



VMware vCenter Server™ 6.0 Deployment Guide

TECHNICAL WHITE PAPER

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Introduction

The VMware vCenter Server™ 6.0 release introduces new, simplified deployment models. The components that make up a vCenter Server installation have been grouped into two types: *embedded* and *external*. Embedded refers to a deployment in which all components—this can but does not necessarily include the database—are installed on the same virtual machine. External refers to a deployment in which vCenter Server is installed on one virtual machine and the Platform Services Controller (PSC) is installed on another. The Platform Services Controller is new to vCenter Server 6.0 and comprises VMware vCenter™ Single Sign-On™, licensing, and the VMware Certificate Authority (VMCA).

Embedded installations are recommended for standalone environments in which there is only one vCenter Server system and replication to another Platform Services Controller is not required. If there is a need to replicate with other Platform Services Controllers or there is more than one vCenter Single Sign-On enabled solution, deploying the Platform Services Controller(s) on separate virtual machine(s)—via external deployment—from vCenter Server is required.

This paper defines the services installed as part of each deployment model, recommended deployment models (reference architectures), installation and upgrade instructions for each reference architecture, postdeployment steps, and certificate management in VMware vSphere 6.0.

VMware vCenter Server 6.0 Services

SERVICE	INSTALLED WITH
VMware AFD Service	vCenter Server and PSC
VMware Certificate Service	PSC
VMware Component Manager	vCenter Server and PSC
VMware Content Library Service	vCenter Server
VMware Directory Service	PSC
VMware ESX Agent Manager	vCenter Server
VMware HTTP Reverse Proxy	vCenter Server and PSC
VMware Identity Management Service	PSC
VMware vCenter Inventory Service	vCenter Server
VMware License Service	PSC
VMware Message Bus Configuration Service	vCenter Server
VMware Performance Charts	vCenter Server
VMware Postgres	vCenter Server (vCenter Server Appliance, Microsoft Windows if embedded database is chosen)
VMware Security Token Service	PSC
VMware Service Control Agent	vCenter Server and PSC
VMware Syslog Collector	vCenter Server
VMware System and Hardware Health Manager	vCenter Server
VMware vAPI Endpoint	vCenter Server

SERVICE	INSTALLED WITH
VMware vCenter Configuration Service	vCenter Server and PSC
VMware vCenter Workflow Manager	vCenter Server
VMware VirtualCenter Server	vCenter Server
VMware vService Manager	vCenter Server
VMware vSphere Auto Deploy Waiter	vCenter Server
VMware vSphere ESXi™ Dump Collector	vCenter Server
VMware vSphere ESXi Dump Collector Web Service	vCenter Server
VMware vSphere Profile-Driven Storage	vCenter Server
VMware vSphere Web Client	vCenter Server

Table 1. vCenter Server and Platform Services Controller Services

Requirements

General

A few requirements are common to both installing vCenter Server on Microsoft Windows and deploying VMware vCenter Server Appliance™. Ensure that all of these prerequisites are in place before proceeding with a new installation or an upgrade.

- DNS – Ensure that resolution is working for all system names via fully qualified domain name (FQDN), short name (host name), and IP address (reverse lookup).
- Time – Ensure that time is synchronized across the environment.
- Passwords – vCenter Single Sign-On passwords must contain only ASCII characters; non-ASCII and extended (or high) ASCII characters are not supported.

Windows Installation

Installing vCenter Server 6.0 on a Windows Server requires a Windows 2008 SP2 or higher 64-bit operating system (OS). Two options are presented: Use the local system account or use a Windows domain account. With a Windows domain account, ensure that it is a member of the local computer's administrator group and that it has been delegated the "Log on as a service" right and the "Act as part of the operating system" right. This option is not available when installing an external Platform Services Controller.

Windows installations can use either a supported external database or a local PostgreSQL database that is installed with vCenter Server and is limited to 20 hosts and 200 virtual machines. Supported external databases include Microsoft SQL Server 2008 R2, SQL Server 2012, SQL Server 2014, Oracle Database 11g, and Oracle Database 12c. When upgrading to vCenter Server 6.0, if SQL Server Express was used in the previous installation, it will be replaced with PostgreSQL. External databases require a 64-bit DSN. DSN aliases are not supported.

When upgrading vCenter Server to vCenter Server 6.0, only versions 5.0 and later are supported. If the vCenter Server system being upgraded is not version 5.0 or later, such an upgrade is required first.

Table 2 outlines minimum hardware requirements per deployment environment type and size when using an external database. If VMware vSphere Update Manager™ is installed on the same server, add 125GB of disk space and 4GB of RAM.

RESOURCES	TINY: UP TO 10 HOSTS/ 100 VIRTUAL MACHINES OR EXTERNAL PSC	SMALL: UP TO 100 HOSTS/ 1,000 VIRTUAL MACHINES	MEDIUM: UP TO 400 HOSTS/ 4,000 VIRTUAL MACHINES	LARGE: UP TO 1,000 HOSTS/ 10,000 VIRTUAL MACHINES
CPU	2	4	8	16
Memory	8GB	16GB	24GB	32GB
Disk Space	50GB 10GB (PSC)	100GB	100GB	100GB

Table 2. Minimum Hardware Requirements - Windows Installation

Appliance Deployment

vCenter Server Appliance can use either a local PostgreSQL database that is built in to the appliance, which is recommended, or an external database. Unlike Windows support for PostgreSQL, vCenter Server Appliance supports up to 1,000 hosts or 10,000 virtual machines at full vCenter Server scale. Supported external databases include Oracle Database 11g and Oracle Database 12c. External database support is being deprecated in this release; this is the last release that supports the use of an external database with vCenter Server Appliance.

When deploying vCenter Server Appliance, the target host must be ESXi 5.0 or later. In addition, prechecks such as connectivity to an external database, NTP server, DNS server, and so on, are performed on the client deploying the appliance rather than against the target host and destination port group. This does not ensure that all required connectivity is available from the ESXi host and the destination port group of vCenter Server Appliance. Users must ensure that the ESXi host and port group have the required connectivity.

Upgrading is possible only from versions 5.1 update 3 and later.

Table 3 outlines minimum hardware requirements per deployment environment type and size.

RESOURCES	TINY: UP TO 10 HOSTS/ 100 VIRTUAL MACHINES OR EXTERNAL PSC	SMALL: UP TO 100 HOSTS/ 1,000 VIRTUAL MACHINES	MEDIUM: UP TO 400 HOSTS/ 4,000 VIRTUAL MACHINES	LARGE: UP TO 1,000 HOSTS/ 10,000 VIRTUAL MACHINES
CPU	2	4	8	16
Memory	8GB	16GB	24GB	32GB
Disk Space (External PSC)	86GB (vCenter) 30GB (PSC)	106GB	245GB	295GB
Disk Space (Embedded PSC)	116GB	136GB	275GB	325GB

Table 3. Minimum Hardware Requirements - vCenter Server Appliance Deployment

Reference Architectures

We examine the following architectures in this deployment guide:

- Fresh embedded deployment
- Upgrade in which all vCenter Server components are installed on a single machine
- Fresh external deployments
- Upgrade with external vCenter Single Sign-On
- Fresh vCenter Single Sign-On high availability deployment
- Upgrade of vCenter Single Sign-On high availability

Fresh Embedded Deployment

A fresh, or new, embedded installation is the simplest of all the deployments. In this scenario, vCenter Server and the Platform Services Controller are deployed together onto a single virtual machine.

The vCenter Server database can be either local or remote. On the Windows platform, the local PostgreSQL database is limited to 20 hosts and 200 virtual machines.

Embedded installations are recommended for standalone environments in which there is only one vCenter Server and replication to another Platform Services Controller is not required. If there is a need to replicate with other Platform Services Controllers or there is more than one vCenter Single Sign-On enabled solution, deploying the Platform Services Controller(s) on separate virtual machine(s)—via external deployment—from vCenter Server is required.

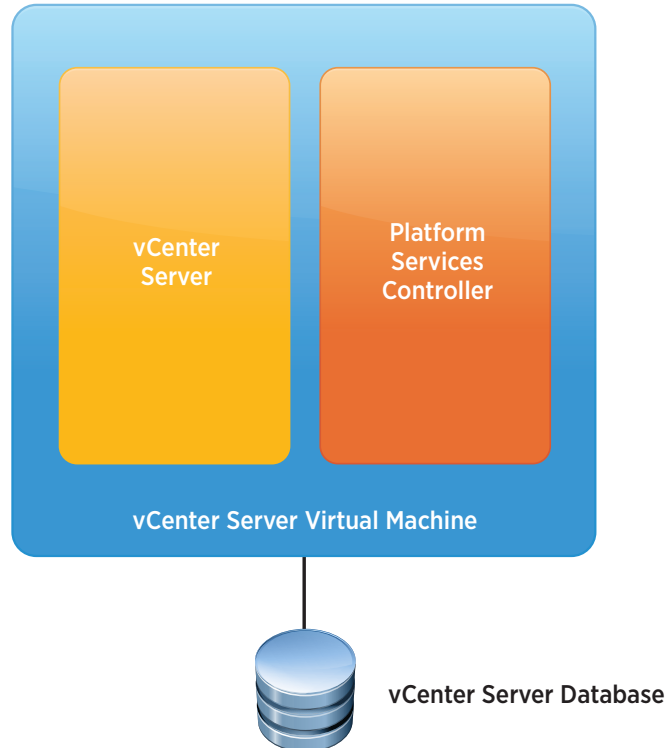


Figure 1. Embedded Architecture

Upgrade in Which All vCenter Server Components Are Installed on a Single Machine

Upgrading vCenter Server 5.0 or vCenter Server with vCenter Single Sign-On—that is, vCenter Server 5.1 or 5.5—installed on the same virtual machine can be accomplished using the embedded deployment method.

All vCenter Server components are upgraded. If upgrading from vCenter Server 5.0, an external Platform Services Controller can be installed or an embedded one can be used. vCenter Single Sign-On in vCenter Server 5.1 and 5.5 is upgraded to a Platform Services Controller. In all upgrade scenarios, all services listed in Table 1 are installed or upgraded.

The vCenter Server database is upgraded during vCenter Server upgrade. On Windows installations using the embedded SQL Server Express database, SQL Server Express is migrated to the PostgreSQL database during the upgrade.

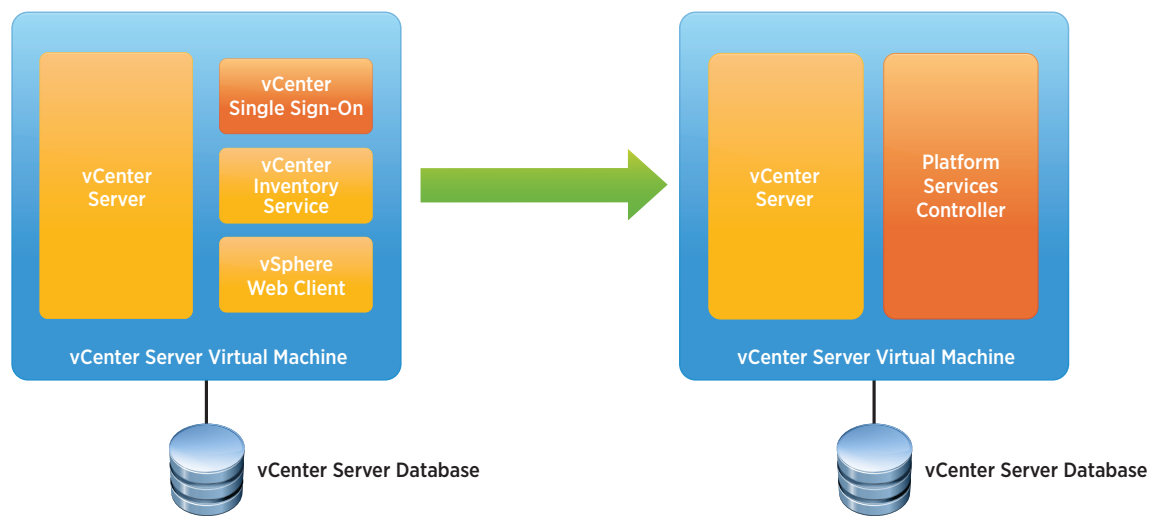


Figure 2. Upgraded Embedded Architecture

Fresh External Deployment

A fresh, or new, external deployment involves running the deployment wizard twice. The first time is to deploy the Platform Services Controller. After this successful deployment, vCenter Server is deployed.

The vCenter Server database can be either local or remote. On the Windows platform, the local PostgreSQL database is limited to 20 hosts and 200 virtual machines.

Deploying the Platform Services Controller externally is recommended for all but standalone vCenter Server systems.

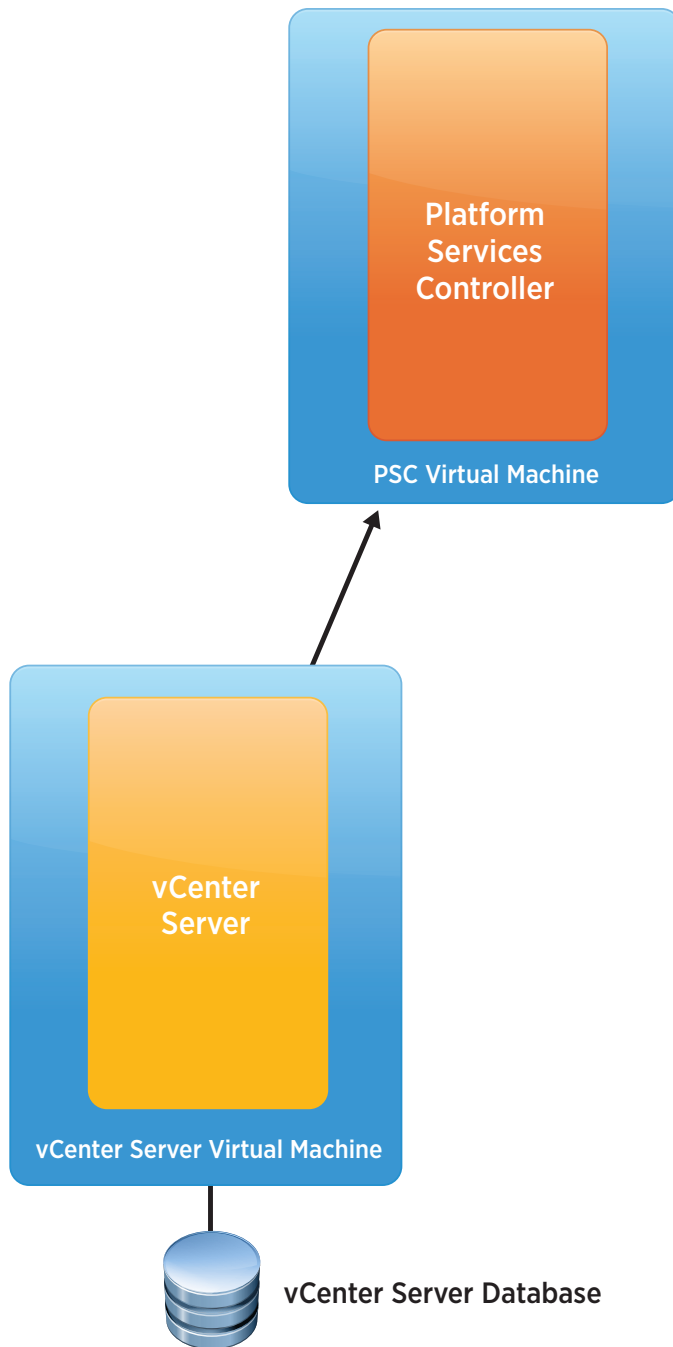


Figure 3. External Platform Services Controller Architecture

Upgrade External vCenter Single Sign-On

When upgrading from vCenter Server 5.1 or 5.5 and vCenter Single Sign-On is deployed externally from vCenter Server, vCenter Single Sign-On is first upgraded to a Platform Services Controller. After the Platform Services Controller has been deployed, the vCenter Server system can be upgraded.

The vCenter Server database is upgraded during the vCenter Server upgrade. In Windows installations using the embedded SQL Server Express database, SQL Server Express is migrated to the PostgreSQL database during the upgrade.

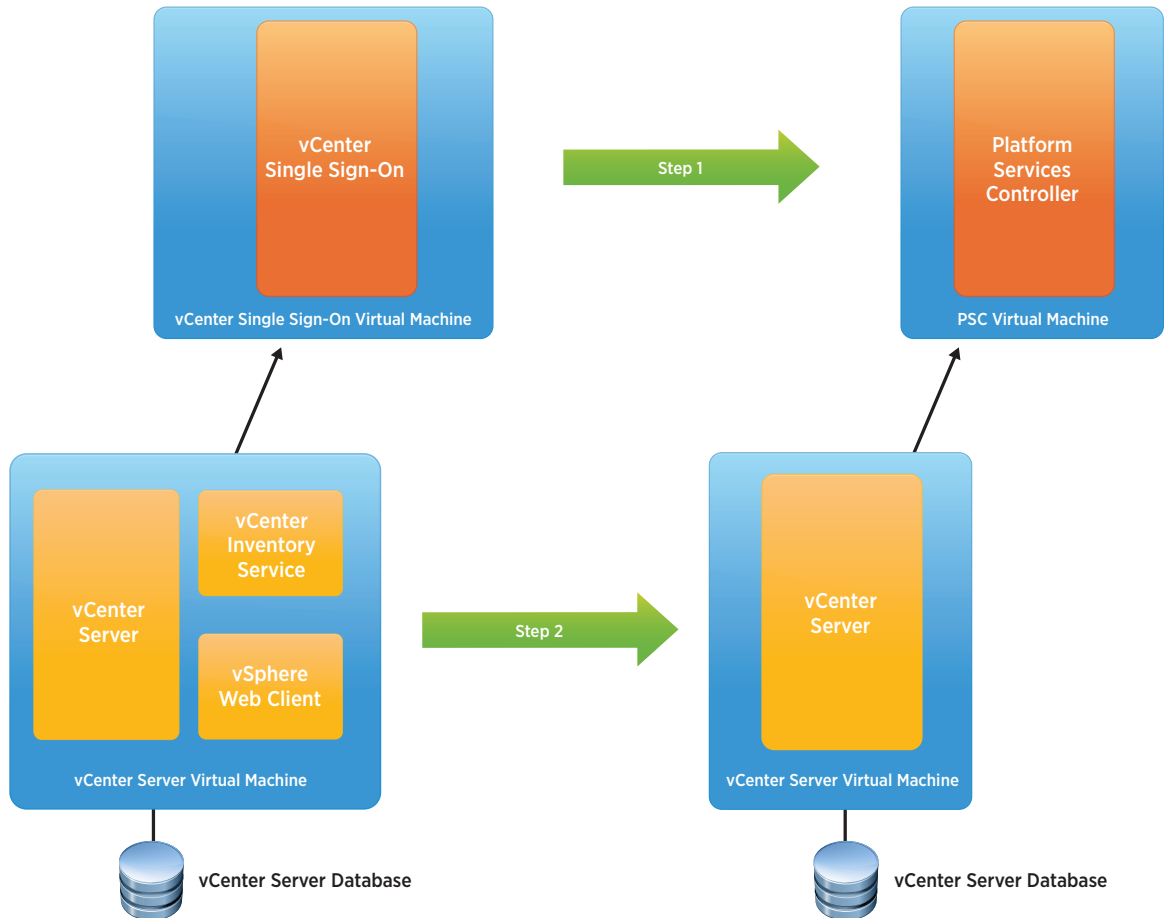


Figure 4. Upgraded External Platform Services Controller Architecture

Fresh vCenter Single Sign-On High Availability Deployment

A fresh, or new, vCenter Single Sign-On high availability deployment is recommended when there are multiple vCenter Server systems or vCenter Single Sign-On enabled solutions that require a high level of uptime.

When deploying the Platform Services Controller externally for multiple services, availability of the Platform Services Controller must be considered. In some cases, simply having the Platform Services Controller located in a vSphere cluster with VMware vSphere High Availability enabled is sufficient. In other cases, having more than one Platform Services Controller deployed in a highly available architecture is recommended. This requires a network load balancer. In Figure 5, we examine redundant Platform Services Controllers behind a network load balancer.

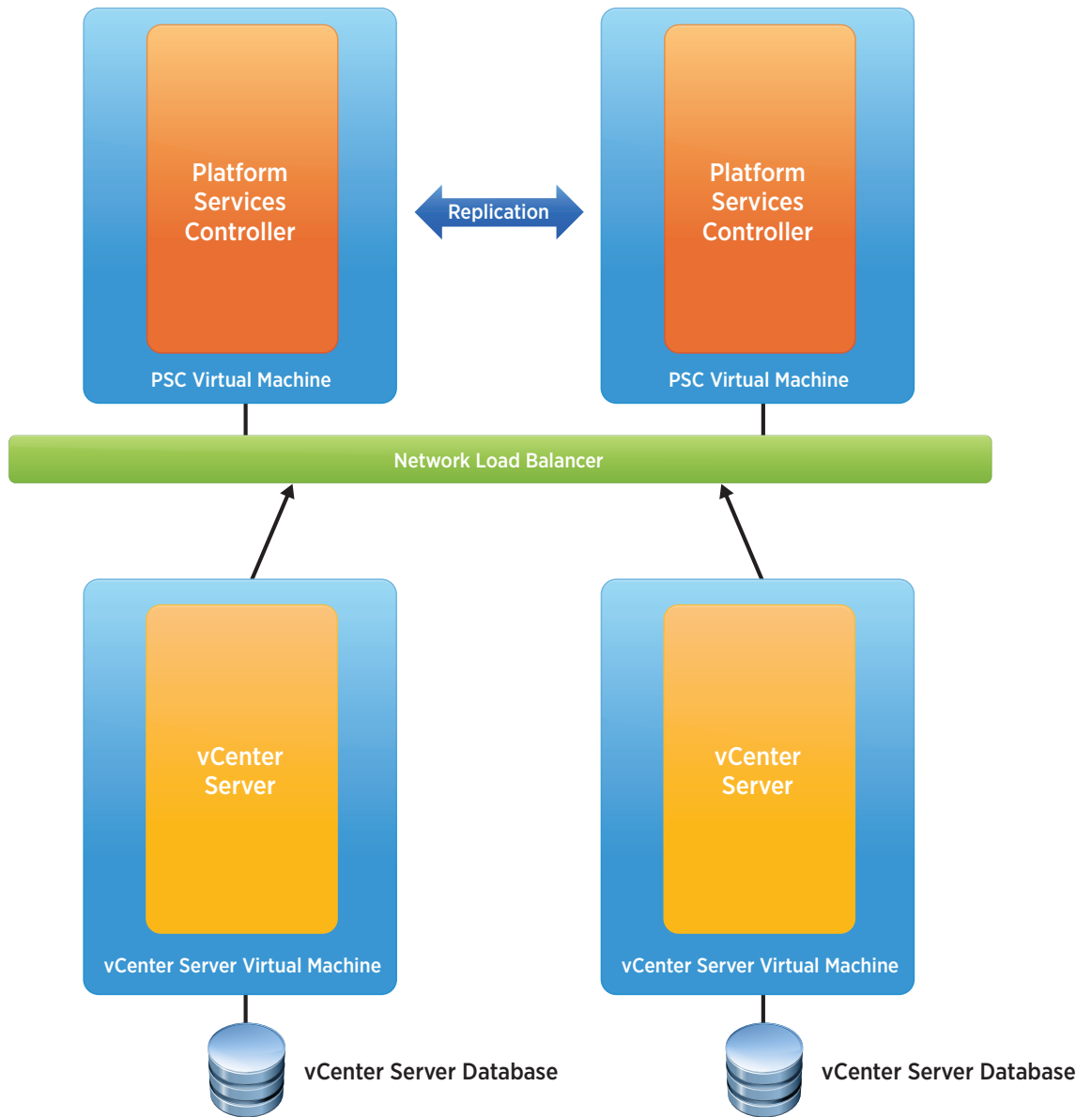


Figure 5. Highly Available Platform Services Controllers

Upgrade of vCenter Single Sign-On High Availability

Upgrading an existing vCenter Single Sign-On high availability deployment converts vCenter Single Sign-On servers to Platform Services Controllers. vCenter Single Sign-On 5.5 and previous versions do not work with vCenter Server 6.0, so upgrading vCenter Single Sign-On to Platform Services Controller is a prerequisite.

After the Platform Services Controllers are up and running, the load balancer rules must be adjusted to load-balance the Platform Services Controller ports before attempting to upgrade vCenter Server. Session affinity is required based on source address and must-span ports. If vCenter Server initiates communication to the Platform Services Controller on port 443 and is placed on the first Platform Services Controller, all subsequent requests must also go to the first Platform Services Controller.

Upgrading from vCenter Single Sign-On high availability has been tested and validated only when upgrading from vCenter Server 5.5 and when the [vCenter Single Sign-On with network load balancer guide](#) is followed to set up the vCenter Single Sign-On high availability environment.

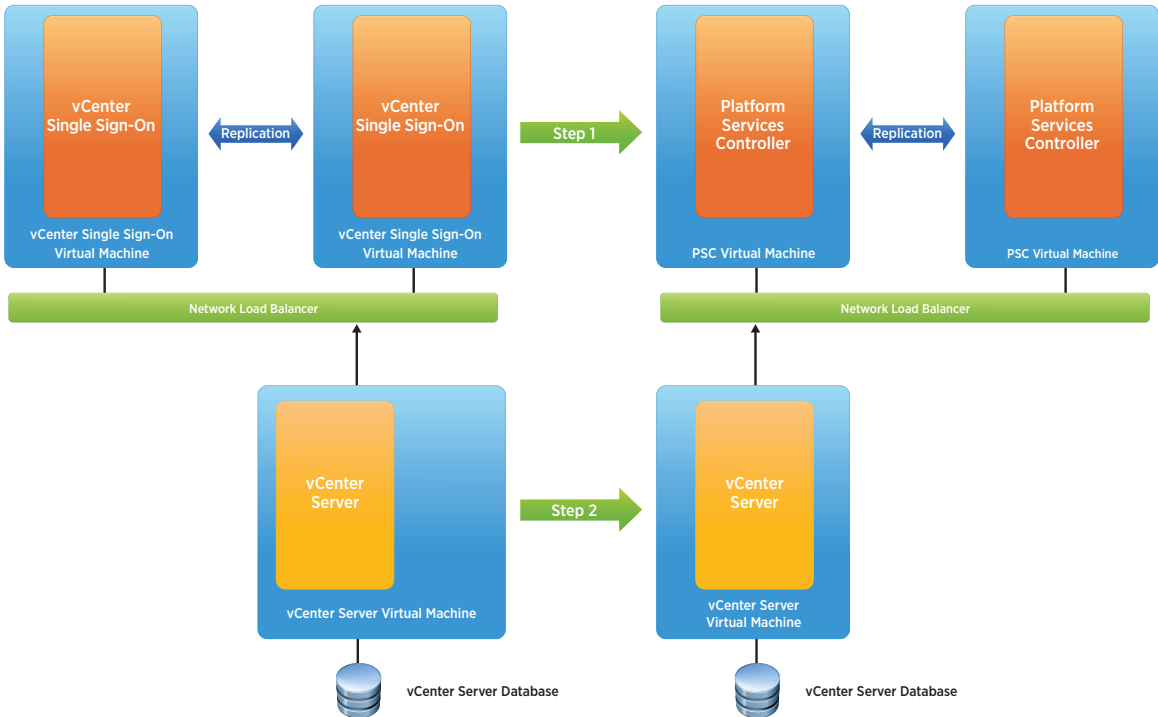


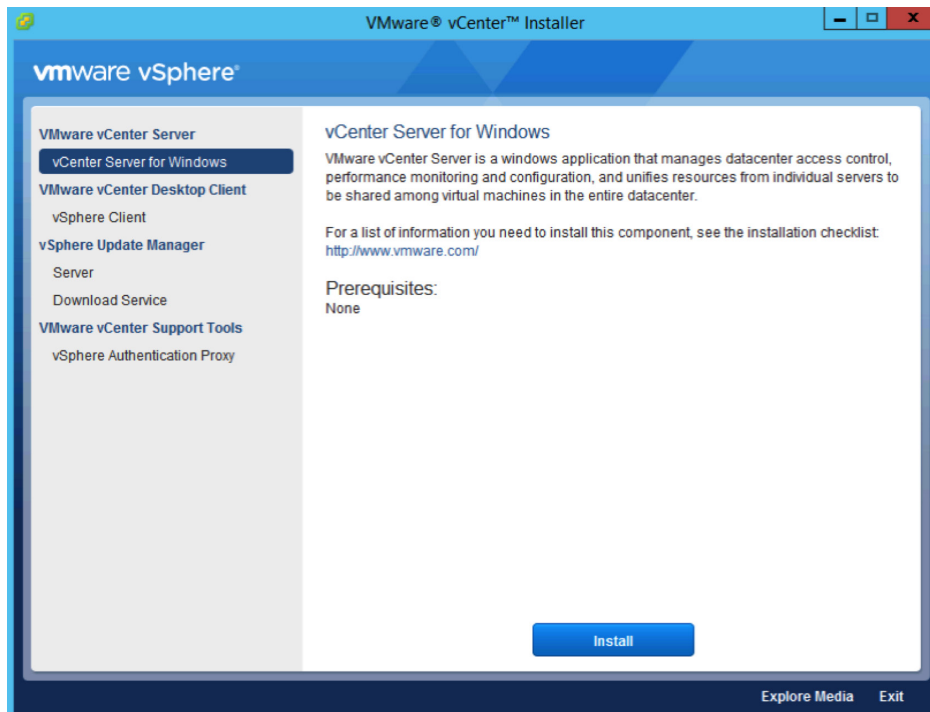
Figure 6. Upgrade of Highly Available Single Sign-On to Highly Available Platform Services Controller

Deploying vCenter Server 6.0

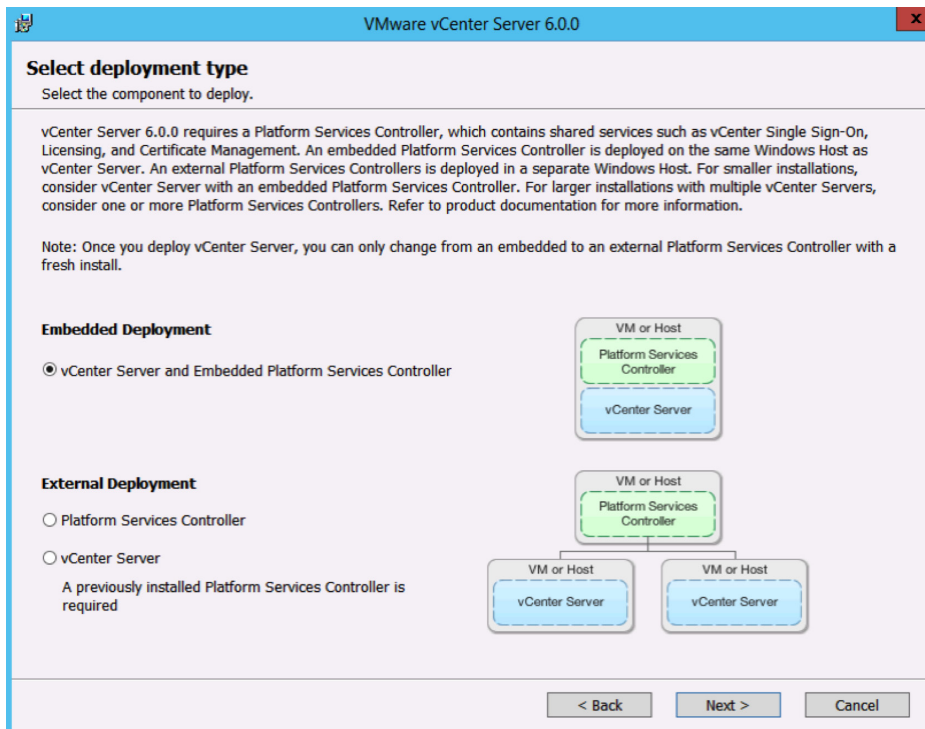
Fresh Embedded Deployment

Windows Deployment

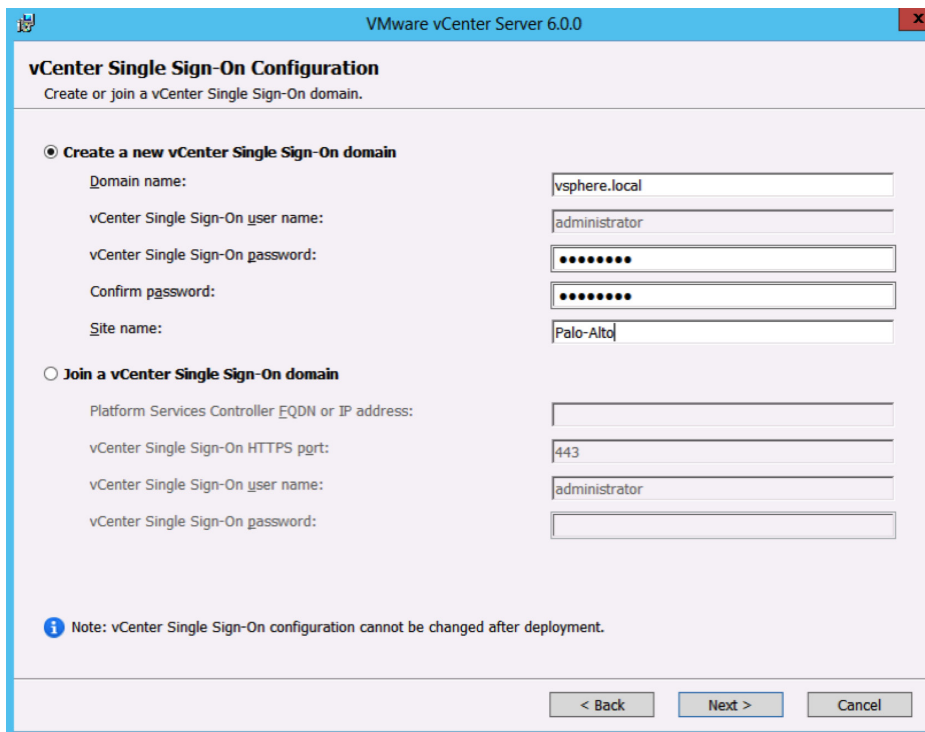
1. Verify all prerequisites.
2. If using a remote database, ensure that a 64-bit DSN has been created. DSN aliases are not supported. This step is not necessary if using the local PostgreSQL database.
3. Mount the vCenter Server 6.0 ISO image.
4. If autorun does not start, execute autorun.exe.
5. Select **vCenter Server for Windows** and click **Install**.



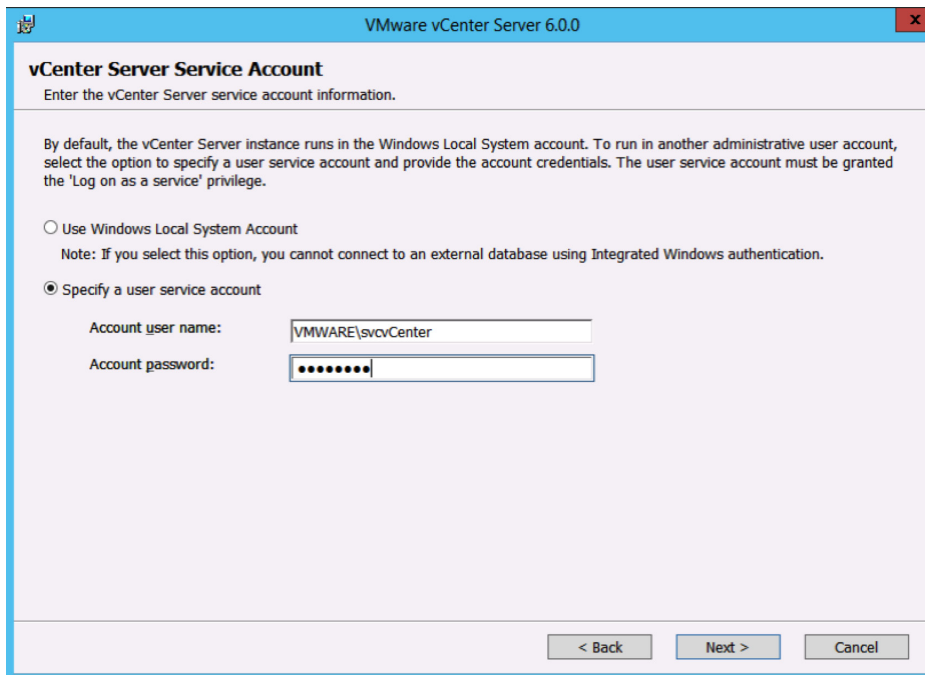
6. Click **Next**.
7. Accept the license agreements.
8. Select **Embedded Deployment** and click **Next**.



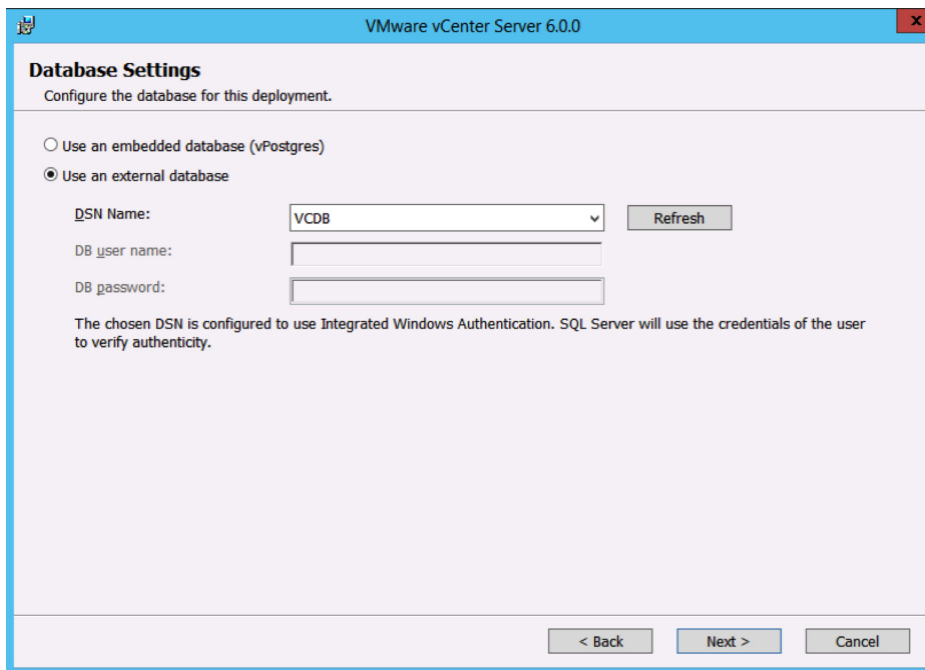
9. Verify that the FQDN is correct and click **Next**.
10. Enter a **password** and **Site name** for vCenter Single Sign-On and click **Next**.



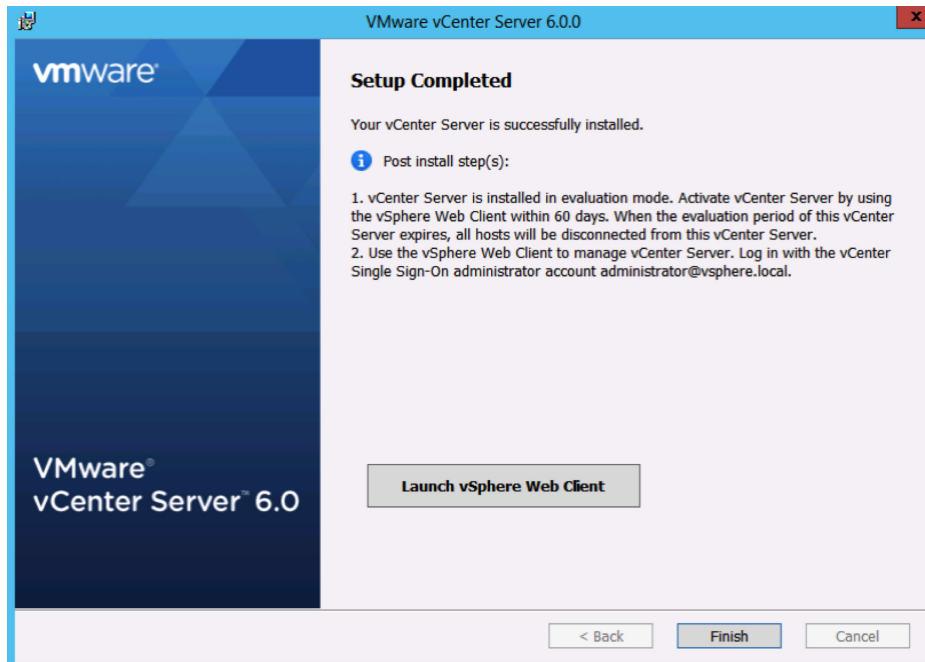
11. Select the local system account or enter the service account **user name** and **password**.



12. Select **Use an embedded database (vPostgres)** or **Use an external database** server's **DSN Name** and click **Next**.

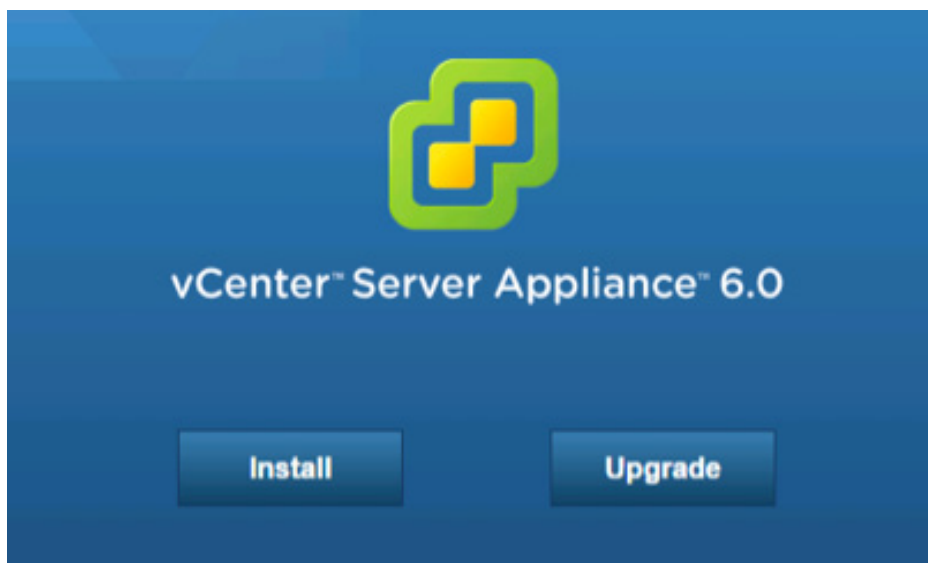


13. Unless required, leave all ports at their defaults and click **Next**.
14. Unless required, leave the default paths for installation and click **Next**.
15. Review and then click **Install**.



vCenter Server Appliance Deployment

1. Mount the ISO image on PC.
2. Open the vcsa folder and install the plug-in.
3. In the root of the ISO image, double-click the vcsa-setup.html file.
4. Wait until you are prompted to enable the client integration plug-in to run. Click **Install**.



5. Accept the **License Agreement** and click **Next**.
6. Enter a target host and a **User name** and **Password** on the host with root access.

VMware vCenter Server Appliance Deployment

1 End User License Agreement
2 Connect to target server
 3 Set up virtual machine
 4 Select deployment type
 5 Set up Single Sign-on
 6 Single Sign-on Site
 7 Select appliance size
 8 Select datastore
 9 Configure database
 10 Network Settings
 11 Ready to complete

Connect to target server
Specify the ESXi host on which to deploy the vCenter Server Appliance.

FQDN or IP Address:

User name:

Password:

Before proceeding:

- Make sure the ESXi host is not in lock down mode or maintenance mode.
- When deploying to a vSphere Distributed Switch (VDS), the appliance must be deployed to an ephemeral portgroup. After deployment, it can be moved to a static or dynamic portgroup.

Back Next Finish Cancel

- Click **Yes** to accept the host's certificate.
- Enter an **Appliance name** and the root **OS password** you want to assign. Click **Next**.

VMware vCenter Server Appliance Deployment

1 End User License Agreement
 2 Connect to target server
3 Set up virtual machine
 4 Select deployment type
 5 Set up Single Sign-on
 6 Single Sign-on Site
 7 Select appliance size
 8 Select datastore
 9 Configure database
 10 Network Settings
 11 Ready to complete

Set up virtual machine
Specify virtual machine settings for the vCenter Server Appliance to be deployed.

Appliance name:

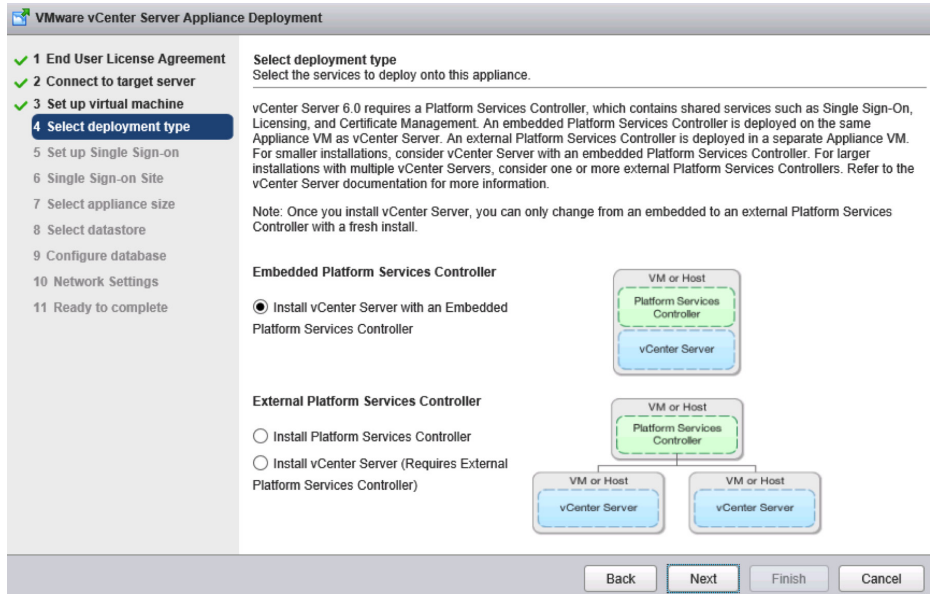
OS user name: root

OS password:

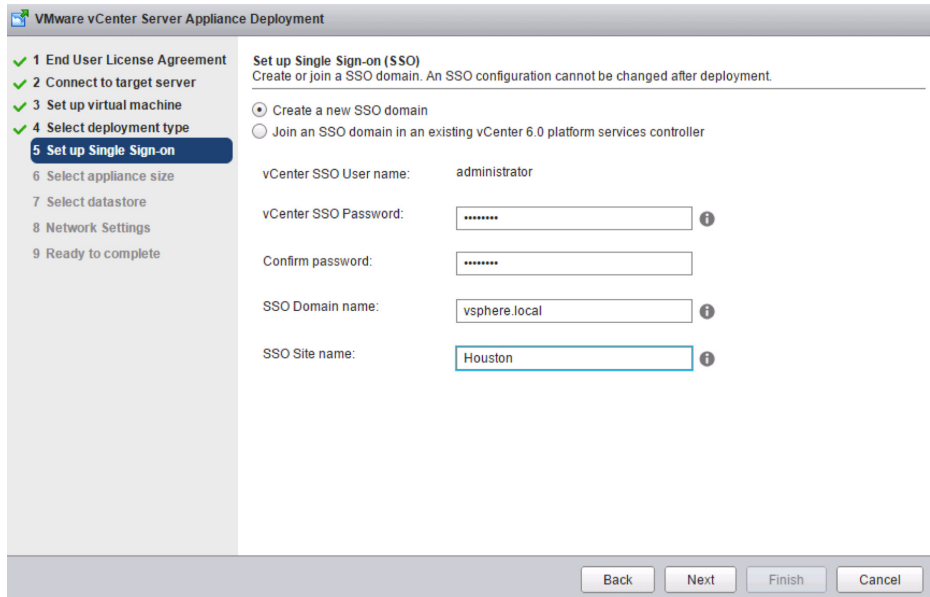
Confirm OS password:

Back Next Finish Cancel

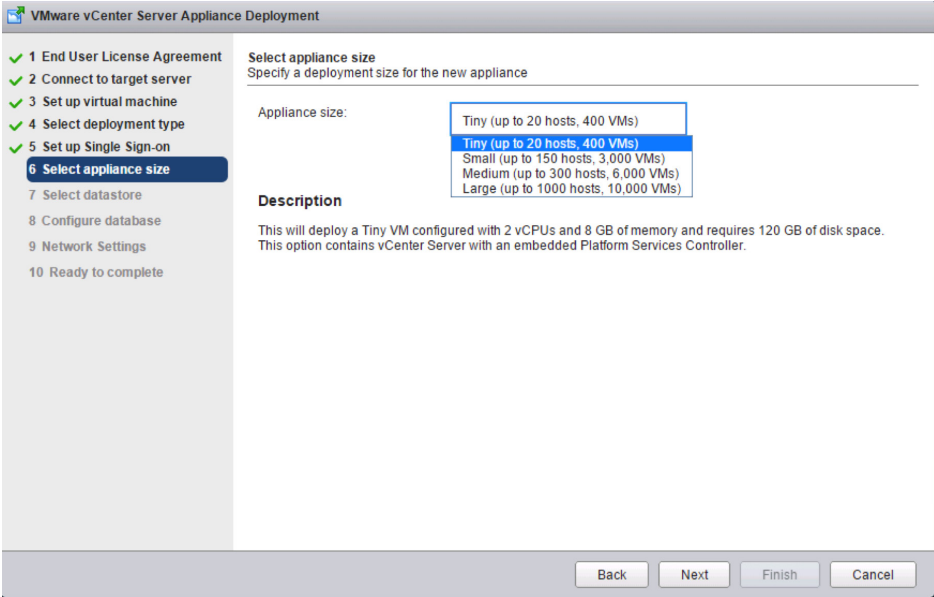
- Select **Install vCenter Server with an Embedded Platform Services Controller** and click **Next**.



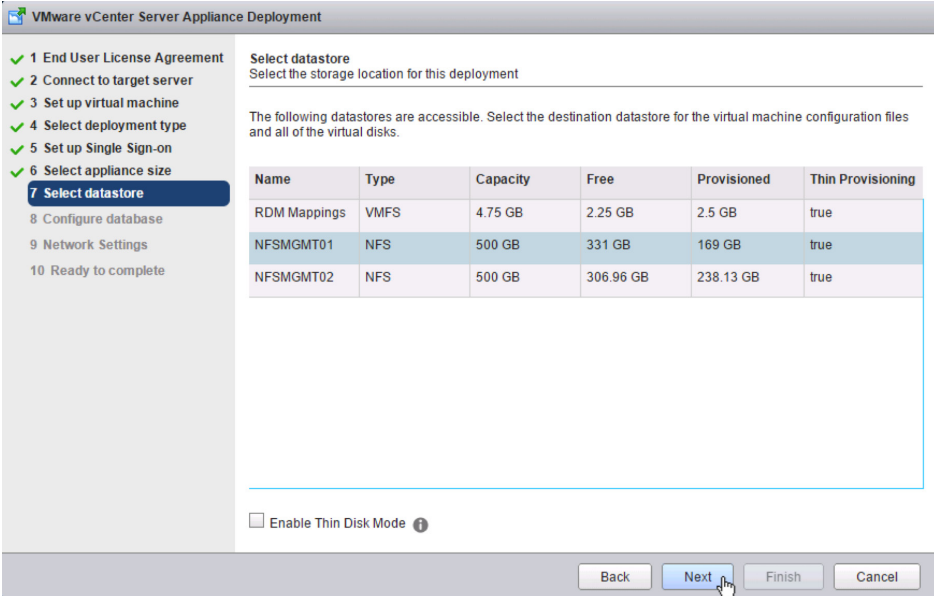
10. Select **Create a new SSO Domain** and enter an administrator **vCenter SSO Password**; enter an **SSO Domain name** such as vsphere.local and an **SSO Site name** such as a city or physical location name.



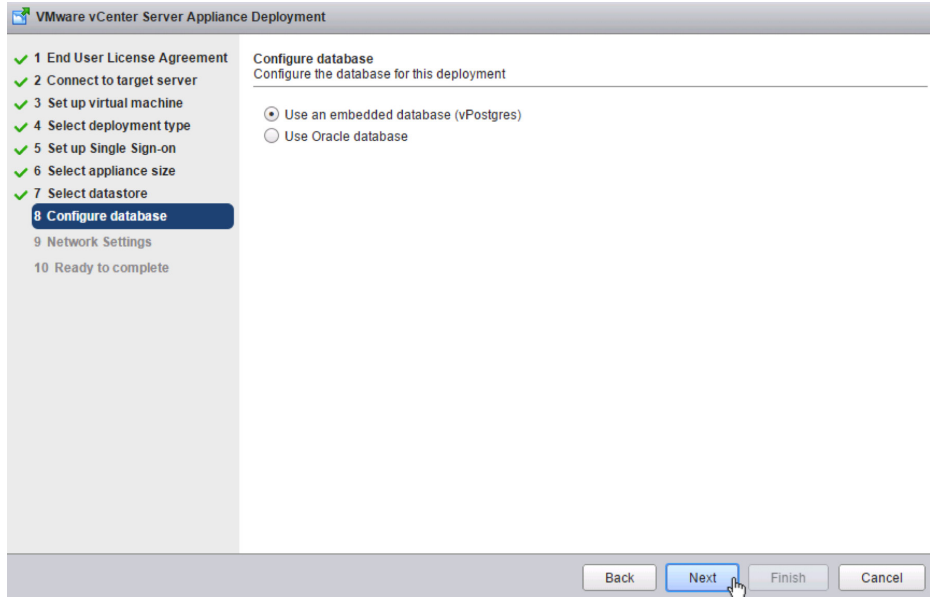
11. Select **appliance size** from the drop-down list and click **Next**.



12. Select **datastore** to deploy the appliance on and click **Next**.

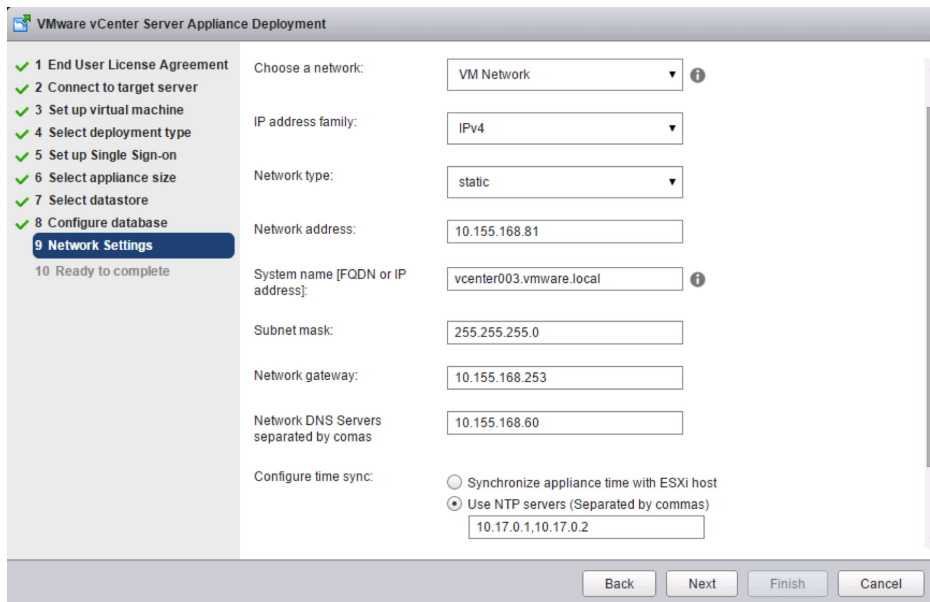


13. Select **Use an embedded database (vPostgres)**, which is recommended, or **Use Oracle database** and click **Next**.

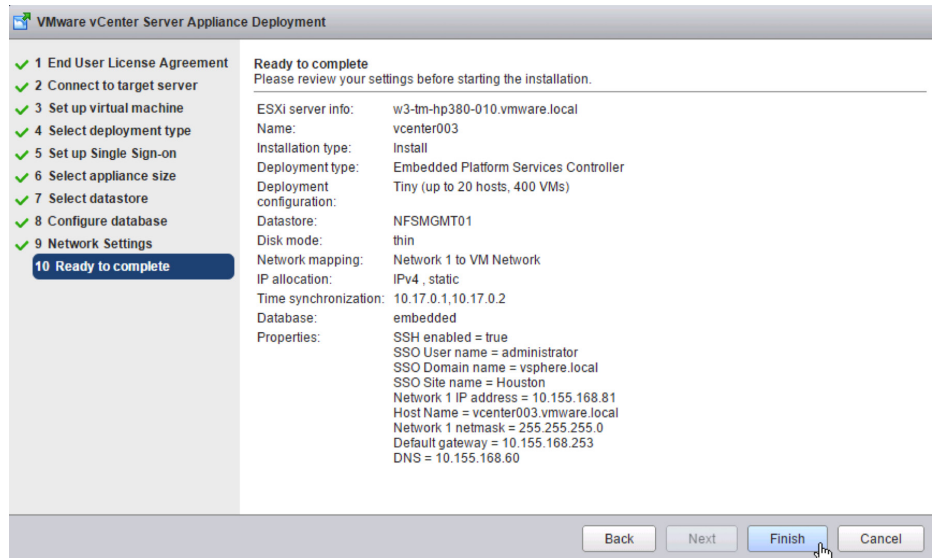


14. Enter **Network Settings** and click **Next**.

NOTE: The FQDN and IP addresses entered here must be resolvable by the DNS server specified or the deployment will fail.



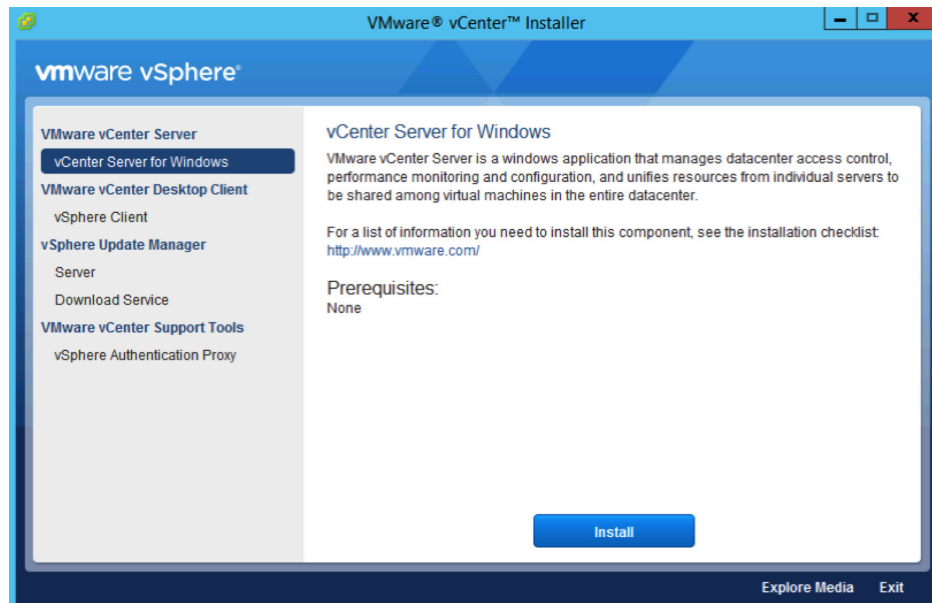
15. Review and click **Finish**.



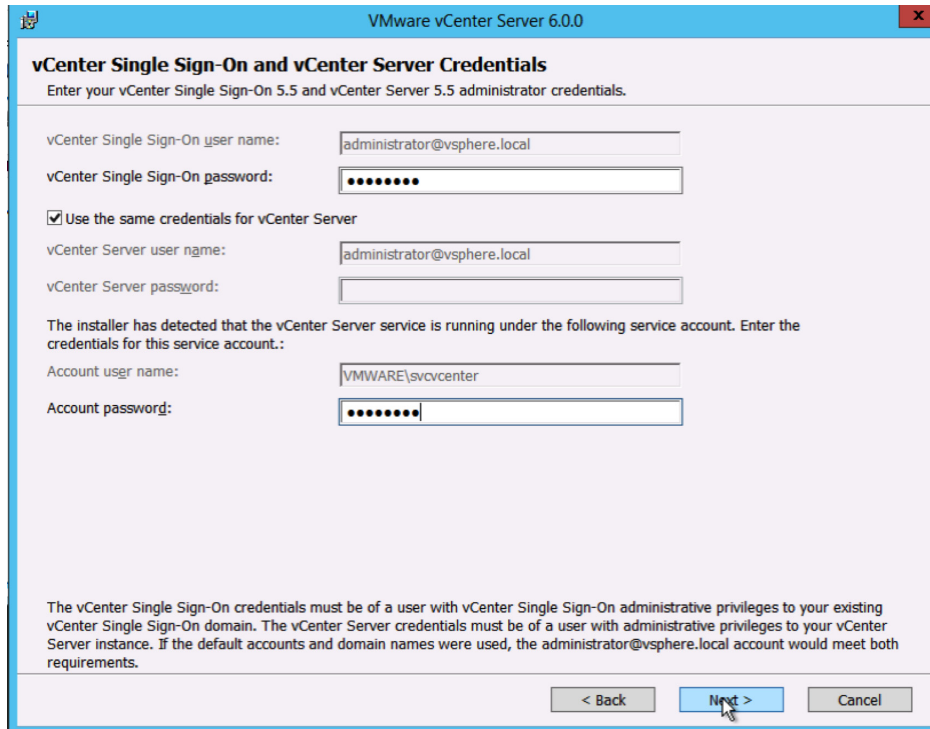
Upgrade in Which All vCenter Server Components Are Installed on a Single Machine

Windows Upgrade

1. Verify all prerequisites.
2. Mount the vCenter Server 6.0 ISO image.
3. If autorun does not start, execute autorun.exe.
4. Select **vCenter Server for Windows** and click **Install**.



5. Click **Next**.
6. Accept the license agreements.
7. Enter the **vCenter Single Sign-On password** and the service account **password** if applicable. Click **Next**.



VMware vCenter Server 6.0.0

vCenter Single Sign-On and vCenter Server Credentials

Enter your vCenter Single Sign-On 5.5 and vCenter Server 5.5 administrator credentials.

vCenter Single Sign-On user name: administrator@vsphere.local

vCenter Single Sign-On password: ●●●●●●

Use the same credentials for vCenter Server

vCenter Server user user name: administrator@vsphere.local

vCenter Server password:

The installer has detected that the vCenter Server service is running under the following service account. Enter the credentials for this service account:

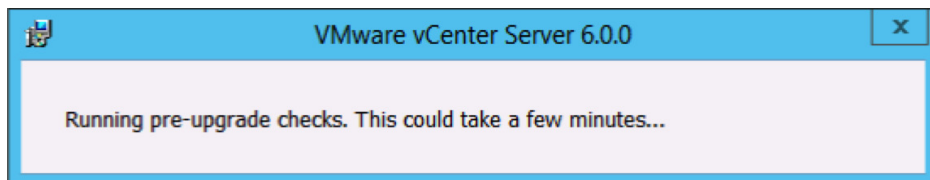
Account user name: VMWARE\svcvcenter

Account password: ●●●●●●

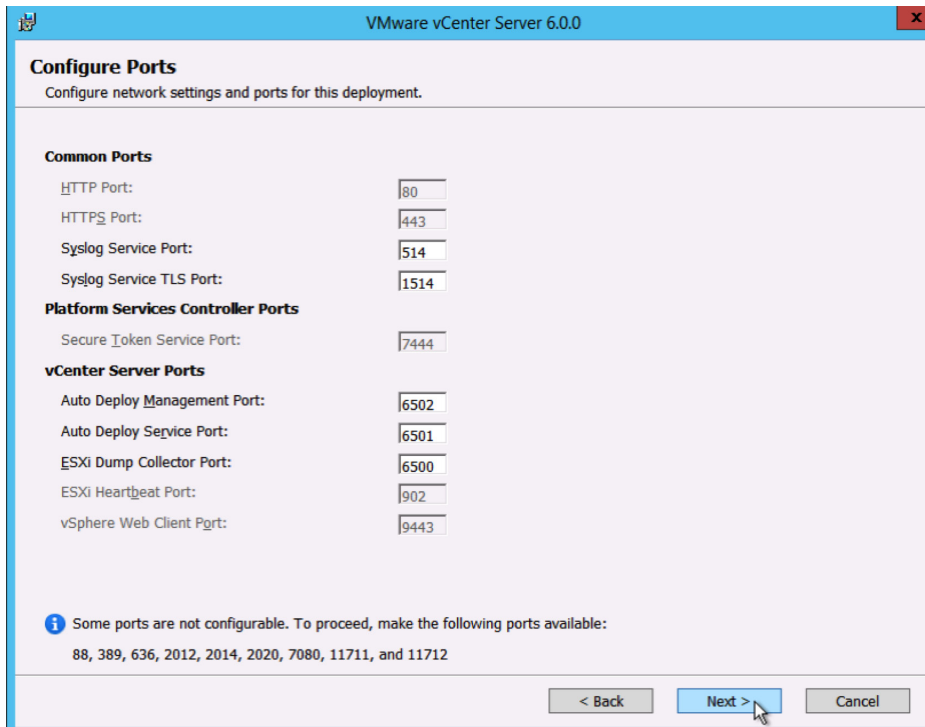
The vCenter Single Sign-On credentials must be of a user with vCenter Single Sign-On administrative privileges to your existing vCenter Single Sign-On domain. The vCenter Server credentials must be of a user with administrative privileges to your vCenter Server instance. If the default accounts and domain names were used, the administrator@vsphere.local account would meet both requirements.

< Back Next > Cancel

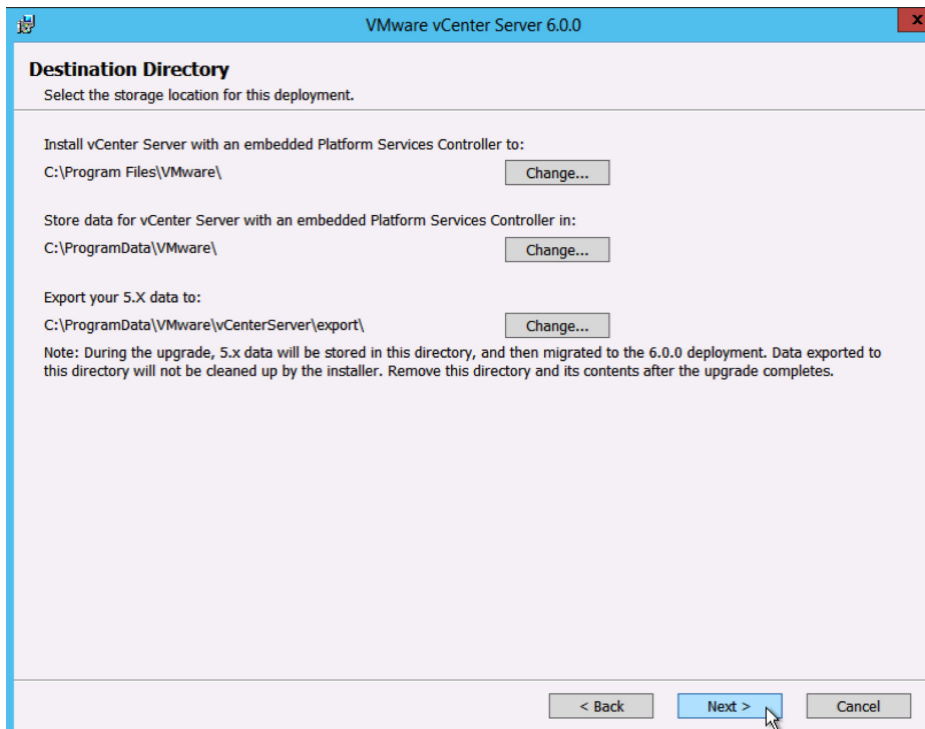
8. Wait for the **pre-upgrade checks** to complete.



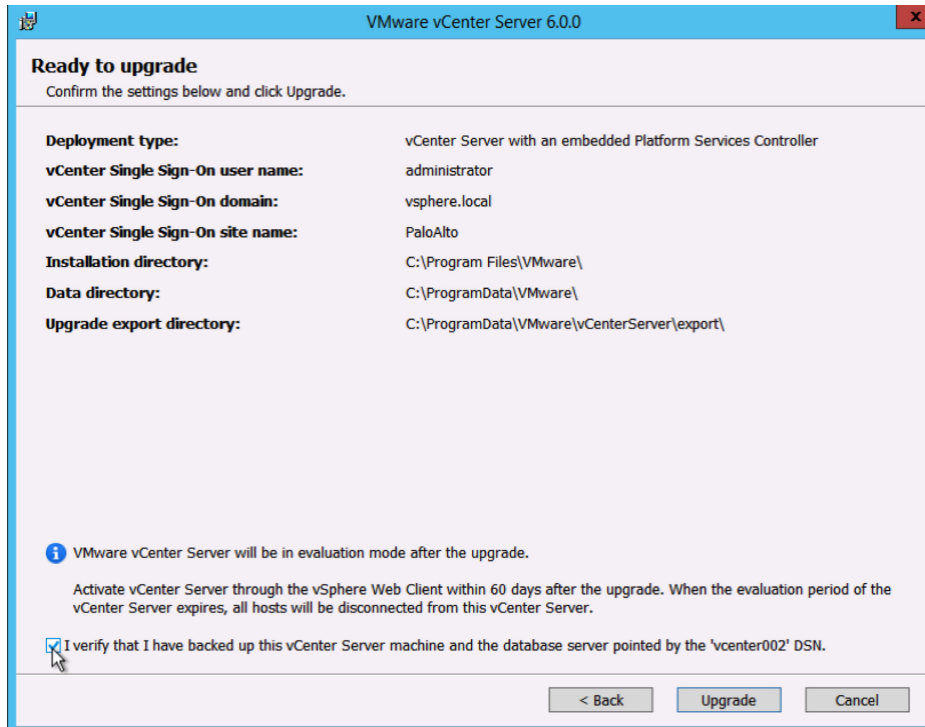
9. Accept the default ports and click **Next**.



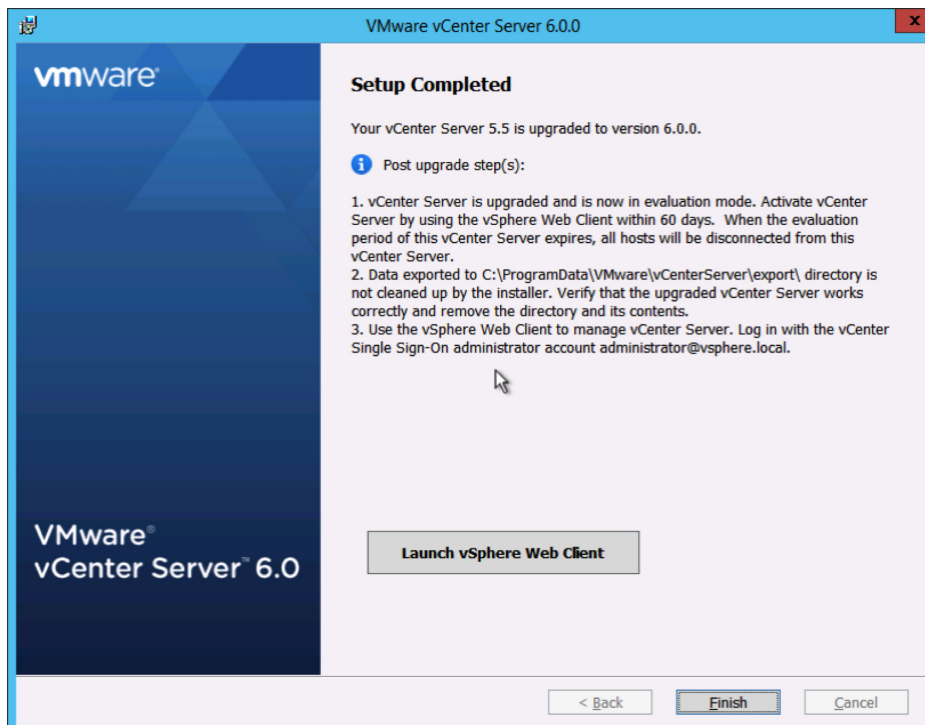
10. Accept or change the installation paths as necessary. Click **Next**.



11. Check the box to verify that you have backed up this vCenter Server and its database. Click **Upgrade**.

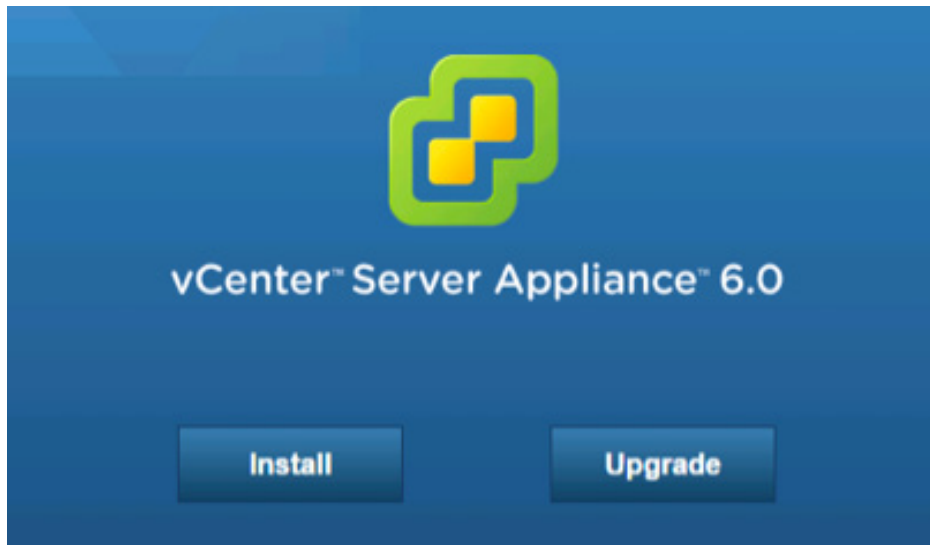


12. When completed, click **Finish**.



vCenter Server Appliance Upgrade

1. Mount the ISO image on PC.
2. Open the vcsa folder and install the plug-in.
3. In the root of the ISO image, double-click the vcsa-setup.html file.
4. Wait until you are prompted to enable the client integration plug-in to run. Click **Upgrade**.



5. Click **OK** to the supported upgrades pop-up.

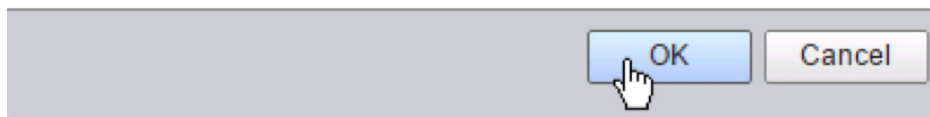
Supported Upgrades

You can upgrade to vCenter Server Appliance 6.0 from the following versions:

- vCenter Server Appliance 5.1 U3
- vCenter Server Appliance 5.5

If you have an earlier version of the appliance, you must first upgrade it to one of the above versions, then you can upgrade it to 6.0.

Continue upgrading to vCenter Server Appliance 6.0?



6. Accept the license agreement and click **Next**.
7. Enter a target host and a **User name** and **Password** on the host with root access.

VMware vCenter Server Appliance Deployment

1 End User License Agreement
2 Connect to target server
 3 Set up virtual machine
 4 Connect to source appliance
 5 Set up Single Sign-on
 6 Select appliance size
 7 Select datastore
 8 Network Settings
 9 Ready to complete

Connect to target server
Specify the ESXi host on which to deploy the vCenter Server Appliance.

FQDN or IP Address:

User name:

Password:

Before proceeding:

- Make sure the ESXi host is not in lock down mode or maintenance mode.
- When deploying to a vSphere Distributed Switch (VDS), the appliance must be deployed to an ephemeral portgroup. After deployment, it can be moved to a static or dynamic portgroup.

Back Next Finish Cancel

- Click **Yes** to accept the host's certificate.
- Enter an **Appliance name** and **Enable SSH** if required. Click **Next**.

VMware vCenter Server Appliance Deployment

1 End User License Agreement
 2 Connect to target server
3 Set up virtual machine
 4 Connect to source appliance
 5 Set up Single Sign-on
 6 Select appliance size
 7 Select datastore
 8 Network Settings
 9 Ready to complete

Set up virtual machine
Specify virtual machine settings for the vCenter Server Appliance to be deployed.

Appliance name:

Back Next Finish Cancel

- Enter the **vCenter Server** version, **FQDN**, **Password**, **vCenter SSO Port** (443), **ESXi host FQDN**, user name, and **password**. Click **Next**.

VMware vCenter Server Appliance Deployment

- ✓ 1 End User License Agreement
- ✓ 2 Connect to target server
- ✓ 3 Set up virtual machine
- 4 Connect to source appliance**
- 5 Select appliance size
- 6 Select datastore
- 7 Network Settings
- 8 Ready to complete

Existing Appliance Type: vCSA 5.5

vCenter Server Appliance

vCenter Server IP address/FQDN: vcsa01.vmware.local

vCenter Administrator User name: administrator@vsphere.local

vCenter Administrator Password:

vCenter SSO Port: 443

Appliance (OS) Root password:

Temporary Upgrade Files Path: /tmp/vmware/cis-export-folder

Migrate Performance & other historical data: Enabled

Source ESXi Host

ESXi host IP address/FQDN: w3-tm-hp380-010.vmware.local

ESXi host user name: root

ESXi host password:

Buttons: Back, Next, Finish, Cancel

11. Select **Appliance size** from the drop-down list and click **Next**.

VMware vCenter Server Appliance Deployment

- ✓ 1 End User License Agreement
- ✓ 2 Connect to target server
- ✓ 3 Set up virtual machine
- ✓ 4 Select deployment type
- ✓ 5 Set up Single Sign-on
- 6 Select appliance size**
- 7 Select datastore
- 8 Configure database
- 9 Network Settings
- 10 Ready to complete

Select appliance size
Specify a deployment size for the new appliance

Appliance size:

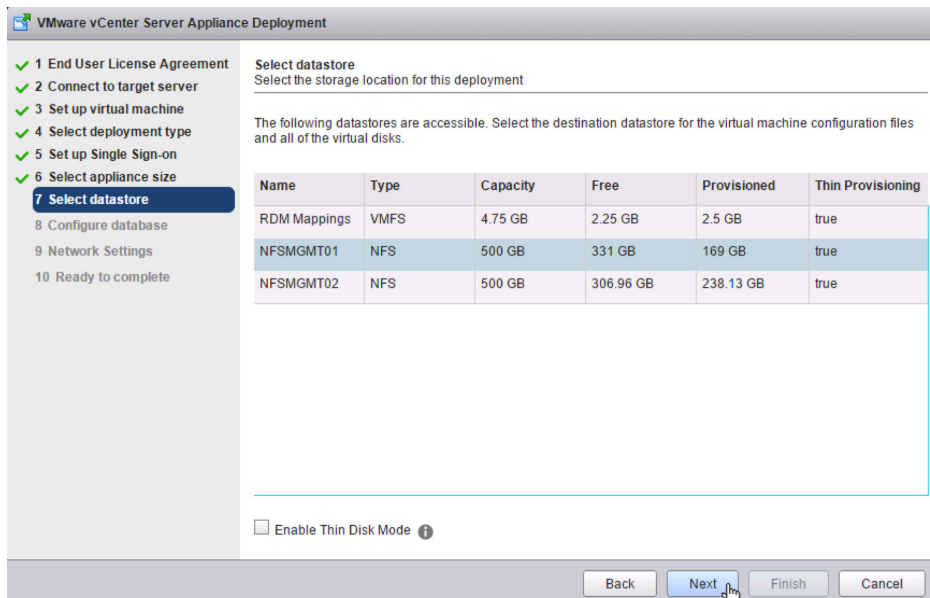
- Tiny (up to 20 hosts, 400 VMs)
- Tiny (up to 20 hosts, 400 VMs)**
- Small (up to 150 hosts, 3,000 VMs)
- Medium (up to 300 hosts, 6,000 VMs)
- Large (up to 1000 hosts, 10,000 VMs)

Description

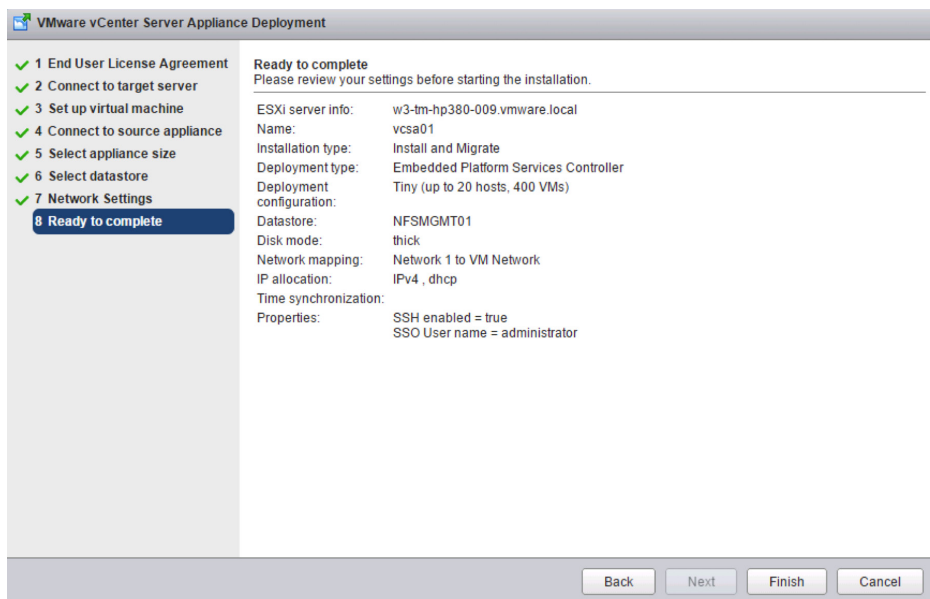
This will deploy a Tiny VM configured with 2 vCPUs and 8 GB of memory and requires 120 GB of disk space. This option contains vCenter Server with an embedded Platform Services Controller.

Buttons: Back, Next, Finish, Cancel

12. Select **datastore** to deploy the appliance on and click **Next**.



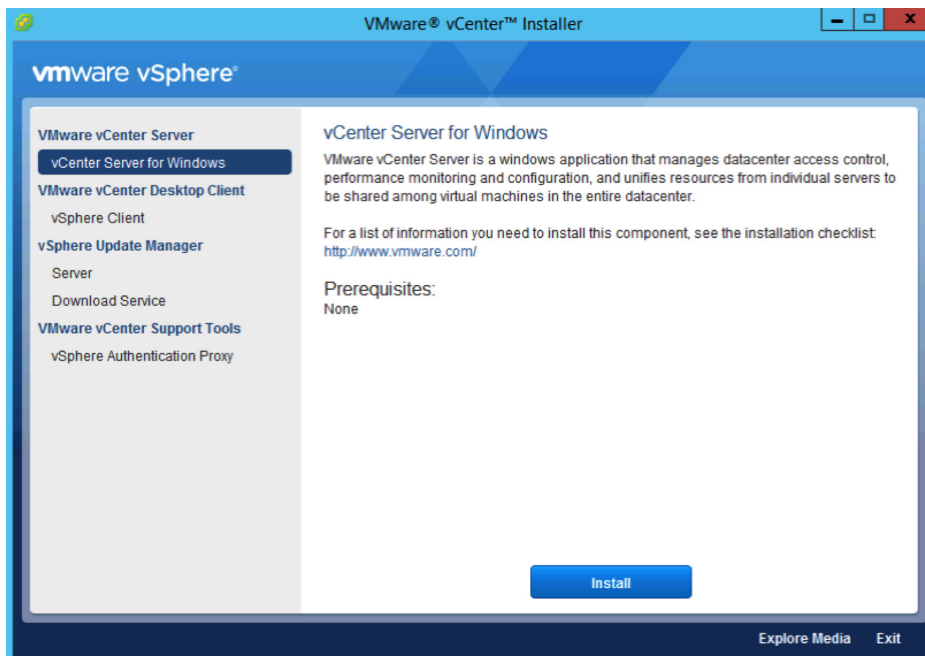
13. Review and click **Finish**.



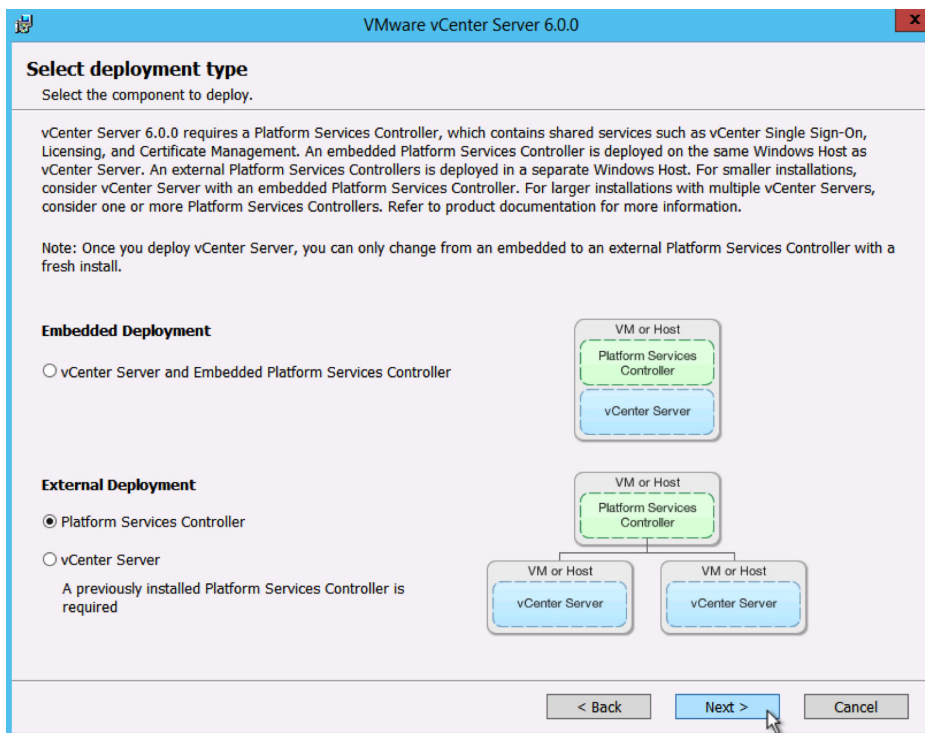
Fresh External Platform Services Controller Deployment

Windows Deployment

1. Verify all prerequisites.
2. Mount the vCenter Server 6.0 ISO image.
3. If autorun does not start, execute autorun.exe.
4. Select **vCenter Server for Windows** and click **Install**.



5. Click **Next**.
6. Accept the license agreements.
7. Select **External Deployment Platform Services Controller** and click **Next**.



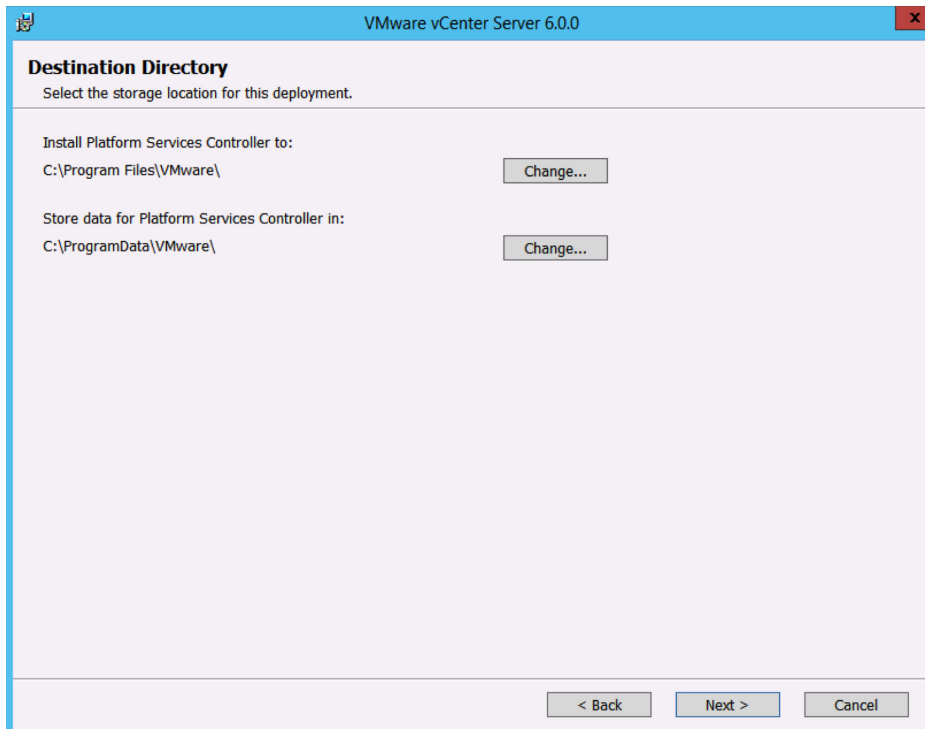
8. Verify the system name and click **Next**.

9. If this is the first Platform Services Controller, select **Create a new vCenter Single Sign-On domain**. If this is an additional Platform Services Controller, select **Join a vCenter Single Sign-On domain**.
 - a. For a new vCenter Single Sign-On domain, enter a **password** for the vCenter Single Sign-On administrator, a **Domain name** such as vsphere.local, and a **Site name** such as a city or physical building name.

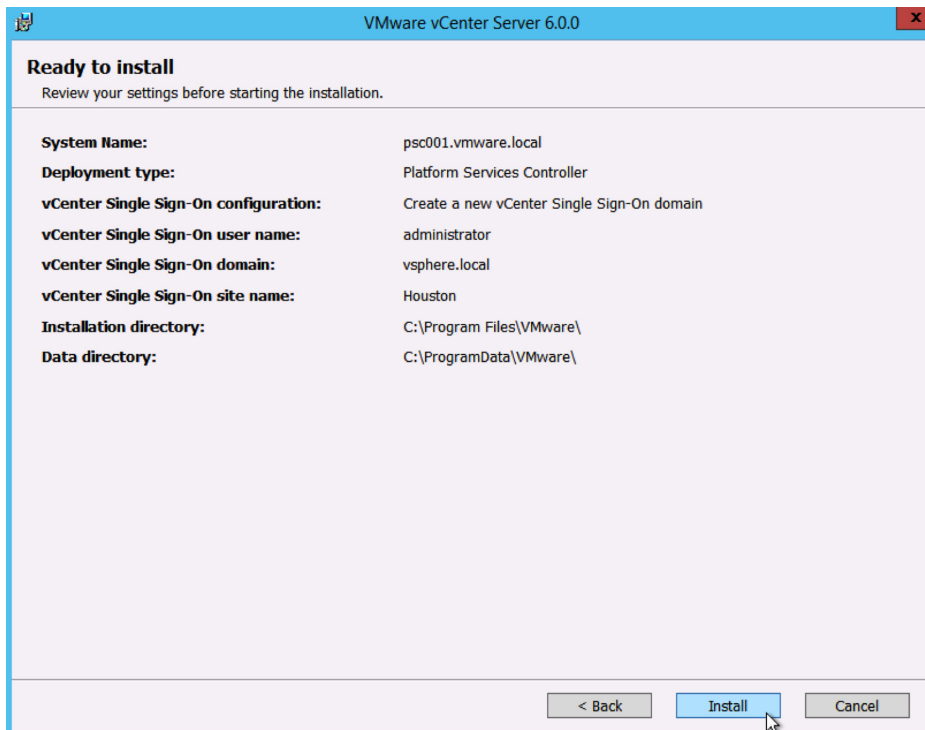
- b. To join an existing vCenter Single Sign-On domain, enter the FQDN of an existing Platform Services Controller and the vCenter Single Sign-On administrator's password. Click **Next**. Choose a site to join from the drop-down list. Click **Next**.

10. Accept the default ports and click **Next**.

11. Accept or change the installation paths as necessary. Click **Next**.

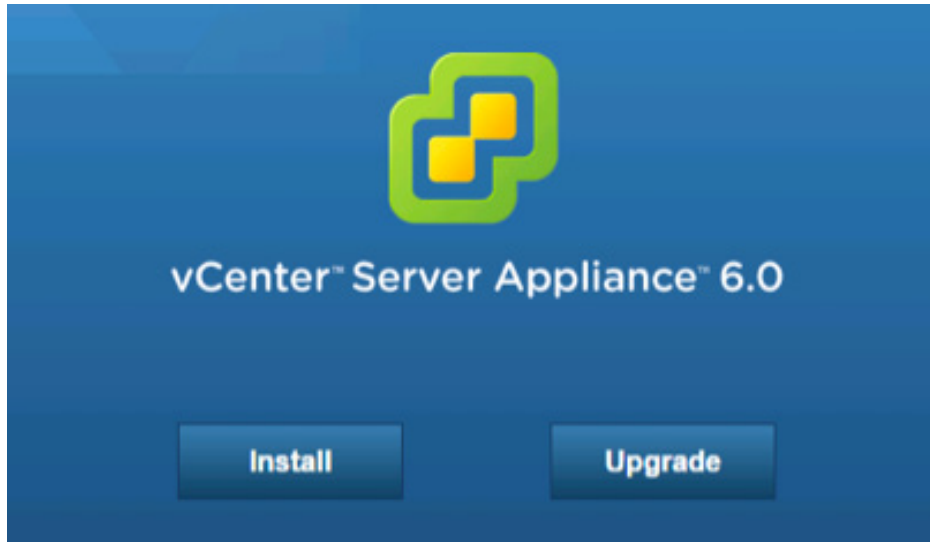


12. Review and click **Install**.



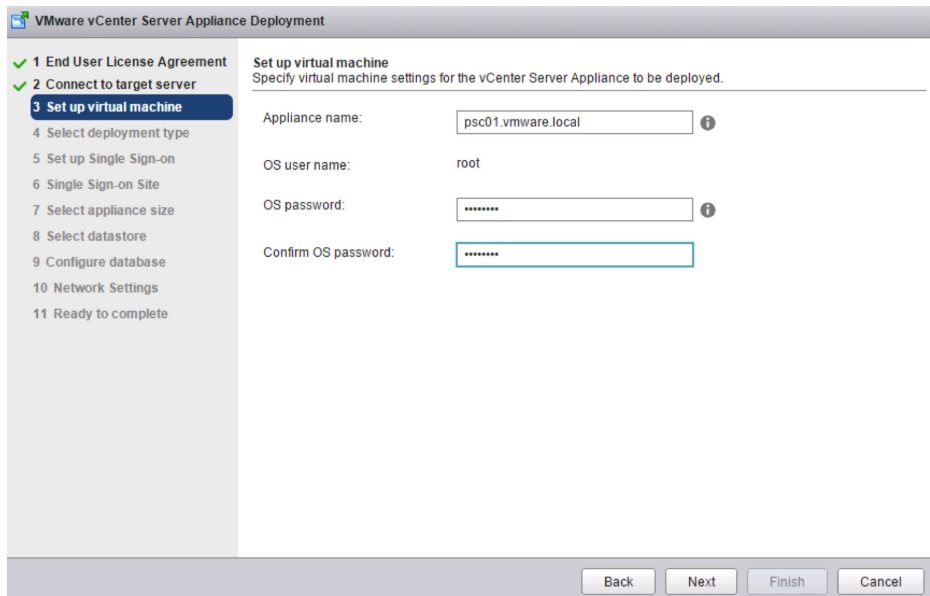
vCenter Server Appliance Deployment

1. Mount the ISO image on a PC.
2. Open the vcsa folder and install the plug-in.
3. In the root of the ISO image, double-click the vcsa-setup.html file.
4. Wait until you are prompted to enable the client integration plug-in to run. Click **Install**.

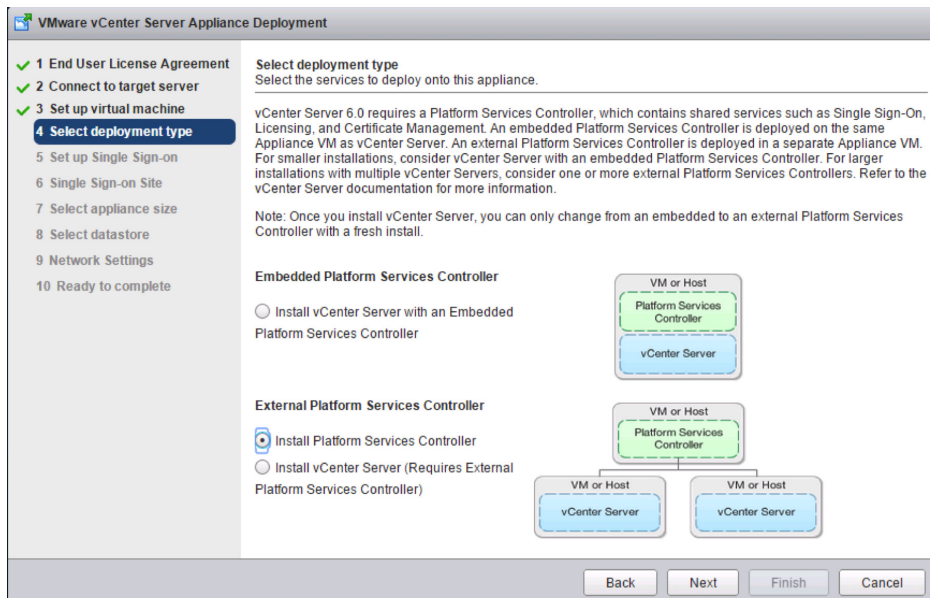


5. Accept the license agreement and click **Next**.
6. Enter a target host and a **User name** and **Password** on the host with root access.

7. Click **Yes** to accept the host's certificate.
8. Enter an **Appliance name** and the root **password** you want to assign. Click **Next**.



9. Under **External Platform Services Controller**, select **Install Platform Services Controller**. Click **Next**.

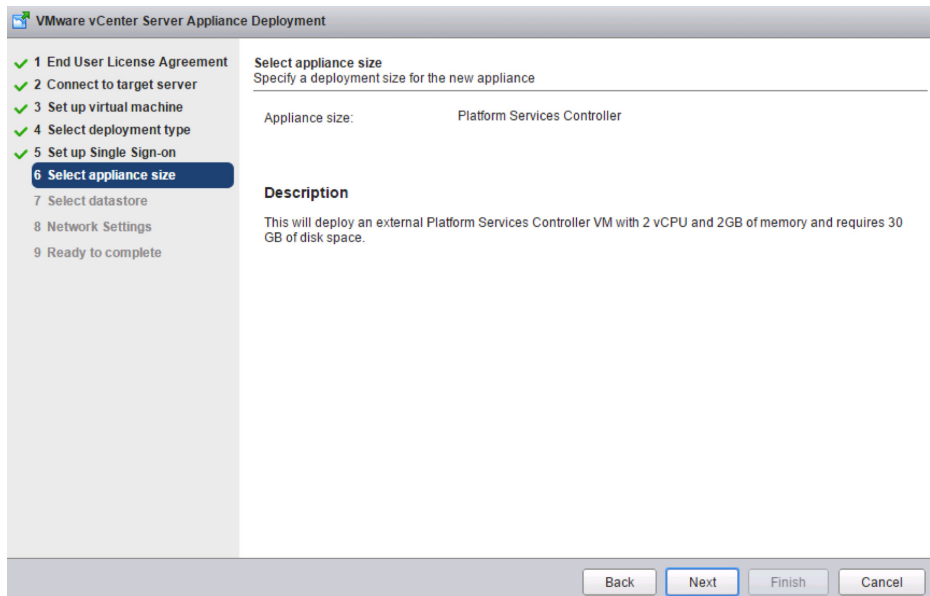


10. If this is the first Platform Services Controller, select **Create a new SSO domain**. If this is an additional Platform Services Controller, select **Join an SSO Domain**.

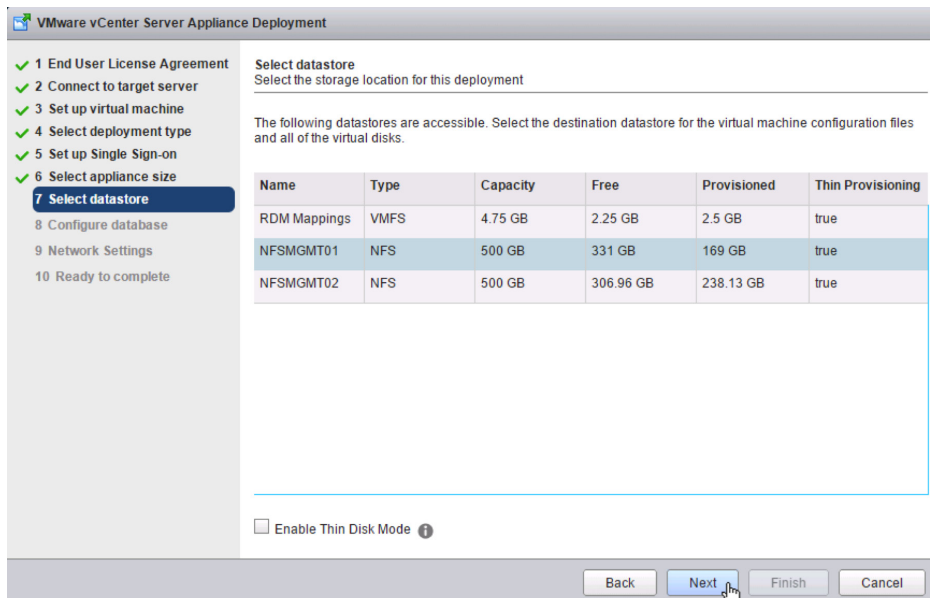
- a. For a new vCenter Single Sign-On domain, enter an administrator **vCenter SSO Password**, an **SSO Domain name** such as vsphere.local, and an **SSO Site name**.

- b. To join an existing vCenter Single Sign-On domain, enter the FQDN of an existing Platform Services Controller and the vCenter Single Sign-On administrator's password. Then click **Next**. Choose a site to join from the drop-down list. Click **Next**.

11. Click **Next**. There is only one appliance size for the Platform Services Controller.



12. Select a datastore to deploy the appliance on and click **Next**.



13. Enter **Network Settings** and click **Next**.

NOTE: The FQDN and IP addresses entered here must be resolvable by the DNS server specified or the deployment will fail.

VMware vCenter Server Appliance Deployment

- ✓ 1 End User License Agreement
- ✓ 2 Connect to target server
- ✓ 3 Set up virtual machine
- ✓ 4 Select deployment type
- ✓ 5 Set up Single Sign-on
- ✓ 6 Select appliance size
- ✓ 7 Select datastore
- 8 Network Settings**
- 9 Ready to complete

Choose a network: VM Network

IP address family: IPv4

Network type: static

Network address: 10.155.168.73

System name [FQDN or IP address]: psc01.vmware.local

Subnet mask: 255.255.255.0

Network gateway: 10.155.168.253

Network DNS Servers separated by commas: 10.155.168.60

Configure time sync:

 Synchronize appliance time with ESXi host

 Use NTP servers (Separated by commas)

10.17.0.1,10.17.0.2

Back Next Finish Cancel

14. Review and click **Finish**.

VMware vCenter Server Appliance Deployment

- ✓ 1 End User License Agreement
- ✓ 2 Connect to target server
- ✓ 3 Set up virtual machine
- ✓ 4 Select deployment type
- ✓ 5 Set up Single Sign-on
- ✓ 6 Select appliance size
- ✓ 7 Select datastore
- ✓ 8 Network Settings
- 9 Ready to complete**

Ready to complete
Please review your settings before starting the installation.

ESXi server info: w3-tm-hp380-010.vmware.local
 Name: psc01.vmware.local
 Installation type: Install
 Deployment type: Platform Services Controller
 Datastore: NFSMGMT01
 Disk mode: thin
 Network mapping: Network 1 to VM Network
 IP allocation: IPv4 , static
 Time synchronization: 10.17.0.1,10.17.0.2
 Properties:
 SSH enabled = true
 SSO User name = administrator
 SSO Domain name = vsphere.local
 SSO Site name = Houston
 Network 1 IP address = 10.155.168.73
 Host Name = psc01.vmware.local
 Network 1 netmask = 255.255.255.0
 Default gateway = 10.155.168.253
 DNS = 10.155.168.60

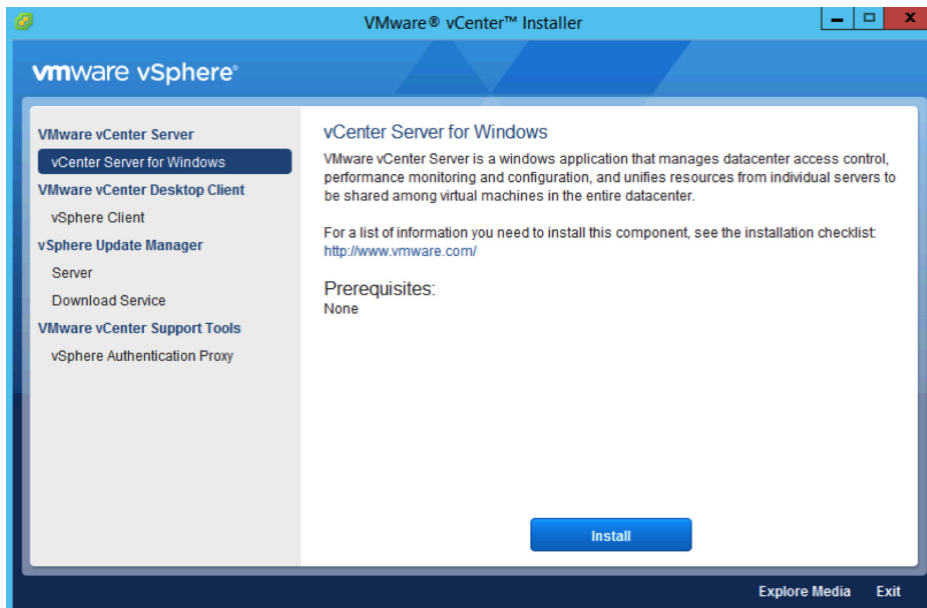
Back Next Finish Cancel

Fresh External vCenter Server Deployment

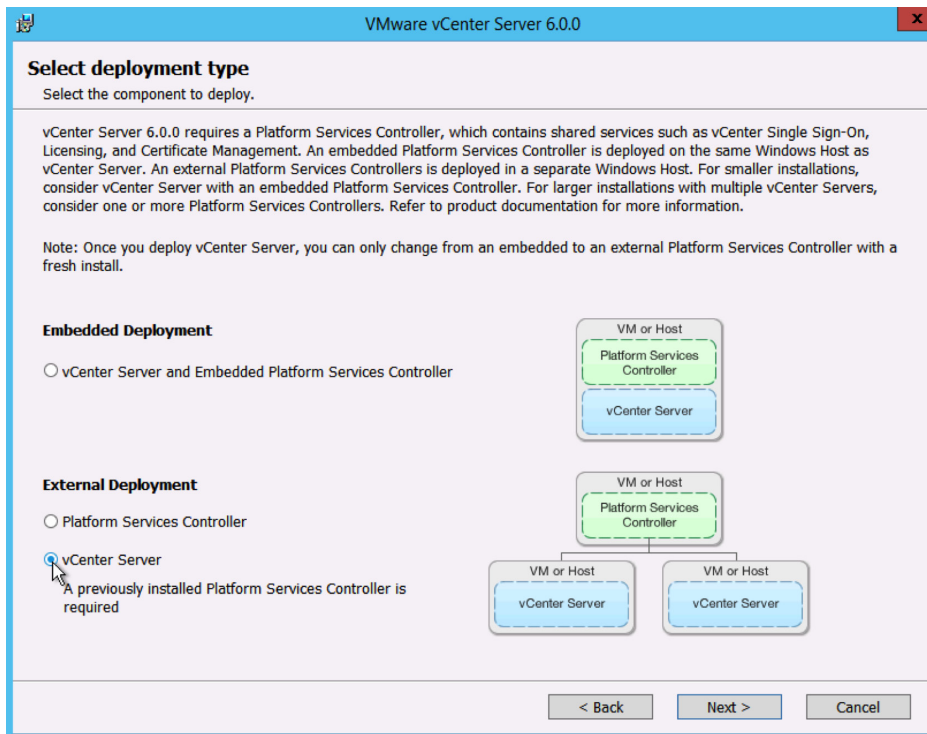
Windows Deployment

1. Verify all prerequisites.
2. If using a remote database, ensure that a 64-bit DSN has been created. This step is not necessary if using the local PostgreSQL database.
3. Mount the vCenter Server 6.0 ISO image.
4. If autorun does not start, execute autorun.exe.

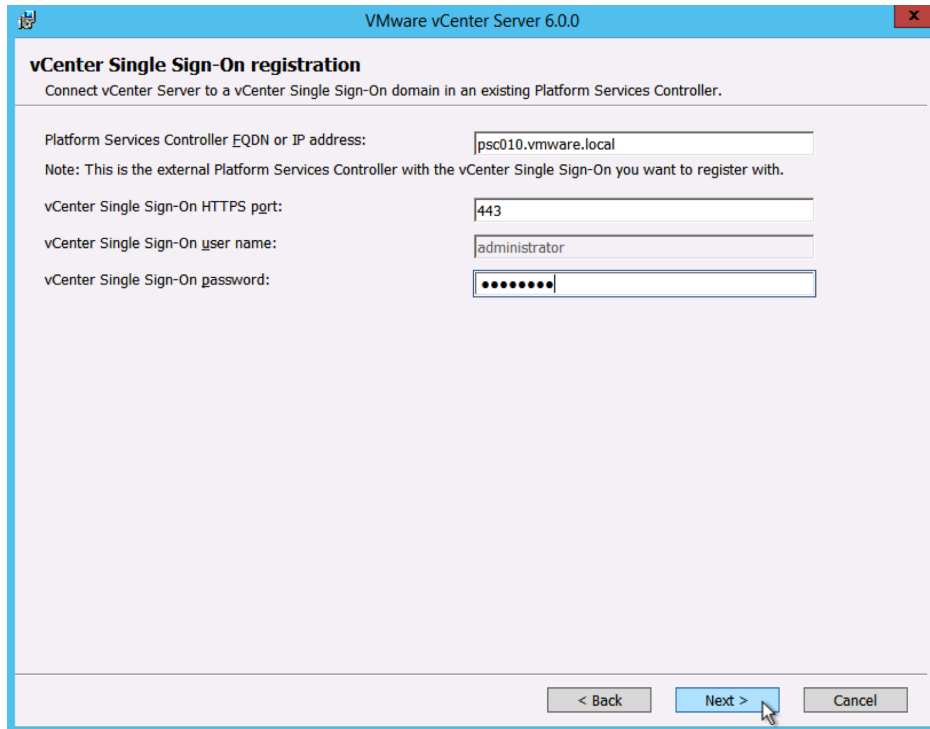
5. Select **vCenter Server for Windows** and click **Install**.



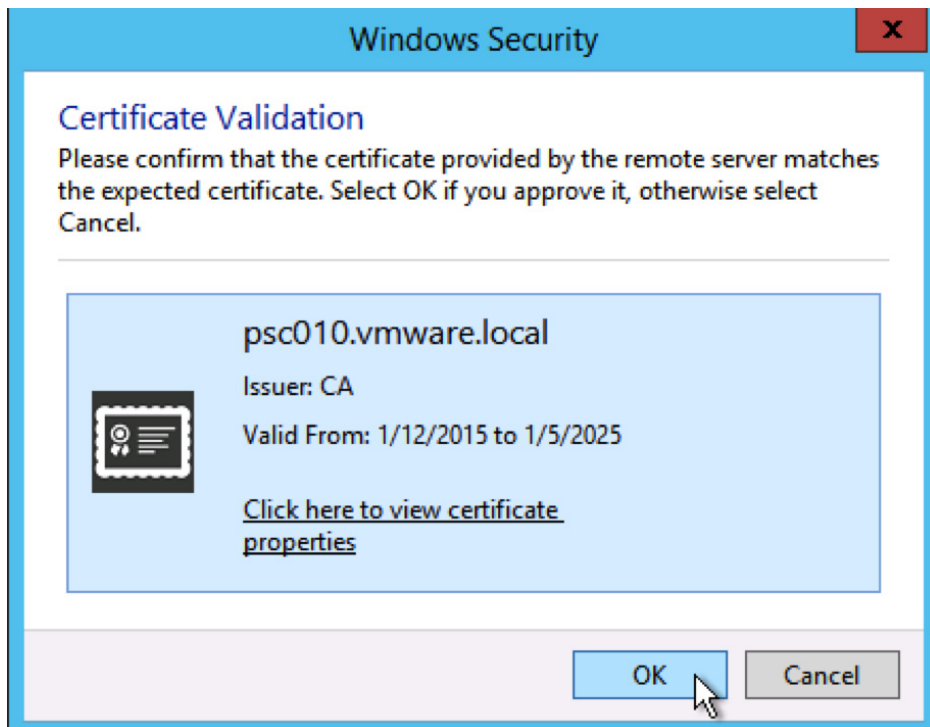
6. Click **Next**.
7. Accept the license agreements.
8. Under **External Deployment**, select **vCenter Server**. Click **Next**.



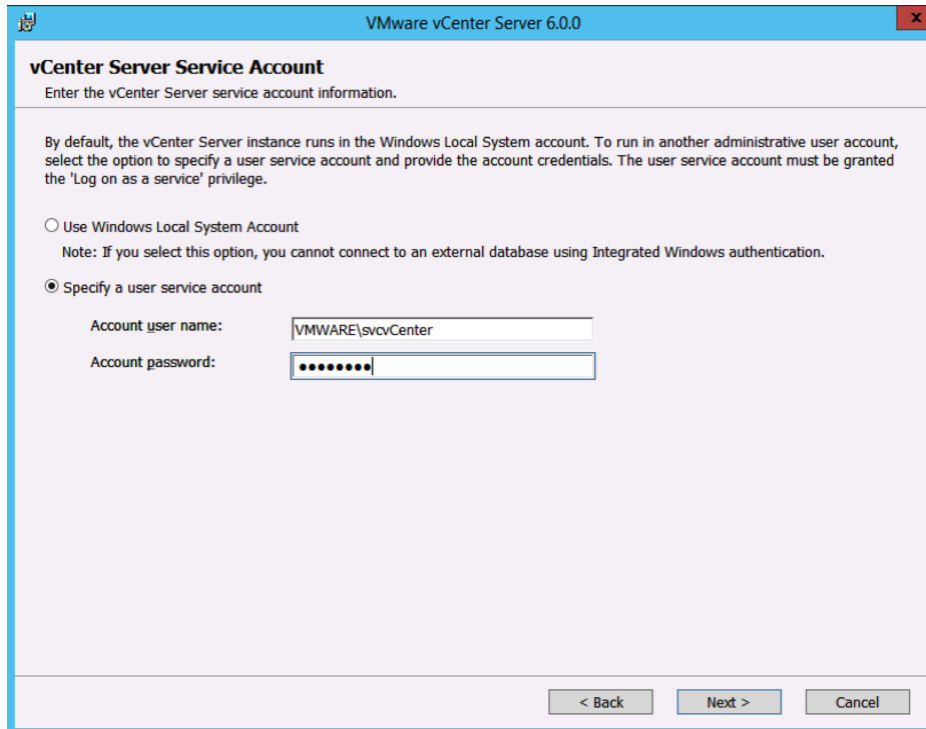
9. Verify that the FQDN is correct and click **Next**.
10. Enter the external **Platform Services Controller FQDN** and **vCenter Single Sign-On password**. Click **Enter**.



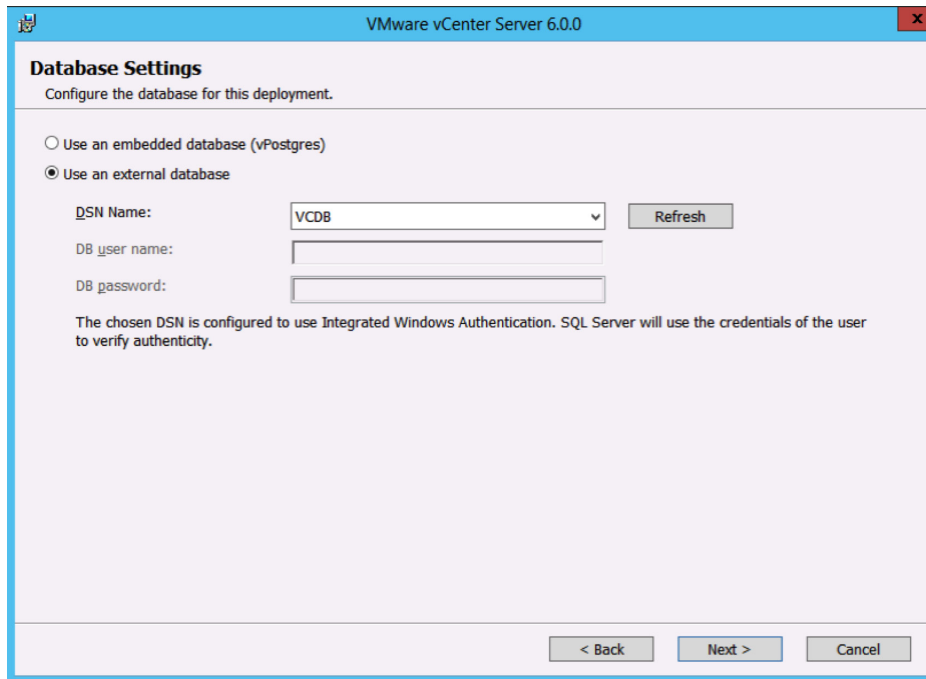
11. Click **OK** to accept the certificate.



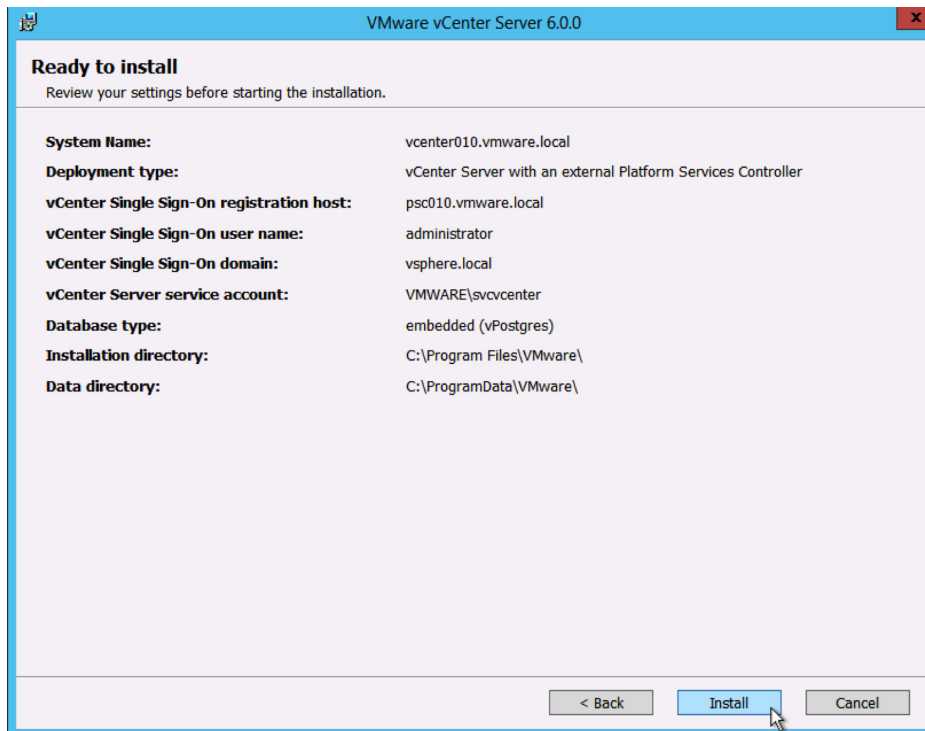
12. Select **Use Windows Local System Account** or enter the service account **user name** and **password**.



13. Select **Use an embedded database (vPostgres)** or **Use an external database** and enter the server's **DSN Name**. Click **Next**.

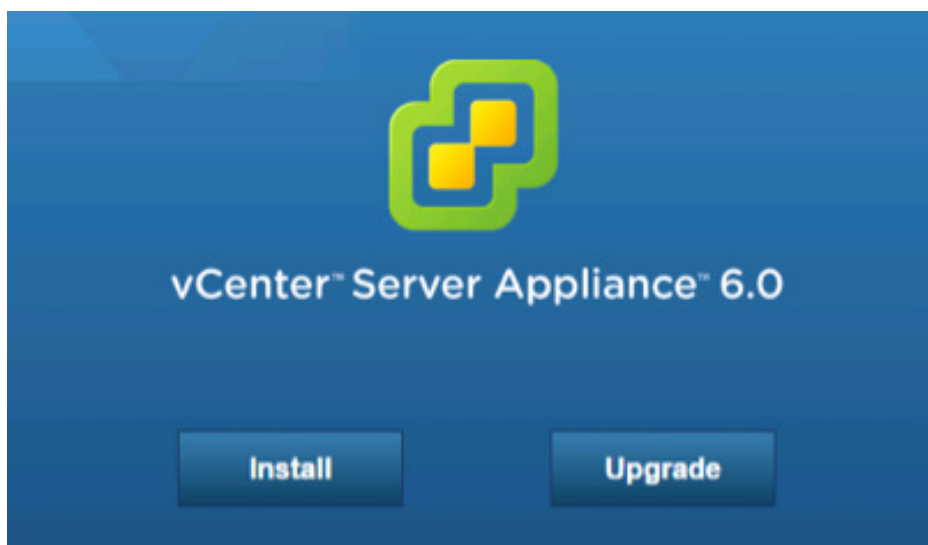


14. Unless required, leave all ports at their defaults and click **Next**.
15. Unless required, leave the default paths for installation and click **Next**.
16. Review and then click **Install**.



vCenter Server Appliance Deployment

1. Mount the ISO image on a PC.
2. Open the vcsa folder and install the plug-in.
3. In the root of the ISO image, double-click the vcsa-setup.html file.
4. Wait until you are prompted to enable the client integration plug-in to run. Click **Install**.



5. Accept the license agreement and click **Next**.
6. Enter a target host, a **user name**, and a **password** on the host with root access.

VMware vCenter Server Appliance Deployment

1 End User License Agreement
2 Connect to target server
 3 Set up virtual machine
 4 Select deployment type
 5 Set up Single Sign-on
 6 Single Sign-on Site
 7 Select appliance size
 8 Select datastore
 9 Configure database
 10 Network Settings
 11 Ready to complete

Connect to target server
Specify the ESXi host on which to deploy the vCenter Server Appliance.

FQDN or IP Address:

User name:

Password:

Before proceeding:

- Make sure the ESXi host is not in lock down mode or maintenance mode.
- When deploying to a vSphere Distributed Switch (VDS), the appliance must be deployed to an ephemeral portgroup. After deployment, it can be moved to a static or dynamic portgroup.

Back Next Finish Cancel

- Click **Yes** to accept the host's certificate.
- Enter **Appliance name** and the root **password** you want to assign. Click **Next**.

VMware vCenter Server Appliance Deployment

1 End User License Agreement
 2 Connect to target server
3 Set up virtual machine
 4 Select deployment type
 5 Set up Single Sign-on
 6 Single Sign-on Site
 7 Select appliance size
 8 Select datastore
 9 Configure database
 10 Network Settings
 11 Ready to complete

Set up virtual machine
Specify virtual machine settings for the vCenter Server Appliance to be deployed.

Appliance name:

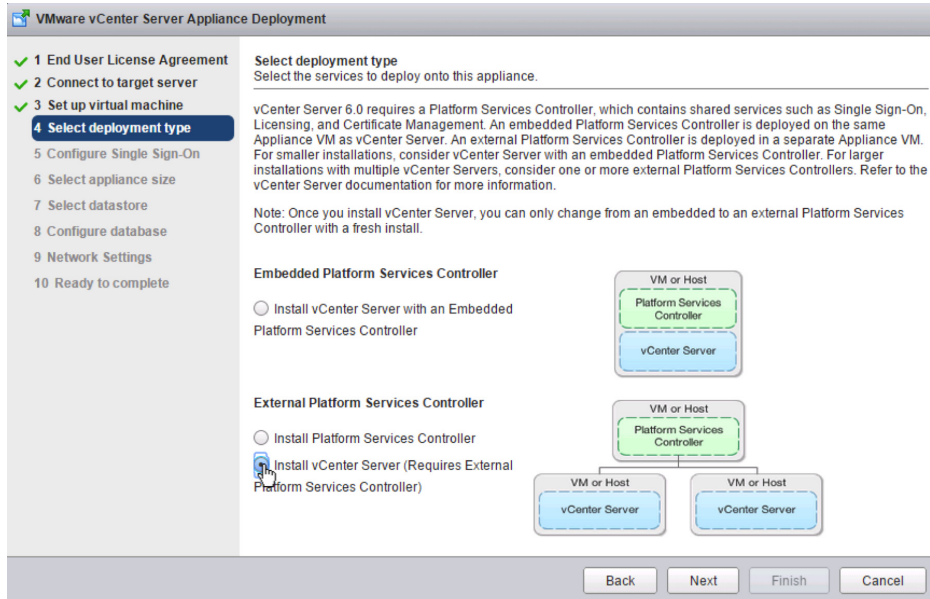
OS user name: root

OS password:

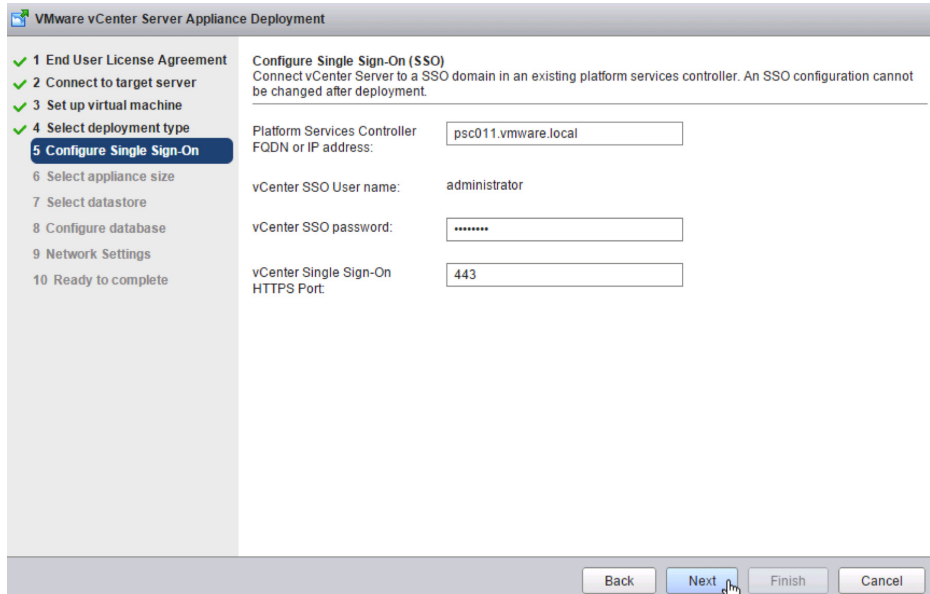
Confirm OS password:

Back Next Finish Cancel

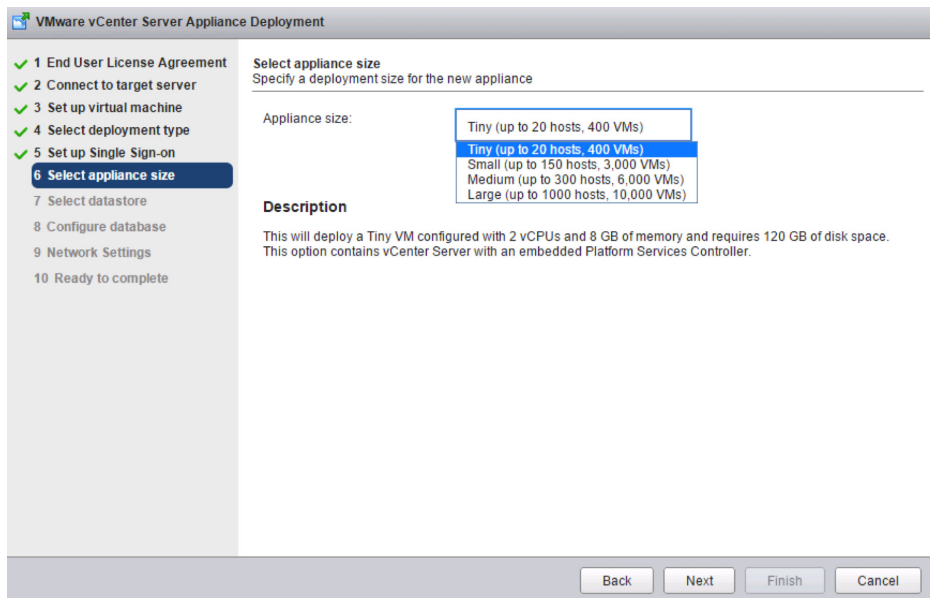
- Under **External Platform Services Controller**, select **Install vCenter Server**. Click **Next**.



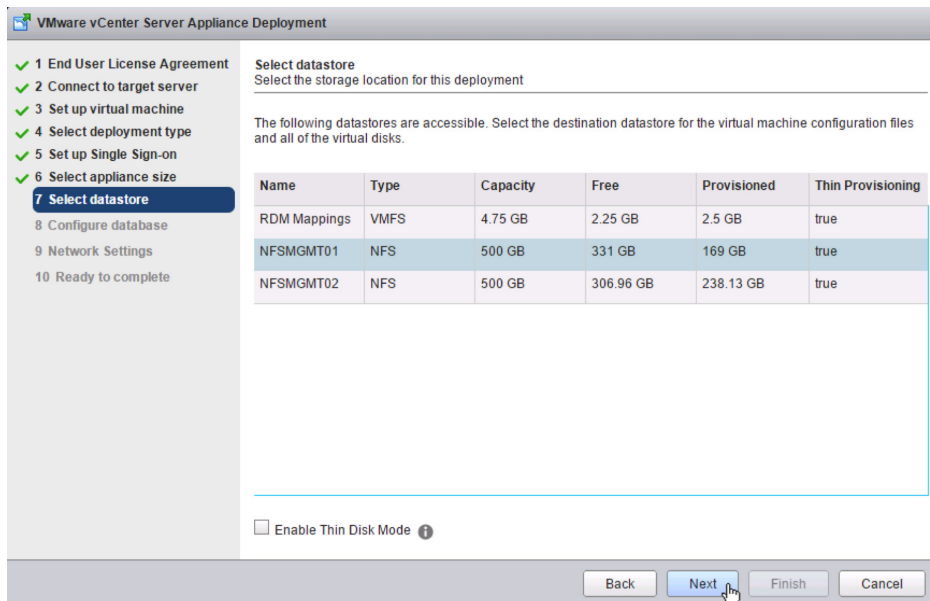
10. Enter the external **Platform Services Controller FQDN** and **vCenter SSO password**. Click **Next**.



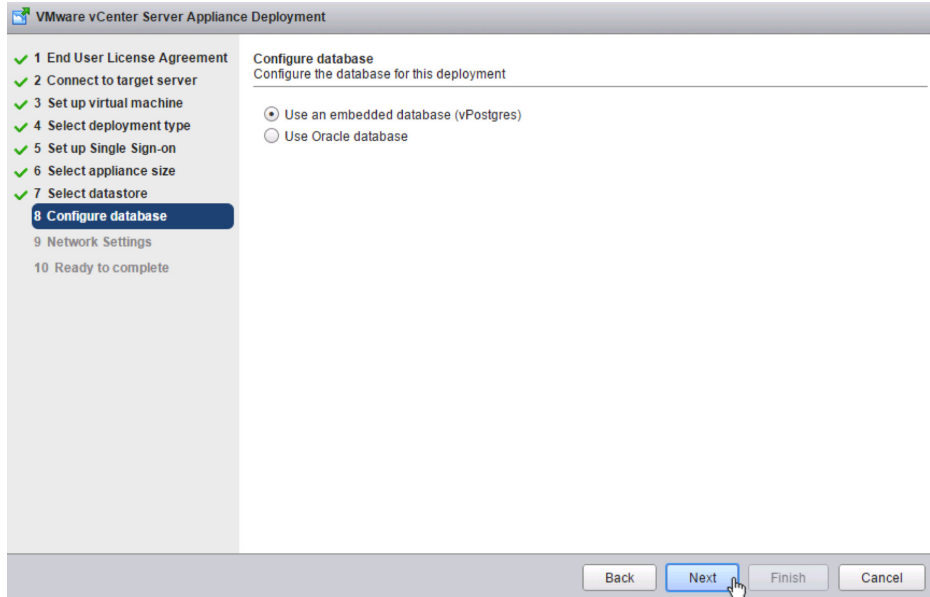
11. Select **Appliance size** from the drop-down list. Click **Next**.



12. **Select datastore** to deploy the appliance on. Click **Next**.

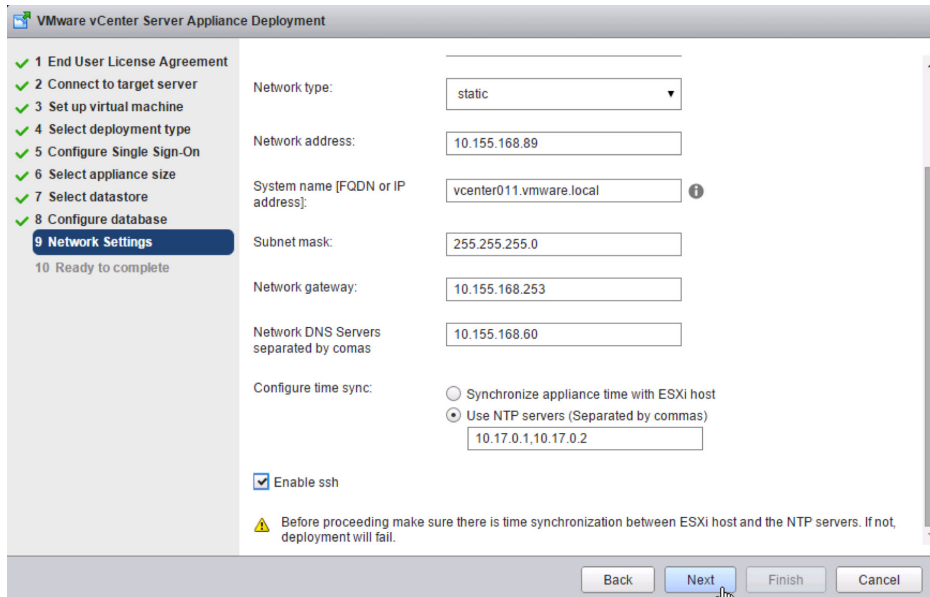


13. Select **Use an embedded database (vPostgres)**, which is recommended, or **Use Oracle database**. Click **Next**.

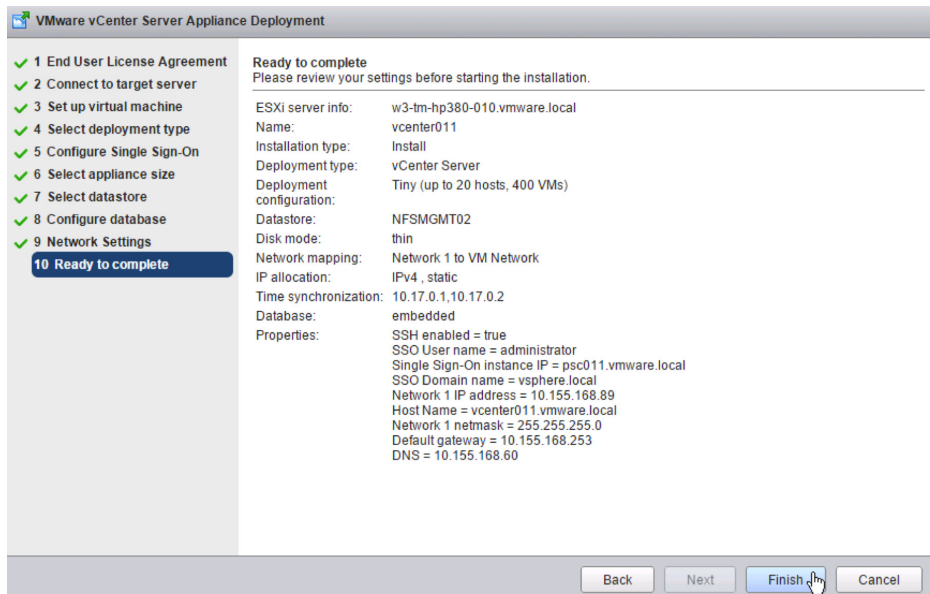


14. Enter **Network settings** and click **Next**.

NOTE: The FQDN or IP address entered here must be resolvable by the DNS server specified or the deployment will fail.

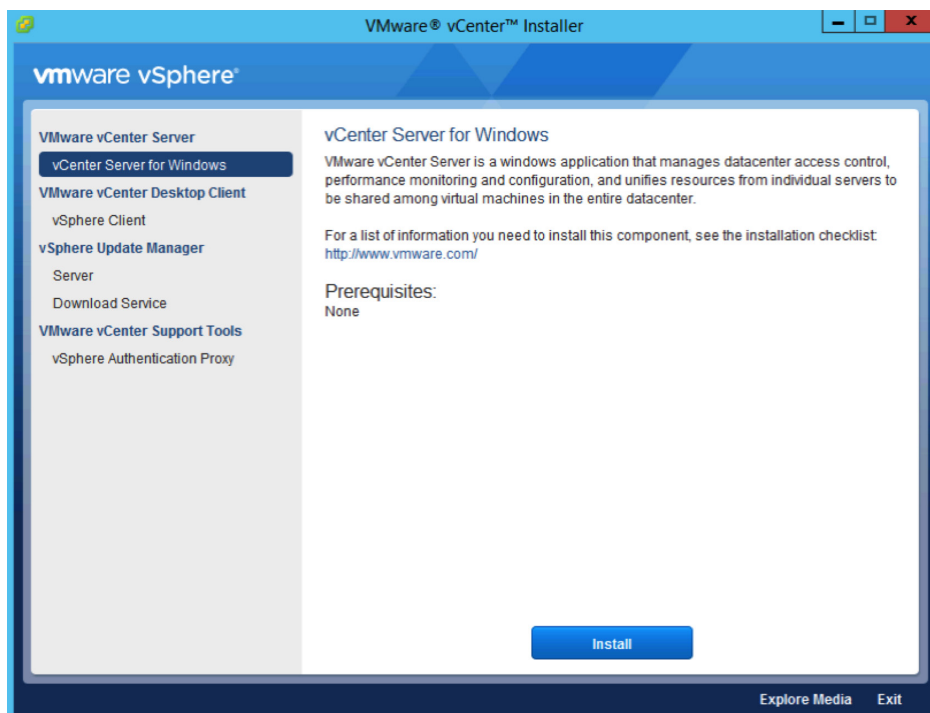


15. Review and click **Finish**.

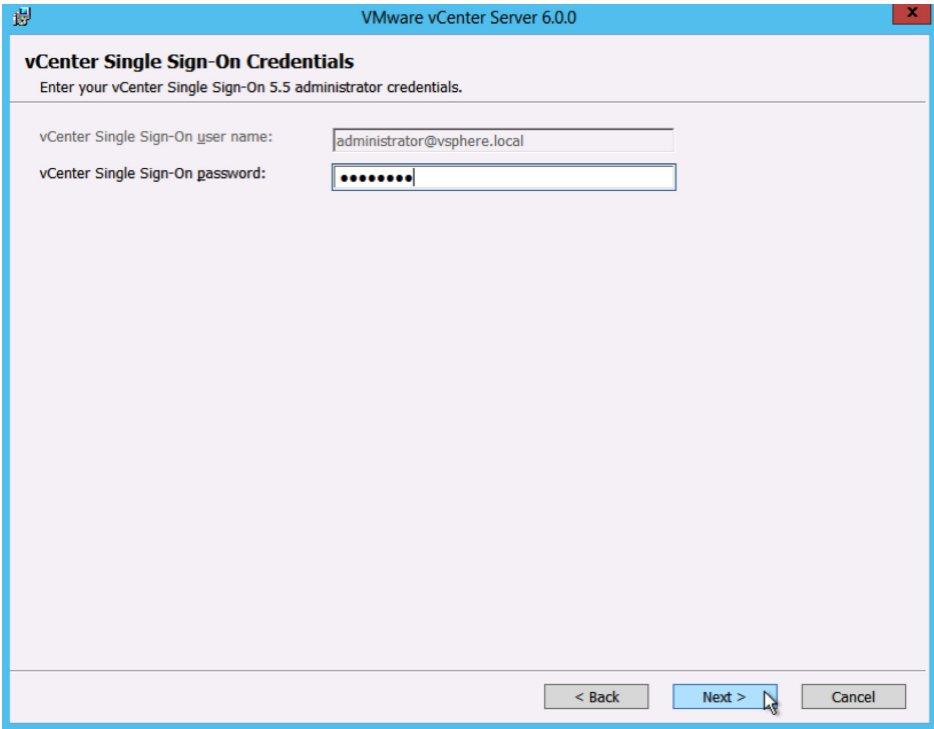


Upgrade External vCenter Single Sign-On

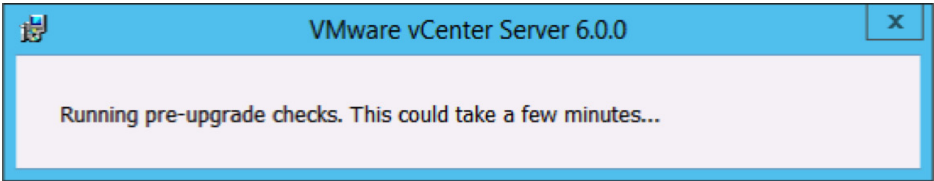
1. Back up the vCenter Single Sign-On and vCenter Server machines.
2. Log in to the vCenter Single Sign-On machine.
3. Mount the vCenter Server 6.0 ISO image.
4. If autorun does not start, execute autorun.exe.
5. Select **vCenter Server for Windows** and click **Install**.



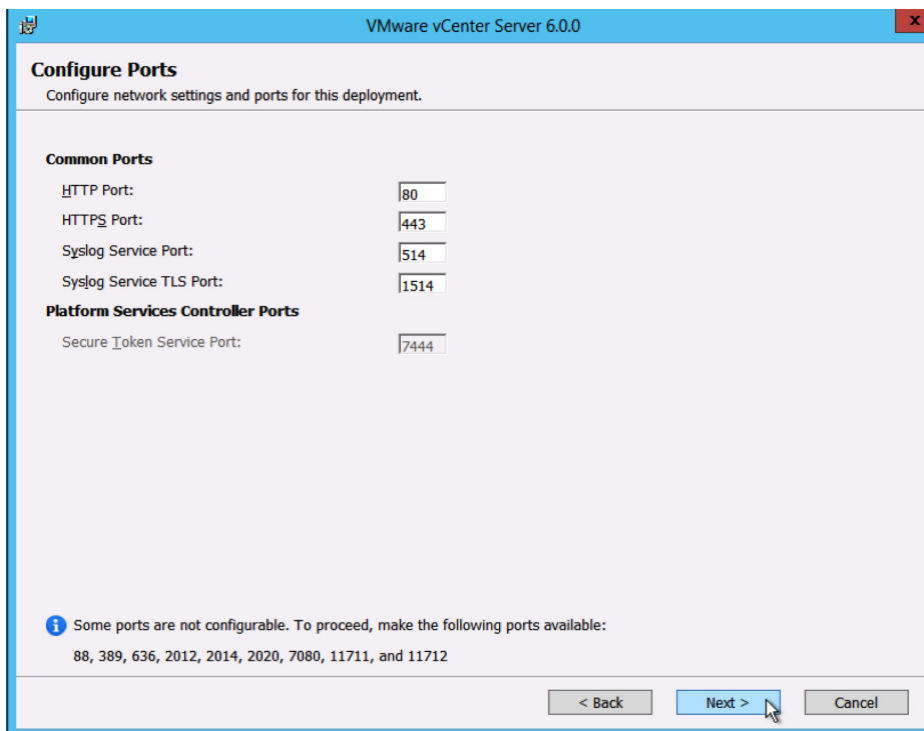
- 6. Click **Next**.
- 7. Accept the license agreements.
- 8. Enter the **vCenter Single Sign-On password** for the administrator@vsphere.local account. Click **Next**.



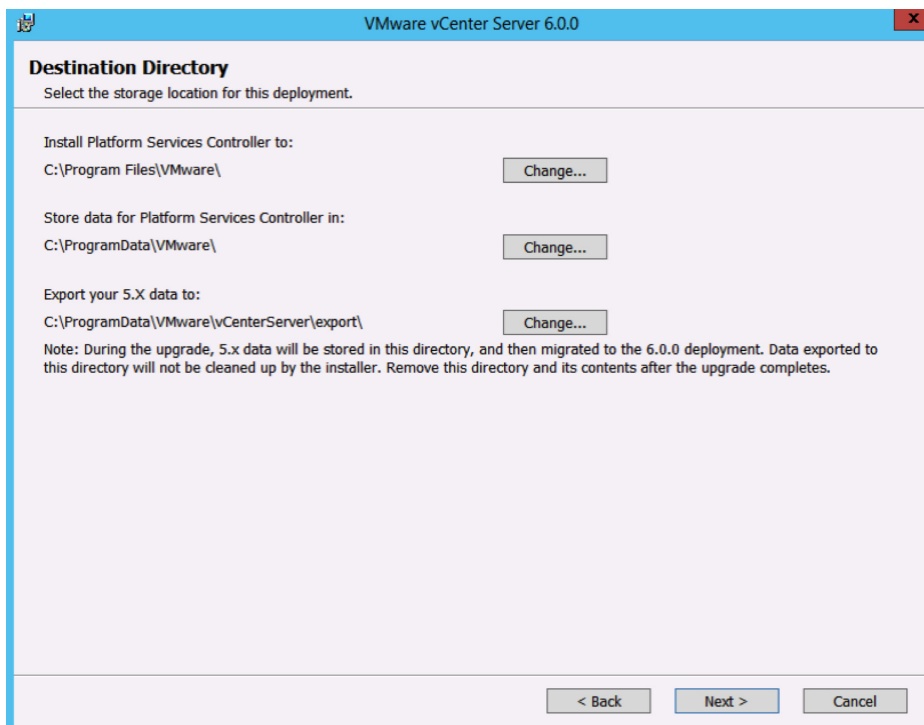
- 9. Wait for the **pre-upgrade checks** to complete.



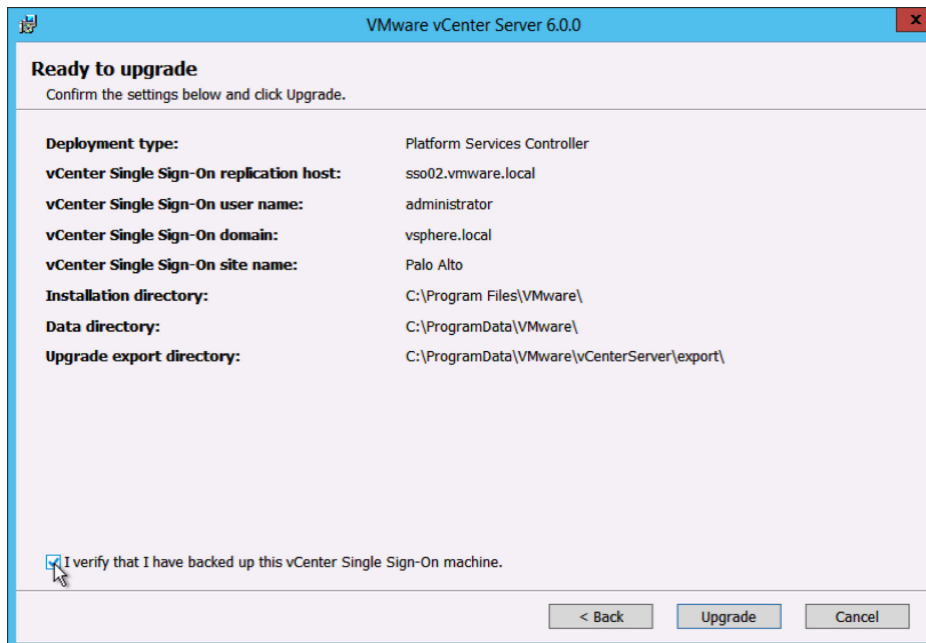
10. Accept the default ports and click **Next**.



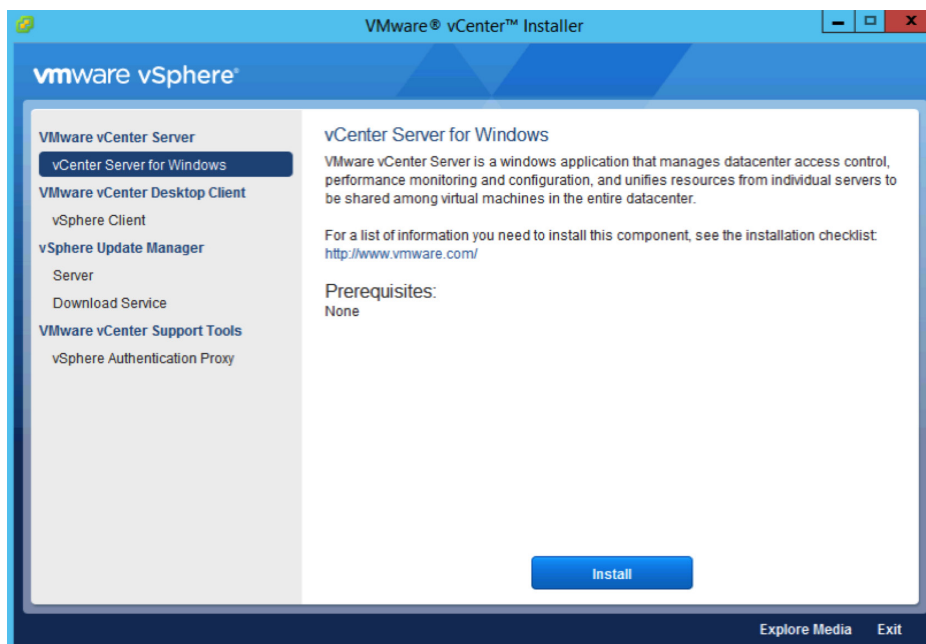
11. Select your installation path or take the defaults. Click **Next**.



12. Check **I verify that I have backed up this vCenter Single Sign-On machine**. Click **Upgrade**.



13. Click **Finish**.
14. Log in to the vCenter Server you want to upgrade.
15. Mount the vCenter Server 6.0 ISO image.
16. If autorun does not start, execute autorun.exe.
17. Select **vCenter Server for Windows** and click **Install**.



18. Click **Next**.
19. Accept the license agreements.

- Enter the **vCenter Server password** for the administrator@vsphere.local account and the **Account password** for the service account (if applicable). Click **Next**.

vCenter Server Credentials
Enter your vCenter Server 5.5 administrator credentials.

vCenter Server user name: administrator@vsphere.local

vCenter Server password: [masked]

The installer has detected that the vCenter Server service is running under the following service account. Enter the credentials for this service account.:

Account user name: VMWARE\svcvcenter

Account password: [masked]

< Back Next > Cancel

- Wait for the **pre-upgrade checks** to complete.

VMware vCenter Server 6.0.0

Running pre-upgrade checks. This could take a few minutes...

- Enter the **vCenter Single Sign-On password** for the administrator@vsphere.local account. Click **Next**.

vCenter Single Sign-On registration
Connect vCenter Server to a vCenter Single Sign-On domain in an existing Platform Services Controller.

Platform Services Controller EQDN or IP address: sso.vmware.local

Note: This is the external Platform Services Controller with the vCenter Single Sign-On you want to register with.

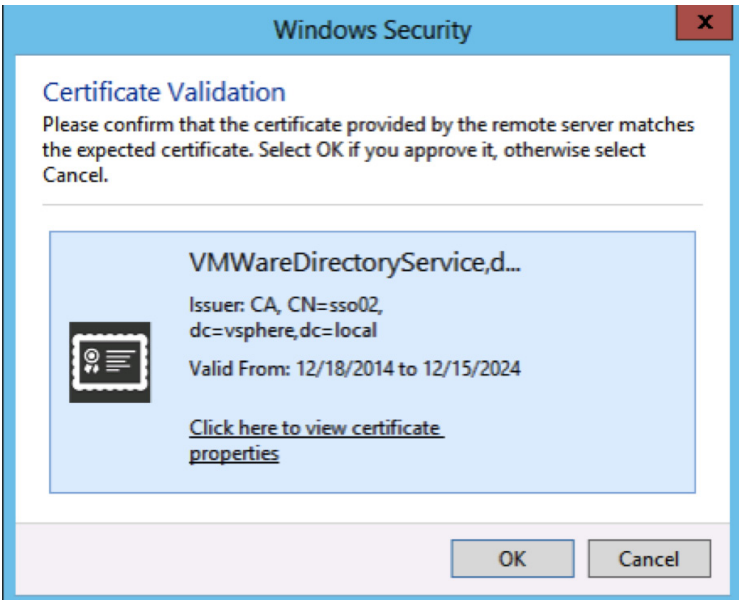
vCenter Single Sign-On HTTPS port: 443

vCenter Single Sign-On user name: administrator

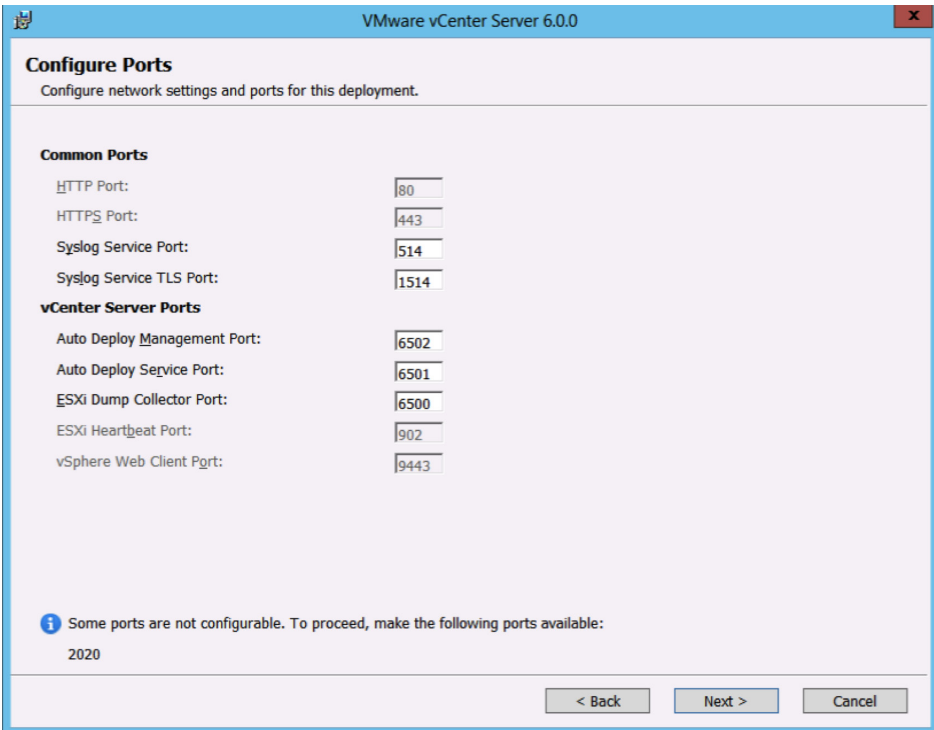
vCenter Single Sign-On password: [masked]

< Back Next > Cancel

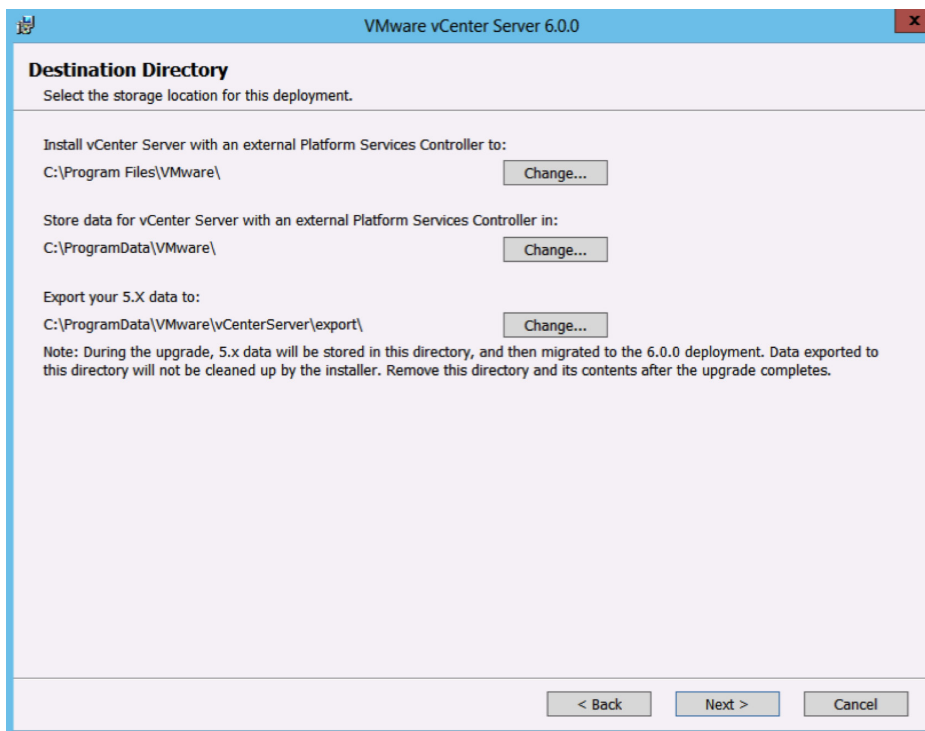
23. Click **OK** to accept the certificate.



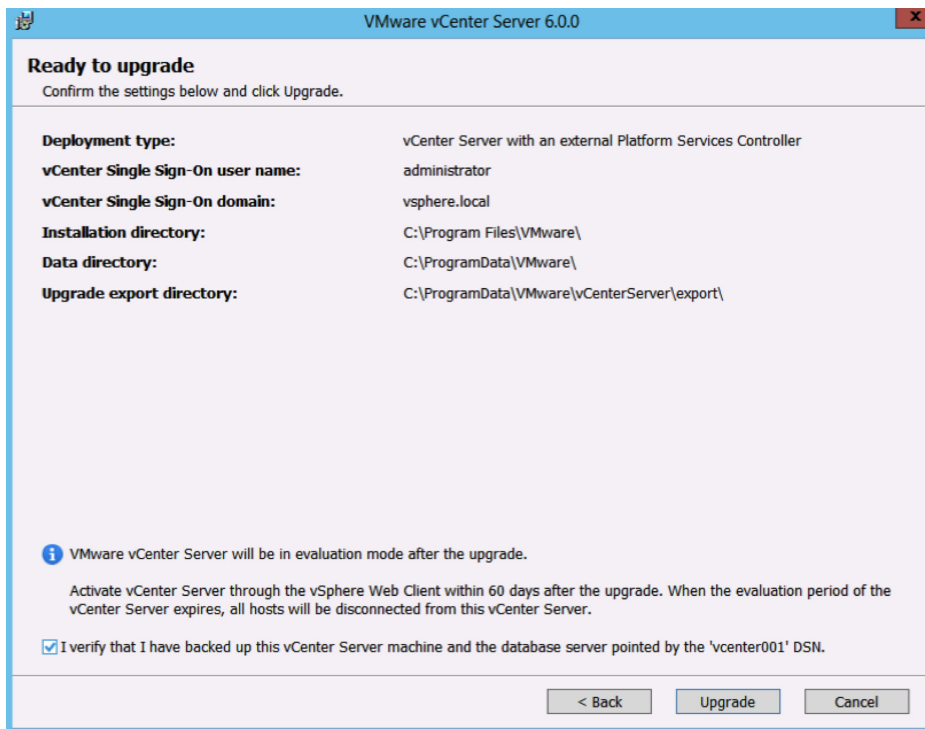
24. Accept the default ports and click **Next**.



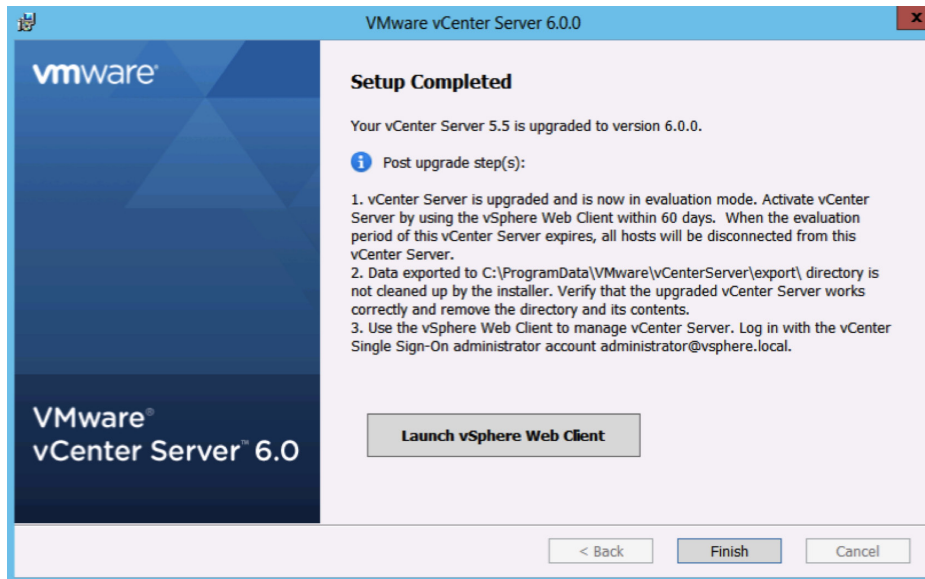
25. Accept or change the installation paths as necessary. Click **Next**.



26. Check the box to verify that you have backed up the vCenter Server and its database. Click **Upgrade**.



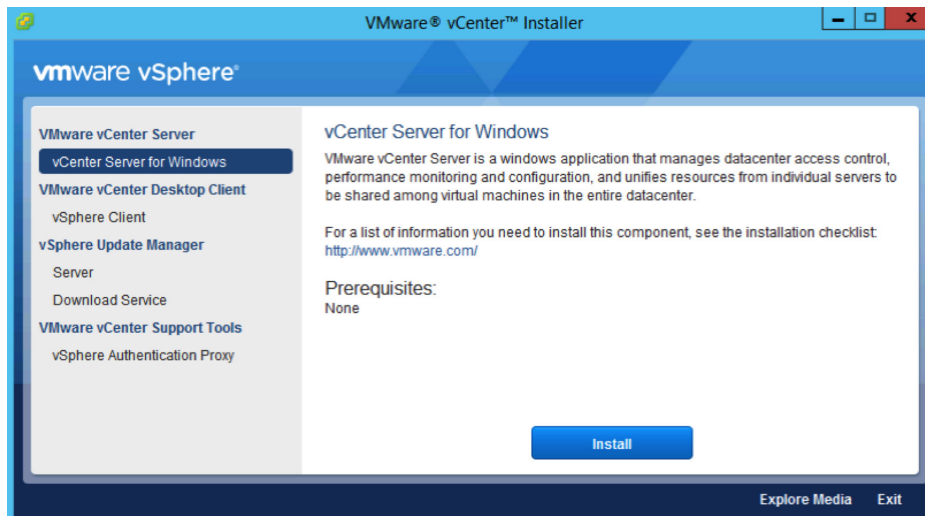
27. When completed, click **Finish**.



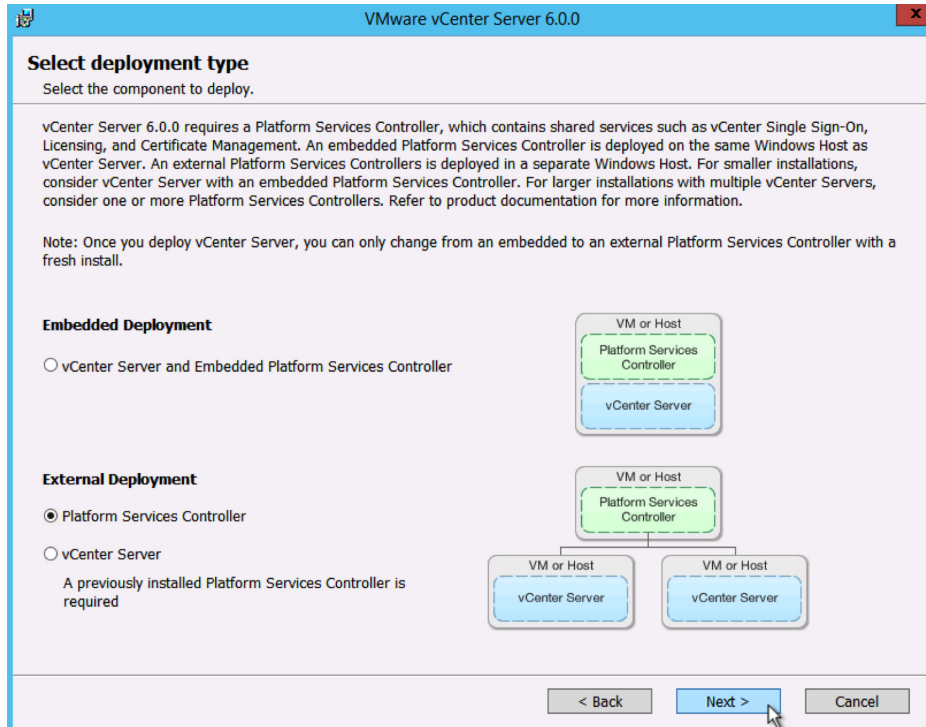
Fresh vCenter Single Sign-On High Availability Deployment

Windows Deployment

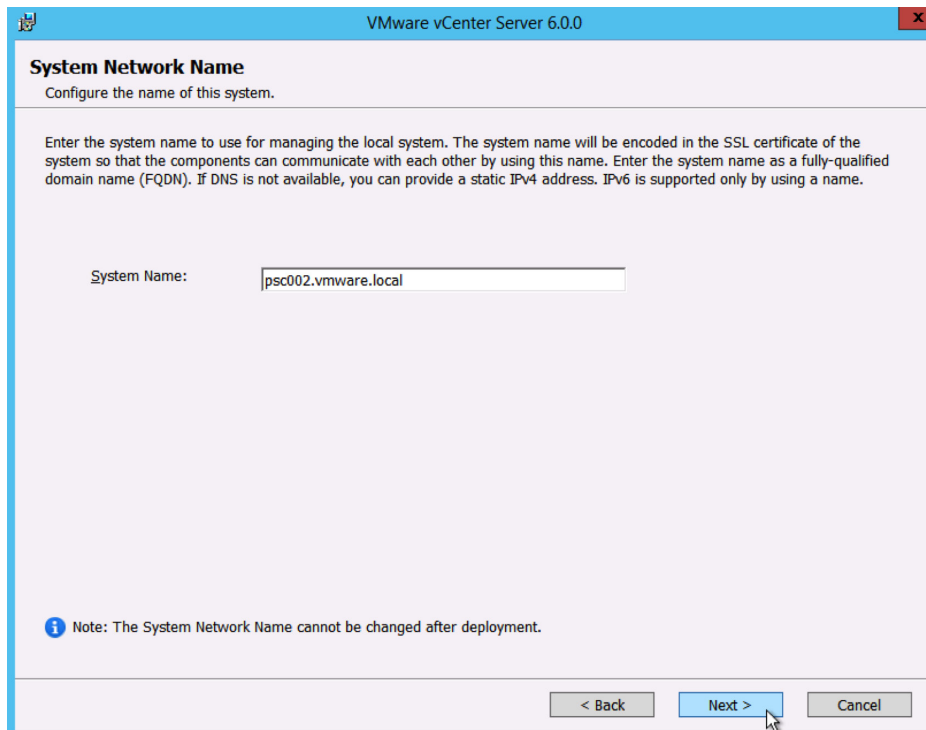
1. Complete steps 1-12 in the “Fresh External Platform Services Controller Deployment” section.
2. Log in to the second Windows Server to become a Platform Services Controller.
3. Mount the vCenter Server 6.0 ISO image.
4. If autorun does not start, execute autorun.exe.
5. Select **vCenter Server for Windows** and click **Install**.



6. Click **Next**.
7. Accept the license agreements.
8. Under **External Deployment**, select **Platform Services Controller**. Click **Next**.



9. Verify the **System Name** and click **Next**.



10. Select **Join a vCenter Single Sign-On domain** and enter the **FQDN** and **password**. Click **Next**.

vCenter Single Sign-On Configuration
Create or join a vCenter Single Sign-On domain.

Create a new vCenter Single Sign-On domain

Domain name: vsphere.local

vCenter Single Sign-On user name: administrator

vCenter Single Sign-On password:

Confirm password:

Site name: Default-First-Site

Join a vCenter Single Sign-On domain

Platform Services Controller FQDN or IP address: psc001.vmware.local

vCenter Single Sign-On HTTPS port: 443

vCenter Single Sign-On user name: administrator

vCenter Single Sign-On password:

i Note: vCenter Single Sign-On configuration cannot be changed after deployment.

< Back Next > Cancel

11. Click **OK** to accept the certificate from the Platform Services Controller.

Windows Security

Certificate Validation

Please confirm that the certificate provided by the remote server matches the expected certificate. Select OK if you approve it, otherwise select Cancel.

psc001.vmware.local

Issuer: CA

Valid From: 1/12/2015 to 1/5/2025

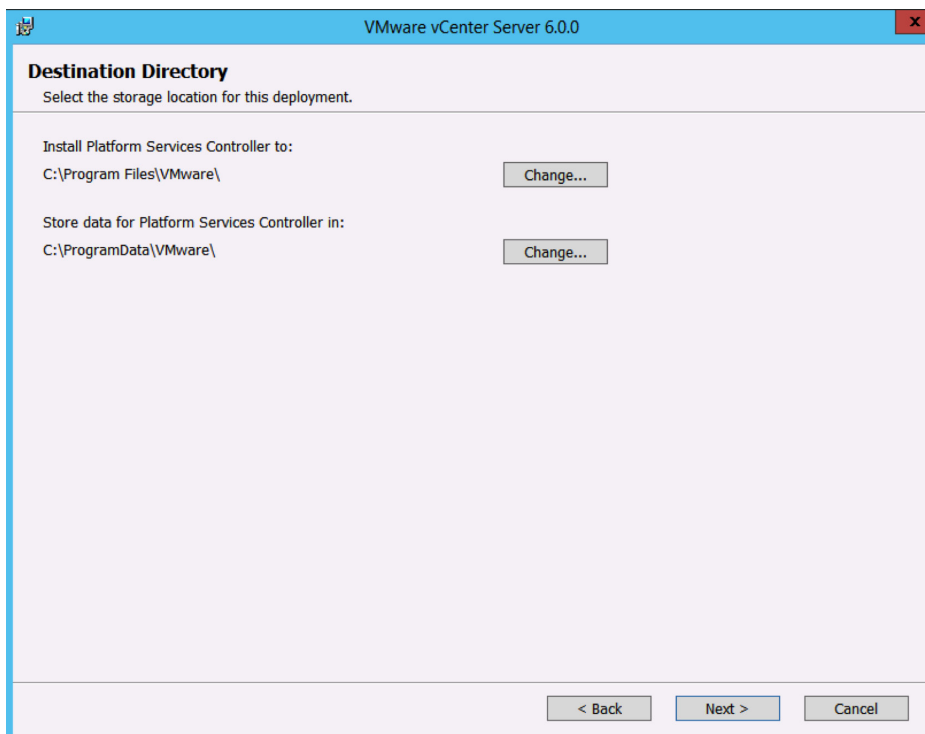
[Click here to view certificate properties](#)

OK Cancel

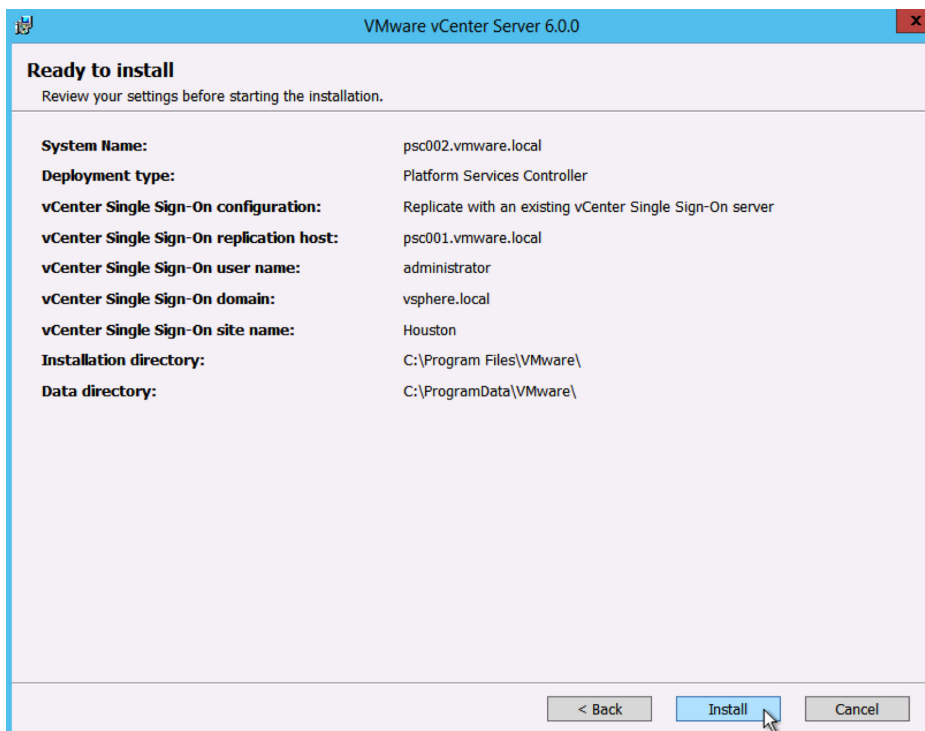
12. Select **Join an existing site** and enter the site. Click **Next**.

13. Accept the default ports and click **Next**.

14. Accept or change the installation paths as necessary. Click **Next**.



15. Review and click **Install**.



16. Log back in to the first Platform Services Controller.
17. Download the vCenter Single Sign-On high availability configuration scripts from the vCenter Server product download page.
18. Extract the vCenter Single Sign-On high availability scripts to c:\sso-ha.
19. Open a command prompt.
20. Add Python to your path by typing:
`PATH=%PATH%;%VMWARE_PYTHON_HOME%`

```
Administrator: C:\Windows\system32\cmd.exe
Microsoft Windows [Version 6.3.9600]
(c) 2013 Microsoft Corporation. All rights reserved.

C:\Users\Administrator.UMWARE>PATH=%PATH%;"c:\Program Files\VMware\Center Server\python"
C:\Users\Administrator.UMWARE>_
```

21. Change directories to c:\sso-ha.

22. Run:

```
python gen-lb-cert.py --primary-node --lb-fqdn=loadbalancerFQDN
```

where *loadbalancerFQDN* is the FQDN of the load balancer's virtual IP (VIP) used for load-balancing the Platform Services Controllers.

```
Administrator: C:\Windows\system32\cmd.exe

C:\sso-ha>python gen-lb-cert.py --primary-node --lb-fqdn=psc010.vmware.local
Initialization complete
executing certtool command
executing certtool command
Using config file : C:\Program Files\VMware\Center Server\vmcad\certool.cfg
Status : Success

Executing openssl command
Loading 'screen' into random state - done
Executing openssl command
writing RSA key
Modifying hostname.txt
modifying server.xml
Executing StopService --all
INFO:root:Service: licenseService, Action: stop
INFO:root:Service: vmwareServiceControlAgent, Action: stop
INFO:root:Service: VMwareComponentManager, Action: stop
INFO:root:Service: rhttpproxy, Action: stop
INFO:root:Service: VMwareSIS, Action: stop
INFO:root:Service: VMwareIdentityHgmtService, Action: stop
INFO:root:Service: VMwareCertificateService, Action: stop
INFO:root:Service: VMwareDirectoryService, Action: stop
INFO:root:Service: VMwareAfdService, Action: stop
INFO:root:Service: vmware-cis-config, Action: stop
Executing StartService --all
INFO:root:Service: vmware-cis-config, Action: start
INFO:root:Service: VMwareAfdService, Action: start
INFO:root:Service: rhttpproxy, Action: start
INFO:root:Service: VMwareDirectoryService, Action: start
INFO:root:Service: VMwareCertificateService, Action: start
INFO:root:Service: VMwareIdentityHgmtService, Action: start
INFO:root:Service: VMwareSIS, Action: start
INFO:root:Service: VMwareComponentManager, Action: start
INFO:root:Service: licenseService, Action: start
INFO:root:Service: vmwareServiceControlAgent, Action: start
Copy the contents of the c:\ha to the other nodes
Please copy the pl2 file into the F5 loadbalancer
Please copy the lb_rsa.key file and lb.crt file into the Netscaler loadbalancer

C:\sso-ha>_
```

23. Set up your load balancer to balance between the two or more Platform Services Controllers on ports 443, 2012, 2014, 2020, 389, and 636.
 - a. An SSL certificate (generated earlier and stored in c:\ha) is required for port 443 only.
 - b. For configuration steps for the F5 BIG-IP, see the appendix in this document.
24. Create a forward and reverse DNS entry for the VIP created to load balance the Platform Services Controller traffic.
25. Log in to the second Platform Services Controller.

26. Copy the sso-ha and ha folder from the first Platform Services Controller into the c: drive.
27. Copy C:\ProgramData\VMware\vCenterServer\cfg\sso\keys from the first Platform Services Controller to c:\ha\keys.
28. Open a command prompt.
29. Add Python to your path by typing:

```
PATH=%PATH%;%VMWARE_PYTHON_HOME%
```

```
Administrator: C:\Windows\system32\cmd.exe
Microsoft Windows [Version 6.3.9600]
(c) 2013 Microsoft Corporation. All rights reserved.
C:\Users\administrator.UMWARE>PATH=%PATH%;"c:\Program Files\VMware\vCenter Server\python"
C:\Users\administrator.UMWARE>
```

30. Change directories to c:\sso-ha.

31. Run:

```
python gen-lb-cert.py --secondary-node --lb-fqdn=loadbalancerFQDN --lb-cert-
folder=C:\ha --sso-server-sign-folder=c:\ha\keys\
```

where *loadbalancerFQDN* is the FQDN of the load balancer's VIP used for load-balancing the Platform Services Controllers.

```
Administrator: C:\Windows\system32\cmd.exe
C:\Users\administrator.UMWARE>path=%path%;"c:\Program Files\VMware\vCenter Server\python"
C:\Users\administrator.UMWARE>cd sso-ha
C:\sso-ha>python gen-lb-cert.py --secondary-node --lb-fqdn=psc010.umware.local --lb-cert-folder=c:\ha --sso-server-sign-folder=c:\ha\keys
Initialization complete
Please make sure that you have copied the contents from HA folder in Node 1 into
the HA folder in the local node
Please Make that you have copied the ssoServerSign.* files and ssoServerRoot.crt file from node 1
Press enter to continue.
Modifying hostname.txt
modifying server.xml
Executing StopService UMWareSTS
Executing StopService UMWareIdentityMgmtService
Executing STS installer
Executing StopService --all
INFO:root:Service: licenseService, Action: stop
INFO:root:Service: umwareServiceControlAgent, Action: stop
INFO:root:Service: UMWareComponentManager, Action: stop
INFO:root:Service: httpProxy, Action: stop
INFO:root:Service: UMWareSTS, Action: stop
INFO:root:Service: UMWareIdentityMgmtService, Action: stop
INFO:root:Service: UMWareDirectoryService, Action: stop
INFO:root:Service: UMWareAfdService, Action: stop
INFO:root:Service: umware-cis-config, Action: stop
Executing StartService --all
INFO:root:Service: umware-cis-config, Action: start
INFO:root:Service: UMWareAfdService, Action: start
INFO:root:Service: httpProxy, Action: start
INFO:root:Service: UMWareDirectoryService, Action: start
INFO:root:Service: UMWareCertificateService, Action: start
INFO:root:Service: UMWareIdentityMgmtService, Action: start
INFO:root:Service: UMWareSTS, Action: start
INFO:root:Service: licenseService, Action: start
INFO:root:Service: umwareServiceControlAgent, Action: start
C:\sso-ha>
```

32. Repeat steps 26–32 for any additional Platform Services Controllers.

33. On one Platform Services Controller, update the endpoint URL by running:

```
python l1stoolHA.py --hostname=FQDNofLocalMachine --lb-fqdn=loadbalancerFQDN --lb-cert-
folder=C:\ha --user=Administrator@SSODomain --password="password"
```

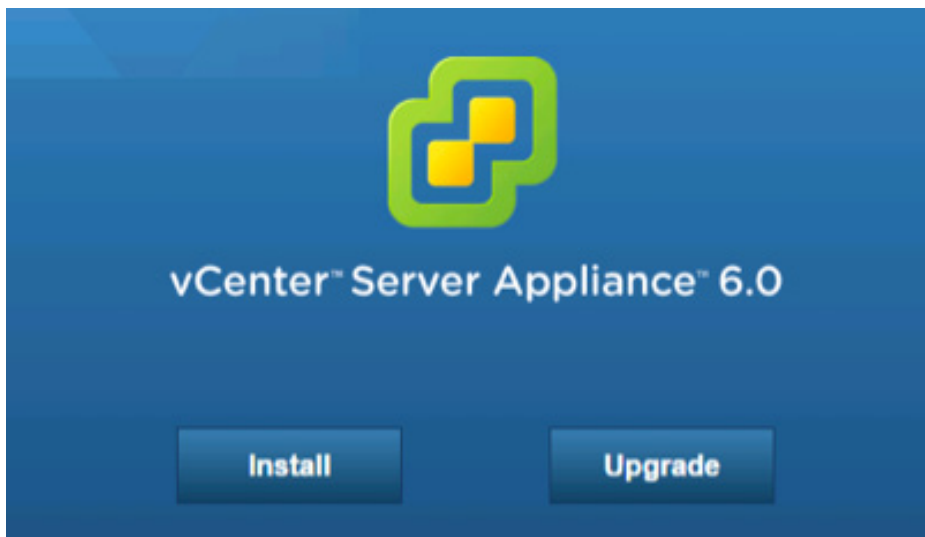
where *FQDNofLocalMachine* is the FQDN of the machine where the script is being run, *loadbalancerFQDN* is the FQDN of the load balancer's VIP used for load balancing the Platform Services Controllers, *SSODomain* is the vCenter Single Sign-On domain (by default vsphere.local), and *password* is the password for the vCenter Single Sign-On administrator. The password parameter is optional; if not specified, you will be prompted for it.

```
Administrator: C:\Windows\system32\cmd.exe
C:\Users\Administrator\UMWARE>path=%path%;%c:\Program Files\VMware\Center Server\python"
C:\Users\Administrator\UMWARE>cd %sso-ha
C:\sso-ha>python gen-lb-cert.py --secondary-node --lb-fqdn=psc010.umware.local --lb-cert-folder=c:\ha --sso-server-sign-folder
c:\ha\keys
Initialization complete
Please make sure that you have copied the contents from HA folder in Node 1 into
the HA folder in the local node
Please make that you have copied the ssoServerSign.* files and ssoServerRoot.crt file from node 1
Press enter to continue.
Modifying hostname.txt
modifying server.xml
Executing StopService VMwareSTS
Executing StopService VMwareIdentityMgmtService
Executing STSInstaller
Executing StopService --all
INFO:root:Service: licenseService, Action: stop
INFO:root:Service: vmwareServiceControlAgent, Action: stop
INFO:root:Service: VMwareComponentManager, Action: stop
INFO:root:Service: httpProxy, Action: stop
INFO:root:Service: VMwareSTS, Action: stop
INFO:root:Service: VMwareIdentityMgmtService, Action: stop
INFO:root:Service: VMwareCertificateService, Action: stop
INFO:root:Service: VMwareDirectoryService, Action: stop
INFO:root:Service: VMwareAfdsService, Action: stop
INFO:root:Service: vmware-cis-config, Action: stop
Executing StartService --all
INFO:root:Service: vmware-cis-config, Action: start
INFO:root:Service: VMwareAfdsService, Action: start
INFO:root:Service: httpProxy, Action: start
INFO:root:Service: VMwareDirectoryService, Action: start
INFO:root:Service: VMwareCertificateService, Action: start
INFO:root:Service: VMwareIdentityMgmtService, Action: start
INFO:root:Service: VMwareSTS, Action: start
INFO:root:Service: VMwareComponentManager, Action: start
INFO:root:Service: licenseService, Action: start
INFO:root:Service: vmwareServiceControlAgent, Action: start
C:\sso-ha>
```

34. Follow the steps to install a new external vCenter Server. When asked for the Platform Services Controller, enter the FQDN of the load balancer's VIP.

vCenter Server Appliance Deployment

1. Complete steps 1-14 in the "Fresh External Platform Services Controller Deployment" section.
2. Click **Install** to start the installation for the second Platform Services Controller.



3. Accept the license agreement and click **Next**.
4. Enter a target host and a **User name** and **Password** on the host with root access.

The screenshot shows the 'Connect to target server' step of the VMware vCenter Server Appliance Deployment wizard. The left sidebar lists 11 steps, with '2 Connect to target server' selected. The main area contains the following fields and instructions:

- Connect to target server**
Specify the ESXi host on which to deploy the vCenter Server Appliance.
- FQDN or IP Address:**
- User name:**
- Password:**
- Before proceeding:**
 - Make sure the ESXi host is not in lock down mode or maintenance mode.
 - When deploying to a vSphere Distributed Switch (VDS), the appliance must be deployed to an ephemeral portgroup. After deployment, it can be moved to a static or dynamic portgroup.

At the bottom right, there are four buttons: 'Back', 'Next', 'Finish', and 'Cancel'. The 'Next' button is highlighted with a mouse cursor.

5. Click **Yes** to accept the host's certificate.
6. Enter an **Appliance name** and the root **password** you want to assign. Click **Next**.

The screenshot shows the 'Set up virtual machine' step of the VMware vCenter Server Appliance Deployment wizard. The left sidebar lists 11 steps, with '3 Set up virtual machine' selected. The main area contains the following fields and instructions:

- Set up virtual machine**
Specify virtual machine settings for the vCenter Server Appliance to be deployed.
- Appliance name:**
- OS user name:**
- OS password:**
- Confirm OS password:**

At the bottom right, there are four buttons: 'Back', 'Next', 'Finish', and 'Cancel'. The 'Next' button is highlighted with a mouse cursor.

7. Under **External Platform Services Controller**, select **Install Platform Services Controller**. Click **Next**.

VMware vCenter Server Appliance Deployment

1 End User License Agreement
 2 Connect to target server
 3 Set up virtual machine
 4 **Select deployment type**
 5 Set up Single Sign-on
 6 Single Sign-on Site
 7 Select appliance size
 8 Select datastore
 9 Network Settings
 10 Ready to complete

Select deployment type
Select the services to deploy onto this appliance.

vCenter Server 6.0 requires a Platform Services Controller, which contains shared services such as Single Sign-On, Licensing, and Certificate Management. An embedded Platform Services Controller is deployed on the same Appliance VM as vCenter Server. An external Platform Services Controller is deployed in a separate Appliance VM. For smaller installations, consider vCenter Server with an embedded Platform Services Controller. For larger installations with multiple vCenter Servers, consider one or more external Platform Services Controllers. Refer to the vCenter Server documentation for more information.

Note: Once you install vCenter Server, you can only change from an embedded to an external Platform Services Controller with a fresh install.

Embedded Platform Services Controller

Install vCenter Server with an Embedded Platform Services Controller

External Platform Services Controller

Install Platform Services Controller
 Install vCenter Server (Requires External Platform Services Controller)

8. Select **Join an SSO domain** and enter the **FQDN** and password. Click **Next**.

VMware vCenter Server Appliance Deployment

1 End User License Agreement
 2 Connect to target server
 3 Set up virtual machine
 4 Select deployment type
 5 **Set up Single Sign-on**
 6 Single Sign-on Site
 7 Select appliance size
 8 Select datastore
 9 Network Settings
 10 Ready to complete

Set up Single Sign-on (SSO)
Create or join a SSO domain. An SSO configuration cannot be changed after deployment.

Create a new SSO domain
 Join an SSO domain in an existing vCenter 6.0 platform services controller

Platform Services Controller FQDN or IP address:

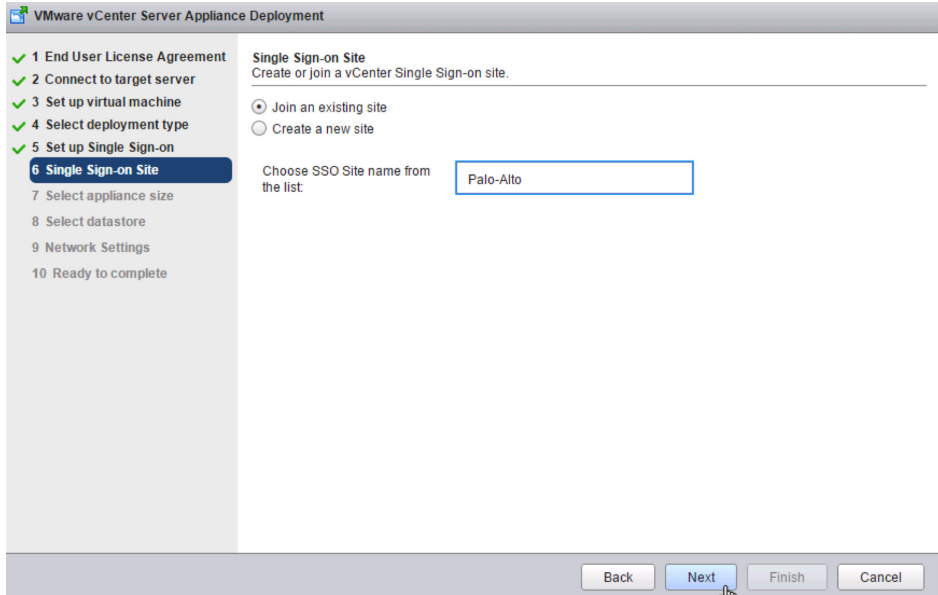
vCenter SSO User name:

vCenter SSO Password:

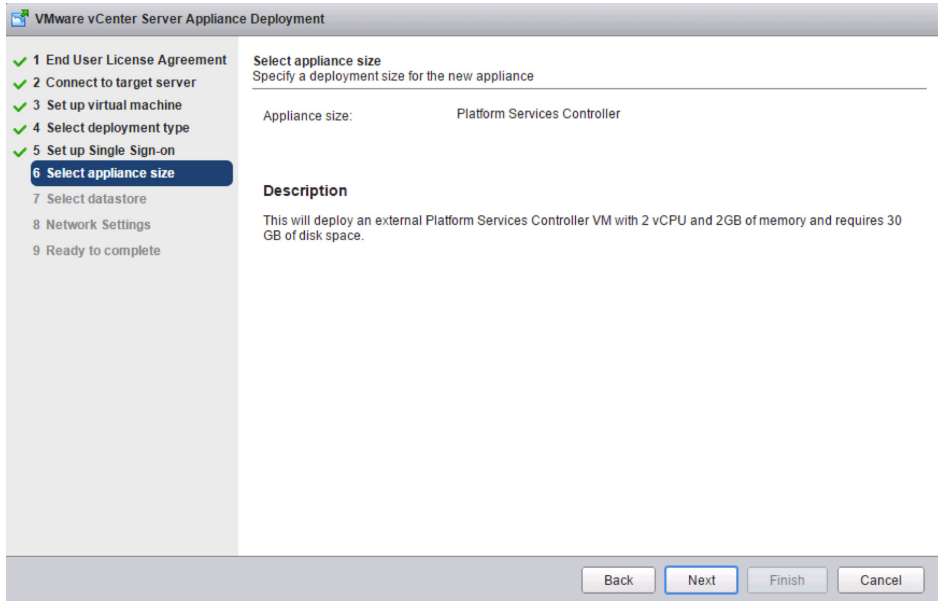
Port:

⚠ Before proceeding make sure to type the correct site name that you want to join. Typing in the wrong site name will create a new site.

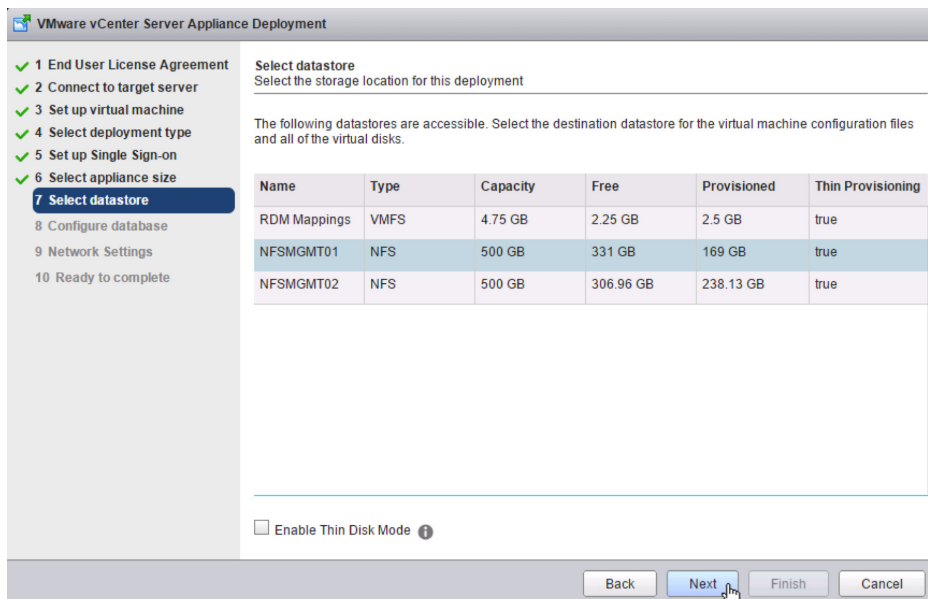
9. Select **Join an existing site**. Choose the site and click **Next**.



10. Click **Next**. There is only one appliance size for the Platform Services Controller.

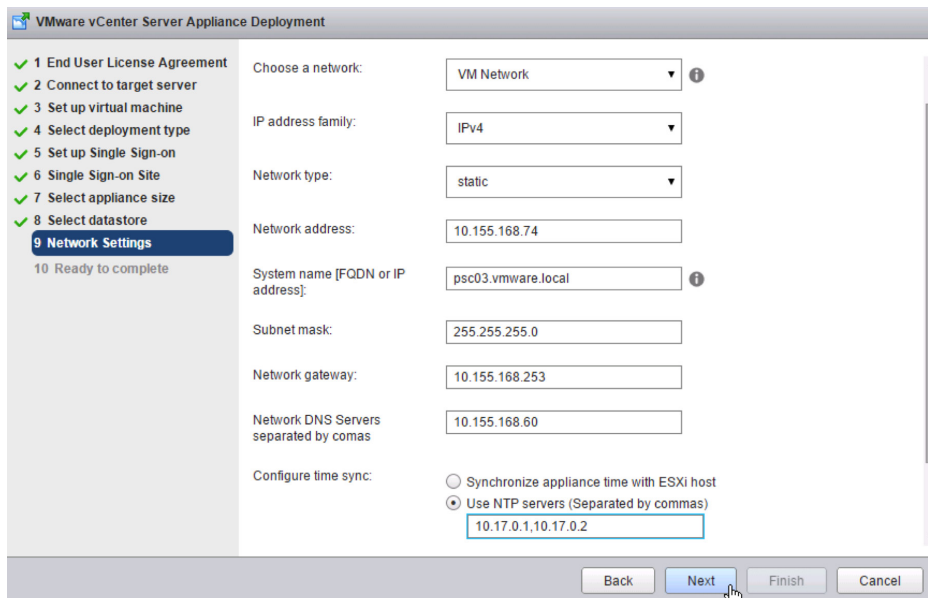


11. Select a datastore to deploy the appliance on and click **Next**.

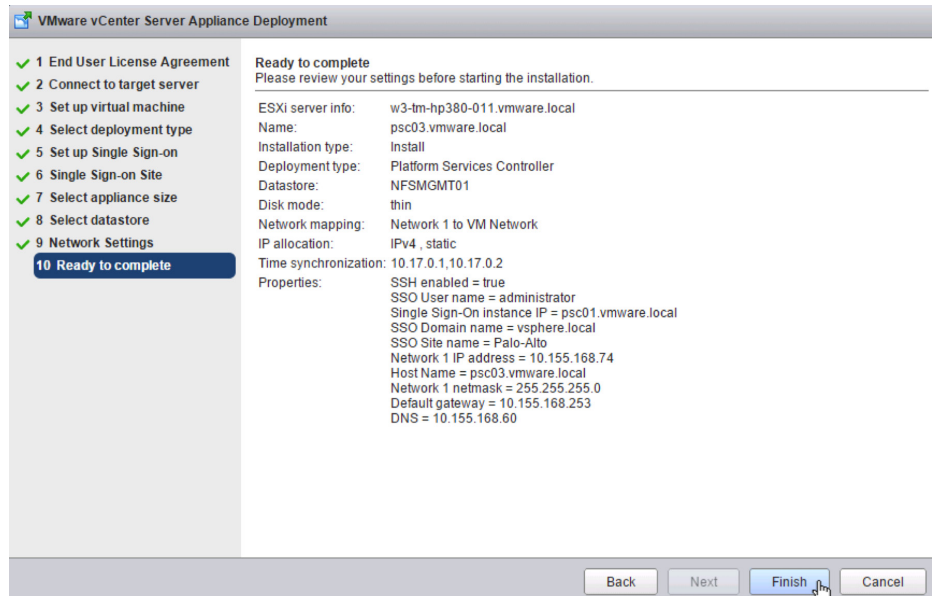


12. Enter **Network Settings** and click **Next**.

NOTE: The FQDN and IP addresses entered here must be resolvable by the DNS server specified or the deployment will fail.



13. Review and click **Finish**.



14. Connect to the first Platform Services Controller via SSH.

15. Type:

```
shell.set --enabled True
```

16. Type:

```
shell
```

17. Download the vCenter Single Sign-On high availability configuration scripts from the vCenter Server product download page.

18. Extract the vCenter Single Sign-On high availability scripts to /sso-ha.

19. Change directories to /sso-ha.

20. Run:

```
python gen-lb-cert.py --primary-node --lb-fqdn=loadbalancerFQDN
```

where *loadbalancerFQDN* is the FQDN of the load balancer's VIP used for load-balancing the Platform Services Controllers.

```

scc01:~ # cd /sso-ha/
scc01:/sso-ha # python gen-lb-cert.py --primary-node --lb-fqdn=scc011.vware.local
Initialization complete
Executing certTool command
Executing certTool command
Using config file : /usr/lib/vmware-vcac/share/config/certool.cfg
Status : Success

Executing openssl command
Executing openssl command
Writing RSA key
Modifying hostnames.txt
Modifying server.xml
Executing StopService --all
INFO:root:Service: vmware-syslog-health, Action: stop
INFO:root:Service: apptelnet, Action: stop
INFO:root:Service: vmware-cis-license, Action: stop
INFO:root:Service: vmware-syslog, Action: stop
INFO:root:Service: vmware-sca, Action: stop
INFO:root:Service: vmware-ca, Action: stop
INFO:root:Service: vmware-rhttproxy, Action: stop
INFO:root:Service: vmware-std, Action: stop
INFO:root:Service: vmware-std-ld, Action: stop
INFO:root:Service: vacad, Action: stop
INFO:root:Service: vmdir, Action: stop
INFO:root:Service: vaaadd, Action: stop
Executing StartService --all
INFO:root:Service: vaaadd, Action: start
INFO:root:Service: vmware-rhttproxy, Action: start
INFO:root:Service: vmdir, Action: start
INFO:root:Service: vacad, Action: start
INFO:root:Service: vmware-std-ld, Action: start
INFO:root:Service: vmware-std, Action: start
INFO:root:Service: vmware-ca, Action: start
INFO:root:Service: vmware-cis-license, Action: start
INFO:root:Service: vmware-sca, Action: start
INFO:root:Service: apptelnet, Action: start
INFO:root:Service: vmware-syslog, Action: start
INFO:root:Service: vmware-syslog-health, Action: start
Copy the contents of the /ha to the other nodes
Please copy the p12 file into the F5 loadbalancer
Please copy the lb_rsa.key file and lb.crt file into the Netscaler loadbalancer
scc01:/sso-ha #

```

21. Set up your load balancer to balance between the two or more Platform Services Controllers on ports 443, 2012, 2014, 2020, 389, and 636.
 - a. An SSL certificate (generated earlier) is required for port 443 only.
 - b. For configuration steps for the F5 BIG-IP, see the appendix in this document.
22. Create a forward and reverse DNS entry for the VIP created to load-balance the Platform Services Controller traffic.
23. Connect to the second Platform Services Controller via SSH.
24. Copy the /sso-ha and /ha folder from the first Platform Services Controller.
25. Copy /etc/vmware-sso/keys/ from the first Platform Services Controller to /ha/keys.
26. Change directories to /sso-ha.
27. Run:

```
python gen-lb-cert.py --secondary-node --lb-fqdn=loadbalancerFQDN --lb-cert-folder=/ha
--sso-serversign-folder=/ha/keys
```

where *loadbalancerFQDN* is the FQDN of the load balancer's VIP used for load-balancing the Platform Services Controllers.


```

pscc01/soo-ha # python gen-lib-cert.py --secondary-node --lb-fqdn=pscc01.vsphere.local --lb-cert-folder=/ha --sso-server-sign-folder=/ha/keys
Initialization complete
Please make sure that you have copied the contents from HA folder in Node 1 into
the HA folder in the local node.
Please Make that you have copied the ssoServerSign.* files and ssoServerRoot.crt file from node 1
Press enter to continue.
Modifying hostname.txt
Modifying server.xml
Executing StopService vware-std
Executing StopService vware-std-isd
Executing StopService --all
Executing StartService --all
INFO:root:Service: vware-syslog-health, Action: stop
INFO:root:Service: vware-cis-license, Action: stop
INFO:root:Service: vware-syslog, Action: stop
INFO:root:Service: vware-sca, Action: stop
INFO:root:Service: vware-ca, Action: stop
INFO:root:Service: vware-rhttpproxy, Action: stop
INFO:root:Service: vware-std, Action: stop
INFO:root:Service: vware-std-isd, Action: stop
INFO:root:Service: vvacd, Action: stop
INFO:root:Service: vadfrd, Action: stop
INFO:root:Service: vaafd, Action: stop
Executing StartService --all
INFO:root:Service: vaafd, Action: start
INFO:root:Service: vware-rhttpproxy, Action: start
INFO:root:Service: vadfrd, Action: start
INFO:root:Service: vvacd, Action: start
INFO:root:Service: vware-std-isd, Action: start
INFO:root:Service: vware-std, Action: start
INFO:root:Service: vware-ca, Action: start
INFO:root:Service: vware-cis-license, Action: start
INFO:root:Service: vware-sca, Action: start
INFO:root:Service: vware-syslog, Action: start
INFO:root:Service: vware-syslog-health, Action: start
pscc01/soo-ha #

```

28. Repeat steps 24-28 for any additional Platform Services Controllers.

29. On one Platform Services Controller, update the endpoint URL by running:

```
python lstoolHA.py --hostname=FQDNofLocalMachine --lb-fqdn=loadbalancerFQDN --lb-cert-
folder=/ha --user=Administrator@SSODomain --password=password
```

where *FQDNofLocalMachine* is the FQDN of the machine where the script is being run, *loadbalancerFQDN* is the FQDN of the load balancer's VIP used for load-balancing the Platform Services Controllers, *SSODomain* is the vCenter Single Sign-On domain (by default, vsphere.local), and *password* is the password for the vCenter Single Sign-On administrator. The password parameter is optional; if not specified, you will be prompted for it.

```

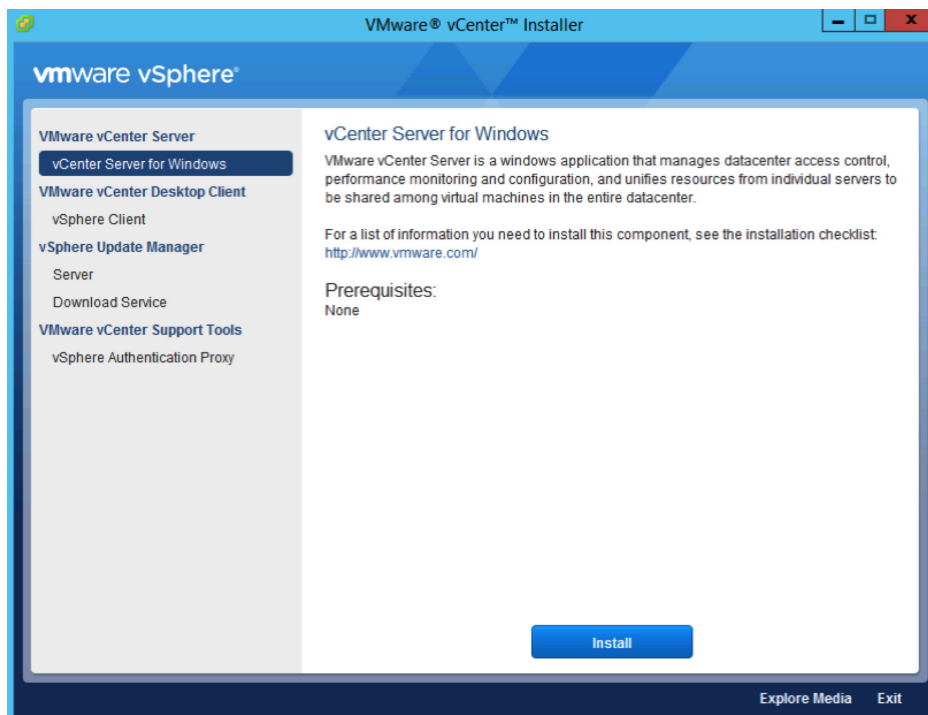
2015-01-13 18:00:18,252 INFO org.springframework.beans.factory.xml.XmlBeanDefinitionReader - Loading XML bean definitions from class path resource [com/vware/vi
w/Binding/lookup/context.xml]
INFO:root:Service: vadfrd, Action: start
2015-01-13 18:00:19,480 INFO com.vware.via.vmoai.core.types.impl.VaodContextImpl$NonValidatingClassPathXmlApplicationContext - Closing com.vware.via.vmoai.co
re.types.impl.VaodContextImpl$NonValidatingClassPathXmlApplicationContext@7fcd72ca; startup date [Tue Jan 13 18:00:18 UTC 2015]; root of context hierarchy
2015-01-13 18:00:19,208 WARN com.vware.via.vmoai.client.http.impl.HttpConfigurationCompilerBase$ConnectionMonitorThreadBase - Shutting down the connection mont
or.
2015-01-13 18:00:20,855 INFO com.vware.via.vmoai.core.types.impl.VaodContextImpl$NonValidatingClassPathXmlApplicationContext - Refreshing com.vware.via.vmoai.
core.types.impl.VaodContextImpl$NonValidatingClassPathXmlApplicationContext@7fd13cab; startup date [Tue Jan 13 18:00:20 UTC 2015]; root of context hierarchy
2015-01-13 18:00:20,112 INFO org.springframework.beans.factory.xml.XmlBeanDefinitionReader - Loading XML bean definitions from class path resource [com/vware/vi
w/Binding/vaod/context-v2.xml]
2015-01-13 18:00:20,427 INFO com.vware.via.vmoai.core.types.impl.VaodContextImpl$NonValidatingClassPathXmlApplicationContext - Closing com.vware.via.vmoai.co
re.types.impl.VaodContextImpl$NonValidatingClassPathXmlApplicationContext@7fd13cab; startup date [Tue Jan 13 18:00:20 UTC 2015]; root of context hierarchy
2015-01-13 18:00:20,431 INFO com.vware.via.vmoai.core.types.impl.VaodContextImpl$NonValidatingClassPathXmlApplicationContext - Refreshing com.vware.via.vmoai.
core.types.impl.VaodContextImpl$NonValidatingClassPathXmlApplicationContext@848bba1c5; startup date [Tue Jan 13 18:00:20 UTC 2015]; root of context hierarchy
2015-01-13 18:00:20,433 INFO org.springframework.beans.factory.xml.XmlBeanDefinitionReader - Loading XML bean definitions from class path resource [com/vware/vi
w/Binding/vaod/context-v2.xml]
2015-01-13 18:00:20,492 INFO com.vware.via.vmoai.core.types.impl.VaodContextImpl$NonValidatingClassPathXmlApplicationContext - Closing com.vware.via.vmoai.co
re.types.impl.VaodContextImpl$NonValidatingClassPathXmlApplicationContext@848bba1c5; startup date [Tue Jan 13 18:00:20 UTC 2015]; root of context hierarchy
2015-01-13 18:00:20,486 INFO com.vware.via.vmoai.core.types.impl.VaodContextImpl$NonValidatingClassPathXmlApplicationContext - Refreshing com.vware.via.vmoai.
core.types.impl.VaodContextImpl$NonValidatingClassPathXmlApplicationContext@2ac2a64df; startup date [Tue Jan 13 18:00:20 UTC 2015]; root of context hierarchy
2015-01-13 18:00:20,488 INFO org.springframework.beans.factory.xml.XmlBeanDefinitionReader - Loading XML bean definitions from class path resource [com/vware/vi
w/Binding/lookup/context.xml]
2015-01-13 18:00:20,596 INFO com.vware.via.vmoai.core.types.impl.VaodContextImpl$NonValidatingClassPathXmlApplicationContext - Closing com.vware.via.vmoai.co
re.types.impl.VaodContextImpl$NonValidatingClassPathXmlApplicationContext@2ac2a64df; startup date [Tue Jan 13 18:00:20 UTC 2015]; root of context hierarchy
2015-01-13 18:00:21,632 INFO com.vware.via.vmoai.core.types.impl.VaodContextImpl$NonValidatingClassPathXmlApplicationContext - Refreshing com.vware.via.vmoai.
core.types.impl.VaodContextImpl$NonValidatingClassPathXmlApplicationContext@452647d; startup date [Tue Jan 13 18:00:21 UTC 2015]; root of context hierarchy
2015-01-13 18:00:21,634 INFO org.springframework.beans.factory.xml.XmlBeanDefinitionReader - Loading XML bean definitions from class path resource [com/vware/vi
w/Binding/sso/context.xml]
2015-01-13 18:00:22,858 INFO com.vware.via.vmoai.core.types.impl.VaodContextImpl$NonValidatingClassPathXmlApplicationContext - Closing com.vware.via.vmoai.co
re.types.impl.VaodContextImpl$NonValidatingClassPathXmlApplicationContext@452647d; startup date [Tue Jan 13 18:00:21 UTC 2015]; root of context hierarchy
2015-01-13 18:00:22,398 INFO com.vware.via.sso.admin.client.vmoai.impl.AdminClientImpl - Client was created successfully
2015-01-13 18:00:22,424 WARN com.vware.via.vmoai.client.http.impl.HttpConfigurationCompilerBase$ConnectionMonitorThreadBase - Shutting down the connection mont
or.
2015-01-13 18:00:22,424 INFO com.vware.via.sso.admin.client.vmoai.impl.AbstractClient - Client was disposed successfully
2015-01-13 18:00:22,591 INFO com.vware.identity.token.impl.Util - Reading resources from zip file path [usr/lib/vaidentity/tools/lib/vstClient.jar]
2015-01-13 18:00:23,800 INFO com.vware.identity.token.impl.Util - Reading resources from decoded zip file path [usr/lib/vaidentity/tools/lib/vstClient.jar]
2015-01-13 18:00:23,574 INFO com.vware.identity.token.impl.Util - Reading resources from zip file path [usr/lib/vaidentity/tools/lib/samltoken.jar]
2015-01-13 18:00:23,575 INFO com.vware.identity.token.impl.Util - Reading resources from decoded zip file path [usr/lib/vaidentity/tools/lib/samltoken.jar]
2015-01-13 18:00:23,691 INFO com.vware.identity.token.impl.SamlTokenImpl - SAML token for SubjectNameId [value=Administrator@SPHERE.LOCAL, format=http://schemas
.xmlsoap.org/claims/UPN] successfully parsed from Element
2015-01-13 18:00:23,749 INFO com.vware.via.sso.client.impl.SecurityTokenServiceImpl - Successfully acquired token for user: administrator@vsphere.local
2015-01-13 18:00:24,101 WARN com.vware.via.vmoai.client.http.impl.HttpConfigurationCompilerBase$ConnectionMonitorThreadBase - Shutting down the connection mont
or.
pscc01/soo-ha #

```

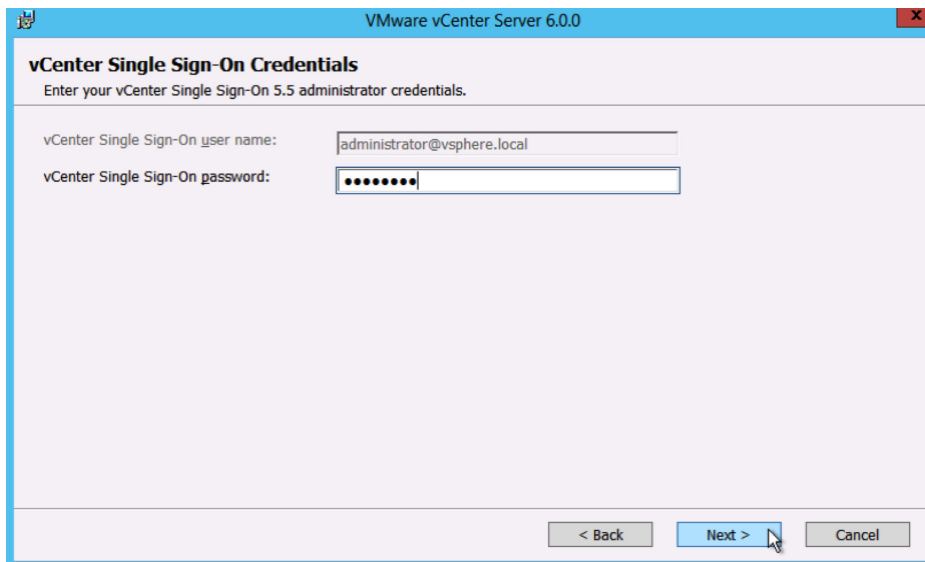
30. Follow the steps to install a new external vCenter Server. When asked for the Platform Services Controller, enter the FQDN of the load balancer VIP.

Upgrade of vCenter Single Sign-On High Availability

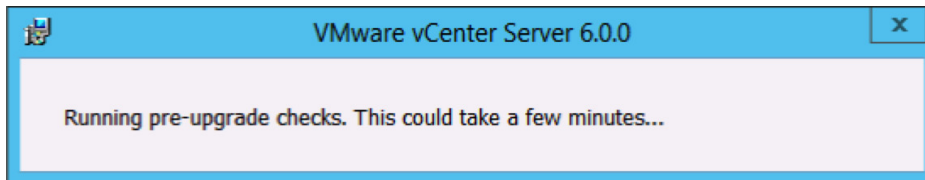
1. Back up all vCenter Single Sign-On machines.
2. Log in to one of the vCenter Single Sign-On machines in your high availability configuration.
3. Add a host file entry that contains the local machine's IP address and the FQDN of the load balancer's VIP.
4. Mount the vCenter Server 6.0 ISO image.
5. If autorun does not start, execute autorun.exe.
6. Select **vCenter Server for Windows** and click **Install**.



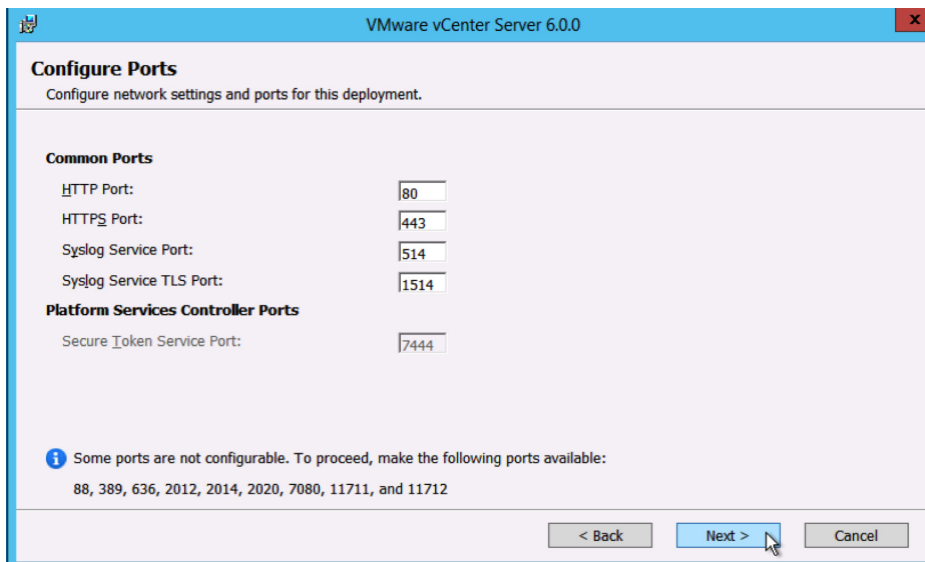
7. Click **Next**.
8. Accept the license agreements.
9. Enter the **password** for the administrator@vsphere.local account and click **Next**.



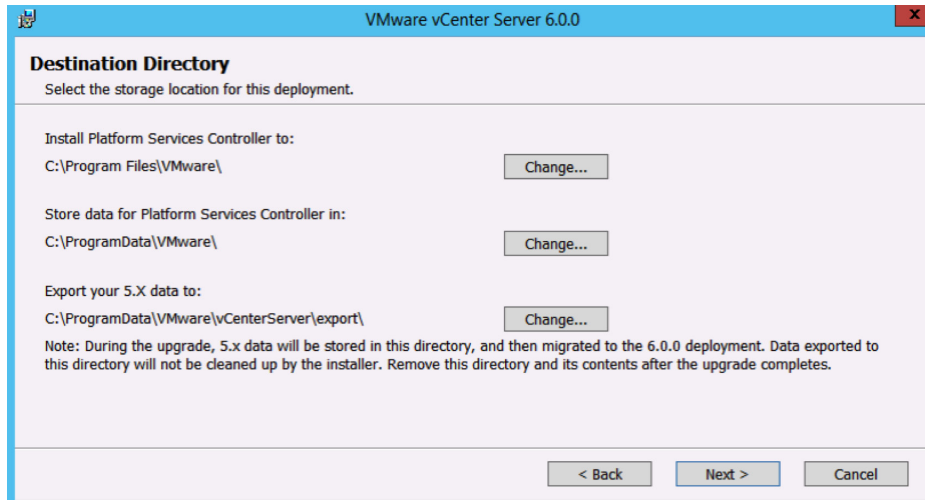
10. Wait for the **pre-upgrade checks** to complete.



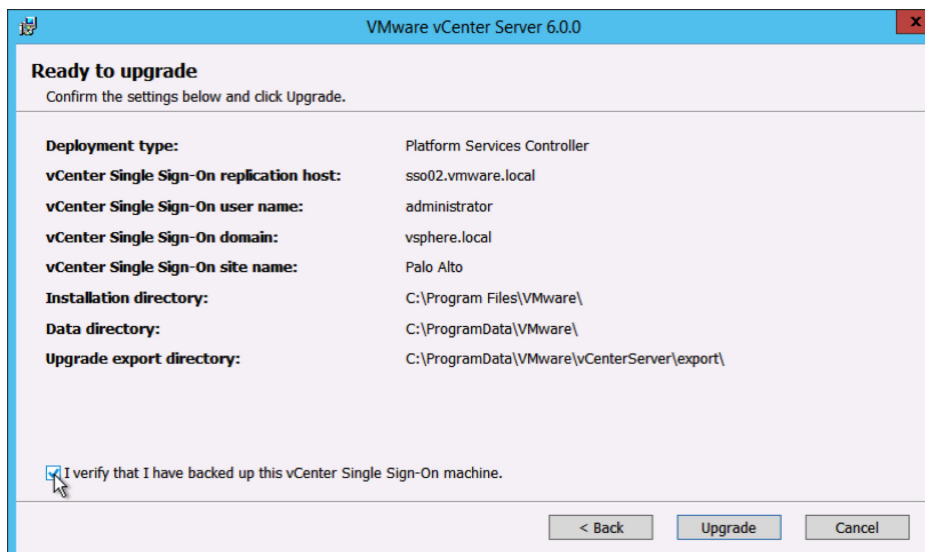
11. Review the ports and click **Next**.



12. Choose your installation path or take the defaults. Click **Next**.



13. Check **I verify that I have backed up this Single Sign-On machine.** Click **Upgrade.**



14. Click **Finish.**

15. Remove the host file entry that was added in step 3.

16. Repeat steps 2–15 on the remainder of the vCenter Single Sign-On machines.

17. Download the vCenter Single Sign-On high availability configuration scripts from the vCenter Server product download page.

18. Extract the vCenter Single Sign-On high availability scripts to c:\sso-ha.

19. Create a folder named HA in the root of c:\.

20. Copy rui.crt, rui.p12 from c:\certs\sso to c:\ha and Root64.cer from c:\certs to c:\ha.

21. Rename rui.crt to lb.crt, rui.p12 to lb.p12, and Root64.cer to root.cer.
22. Open a command prompt.
23. Add Python to your path by typing:

```
PATH=%PATH%;%VMWARE_PYTHON_HOME%
```

```
Administrator: C:\Windows\system32\cmd.exe
Microsoft Windows [Version 6.3.9600]
(c) 2013 Microsoft Corporation. All rights reserved.
C:\Users\administrator.UVMARE>PATH=%PATH%;"c:\Program Files\VMware\Center Server\python"
C:\Users\administrator.UVMARE>_
```

24. Change directories to c:\sso-ha.

25. Run:

```
python gen-lb-cert.py --upgrade --lb-fqdn=loadbalancerFQDN --root-cert=c:\ha\root.cer
```

where *loadbalancerFQDN* is the FQDN of the load balancer's VIP used for load-balancing vCenter Single Sign-On.

```
Administrator: C:\Windows\system32\cmd.exe
Microsoft Windows [Version 6.3.9600]
(c) 2013 Microsoft Corporation. All rights reserved.
C:\Users\administrator.UVMARE>
C:\Users\administrator.UVMARE>PATH=%PATH%;"c:\Program Files\VMware\Center Server\python"
C:\Users\administrator.UVMARE>cd \sso-ha
C:\sso-ha>python gen-lb-cert.py --upgrade --lb-fqdn=sso.vmware.local --root-cert=c:\ha\root.cer
Initialization complete
Modifying hostname.txt
modifying server.xml
Executing dir-ctl command
Enter Password:
Executing StopService --all
INFO:root:Service: licenseService, Action: stop
INFO:root:Service: vmwareServiceControlAgent, Action: stop
INFO:root:Service: VMwareComponentManager, Action: stop
INFO:root:Service: rhtgproxy, Action: stop
INFO:root:Service: VMwareSIS, Action: stop
INFO:root:Service: VMwareIdentityMgmtService, Action: stop
INFO:root:Service: VMwareCertificateService, Action: stop
INFO:root:Service: VMwareDirectoryService, Action: stop
INFO:root:Service: VMwareAfdService, Action: stop
INFO:root:Service: vmware-cis-config, Action: stop
Executing StartService --all
INFO:root:Service: vmware-cis-config, Action: start
INFO:root:Service: VMwareAfdService, Action: start
INFO:root:Service: rhtgproxy, Action: start
INFO:root:Service: VMwareDirectoryService, Action: start
INFO:root:Service: VMwareCertificateService, Action: start
INFO:root:Service: VMwareIdentityMgmtService, Action: start
INFO:root:Service: VMwareSIS, Action: start
INFO:root:Service: VMwareComponentManager, Action: start
INFO:root:Service: licenseService, Action: start
INFO:root:Service: vmwareServiceControlAgent, Action: start
C:\sso-ha>_
```

26. When prompted, enter the **password** for the administrator@vsphere.local account.

27. Repeat steps 17-26 on the remaining Platform Services Controllers.

28. On one Platform Services Controller in the site, run:

```
python l1stoolHA.py --hostname=FQDNofLocalMachine --lb-fqdn=loadbalancerFQDN --lb-cert-
folder=C:\ha --user=Administrator@vsphere.local --password="password"
```

where *FQDNofLocalMachine* is the FQDN of the Platform Services Controller the command is being run on, *loadbalancerFQDN* is the FQDN of the load balancer's VIP used for load-balancing vCenter Single Sign-On, and *password* is the password for the administrator@vsphere.local account. The password parameter is optional; if not specified, you will be prompted for it.

```

Administrator: C:\Windows\system32\cmd.exe
2015-01-09 14:15:20.434 INFO org.springframework.beans.factory.xml.XmlBeanDefinitionReader - Loading XML bean definitions from class path resource [com/vmware/vin/hindling/vmomi/context_v2.xml]
2015-01-09 14:15:20.512 INFO com.vmware.vin.vmonl.core.types.impl.UmodlContextImpl$NonValidatingClassPathMnlApplicationContext - Closing com.vmware.vin.vmonl.core.types.impl.UmodlContextImpl$NonValidatingClassPathMnlApplicationContext@42bf7a35; startup date [Fri Jan 09 14:15:20 PST 2015]; root of context hierarchy
2015-01-09 14:15:20.520 INFO com.vmware.vin.vmonl.core.types.impl.UmodlContextImpl$NonValidatingClassPathMnlApplicationContext - Refreshing com.vmware.vin.vmonl.core.types.impl.UmodlContextImpl$NonValidatingClassPathMnlApplicationContext@512a754; startup date [Fri Jan 09 14:15:20 PST 2015]; root of context hierarchy
2015-01-09 14:15:20.524 INFO org.springframework.beans.factory.xml.XmlBeanDefinitionReader - Loading XML bean definitions from class path resource [com/vmware/vin/hindling/lookup/context.xml]
2015-01-09 14:15:20.717 INFO com.vmware.vin.vmonl.core.types.impl.UmodlContextImpl$NonValidatingClassPathMnlApplicationContext - Closing com.vmware.vin.vmonl.core.types.impl.UmodlContextImpl$NonValidatingClassPathMnlApplicationContext@5e2926a; startup date [Fri Jan 09 14:15:20 PST 2015]; root of context hierarchy
2015-01-09 14:15:29.847 INFO org.springframework.beans.factory.xml.XmlBeanDefinitionReader - Loading XML bean definitions from class path resource [com/vmware/vin/hindling/ssso/context.xml]
2015-01-09 14:15:29.842 INFO com.vmware.vin.vmonl.core.types.impl.UmodlContextImpl$NonValidatingClassPathMnlApplicationContext - Refreshing com.vmware.vin.vmonl.core.types.impl.UmodlContextImpl$NonValidatingClassPathMnlApplicationContext@5e2926a; startup date [Fri Jan 09 14:15:29 PST 2015]; root of context hierarchy
2015-01-09 14:15:29.847 INFO org.springframework.beans.factory.xml.XmlBeanDefinitionReader - Loading XML bean definitions from class path resource [com/vmware/vin/hindling/ssso/context.xml]
2015-01-09 14:15:29.847 INFO com.vmware.vin.vmonl.core.types.impl.UmodlContextImpl$NonValidatingClassPathMnlApplicationContext - Closing com.vmware.vin.vmonl.core.types.impl.UmodlContextImpl$NonValidatingClassPathMnlApplicationContext@53e9296a; startup date [Fri Jan 09 14:15:29 PST 2015]; root of context hierarchy
2015-01-09 14:15:30.000 INFO com.vmware.vin.sso.admin.client.vmonl.impl.AdminClientImpl - Client was created successfully
2015-01-09 14:15:30.067 WARN com.vmware.vin.vmonl.client.http.impl.HttpConfigurationCompilerBase$ConnectionMonitorThreadBase - Shutting down the connection monitor.
2015-01-09 14:15:30.069 INFO com.vmware.vin.sso.admin.client.vmonl.impl.AbstactClient - Client was disposed successfully
2015-01-09 14:15:31.683 INFO com.vmware.identity.token.impl.Util - Reading resources from zip file path=[C:/Program20Files/VMware/vCenter/20Server/VMware20Identity20Services/1stool/lib/vstClient.jar]
2015-01-09 14:15:31.685 INFO com.vmware.identity.token.impl.Util - Reading resources from decoded zip file path=[C:/Program Files/VMware/vCenter Server/VMware Identity Services/1stool/lib/vstClient.jar]
2015-01-09 14:15:32.357 INFO com.vmware.identity.token.impl.Util - Reading resources from zip file path=[C:/Program Files/VMware/vCenter/20Server/VMware20Identity20Services/1stool/lib/san1token.jar]
2015-01-09 14:15:32.360 INFO com.vmware.identity.token.impl.Util - Reading resources from decoded zip file path=[C:/Program Files/VMware/vCenter Server/VMware Identity Services/1stool/lib/san1token.jar]
2015-01-09 14:15:32.482 INFO com.vmware.identity.token.impl.SamlTokenImpl - Saml token for SubjectNameId [value=Administrator@BUSPHERE.LOCAL, format=http://schemas.xmlsoap.org/claims/UPN] successfully parsed from Element
2015-01-09 14:15:32.541 INFO com.vmware.vin.sso.admin.client.impl.SecurityTokenServiceImpl - Successfully acquired token for user: administrator@busphere.local
2015-01-09 14:15:32.985 WARN com.vmware.vin.vmonl.client.http.impl.HttpConfigurationCompilerBase$ConnectionMonitorThreadBase - Shutting down the connection monitor.
C:\sso>ha>_
  
```

29. Log in to the load balancer. In this example, we are using an F5 BIG-IP.

30. Create a pool for ports 443, 2012, 2014, 2020, 389, and 636. Set health monitors to use **TCP** and **Load Balancing Method** to **Round Robin**.

When complete, the **Pool List** should look like this:

The screenshot shows the 'Local Traffic >> Pools: Pool List' interface. It features a search bar, a 'Create...' button, and a table with columns for 'Status', 'Name', 'Application', 'Members', and 'Partition / Path'. Below the table is a 'Delete...' button.

Status	Name	Application	Members	Partition / Path
<input type="checkbox"/>	SSO		2	Common
<input type="checkbox"/>	sso.vmware.local-2012		2	Common
<input type="checkbox"/>	sso.vmware.local-2014		2	Common
<input type="checkbox"/>	sso.vmware.local-2020		2	Common
<input type="checkbox"/>	sso.vmware.local-389		2	Common
<input type="checkbox"/>	sso.vmware.local-443		2	Common
<input type="checkbox"/>	sso.vmware.local-636		2	Common

31. Create a virtual server using the same IP address as the original vCenter Single Sign-On high availability virtual server for each of the new pools. Use **TCP** for each virtual server. Set **Source Address Translation** to **Auto Map** and **Default Persistence Profile** to **Source Address**. Assign the client and server SSL profiles created when setting up vCenter Single Sign-On high availability for vCenter Server 5.5 to port 443 only. No other port requires a client or server SSL profile.

When complete, the **Virtual Server List** should look like this:

✓	Status	Name	Application	Destination	Service Port	Type	Resources	Partition / Path
<input type="checkbox"/>	●	sso.vmware.local		10.155.168.100	7444	Standard	Edit...	Common
<input type="checkbox"/>	●	sso.vmware.local-2012		10.155.168.100	2012	Standard	Edit...	Common
<input type="checkbox"/>	●	sso.vmware.local-2014		10.155.168.100	2014	Standard	Edit...	Common
<input type="checkbox"/>	●	sso.vmware.local-2020		10.155.168.100	2020	Standard	Edit...	Common
<input type="checkbox"/>	●	sso.vmware.local-389		10.155.168.100	389	Standard	Edit...	Common
<input type="checkbox"/>	●	sso.vmware.local-443		10.155.168.100	443 (HTTPS)	Standard	Edit...	Common
<input type="checkbox"/>	●	sso.vmware.local-636		10.155.168.100	636	Standard	Edit...	Common

32. Edit the **source_addr** Persistence Policy and check the **Match Across Services** box.

Local Traffic » Profiles : Persistence » source_addr

Properties

General Properties

Name	source_addr
Partition / Path	Common
Persistence Type	Source Address Affinity

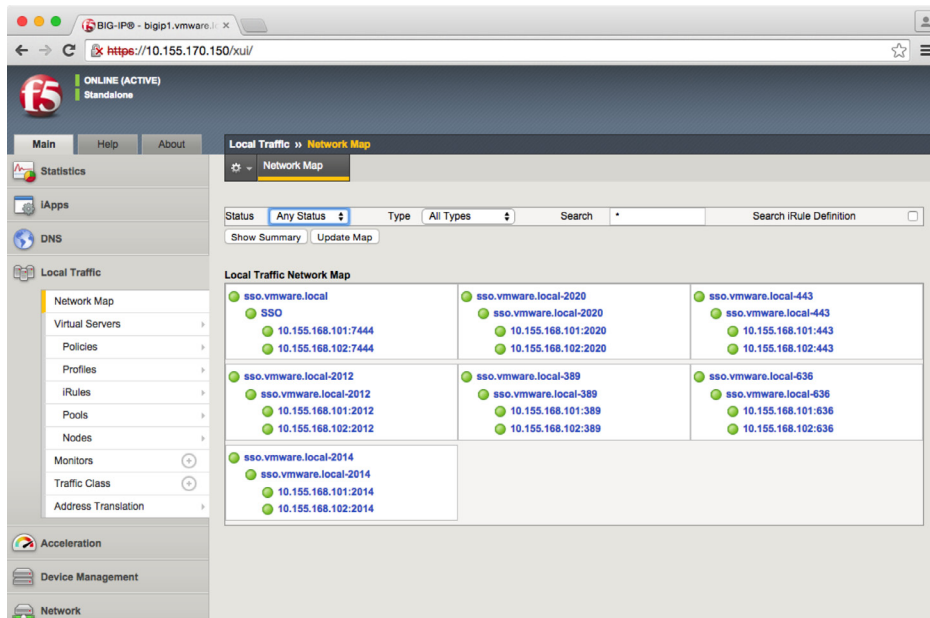
Configuration

Match Across Services	<input checked="" type="checkbox"/> Enabled
Match Across Virtual Servers	<input type="checkbox"/>
Match Across Pools	<input type="checkbox"/>
Hash Algorithm	Default
Timeout	Specify... 180 seconds
Mask	None
Map Proxies	<input checked="" type="checkbox"/> Enabled
Override Connection Limit	<input type="checkbox"/>

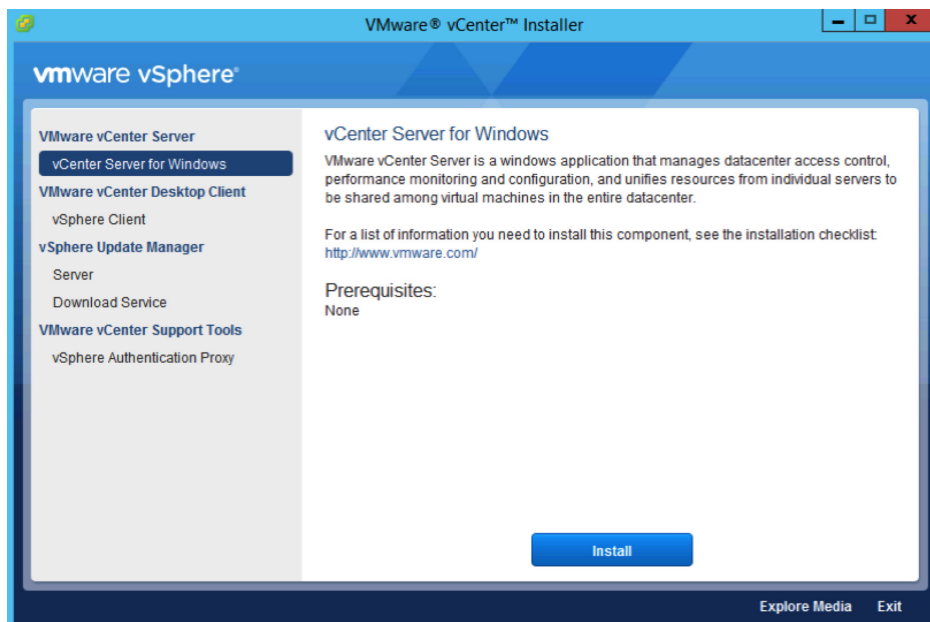
Update

33. View the **Network Map** and verify that all services are up (green).

For full configuration instructions of the F5 BIG-IP load balancer, see the appendix.



34. Log in to the vCenter Server you want to upgrade.
35. Mount the vCenter Server 6.0 ISO image.
36. If autorun does not start, execute autorun.exe.
37. Select **vCenter Server for Windows** and click **Install**.



38. Click **Next**.
39. Accept the license agreements.
40. Enter the **password** for the administrator@vsphere.local account and the **password** for the service account (if applicable). Click **Next**.

vCenter Server Credentials
Enter your vCenter Server 5.5 administrator credentials.

vCenter Server user name:

vCenter Server password:

The installer has detected that the vCenter Server service is running under the following service account. Enter the credentials for this service account.:

Account user name:

Account password:

< Back Next > Cancel

41. Wait for the **pre-upgrade checks** to complete.

VMware vCenter Server 6.0.0

Running pre-upgrade checks. This could take a few minutes...

42. Enter the **password** for the administrator@vsphere.local account. Click **Next**.

vCenter Single Sign-On registration
Connect vCenter Server to a vCenter Single Sign-On domain in an existing Platform Services Controller.

Platform Services Controller EQDN or IP address:

Note: This is the external Platform Services Controller with the vCenter Single Sign-On you want to register with.

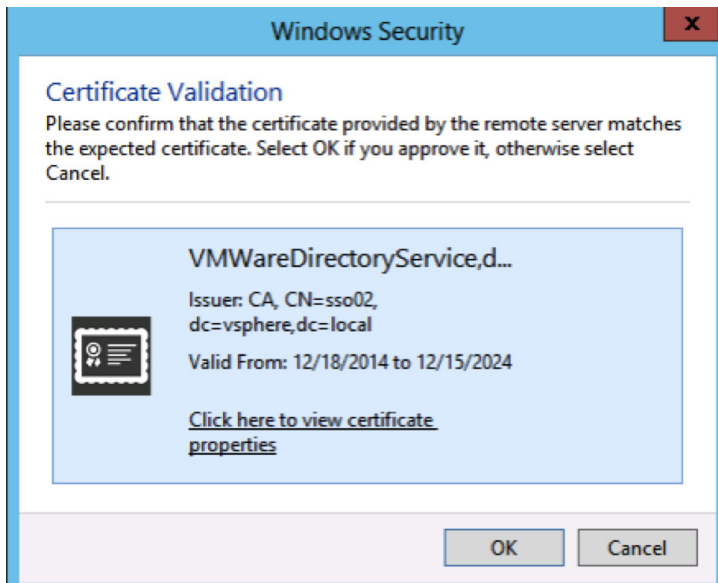
vCenter Single Sign-On HTTPS port:

vCenter Single Sign-On user name:

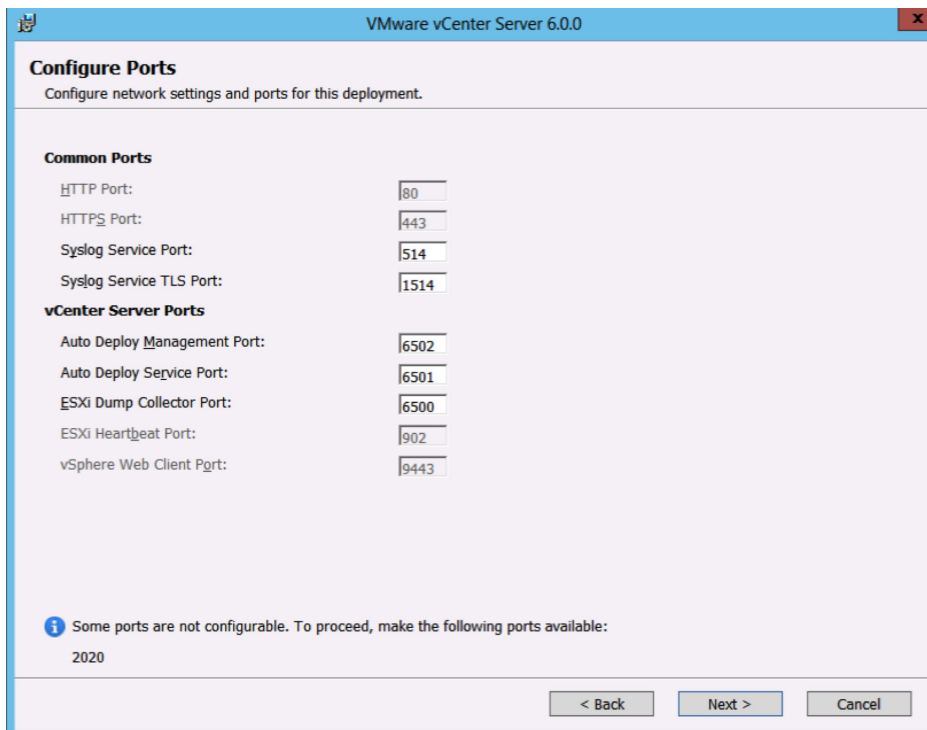
vCenter Single Sign-On password:

< Back Next > Cancel

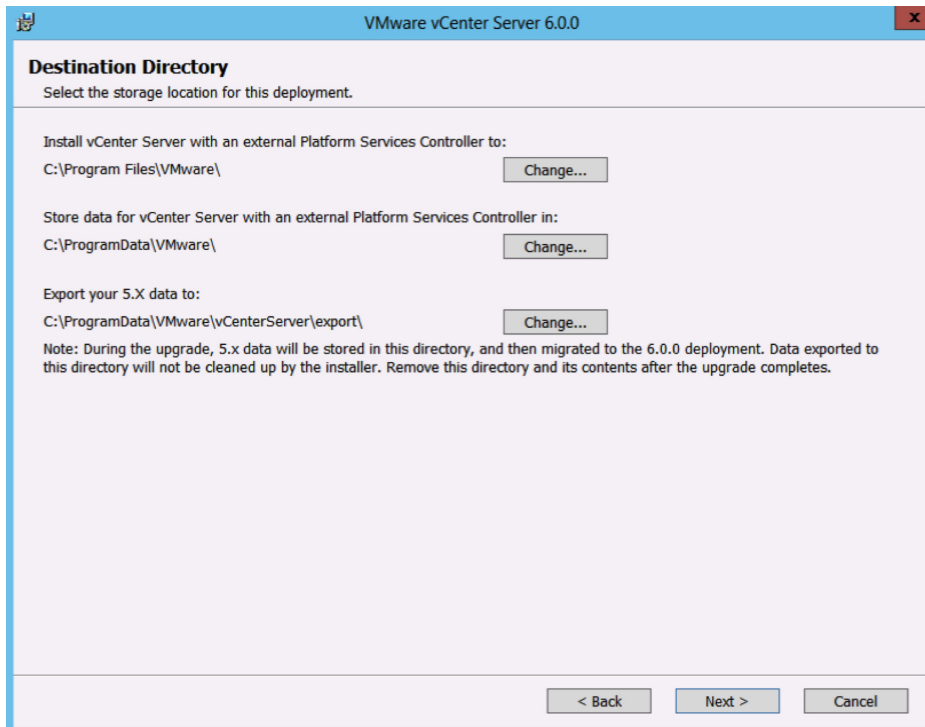
43. Click **OK** to accept the certificate.



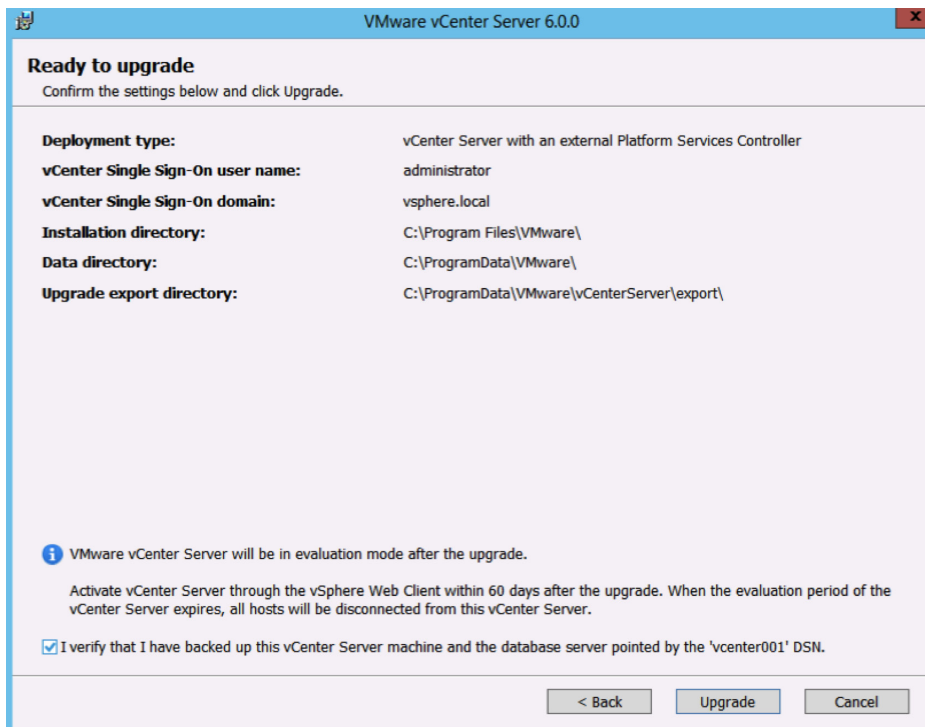
44. Accept the default ports and click **Next**.



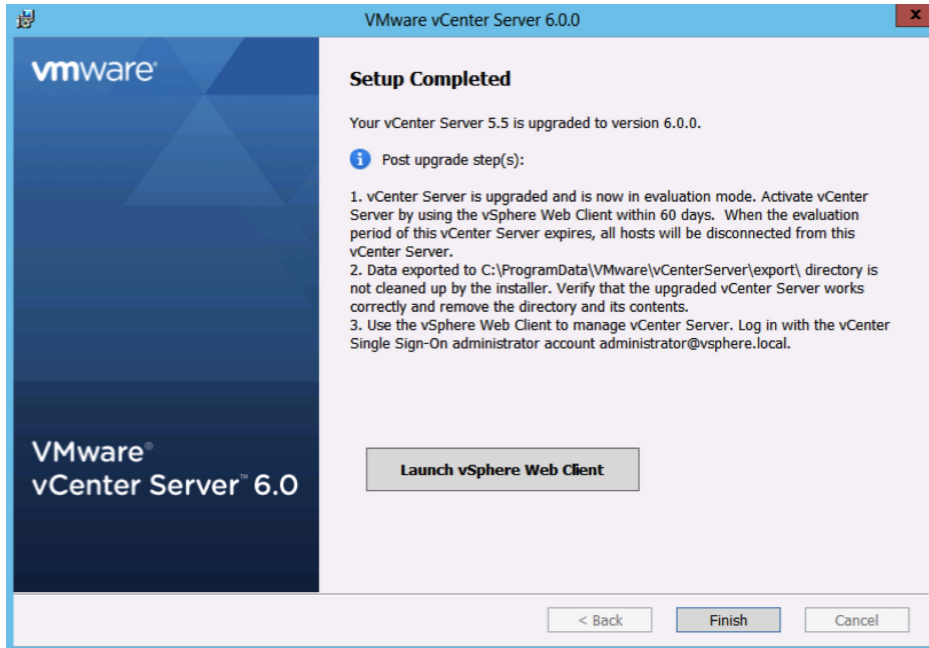
45. Accept or change the installation paths as necessary. Click **Next**.



46. Check the box to verify that you have backed up the vCenter Server and its database. Click **Upgrade**.



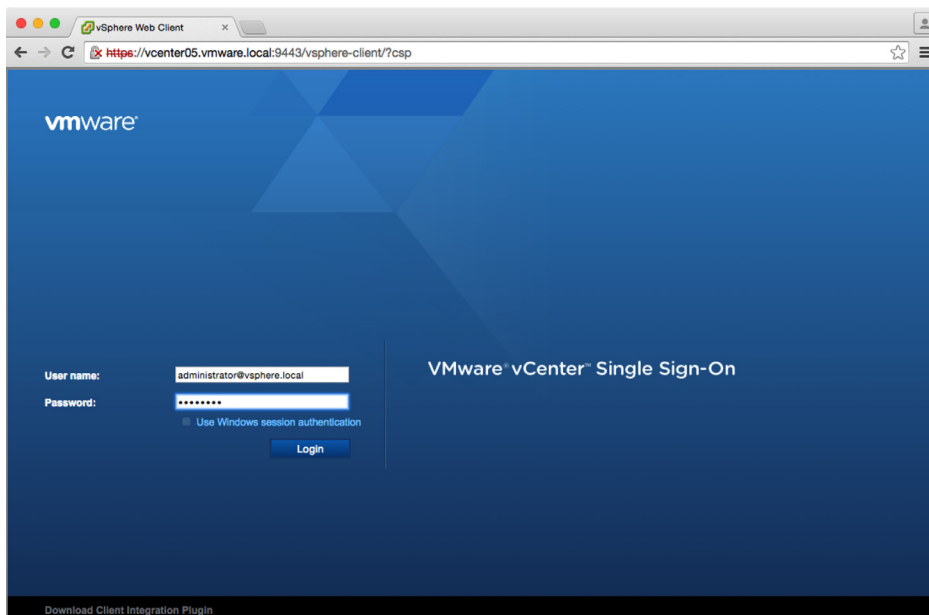
47. When completed, click **Finish**.



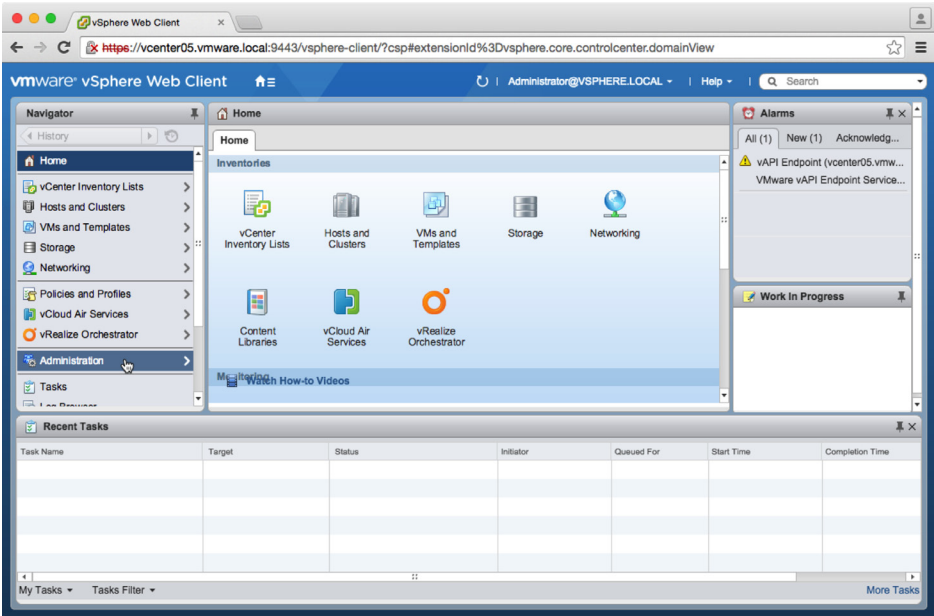
Postdeployment Steps

Configure Identity Sources

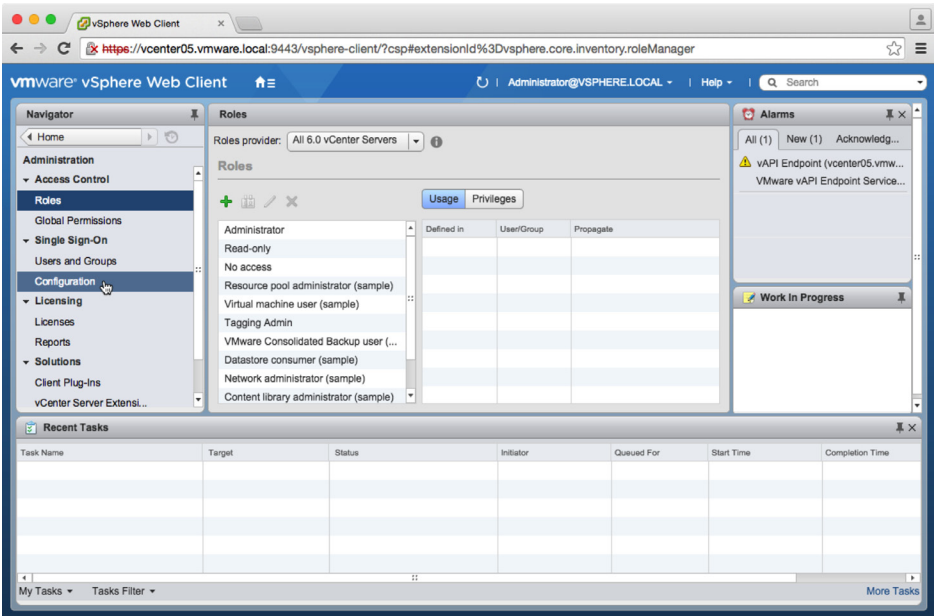
1. Open your Web browser and navigate to <https://vcenter:9443>, where *vcenter* is the FQDN of the vCenter Server.
2. Log in with **User name** administrator@vsphere.local and the **Password** used during installation.



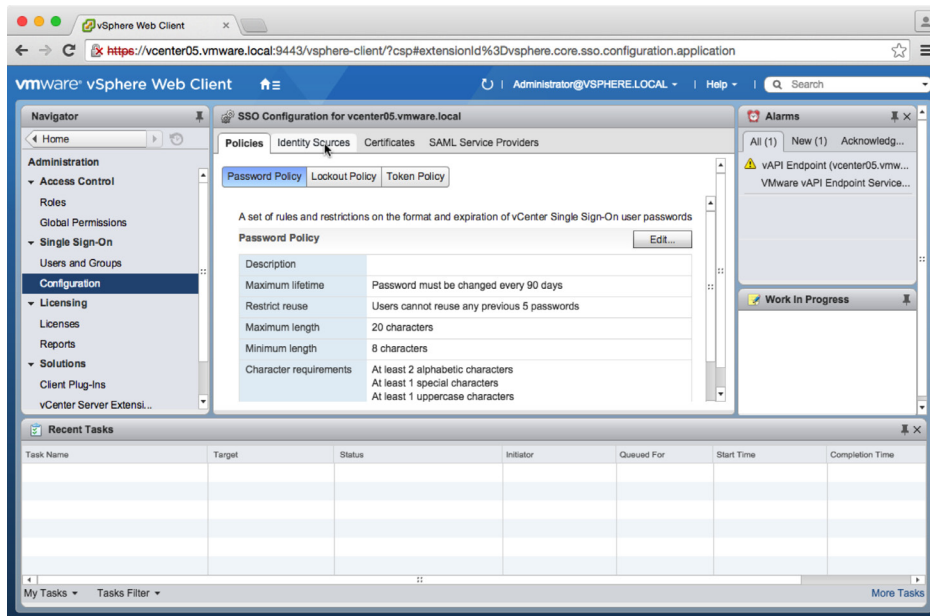
3. Click **Administration** in the left-hand **Navigator** pane.



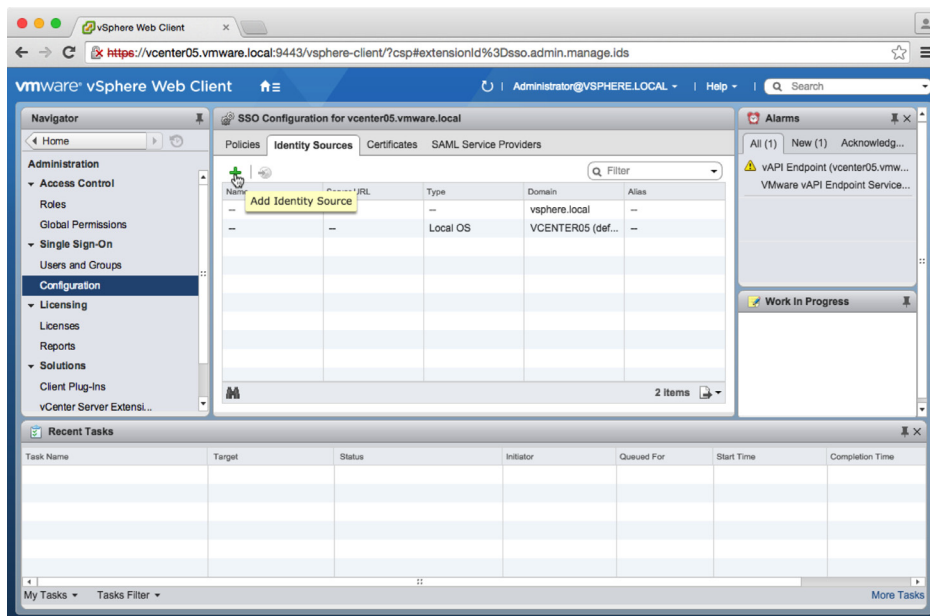
4. Click **Configuration** under vCenter **Single Sign-On**.



5. Click **Identity Sources**.



6. Click the **green plus icon** to **Add Identity Source**.



7. If using Microsoft Active Directory, select **Active Directory (Integrated Windows Authentication)**. It will autopopulate the root domain in the forest. If using Open LDAP, select and configure it.

Add identity source

Identity source type:

- Active Directory (Integrated Windows Authentication)
- Active Directory as an LDAP Server
- Open LDAP
- Local OS

Identity source settings

Domain name: ⓘ

Use machine account

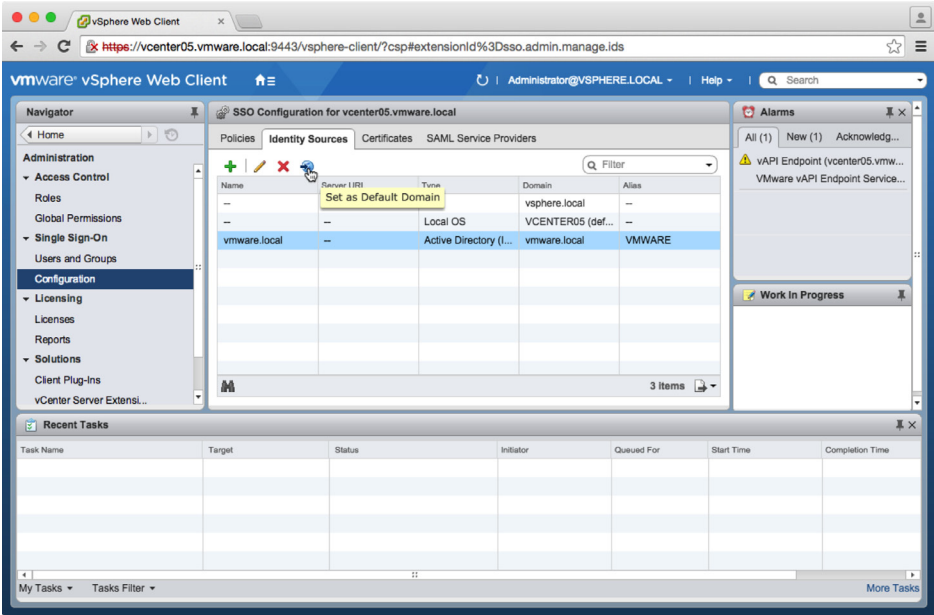
Use Service Principal Name (SPN)

Service Principal Name (SPN): ⓘ

User Principal Name (UPN): ⓘ

Password:

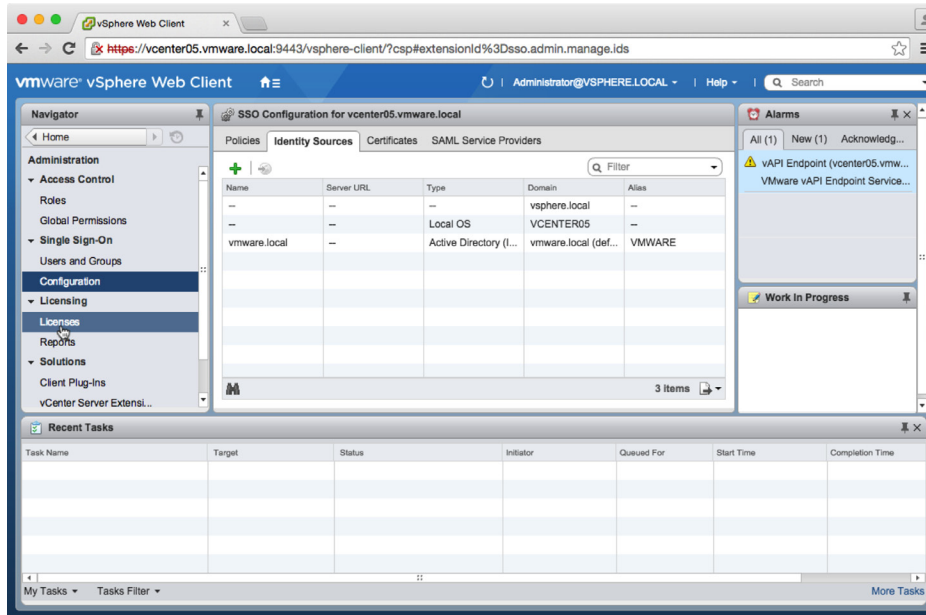
8. Highlight the newly added identity source. Click the **Set as Default Domain** icon.



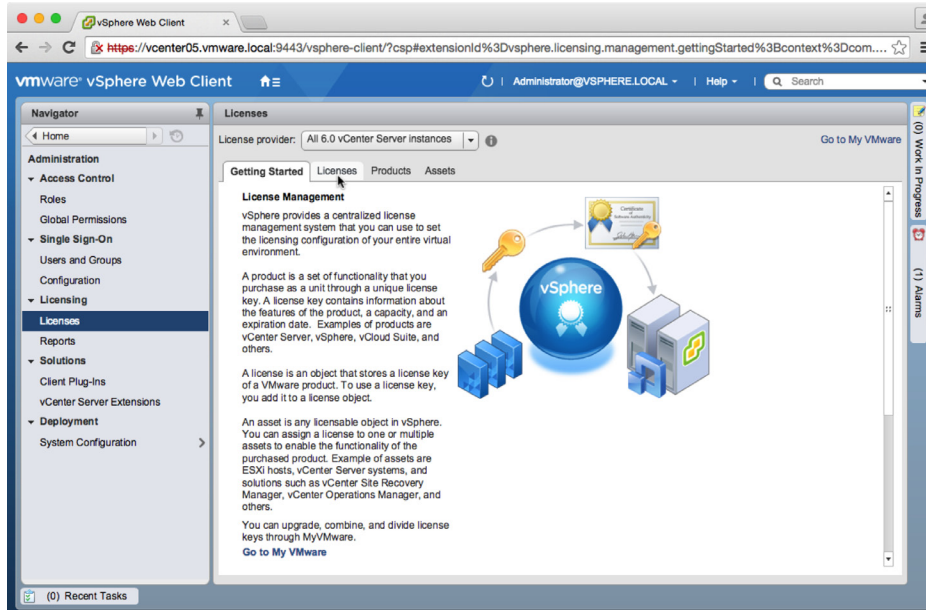
9. Click **Yes** in the pop-up.

License Management

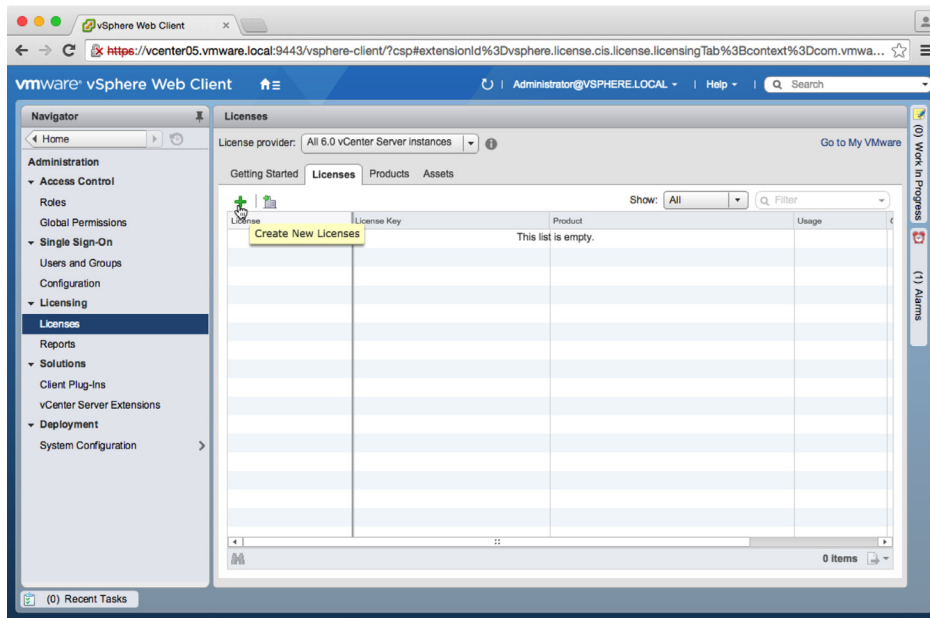
1. Click **Licenses** in the left-hand **Navigator** pane.



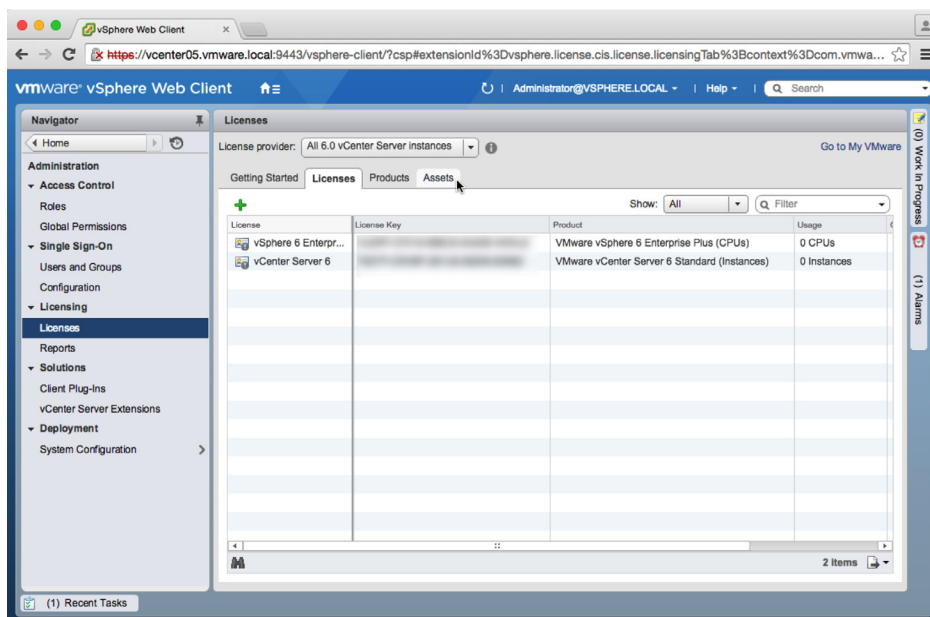
2. Click **Licenses**.



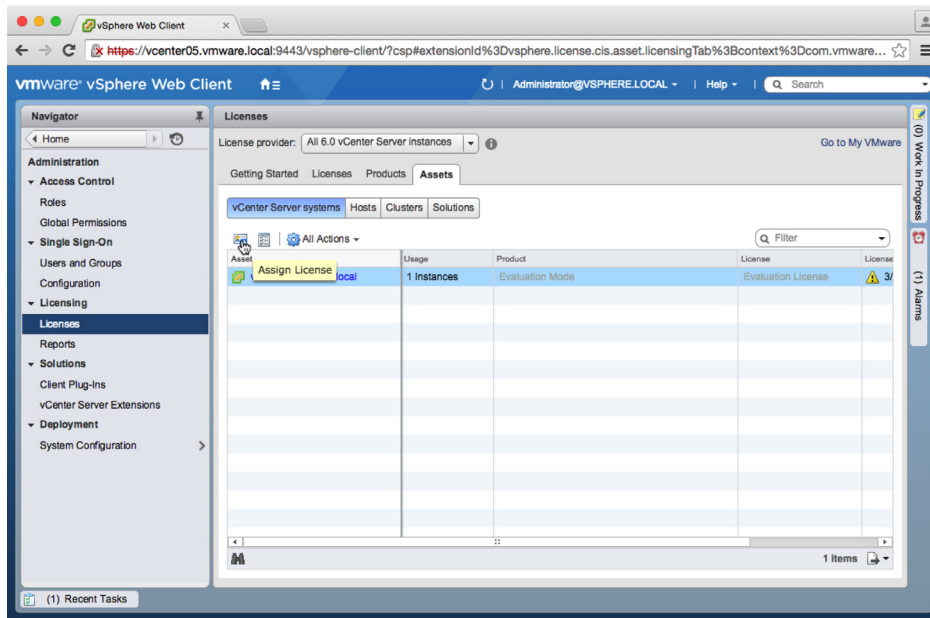
3. Click the **green plus** icon to add your licenses.



4. Enter your license keys, one per line, and click **Next**.
5. Give each license a descriptive name and click **Next**.
6. Click **Finish**.
7. Click **Assets**.



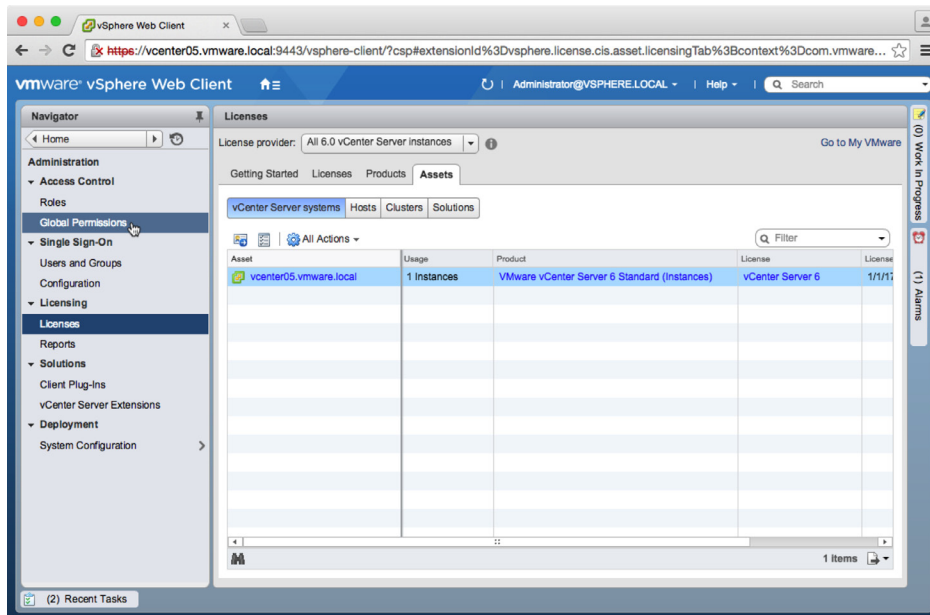
8. Highlight **vCenter Server systems** in evaluation mode and click the **Assign License** icon.



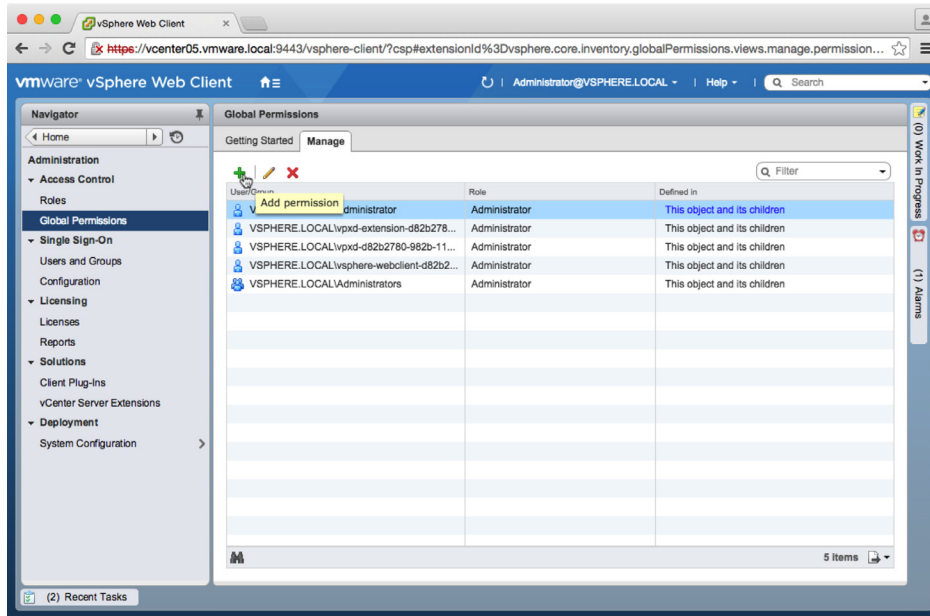
9. Select the vCenter Server license entered earlier and click **OK**.

Global Permissions

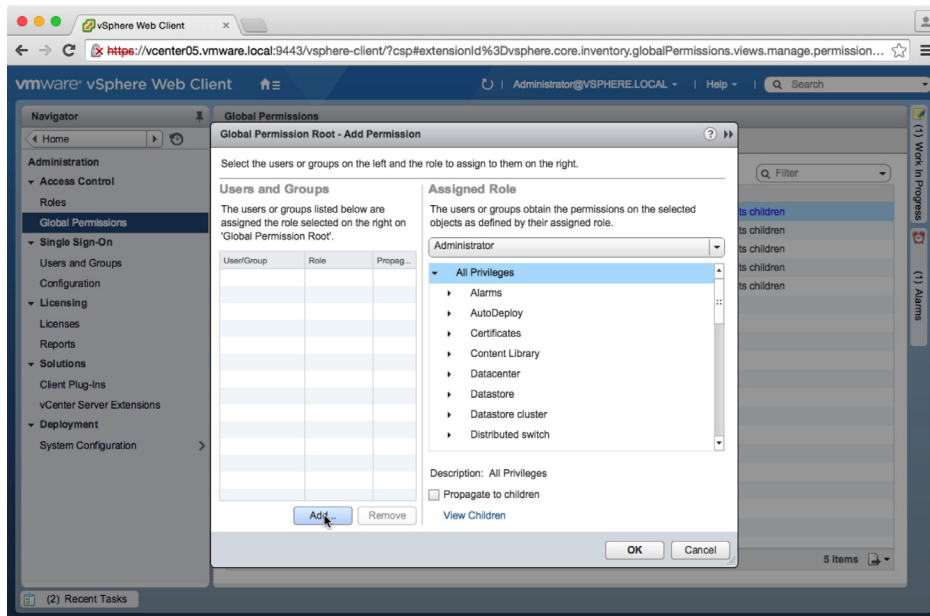
1. Click **Global Permissions** in the left-hand **Navigator** pane.



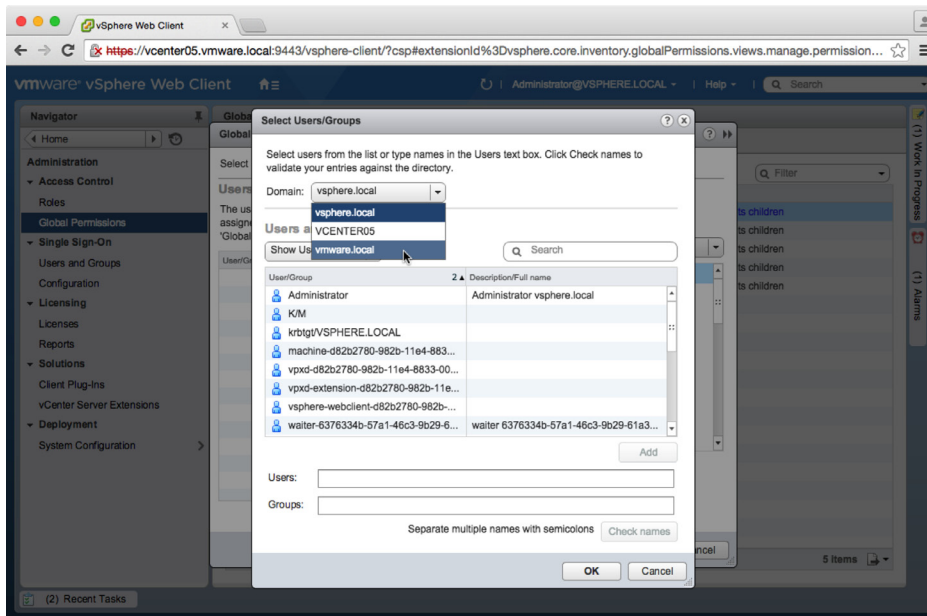
2. Click **Manage**.
3. Click the **green plus** icon to add a permission.



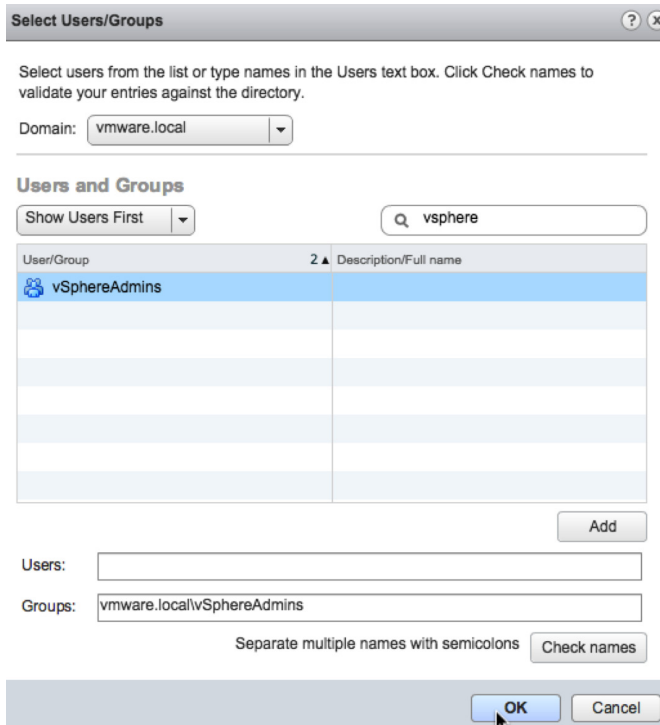
4. Click **Add**.



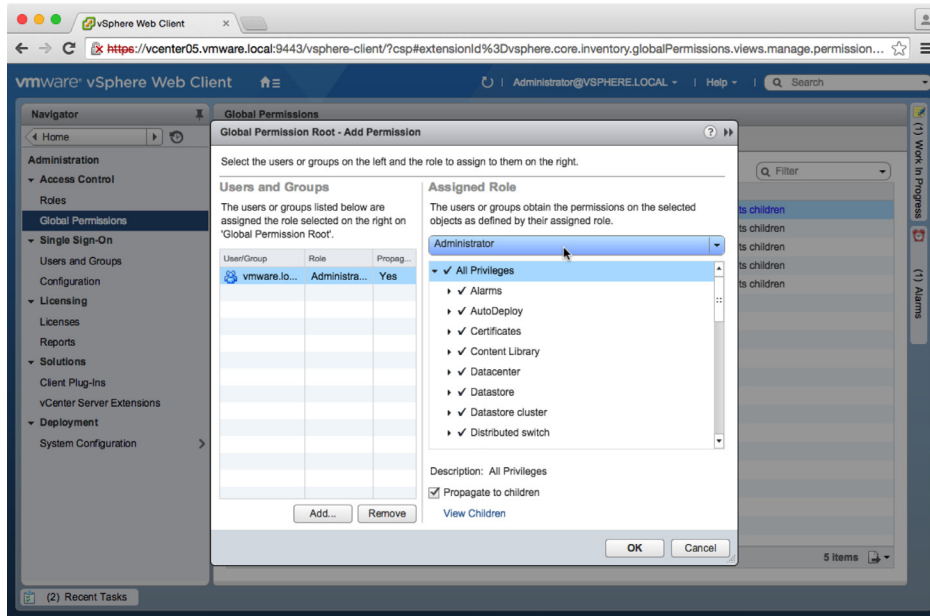
5. Select your Active Directory domain or other identity source you added earlier.



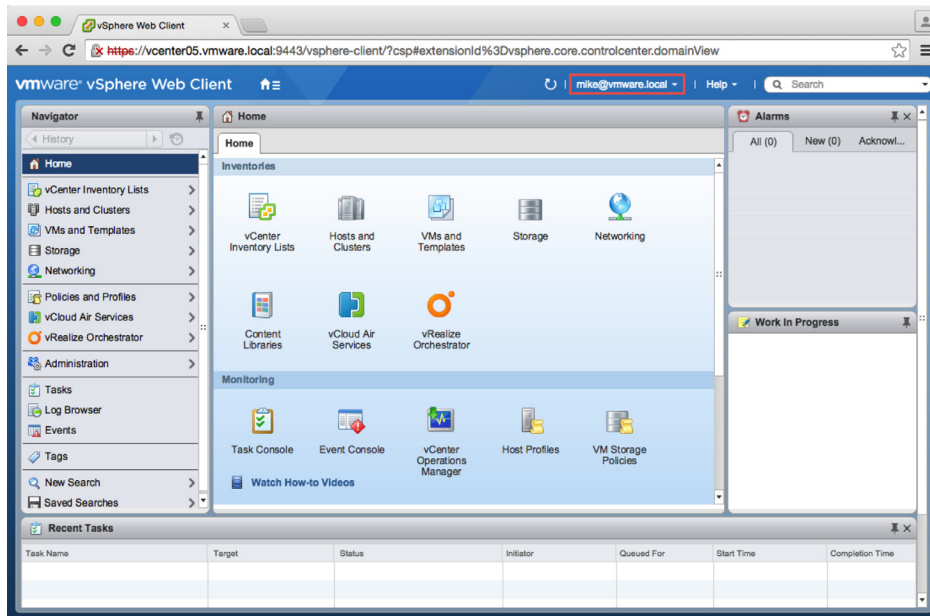
6. Add your vSphere Administrators group or users. Click **OK**.



7. Ensure that the **Administrator** role is selected and **Propagate to children** is checked. Click **OK**.



8. You can now log out and back in to vSphere Web Client as an **Administrator** you just added.



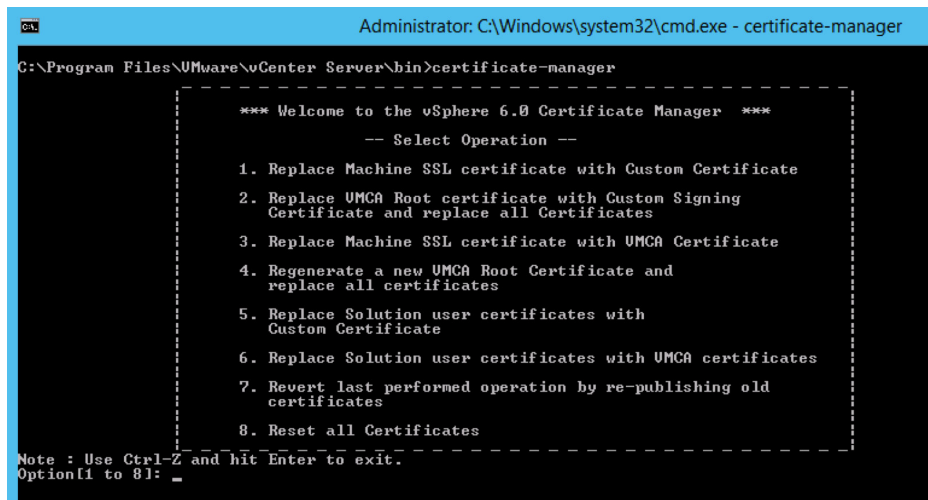
Certificate Management

In most cases, certificate replacement in vSphere 6.0 is not necessary. This is because the Platform Services Controller contains the VMware Certificate Authority (VMCA), which issues certificate authority (CA) signed certificates with a validity period of 10 years.

These certificates are issued to solution users—the users created when a solution such as vCenter Server, vCenter Inventory Service, and so on, is registered with vCenter Single Sign-On—and are utilized as certificate endpoints. These users are issued certificates instead of individual services. This enables the services associated with a solution user to utilize the same certificate, substantially reducing the number of certificates required to manage in the environment.

ESXi hosts are also issued certificates from the VMCA when the hosts are added to the vCenter Server inventory or when vCenter Server is upgraded.

When certificates must be changed—such as when making the VMCA a subordinate of an existing enterprise CA or when generating new solution user certificates after the VMCA mode has changed—the certificate manager utility can be used.

A screenshot of a Windows command prompt window titled "Administrator: C:\Windows\system32\cmd.exe - certificate-manager". The prompt shows the command "C:\Program Files\VMware\vCenter Server\bin>certificate-manager" being executed. The output is a text-based menu for the vSphere 6.0 Certificate Manager. The menu is enclosed in a dashed border and lists eight options: 1. Replace Machine SSL certificate with Custom Certificate; 2. Replace UMCA Root certificate with Custom Signing Certificate and replace all Certificates; 3. Replace Machine SSL certificate with UMCA Certificate; 4. Regenerate a new UMCA Root Certificate and replace all certificates; 5. Replace Solution user certificates with Custom Certificate; 6. Replace Solution user certificates with UMCA certificates; 7. Revert last performed operation by re-publishing old certificates; 8. Reset all Certificates. At the bottom of the menu, there is a note: "Note : Use Ctrl-Z and hit Enter to exit. Option[1 to 8]: _".

```
Administrator: C:\Windows\system32\cmd.exe - certificate-manager
C:\Program Files\VMware\vCenter Server\bin>certificate-manager

*** Welcome to the vSphere 6.0 Certificate Manager ***
-- Select Operation --
1. Replace Machine SSL certificate with Custom Certificate
2. Replace UMCA Root certificate with Custom Signing
   Certificate and replace all Certificates
3. Replace Machine SSL certificate with UMCA Certificate
4. Regenerate a new UMCA Root Certificate and
   replace all certificates
5. Replace Solution user certificates with
   Custom Certificate
6. Replace Solution user certificates with UMCA certificates
7. Revert last performed operation by re-publishing old
   certificates
8. Reset all Certificates

Note : Use Ctrl-Z and hit Enter to exit.
Option[1 to 8]: _
```

Make the VMCA a Subordinate Certificate Authority

1. Log in to the Platform Services Controller.
2. Using openssl, generate a certificate request.

```
openssl genrsa -out c:\certs\psc001.key 2048
openssl req -new -key c:\certs\psc001.key -out c:\certs\psc001.csr
```

- a. Answer questions to build the request.
- b. Submit the request to a CA. Use the subordinate CA template for the request.

Microsoft Active Directory Certificate Services -- vmware-DC01-CA

Submit a Certificate Request or Renewal Request

To submit a saved request to the CA, paste a base-64-encoded CMC or PKCS #10 certificate request or PKCS #7 Request box.

Saved Request:

Base-64-encoded certificate request (CMC or PKCS #10 or PKCS #7):

```

-----BEGIN CERTIFICATE REQUEST-----
dJMr31dyBQqMRbk8g7GrDOhF7rwR6/2VAXtSrYj1L
9yRM9jmsOX9OwbGOrBU6Aa8Sm2+rwVXrR2wGTduxi
bTEK20OPLR9iz9j6Oin4gLen49xX4v0x/Yc5OjXCI
iM9RkQaN3XMZ9dRbkZHESuwzb+RZw318/JaC+ms
-----END CERTIFICATE REQUEST-----

```

Certificate Template:

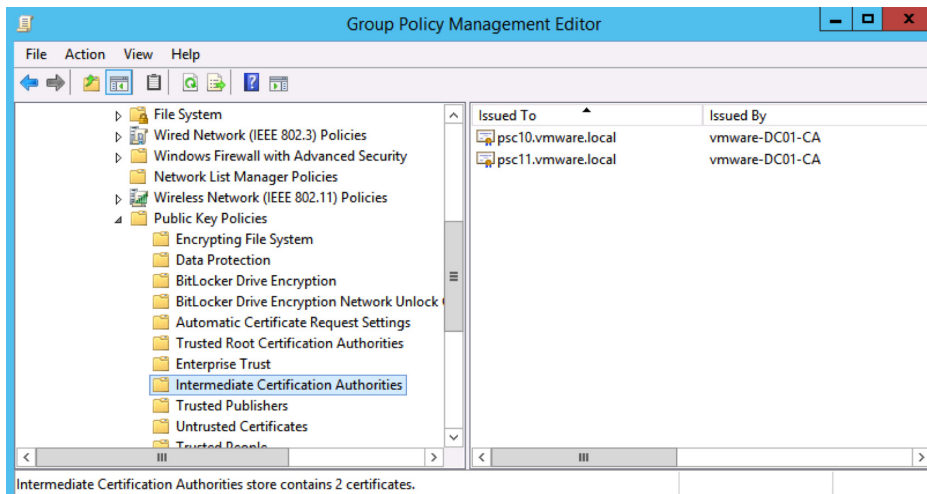
Subordinate Certification Authority

Additional Attributes:

Attributes:

Submit >

- c. Download the certificate in Base 64 format; save it to c:\certs.
3. Wait at least 24 hours before continuing. The VMCA requires that the certificate have a valid date of at least 24 hours prior.
4. Run certificate-manager from c:\program files\vmware\vCenter Server\bin for Windows installs or /usr/lib/vmware-vmca/bin/certificate-manager for vCenter Server Appliance.
5. Choose option 2: **Replace VMCA Root certificate with Custom Signing Certificate and replace all Certificates.**
6. Enter the administrator@vsphere.local password.
7. Answer all questions as you did earlier when creating the certificate request.
8. When asked to provide a valid custom certificate for root, enter the path to the certificate obtained earlier.
9. When asked to provide a valid custom key for root, enter the path to the .key file generated with openssl earlier.
10. Enter **Y** to continue to replace the certificate.
11. Add the certificate to a Windows Group policy as an intermediate CA. This will enable client machines—such as those using vSphere Web Client—to trust the certificates issued by the VMCA.



Appendix

Configure the F5 BIG-IP Load Balancer

1. Download the lb.p12 file from the ha folder of one of the Platform Services Controllers.
2. Log in to the F5 BIG-IP configuration Web page.
3. Click **System**.
4. Open **File Management, SSL Certificate List**.
5. Click **Import**.
6. For **Import Type**, select **PKCS 12**. Provide a descriptive **Certificate Name**. Browse for the **Certificate** downloaded earlier. Enter **changeme** for the **Password**. Click **Import**.

NOTE: If you want to use a custom password when running the gen-lb-cert.py --primary-node command on the first Platform Services Controller to generate the certificates, add the following: --password=yourPassword.

SSL Certificate/Key Source	
Import Type	PKCS 12 (IIS)
Certificate Name	psc011
Certificate Source	Choose File lb.p12
Password	*****
Key Security	Normal
Free Space on Disk	146 MB

Cancel Import

7. Click **Local Traffic**.
8. Open **Profiles, SSL, Client**.
9. Click **Create**.
10. Provide a descriptive **Name**.
 - a. Click **Custom**.
 - b. Choose the **Certificate** and **Key** installed earlier.
 - c. Enter the **Passphrase** for the certificate.
 - d. Click **Add**.
 - e. Scroll to the bottom and click **Finished**.

11. Open **Profiles, SSL, Server**.
12. Click **Create**.
13. Provide a descriptive **Name**.
 - a. Click **Custom**.
 - b. Choose the **Certificate** and **Key** installed earlier.
 - c. Click **Add**.
 - d. Scroll to the bottom and click **Finished**.

14. Open **Nodes, Node List**.
15. Click **Create**.
16. Add all Platform Services Controllers as a node. Use **Repeat** to speed up the process.

Local Traffic » Nodes : Node List » New Node...

General Properties

Name	<input type="text" value="psc01"/>
Description	<input type="text"/>
Address	<input checked="" type="radio"/> Address <input type="radio"/> FQDN <input type="text" value="10.155.168.101"/>

Configuration

Health Monitors	<input type="text" value="Node Default"/> ▾
Ratio	<input type="text" value="1"/>
Connection Limit	<input type="text" value="0"/>
Connection Rate Limit	<input type="text" value="0"/>

17. Open **Pools, Pool List**.
18. Click **Create**.
19. Create six pools, one each for port 443, 2012, 2014, 2020, 389, and 636.
 - a. All pools have the same **Configuration, tcp** for monitoring, and **Round Robin** for **Load Balancing Method**.
 - b. Use **Repeat** to save time: Remove the existing members from the list.

20. Open **Virtual Servers, Virtual Server List**.
21. Click **Create**.
22. All virtual servers—except the one for port 443—have the same configuration.
 - a. Provide a descriptive **Name**.
 - b. Enter the **Destination Address**.
 - c. For **Service Port**, enter **443**.
 - d. For **SSL Profile (Client)**, select the client profile created earlier.
 - e. For **SSL Profile (Server)**, select the client profile created earlier.
 - f. For **Source Address Translation**, select **Auto Map**.
 - g. For the **Default Pool**, select the pool created for port 443.
 - h. For the **Default Persistence Profile**, select **source_addr**.
 - i. Click **Finished**.

Local Traffic » Virtual Servers : Virtual Server List » New Virtual Server...

General Properties

Name	psc011-443	
Description		
Type	Standard	
Source Address		
Destination Address	10.155.168.87	
Service Port	443	HTTPS
Notify Status to Virtual Address	<input checked="" type="checkbox"/>	
State	Enabled	

Configuration: Basic

Protocol	TCP				
Protocol Profile (Client)	tcp				
Protocol Profile (Server)	(Use Client Profile)				
HTTP Profile	None				
FTP Profile	None				
RTSP Profile	None				
SSL Profile (Client)	<table border="1"> <thead> <tr> <th>Selected</th> <th>Available</th> </tr> </thead> <tbody> <tr> <td>/Common psc011-client</td> <td>clientssl-insecure-compatible crypto-server-default-clientssl psc010-client sso-client wom-default-clientssl</td> </tr> </tbody> </table>	Selected	Available	/Common psc011-client	clientssl-insecure-compatible crypto-server-default-clientssl psc010-client sso-client wom-default-clientssl
Selected	Available				
/Common psc011-client	clientssl-insecure-compatible crypto-server-default-clientssl psc010-client sso-client wom-default-clientssl				
SSL Profile (Server)	<table border="1"> <thead> <tr> <th>Selected</th> <th>Available</th> </tr> </thead> <tbody> <tr> <td>/Common psc011-server</td> <td>apm-default-serverssl crypto-client-default-serverssl pcoip-default-serverssl psc010-server serverssl</td> </tr> </tbody> </table>	Selected	Available	/Common psc011-server	apm-default-serverssl crypto-client-default-serverssl pcoip-default-serverssl psc010-server serverssl
Selected	Available				
/Common psc011-server	apm-default-serverssl crypto-client-default-serverssl pcoip-default-serverssl psc010-server serverssl				

SMTP Profile	None
VLAN and Tunnel Traffic	All VLANs and Tunnels
Source Address Translation	Auto Map
Content Rewrite	
Rewrite Profile	None
HTML Profile	None
Acceleration: Basic	
Rate Class	None
OneConnect Profile	None
NTLM Conn Pool	None
HTTP Compression Profile	None
Web Acceleration Profile	None
SPDY Profile	None
Resources	
iRules	<p>Enabled</p> <div style="display: flex; align-items: center;"> <div style="border: 1px solid gray; width: 100px; height: 50px; margin-right: 10px;"></div> <div style="display: flex; flex-direction: column; align-items: center;"> << >> </div> <div style="border: 1px solid gray; padding: 5px; font-size: 8px;"> /Common _sys_APM_Exchar _sys_APM_Exchar _sys_APM_Exchar _sys_APM_Exchar </div> </div> <p style="text-align: center;">Up Down</p>
Policies	<p>Enabled</p> <div style="display: flex; align-items: center;"> <div style="border: 1px solid gray; width: 100px; height: 50px; margin-right: 10px;"></div> <div style="display: flex; flex-direction: column; align-items: center;"> << >> </div> <div style="border: 1px solid gray; padding: 5px; font-size: 8px;"> /Common _sys_CEC_SSL_cl _sys_CEC_SSL_se _sys_CEC_video_f </div> </div> <p style="text-align: right;">Available</p>
Default Pool	psc011-443
Default Persistence Profile	source_addr
Fallback Persistence Profile	None
<input type="button" value="Cancel"/> <input type="button" value="Repeat"/> <input type="button" value="Finished"/>	

23. Repeat step 22 for all other ports: 2012, 2014, 2020, 389, and 636. All settings are the same, except there is no **SSL Profile (Client)** or **SSL Profile (Server)** and the **Service Port** and **Default Pool** should match. For example, if the **Service Port** is 2012, the **Default Pool** should be the pool set up for port 2012.

Local Traffic » Virtual Servers : Virtual Server List » New Virtual Server...

General Properties

Name	psc011-20142
Description	
Type	Standard
Source Address	
Destination Address	10.155.168.87
Service Port	2012 Other:
Notify Status to Virtual Address	<input checked="" type="checkbox"/>
State	Enabled

Configuration: Basic

Protocol	TCP				
Protocol Profile (Client)	tcp				
Protocol Profile (Server)	(Use Client Profile)				
HTTP Profile	None				
FTP Profile	None				
RTSP Profile	None				
SSL Profile (Client)	<table border="1"> <thead> <tr> <th>Selected</th> <th>Available</th> </tr> </thead> <tbody> <tr> <td></td> <td> clientssl-insecure-compatible crypto-server-default-clientssl psc010-client sso-client wom-default-clientssl </td> </tr> </tbody> </table>	Selected	Available		clientssl-insecure-compatible crypto-server-default-clientssl psc010-client sso-client wom-default-clientssl
Selected	Available				
	clientssl-insecure-compatible crypto-server-default-clientssl psc010-client sso-client wom-default-clientssl				
SSL Profile (Server)	<table border="1"> <thead> <tr> <th>Selected</th> <th>Available</th> </tr> </thead> <tbody> <tr> <td></td> <td> apm-default-serverssl crypto-client-default-serverssl pcoip-default-serverssl psc010-server serverssl </td> </tr> </tbody> </table>	Selected	Available		apm-default-serverssl crypto-client-default-serverssl pcoip-default-serverssl psc010-server serverssl
Selected	Available				
	apm-default-serverssl crypto-client-default-serverssl pcoip-default-serverssl psc010-server serverssl				

24. Open **Profiles, Persistence**.
25. Click **source_addr**.
26. Check **Match Across Services** and click **Update**.

Local Traffic » Profiles : Persistence » source_addr

Properties

General Properties

Name	source_addr
Partition / Path	Common
Persistence Type	Source Address Affinity

Configuration

Match Across Services	<input checked="" type="checkbox"/> Enabled
Match Across Virtual Servers	<input type="checkbox"/>
Match Across Pools	<input type="checkbox"/>
Hash Algorithm	Default
Timeout	Specify... 180 seconds
Mask	None
Map Proxies	<input checked="" type="checkbox"/> Enabled
Override Connection Limit	<input type="checkbox"/>

Update

27. After both Platform Services Controller nodes have been installed and configured, click **Network Map** and verify that all services are up (green).

Local Traffic » Network Map

Network Map

Status: Any Status Type: All Types Search: Search iRule Definition

Show Summary Update Map

Local Traffic Network Map

<p>psc010-2012</p> <ul style="list-style-type: none"> psc010-2012 10.155.168.82:2012 10.155.168.83:2012 	<p>psc010-636</p> <ul style="list-style-type: none"> psc010-636 10.155.168.82:636 10.155.168.83:636 	<p>psc011-389</p> <ul style="list-style-type: none"> psc011-389 10.155.168.73:389 10.155.168.74:389
<p>psc010-2014</p> <ul style="list-style-type: none"> psc010-2014 10.155.168.82:2014 10.155.168.83:2014 	<p>psc011-2012</p> <ul style="list-style-type: none"> psc011-2012 10.155.168.73:2012 10.155.168.74:2012 	<p>psc011-443</p> <ul style="list-style-type: none"> psc011-443 10.155.168.73:443 10.155.168.74:443
<p>psc010-2020</p> <ul style="list-style-type: none"> psc010-2020 10.155.168.82:2020 10.155.168.83:2020 	<p>psc011-2014</p> <ul style="list-style-type: none"> psc011-2014 10.155.168.73:2014 10.155.168.74:2014 	<p>psc011-636</p> <ul style="list-style-type: none"> psc011-636 10.155.168.73:636 10.155.168.74:636
<p>psc010-389</p> <ul style="list-style-type: none"> psc010-389 10.155.168.82:389 10.155.168.83:389 	<p>psc011-2020</p> <ul style="list-style-type: none"> psc011-2020 10.155.168.73:2020 10.155.168.74:2020 	<p>sso.vmware.local</p> <ul style="list-style-type: none"> SSO 10.155.168.101:7444 10.155.168.102:7444
<p>psc010-443</p> <ul style="list-style-type: none"> psc010-443 10.155.168.82:443 10.155.168.83:443 		

Scripted vCenter Server Installations

vCenter Server Appliance can be deployed via custom JSON files from a command line. The ISO ships with examples for deploying an embedded (vCenter Server and Platform Services Controller), management (vCenter Server), and Platform Services Controller appliance.

There are command-line utilities for 64-bit Linux, Mac OS X, and Windows.

The following is a sample embedded JSON file:

```
{
  "__comments":
  [
    "Will deploy an embedded VCSA to host 10 in the MGMT Cluster"
  ],

  "deployment":
  {
    "esx.hostname":"w3-tm-hp380-010.vmware.local",
    "esx.datastore":"NFSMGMT01",
    "esx.username":"root",
    "esx.password":"VMware!",
    "deployment.option":"tiny",
    "deployment.network":"VM Network",
    "appliance.name":"embedded-node",
    "appliance.thin.disk.mode":true
  },

  "vcsa":
  {

    "system":
    {
      "root.password":"VMware!",
      "ssh.enable":true
    },

    "sso":
    {
      "password":"VMware!",
      "domain-name":"vsphere.local",
      "site-name":"PaloAlto"
    }
  }
}
```


To deploy vCenter Server Appliance from this file, save it on your local system. From a command line, navigate to the utilities folder for your OS. For example, on Mac OS X, this is /Volumes/VMware VCSA/vcsa-cli-installer/mac. Now run vcsa-deploy followed by the full path to the custom JSON file. For example:

```
./vcsa-deploy /Users/mike/Downloads/embedded_node.json
```

```
Mikes-Mac:mac mike$ ./vcsa-deploy /Users/mike/Downloads/embedded_node.json
Start VCSA command line installer to deploy VCSA "embedded-node", an embedded node.
Please see /var/folders/h2/wltp1cn@gl5vsg60hysg6r000gn/T/vcsa-cli-installer-0l42iv.log for logging information.
Run installer with "-v" or "--verbose" to log detailed information.

The SSO password meets the installation requirements.
Opening VCSA image: /Volumes/VMware VCSA/vcsa/vmware-vcsa
Accept SSL fingerprint (08:8F:F7:C7:9C:3E:F3:EE:36:2F:2C:CA:A3:09:88:96:56:2E:E4:A8) for host v3-ta-hp388-010.vmware.local as target type.
Fingerprint will be added to the known host file
Write 'yes' or 'no'
yes
Opening VI target: vi:///root@v3-ta-hp388-010.vmware.local:443/
Deploying to VI: vi:///root@v3-ta-hp388-010.vmware.local:443/
```

References

vSphere 6.0 Documentation Center
<http://pubs.vmware.com/vsphere-60>

Additional Resources

VMware vSphere 6.0 Feature Walkthroughs
<http://featurewalkthrough.vmware.com/#!/vsphere-6-0>

VMware Mobile Knowledge Portal
<http://www.vmwaremp.com>

About the Author

Mike Brown is a senior technical marketing manager in the Integrated Systems Technical Marketing group. Mike has worked in the IT industry for more than 17 years. His focus is on reference architectures for VMware vCloud Suite® and the software-defined data center (SDDC) as well as VMware vCenter Server, VMware vCenter Single Sign-On, and VMware vSphere Web Client. Mike has multiple industry certifications, including VMware Certified Design Expert (VCDX).

Follow Mike on the [vSphere Blog](#) and on Twitter [@vMikeBrown](#).



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