration Assistant on the VMware Update Manager instance.	run_migration_assistant	<p>Optional if the source vCenter Server appliance that you want to upgrade is connected to a VMware Update Manager instance that runs on a Windows virtual machine. Use this subsection if you want to automatically run Migration Assistant on the source VMware Update Manager instance.</p> <p>Contains the configuration parameters that describe the source VMware Update Manager instance, which will be migrated to the new upgraded vCenter Server appliance. See <a href="#">Table 3-17. Configuration Parameters in the source_vum Section, run_migration_assistant Subsection</a>.</p> <p><b>Note</b> The Migration Assistant uses port 9123 by default. If port 9123 is used by another service on the Update Manager machine, Migration Assistant automatically finds another free port. You cannot set a custom port for Migration Assistant.</p>
ceip - describes joining the VMware Customer Experience Improvement Program (CEIP).	settings	<p>Contains only the <code>ceip_enabled</code> configuration parameter to join or not to join the VMware Customer Experience Improvement Program (CEIP). See <a href="#">Table 3-18. Configuration Parameters in the ceip Section, settings Subsection</a>.</p> <p>Required only if you are upgrading a vCenter Server appliance with an embedded Platform Services Controller or a Platform Services Controller appliance.</p> <p><b>Note</b> If the <code>ceip_enabled</code> configuration parameter is set to <code>true</code>, you must run the CLI deployment command with the <code>--acknowledge-ceip</code> argument.</p> <p>For information about the CEIP, see the Configuring Customer Experience Improvement Program section in <i>vCenter Server and Host Management</i>.</p>

**Important** The string values, including the passwords, must contain only ASCII characters. Extended ASCII and non-ASCII characters are unsupported.

To set a value that contains a backslash (\) or quotation mark (") character, you must precede the character with the backslash (\) character. For example, `"password": "my\"password"` sets the password `my"password`, `"image": "G:\vcsa\VMware-vCenter-Server-Appliance-7.0.0.XXXX-YYYYYYY_OVF10.ova"` sets the path `G:\vcsa\VMware-vCenter-Server-Appliance-7.0.0.XXXX-YYYYYYY_OVF10.ova`.

The Boolean values must contain only lowercase characters. Can be either `true` or `false`. For example, `"ssh_enable": false`.

## Configuration Parameters in the `new_vcsa` Section

**Table 3-9. Configuration Parameters in the `new_vcsa` Section, `esxi` Subsection**

Name	Type	Description
<code>hostname</code>	string	The IP address or FQDN of the target ESXi host on which you want to deploy the new appliance.
<code>username</code>	string	A user name with administrative privileges on the target ESXi host, for example, <code>root</code> .
<code>password</code>	string	The password of the user with administrative privileges on the target ESXi host.
<code>deployment_network</code>	string	<p>The name of the network to which to connect the new appliance. The network must be part of the target ESXi host or vCenter Server appliance instance (as identified by the <code>managing_esxi_or_vc</code> configuration parameter) network configuration.</p> <p><b>Note</b> The network must be accessible from the source ESXi host or vCenter Server appliance instance (as identified by the <code>managing_esxi_or_vc</code> configuration parameter) on which resides the appliance that you want to upgrade. The network must be also accessible from the client machine from which you are performing the upgrade.</p> <p>Ignored if the target ESXi host has only one network.</p>
<code>datastore</code>	string	<p>The name of the datastore on which to store the virtual machine configuration files and virtual disks of the new appliance. The datastore must be available to the target ESXi host.</p> <p><b>Note</b> The datastore must have at least 25 GB of free space.</p>

Table 3-9. Configuration Parameters in the `new_vc` Section, `esxi` Subsection (continued)

Name	Type	Description
<code>port</code>	integer	The HTTPS reverse proxy port of the target ESXi host. The default port is 443. Use only if the target ESXi host uses a custom HTTPS reverse proxy port.
<code>ssl_certificate_verification</code>	string	<p>The CLI verifies that a server's security certificate is signed by a Certificate Authority (CA), and establishes a secure connection. If the certificate is self-signed, the CLI stops the upgrade unless you specify one of the following SSL certificate configuration options:</p> <p>Specify the Secure Hash Algorithm 1 (SHA-1) certificate thumbprint. A certificate thumbprint is a hexadecimal string that uniquely identifies a certificate. The thumbprint is calculated from the content of the certificate using a thumbprint algorithm.</p> <pre>"thumbprint": "certificate SHA-1 thumbprint"</pre> <p>Set <code>verification_mode</code> to <code>NONE</code>.</p> <pre>"verification_mode": "NONE"</pre> <p>If you are connecting to a server with a self-signed certificate, and fail to either specify the SHA-1 certificate thumbprint or set the verification mode to <code>NONE</code>, the CLI displays the server's self-signed certificate thumbprint, and prompts you to accept or reject the certificate thumbprint.</p> <p>You may also specify that the CLI ignore the self-signed using the <code>vc</code> <code>deploy upgrade</code> command parameter <code>--no-ssl-certificate-validation</code>. See <a href="#">Syntax of the CLI Upgrade Command</a>.</p>

Table 3-10. Configuration Parameters in the `new_vc` Section, `vc` Subsection

Name	Type	Description
<code>hostname</code>	string	The IP address or FQDN of the target vCenter Server instance on which you want to deploy the new appliance.
<code>username</code>	string	vCenter Single Sign-On administrator user name on the target vCenter Server instance, for example, <code>administrator@vsphere.local</code> .
<code>password</code>	string	The password of the vCenter Single Sign-On administrator user on the target vCenter Server instance.
<code>deployment_network</code>	string	<p>The name of the network to which to connect the new appliance. The network must part of the target ESXi host or DRS cluster network configuration.</p> <p><b>Note</b> The network must be accessible from the source ESXi host on which resides the appliance that you want to upgrade. The network must be also accessible from the client machine from which you are performing the upgrade.</p> <p>Ignored if the target ESXi host or DRS cluster has only one network.</p>



Table 3-10. Configuration Parameters in the `new_vc.sa` Section, `vc` Subsection (continued)

Name	Type	Description
<code>datacenter</code>	array	<p>The vCenter Server data center that contains the target ESXi host or DRS cluster on which you want to deploy the new appliance.</p> <p>If the data center is located in a folder or a structure of folders, specify the as a comma-separated list of strings. For example,</p> <pre>["parent_folder", "child_folder", "datacenter_name"]</pre> <p>If there is no folder path on the data center, then use only the data center name. For example,</p> <pre>["datacenter_name"]</pre> <p>or</p> <pre>"datacenter_name"</pre> <p><b>Note</b> The value is case-sensitive.</p>
<code>datastore</code>	string	<p>The name of the datastore that you want to store all virtual machine configuration files and virtual disks of the new appliance.</p> <p><b>Note</b> The datastore must be available to the target ESXi host or DRS cluster.</p> <p>The datastore must have at least 25 GB of free space.</p>
<code>port</code>	integer	<p>The HTTPS reverse proxy port of the target vCenter Server instance.</p> <p>The default port is 443. Use only if the target vCenter Server instance uses a custom HTTPS reverse proxy port.</p>

Table 3-10. Configuration Parameters in the `new_vc` Section, `vc` Subsection (continued)

Name	Type	Description
<code>target</code>	array	<p>The target cluster, ESXi host, or resource pool on which you want to deploy the new appliance. This is the target you specified with the <code>datacenter</code> parameter. This path must end with a cluster name, ESXi hostname, or resource pool name.</p> <hr/> <p><b>Important</b> You must provide the name that is displayed in the vCenter Server inventory. For example, if the name of the target ESXi host is an IP address in the vCenter Server inventory, you cannot provide an FQDN.</p> <hr/> <p><b>Note</b> All values are case-sensitive.</p> <hr/> <p>If you want the deployed appliance to be listed in a different location within the data center's hierarchy, use the <code>vm_folder</code> parameter described later in this section.</p> <p>If the target cluster, ESXi host, or resource pool is located in a folder or a structure of folders, specify the value as a comma-separated list of strings. For example,</p> <pre>["parent_folder", "child_folder", "esxi-host.domain.com"]</pre> <p>If the target ESXi host is part of a cluster, specify the path as a comma-separated list of strings. For example,</p> <pre>["cluster_name", "esxi-host.domain.com"]</pre> <p>If you are deploying to a resource pool, include the label <code>Resources</code> before the resource pool name. For example:</p> <pre>["cluster_name", "Resources", "resource_pool_name"]</pre> <hr/> <p><b>Note</b> Pre-checks verify only the memory of the resource pool.</p> <hr/>
<code>vm_folder</code>	string	Optional. The name of the virtual machine (VM) folder to which to add the new appliance.

**Table 3-11. Configuration Parameters in the `new_vcsa` Section, `appliance` Subsection**

Name	Type	Description
<code>thin_disk_mode</code>	Boolean	Set to <code>true</code> to deploy the new appliance with thin virtual disks.
<code>deployment_option</code>	string	<p>The size for the new appliance.</p> <p><b>Note</b> You must consider the database size of the appliance that you want to upgrade. For an external database, see <a href="#">Determine the Oracle Database Size and the Storage Size for the New Appliance</a>.</p> <ul style="list-style-type: none"> <li>■ Set to <code>tiny</code> if you want to deploy a vCenter Server appliance for up to 10 hosts and 100 virtual machines with the default storage size. Deploys an appliance with 2 CPUs, 10 GB of memory, and 300 GB of storage.</li> <li>■ Set to <code>tiny-lstorage</code> if you want to deploy a vCenter Server appliance for up to 10 hosts and 100 virtual machines with the large storage size. Deploys an appliance with 2 CPUs, 10 GB of memory, and 825 GB of storage.</li> <li>■ Set to <code>tiny-xlstorage</code> if you want to deploy a vCenter Server appliance for up to 10 hosts and 100 virtual machines with the x-large storage size. Deploys an appliance with 2 CPUs, 10 GB of memory, and 1700 GB of storage.</li> <li>■ Set to <code>small</code> if you want to deploy a vCenter Server appliance for up to 100 hosts and 1,000 virtual machines with the default storage size. Deploys an appliance with 4 CPUs, 16 GB of memory, and 340 GB of storage.</li> <li>■ Set to <code>small-lstorage</code> if you want to deploy a vCenter Server appliance for up to 100 hosts and 1,000 virtual machines with the large storage size. Deploys an appliance with 4 CPUs, 16 GB of memory, and 870 GB of storage.</li> <li>■ Set to <code>small-xlstorage</code> if you want to deploy a vCenter Server appliance for up to 100 hosts and 1,000 virtual machines with the x-large storage size. Deploys an appliance with 4 CPUs, 16 GB of memory, and 1750 GB of storage.</li> <li>■ Set to <code>medium</code> if you want to deploy a vCenter Server appliance for up to 400 hosts and 4,000 virtual machines with the default storage size. Deploys an appliance with 8 CPUs, 24 GB of memory, and 525 GB of storage.</li> <li>■ Set to <code>medium-lstorage</code> if you want to deploy a vCenter Server appliance for up to 400 hosts and 4,000 virtual machines with the large storage size. Deploys an appliance with 8 CPUs, 24 GB of memory, and 1025 GB of storage.</li> <li>■ Set to <code>medium-xlstorage</code> if you want to deploy a vCenter Server appliance for up to 400 hosts and 4,000 virtual machines with the x-large storage size. Deploys an appliance with 8 CPUs, 24 GB of memory, and 1905 GB of storage.</li> </ul>

Table 3-11. Configuration Parameters in the `new_vcsa` Section, `appliance` Subsection (continued)

Name	Type	Description
		<ul style="list-style-type: none"> <li>Set to <code>large</code> if you want to deploy a vCenter Server appliance for up to 1,000 hosts and 10,000 virtual machines with the default storage size. Deploys an appliance with 16 CPUs, 32 GB of memory, and 740 GB of storage.</li> <li>Set to <code>large-1storage</code> if you want to deploy a vCenter Server appliance for up to 1,000 hosts and 10,000 virtual machines with the large storage size. Deploys an appliance with 16 CPUs, 32 GB of memory, and 1090 GB of storage.</li> <li>Set to <code>large-xlstorage</code> if you want to deploy a vCenter Server appliance for up to 1,000 hosts and 10,000 virtual machines with the x-large storage size. Deploys an appliance with 16 CPUs, 32 GB of memory, and 1970 GB of storage.</li> <li>Set to <code>xlarge</code> if you want to deploy a vCenter Server appliance for up to 2,000 hosts and 35,000 virtual machines with the default storage size. Deploys an appliance with 24 CPUs, 48 GB of memory, and 1180 GB of storage.</li> <li>Set to <code>xlarge-1storage</code> if you want to deploy a vCenter Server appliance for up to 2,000 hosts and 35,000 virtual machines with the large storage size. Deploys an appliance with 24 CPUs, 48 GB of memory, and 1230 GB of storage.</li> <li>Set to <code>xlarge-xlstorage</code> if you want to deploy a vCenter Server appliance for up to 2,000 hosts and 35,000 virtual machines with the x-large storage size. Deploys an appliance with 24 CPUs, 48 GB of memory, and 2110 GB of storage.</li> <li>Set to <code>management-tiny</code> if you want to deploy a vCenter Server appliance with an external Platform Services Controller for up to 10 hosts and 100 virtual machines with the default storage size. Deploys an appliance with 2 CPUs, 10 GB of memory, and 300 GB of storage.</li> </ul>
<code>image</code>	string	Optional. A local file path or URL to the vCenter Server appliance installation package. By default the installer uses the installation package that is included in the ISO file, in the <code>vcsa</code> folder.
<code>name</code>	string	The VM name for the new appliance. Must contain only ASCII characters except a percent sign (%), backslash (\), or forward slash (/) and must be no more than 80 characters in length.
<code>ovftool_path</code>	string	Optional. A local file path to the OVF Tool executable file. By default the installer uses the OVF Tool instance that is included in the ISO file, in the <code>vcsa/ovftool</code> folder.

**Table 3-12. Configuration Parameters in the `new_vcsa` Section, `temporary_network` Subsection**

Name	Type	Description
<code>ip_family</code>	string	IP version for the temporary network of the new appliance. Set to <code>ipv4</code> or <code>ipv6</code> .
<code>mode</code>	string	IP assignment for the temporary network of the new appliance. Set to <code>static</code> or <code>dhcp</code> .
<code>ip</code>	string	Temporary IP address for the new appliance. Required only if you use a static assignment, that is, if you set the <code>mode</code> parameter to <code>static</code> . You must set an IPv4 or IPv6 address that corresponds to the temporary network IP version, that is, to the value of the <code>ip_family</code> parameter. An IPv4 address must comply with the RFC 790 guidelines. An IPv6 address must comply with the RFC 2373 guidelines.
<code>dns_servers</code>	string or array	IP addresses of one or more DNS servers for the temporary network of the new appliance. To set more than one DNS server, use a comma-separated list of strings or a comma-separated list as a single string to provide the path. For example, <pre>["x.y.z.a", "x.y.z.b"]</pre> or <pre>"x.y.z.a, x.y.z.b"</pre> Required only if you use static network mode for the temporary IP address allocation, that is, if you set the <code>mode</code> parameter to <code>static</code> .
<code>prefix</code>	string	Network prefix length for the temporary network of the new appliance. Use only if the <code>mode</code> parameter is set to <code>static</code> . Remove if the <code>mode</code> parameter is set to <code>dhcp</code> . The network prefix length is the number of bits that are set in the subnet mask. For example, if the subnet mask is 255.255.255.0, there are 24 bits in the binary version of the prefix length, so the network prefix length is 24. For IPv4 version, the value must be between 0 and 32. For IPv6 version, the value must be between 0 and 128.
<code>gateway</code>	string	IP address of the default gateway for the temporary network of the new appliance. For IPv6 version, the value can be <code>default</code> .

Table 3-13. Configuration Parameters in the `new_vcsa` Section, `user_options` Subsection

Name	Type	Description
<code>vcdb_migrateSet</code>	string	<p>Select the types of data to migrate from the old appliance to the new appliance. Data is copied from the source vCenter Server to the target server. The original source of the data remains unchanged.</p> <ul style="list-style-type: none"> <li>■ Set to <code>core</code> if you want to transfer only the configuration data. This option provides the fastest data migration, keeping system downtime to a minimum.</li> <li>■ Set to <code>core_events_tasks</code> if you want to transfer the configuration and historical data (events and tasks) immediately. vCenter Server will not start until all data has been migrated from the source vCenter Server appliance.</li> <li>■ Set to <code>all</code> if you want to transfer the configuration, historical, and performance metrics data immediately. vCenter Server will not start until all data has been migrated from the source vCenter Server for Windows. This option transfers the largest amount of data, and requires more downtime than other data migration options.</li> <li>■ Set to <code>transfer_events_tasks_after_upgrade</code> if you want to transfer the historical data (events and tasks) in the background after the upgrade finishes. During this time, vCenter Server performance might not be optimal.</li> <li>■ Set to <code>transfer_stats_events_tasks_after_upgrade</code> if you want to transfer historical data and performance metrics data in the background after the upgrade finishes. During this time, vCenter Server performance might not be optimal.</li> </ul> <p><b>Note</b> To minimize the upgrade time and the amount of storage required for the new vCenter Server appliance, use the <code>core</code> value.</p> <p>For more information on the types of data you can transfer from your existing vCenter Server to the new, upgraded vCenter Server, see <a href="#">Transferring Data from an Existing vCenter Server Appliance</a>.</p>

Table 3-14. Configuration Parameters in the `new_vcsa` Section, `SSO` Subsection

Name	Type	Description
<code>first_instance</code>	string	<p>Set <code>first_instance</code> to <code>true</code> if this is the first converge upgrade operation in your vCenter Server SSO domain, or if you do not want to set the replication partner for this node.</p> <p>If you want to set the replication partner for this node, set <code>first_instance</code> to <code>false</code> and provide the value of the <code>replication_partner_hostname</code> as the FQDN of a previously converged node which is currently in an embedded vCenter Server topology.</p> <p>For more information on specifying the <code>first_instance</code> and <code>replication_partner_hostname</code> parameters, see <a href="#">About Upgrading a vCenter Server with an External Platform Services Controller Using the CLI</a>.</p>
<code>replication_partner_hostname</code>	string	Host name of the replication partner. Remove if it is the <code>first_instance</code> .

## Configuration Parameters in the `source_vc` Section

**Table 3-15. Configuration Parameters in the `source_vc` Section, `managing_esxi_or_vc` Subsection**

Name	Type	Description
<code>hostname</code>	string	The IP address or FQDN of the source ESXi or vCenter Server host on which resides the appliance that you want to upgrade.
<code>username</code>	string	A user name with administrative privileges on the source ESXi host, for example, <code>root</code> .
<code>password</code>	string	The password of the user with administrative privileges on the source ESXi host.
<code>port</code>	integer	The HTTPS reverse proxy port of the source ESXi host. The default port is 443. Use only if the source ESXi host uses a custom HTTPS reverse proxy port.

**Table 3-16. Configuration Parameters in the `source_vc` Section, `vc_vcsa` Subsection**

Name	Type	Description
<code>hostname</code>	string	The IP address or FQDN of the source appliance that you want to upgrade.
<code>username</code>	string	vCenter Single Sign-On administrator user on the source appliance, for example <code>administrator@vsphere.local</code> . <b>Important</b> The user must be <code>administrator@your_domain_name</code> .
<code>password</code>	string	The password of the vCenter Single Sign-On administrator user on the source appliance.
<code>root_password</code>	string	The password for the root user of the operating system of the source appliance.
<code>export_dir</code>	string	Directory to export source configuration and data.

## Configuration Parameters in the `source_vum` Section

**Table 3-17. Configuration Parameters in the `source_vum` Section, `run_migration_assistant` Subsection**

Name	Type	Description
<code>esxi_hostname</code>	string	The IP address or FQDN of the ESXi host on which resides the source VMware Update Manager instance. If an FQDN is provided, it must be resolvable from the client machine from which you run the upgrade.
<code>esxi_username</code>	string	A user name with administrative privileges on the ESXi host, for example, <code>root</code> .
<code>esxi_password</code>	string	The password of the user with administrative privileges on the ESXi host.
<code>esxi_port</code>	string	The HTTPS reverse proxy port of the ESXi host. The default port is 443. Use only if the ESXi host uses a custom HTTPS reverse proxy port.

**Table 3-17. Configuration Parameters in the `source_vum` Section, `run_migration_assistant` Subsection (continued)**

Name	Type	Description
<code>vum_hostname</code>	string	The IP address or FQDN of the Windows virtual machine on which the source VMware Update Manager instance runs. If an FQDN is provided, it must be resolvable from the client machine from which you run the upgrade.
<code>vum_os_username</code>	string	The administrator user name of the Windows virtual machine on which the source VMware Update Manager instance runs.
<code>vum_os_password</code>	string	The administrator password of the Windows virtual machine on which the source VMware Update Manager instance runs. If not provided, you are prompted to enter the password at the command console during the template verification.
<code>export_dir</code>	string	Directory to export source configuration and data.

### Configuration Parameters in the `ceip` Section

**Table 3-18. Configuration Parameters in the `ceip` Section, `settings` Subsection**

Name	Type	Description
<code>ceip_enabled</code>	Boolean	Set to <code>true</code> to join the CEIP for the new upgraded appliance.

## Upgrade a vCenter Server Appliance by Using the CLI

You can use the CLI installer to perform an unattended upgrade of a vCenter Server appliance or Platform Services Controller appliance. You must run the CLI upgrade from a Windows, Linux, or Mac machine that is in the same network as the appliance that you want to upgrade.

### Prerequisites

- See [Prerequisites for Upgrading the vCenter Server Appliance](#).
- [Prepare Your JSON Configuration File for CLI Upgrade](#).
- Review the arguments for running the CLI upgrade. See [Syntax of the CLI Upgrade Command](#).
- Verify that the user name with which you are logged in to your machine, the path to the vCenter Server appliance installer, the path to your JSON configuration file, and the string values in your JSON configuration file contain only ASCII characters. Extended ASCII and non-ASCII characters are not supported.

### Procedure

- 1 Navigate to the `vcasa-cli-installer` subdirectory for your operating system.
  - If you are running the upgrade on Windows, navigate to the `vcasa-cli-installer\win32` directory.



- If you are running the upgrade on Linux, navigate to the `vcasa-cli-installer/lin64` directory.
  - If you are running the upgrade on Mac, navigate to the `vcasa-cli-installer/mac` directory.
- 2** (Optional) Verify that you prepared the upgrade template correctly by running a basic template verification.

```
vcasa-deploy upgrade --verify-template-only path_to_the_json_file
```

- 3** (Optional) Gather and validate the upgrade requirements by running a pre-upgrade check.

```
vcasa-deploy upgrade --precheck-only path_to_the_json_file
```

The pre-upgrade check installs the Upgrade Runner on the source appliance that you want to upgrade without upgrading the appliance.

The Upgrade Runner validates the configurations such as ESXi, network settings, and NTP servers. The Upgrade Runner also checks if you have selected a suitable deployment size and storage size for the new appliance against the compute resources required for the upgrade.

- 4** Perform the upgrade by running the following command.

```
vcasa-deploy upgrade --accept-eula optional_arguments path_to_the_json_file
```

Use *optional\_arguments* to enter space-separated arguments to set additional execution parameters of the upgrade command.

For example, you can set the location of the log and other output files that the installer generates. This example also confirms participation in the VMware Customer Experience Improvement Program (CEIP). If the `ceip_enabled` parameter is set to true in the JSON deployment template, you must include the argument `--acknowledge-ceip`.

```
vcasa-deploy upgrade --accept-eula --acknowledge-ceip --log-dir=path_to_the_location
path_to_the_json_file
```

## What to do next

[Verify Your vCenter Server Upgrade or Migration Is Successful.](#)

## Syntax of the CLI Upgrade Command

You can use command arguments to set the execution parameters of the upgrade command.

You can add a space-separated list of arguments to the CLI upgrade command.

```
vcasa-deploy upgrade path_to_the_json_file list_of_arguments
```

Argument	Description
<code>--accept-eula</code>	Accepts the end-user license agreement. Required for executing the deployment command.
<code>--acknowledge-ceip</code>	Confirms your acknowledgement of your VMware Customer Experience Improvement Program (CEIP) participation. Required if the <code>ceip_enabled</code> parameter is set to <code>true</code> in the JSON deployment template.
<code>-v, --verbose</code>	Adds debug information to the console output.
<code>-t, --terse</code>	Hides the console output. Displays only warning and error messages.
<code>--log-dir LOG_DIR</code>	Specifies the location of the log and other output files that the installer generates.
<code>--skip-ovftool-verification</code>	Performs basic verification of the configuration parameters and deploys the vCenter Server appliance, but does not validate the OVF Tool parameters in the <code>ovftool_arguments</code> subsection of the JSON template. If you set arguments that the OVF Tool does not recognize, the deployment might fail.
<code>--no-ssl-certificate-verification</code>	Prohibits SSL verification of for all server connections. The CLI verifies that a server's security certificate is signed by a Certificate Authority (CA), and establishes a secure connection. If the certificate is self-signed, the CLI stops the upgrade unless you specify that the CLI ignore the self-signed certificate using the <code>--no-ssl-certificate-validation</code> command parameter. If you are connecting to a server with a self-signed certificate, and fail to specify that the CLI accept it, the CLI displays the server's self-signed certificate thumbprint, and prompts you to accept or reject the it. You can also specify that the CLI ignore self-signed certificates using the <code>ssl_certificate_verification</code> configuration parameter in the JSON template. See <a href="#">Upgrade Configuration Parameters for CLI Upgrade of vCenter Server Appliance</a> . <b>Important</b> Avoid using this option as it may cause problems during or after upgrade due to an un-validated identity of the target host.
<code>--operation-id</code>	Lets you provide an identifier to track the concurrent installation, migration, or upgrade of multiple vCenter Server instances. If do not provide an operation ID, the CLI generates a universally unique identifier (UUID) which you can use to identify the different instances of vCenter Server and their installation or upgrade status.
<code>--pause-on-warnings</code>	Pauses and waits for acknowledgment of warnings.

Argument	Description
<code>--verify-template-only</code>	Performs basic template verification without installing Upgrade Runner, running prechecks, and upgrading or migrating the vCenter Server Appliance.
<code>--precheck-only</code>	Installs Upgrade Runner on the source appliance and runs a complete set of prechecks without performing the upgrade.
<code>-h, --help</code>	Displays the help message for the <code>vcsa-deploy upgrade</code> command.
<code>--template-help</code>	Displays the help message for the use of configuration parameters in the JSON upgrade file.

After the execution finishes, you can get the exit code of the command.

Exit Code	Description
0	Command ran successfully
1	Runtime error
2	Validation error
3	Template error

# Migrating vCenter Server for Windows to vCenter Server Appliance

# 4

You can migrate a vCenter Server installation on Windows to a vCenter Server appliance installation while upgrading to version 7.0.

This chapter includes the following topics:

- Overview of Migration from vCenter Server on Windows to vCenter Server Appliance
- System Requirements for Migrating vCenter Server Deployments to vCenter Server Appliance Deployments
- Pre-migration Checks
- Known Limitations
- Preparing for Migration
- Prerequisites for Migrating vCenter Server
- Required Information for Migrating vCenter Server from Windows to an Appliance
- GUI Migration of vCenter Server with an Embedded Platform Services Controller to an vCenter Server Appliance
- GUI Migration of vCenter Server with an External Platform Services Controller to an Appliance
- CLI Migration of a vCenter Server Installation from Windows to an Appliance

## Overview of Migration from vCenter Server on Windows to vCenter Server Appliance

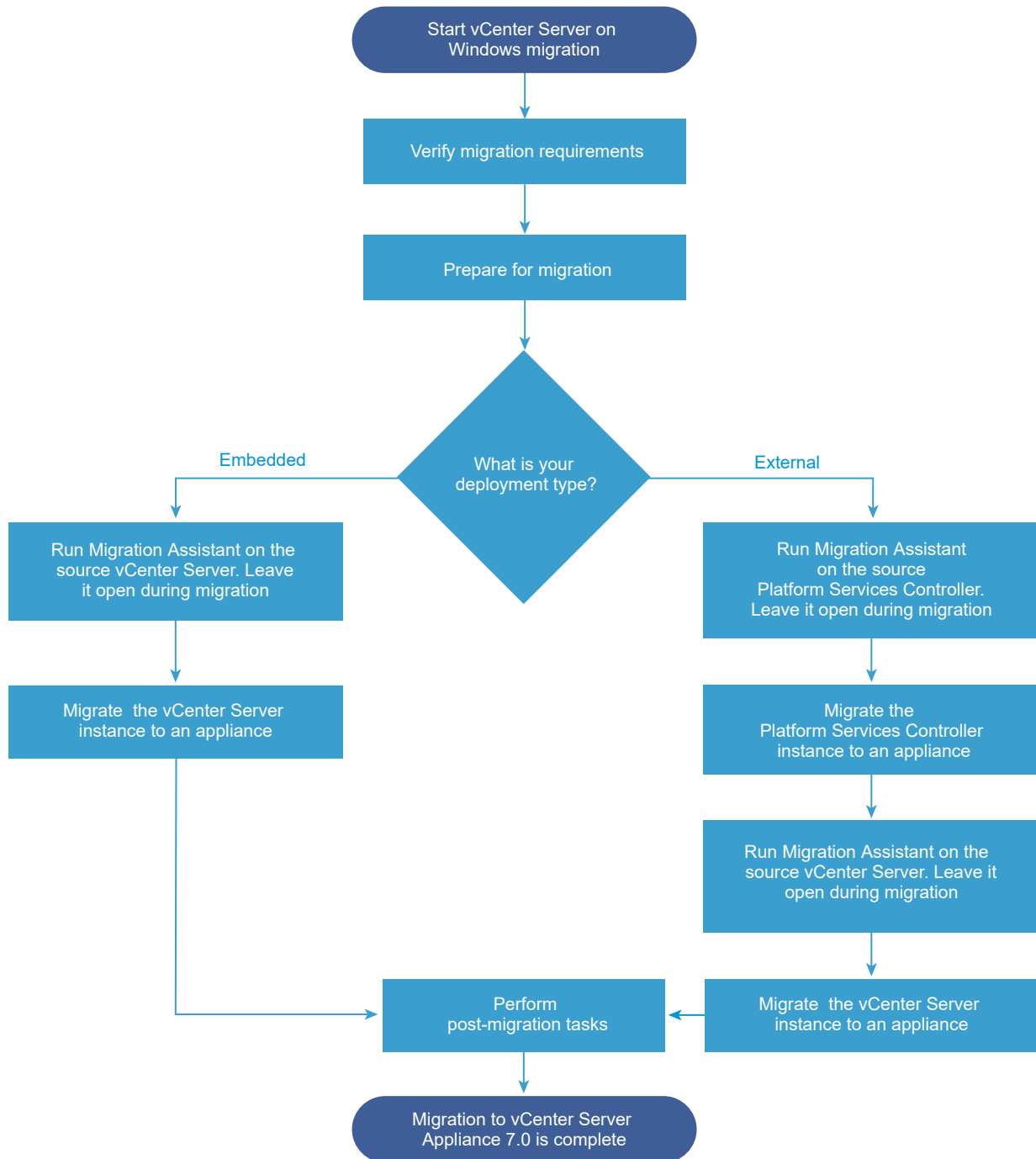
VMware provides supported paths for migrating from vCenter Server version 6.5 and version 6.7 installations on Windows to vCenter Server Appliance 7.0 installations.

You can migrate the following deployments:

**Table 4-1. Supported vSphere Migration Paths**

Source Configuration	Target Configuration
vCenter Server 6.5 with an Platform Services Controller embedded instance on Windows	vCenter Server Appliance 7.0
vCenter Server 6.7 with an embedded Platform Services Controller instance on Windows	
vCenter Server 6.5 instance on Windows	
vCenter Server 6.7 instance on Windows	

**Figure 4-1. High-level Tasks for vCenter Server on Windows Migration to vCenter Server Appliance 7.0**



You can use the GUI method or the CLI method to migrate your vCenter Server installation from Windows to an appliance.

- GUI Migration of vCenter Server with an Embedded Platform Services Controller to an vCenter Server Appliance
- GUI Migration of vCenter Server with an External Platform Services Controller to an Appliance

- [CLI Migration of a vCenter Server Installation from Windows to an Appliance](#)

---

**Important** You cannot change your deployment type during migration.

---

## Migration of Update Manager from Windows to a vCenter Server Appliance 7.0

For vSphere 6.5 and later releases, Update Manager is delivered as a 64-bit application and can be installed only on a 64-bit Windows operating system. In vSphere 6.5 and 6.7, Update Manager is provided as an optional service in vCenter Server Appliance 6.7. VMware provides supported paths for migrating Update Manager from a Windows operating system to a vCenter Server appliance version 7.0. In vSphere 7.0, Update Manager functionality is delivered as part of vSphere Lifecycle Manager.

You can migrate Update Manager in the following vCenter Server deployments:

**Table 4-2. Supported Migration Paths for Update Manager That Runs on Windows to a vCenter Server Appliance**

Source Configuration	Target Configuration
vCenter Server and Update Manager run on the same Windows machine	vCenter Server appliance 7.0 with embedded vSphere Lifecycle Manager
vCenter Server and Update Manager run on different Windows machines	vCenter Server appliance 7.0 with embedded vSphere Lifecycle Manager
Update Manager run on a Windows machine and is connected to a vCenter Server Appliance	vCenter Server appliance 7.0 with embedded vSphere Lifecycle Manager

You can use the GUI method or the CLI method to migrate your vCenter Server deployment that uses external Update Manager instance. If you use the GUI method, perform manual steps on the Update Manager Windows system. If you use the CLI method, add configuration parameters about Update Manager in your JSON template.

---

**Important** Verify that the Update Manager source machine does not run additional extensions that are connected to other vCenter Server systems, which are not part of your migration.

---

Before the migration, Update Manager might use any of the supported Microsoft SQL Server, Oracle, or embedded database solutions. After the migration to the vCenter Server appliance, Update Manager is upgraded to embedded vSphere Lifecycle Manager, which uses the PostgreSQL database.

## System Requirements for Migrating vCenter Server Deployments to vCenter Server Appliance Deployments

Your source and target systems must meet specific software and hardware requirements before you can migrate a vCenter Server, vCenter Single Sign-On, or Platform Services Controller deployment to a vCenter Server appliance.

## Source System

- Synchronize the clocks on all machines running the source vCenter Server services. See [Synchronizing Clocks on the vSphere Network](#).
- Verify that your vCenter Server and Platform Services Controller certificates are valid for the vCenter Server or Platform Services Controller and have not expired.
- Verify that the system network name of the machines running the target vCenter Server services are valid, and are reachable from other machines in the network.
- Verify that the host name of the virtual machine or physical server from which you are migrating vCenter Server complies with RFC 1123 guidelines.
- If your vCenter Server service is running in a user account other than the Local System account, verify that the user account in which the vCenter Server service is running has the following permissions:
  - **Member of the Administrators group**
  - **Log on as a service**
  - **Act as part of the operating system (if the user is a domain user)**
  - **Replace a process level token**
- Verify that the LOCAL SERVICE account has read permission on the folder in which vCenter Server is installed and on the HKLM registry.
- Verify that the connection between the virtual machine or physical server and the domain controller is working.
- Verify that the source vCenter Server instance or Platform Services Controller instance on Windows does not use a DHCP IP address as its system network name.

---

**Important** Migration from a source Windows machine using a DHCP IP Address as its system network name to an appliance is not supported.

---

## Target System

- Your target system must meet specific software and hardware requirements for vCenter Server appliance. See [System Requirements for the New vCenter Server Appliance](#).
- When you use Fully Qualified Domain Names, make sure that the machine you use for deploying the vCenter Server appliance and the target ESXi host or vCenter Server instance are on the same DNS server.
- Synchronize the clocks of all target virtual machines on the vSphere network before beginning migration. Unsynchronized clocks might result in authentication problems and can cause the migration to fail or prevent the vCenter Server services from starting. See [Synchronizing Clocks on the vSphere Network](#).



## Pre-migration Checks

When you migrate vCenter Server for Windows to vCenter Server Appliance, the upgrade installer performs a pre-check of the environment to ensure it meets requirements. For example, the pre-check verifies that enough space is available on the virtual machine or physical server where you are migrating, and that the external database, if any, can be successfully accessed.

## Source Environment Checks

When you migrate vCenter Server for Windows versions 6.5 or 6.7, vCenter Single Sign-On is included as part of the Platform Services Controller. When you provide the information about the vCenter Single Sign-On service, the installer uses the administrator account to check the host name and password, to verify that the details of the vCenter Single Sign-On server you provided can be authenticated before proceeding with the migration process.

The pre-migration checker performs checks for the following aspects of the source environment:

- vCenter Server or Platform Services Controller to verify that migration is supported
- SSL certificates validity and compatibility with system names
- Network connections
- DNS resolution
- Internal and external ports used
- External database connectivity
- Administrator privileges on the Windows machine
- Required disk space for exporting configuration data
- NTP server validation
- Any credentials that you enter

## Target Environment Checks

The pre-migration checker performs checks for the following aspects of the target environment:

- Minimum processor requirements
- Minimum memory requirements
- Minimum disk space requirements
- Administrator privileges on the target host
- Any credentials that you enter

## Known Limitations

The current release has several known limitations.

The following list contains features or actions that are currently not supported:

- Local Windows OS users and groups are not migrated to the Photon OS of the vCenter Server 7.0. If you assigned vCenter Server permissions to any Local Windows OS users and groups, remove the permissions assignments before the migration. You can re-create Local OS users and groups on the Photon OS of the vCenter Server 7.0 after the migration.
- After the migration, the source vCenter Server is turned off and cannot be turned on to avoid network ID conflicts with the target vCenter Server appliance. After the source vCenter Server is turned off, all solutions that are installed on the source vCenter Server and that are not migrated become unavailable.
- Migration of deployments that use custom ports for services other than Auto Deploy, Update Manager, vSphere ESXi Dump Collector, and HTTP reverse proxy (RHTTP) are not supported.
- The migration process migrates only one network adapter setting to the target vCenter Server appliance. If the hostname of the source vCenter Server resolves to multiple IP addresses across multiple network adapters, you can select which IP address and network adapter settings to migrate. You cannot add the rest of the network adapters and settings to the target vCenter Server appliance.

## Preparing for Migration

Before beginning to migrate any type of vCenter Server deployment to an appliance, you must complete the preparation tasks.

Preparation tasks:

- [Synchronizing Clocks on the vSphere Network](#)
- [Preparing vCenter Server Databases for Migration](#)
- [Prepare Managed ESXi Hosts for Migration](#)
- [Download and Mount the vCenter Server Installer](#)
- [Download and Run VMware Migration Assistant on the Source Windows Machine](#)

## Synchronizing Clocks on the vSphere Network

Verify that all components on the vSphere network have their clocks synchronized. If the clocks on the physical machines in your vSphere network are not synchronized, SSL certificates and SAML Tokens, which are time-sensitive, might not be recognized as valid in communications between network machines.

Unsynchronized clocks can result in authentication problems, which can cause the installation to fail or prevent the vCenter Server `vmware-vpxd` service from starting.

Time inconsistencies in vSphere can cause firstboot to fail at different services depending on where in the environment time is not accurate and when the time is synchronized. Problems most commonly occur when the target ESXi host for the destination vCenter Server is not synchronized with NTP or PTP. Similarly, issues can arise if the destination vCenter Server migrates to an ESXi host set to a different time due to fully automated DRS.

To avoid time synchronization issues, ensure that the following is correct before installing, migrating, or upgrading a vCenter Server.

- The target ESXi host where the destination vCenter Server is to be deployed is synchronized to NTP or PTP.
- The ESXi host running the source vCenter Server is synchronized to NTP or PTP.
- When upgrading or migrating from vSphere 6.5 or 6.7 to vSphere 7.0, if the vCenter Server appliance is connected to an external Platform Services Controller, ensure the ESXi host running the external Platform Services Controller is synchronized to NTP or PTP.
- If you are upgrading or migrating from vSphere 6.5 or 6.7 to vSphere 7.0, verify that the source vCenter Server or vCenter Server appliance and external Platform Services Controller have the correct time.
- When you upgrade a vCenter Server 6.5 or 6.7 instance with an external Platform Services Controller to vSphere 7.0, the upgrade process converts to a vCenter Server instance with an embedded Platform Services Controller.

Verify that any Windows host machine on which vCenter Server runs is synchronized with the Network Time Server (NTP) server. See the VMware knowledge base article at <https://kb.vmware.com/s/article/1318>.

To synchronize ESXi clocks with an NTP server or a PTP server, you can use the VMware Host Client. For information about editing the time configuration of an ESXi host, see *vSphere Single Host Management - VMware Host Client*.

To learn how to change time synchronization settings for vCenter Server, see "Configure the System Time Zone and Time Synchronization Settings" in *vCenter Server Configuration*.

To learn how to edit time configuration for a host by using the vSphere Client, see "Editing Time Configuration for a Host" in *vCenter Server and Host Management*.

## Synchronize ESXi Clocks with a Network Time Server

Before you install vCenter Server or deploy the vCenter Server Appliance, make sure all machines on your vSphere network have their clocks synchronized.

This task explains how to set up NTP from the VMware Host Client. You can instead use the `vicfg-ntp` vCLI command. See the *vSphere Command-Line Interface Reference*.

### Procedure

- 1 Start the VMware Host Client, and connect to the ESXi host.
- 2 Click **Configure**.

- 3 Under **System**, click **Time Configuration**, and click **Edit**.
- 4 Select **Use Network Time Protocol (Enable NTP client)**.
- 5 In the Add NTP Server text box, enter the IP address or fully qualified domain name of one or more NTP servers to synchronize with.
- 6 (Optional) Set the startup policy and service status.
- 7 Click **OK**.

The host synchronizes with the NTP server.

## Preparing vCenter Server Databases for Migration

The vCenter Server appliance instance requires a database to store and organize server data. Ensure your source vCenter Server database is prepared for migration to the target vCenter Server appliance.

Each vCenter Server appliance instance must have its own database. The bundled PostgreSQL database that is included in the vCenter Server appliance supports up to 2,500 hosts and 30,000 virtual machines.

To ensure your database is prepared for migration:

- Verify that passwords are current and not set to expire soon.
- (Optional) Reduce the database size. For more information, see Knowledge Base article [KB 2110031](#).
- Verify that you have backed up your database. See your database documentation.
- Verify that vCenter Server can communicate with the local database.

During the migration of vCenter Server to vCenter Server appliance, the installer:

- 1 Exports the vCenter Server database.
- 2 Deploys the target vCenter Server appliance in an unconfigured state.
- 3 Copies exported data to the target vCenter Server appliance.
- 4 Starts the PostgreSQL service to import the source database data.
- 5 Upgrades the database schema to be compatible with the target vCenter Server appliance.
- 6 Starts the target vCenter Server appliance services.

When you configure the target vCenter Server appliance, you initialize and configure using the imported database with the old schema. You have a choice of migration options:

- 1 Inventory tables
- 2 Inventory tables with events and tasks
- 3 All database data

## Prepare an Oracle Database for Migration

Ensure that you have the necessary credentials, and that you complete any necessary cleanup or other preparation before migrating your Oracle database from Windows to an embedded PostgreSQL database in the appliance.

### Prerequisites

Verify that you have confirmed basic interoperability before preparing your Oracle database for migration.

Verify that you have backed up your database. For information about backing up the vCenter Server database, see the Oracle documentation.

### Procedure

- 1 Verify that passwords are current and not set to expire soon.
- 2 Ensure that you have login credentials, the database name, and the database server name that the vCenter Server database is to use.  
  
Look in the ODBC system for the connection name of the database source name for the vCenter Server database.
- 3 Use the Oracle SERVICE\_NAME instead of SID to verify that your Oracle database instance is available.
  - Log in to the database server to read from the alert log: `$ORACLE_BASE/diag/rdbms/$instance_name/$INSTANCE_NAME/trace/alert_$ INSTANCE_NAME.log`.
  - Log in to the database server to read from the Oracle Listener status output.
  - If you have the SQL\*Plus client installed, you can use `tnsping` for the vCenter Database instance. If the `tnsping` command does not work the first time, retry it after waiting a few minutes. If retrying does not work, restart the vCenter Database instance on the Oracle server and then retry `tnsping` to ensure it is available.
- 4 Verify that the JDBC driver file is included in the CLASSPATH variable.
- 5 Verify that permissions are set correctly.
- 6 Either assign the DBA role or grant the required permissions to the user.
- 7 Make a full backup of the vCenter Server database.

### Results

Your database is prepared for the vCenter Server migration to vCenter Server Appliance.

## Prepare a Microsoft SQL Server Database for Migration

Ensure that you have the necessary credentials, and that you complete any necessary cleanup or other preparation before migrating your Microsoft SQL Server database on Windows to an embedded PostgreSQL database appliance.

---

**Important** You cannot use Integrate Windows for your authentication method if the vCenter Server service is running under the Microsoft Windows built-in system account.

---

### Prerequisites

Verify that you have backed up your database. For information about backing up the vCenter Server database, see the Microsoft SQL Server documentation.

### Procedure

- 1 Verify that passwords are current and not set to expire soon.
- 2 Verify that JDK 1.6 or later is installed on the vCenter Server machine.
- 3 Verify that the `sqljdbc4.jar` file is added to the CLASSPATH variable on the machine where vCenter Server Appliance is to be migrated.

If the `sqljdbc4.jar` file is not installed on your system, the vCenter Server Appliance installer installs it.

- 4 Verify that your system database source name is using the Microsoft SQL Server Native Client 10 or 11 driver.
- 5 Make a full backup of the vCenter Server database.

### Results

Your database is prepared for the vCenter Server migration to vCenter Server Appliance.

## Prepare PostgreSQL Database Before Migrating vCenter Server to an Appliance

Ensure that you have the necessary credentials, and that you complete any necessary cleanup or other preparation before migrating your PostgreSQL database installation on Windows to an appliance.

For information about backing up the vCenter Server database, see the PostgreSQL documentation.

### Prerequisites

Verify that you have confirmed basic migration interoperability before preparing your PostgreSQL database for migrating vCenter Server.

### Procedure

- 1 Verify that passwords are current and not set to expire soon.

2 For vCenter Server, locate the `cleanup_orphaned_data_PostgreSQL.sql` script in the ISO image and copy it to your PostgreSQL server.

3 Log in to vCenter Server Appliance as root user.

4 Run the cleanup script.

```
/opt/vmware/vpostgres/9.4/bin/psql -U postgres -d VCDB -f path
cleanup_orphaned_data_Postgres.sql
```

The cleanup script cleans and purges any unnecessary or orphaned data in your vCenter Server database that is not used by any vCenter Server component.

5 Make a full backup of the vCenter Server database.

### Results

Your database is prepared for the vCenter Server migration to vCenter Server Appliance.

## Prepare Managed ESXi Hosts for Migration

You must prepare the ESXi hosts managed by your vCenter Server installation before migrating it from Windows to vCenter Server 7.0.

### Prerequisites

To migrate vCenter Server or an external Platform Services Controller from Windows to vCenter Server 7.0, your source and target ESXi hosts must meet the migration requirements.

- ESXi hosts must be at version 6.5 or greater. For information on ESXi compatibility, see the [VMware Compatibility Guide](#).
- ESXi hosts must not be in lockdown or maintenance mode.

### Procedure

1 To keep your current SSL certificates, back up the SSL certificates that are on the vCenter Server system before you upgrade to vCenter Server 7.0.

The default location of the SSL certificates is `%allusersprofile%\VMware\VMware VirtualCenter`.

2 If you have Custom or Thumbprint certificates, see [Host Upgrades and Certificates](#) to determine your preparatory steps.

3 If you have vSphere HA clusters, SSL certificate checking must be enabled.

If you have vSphere HA clusters, SSL certificate checking must be enabled.

- a Select the vCenter Server instance in the vSphere Client inventory tree.
- b Select the **Manage** tab and the **General** subtab.
- c Verify that **vCenter Server requires verified host SSL certificates** is selected.

## Results

Your ESXi hosts are ready for migration to the vCenter Server appliance.

## Preparing vCenter Server Certificates for Migration

You must verify that your source vCenter Server certificates are prepared before you start the migration process.

In vSphere 6.0 and later certificates are stored in the VMware Endpoint Certificate Store. The migration process proceeds normally and preserves your certificates. For information about vCenter Server certificate locations, see Knowledge Base article [KB 2111411](#).

### Certificate Files Location

The vCenter Server certificate files are located at `%ProgramData%\VMware\VMware VirtualCenter\SSL`

### Supported Certificate Types

If your environment uses any of the supported certificate types, you can continue with the migration. The migration process proceeds normally and preserves your certificates.

- Your `ru1.crt` file contains the entire chain including the leaf certificate. You can create this type of certificate by deploying and using the VMware SSL Certificate Automation Tool, see see Knowledge Base article [KB 2057340](#) .
- Your `ru1.crt` file contains the leaf certificate and the corresponding `cacert.pem` is available in `%ProgramData%\VMware\VMware VirtualCenter\SSL` to validate the `ru1.crt`.

### Unsupported Certificate Types

If your environment uses any of the unsupported certificate types, you must prepare your certificates before you can proceed with the migration process proceeds.

- Your `ru1.crt` contains only the leaf certificate, the `cacert.pem` is missing or invalid, and `cacert.pem` is not added to the Windows trust store.  
  
Get the Certificate Authority certificate, including all intermediate certificates, and create a `cacert.pem` file, or replace the vCenter Server certificates with any of the supported formats.
- Your `ru1.crt` contains only the leaf certificate and the `cacert.pem` is missing or invalid, but the `cacert.pem` is added to the Windows trust store.  
  
Get the Certificate Authority certificate, including all intermediate certificates from the Windows trust store and create `cacert.pem`. Use OpenSSL to verify the certificate by running `verify -CAfile cacert.pem ru1.crt` command.

For more information about vSphere security certificates, see the *vSphere Security* documentation.



## System Requirements for the vCenter Server Installer

You can run the vCenter Server GUI or CLI installer from a network client machine that is running on a Windows, Linux, or Mac operating system of a supported version.

To ensure optimal performance of the GUI and CLI installers, use a client machine that meets the minimum hardware requirements.

**Table 4-3. System Requirements for the GUI and CLI Installers**

Operating System	Supported Versions	Minimum Hardware Configuration for Optimal Performance
Windows	<ul style="list-style-type: none"> <li>■ Windows 8, 8.1, 10</li> <li>■ Windows 2012 x64 bit</li> <li>■ Windows 2012 R2 x64 bit</li> <li>■ Windows 2016 x64 bit</li> <li>■ Windows 2019 x64</li> </ul>	4 GB RAM, 2 CPU having 4 cores with 2.3 GHz, 32 GB hard disk, 1 NIC
Linux	<ul style="list-style-type: none"> <li>■ SUSE 15</li> <li>■ Ubuntu 16.04 and 18.04</li> </ul>	4 GB RAM, 1 CPU having 2 cores with 2.3 GHz, 16 GB hard disk, 1 NIC <b>Note</b> The CLI installer requires 64-bit OS.
Mac	<ul style="list-style-type: none"> <li>■ macOS v10.13, 10.14, 10.15</li> <li>■ macOS High Sierra, Mojave, Catalina</li> </ul>	8 GB RAM, 1 CPU having 4 cores with 2.4 GHz, 150 GB hard disk, 1 NIC

**Note** For client machines that run on Mac 10.13 or later, concurrent GUI deployments of multiple appliances are unsupported. You must deploy the appliances in a sequence.

**Note** Visual C++ redistributable libraries need to be installed to run the CLI installer on versions of Windows older than Windows 10. The Microsoft installers for these libraries are located in the `vcsa-cli-installer/win32/vcredist` directory.

**Note** Deploying the vCenter Server appliance with the GUI requires a minimum resolution of 1024x768 to properly display. Lower resolutions can truncate the UI elements.

## Determine the Oracle Database Size and the Storage Size for the New Appliance

Before upgrading a vCenter Server appliance or migrating a vCenter Server on Windows that uses an external Oracle database, you must determine the size of the existing database. Based on the size of the existing database, you can calculate the minimum storage size for the new vCenter Server appliance database using an embedded PostgreSQL database.

You run scripts to determine the Oracle core table size, the events and tasks table size, and the statistics table size. The Oracle core table corresponds to the database (/storage/db) partition of the PostgreSQL database. The Oracle events and tasks and statistics tables correspond to the statistics, events, alarms, and tasks (/storage/seat) partition of the PostgreSQL database.

During the upgrade of the appliance, you must select a storage size for the new appliance that is at least twice the size of the Oracle tables size.

During the upgrade of the appliance, you can select the types of data to transfer to the new appliance. To minimize upgrade time and storage requirements for the new appliance, you can choose to transfer only the configuration data.

### Prerequisites

You must have the vCenter Server database login credentials.

### Procedure

- 1 Log in to a SQL\*Plus session with the vCenter Server database user.
- 2 Determine the core table size by running the following script.

```
SELECT ROUND(SUM(s.bytes)/(1024*1024)) SIZE_MB
FROM   user_segments s
WHERE  (s.segment_name,s.segment_type)
        IN (SELECT seg_name, seg_type FROM
              (SELECT t.table_name seg_name, t.table_name tname,
                    'TABLE' seg_type
               FROM   user_tables t
              UNION
               SELECT i.index_name, i.table_name,
                    'INDEX'
               FROM   user_indexes i
              ) ti
         WHERE (ti.tname LIKE 'VPX_%'
              OR ti.tname LIKE 'CL_%'
              OR ti.tname LIKE 'VDC_%')
              AND ti.tname NOT LIKE 'VPX_SAMPLE_TIME%'
              AND ti.tname NOT LIKE 'VPX_HIST_STAT%'
              AND ti.tname NOT LIKE 'VPX_TOPN%'
              AND ti.tname NOT LIKE 'VPX_SDRS_STATS_VM%'
              AND ti.tname NOT LIKE 'VPX_SDRS_STATS_DATASTORE%'
              AND ti.tname NOT LIKE 'VPX_TASK%'
              AND ti.tname NOT LIKE 'VPX_EVENT%'
              AND ti.tname NOT LIKE 'VPX_PROPERTY_BULLETIN%');
```

The script returns the database storage size in MB.

- 3 Determine the events and tasks table size by running the following script.

```
SELECT ROUND(SUM(s.bytes)/(1024*1024)) SIZE_MB
FROM   user_segments s
WHERE  (s.segment_name,s.segment_type)
        IN (SELECT seg_name, seg_type FROM
```

```

        (SELECT t.table_name seg_name, t.table_name tname,
            'TABLE' seg_type
        FROM    user_tables t
        UNION
        SELECT i.index_name, i.table_name,
            'INDEX'
        FROM    user_indexes i
        ) ti
    WHERE
        ti.tname LIKE 'VPX_TASK%'
    OR ti.tname LIKE 'VPX_EVENT%');

```

The script returns the events and tasks storage size in MB.

#### 4 Determine the statistics table size by running the following script.

```

SELECT ROUND(SUM(s.bytes)/(1024*1024)) SIZE_MB
FROM    user_segments s
WHERE   (s.segment_name,s.segment_type)
        IN (SELECT seg_name, seg_type FROM
            (SELECT t.table_name seg_name, t.table_name tname,
                'TABLE' seg_type
            FROM    user_tables t
            UNION
            SELECT i.index_name, i.table_name,
                'INDEX'
            FROM    user_indexes i
            ) ti
        WHERE
            ti.tname LIKE 'VPX_SAMPLE_TIME%'
        OR ti.tname LIKE 'VPX_TOPN%'
        OR ti.tname LIKE 'VPX_TASK%'
        OR ti.tname LIKE 'VPX_EVENT%'
        OR ti.tname LIKE 'VPX_HIST_STAT%');

```

The script returns the statistics storage size in MB.

#### 5 Calculate the minimum storage size for the new appliance that you are going to deploy during the upgrade.

- a The size of the database (/storage/db) partition of the embedded PostgreSQL database must be at least twice the size of the Oracle core table returned in [Step 2](#).
- b The size of the statistics, events, alarms, and tasks (/storage/seat) partition of the embedded PostgreSQL database must be at least twice the sum of the sizes of the Oracle events and tasks and statistics tables returned in [Step 3](#) and [Step 4](#).

For example, if the Oracle core table is 100 MB, the events and tasks table is 1,000 MB, and the statistics table is 2,000 MB, then the Postgres /storage/db partition must be at least 200 MB and the /storage/seat partition must be at least 6,000 MB.

## Determine the Microsoft SQL Server Database Size and the Storage Size for the New vCenter Server Appliance

Before upgrading a vCenter Server appliance, or migrating a vCenter Server on Windows that uses an external Microsoft SQL Server database, you must determine the size of the existing database. Based on the size of the existing database, you can calculate the minimum storage size for the new vCenter Server appliance. This storage size allows the embedded PostgreSQL database to assume the data from the old database with enough free disk space after the upgrade.

You run scripts to determine the Microsoft SQL Server core table size, the events and tasks table size, and the statistics table size. The Microsoft SQL Server core table corresponds to the database (`/storage/db`) partition of the PostgreSQL database. The Microsoft SQL Server events and tasks and statistics tables correspond to the statistics, events, alarms, and tasks (`/storage/seat`) partition of the PostgreSQL database.

During the upgrade of the appliance, you must select a storage size for the new appliance that is at least twice the size of the Microsoft SQL Server tables size.

### Prerequisites

You must have the vCenter Server database login credentials.

### Procedure

- 1 Log in to a SQL Management Studio session with the vCenter Server database user.
- 2 Determine the core table size by running the following script.

```
SELECT SUM(p.used_page_count * 8)/1024 AS disk_size
FROM sys.dm_db_partition_stats p
JOIN sys.objects o
  ON o.object_id = p.object_id
WHERE o.type_desc = 'USER_TABLE'
  AND o.is_ms_shipped = 0 AND UPPER(o.name) NOT LIKE 'VPX_HIST_STAT%'
  AND UPPER(o.name) NOT LIKE 'VPX_SAMPLE_TIME%'
  AND UPPER(o.name) NOT LIKE 'VPX_TOPN%'
  AND UPPER(o.name) NOT LIKE 'VPX_TASK%'
  AND UPPER(o.name) NOT LIKE 'VPX_EVENT%'
  AND UPPER(o.name) NOT LIKE 'VPX_SDRS_STATS_VM%'
  AND UPPER(o.name) NOT LIKE 'VPX_SDRS_STATS_DATASTORE%'
  AND UPPER(o.name) NOT LIKE 'VPX_PROPERTY_BULLETIN%';
```

The script returns the database storage size in MB.

- 3 Determine the events and tasks table size by running the following script.

```
SELECT SUM(p.used_page_count * 8)/1024 AS disk_size
FROM sys.dm_db_partition_stats p
JOIN sys.objects o
```

```

ON o.object_id = p.object_id
WHERE o.type_desc = 'USER_TABLE'
AND o.is_ms_shipped = 0 AND ( UPPER(o.name) LIKE 'VPX_TASK%'
OR UPPER(o.name) LIKE 'VPX_EVENT%');

```

The script returns the events and tasks storage size in MB.

#### 4 Determine the statistics table size by running the following script.

```

SELECT SUM(p.used_page_count * 8)/1024 AS disk_size
FROM sys.dm_db_partition_stats p
JOIN sys.objects o
ON o.object_id = p.object_id
WHERE o.type_desc = 'USER_TABLE'
AND o.is_ms_shipped = 0
AND ( UPPER(o.name) LIKE 'VPX_HIST_STAT%'
OR UPPER(o.name) LIKE 'VPX_SAMPLE_TIME%'
OR UPPER(o.name) LIKE 'VPX_TOPN%');

```

The script returns the statistics storage size in MB.

#### 5 Calculate the minimum storage size for the new appliance that you are going to deploy during the upgrade.

- a The size of the database (`/storage/db`) partition of the embedded PostgreSQL database must be at least twice the size of the Microsoft SQL Server core table returned in [Step 2](#).
- b The size of the statistics, events, alarms, and tasks (`/storage/seat`) partition of the embedded PostgreSQL database must be at least twice the sum of the sizes of the Microsoft SQL Server events and tasks and statistics tables returned in [Step 3](#) and [Step 4](#).

For example, if the Microsoft SQL Server core table is 100 MB, the events and tasks table is 1,000 MB, and the statistics table is 2,000 MB, then the Postgres `/storage/db` partition must be at least 200 MB and the `/storage/seat` partition must be at least 6,000 MB.

## Download and Run VMware Migration Assistant on the Source Windows Machine

You must download and run the VMware Migration Assistant on your source vCenter Server or Platform Services Controller to prepare it for migration from Windows to a vCenter Server appliance. If your deployment of vCenter Server has an external Update Manager that runs on Windows, download and run the VMware Migration Assistant on the source Windows machine. Update Manager prepares the Update Managerserver and database for migration from Windows to the vCenter Server appliance.

The VMware Migration Assistant performs the following tasks on the source Windows machine where you run it:

- 1 Discovers the source deployment type.
- 2 Runs pre-checks on the source.
- 3 Reports errors that must be addressed before starting the migration.

4 Provides information for the next steps in the migration process.

Ensure that the VMware Migration Assistant window remains open during the migration process. Closing the VMware Migration Assistant causes the migration process to stop.

### Prerequisites

- [Download and Mount the vCenter Server Installer.](#)
- Log in to the Windows machine as an administrator.

### Procedure

- 1 In the vCenter Server appliance installer package, locate the directory that contains VMware Migration Assistant.
- 2 Copy the VMware Migration Assistant folder to the source Windows machine where either one of the following components runs:
  - Update Manager
  - Platform Services Controller
  - vCenter Server

---

**Caution** If Update Manager runs on a different Windows machine than any other of the vCenter Server components that you are migrating, run VMware Migration Assistant on the Update Manager source machine first. If you do not run VMware Migration Assistant on the Update Manager source machine first, the VMware Migration Assistant on vCenter Server may fail.

---

- 3 Run the VMware Migration Assistant on the Windows machine.
  - For the GUI, double-click `VMware-Migration-Assistant.exe`
  - For the CLI, enter: `VMware-Migration-Assistant.exe -p <password of Administrator@vmdir.domain>`  
 To list all the available input parameters, enter: `VMware-Migration-Assistant.exe --help`.

---

**Important** Leave the Migration Assistant window open until you finish the upgrade or the migration process of your vCenter Server deployment.

---

The VMware Migration Assistant runs pre-upgrade checks and prompts you to resolve any errors it finds before proceeding with the migration.

### Results

When the pre-checks are finished and any errors are addressed, your source system is ready for migration.

## What to do next

To begin the migration process, follow the VMware Migration Assistant instructions.

For detailed migration steps, see one of the following.

- [GUI Migration of vCenter Server with an Embedded Platform Services Controller to an vCenter Server Appliance](#)
- [GUI Migration of vCenter Server with an External Platform Services Controller to an Appliance](#)
- [CLI Migration of a vCenter Server Installation from Windows to an Appliance](#)

## Prerequisites for Migrating vCenter Server

To ensure the successful migration of vCenter Server, you must perform a set of required tasks and pre-checks prior to running the migration.

### General Prerequisites

- [Download and Mount the vCenter Server Installer.](#)
- Verify that the clocks of all machines on the vSphere network are synchronized. See [Synchronizing Clocks on the vSphere Network.](#)

### Target System Prerequisites

- Verify that your system meets the minimum software and hardware requirements. See [System Requirements for the New vCenter Server Appliance.](#)
- If you plan to deploy the new appliance on an ESXi host, verify that the target ESXi host is not in lockdown or maintenance mode.
- If you plan to deploy the new appliance on an ESXi host, verify that the target ESXi host is not part of a fully automated DRS cluster.
- If you plan to deploy the new appliance on a DRS cluster of the inventory of a vCenter Server instance, verify that the cluster contains at least one ESXi host that is not in lockdown or maintenance mode.
- If you plan to deploy the new appliance on a DRS cluster of the inventory of a vCenter Server instance, verify that the cluster is not fully automated.

### Source System Prerequisites

- Verify that the source machine that you want to migrate does not run on an ESXi host that is part of a fully automated DRS cluster.
- Verify that you have sufficient disk space on the source machine that you want to migrate so that you can accommodate the data for the migration.

- Create an image-based backup of the vCenter Server appliance you are migrating as a precaution in case there is a failure during the migration process. If you are migrating a vCenter Server appliance with an external Platform Services Controller, take a image-based backup of the Platform Services Controller appliance as well.

---

**Important** To take a pre-migration image-based backup, power off all the vCenter Server and Platform Services Controller nodes in your environment, and take a backup of each node. After you have taken backups of all the nodes, you can restart them and proceed with the migration procedure.

---

If the migration fails, delete the newly deployed vCenter Server appliance, and restore the vCenter Server and Platform Services Controller nodes from their respective backups. You must restore all the nodes in the environment from their backups. Failing to do so will cause the replication partners to be out of synchronization with the restored node.

To learn about image-based back, see "Image-Based Backup and Restore of a vCenter Server Environment" in *vCenter Server Installation and Setup*.

- If you use an external database, back up the external database.

## Network Prerequisites

- If you plan to assign a static IP address in the temporary network settings of the appliance, verify that you have configured the forward and reverse DNS records for the IP address.
- If you plan to assign a DHCP IP address in the temporary network settings of the new appliance, verify that the ESXi host on which you want to deploy the new appliance is in the same network as the ESXi host on which the existing vCenter Server appliance runs.
- If you plan to assign a DHCP IP address in the temporary network settings of the new appliance, verify that the ESXi host on which you want to deploy the new appliance is connected to at least one network that is associated with a port group which accepts MAC address changes. Note that the default security policy of a distributed virtual switch is to reject MAC address changes. For information about how to configure the security policy for a switch or port group, see *vSphere Networking*.

## Required Information for Migrating vCenter Server from Windows to an Appliance

The vCenter Server migration wizard prompts you for the deployment and migration information when migrating a vCenter Server instance or a Platform Services Controller instance from Windows to an appliance. It is a best practice to keep a record of the values that you entered in case you must power off the appliance and restore the source installation.



You can use this worksheet to record the information that you need for migrating a vCenter Server instance with a Platform Services Controller from Windows to an appliance.

**Important** The user name that you use to log in to the machine from which you want run the GUI installer, the path to the vCenter Server Appliance installer, and your values including the passwords, must contain only ASCII characters. Extended ASCII and non-ASCII characters are unsupported.

Local OS users existing on source windows machine are not migrated to the target vCenter Server Appliance and must be recreated after migration is complete. If any local OS user names are used to log in to the vCenter Single Sign-On, you must recreate them and reassign permissions in the Platform Services Controller appliance.

If the source vCenter Server machine is joined to an Active Directory domain, the account you use must have permissions to rejoin the machine to the domain. For more information, see <http://kb.vmware.com/kb/2146454>.

**Table 4-4. Information Required for Migrating vCenter Server from Windows to vCenter Server Appliance**

Required Information	Default Value	Your Entry
Required source vCenter Server migration data	vCenter Server IP address or FQDN	
	vCenter Single Sign-On administrator user name	administrator@vsphere.local  <b>Important</b> The user must be administrator@your_domain_name.
	Password of the vCenter Single Sign-On administrator	
	Migration Assistant port number	
	vCenter Server version	
	Temporary upgrade files path	%LOCALAPPDATA%\VMware\Migration-Assistant\export
	IP address or FQDN of the source ESXi host on which the source vCenter Server resides	
	Source ESXi host user name with administrative rights on the source ESXi host	
	Source ESXi host password	
	Migrate performance & other historical data	Disabled by default
	Migration Assistant thumbprint	

**Table 4-4. Information Required for Migrating vCenter Server from Windows to vCenter Server Appliance (continued)**

Required Information	Default Value	Your Entry
	Active Directory administrator credentials	
	Service account credentials, if vCenter Server is running under a customer user account	
Required target vCenter Server Appliance data	IP address or FQDN of the target ESXi host or vCenter Server instance where you deploy the new vCenter Server Appliance to which you migrate the source vCenter Server	
	User name with administrative privileges for the target ESXi host or vCenter Server instance, data center or data center folder, and resource pool of an ESXi host or DRS cluster to which to migrate the source installation	
	Password for the target ESXi host, or vCenter Server instance, data center or data center folder, and resource pool of an ESXi host or DRS cluster	
	vCenter Single Sign-On username	
	vCenter Single Sign-On password	
	Target vCenter Server Appliance name	
	Password of the root user	
	vCenter Server Appliance size. The options vary depending on the size of your vSphere environment. <ul style="list-style-type: none"> <li>■ Tiny (up to 10 hosts, 100 virtual machines)</li> <li>■ Small (up to 100 hosts, 1,000 virtual machines)</li> <li>■ Medium (up to 400 hosts, 4,000 virtual machines)</li> <li>■ Large (up to 1,000 hosts, 10,000 virtual machines)</li> <li>■ X-Large (up to 2,000 hosts, 35,000 virtual machines)</li> </ul>	Tiny (up to 10 hosts, 100 virtual machines)

**Table 4-4. Information Required for Migrating vCenter Server from Windows to vCenter Server Appliance (continued)**

Required Information	Default Value	Your Entry
<p>Storage size of the vCenter Server Appliance for your vSphere environment.</p> <p>Increase the default storage size if you want larger volume for SEAT data (stats, events, alarms, and tasks).</p>	Default	
<ul style="list-style-type: none"> <li> <p>■ Default</p> <p>For tiny deployment size, deploys the appliance with 250 GB of storage.</p> <p>For small deployment size, deploys the appliance with 290 GB of storage.</p> <p>For medium deployment size, deploys the appliance with 425 GB of storage.</p> <p>For large deployment size, deploys the appliance with 640 GB of storage.</p> <p>For x-large deployment size, deploys the appliance with 980 GB of storage.</p> </li> <li> <p>■ Large</p> <p>For tiny deployment size, deploys the appliance with 775 GB of storage.</p> <p>For small deployment size, deploys the appliance with 820 GB of storage.</p> <p>For medium deployment size, deploys the appliance with 925 GB of storage.</p> <p>For large deployment size, deploys the appliance with 990 GB of storage.</p> <p>For x-large deployment size, deploys the appliance with 1030 GB of storage.</p> </li> <li> <p>■ X-Large</p> <p>For tiny deployment size, deploys the appliance with 1650 GB of storage.</p> </li> </ul>		

**Table 4-4. Information Required for Migrating vCenter Server from Windows to vCenter Server Appliance (continued)**

Required Information	Default Value	Your Entry
For small deployment size, deploys the appliance with 1700 GB of storage.		
For medium deployment size, deploys the appliance with 1805 GB of storage.		
For large deployment size, deploys the appliance with 1870 GB of storage.		
For x-large deployment size, deploys the appliance with 1910 GB of storage.		
Name of the datastore on which the new version of the vCenter Server Appliance is deployed		
Enable or disable thin disk mode.	Disabled by default	
Join or do not participate in the VMware Customer Experience Improvement Program (CEIP). For information about the CEIP, see the Configuring Customer Experience Improvement Program section in <i>vCenter Server and Host Management</i> .	Join the CEIP	
Temporary network for communication between the source vCenter Server and the target vCenter Server Appliance	IP address version	IPv4
	IP address allocation method	DHCP
Static assignment settings	Network address	
	Subnet mask	
	Network gateway	
	Network DNS servers, separated with commas	
Enable or disable SSH	Disabled by default	

## GUI Migration of vCenter Server with an Embedded Platform Services Controller to an vCenter Server Appliance

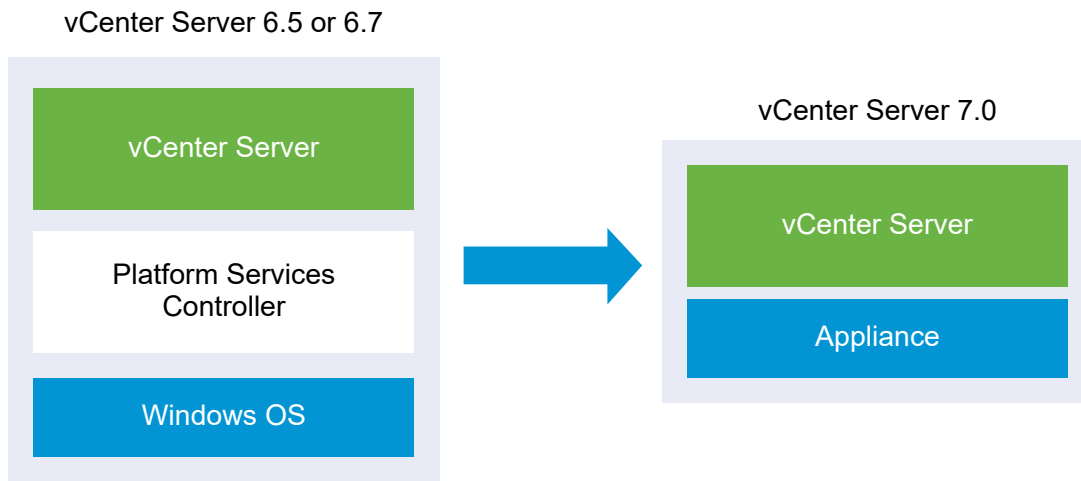
You can use the GUI method to migrate a vCenter Server instance with an embedded Platform Services Controller to a vCenter Server appliance.

When you migrate from vCenter Server with an embedded Platform Services Controller on Windows to vCenter Server appliance, the entire deployment is migrated in a single step.

If you use Update Manager in the vCenter Server deployment on Windows that you migrate, and Update Manager runs on a separate machine from any other of the vCenter Server components, take an extra step to migrate Update Manager to an appliance.

- 1 If your vCenter Server deployment on Windows uses an external Update Manager, run Migration Assistant on the Update Manager machine to start the migration of the Update Manager server and database to the Update Manager appliance.
- 2 Migrate the vCenter Server instance with embedded Platform Services Controller from Windows to a vCenter Server appliance.

**Figure 4-2. vCenter Server 6.5 or 6.7 with Embedded Platform Services Controller Deployment Before and After Migration**



GUI tasks for migrating vCenter Server with an embedded Platform Services Controller from Windows to a vCenter Server appliance.

- 1 [Download and Mount the vCenter Server Installer ISO](#) file on a network virtual machine or physical server from which you want to perform the migration.
- 2 [Download and Run VMware Migration Assistant on the Source Windows Machine.](#)

---

**Note** If you are migrating a vCenter Server system that uses an external instance of Update Manager that runs on a separate Windows machine, first run Migration Assistant on the Update Manager machine.

---

- 3 Assemble the [Required Information for Migrating vCenter Server from Windows to an Appliance](#).
- 4 [Deploy the OVA File for Migrating to the Target vCenter Server Appliance](#).
- 5 [Set Up the Target vCenter Server Appliance](#)

---

**Important** The user name that you use to log in to the machine from which you want run the GUI installer, the path to the vCenter Server appliance installer, and your values including the passwords, must contain only ASCII characters. Extended ASCII and non-ASCII characters are unsupported.

---

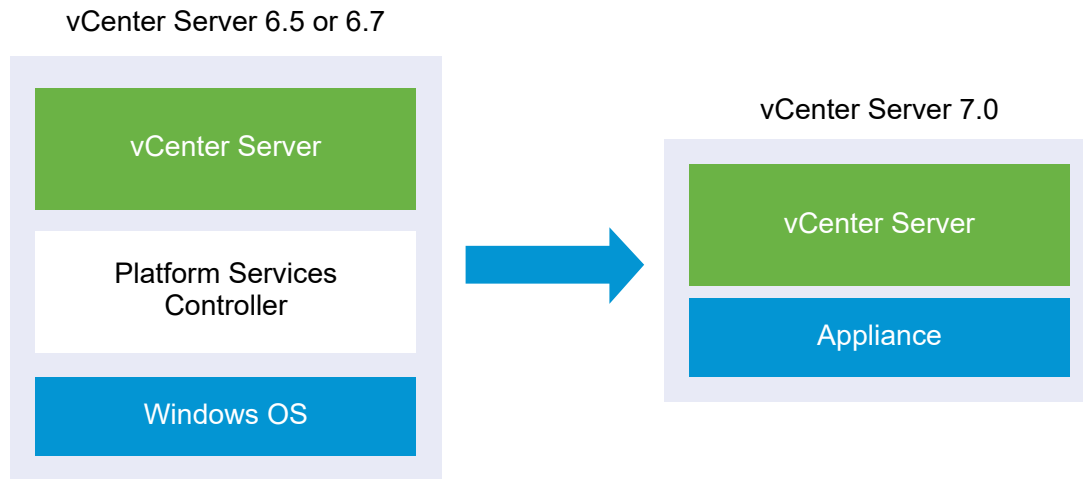
The installer:

- Deploys a new target appliance.
- Exports the required files from the source vCenter Server.
- Copies the required files to the new vCenter Server appliance.
- Runs the migration process on the new vCenter Server appliance as specified in the Summary.
- Imports and updates the files and settings of the source vCenter Server installation to the new vCenter Server appliance.

## Deploy the OVA File for Migrating to the Target vCenter Server Appliance

To start the migration process, you use the GUI installer to deploy the OVA file that is included in the installer ISO file as the target vCenter Server appliance.

Figure 4-3. vCenter Server 6.5 or 6.7 with Embedded Platform Services Controller Deployment Before and After Migration



## Prerequisites

- See [Prerequisites for Migrating vCenter Server](#)

## Procedure

- 1 In the vCenter Server installer, navigate to the `vcsa-ui-installer` directory, go to the subdirectory for your operating system, and run the installer executable file.
  - For Windows OS, go to the `win32` subdirectory, and run the `installer.exe` file.
  - For Linux OS, go to the `lin64` subdirectory, and run the `installer` file.
  - For Mac OS, go to the `mac` subdirectory, and run the `Installer.app` file.
- 2 On the Home page, click **Migrate**.
- 3 Review the Introduction page to understand the migration process and click **Next**.
- 4 Read and accept the license agreement, and click **Next**.
- 5 On the Connect to source page, enter the details for the source vCenter Server instance, and click **Next**.
  - a Enter the IP address or FQDN.
  - b Enter the user name and password of a user who has administrative privileges on the vCenter Server instance, for example, the `administrator@your_domain_name` user.
  - c Enter the Migration Assistant Port you received in the Migration Assistant instructions.
- 6 (Optional) Review the warning message and try to resolve the warnings, if any, and click **Yes**.

## 7 Connect to the target server to which you want to migrate the source vCenter Server.

Option	Steps
You can connect to an ESXi host on which to deploy the target appliance.	<ol style="list-style-type: none"> <li>1 Enter the FQDN or IP address of the ESXi host.</li> <li>2 Enter the HTTPS port of the ESXi host.</li> <li>3 Enter the user name and password of a user with administrative privileges on the ESXi host, for example, the root user.</li> <li>4 Click <b>Next</b>.</li> <li>5 Accept the certificate warning, if any, by clicking <b>Yes</b>.</li> </ol>
You can connect to a vCenter Server instance and browse the inventory to select an ESXi host or DRS cluster on which to deploy the target appliance.	<ol style="list-style-type: none"> <li>1 Enter the FQDN or IP address of the vCenter Server instance.</li> <li>2 Enter the HTTPS port of the vCenter Server instance.</li> <li>3 Enter the user name and password of a vCenter Single Sign-On user with administrative privileges on the vCenter Server instance, for example, the <code>administrator@your_domain_name</code> user.</li> <li>4 Click <b>Next</b>.</li> <li>5 Accept the certificate warning, if any, by clicking <b>Yes</b>.</li> <li>6 Select the data center or data center folder that contains the ESXi host or DRS cluster on which you want to deploy the new appliance, and click <b>Next</b></li> </ol> <p><b>Note</b> You must select a data center or data center folder that contains at least one ESXi host that is not in lockdown or maintenance mode.</p> <ol style="list-style-type: none"> <li>7 Select the ESXi host or DRS cluster on which you want to deploy the new appliance, and click <b>Next</b>.</li> </ol>

## 8 On the Set up target appliance VM page, enter a name for the target vCenter Server appliance, set the password for the root user, and click **Next**.

The password must contain at least eight characters, a number, uppercase and lowercase letters, and a special character, for example, an exclamation mark (!), hash key (#), at sign (@), or brackets (()).

**Important** The local operating system password is not migrated to the target appliance.

## 9 Select the deployment size for the new vCenter Server appliance for your vSphere inventory.

**Note** You cannot select a deployment size that is smaller than the source deployment.

Deployment Size Option	Description
<b>Tiny</b>	Deploys an appliance with 2 vCPUs and 12 GB of memory. Suitable for environments with up to 10 hosts or 100 virtual machines
<b>Small</b>	Deploys an appliance with 4 CPUs and 19 GB of memory. Suitable for environments with up to 100 hosts or 1,000 virtual machines
<b>Medium</b>	Deploys an appliance with 8 CPUs and 28 GB of memory. Suitable for environments with up to 400 hosts or 4,000 virtual machines



Deployment Size Option	Description
<b>Large</b>	Deploys an appliance with 16 CPUs and 37 GB of memory. Suitable for environments with up to 1,000 hosts or 10,000 virtual machines
<b>X-Large</b>	Deploys an appliance with 24 CPUs and 56 GB of memory. Suitable for environments with up to 2,500 hosts or 45,000 virtual machines

**Note** At the bottom of the deployment size table, a row shows the size information of the source machine. This size information is reported by the migration assistant and might help understand why you cannot select some deployment sizes.

- 10 Select the storage size for the new vCenter Server appliance, and click **Next**.

Storage Size Option	Description for Tiny Deployment Size	Description for Small Deployment Size	Description for Medium Deployment Size	Description for Large Deployment Size	Description for X-Large Deployment Size
<b>Default</b>	Deploys an appliance with 315 GB of storage.	Deploys an appliance with 380 GB of storage.	Deploys an appliance with 600 GB of storage.	Deploys an appliance with 965 GB of storage.	Deploys an appliance with 1705 GB of storage.
<b>Large</b>	Deploys an appliance with 1390 GB of storage.	Deploys an appliance with 1435 GB of storage.	Deploys an appliance with 1600 GB of storage.	Deploys an appliance with 1665 GB of storage.	Deploys an appliance with 1805 GB of storage.
<b>X-Large</b>	Deploys an appliance with 3145 GB of storage.	Deploys an appliance with 3195GB of storage.	Deploys an appliance with 3360 GB of storage.	Deploys an appliance with 3425 GB of storage.	Deploys an appliance with 3565 GB of storage.

- 11 From the list of available datastores, select the location where all the virtual machine configuration files and virtual disks will be stored and, optionally, enable thin provisioning by selecting **Enable Thin Disk Mode**. NFS datastores are thin provisioned by default.

- 12 Configure the temporary network for communication between the source vCenter Server and the target vCenter Server appliance, and click **Next**.

Option	Action
<b>Choose a network</b>	<p>Select the network to which to connect the new appliance temporarily.</p> <p>The networks displayed in the drop-down menu depend on the network settings of the target server. If you are deploying the appliance directly on an ESXi host, non-ephemeral distributed virtual port groups are unsupported and are not displayed in the drop-down menu.</p> <hr/> <p><b>Important</b> If you want to assign a temporary IPv4 address with DHCP allocation, you must select a network that is associated with a port group which accepts MAC address changes.</p>
<b>IP Address family</b>	<p>Select the version for the temporary IP address of the new appliance.</p> <p>Can be either IPv4 or IPv6.</p>
<b>Network type</b>	<p>Select the allocation method for the temporary IP address of the appliance.</p> <ul style="list-style-type: none"> <li>■ <b>Static</b> <p>The wizard prompts you to enter the temporary IP address and network settings.</p> </li> <li>■ <b>DHCP</b> <p>A DHCP server is used to allocate the temporary IP address. Select this option only if a DHCP server is available in your environment.</p> </li> </ul>

- 13 On the Ready to complete stage 1 page, review the deployment settings for the target vCenter Server appliance and click **Finish** to start the OVA deployment process.
- 14 Wait for the OVA deployment process to finish and click **Continue** to proceed with stage 2 of the migration process to transfer the data from the source vCenter Server and start the services of the target appliance.

**Note** If you exit the wizard by clicking **Close**, you must log in to the vCenter Server Management Interface of the newly deployed target vCenter Server appliance to transfer the data from the source vCenter Server and set up the services.

## Results

The newly deployed target vCenter Server appliance version 7.0 is running on the target server but is not yet configured.

**Important** The data from the source vCenter Server is not yet transferred and the services of the target appliance are not started.

## Set Up the Target vCenter Server Appliance

When the OVA deployment completes, you are redirected to stage 2 of the migration process to transfer the data from the source vCenter Server and start the services of the newly deployed vCenter Server appliance version 7.0.

Your window of downtime does not begin until you begin to set up the target appliance. You cannot cancel or interrupt the process until it completes with the shut down of the source deployment. Your window of downtime ends when the target appliance starts.

## Procedure

- 1 Review the introduction to stage 2 of the migration process and click **Next**.
- 2 On the Select source vCenter Server page, enter the vCenter Single Sign-On administrator password and the root password of the source vCenter Server, enter the password of the user with administrative privileges on the vCenter Server instance, and click **Next**.
- 3 (Optional) Accept the warning message, if any, by clicking **Yes**.
- 4 If your source Windows machine is connected to an Active Directory domain, enter the credentials for an administrator domain user with permission to add the target machine to the Active Directory domain, and click **Next**.

---

**Note** The installer verifies the entered credentials, but does not check the required privileges to add the target machine to the Active Directory domain. Verify that the user credentials have all the required permissions to add a machine to the Active Directory domain.

---

- 5 Review the VMware Customer Experience Improvement Program (CEIP) page and choose if you want to join the program.

For information about the CEIP, see the Configuring Customer Experience Improvement Program section in *vCenter Server and Host Management*.

- 6 On the ready to complete page, review the migration settings, accept the backup acknowledgment, and click **Finish**.
- 7 Click **OK** to confirm the shutdown of the source vCenter Server.
- 8 Wait for the data transfer and setup process to finish and click **OK** to go to the vCenter Server Getting Started page.

## Results

The source vCenter Server instance is migrated from Windows to a vCenter Server appliance. The source vCenter Server instance is powered off and the new target appliance starts.

## What to do next

Verify that your migration to an appliance was successful. For verification steps, see [Verify Your vCenter Server Upgrade or Migration Is Successful](#). For post-migration steps, see [Chapter 5 After Upgrading or Migrating vCenter Server](#).

# GUI Migration of vCenter Server with an External Platform Services Controller to an Appliance

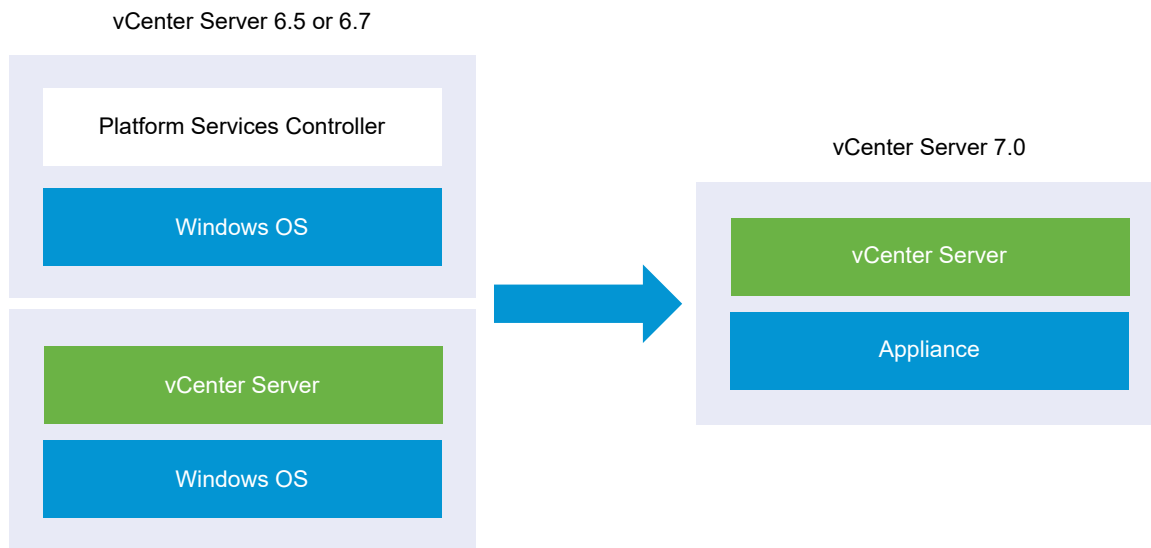
You can use the GUI to migrate vCenter Server with an external Platform Services Controller to a vCenter Server appliance.

When you migrate from vCenter Server with an external Platform Services Controller on Windows to vCenter Server appliance, you migrate in two steps.

If you use Update Manager in the vCenter Server deployment on Windows that you migrate, and Update Manager runs on a separate machine from any other of the vCenter Server components, take an extra step to migrate Update Manager to an appliance.

- 1 If your vCenter Server deployment on Windows uses an external Update Manager, run Migration Assistant on the Update Manager machine to start the migration of the Update Manager server and database to the Update Manager appliance.
- 2 Migrate the vCenter Server instance from Windows to a vCenter Server appliance.
- 3 Verify the newly migrated vCenter Server appliance.
- 4 Decommission the Platform Services Controller.

**Figure 4-4. vCenter Server 6.5 or 6.7 with External Platform Services Controller Before and After Migration**



GUI tasks for migrating an external Platform Services Controller instance from Windows to an appliance.

- 1 [Download and Mount the vCenter Server Installer ISO file](#) on a network virtual machine or physical server from which you want to perform the migration.
- 2 [Download and Run VMware Migration Assistant on the Source Windows Machine.](#)

---

**Note** If you are migrating a vCenter Server system that uses an external instance of Update Manager that runs on a separate Windows machine, first run Migration Assistant on the Update Manager machine.

---

- 3 [Assemble the Required Information for Migrating vCenter Server from Windows to an Appliance](#) for each Platform Services Controller or vCenter Server instance.
- 4 [Deploy the OVA File for the Target vCenter Server Appliance](#)

## 5 Set Up the Target vCenter Server Appliance

**Important** The user name you use to log in to the physical machine from which you want to run the GUI installer, the path to the vCenter Server appliance installer, and values, including the passwords, must contain only ASCII characters. Extended ASCII and non-ASCII characters are unsupported.

For each node to be migrated, the installer:

- Deploys a new target appliance.
- Exports the required files from the source Platform Services Controller or vCenter Server instance.
- Copies the required files to the target appliance for migration.
- Runs the migration process on the target appliance as indicated in the Summary.
- Imports and updates the files and settings of the source Platform Services Controller or vCenter Server instance to the new vCenter Server appliance.

### Deploy the OVA File for the Target vCenter Server Appliance

To start the migration process, you use the GUI installer to deploy the OVA file that is included in the installer ISO file as the target vCenter Server appliance.

#### Prerequisites

- See [Prerequisites for Migrating vCenter Server](#)

#### Procedure

- 1 In the vCenter Server installer, navigate to the `vcsa-ui-installer` directory, go to the subdirectory for your operating system, and run the installer executable file.
  - For Windows OS, go to the `win32` subdirectory, and run the `installer.exe` file.
  - For Linux OS, go to the `lin64` subdirectory, and run the `installer` file.
  - For Mac OS, go to the `mac` subdirectory, and run the `Installer.app` file.
- 2 On the Home page, click **Migrate**.
- 3 Review the Introduction page to understand the migration process and click **Next**.
- 4 Read and accept the license agreement, and click **Next**.

## 5 Connect to the target server to which you want to migrate the source vCenter Server.

Option	Steps
You can connect to an ESXi host on which to deploy the target appliance.	<ol style="list-style-type: none"> <li>1 Enter the FQDN or IP address of the ESXi host.</li> <li>2 Enter the HTTPS port of the ESXi host.</li> <li>3 Enter the user name and password of a user with administrative privileges on the ESXi host, for example, the root user.</li> <li>4 Click <b>Next</b>.</li> <li>5 Accept the certificate warning, if any, by clicking <b>Yes</b>.</li> </ol>
You can connect to a vCenter Server instance and browse the inventory to select an ESXi host or DRS cluster on which to deploy the target appliance.	<ol style="list-style-type: none"> <li>1 Enter the FQDN or IP address of the vCenter Server instance.</li> <li>2 Enter the HTTPS port of the vCenter Server instance.</li> <li>3 Enter the user name and password of a vCenter Single Sign-On user with administrative privileges on the vCenter Server instance, for example, the administrator@your_domain_name user.</li> <li>4 Click <b>Next</b>.</li> <li>5 Accept the certificate warning, if any, by clicking <b>Yes</b>.</li> <li>6 Select the data center or data center folder that contains the ESXi host or DRS cluster on which you want to deploy the new appliance, and click <b>Next</b></li> </ol> <p><b>Note</b> You must select a data center or data center folder that contains at least one ESXi host that is not in lockdown or maintenance mode.</p> <ol style="list-style-type: none"> <li>7 Select the ESXi host or DRS cluster on which you want to deploy the new appliance, and click <b>Next</b>.</li> </ol>

## 6 (Optional) Review the warning message and try to resolve the warnings, if any, and click **Yes**.

## 7 On the Set up target appliance VM page, enter a name for the target vCenter Server Appliance, set the password for the root user, and click **Next**.

The password must contain at least eight characters, a number, uppercase and lowercase letters, and a special character, for example, an exclamation mark (!), hash key (#), at sign (@), or brackets (()).

**Important** The local operating system password is not migrated to the target appliance.

## 8 On the Connect to source page, enter the details for the source vCenter Server instance, and click **Next**.

- a Enter the IP address or FQDN.
- b Enter the user name and password of a user who has administrative privileges on the vCenter Server instance, for example, the administrator@your\_domain\_name user.
- c Enter the Migration Assistant Port you received in the Migration Assistant instructions.

- 9 On the Connect to source instance page, enter the details for the source Windows installation that you want to migrate.

Option	Action
<b>vCenter Server IP Address/FQDN</b>	Enter the IP address or FQDN of the vCenter Server Appliance that you want to upgrade.
<b>vCenter Single Sign-On administrator user name</b>	Enter the vCenter Single Sign-On administrator user name.
<b>vCenter Single Sign-On administrator password</b>	Enter the password of the vCenter Single Sign-On administrator.
<b>vCenter Server HTTPS Port</b>	Optionally, change the default vCenter Server HTTPS port number. The default value is 443.

- 10 (Optional) Accept the warning message, if any, by clicking **Yes**.
- 11 Select the deployment size for the new vCenter Server Appliance for your vSphere inventory.

Deployment Size Option	Description
<b>Tiny</b>	Deploys an appliance with 2 vCPUs and 12 GB of memory. Suitable for environments with up to 10 hosts or 100 virtual machines
<b>Small</b>	Deploys an appliance with 4 CPUs and 19 GB of memory. Suitable for environments with up to 100 hosts or 1,000 virtual machines
<b>Medium</b>	Deploys an appliance with 8 CPUs and 28 GB of memory. Suitable for environments with up to 400 hosts or 4,000 virtual machines
<b>Large</b>	Deploys an appliance with 16 CPUs and 37 GB of memory. Suitable for environments with up to 1,000 hosts or 10,000 virtual machines
<b>X-Large</b>	Deploys an appliance with 24 CPUs and 56 GB of memory. Suitable for environments with up to 2,500 hosts or 45,000 virtual machines

**Note** At the bottom of the deployment size table, a row shows the size information of the source machine. This size information is reported by the migration assistant and might help understand why you cannot select some deployment sizes.

- 12 Select the storage size for the new vCenter Server Appliance, and click **Next**.

Storage Size Option	Description for Tiny Deployment Size	Description for Small Deployment Size	Description for Medium Deployment Size	Description for Large Deployment Size	Description for X-Large Deployment Size
<b>Default</b>	Deploys an appliance with 315 GB of storage.	Deploys an appliance with 380 GB of storage.	Deploys an appliance with 600 GB of storage.	Deploys an appliance with 965 GB of storage.	Deploys an appliance with 1705 GB of storage.
<b>Large</b>	Deploys an appliance with 1390 GB of storage.	Deploys an appliance with 1435 GB of storage.	Deploys an appliance with 1600 GB of storage.	Deploys an appliance with 1665 GB of storage.	Deploys an appliance with 1805 GB of storage.
<b>X-Large</b>	Deploys an appliance with 3145 GB of storage.	Deploys an appliance with 3195GB of storage.	Deploys an appliance with 3360 GB of storage.	Deploys an appliance with 3425 GB of storage.	Deploys an appliance with 3565 GB of storage.

- 13 From the list of available datastores, select the location where all the virtual machine configuration files and virtual disks will be stored and, optionally, enable thin provisioning by selecting **Enable Thin Disk Mode**. NFS datastores are thin provisioned by default.
- 14 Configure the temporary network for communication between the source vCenter Server and the target vCenter Server appliance, and click **Next**.

Option	Action
<b>Choose a network</b>	<p>Select the network to which to connect the new appliance temporarily.</p> <p>The networks displayed in the drop-down menu depend on the network settings of the target server. If you are deploying the appliance directly on an ESXi host, non-ephemeral distributed virtual port groups are unsupported and are not displayed in the drop-down menu.</p> <hr/> <p><b>Important</b> If you want to assign a temporary IPv4 address with DHCP allocation, you must select a network that is associated with a port group which accepts MAC address changes.</p>
<b>IP Address family</b>	<p>Select the version for the temporary IP address of the new appliance.</p> <p>Can be either IPv4 or IPv6.</p>
<b>Network type</b>	<p>Select the allocation method for the temporary IP address of the appliance.</p> <ul style="list-style-type: none"> <li>■ <b>Static</b> <p>The wizard prompts you to enter the temporary IP address and network settings.</p> </li> <li>■ <b>DHCP</b> <p>A DHCP server is used to allocate the temporary IP address. Select this option only if a DHCP server is available in your environment.</p> </li> </ul>

- 15 On the Ready to complete stage 1 page, review the deployment settings for the target vCenter Server appliance and click **Finish** to start the OVA deployment process.



- 16 Wait for the OVA deployment to finish, and click **Continue** to proceed with stage 2 of the deployment process to set up and start the services of the newly deployed appliance.

---

**Note** If you exit the wizard by clicking **Close**, you must log in to the vCenter Server Management Interface to set up and start the services.

---

### Results

The newly deployed target vCenter Server appliance version 7.0 is running on the target server but is not yet configured.

---

**Important** The data from the source vCenter Server is not yet transferred and the services of the target appliance are not started.

---

## Set Up the Target vCenter Server Appliance

When the OVA deployment finishes, you are redirected to stage 2 of the migration process to transfer the data from the source vCenter Server and start the services of the newly deployed target vCenter Server appliance.

The period of time during which your system is unavailable does not begin until you start to set up the target appliance. You cannot cancel or interrupt the process until it finishes with the shutdown of the source deployment. The time your system is unavailable ends when the target appliance starts.

### Procedure

- 1 Review the introduction to stage 2 of the migration process and click **Next**.
- 2 On the Select source vCenter Server page, enter the vCenter Single Sign-On administrator password and the root password of the source vCenter Server, enter the password of the user with administrative privileges on the vCenter Server instance, and click **Next**.
- 3 (Optional) Accept the warning message, if any, by clicking **Yes**.
- 4 If your source Windows machine is connected to an Active Directory domain, enter the credentials for an administrator domain user with permission to add the target machine to the Active Directory domain, and click **Next**.

---

**Note** The installer verifies the entered credentials, but does not check the required privileges to add the target machine to the Active Directory domain. Verify that the user credentials have all the required permissions to add a machine to the Active Directory domain.

---

- 5 Specify the replication topology for the vCenter Server. When converging vCenter Server instance with an external Platform Services Controller you must specify the replication topology.

Convergence is the process of converting a vCenter Server instance with an external Platform Services Controller to a vCenter Server instance with those services embedded in the appliance.

- This is the first vCenter Server in the topology that I want to converge.
- This is a subsequent vCenter Server.

If this is a subsequent vCenter Server, provide the IP address of its partner vCenter Server and its HTTPS port.

- 6 On the Select migration data page, choose the types of data that you want to transfer from the source vCenter Server to the target appliance.

The large amount of data requires more time to be transferred to the new appliance.

- 7 On the ready to complete page, review the migration settings, accept the backup acknowledgment, and click **Finish**.
- 8 Click **OK** to confirm the shutdown of the source vCenter Server.
- 9 Wait for the data transfer and setup process to finish. Click **OK** to go to the vCenter Server Getting Started page.

## Results

vCenter Server is migrated from Windows to a newly deployed target vCenter Server appliance. The source vCenter Server is powered off and the target appliance starts.

## What to do next

- [Verify Your vCenter Server Upgrade or Migration Is Successful](#).
- Upgrade all vCenter Server instances in the vCenter Single Sign-On domain.
- After converging a vCenter Server with an external Platform Services Controller node to a vCenter Server appliance, you must decommission the original external Platform Services Controller. Decommissioning a Platform Services Controller shuts it down and removes it from the single sign-on domain. See [Decommission the Platform Services Controller](#).
- For post-migration steps, see [Chapter 5 After Upgrading or Migrating vCenter Server](#).
- You can configure high availability for the vCenter Server appliance. For information about providing vCenter Server appliance high availability, see *vSphere Availability*.

## CLI Migration of a vCenter Server Installation from Windows to an Appliance

You can use the CLI installer to automatically migrate a vCenter Server or Platform Services Controller from Windows to an appliance.

The installer ISO file contains example templates of JSON files that contain the minimum configuration parameters required for migrating a vCenter Server or Platform Services Controller instance from Windows to an appliance. The example templates are located in the `vcsa-cli-installer/templates/migrate` directory.

CLI tasks for migrating your vCenter Server installation from Windows to an appliance:

- 1 [Download and Mount the vCenter Server Installer.](#)
- 2 [Download and Run VMware Migration Assistant on the Source Windows Machine.](#)
- 3 [Prepare JSON Configuration Files for CLI Migration.](#)
- 4 [Run a Pre-Check Before a CLI Migration to vCenter Server Appliance.](#)
- 5 [Perform a CLI Migration of vCenter Server from Windows to an Appliance.](#)

You can run the CLI installer multiple times with different JSON files to perform multiple CLI migrations, or you can run the CLI migrations concurrently in a batch mode.

---

**Important** The user name that you use to log in to the machine from which you want to run the CLI installer, the path to the vCenter Server appliance installer, the path to your JSON configuration file, and the string values in your JSON configuration file, including the passwords, must contain only ASCII characters. Extended ASCII and non-ASCII characters are unsupported.

---

## Prepare JSON Configuration Files for CLI Migration

When you use the CLI to migrate a source vCenter Server installation to a target vCenter Server Appliance, you must prepare a JSON template with the configuration values for the new appliance.

You can migrate vCenter Server or Platform Services Controller instances from Windows to a vCenter Server Appliance by setting values to the configuration parameters in the templates that are available in the installer ISO file. The configuration parameters that are not included in the templates are set to their default values. You can add configuration parameters in the templates to set their values for your migration specification.

The `vcsa-cli-installer/templates/migrate` directory contains example migration templates for CLI migration of vCenter Server 6.5 and vCenter Server 6.7 to an appliance.

For a complete list of the configuration parameters and their descriptions, navigate to the installer subdirectory for your operating system and run the `vcsa-deploy migrate --template-help` command.

---

**Important** The user name that you use to log in to the machine from which you want to run the CLI installer, the path to the vCenter Server Appliance installer, the path to your JSON configuration file, and the string values in your JSON configuration file, including the passwords, must contain only ASCII characters. Extended ASCII and non-ASCII characters are unsupported.

---

To perform the batch migration, place the JSON templates defining your deployment in a single directory. When invoked, the CLI installer migrates your existing deployment to the new vCenter Server version using the topology defined in the JSON templates.

### Prerequisites

Verify your environment meets the requirements for migration. See [System Requirements for Migrating vCenter Server Deployments to vCenter Server Appliance Deployments](#),

Prepare your environment for migration. See [Preparing for Migration](#).

### Procedure

- 1 Open the `migrate` subfolder in the `vcsa-cli-installer/templates` directory.
- 2 Copy the migration template from the `migrate` subfolder to your workspace.
  - For vCenter Server 6.5, use the `migrate/winvc6.5/` folder.
  - For vCenter Server 6.7, use the `migrate/winvc6.7/` folder.
- 3 Open the template file for your use case in a text editor.

To ensure the correct syntax of your JSON configuration file, use a JSON editor.

- 4 Fill in values for the required configuration parameters and, optionally, enter additional parameters and their values.

---

**Important** To set a value that contains the backslash (\) or quotation mark (") character, you must precede the character with the backslash (\) character. For example, `"password": "my\"password"` sets the password `my"password`, `"image": "C:\\vmware\\vcsa"` sets the path `C:\vmware\vcsa`.

The boolean values must contain only lowercase characters. Can be either `true` or `false`. For example, `"ssh_enable": false`

---

- 5 Save in UTF-8 format and close the file.

### Results

Your file is ready to use for migration.

### What to do next

You can create and save as many templates as are needed for your specific environment. When your template is ready, run the pre-check before using it to run the migration. See [Run a Pre-Check Before a CLI Migration to vCenter Server Appliance](#).

## JSON Templates for CLI Migration of vCenter Server for Windows

The vCenter Server installer contains JSON templates that are located in the `vcsa-cli-installer/templates` directory. In the `migrate` subfolder, you can find the JSON templates with the minimum configuration parameters for all migration types.

Table 4-5. Migration JSON Templates Included in the vCenter Server Installer

Location	Template	Description
vcsa-cli- installer\templates\migrate\vc sa\6.5	embedded_win_vc_to_embedded_vC SA_on_ESXi.json	Contains the minimum configuration parameters required to migrate vCenter Server 6.5 on Windows with an embedded Platform Services Controller, to a vCenter Server appliance 7.0 on an ESXi host.
	embedded_win_vc_to_embedded_vC SA_on_VC.json	Contains the minimum configuration parameters required to migrate vCenter Server 6.5 on Windows with an embedded Platform Services Controller to a vCenter Server appliance 7.0 on a vCenter Server instance.
	win_vc_to_vCSA_on_ESXi.json	Contains the minimum configuration parameters required to migrate vCenter Server 6.5 on Windows with an external Platform Services Controller to vCenter Server appliance 7.0 on an ESXi host.
	win_vc_to_vCSA_on_VC.json	Contains the minimum configuration parameters required to migrate vCenter Server 6.5 on Windows with an external Platform Services Controller to vCenter Server appliance 7.0 on a vCenter Server instance.
vcsa-cli- installer\templates\migrate\vc sa\6.7	embedded_win_vc_to_embedded_vC SA_on_ESXi.json	Contains the minimum configuration parameters required to migrate vCenter Server 6.7 on Windows with an embedded Platform Services Controller to vCenter Server appliance 7.0 on an ESXi host.
	embedded_win_vc_to_embedded_vC SA_on_VC.json	Contains the minimum configuration parameters required to migrate vCenter Server 6.7 on Windows with an embedded Platform Services Controller to vCenter Server Appliance 7.0 on a vCenter Server instance.

Table 4-5. Migration JSON Templates Included in the vCenter Server Installer (continued)

Location	Template	Description
	<code>win_vc_to_vCSA_on_ESXi.json</code>	Contains the minimum configuration parameters required to migrate vCenter Server 6.7 on Windows with an external Platform Services Controller to vCenter Server appliance 7.0 on an ESXi host.
	<code>win_vc_to_vCSA_on_VC.json.json</code>	Contains the minimum configuration parameters required to migrate vCenter Server 6.7 on Windows with an external Platform Services Controller to vCenter Server appliance 7.0 on a vCenter Server instance.

## About Migrating a vCenter Server for Windows with an External Platform Services Controller Using the CLI

When migrating a vCenter Server for Windows that uses an external Platform Services Controller, it is converted to a vCenter Server instance with those services embedded in the appliance. For this reason, you must specify replication partner parameters in the JSON migration templates.

When migrating a vCenter Server for Windows that uses an external Platform Services Controller, you must specify replication partner parameters in the JSON migrate template. These parameters indicate if the migration is for one of the following vCenter Server and Platform Services Controller migration scenarios.

- A single vCenter Server and a single Platform Services Controller instance within an SSO domain.
- The first vCenter Server and Platform Services Controller instance within an SSO domain containing more than one vCenter Server.
- Replicating vCenter Server and Platform Services Controller instances within an SSO domain, which you must point to an existing vCenter Server 7.0 instance as the replication partner.

**Important** It is not possible to migrate an external Platform Services Controller. The migration process converges the Platform Services Controller services into the vCenter Server appliance. For more information, see [Removal of Platform Services Controller](#).

Deployments using an external Platform Services Controller are often called an  $M \times N$  deployment, where  $M$  represents the vCenter Server, and  $N$  represents the external Platform Services Controller. When representing multiple instances of vCenter Server and Platform Services Controller in a domain, this is expressed as  $Mn \times Nn$ , where  $n$  is the number of instances. For

example, M2xN2 indicates two vCenter Server instances and two Platform Services Controller instances within the same domain. When migrating such a deployment, you first migrate one instance to version 7.0, and then migrate the second instance to 7.0, specifying the first of the two instances as the replicating partner.

The replication parameters in the JSON migration template are located in the `sso` section of the template, and are `first_instance` and `replication_partner_hostname`.

Parameter Name	Description
<code>first_instance</code>	The <code>first_instance</code> parameter identifies the vCenter Server as either the first instance in your vCenter Server SSO domain, or as a replicating partner.  If it is the first vCenter Server instance, set <code>first_instance</code> to <code>true</code> . For additional instances of vCenter Server in the same SSO domain, set <code>first_instance</code> to <code>false</code> .
<code>replication_partner_hostname*</code>	If you set <code>first_instance</code> to <code>false</code> , you must specify the FQDN or IP address of a vCenter Server that has already been migrated to version 7.0, and whose external PSC has been converged into the vCenter Server appliance.

When you perform the CLI migration of a single vCenter Server for Windows instance that uses an external Platform Services Controller, the process is as follows:

- 1 Migrate the vCenter Server in your topology using the `win_vc_to_vCSA_on_ESXi.json` template when migrating on ESXi, or the `win_vc_to_vCSA_on_VC.json` template when migrating on a vCenter Server deployment.
- 2 For a deployment topology consisting of a single vCenter Server and a Platform Services Controller (an M1xN1 deployment), edit the `sso` section of the template such that the `first_instance` parameter is set to `true`, and remove the `replication_partner_hostname` parameter.

```
"sso": {
  "__comments": [ This is the first instance (M1) vCenter Server management node, with
  "first_instance" set to "true" and "replication_partner_hostname" removed.
  ],
  "first_instance": true
}
```

- 3 Specify the remaining configuration parameters in the JSON template, and migrate vCenter Server to version 7.0 using the CLI. See [Perform a CLI Migration of vCenter Server from Windows to an Appliance](#).
- 4 After successfully migrating vCenter Server, decommission the Platform Services Controller. See [Decommission the Platform Services Controller](#).

---

**Important** Decommission the Platform Services Controller instances only after migrating and converging all vCenter Server instances in your topology.

---

For a deployment consisting of two or more vCenter Server and Platform Services Controller instances (an M2xN2 deployment), you first migrate the M1 vCenter Server instance to version 7.0, and then migrate the second, replicating vCenter Server instance.

- 1 Migrate the vCenter Server in your topology using the `win_vc_to_vCSA_on_ESXi.json` template when migrating on ESXi, or the `win_vc_to_vCSA_on_VC.json` template when migrating on a vCenter Server deployment.
- 2 For the first vCenter Server instance (M1), edit the `sso` section of the template such that the `first_instance` parameter is set to `true`, and remove the `replication_partner_hostname` parameter.

```
"sso": {
  "__comments": [ This is the first instance (M1) vCenter Server management node, with
  "first_instance" set to "true" and "replication_partner_hostname" removed.
  ],
  "first_instance": true
}
```

- 3 For the remaining vCenter Server instance (M2), edit the `sso` section of the template such that the `first_instance` parameter is set to `false`, and provide the FQDN or IP address of the vCenter Server instance to which you want to replicate the second node. The replication partner is the first vCenter Server instance (M1) you migrated to version 7.0, which has been converged with its Platform Services Controller instance.

```
"sso": {
  "__comments": [ This is the second instance (M2) vCenter Server management node, with
  "first_instance" set to "false" and "replication_partner_hostname" set to the hostname of
  the replication partner.],
  "first_instance": false,
  "replication_partner_hostname": "FQDN_or_IP_address"
```

- 4 Specify the remaining configuration parameters in the JSON templates, and migrate vCenter Server to version 7.0 using the CLI. See [Perform a CLI Migration of vCenter Server from Windows to an Appliance](#).
- 5 After successfully migrating all vCenter Server instances in the topology, decommission the Platform Services Controller instances. See [Decommission the Platform Services Controller](#).

---

**Important** Decommission the Platform Services Controller instances only after migrating and converging all vCenter Server instances in your topology.

---

## Migration Configuration Parameters

When using the CLI installer to migrate your vCenter Server installation to an appliance, you must provide the parameters with values for your migration specification.



The table lists the configuration parameters that you use to provide input data for the source vCenter Server.

**Important** The path to the vCenter Server appliance installer, the path to your JSON configuration file, and the string values in your JSON configuration file, including passwords, must contain only ASCII characters. Extended ASCII and non-ASCII characters are not supported.

To set a value that contains the backslash (\) or quotation mark (") character, you must precede the character with the backslash (\) character. For example, "password": "my\"password" sets the password my"password, "image": "C:\\vmware\\vcsa" sets the path C:\vmware\vcsa.

The boolean values must contain only lowercase characters. Can be either `true` or `false`. For example, "ssh\_enable":false.

## Sections and Subsections of Configuration Parameters in the JSON Migration Templates

The configuration parameters in the JSON migration templates are organized in sections and subsections.

**Table 4-6. Sections and Subsections of Configuration Parameters in the JSON Migration Templates**

Section	Subsection	Description
new_vcsa - describes the target appliance that you want to migrate to	esxi	Use only if you want to deploy the appliance directly on an ESXi host. Contains the configuration parameters that describe the target ESXi host.  <b>Note</b> You must fill in either the <code>esxi</code> or the <code>vc</code> subsection.
	vc	Use only if you want to deploy the appliance on the inventory of a vCenter Server instance. Contains the configuration parameters that describe the target ESXi host or DRS cluster from the vCenter Server inventory.  <b>Note</b> You must fill in either the <code>vc</code> or the <code>esxi</code> subsection.
	appliance	Contains the configuration parameters that describe the appliance.
	os	Contains the configuration parameters that describe the operating system settings for the appliance.
	ovftool_arguments	Optional subsection for adding arbitrary arguments and their values to the OVF Tool command that the installer generates.  <b>Important</b> The vCenter Server appliance installer does not validate the configuration parameters in the <code>ovftool_arguments</code> subsection. If you set arguments that the OVF Tool does not recognize, the deployment might fail.
	temporary_network	Contains the configuration parameters that describe the temporary network for migrating the data from the source to the new target appliance.

**Table 4-6. Sections and Subsections of Configuration Parameters in the JSON Migration Templates (continued)**

Section	Subsection	Description
	user-options	Use only when the source is a vCenter Server instance. Contains the configuration parameters that let you control aspects of the migration process for particular components.
source_vc - describes the source vCenter Server, vCenter Single Sign-On, or Platform Services Controller	vc_win	Contains the configuration parameters that describe the source Windows installation of vCenter Server or Platform Services Controller
	run_migration_assistant	Use only if the source Windows installation is running as a virtual machine and you want to automate the invocation of Migration Assistant. For a source Windows installation running on a physical machine, or if you are running Migration Assistant manually on the source Windows machine, copy and paste the thumbprint value from the Migration Assistant console output on the source machine to the <code>migration_ssl_thumbprint</code> key in the <code>vc_win</code> subsection, and remove the <code>run_migration_assistant</code> section.
ceip - describes joining the VMware Customer Experience Improvement Program (CEIP)	settings	Contains only the <code>ceip_enabled</code> configuration parameter to join or not to join the VMware Customer Experience Improvement Program (CEIP). Required only if you are deploying a vCenter Server appliance.  <b>Note</b> If set to <code>true</code> , you must run the CLI deployment command with the <code>--acknowledge-ceip</code> argument.  For information about the CEIP, see the Configuring Customer Experience Improvement Program section in <i>vCenter Server and Host Management</i> .

## Configuration Parameters in the `new_vcса` Section

**Table 4-7. Configuration Parameters in the `new_vcса` Section, `esxi` Subsection**

Name	Type	Description
hostname	string	The IP address or FQDN of the target ESXi host on which you want to deploy the appliance.
username	string	A user name with administrative privileges on the target ESXi host, for example, root.
password	string	The password of the user with administrative privileges on the target ESXi host.
deployment_network	string	The name of the network to which to connect the appliance.  <b>Note</b> The network must be accessible from the target ESXi host.  Ignored if the target ESXi host has only one network.
datastore	string	The name of the datastore that you want to store all virtual machine configuration files and virtual disks of the appliance.  <b>Note</b> The datastore must be accessible from the ESXi host.  The datastore must have enough free space.

Table 4-7. Configuration Parameters in the `new_vcsa` Section, `esxi` Subsection (continued)

Name	Type	Description
<code>port</code>	integer	The port number of the ESXi host. The default port is 443.
<code>ssl_certificate_verification</code>	string	<p>The CLI verifies that a server's security certificate is signed by a Certificate Authority (CA), and establishes a secure connection. If the certificate is self-signed, the CLI stops the upgrade unless you specify one of the following SSL certificate configuration options.</p> <p>Specify the Secure Hash Algorithm 1 (SHA-1) certificate thumbprint. A certificate thumbprint is a hexadecimal string that uniquely identifies a certificate. The thumbprint is calculated from the content of the certificate using a thumbprint algorithm.</p> <pre>"thumbprint": "certificate SHA-1 thumbprint"</pre> <p>Set <code>verification_mode</code> to <code>NONE</code>.</p> <pre>"verification_mode": "NONE"</pre> <p>If you are connecting to a server with a self-signed certificate, and fail to either specify the SHA-1 certificate thumbprint, or set the verification mode to <code>NONE</code>, the CLI will display the server's self-signed certificate's thumbprint, and prompt you to accept or reject the certificate thumbprint.</p> <p>You can also specify that the CLI ignore the self-signed using the <code>vcsa-deploy upgrade</code> command parameter <code>--no-ssl-certificate-validation</code>. See <a href="#">Syntax of the CLI Migrate Command</a>.</p>

Table 4-8. Configuration Parameters in the `new_vcsa` Section, `vc` Subsection

Name	Type	Description
<code>hostname</code>	string	The IP address or FQDN of the target vCenter Server instance on which you want to deploy the appliance.
<code>username</code>	string	vCenter Single Sign-On administrator user name on the target vCenter Server instance, for example, <code>administrator@vsphere.local</code> .
<code>password</code>	string	The password of the vCenter Single Sign-On administrator user on the target vCenter Server instance.
<code>deployment_network</code>	string	<p>The name of the network to which to connect the appliance.</p> <p><b>Note</b> The network must be accessible from the target ESXi host or DRS cluster on which you want to deploy the appliance.</p> <p>Ignored if the target ESXi host or DRS cluster has only one network.</p>

Table 4-8. Configuration Parameters in the `new_vc.sa` Section, `vc` Subsection (continued)

Name	Type	Description
<code>datacenter</code>	string or array	<p>The vCenter Server data center that contains the target ESXi host or DRS cluster on which you want to deploy the appliance.</p> <p>If the datacenter is located in a folder or a structure of folders, the value must be either a comma-separated list of strings or a comma-separated list as a single string. For example,</p> <pre>["parent_folder", "child_folder", "datacenter_name"]</pre> <p>or</p> <pre>"parent_folder, child_folder, datacenter_name"</pre> <p>If there is no folder path on the data center, then use only the datacenter name. For example,</p> <pre>["datacenter_name"]</pre> <p>or</p> <pre>"datacenter_name"</pre> <p><b>Note</b> The value is case-sensitive.</p>
<code>datastore</code>	string	<p>The name of the datastore that you want to store all virtual machine configuration files and virtual disks of the appliance.</p> <p><b>Note</b> The datastore must be accessible from the target ESXi host or DRS cluster.</p> <p>The datastore must have at least 25 GB of free space.</p>
<code>port</code>	integer	The port number of the vCenter Server. The default port is 443.

Table 4-8. Configuration Parameters in the `new_vcsa` Section, `vc` Subsection (continued)

Name	Type	Description
<code>target</code>	string or array	<p>The target cluster, ESXi host, or resource pool on which you want to deploy the new appliance. This is the target you specified with the <code>datacenter</code> parameter. This path must end with a cluster name, ESXi hostname, or resource pool name.</p> <hr/> <p><b>Important</b> You must provide the name that is displayed in the vCenter Server inventory. For example, if the name of the target ESXi host is an IP address in the vCenter Server inventory, you cannot provide an FQDN.</p> <hr/> <p><b>Note</b> All values are case-sensitive.</p> <hr/> <p>If you want the deployed appliance to be listed in a different location within the data center's hierarchy, use the <code>vm_folder</code> parameter described later in this section.</p> <p>If the target cluster, ESXi host, or resource pool is located in a folder or a structure of folders, the value must be a comma-separated list of strings or a comma-separated list as a single string. For example,</p> <pre>["parent_folder", "child_folder", "esxi-host.domain.com"]</pre> <p>or</p> <pre>"parent_folder, child_folder, esxi-host.domain.com"</pre> <p>If the target ESXi host is part of a cluster, use a comma-separated list of strings or a comma-separated list as a single string to provide the path. For example,</p> <pre>["cluster_name", "esxi-host.domain.com"]</pre> <p>or</p> <pre>"cluster_name, esxi-host.domain.com"</pre> <p>If you are deploying to a resource pool, include the label <code>Resources</code> before the resource pool name. For example:</p> <pre>["cluster_name", "Resources", "resource_pool_name"]</pre> <hr/> <p><b>Note</b> Pre-checks verify only the memory of the resource pool.</p> <hr/>
<code>vm_folder</code>	string	Optional. The name of the virtual machine (VM) folder to which to add the appliance.

**Table 4-9. Configuration Parameters in the `new_vcsa` Section, `appliance` Subsection**

Name	Type	Description
<code>thin_disk_mode</code>	Boolean	Set to <code>true</code> to deploy the appliance with thin virtual disks.
<code>deployment_option</code>	string	<p>The size of the appliance.</p> <ul style="list-style-type: none"> <li>■ Set to <code>tiny</code> if you want to deploy a vCenter Server appliance for up to 10 hosts and 100 virtual machines with the default storage size. Deploys an appliance with 2 CPUs, 10 GB of memory, and 300 GB of storage.</li> <li>■ Set to <code>tiny-1storage</code> if you want to deploy a vCenter Server appliance for up to 10 hosts and 100 virtual machines with the large storage size. Deploys an appliance with 2 CPUs, 10 GB of memory, and 825 GB of storage.</li> <li>■ Set to <code>tiny-xlstorage</code> if you want to deploy a vCenter Server appliance for up to 10 hosts and 100 virtual machines with the x-large storage size. Deploys an appliance with 2 CPUs, 10 GB of memory, and 1700 GB of storage.</li> <li>■ Set to <code>small</code> if you want to deploy a vCenter Server appliance for up to 100 hosts and 1,000 virtual machines with the default storage size. Deploys an appliance with 4 CPUs, 16 GB of memory, and 340 GB of storage.</li> <li>■ Set to <code>small-1storage</code> if you want to deploy a vCenter Server appliance for up to 100 hosts and 1,000 virtual machines with the large storage size. Deploys an appliance with 4 CPUs, 16 GB of memory, and 870 GB of storage.</li> <li>■ Set to <code>small-xlstorage</code> if you want to deploy a vCenter Server appliance for up to 100 hosts and 1,000 virtual machines with the x-large storage size. Deploys an appliance with 4 CPUs, 16 GB of memory, and 1750 GB of storage.</li> <li>■ Set to <code>medium</code> if you want to deploy a vCenter Server appliance for up to 400 hosts and 4,000 virtual machines with the default storage size. Deploys an appliance with 8 CPUs, 24 GB of memory, and 525 GB of storage.</li> <li>■ Set to <code>medium-1storage</code> if you want to deploy a vCenter Server appliance for up to 400 hosts and 4,000 virtual machines with the large storage size. Deploys an appliance with 8 CPUs, 24 GB of memory, and 1025 GB of storage.</li> <li>■ Set to <code>medium-xlstorage</code> if you want to deploy a vCenter Server appliance for up to 400 hosts and 4,000 virtual machines with the x-large storage size. Deploys an appliance with 8 CPUs, 24 GB of memory, and 1905 GB of storage.</li> <li>■ Set to <code>large</code> if you want to deploy a vCenter Server appliance for up to 1,000 hosts and 10,000 virtual machines with the default storage size.</li> </ul>

Table 4-9. Configuration Parameters in the `new_vcsa` Section, `appliance` Subsection (continued)

Name	Type	Description
		<p>Deploys an appliance with 16 CPUs, 32 GB of memory, and 740 GB of storage.</p> <ul style="list-style-type: none"> <li>■ Set to <code>large-lstorage</code> if you want to deploy a vCenter Server appliance for up to 1,000 hosts and 10,000 virtual machines with the large storage size.</li> </ul> <p>Deploys an appliance with 16 CPUs, 32 GB of memory, and 1090 GB of storage.</p> <ul style="list-style-type: none"> <li>■ Set to <code>large-xlstorage</code> if you want to deploy a vCenter Server appliance for up to 1,000 hosts and 10,000 virtual machines with the x-large storage size.</li> </ul> <p>Deploys an appliance with 16 CPUs, 32 GB of memory, and 1970 GB of storage.</p> <ul style="list-style-type: none"> <li>■ Set to <code>xlarge</code> if you want to deploy a vCenter Server appliance for up to 2,000 hosts and 35,000 virtual machines with the default storage size.</li> </ul> <p>Deploys an appliance with 24 CPUs, 48 GB of memory, and 1180 GB of storage.</p> <ul style="list-style-type: none"> <li>■ Set to <code>xlarge-lstorage</code> if you want to deploy a vCenter Server appliance for up to 2,000 hosts and 35,000 virtual machines with the large storage size.</li> </ul> <p>Deploys an appliance with 24 CPUs, 48 GB of memory, and 1230 GB of storage.</p> <ul style="list-style-type: none"> <li>■ Set to <code>xlarge-xlstorage</code> if you want to deploy a vCenter Server appliance for up to 2,000 hosts and 35,000 virtual machines with the x-large storage size.</li> </ul> <p>Deploys an appliance with 24 CPUs, 48 GB of memory, and 2110 GB of storage.</p>
<code>image</code>	string	<p>Optional. A local file path or URL to the vCenter Server appliance installation package.</p> <p>By default the installer uses the installation package that is included in the ISO file, in the <code>vcsa</code> folder.</p>
<code>name</code>	string	<p>The VM name for the appliance.</p> <p>Must contain only ASCII characters except a percent sign (%), backslash (\), or forward slash (/) and must be no more than 80 characters in length.</p>
<code>ovftool_path</code>	string	<p>Optional. A local file path to the OVF Tool executable file.</p> <p>By default the installer uses the OVF Tool instance that is included in the ISO file, in the <code>vcsa/ovftool</code> folder.</p>

**Table 4-10. Configuration Parameters in the `new_vcsa` Section, `os` Subsection**

Name	Type	Description
<code>password</code>	string	The password for the root user of the appliance operating system. The password must contain between 8 and 20 characters, at least one uppercase letter, at least one lowercase letter, at least one number, and at least one special character, for example, a dollar sign (\$), hash key (#), at sign (@), period (.), or exclamation mark (!). All characters must be lower ASCII characters without spaces.
<code>ssh_enable</code>	Boolean	Set to <code>true</code> to enable the SSH administrator login to the appliance.

**Table 4-11. Configuration Parameters in the `new_vcsa` Section, `temporary_network` Subsection**

Name	Type	Description
<code>ip_family</code>	string	IP version for the network of the appliance. Set to <code>ipv4</code> or <code>ipv6</code> .
<code>mode</code>	string	IP assignment for the network of the appliance. Set to <code>static</code> or <code>dhcp</code> .
<code>ip</code>	string	IP address for the appliance. Required only if you use a static assignment, that is, if you set the <code>mode</code> parameter to <code>static</code> . You must set an IPv4 or IPv6 address that corresponds to the network IP version, that is, to the value of the <code>ip_family</code> parameter. An IPv4 address must comply with the RFC 790 guidelines. An IPv6 address must comply with the RFC 2373 guidelines.
<code>dns_servers</code>	string or array	IP addresses of one or more DNS servers. To set more than one DNS server, use a comma-separated list of strings or a comma-separated list as a single string to provide the path. For example, <pre>["x.y.z.a", "x.y.z.b"]</pre> or <pre>"x.y.z.a, x.y.z.b"</pre> Required only if you use a static assignment, that is, if you set the <code>mode</code> parameter to <code>static</code> .
<code>prefix</code>	string	Network prefix length. Required only if you use assignment, that is, if you set the <code>mode</code> parameter to <code>static</code> . For IPv4 version, the value must be between 0 and 32. For IPv6 version, the value must be between 0 and 128.
<code>gateway</code>	string	IP address of the default gateway. For IPv6 version, the value can be <code>default</code> .



Table 4-12. Configuration Parameters in the `new_vcsa` Section, `user_options` Subsection

Name	Type	Description
<code>vcdb_migrateSet</code>	string	<p>Select the types of data to migrate from the old appliance to the new appliance. Data is copied from the source vCenter Server to the target server. The original source of the data remains unchanged.</p> <ul style="list-style-type: none"> <li>■ Set to <code>core</code> if you want to transfer only the configuration data. This provides the fastest data migration, keeping system downtime to a minimum.</li> <li>■ Set to <code>core_events_tasks</code> if you want to transfer the configuration and historical data (events and tasks) immediately. vCenter Server will not start until all data has been migrated from the source vCenter Server for Windows.</li> <li>■ Set to <code>all</code> if you want to transfer the configuration, historical, and performance metrics data immediately. vCenter Server will not start until all data has been migrated from the source vCenter Server for Windows. This option transfers the largest amount of data, and requires more downtime than other data migration options.</li> <li>■ Set to <code>transfer_events_tasks_after_upgrade</code> if you want to transfer the historical data (events and tasks) in the background after the upgrade finishes. During this time, vCenter Server performance might not be optimal.</li> <li>■ Set to <code>transfer_stats_events_tasks_after_upgrade</code> if you want to transfer historical data and performance metrics data in the background after the upgrade finishes. During this time, vCenter Server performance might not be optimal.</li> </ul> <hr/> <p><b>Note</b> To minimize the migration time and the amount of storage required for the new vCenter Server appliance, use the <code>core</code> value.</p> <hr/> <p>For more information on the types of data you can transfer from your existing vCenter Server to the new, upgraded vCenter Server, see <a href="#">Transferring Data from an Existing vCenter Server Appliance</a>.</p>

Table 4-13. Configuration Parameters in the `new_vcsa` Section, `SSO` Subsection

Name	Type	Description
<code>first_instance</code>	string	<p>Set <code>first_instance</code> to <code>true</code> if this is the first converge migration operation in your vCenter Server SSO domain, or if you do not want to set the replication partner for this node.</p> <p>If you want to set the replication partner for this node, set <code>first_instance</code> to <code>false</code> and provide the value of the <code>replication_partner_hostname</code> as the FQDN of a previously converged node which is currently in an embedded vCenter Server topology.</p> <p>For more information on specifying the <code>first_instance</code> and <code>replication_partner_hostname</code> parameters, see <a href="#">About Migrating a vCenter Server for Windows with an External Platform Services Controller Using the CLI</a>.</p>
<code>replication_partner_hostname</code>	string	Host name of the replication partner. Remove if it is the <code>first_instance</code>

## Requirements for the Automatic Invocation of Migration Assistant

You use the `run_migration_assistant` subsection to automate the invocation of Migration Assistant. Automatic invocation works only if the source Windows installation is running as a virtual machine.

The user account that you specify in the `os_username` or `vum_os_username` parameters needs a privilege elevation to Administrator. For example:

- The built-in Windows Administrator account.
- A user account with a user name other than Administrator that is a member of the local Windows Administrators group.
- The Domain Administrator account with the user name Administrator that is a member of the local Windows Administrators group.
- The user name ID must be in the format `your_domain_name\user_ID` or `user_ID@your_domain_name`.

---

**Restriction** Automatic invocation of Migration Assistant does not work with a Windows account that requires a privilege elevation to Administrator. Instead, run Migration Assistant manually on the source Windows machine. Copy and paste the thumbprint value from the Migration Assistant console output on the source machine to the `migration_ssl_thumbprint` key in the `vc_win` subsection, and remove the `run_migration_assistant` section.

---

## Configuration Parameters in the `source_vc` Section

Table 4-14. Configuration Parameters in the `source_vc` Section, `vc_win` Subsection

Name	Type	Description
<code>hostname</code>	string	The host name or IP address of the source Windows installation of vCenter Server or Platform Services Controller that you want to migrate.
<code>username</code>	string	A vCenter Single Sign-On user name with administrative privileges for the vCenter Server, vCenter Single Sign-On, or Platform Services Controller instance that you want to migrate.
<code>password</code>	string	The password of the vCenter Server or Platform Services Controller instance that you want to migrate.
<code>migration_port</code>	string	Migration Assistant port number shown in the Migration Assistant console. The default port is 9123.
<code>active_directory_domain</code>	string	The name of the Active Directory domain to which the source vCenter Server instance is joined.
<code>active_directory_username</code>	string	Administrator user name of the Active Directory domain to which the source vCenter Server instance is joined.

**Table 4-14. Configuration Parameters in the `source_vc` Section, `vc_win` Subsection (continued)**

Name	Type	Description
<code>active_directory_password</code>	string	Administrator password of the Active Directory domain to which the source vCenter Server instance is joined.  <b>Note</b> The installer verifies the entered credentials, but does not check the required privileges to add the target machine to the Active Directory domain. Verify that the user credentials have all the required permissions to add a machine to the Active Directory domain.
<code>migration_ssl_thumbprint</code>	string	The SSL thumbprint of Migration Assistant.

**Table 4-15. Configuration Parameters in the `source_vc` Section, `run_migration_assistant` Subsection**

Name	Type	Description
<code>esxi_hostname</code>	string	FQDN or IP address of ESXi on which the source vCenter Server, vCenter Single Sign-On, or Platform Services Controller instance resides.
<code>esxi_username</code>	string	User name of a user with administrative privileges on the ESXi host.
<code>esxi_password</code>	string	The password of the ESXi host user. If omitted, you are prompted to enter the password at the command console during the template verification.
<code>esxi_port</code>	string	The port number of the ESXi host. The default port is 443.
<code>os_username</code>	string	Administrator user name for the source Windows machine.
<code>os_password</code>	string	Administrator user password for the source Windows machine. If omitted, you are prompted to enter it at the command console during the template verification.
<code>migration_ip</code>	string	The IP address of the network adapter to be migrated.
<code>migration_port</code>	string	Migration Assistant port number shown in the Migration Assistant console. The default port is 9123.
<code>export_dir</code>	string	Directory to export source configuration and data.
<code>sa_password</code>	string	The IP address of the network vCenter Server service account user password. This option is only required if the vCenter Server service is running under a non-LocalSystem account. If omitted, you are prompted to enter it at the command console during the template verification.

**Table 4-16. Configuration Parameters in the `source_vum` Section, `run_migration_assistant` Subsection**

Name	Type	Description
<code>esxi_hostname</code>	string	FQDN or IP address of ESXi on which the source vCenter Server, vCenter Single Sign-On, or Platform Services Controller instance resides.
<code>esxi_username</code>	string	User name of a user with administrative privileges on the ESXi host.
<code>esxi_password</code>	string	The password of the ESXi host user. If omitted, you are prompted to enter the password at the command console during the template verification.

**Table 4-16. Configuration Parameters in the `source_vum` Section, `run_migration_assistant` Subsection (continued)**

Name	Type	Description
<code>esxi_port</code>	string	The port number of the ESXi host. The default port is 443.
<code>vum_hostname</code>	string	FQDN or IP address of ESXi on which the source Update Manager instance resides.
<code>vum_os_username</code>	string	Administrator user name for the source Windows machine.
<code>vum_os_password</code>	string	Administrator user password for the source Update Manager Windows machine. If omitted, you are prompted to enter it at the command console during the template verification.
<code>migration_port</code>	string	Migration Assistant port number shown in the Migration Assistant console. The default port is 9123.
<code>export_dir</code>	string	Directory to export source configuration and data.

## Configuration Parameters in the `ceip` Section

**Table 4-17. Configuration Parameters in the `ceip` Section, `settings` Subsection**

Name	Type	Description
<code>ceip_enabled</code>	Boolean	Set to <code>true</code> to join the CEIP for this appliance.

## Run a Pre-Check Before a CLI Migration to vCenter Server Appliance

You can run a pre-check to verify that the migration requirements are met and resolve any problems before migration of your vCenter Server deployment.

Before migrating your vCenter Server deployment to an appliance, you can run a pre-check to find out the disk space requirement, the estimated upgrade time, and the extensions registered with the vCenter Server appliance. Running pre-upgrade is an optional but highly recommended step when planning your upgrade.

### Prerequisites

[Prepare JSON Configuration Files for CLI Migration](#) using the example templates and [Migration Configuration Parameters](#).

### Procedure

- 1 Verify your template without deploying the appliance by entering the command: `vcasa-deploy migrate --verify-template-only path_to_json_file`.
- 2 Run CLI `Migrate` using the `--precheck-only` option.

You can adjust your migration plans using the disk space requirements and estimated migration time. If you receive an error, you can troubleshoot and resolve the problem before the actual migration.

- 3 After resolving any errors, run the CLI `Migrate` command using the `--verify-template-only` option again until all errors are resolved.

## Results

You are now prepared for an error-free CLI migration process.

## What to do next

[Perform a CLI Migration of vCenter Server from Windows to an Appliance.](#)

# Perform a CLI Migration of vCenter Server from Windows to an Appliance

You can migrate vCenter Server to an appliance from a machine that is in your vSphere network.

## Prerequisites

- See [Prerequisites for Migrating vCenter Server](#)
- Create a snapshot of the deployment that you want to migrate as a precaution in case of failure during the migration process.
- Download the installer ISO file from the VMware website to a machine that is in your vSphere network. The installer ISO filename is `VMware-VCSA-all-7.0.0-yyyyyy.iso`, where `yyyyyy` is the build number. See [Download and Mount the vCenter Server Installer](#).
- [Prepare JSON Configuration Files for CLI Migration.](#)
- [Run a Pre-Check Before a CLI Migration to vCenter Server Appliance](#) to identify problems and refine your migration plan.
- Review the optional arguments for running the migration. See [Syntax of the CLI Migrate Command](#).

## Procedure

- 1 Navigate to the software CLI installer directory for your operating system.
  - If you are deploying the appliance from a machine with Windows OS, navigate to the `vcsa-cli-installer\win32` directory.
  - If you are deploying the appliance from a machine with Linux OS, navigate to the `vcsa-cli-installer/lin64` directory.
  - If you are deploying the appliance from a machine with Mac OS, navigate to the `vcsa-cli-installer/mac` directory.
- 2 Select the CLI installer: `vcsa-deploy.exe`.
- 3 Run the migration command.

```
vcsa-deploy migrate --accept-eula optional_arguments path_to_the_json_file
```

The *optional\_arguments* variable is a space-separated list of optional arguments to set additional configurations.

For example, you can set the location of the log and other output files that the installer generates.

```
vcsa-deploy migrate --accept-eula --log-dir=path_to_the_location path_to_the_json_file
```

## Results

The migration template is deployed. You can [Verify Your vCenter Server Upgrade or Migration Is Successful](#).

## Syntax of the CLI Migrate Command

You can use one or more command arguments to set the execution parameters of the migrate command.

You can add a space-separated list of arguments to the CLI upgrade command.

```
vcsa-deploy migrate list_of_arguments path_to_the_json_file
```

The required `template` argument provides the path of a JSON file that describes the vCenter Server appliance deployment procedure. You can place multiple JSON files in a directory, and the CLI will migrate all of the deployments in batch mode. For more information on performing concurrent migrations, see [Prepare JSON Configuration Files for CLI Migration](#).

**Important** The string values, including the passwords, must contain only ASCII characters. Extended ASCII and non-ASCII characters are unsupported.

To set a value that contains the backslash (\) or quotation mark (") character, you must precede the character with the backslash (\) character. For example, "password": "my\"password" sets the password my"password, "image": "C:\\vmware\\vcsa" sets the path C:\vmware\vcsa.

The boolean values must contain only lowercase characters. Can be either `true` or `false`. For example, "ssh.enable": false.

Optional Argument	Description
--accept-eula	Accepts the end-user license agreement. Required for executing the deployment command.
-h, --help	Displays the help message for the command.
--template-help	Displays the help message for the configuration parameters in the JSON deployment file. You can use <code>vcsa-deploy [subcommand] --help</code> for a list of subcommand-specific arguments.
-v, --verbose	Adds debug information to the console output.
-t, --terse	Hides the console output. Displays only warning and error messages.

Optional Argument	Description
<code>--log-dir, LOG_DIR</code>	Specifies the location of the log and other output files that the installer generates.
<code>--skip-ovftool-verification</code>	Performs basic verification of the configuration parameters and deploys the vCenter Server appliance, but does not validate the OVF Tool parameters in the <code>ovftool_arguments</code> subsection of the JSON template. If you set arguments that the OVF Tool does not recognize, the deployment might fail.
<code>--no-ssl-certificate-verification</code>	<p>Prohibits SSL verification of ESXi connections.</p> <p>The CLI verifies that a server's security certificate is signed by a Certificate Authority (CA), and establishes a secure connection. If the certificate is self-signed, the CLI will stop the upgrade unless you specify that the CLI ignore the self-signed certificate using the <code>--no-ssl-certificate-validation</code> command parameter.</p> <p>If you are connecting to a server with a self-signed certificate, and fail to specify that the CLI accept it, the CLI displays the server's self-signed certificate thumbprint, and prompts you to accept or reject the it.</p> <p>You can also specify that the CLI ignore self-signed certificates using the <code>ssl_certificate_verification</code> configuration parameter in the JSON template. See <a href="#">Upgrade Configuration Parameters for CLI Upgrade of vCenter Server Appliance</a> .</p> <hr/> <p><b>Important</b> Avoid using this option as it may cause problems during or after upgrade due to an un-validated identity of the target host.</p>
<code>--operation-id</code>	Lets you provide an identifier to track the concurrent installation, migration, or upgrade of multiple vCenter Server instances. If do not provide an operation ID, the CLI generates a universally unique identifier (UUID) which you can use to identify the different instances of vCenter Server and their installation or upgrade status.
<code>--verify-template-only</code>	Performs basic template verification without installing Upgrade Runner, running prechecks, and upgrading or migrating the vCenter Server appliance.
<code>--precheck-only</code>	Installs Migration Assistant on the source vCenter Server virtual machine, and runs a complete set of prechecks without performing the migration.
<code>--acknowledge-ceip</code>	Confirms acknowledgement of your VMware Customer Experience Improvement Program (CEIP) participation. This argument is required if <code>ceip.enabled</code> is set to true in the upgrade template.

Exit Code	Description
0	Command ran successfully
1	Runtime error
2	Validation error
3	Template error



# After Upgrading or Migrating vCenter Server

# 5

After you upgrade to vCenter Server, consider the post-upgrade options and requirements.

- Complete any component reconfigurations that might be required for changes during upgrade.
- Verify that you understand the authentication process and identify your identity sources.
- If you migrated vCenter Server on Windows to a target vCenter Server appliance and you use any local OS user names to log in to the vCenter Single Sign-On, you must recreate them and reassign permissions.
- If you performed an upgrade, upgrade any additional modules that are linked to this instance of vCenter Server, such as Update Manager. If you performed a migration from vCenter Server for Windows to a vCenter Server appliance, the Update Manager module is migrated as well into vSphere Lifecycle Manager.
- Optionally, upgrade or migrate the ESXi hosts in the vCenter Server inventory to the same version as the vCenter Server instance.
- If you use Update Manager in your vCenter Server deployment, and Update Manager and vCenter Server were running on separate machines prior the migration, consider to shut down or delete the Update Manager host machine after the migration is complete. Before disposing of the Update Manager host machine, take into account the following:
  - You might need the host machine for rolling back purposes of your upgraded or migrated environment.
  - You might have other software that runs on that machine.

This chapter includes the following topics:

- [Verify Your vCenter Server Upgrade or Migration Is Successful](#)
- [Log In to vCenter Server by Using the vSphere Client](#)
- [Decommission the Platform Services Controller](#)
- [Install the VMware Enhanced Authentication Plug-in](#)
- [Identity Sources for vCenter Server with vCenter Single Sign-On](#)
- [Reregister Plug-In Solution in vCenter Server After Upgrade or Migration](#)
- [Roll Back a vCenter Server Upgrade or vCenter Server on Windows Migration](#)

- [Monitor and Manage Historical Data Migration](#)

## Verify Your vCenter Server Upgrade or Migration Is Successful

You can verify the success of your vCenter Server upgrade or migration.

You must be logged into the upgraded or migrated vCenter Server instance. If you created a reference of required information based on a CLI template, you can use it to validate the upgrade or migration success.

### Procedure

- 1 Verify that the IP address is correct.
- 2 Verify that the Active Directory registration has not changed.
- 3 Verify the Network registration is correct.
- 4 Verify the Domain is correct.
- 5 Verify the certificates are valid.
- 6 Verify the inventory data is correctly migrated.
  - a Review the events history.
  - b Review the performance charts.
  - c Review the users, permissions, and roles.

### Results

If the postupgrade or postmigration configuration conforms to your required information or CLI template reference and expectations, the vCenter Server upgrade or migration is complete.

### What to do next

You can troubleshoot unexpected behavior by reviewing logs. You can also perform a rollback to the source configuration. See [Roll Back a vCenter Server Upgrade or vCenter Server on Windows Migration](#)

## Log In to vCenter Server by Using the vSphere Client

Log in to vCenter Server by using the vSphere Client to manage your vSphere inventory.

In vSphere 6.5 and later, the vSphere Client is installed as part of the vCenter Server appliance deployment. This way, the vSphere Client always points to the same vCenter Single Sign-On instance.

## Procedure

- 1 Open a Web browser and enter the URL for your vCenter Server instance: **https://*vcenter\_server\_ip\_address\_or\_fqdn***
- 2 Select **Launch vSphere Client (HTML5)**.  
You can instead open a Web browser and enter the URL for the vSphere Client: **https://*vcenter\_server\_ip\_address\_or\_fqdn*/ui**.
- 3 Enter the credentials of a user who has permissions on vCenter Server, and click **Login**.
- 4 If a warning message about an untrusted SSL certificate appears, select the appropriate action based on your security policy.

Option	Action
<b>Ignore the security warning for this login session only.</b>	Click <b>Ignore</b> .
<b>Ignore the security warning for this login session, and install the default certificate so that the warning does not appear again.</b>	Select <b>Install this certificate and do not display any security warnings for this server</b> and click <b>Ignore</b> . Select this option only if using the default certificate does not present a security problem in your environment.
<b>Cancel and install a signed certificate before proceeding.</b>	Click <b>Cancel</b> and ensure that a signed certificate is installed on the vCenter Server system before you attempt to connect again.

- 5 To log out, click the user name at the top of the vSphere Client window and select **Logout**.

## Results

The vSphere Client connects to all the vCenter Server systems on which the specified user has permissions, allowing you to view and manage your inventory.

## Decommission the Platform Services Controller

After you upgrade to vCenter Server appliance, can decommission external Platform Services Controller instances.

After converging an external Platform Services Controller node to a vCenter Server appliance, decommission the original external Platform Services Controller. Decommissioning a Platform Services Controller shuts it down and removes it from the single sign-on domain.

### Prerequisites

Make sure no vCenter Server instances are pointing to the Platform Services Controller before decommissioning.

Reconfigure any products deployed into the environment that use the Platform Services Controller to use the newly deployed vCenter Server appliance.

Make a backup of the Platform Services Controller before decommissioning to ensure no loss of data.

## Decommission an External Platform Services Controller Appliance

Decommission and remove an external Platform Services Controller appliance from the vSphere inventory.

After converging an external Platform Services Controller node to a vCenter Server appliance, decommission the original external Platform Services Controller. Decommissioning a Platform Services Controller shuts it down and removes it from the single sign-on domain.

### Prerequisites

Make sure no vCenter Server instances are pointing to the Platform Services Controller before decommissioning.

Reconfigure any products deployed into the environment that use the Platform Services Controller to use the newly deployed vCenter Server appliance.

Make a backup of the Platform Services Controller before decommissioning to ensure no loss of data.

### Procedure

- 1 Stop the Platform Services Controller that you no longer need.
- 2 Log in as root to the appliance shell of one of the Platform Services Controller appliances within the domain.
- 3 Enable access to the Bash shell using the `shell.set --enabled true` command.
- 4 Start the Bash shell using the `shell` command, and log in.
- 5 Unregister the stopped Platform Services Controller appliance using the `cmsso-util unregister` command.

Where, *Platform\_Services\_Controller\_System* is the FQDN or IP address of the Platform Services Controller that you want to decommission. Run this command only on one of the Platform Services Controller replication partners, as the synchronization removes the entries from all other Platform Services Controller replication partners. Enter the `vCenter_Single_Sign_On_password` in quotes.

---

**Note** The `cmsso-util unregister` command restarts the services on the Platform Services Controller on which you are running the command. It can take several minutes for the command to finish.

---

```
cmsso-util unregister --node-pnid Platform_Services_Controller_System --username
administrator@your_domain_name --passwd 'vCenter_Single_Sign_On_password'
```

- 6 Remove the Platform Services Controller appliance that you no longer need from the vSphere inventory.

## What to do next

You can delete the virtual machine for the decommissioned Platform Services Controller.

Ensure that any external solutions or products are registered with the new vCenter Server appliance.

## Decommission an External Platform Server Controller for Windows

Decommission and remove an external Platform Services Controller for Windows from the vSphere inventory.

After converging an external Platform Services Controller node to a vCenter Server appliance, decommission the original external Platform Services Controller. Decommissioning a Platform Services Controller shuts it down and removes it from the single sign-on domain.

### Prerequisites

Make sure no vCenter Server instances are pointing to the Platform Services Controller before decommissioning.

Reconfigure any products deployed into the environment that use the Platform Services Controller to use the newly deployed vCenter Server appliance.

Make a backup of the Platform Services Controller before decommissioning to ensure no loss of data.

### Procedure

- 1 On the Windows computer running Platform Services Controller, click **Start > Run**, type `cmd`, and click **OK**.

The Command Prompt opens.

- 2 Navigate to the directory `C:\Program Files\VMware\vCenter Server\bin\`
- 3 Unregister the stopped Platform Services Controller appliance using the `cmsso-util unregister` command.

Where, *Platform\_Services\_Controller\_System* is the FQDN or IP address of the Platform Services Controller that you want to decommission. Run this command only on one of the Platform Services Controller replication partners, as the synchronization removes the entries from all other Platform Services Controller replication partners. Enter the *vCenter\_Single\_Sign\_On\_password* in quotes.

---

**Note** The `cmsso-util unregister` command restarts the services on the Platform Services Controller on which you are running the command. It can take several minutes for the command to finish.

---

```
cmsso-util unregister --node-pnid Platform_Services_Controller_System --username
administrator@your_domain_name --passwd 'vCenter_Single_Sign_On_password'
```

- 4 Remove the Platform Services Controller appliance that you no longer need from the vSphere inventory.

#### What to do next

You can delete the virtual machine for the decommissioned Platform Services Controller.

Ensure that any external solutions or products are registered with the new vCenter Server appliance.

## Install the VMware Enhanced Authentication Plug-in

The VMware Enhanced Authentication Plug-in provides Integrated Windows Authentication and Windows-based smart card functionality.

In the vSphere 6.5 release, the VMware Enhanced Authentication Plug-in replaced the Client Integration Plug-in from vSphere 6.0 releases and earlier. The Enhanced Authentication Plug-in provides Integrated Windows Authentication and Windows-based smart card functionality. These are the only two features carried over from the previous Client Integration Plug-in. The Enhanced Authentication Plug-in can function seamlessly if you already have the Client Integration Plug-in installed on your system from vSphere 6.0 or earlier. There are no conflicts if both plug-ins are installed.

Install the plug-in only once to enable all the functionality the plug-in delivers.

---

**Note** When you enable Active Directory Federation Services, Enhanced Authentication Plug-in applies only to configurations where vCenter Server is the identity provider (Active Directory over LDAP, Integrated Windows Authentication, and OpenLDAP configurations).

---

#### Procedure

- 1 Open a Web browser and type the URL for the vSphere Client.
- 2 At the bottom of the vSphere Client login page, click **Download Enhanced Authentication Plug-in**.
- 3 If the browser blocks the installation either by issuing certificate errors or by running a pop-up blocker, follow the Help instructions for your browser to resolve the problem.
- 4 Save the plug-in to your computer, and run the executable.
- 5 Step through the installation wizard for both the VMware Enhanced Authentication Plug-in and the VMware Plug-in Service which are run in succession.
- 6 When the installations are complete, refresh your browser.
- 7 On the External Protocol Request dialog box, click **Launch Application** to run the Enhanced Authentication Plug-in.

The link to download the plug-in disappears from the login page.

## Identity Sources for vCenter Server with vCenter Single Sign-On

You can use identity sources to attach one or more domains to vCenter Single Sign-On. A domain is a repository for users and groups that the vCenter Single Sign-On server can use for user authentication.

Starting in vSphere 7.0, vCenter Server supports federated authentication to sign in to vCenter Server. VMware encourages you to use federated authentication as vSphere moves towards token-based authentication. See [#unique\\_106](#).

An administrator can add identity sources, set the default identity source, and create users and groups in the vsphere.local identity source.

The user and group data is stored in Active Directory, OpenLDAP, or locally to the operating system of the machine where vCenter Single Sign-On is installed. After installation, every instance of vCenter Single Sign-On has the identity source *your\_domain\_name*, for example vsphere.local. This identity source is internal to vCenter Single Sign-On.

---

**Note** At any time, only one default domain exists. If a user from a non-default domain logs in, that user must add the domain name (*DOMAIN\user*) to authenticate successfully.

---

The following identity sources are available.

- Active Directory over LDAP. vCenter Single Sign-On supports multiple Active Directory over LDAP identity sources.
- Active Directory (Integrated Windows Authentication) versions 2003 and later. vCenter Single Sign-On allows you to specify a single Active Directory domain as an identity source. The domain can have child domains or be a forest root domain. VMware KB article [2064250](#) discusses Microsoft Active Directory Trusts supported with vCenter Single Sign-On.
- OpenLDAP versions 2.4 and later. vCenter Single Sign-On supports multiple OpenLDAP identity sources.

---

**Note** A future update to Microsoft Windows will change the default behavior of Active Directory to require strong authentication and encryption. This change will impact how vCenter Server authenticates to Active Directory. If you use Active Directory as your identity source for vCenter Server, you must plan to enable LDAPS. For more information about this Microsoft security update, see <https://portal.msrc.microsoft.com/en-US/security-guidance/advisory/ADV190023> and <https://blogs.vmware.com/vsphere/2020/01/microsoft-ldap-vsphere-channel-binding-signing-adv190023.html>.

---

For more information about vCenter Single Sign-On, see *vSphere Authentication*.

## Reregister Plug-In Solution in vCenter Server After Upgrade or Migration

You reregister a previously registered plug-in solution and any third-party client plug-in packages with vCenter Server after the SSL certificate has been refreshed following an upgrade or migration.

Consult the vendor documentation for any solution-based vCenter Server extensions and client plug-ins for instructions to re-register after a vCenter Server upgrade or migration.

If the procedure provided by your plug-in solution vendor fails to reregister the plug-in, you can use the following procedure to remove the plug-in registration, and then register it again with vCenter Server. For information on registering plug-ins, see the *vCenter Server and Host Management* documentation. For information on removing or disabling unwanted plug-ins from vCenter Server, see Knowledge Base article [KB 102536](#).

### Procedure

- 1 In a Web browser, navigate to the Managed Object Browser of your vCenter Server.  
`https://vcenter_server_ip_address_or_fqdn/mob/?moid=ExtensionManager`
- 2 Log in with your vCenter Server credentials.
- 3 On the `ManagedObjectReference:ExtensionManager` page, under **Methods**, click **UnregisterExtension**.
- 4 On the `void UnregisterExtension` page, in the text box inside the **Value** column, enter the value for the `key` property of the `Extension` data object of your vSphere Client extension.
- 5 To unregister the extension click **Invoke Method**.

### What to do next

Go to the solution registration page and register the plug-in.

Verify that your extension is registered successfully with vCenter Server by using one of the following approaches.

- In the vSphere Client, go to Administration and under Solutions, select **Client Plug-Ins** and click **Check for New Plug-Ins**.
- Log out and log in again to the vSphere Client. The vSphere Client checks for new plug-ins for each new user session

## Roll Back a vCenter Server Upgrade or vCenter Server on Windows Migration

You can roll back a vCenter Server upgrade or migration by reverting to the source appliance or vCenter Server on Windows.



The rollback procedure applies in the following upgrade and migration contexts:

- vCenter Server appliance with an embedded Platform Services Controller .
- vCenter Server appliance with an external Platform Services Controller .

#### Prerequisites

You must have access to the source vCenter Server appliance or vCenter Server on Windows.

#### Procedure

- ◆ To revert a failed migration of vCenter Server, see Knowledge Base article [KB 2146453](#).

## Monitor and Manage Historical Data Migration

You can monitor and manage the background migration of historical data using the vCenter Server Management Interface.

Using the vCenter Server Appliance Management Interface, you can perform the following data management tasks:

- Monitor the progress of the data migration.
- Pause the data migration.
- Cancel the data migration.

#### Prerequisites

- Verify that vCenter Server is successfully deployed and running.
- You must have selected to import historical data from the external database in use by the previous version of vCenter Server, to the embedded PostgreSQL database in vCenter Server 7.0. See [Transferring Data from an Existing vCenter Server Appliance](#).

#### Procedure

**1** In a Web browser, go to the vCenter Server Management Interface, <https://appliance-IP-address-or-FQDN:5480>.

**2** Log in as root.

The default root password is the password you set when deploying vCenter Server .

**3** A status bar at the top of the vCenter Server Management Interface displays the percentage of data that has been copied from the source vCenter Server to the PostgreSQL database embedded in the target vCenter Server appliance.

#### 4 To pause or cancel the data migration, click **Manage**.

Option	Description
<b>Pause</b>	During the data migration, vCenter Server performance might not be optimal. Pausing the migration lets vCenter Server run with better performance until such time that you can resume the process when it does not interfere with the needs of your business.
<b>Resume</b>	You can resume the data migration at a time that does not interfere with the business needs of your vCenter Server deployment.
<b>Cancel</b>	If you cancel the data import, the historical data will fail to import to the embedded PostgreSQL database. You cannot recover the data once you cancel the operation.  If you cancel the import process, and want to import the historical data later, you must restart the upgrade or migration process from Stage 1 of the GUI installer.

#### Results

When the data has been migrated, a success message displays in the vCenter Server Management Interface status bar.

# Managing Software Updates, Upgrades, and Product Compatibility

# 6

You can view available vCenter Server updates and upgrades and produce interoperability reports about VMware products associated with vCenter Server. The reports help you plan vCenter Server updates and upgrades in your environment.

You can perform an interoperability check of VMware products within your environment against both source and target vCenter Server versions. You can also generate a pre-update report to ensure your environment meets the minimum software and hardware requirements for a successful upgrade of vCenter Server. You can plan vCenter Server updates and upgrades based on the information in the reports you generate.

## **Interoperability report for the current vCenter Server**

Lists VMware products in your environment and their compatibility with the current, or source, version of vCenter Server.

## **Interoperability reports for target versions of vCenter Server**

Lists the VMware products in your environment and their compatibility against the target version of vCenter Server to which you want to upgrade.

## **Pre-update reports**

With the pre-update report, you can ensure that your system meets the minimum software and hardware requirements for a successful upgrade of vCenter Server. The report provides information about problems that might prevent the completion of a software upgrade, and actions you can take to remedy those problems.

This chapter includes the following topics:

- [Monitor Interoperability for the Current vCenter Server Version](#)
- [Generate an Interoperability Report for Target vCenter Server Versions](#)
- [Generate Pre-Update Reports](#)

# Monitor Interoperability for the Current vCenter Server Version

You can view an interoperability report that lists products in your environment associated with the current vCenter Server version and their compatibility.

The product interoperability report lists available products in your environment and their compatibility with the selected vCenter Server version.

## Prerequisites

To use Update Planner, you must join the VMware Customer Experience Improvement Program (CEIP). For information about the CEIP, see the "Configuring Customer Experience Improvement Program" section in *vCenter Server and Host Management*.

## Procedure

- 1 In the vSphere Client navigate to a vCenter Server for which you want to view an interoperability report.
- 2 On the **Monitor** tab, click **Interoperability**.  
The Product Interoperability report lists all available products in your environment associated with the selected vCenter Server.
- 3 (Optional) If there are VMware products in your environment that go undetected, you can manually add them to the list of products to check and regenerate the interoperability report.
  - a Click **Add Product** in the Product Interoperability pane.
  - b Select the VMware product and version you want to include in the interoperability report. Repeat this step for each VMware product you want to add to the report.
  - c To add the selected products to the product inventory click **Done**.
  - d Regenerate the report and verify that the products you added are included in the report.
- 4 (Optional) Click **Export** in the Product Interoperability pane to export and save a copy of the report as a comma-separated values (CSV) file, which allows data to be saved in a tabular format.

## What to do next

- Using the information in the report, you can apply patches and updates to your vCenter Server environment. See [Chapter 7 Patching and Updating vCenter Server 7.0 Deployments](#).
- You can generate a pre-upgrade report that lists actions that you must address to ensure a successful upgrade of vCenter Server in your environment. See [Generate an Interoperability Report for Target vCenter Server Versions](#).

# Generate an Interoperability Report for Target vCenter Server Versions

You can use Update Planner to perform pre-checks and generate reports that provide product interoperability information for recommended update and upgrade versions of vCenter Server.

You can create a vCenter Server pre-update interoperability report to check the compatibility of VMware products in your environment against a pending version of vCenter Server. Update Planner lists the products in your environment associated with the current vCenter Server version, and whether or not those products are compatible with a suggested update version.

## Prerequisites

To use Update Planner, you must join the VMware Customer Experience Improvement Program (CEIP). For information about the CEIP, see the "Configuring Customer Experience Improvement Program" section in *vCenter Server and Host Management*.

## Procedure

- 1 In the vSphere Client, select a vCenter Server for which you want to view an interoperability report.
- 2 On the **Updates** tab, click **Update Planner**
- 3 Select the target vCenter Server on which you want to run an interoperability check from the list of available updates. The list can contain minor updates and major upgrade versions of vCenter Server.
- 4 Click the **Generate Report** drop-down menu and select **Interoperability**.  
The Interoperability report displays in the bottom pane of the Pre-Update Checks panel.
- 5 (Optional) If there are VMware products in your environment that go undetected by Update Planner, you can manually add them to the list of products to check and regenerate the interoperability report.
  - a Click **Add Product** in the Product Interoperability pane.
  - b Select the VMware product and version you want to include in the interoperability report. Repeat this step for each VMware product you want to add to the report.
  - c To add the selected products to the Update Planner product inventory click **Done**.
  - d Regenerate the report and verify that the products you added are included in the report.
- 6 (Optional) Click **Export** in the Product Interoperability pane to save the report as a comma-separated values (CSV) file, which allows data to be saved in a tabular format.

## What to do next

- Using the information in the pre-upgrade report, you can apply patches and updates to your vCenter Server environment. See [Chapter 7 Patching and Updating vCenter Server 7.0 Deployments](#).

- You can generate a pre-upgrade report that lists actions that you must address to ensure a successful upgrade of vCenter Server in your environment. See [Generate an Interoperability Report for Target vCenter Server Versions](#).

## Generate Pre-Update Reports

You can use Update Planner to run pre-checks and generate reports that provide pre-update information. You use this information to make sure that your system meets the minimum software and hardware requirements to ensure a successful upgrade of vCenter Server.

When you generate a pre-update report, Update Planner generates a list with actions that you must address to ensure a successful upgrade of vCenter Server in your environment. The report provides information about problems that might prevent the completion of a software upgrade or update.

### Procedure

- 1 In the vSphere Client, select a vCenter Server for which you want to view a pre-update report.
- 2 On the **Updates** tab, click **Update Planner**
- 3 Select the target vCenter Server on which you want to run a pre-upgrade check from the list of available servers in your environment.
- 4 Click the **Generate Report** drop-down menu and select **Pre-Update Checks**.  
The report displays in the bottom pane of the Pre-Update Checks panel.
- 5 (Optional) Click **Export** in the Pre-Update Checks pane to save the report as a comma-separated values (CSV) file, which allows data to be saved in a tabular format.
- 6 (Optional) Click **Open Appliance Management** to open the vCenter Server Management Interface, or **Download ISO** to download the selected ISO image with which to upgrade vCenter Server to the the selected target release.

You use the vCenter Server Management Interface to perform administrative tasks such as monitoring vCenter Server, changing the host name and the network configuration, and applying patches and updates.

### What to do next

- Using the information in the pre-upgrade report, you can apply patches and updates to your vCenter Server environment. See [Chapter 7 Patching and Updating vCenter Server 7.0 Deployments](#).
- You can generate an interoperability report that lists available VMware products in your environment, and the versions compatible with the vCenter Server version for which you are generating the report. See [Generate an Interoperability Report for Target vCenter Server Versions](#).

# Patching and Updating vCenter Server 7.0 Deployments

# 7

You can update the vCenter Server with patches by using the `software-packages` utility available in the vCenter Server appliance shell.

This chapter includes the following topics:

- [Patching vCenter Server](#)

## Patching vCenter Server

VMware regularly releases patches for the vCenter Server. You can use the Appliance Management Interface or the appliance shell to apply patches to a vCenter Server.

VMware makes patches available on a monthly basis. These patches can only be applied in between major releases of vCenter Server. For example, patches released for the initial release of vCenter Server 7.0, are not applicable to vCenter Server 7.0 Update 1, as any patches previously made available will be included with the Update 1 release.

These patches can be for core product functionality, other packages in the vCenter Server such as Photon, or both.

---

**Note** You must use only the patches provided by VMware to update the packages in your vCenter Server. Updating these packages through any other means may impact the product functionality.

---

VMware distributes the available patches in two forms, one for ISO-based and one for URL-based models of patching.

- You can download the patch ISO images from <https://my.vmware.com/group/vmware/patch>.

VMware publishes a single type of ISO image that contains patches.

Download Filename	Description
<code>VMware-vCenter-Server-Appliance-product_version-build_number-patch-FP.iso</code>	Full product patch for the appliance, which contains the VMware software patches and the fixes related to security and third-party products (e.g. JRE and Photon OS components).

---

- You can configure the vCenter Server appliance to use a repository URL as a source of available patches. The appliance is preset with a default VMware repository URL.

You can download the patches in ZIP format from the VMware Web site at <https://my.vmware.com/web/vmware/downloads> and build a custom repository on a local Web server. The download filename is `VMware-vCenter-Server-Appliance-product_version-build_number-updaterepo.zip`.

## Patching vCenter Server Using the vCenter Server Management Interface

You can use the vCenter Server Management Interface to view the installed patches, check for new patches and install them, and configure automatic checks for available patches.

To perform ISO-based patching, you download an ISO image, attach the ISO image to the CD/DVD drive of the appliance, check for available patches in the ISO image, and install the patches.

To perform URL-based patching, you check for available patches in a repository URL and install the patches. The vCenter Server is preset with a default VMware repository URL for the build profile of the appliance. You can configure the appliance to use the default VMware repository URL or a custom repository URL, for example, a repository URL that you previously built on a local Web server running within your data center.

### Log In to the vCenter Server Management Interface

Log in to the vCenter Server Management Interface to access the vCenter Server configuration settings.

---

**Note** The login session expires if you leave the vCenter Server Management Interface idle for 10 minutes.

---

#### Prerequisites

Verify that the vCenter Server is successfully deployed and running.

#### Procedure

- 1 In a Web browser, go to the vCenter Server Management Interface, `https://appliance-IP-address-or-FQDN:5480`.
- 2 Log in as root.

The default root password is the password that you set while deploying vCenter Server.

### Check for and Stage Patches to the vCenter Server Appliance

Before you install available patches, you can stage the patches to the appliance. You can use the vCenter Server Management Interface to stage patches either from a local repository by attaching an ISO image to the appliance, or from a remote repository directly by using a repository URL.



During the process of staging, the vCenter Server Management Interface validates that a patch is a VMware patch, that the staging area has enough free space, and that the patches are not altered. Only new patches or patches for existing packages that can be upgraded are staged.

If a problem that prevents the successful staging of the patches occurs, vCenter Server suspends the staging process. Review the error messages, correct the problem, and, in many cases, you can resume staging the patches from the point at which vCenter Server encountered the problem.

### Prerequisites

- If you are staging patches from an ISO image that you previously downloaded from <https://my.vmware.com/group/vmware/patch>, you must attach the ISO image to the CD/DVD drive of the vCenter Server. You can configure the ISO image as a datastore ISO file for the CD/DVD drive of the appliance using the vSphere Client. See *vSphere Virtual Machine Administration*.
- If you are staging patches from a remote repository, verify that you have configured the repository settings and that the current repository URL is accessible. See [Configure URL-Based Patching](#).

### Procedure

- 1 Log into the vCenter Server Management Interface as root.

The default root password is the password you set when deploying vCenter Server.

- 2 Click **Update**.
- 3 Click **Check Updates** and select a source.

Option	Description
Check URL	Scans the configured repository URL for available patches.
Check CDROM	Scans the ISO image that you attached to the CD/DVD drive of the appliance for available patches.

In the Available Updates pane, you can view the details about the available patches in the source that you selected.

**Important** Some updates might require a reboot of the system. You can see information about these updates in the Available Updates pane.

- 4 You can run a pre-check of an update to verify that it is compatible with your current deployment.

## 5 Click the staging option you would like to use.

Option	Description
<b>Stage</b>	Stages the selected patches to the vCenter Server appliance for installation at a later time.
<b>Stage and Install</b>	Stages and installs the selected patches to the vCenter Server appliance. For more information on installing patches, see <a href="#">Install vCenter Server Patches</a> .
<b>Unstage</b>	Unstages the selected patches.
<b>Resume</b>	If vCenter Server encounters a problem staging the patches, the vCenter Server Management Interface displays the <b>Resume</b> button. Correct the problem preventing the patches from staging, and click <b>Resume</b> to finish staging the patches. The staging process resumes from the point at which vCenter Server encountered the problem.

### What to do next

If you decided to stage the available patches for installation at a later time, you can now install. See [Install vCenter Server Patches](#).

## Configure the Repository for URL-Based Patching

For URL-based patching, by default the vCenter Server appliance is configured to use the default VMware repository URL that is preset for the build profile of the appliance. You can configure a custom repository URL as the current source of patches for your environment's requirements.

By default the current repository for URL-based patching is the default VMware repository URL.

If vCenter Server is not connected to the Internet or if your security policy requires it, you can build and configure a custom repository. The custom patching repository runs on a local Web server within your data center and replicates the data from the default repository. Optionally, you can set up an authentication policy for accessing the Web server that hosts the custom patching repository.

### Prerequisites

Log in to the vCenter Server Management Interface as root.

## Procedure

1 If you want to configure a custom repository URL, build the repository on your local web server.

- a Download the vCenter Server appliance patch ZIP file from the VMware website at <https://my.vmware.com/web/vmware/downloads>.

vCenter Server is part of VMware vCloud Suite and VMware vSphere, listed under Datacenter & Cloud Infrastructure.

- b On your Web server, create a repository directory under the root.

For example, create the **vc\_update\_repo** directory.

- c Extract the ZIP file into the repository directory.

The extracted files are in the `manifest` and `package-pool` subdirectories.

2 In the vCenter Server Management Interface, click **Update**.

3 Click **Settings**.

4 Select the Repository settings.

Option	Description
<b>Default repository</b>	Uses the default VMware repository URL that is preset for the build profile of the appliance.
<b>Specified repository</b>	Uses a custom repository. You must enter the repository URL, for example, <code>https://web_server_name.your_company.com/vc_update_repo</code> . The repository URL must use a secure protocol such as HTTPS or FTPS.

5 If the specified repository requires authentication, enter the user name and password.

6 (Optional) If you do not want to perform a security certificate check, deselect the **Check Certificate** check box.

If you trust the URL for the repository, you can choose to bypass the certificate check for the repository URL.

7 Click **OK**.

## What to do next

[Install vCenter Server Patches](#)

## Install vCenter Server Patches

You can check for and install patches either from an ISO image or directly from a repository URL.

**Important** The services running in the vCenter Server appliance become unavailable during the installation of the patches. You must perform this procedure during a maintenance period. As a precaution if there is a failure, you can back up the vCenter Server. For information on backing up and restoring vCenter Server, see *vCenter Server Installation and Setup*.

## Prerequisites

- Log in to the vCenter Server Management Interface as root.
- Before you can install available patches, you check for new patches and stage the patches to the vCenter Server appliance. See [Check for and Stage Patches to the vCenter Server Appliance](#).
- If you are patching the appliance from an ISO image that you previously downloaded from <https://my.vmware.com/group/vmware/patch>, you must attach the ISO image to the CD/DVD drive of the vCenter Server appliance. You can configure the ISO image as a datastore ISO file for the CD/DVD drive of the appliance by using the vSphere Client. See *vSphere Virtual Machine Administration*.
- If you are patching the appliance from a repository URL, verify that you have configured the repository settings and that the current repository URL is accessible. See [Configure the Repository for URL-Based Patching](#).

## Procedure

- 1 In the vCenter Server Management Interface, click **Update**.

In the Current version details pane, you can view the vCenter Server version and build number.

- 2 Select the range of staged patches to apply and click **Install**.

---

**Important** Some updates might require a reboot of the system. You can see information about these updates in the Available Updates pane.

---

- 3 Read and accept the End User License Agreement.
- 4 A system pre-check verifies that the patches can be successfully installed with the provided information.  
  
If the pre-check discovers missing or incorrect information, or other problems preventing a successful installation, you are prompted to correct the problem and resume the installation.
- 5 After the installation finishes, click **OK**.
- 6 If the patch installation requires the appliance to reboot, click **Summary**, and click **Reboot** to reset the appliance.

## Results

In the Available Updates pane, you can see the changed update status of the vCenter Server appliance.

## Enable Automatic Checks for vCenter Server Patches

You can configure vCenter Server to perform automatic checks for available patches in the configured repository URL at a regular interval.

### Prerequisites

- Log in to the vCenter Server Management Interface as root.
- Verify that you have configured the repository settings and that the current repository URL is accessible. See [Configure the Repository for URL-Based Patching](#).

### Procedure

- 1 In the vCenter Server Management Interface, click **Update**.
- 2 Click **Settings**.
- 3 Select **Check for updates automatically**, and select the day and time in UTC to perform automatic checks for available patches.
- 4 Click **OK**.

### Results

vCenter Server appliance performs regular checks for available patches in the configured repository URL. In the Available Updates pane, you can view information about the available patches. You can also view the vCenter Server health status for notifications about available patches. See *vCenter Server Configuration*.

## Patching the vCenter Server Appliance by Using the Appliance Shell

You can use the `software-packages` utility in the appliance shell of a vCenter Server appliance to see the installed patches, stage new patches, and install new patches.

To perform ISO-based patching, you download an ISO image, attach the ISO image to the CD/DVD drive of the appliance, optionally stage the available patches from the ISO image to the appliance, and install the patches.

To perform URL-based patching, you optionally stage the available patches from a repository URL to the appliance and install the patches. The vCenter Server appliance is preset with a default VMware repository URL for the build profile of the appliance. You can use the `update.set` command to configure the appliance to use the default VMware repository URL or a custom repository URL, for example, a repository URL that you previously built on a local Web server running within your data center. You can also use the `proxy.set` command to configure a proxy server for the connection between the vCenter Server appliance and the repository URL.

### View a List of All Installed Patches in the vCenter Server Appliance

You can use the `software-packages` utility to see a list of the patches currently applied to the vCenter Server appliance. You can also view the list of the installed patches in chronological order and details about a specific patch.

### Procedure

- 1 Access the appliance shell and log in as a user who has a super administrator role.  
The default user with a super administrator role is root.

- 2 To view the full list of patches and software packages installed in the vCenter Server appliance, run the following command:

```
software-packages list
```

- 3 To view all patches applied to the vCenter Server appliance in chronological order, run the following command:

```
software-packages list --history
```

You see the list in chronological order. A single patch in this list can be an update of multiple different packages.

- 4 To view details about a specific patch, run the following command:

```
software-packages list --patch patch_name
```

For example, if you want to view the details about the VMware-vCenter-Server-Appliance-Patch1 patch, run the following command:

```
software-packages list --patch VMware-vCenter-Server-Appliance-Patch1
```

You can see the complete list of details about the patch, such as vendor, description, and installation date.

## Configure URL-Based Patching

For URL-based patching, the vCenter Server appliance is preset with a default VMware repository URL for the build profile of the appliance. You can use the `update.set` command to configure the appliance to use the default or a custom repository URL as the current source of patches and enable automatic checks for patches.

By default the current repository for URL-based patching is the default VMware repository URL.

---

**Note** You can use the `proxy.set` command to configure a proxy server for the connection between vCenter Server and the repository URL. For more information about the API commands in the appliance shell, see *vCenter Server Configuration*.

---

If vCenter Server is not connected to the Internet or if your security policy requires it, you can build and configure a custom repository. The custom patching repository runs on a local Web server within your data center and replicates the data from the default repository. Optionally, you can set up an authentication policy for accessing the Web server that hosts the custom patching repository.

## Procedure

- 1 If you want to configure a custom repository URL, build the repository on your local web server.

- a Download the vCenter Server appliance patch ZIP file from the VMware website at <https://my.vmware.com/web/vmware/downloads>.

vCenter Server is part of VMware vCloud Suite and VMware vSphere, listed under Datacenter & Cloud Infrastructure.

- b On your Web server, create a repository directory under the root.

For example, create the **vc\_update\_repo** directory.

- c Extract the ZIP file into the repository directory.

The extracted files are in the `manifest` and `package-pool` subdirectories.

- 2 Access the appliance shell and log in as a user who has a super administrator role.

The default user with a super administrator role is `root`.

- 3 To see information about the current URL-based patching settings, run the `update.get` command.

You can see information about the current repository URL, the default repository URL, the time at which the appliance last checked for patches, the time at which the appliance last installed patches, and the current configuration of automatic checks for patches.

- 4 Configure the current repository for URL-based patching.

- To configure the appliance to use the default VMware repository URL, run the following command:

```
update.set --currentURL default
```

- To configure the appliance to use a custom repository URL, run the following command:

```
update.set --currentURL http://web_server_name.your_company.com/vc_update_repo [--username username] [--password password]
```

The square brackets `[]` enclose the command options.

If the custom repository requires authentication, use the `--username username` and `--password password` options.

- 5 To enable automatic checks for vCenter Server appliance patches in the current repository URL at regular intervals, run the following command:

```
update.set --CheckUpdates enabled [--day day] [--time HH:MM:SS]
```

The square brackets `[]` enclose the command options.

Use the `--day day` option to set the day for performing the regular checks for patches. You can set a particular day of the week, for example, `Monday`, or `Everyday`. The default value is `Everyday`.

Use the `--time HH:MM:SS` option to set the time in UTC for performing the regular checks for patches. The default value is `00:00:00`.

The appliance performs regular checks for available patches in the current repository URL.

- 6** To disable automatic checks for vCenter Server patches, run the following command:

```
update.set --CheckUpdates disabled
```

### What to do next

If you configured the appliance to perform automatic checks for available patches, you can regularly view the vCenter Server appliance health status for notifications about available patches. See *vCenter Server Configuration*.

## Stage Patches to the vCenter Server Appliance

Before you install available patches, you can stage the patches to the appliance. You can use the `software-packages` utility to stage patches either from a local repository by attaching an ISO image to the appliance, or from a remote repository directly by using a repository URL.

### Prerequisites

- If you are staging patches from an ISO image that you previously downloaded from <https://my.vmware.com/group/vmware/patch>, you must attach the ISO image to the CD/DVD drive of the vCenter Server appliance. You can configure the ISO image as a datastore ISO file for the CD/DVD drive of the appliance by using the vSphere Client. See *vSphere Virtual Machine Administration*.
- If you are staging patches from a remote repository, verify that you have configured the repository settings and that the current repository URL is accessible. See [Configure URL-Based Patching](#).

### Procedure

- 1** Access the appliance shell and log in as a user who has a super administrator role.

The default user with a super administrator role is `root`.

- 2** Stage the patches.

- To stage the patches included in the attached ISO image, run the following command:

```
software-packages stage --iso
```

- To stage the patches included in the current repository URL, run the following command:

```
software-packages stage --url
```



By default the current repository URL is the default VMware repository URL.

If you want to stage only the third-party patches, use the `--thirdParty` option.

- To stage the patches included in a repository URL that is not currently configured in the appliance, run the following command:

```
software-packages stage --url URL_of_the_repository
```

If you want to stage only the third-party patches, use the `--thirdParty` option.

If you want to directly accept the End User License Agreement, use the `--acceptEulas` option.

For example, to stage only the third-party patches from the current repository URL with directly accepting the End User License Agreement, run the following command:

```
software-packages stage --url --thirdParty --acceptEulas
```

In the process of staging, the command validates that a patch is a VMware patch, that the staging area has enough free space, and that the patches are not altered. Only completely new patches or patches for existing packages that can be upgraded are staged.

- 3 (Optional) To see information about the staged patches, run the following command:

```
software-packages list --staged
```

Each patch includes a metadata file that contains information such as patch version, product name, whether a restart of the system is required, and so on.

- 4 (Optional) To view a list of the staged patches, run the following command:

```
software-packages list --staged --verbose
```

- 5 (Optional) To unstage the staged patches, run the following command:

```
software-packages unstage
```

All directories and files generated by the staging process are removed.

### What to do next

Install the staged patches. See [Install vCenter Server Patches](#).

---

**Important** If you staged the patches from an ISO image, keep the ISO image attached to the CD/DVD drive of the appliance. The ISO image must be attached to the CD/DVD drive of the appliance throughout the staging and installation processes.

---

## Install vCenter Server Patches

You can use the `software-packages` utility to install the staged patches. You can also use the `software-packages` utility to install patches directly from an attached ISO image or repository URL without staging the patch payload.

---

**Important** The services running in the appliance become unavailable during the installation of the patches. You must perform this procedure during a maintenance period. As a precaution in case of failure, you can back up the vCenter Server appliance. For information about backing up and restoring vCenter Server, see *vCenter Server Installation and Setup*.

---

### Prerequisites

- If you are installing staged patches, verify that you staged the correct patch payload. See [Stage Patches to the vCenter Server Appliance](#).
- If you are installing patches that you previously staged from an ISO image, verify that the ISO image is attached to the CD/DVD drive of the vCenter Server appliance. See [Stage Patches to the vCenter Server Appliance](#).
- If you are installing patches directly from an ISO image that you previously downloaded from <https://my.vmware.com/group/vmware/patch>, you must attach the ISO image to the CD/DVD drive of the vCenter Server appliance. You can configure the ISO image as a datastore ISO file for the CD/DVD drive of the appliance by using the vSphere Client. See *vSphere Virtual Machine Administration*.
- If you are installing patches directly from a repository, verify that you have configured the repository settings and that the current repository URL is accessible. See [Configure URL-Based Patching](#).

### Procedure

- 1 Access the appliance shell and log in as a user who has a super administrator role.  
The default user with a super administrator role is root.
- 2 Install the patches.

- To install staged patches, run the following command:

```
software-packages install --staged
```

- To install patches directly from an attached ISO image, run the following command:

```
software-packages install --iso
```

- To install patches directly from the current repository URL, run the following command:

```
software-packages install --url
```

By default the current repository URL is the default VMware repository URL.

- To install patches directly from a repository URL that is not currently configured, run the following command:

```
software-packages install --url URL_of_the_repository
```

If you want to directly accept the End User License Agreement, use the `--acceptEulas` option.

For example, to install patches from the current repository URL without staging the patches with directly accepting the End User License Agreement, run the following command:

```
software-packages install --url --acceptEulas
```

- 3 If the patch installation requires a reboot of the appliance, run the following command to reset the appliance.

```
shutdown reboot -r "patch reboot"
```

## Patch a vCenter High Availability Environment

To patch a vCenter Server Appliance configured in a vCenter High Availability (HA) cluster, you must remove the vCenter Server High Availability configuration and delete the passive and witness nodes. After patching the vCenter Server Appliance, you must re-create your vCenter Server High Availability clusters.

This procedure describes how to remove the vCenter HA configuration.

### Procedure

- 1 In the vSphere Client, log in to the vCenter Server from which you want to remove the vCenter HA configuration.
- 2 Click the **Configure** tab, and select **vCenter HA**.
- 3 (Conditional) If you are using the vSphere Web Client, click **Edit**.
- 4 Select **Remove vCenter HA**.
  - The vCenter HA cluster's configuration is removed from the Active, Passive, and Witness nodes.
  - The Active node continues to run as a standalone vCenter Server Appliance.
- 5 Delete the Passive and Witness nodes.

### What to do next

Patch the vCenter Server Appliance as described in either [Patching vCenter Server Using the vCenter Server Management Interface](#) or [Patching the vCenter Server Appliance by Using the Appliance Shell](#).

After patching the vCenter Server Appliance, you can configure vCenter HA. For information about configuring vCenter HA, see *vSphere Availability*.

# Troubleshooting a vSphere Upgrade



The installation and upgrade software enables you to identify problems on the host machine that can cause an installation, upgrade, or migration to fail.

For interactive installations, upgrades, and migrations, the errors or warnings are displayed on the final panel of the installer, where you are asked to confirm or cancel the installation or upgrade. For scripted installations, upgrades, or migrations, the errors or warnings are written to the installation log file. You can also consult the product release notes for known problems.

vSphere Update Manager provides custom messages for these errors or warnings. To see the original errors and warnings returned by the precheck script during an Update Manager host upgrade scan, review the Update Manager log file `vmware-vum-server-log4cpp.log`.

The *vSphere Upgrade* guide describes how to use VMware products and their features. If you encounter problems or error situations that are not described in this guide, you may find a solution in VMware Knowledge Base. You can also use VMware Community Forums to find others with same problem or ask for help, or you can open Support Request to get help from VMware service professional.

This chapter includes the following topics:

- [Collect Installation Logs for vCenter Server Appliance](#)
- [Errors and Warnings Returned by the Installation and Upgrade Precheck Script](#)
- [Upgrade Issues with vCenter Server Containing Host Profiles](#)
- [Roll Back a vCenter Server Instance on Windows When vCenter Server Upgrade Fails](#)
- [Collect Logs to Troubleshoot ESXi Hosts](#)

## Collect Installation Logs for vCenter Server Appliance

You can collect installation log files and check these files to identify the source of a failure if vCenter Server appliance stops responding during initial startup.

## Procedure

- 1 Access the vCenter Server appliance shell.

Option	Description
<b>If you have direct access to the appliance</b>	Press Alt+F1.
<b>To connect remotely</b>	Use SSH or another remote console connection to start a session to the appliance.

- 2 Enter a user name and password that the appliance recognizes.
- 3 In the appliance shell, run the `pi shell` command to access the Bash shell.
- 4 In the Bash shell, run the `vc-support.sh` script to generate a support bundle.  
This command generates a `.tgz` file in `/storage/log`.
- 5 Export the generated support bundle to the `user@x.x.x.x:/tmp` folder.

```
scp /var/tmp/vc-etco-vm-vlan11-dhcp-63-151.eng.vmware.com-2014-02-28--21.11.tgz
user@x.x.x.x:/tmp
```

- 6 Determine which `firstboot` script failed.

```
cat /var/log/firstboot/firstbootStatus.json
```

### What to do next

To identify potential causes of the failure, examine the log file of the `firstboot` script that failed.

## Errors and Warnings Returned by the Installation and Upgrade Precheck Script

The installation and upgrade precheck script runs tests to identify problems on the host machine that can cause an installation, upgrade, or migration to fail.

For interactive installations, upgrades, and migrations, the errors or warnings are displayed on the final screen of the GUI installer, where you are asked to confirm or cancel the installation or upgrade. For scripted installations, upgrades, or migrations, the errors and warnings are written to the installation log file.

vSphere Update Manager provides custom messages for these errors or warnings. To see the original errors and warnings returned by the precheck script during an Update Manager host upgrade scan, review the Update Manager log file `vmware-vum-server-log4cpp.log`.

**Table 8-1. Error and Warning Codes That Are Returned by the Installation and Upgrade Precheck Script**

Error or Warning	Description
64BIT_LONGMODESTATUS	The host processor must be 64-bit.
COS_NETWORKING	Warning. An IPv4 address was found on an enabled service console virtual NIC that has no corresponding address in the same subnet in the VMkernel. A separate warning appears for each such occurrence.
CPU_CORES	The host must have at least two cores.
DISTRIBUTED_VIRTUAL_SWITCH	If the Cisco Virtual Ethernet Module (VEM) software is found on the host, the test checks that the upgrade also contains the VEM software. The test also determines whether the upgrade supports the same version of the Cisco Virtual Supervisor Module (VSM) as the existing version on the host. If the software is missing or is compatible with a different version of the VSM, the test returns a warning. The result indicates which version of the VEM software was expected on the upgrade ISO and which versions, if any, were found. You can use ESXi Image Builder CLI to create a custom installation ISO that includes the appropriate version of the VEM software.
HARDWARE_VIRTUALIZATION	Warning. If the host processor does not have hardware virtualization, or if hardware virtualization is not turned on in the host BIOS, host performance suffers. You can enable hardware virtualization in the host machine boot options panel. See your hardware vendor's documentation.
MD5_ROOT_PASSWORD	This test checks that the root password is encoded in MD5 format. If a password is not encoded in MD5 format, it might be significant only to eight characters. In this case, any characters after the first eight are no longer authenticated after the upgrade, which can create a security problem. To work around this problem, see Knowledge Base article <a href="#">KB 1024500</a> .
MEMORY_SIZE	The host requires the specified amount of memory to upgrade.
PACKAGE_COMPLIANCE	vSphere Update Manager upgrade to vSphere Lifecycle Manager only. This test checks the existing software on the host against the software contained on the upgrade ISO to determine whether the host has been successfully upgraded. If any of the packages are missing or are an older version than the package on the upgrade ISO, the test returns an error. The test results indicate which software was found on the host and which software was found on the upgrade ISO.
PARTITION_LAYOUT	You can upgrade or migrate software only if at most one VMFS partition on the disk is being upgraded. The VMFS partition must begin after sector 1843200.

**Table 8-1. Error and Warning Codes That Are Returned by the Installation and Upgrade Precheck Script (continued)**

Error or Warning	Description
POWERPATH	This test checks for the installation of EMC PowerPath software, consisting of a CIM module and a kernel module. If either of these components is found on the host, the test checks that matching components, such as CIM or the VMkernel and module, also exist in the upgrade. If they do not exist, the test returns a warning that indicates which PowerPath components were expected on the upgrade ISO and which, if any, were found.
PRECHECK_INITIALIZE	This test checks that the precheck script can be run.
SANE_ESX_CONF	The <code>/etc/vmware/esx.conf</code> file must exist on the host.
SPACE_AVAIL_ISO	vSphere Update Manager only. The host disk must have enough free space to store the contents of the installer CD or DVD.
SPACE_AVAIL_CONFIG	vSphere Update Manager upgrade to vSphere Lifecycle Manager only. The host disk must have enough free space to store the legacy configuration between reboots.
SUPPORTED_ESX_VERSION	You can upgrade or migrate to ESXi 7.0 only from version 6.0 ESXi hosts.
TBOOT_REQUIRED	This message applies only to vSphere Update Manager upgrade to vSphere Lifecycle Manager only. The upgrade fails with this error when the host system is running in trusted boot mode (tboot), but the ESXi upgrade ISO does not contain any tboot VIBs. This test prevents an upgrade that can make the host less secure.
UNSUPPORTED_DEVICES	Warning. This test checks for unsupported devices. Some PCI devices are not supported in ESXi 7.0.
UPDATE_PENDING	This test checks the host for VIB installations that require a reboot. This test fails if one or more such VIBs are installed, but the host has not yet been rebooted. In these conditions, the precheck script is unable to determine reliably which packages are currently installed on the host. If this test fails, it may not be safe to rely on the rest of the precheck tests to determine whether an upgrade is safe.  If you encounter this error, restart the host and retry the upgrade.

## Upgrade Issues with vCenter Server Containing Host Profiles

Most common issues that might occur during a vCenter Server upgrade to version 7.0, that contains host profiles.

- For issues occurring during a vCenter Server upgrade or ESXi upgrade, see *Troubleshooting a vSphere Upgrade*.
- If upgrading vCenter Server 6.5 or 6.7, containing host profiles with version earlier than 6.5, results with a failure, see [KB 52932](#).
- For error `There is no suitable host in the inventory as reference host for the profile Host Profile. The profile does not have any associated reference host`, see [KB 2150534](#).
- If an error occurs when you import a host profile to an empty vCenter Server inventory, see *vSphere Host Profiles for Reference Host is Unavailable*.
- If a host profile compliance check fails for NFS datastore, see *vSphere Host Profiles for Host Profile without NFS Datastore*.
- If compliance check fails with an error for the `UserVars.ESXiVPsDisabledProtocols` option, when an ESXi host upgraded to version 7.0 is attached to a host profile with version 6.5, see VMware vSphere 7.0 Release Notes.

## Roll Back a vCenter Server Instance on Windows When vCenter Server Upgrade Fails

You can roll back or restore a vCenter Server instance on Windows when an upgrade of vCenter Server with an external Platform Services Controller fails after the export stage and the legacy environment has been uninstalled.

### Prerequisites

The roll back or restore of vCenter Server applies when all of the following conditions apply:

- You must have access to the vCenter Server for Windows machine.
- The vCenter Server instance is attached to an external Platform Services Controller.
- The upgrade of the vCenter Server instance attached to the Platform Services Controller instance is in a failed state after the export stage and uninstallation of the legacy vCenter Server.
- Ensure that vCenter Server rollback happened properly in case of upgrade failure and that no stale failed upgrade log entries remain.



For Rollback Method 1:

- To clean up vCenter Server appliance 7.0 data from the legacy Platform Services Controller, see [KB 2106736](#).
- Use a vCenter Server database snapshot taken before the start of the vCenter Server upgrade.

For Rollback Method 2:

- Use a powered off snapshot of the vCenter Server before the vCenter Server upgrade.
- Use a Platform Services Controller snapshot taken after the Platform Services Controller node upgrade and before the start of the vCenter Server upgrade.
- Use a vCenter Server snapshot taken after the Platform Services Controller upgrade and before the start of the vCenter Server upgrade.

### Procedure

- ◆ You can restore the legacy vCenter Server using Rollback Method 1 or Rollback Method 2.
  - Use Rollback Method 1.
    - a Manually clean up vCenter Server appliance data from Platform Services Controller.
    - b Restore the legacy vCenter Server database from a backup which was taken before the upgrade.
    - c Point the legacy vCenter Server instance to the Platform Services Controller, and also point to the database with the restored data.
    - d Ensure that the vCenter Server services are up and running.
  - Use Rollback Method 2.
    - a Restore the Platform Services Controller instance from a snapshot to the point where you were about to start vCenter Server upgrade. You can use a backup for a Windows configuration or use another backup and restore approach to revert the snapshot.
    - b Restore the vCenter Server instance from a snapshot.
    - c Restore the vCenter Server database from a snapshot.
    - d Ensure that the vCenter Server services are up and running.

For Rollback Method 2, you will lose all data written to Platform Services Controller after the vCenter Server upgrade has been started when you restore from the Platform Services Controller snapshot taken before that point in time.

## Collect Logs to Troubleshoot ESXi Hosts

You can collect installation or upgrade log files for ESXi. If an installation or upgrade fails, checking the log files can help you identify the source of the failure.

### Solution

- 1 Enter the `vm-support` command in the ESXi Shell or through SSH.
- 2 Navigate to the `/var/tmp/` directory.
- 3 Retrieve the log files from the `.tgz` file.