

W-ClearPass Policy Manager Tech Note

Installing or Upgrading W-ClearPass 6.5 on a Virtual Machine

This document describes the procedures for installing and upgrading W-ClearPass Policy Manager 6.5 on a Virtual Machine. Information is provided for both ESX/ESXi and Hyper-V installations.

This Tech Note includes the following sections:

- "ESX/ESXi Installations" on page 1
- "Hyper-V Installations" on page 13
- "Caveats, Hyper-V" on page 22

ESX/ESXi Installations

This section describes how to install or upgrade W-ClearPass on a VMware ESX/ESXi virtual machine, including:

- "ESX/ESXi Installation Process Overview" on page 1
- "Recommended ESX/ESXi Server Specifications" on page 1
- "Installing W-ClearPass Policy Manager on an ESX/ESXi Virtual Machine" on page 3
- "Upgrading W-ClearPass Policy Manager on an ESX/ESXi Virtual Machine" on page 10

ESX/ESXi Installation Process Overview

The process of installing W-ClearPass on a VMware ESX/ESXi virtual machine is done in four stages:

1. W-ClearPass 6.5 VMware software packages are distributed as Zip files. Download the software image from the **Download Software > ClearPass > Policy Manager > Current Release > ESXi** folder on the Support site (<http://download.dell-pcw.com>) and unzip it to a folder on your server to extract the files.
2. Follow the steps in the OVF wizard to deploy the OVF files, but do not power on yet.
3. Add a new hard disk, based on the requirements for your type of VM. See "Recommended ESX/ESXi Server Specifications" on page 1 for more information.
4. Power on and configure the VM.

Instructions for these procedures are provided in "Installing W-ClearPass Policy Manager on an ESX/ESXi Virtual Machine" on page 3.



Review the release notes for the current release before you upgrade W-ClearPass Policy Manager.

Recommended ESX/ESXi Server Specifications

Please carefully review all VA requirements, including functional IOP ratings, and verify that your system meets these requirements. These recommendations supersede earlier requirements that were published for W-ClearPass Policy Manager 6.x installations.

Virtual appliance recommendations are adjusted to align with the requirements for W-ClearPass hardware appliances. If you do not have the VA resources to support a full workload, then you should consider ordering the W-ClearPass Policy Manager hardware appliance.

Be sure that your system meets the recommended specifications required for the Policy Manager Virtual Appliance. The W-ClearPass VMware ships with a 20 GB hard disk volume. This must be supplemented with

additional storage/hard disk through VMware settings by adding a new hard disk. The additional space required depends on the W-ClearPass virtual appliance version.

To ensure scalability, dedicate or reserve the processing and memory to the W-ClearPass VM instance. You must also ensure that the disk subsystem can maintain the IOP's throughput as detailed below. Most virtualized environments use a shared disk subsystem assuming that each application will have bursts of I/O without a sustained high I/O throughput. W-ClearPass Policy Manager requires a continuous sustained high data I/O rate.



If you do not add a new hard disk to the VM before it is powered on, it will continue to restart with kernel panics.

Supported ESX/ESXi Versions

The following VMware versions are supported. VMware Player is not supported.

- VMware ESX 4.0 (Recommended minimum version of software for CP-VA-500 and CP-VA-5K. It does not support greater than 8 virtual CPUs required for the CP-VA-25K.)
- VMware ESXi 5.0
- VMware ESXi 5.1
- VMware ESXi 5.5

CP-VA-500 (500 Virtual Appliance OVF)

- 2 Virtual CPUs
- 500 GB disk space
- 4 GB RAM
- 2 Gigabit virtual switched ports
- Functional IOP rating for a 40-60 read/write profile for 4k random read/write = 75

CP-VA-5K (5K Virtual Appliance OVF)

- 8 Virtual CPUs
- Disk space:
 - 500 GB disk space required for existing deployments (upgrading from 6.2.6, 6.3.6, or 6.4.x)
 - 1000 GB disk space recommended for new deployments
- 8 GB RAM
- 2 Gigabit virtual switched ports
- Functional IOP rating for a 40-60 read/write profile for 4k random read/write = 105

CP-VA-25K (25K Virtual Appliance OVF)

- 24 Virtual CPUs
- Disk space:
 - 1000 GB disk space required for existing deployments (upgrading from 6.2.6, 6.3.6, or 6.4.x)
 - 1800 GB disk space recommended for new deployments
- 64 GB RAM
- 2 Gigabit virtual switched ports
- Functional IOP rating for a 40-60 read/write profile for 4k random read/write = 350

CP-SW-EVAL (Evaluation OVF)

- 2 Virtual CPUs
- 80 GB disk space
- 4 GB RAM
- 2 Gigabit virtual switched ports

An evaluation version can be upgraded to a later evaluation version in a manner similar to a production upgrade.

An ESX/ESXi evaluation version can be morphed to a production VM by using the `morph-vm` command. For more information, see the **Command Line Interface > System Commands** section in the *W-ClearPass Policy Manager User Guide*.

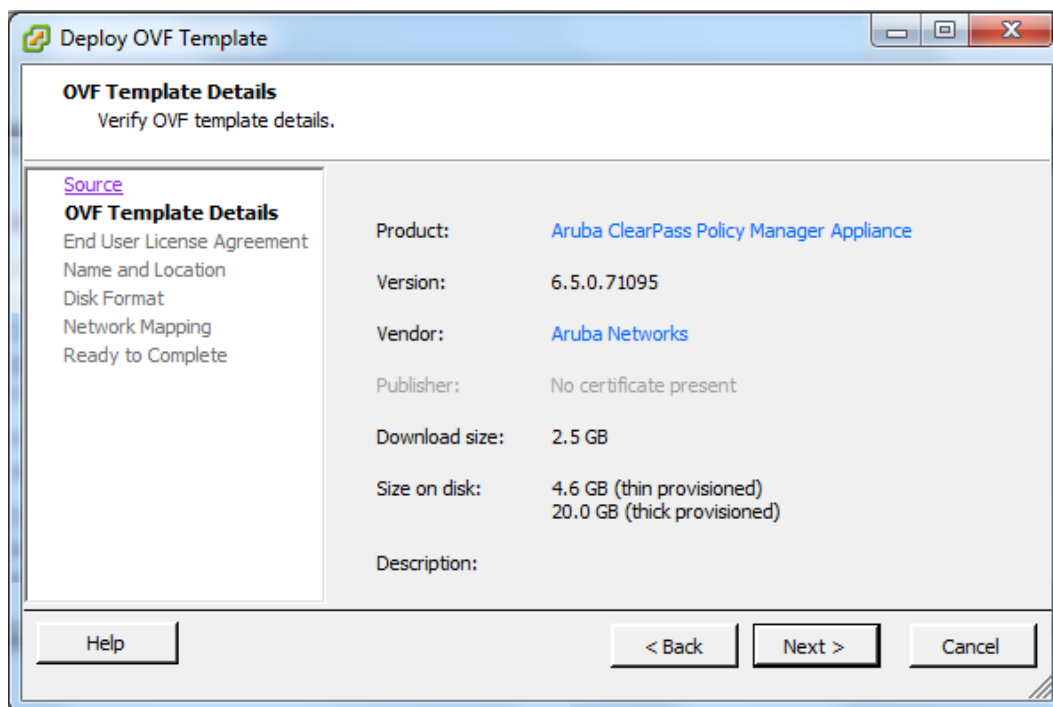
Installing W-ClearPass Policy Manager on an ESX/ESXi Virtual Machine

After you download and unzip the W-ClearPass 6.5 VMware ESX/ESXi software package Zip files, follow the instructions in this section to deploy the W-ClearPass files, add a new hard disk, and power on and configure the VM:

- ["Deploy W-ClearPass Policy Manager Image on a VMware ESX/ESXi Server" on page 3](#)
- ["Add a Hard Disk to the Virtual Machine" on page 5](#)
- ["Power On and Configure the VM" on page 9](#)

Deploy W-ClearPass Policy Manager Image on a VMware ESX/ESXi Server

1. Start the VMware vSphere console and connect to your ESX/ESXi server.
2. Select **File > Deploy OVF template**.
3. Select the .ovf file from the folder where the W-ClearPass Policy Manager Zip file was extracted. The Deploy OVF wizard opens with the OVF Template Details page displayed. (OVF, or Open Virtualization Format, is a standard for distributing virtual appliances or software to virtual machines)



4. Click **Next**.

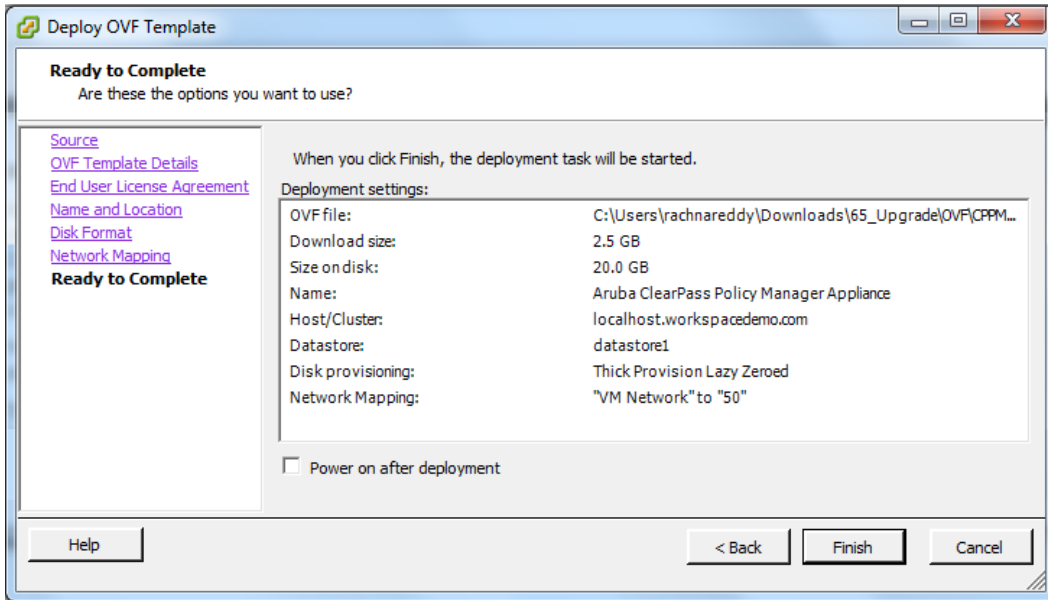
5. On the **End User License Agreement** page, click **Accept**, and then click **Next**.
6. On the **Name and Location** page, the **Name** is set by default to Aruba ClearPass Policy Manager Appliance. You can change it as you wish, and then click **Next**.

The screenshot shows the 'Deploy OVF Template' wizard window. The title bar reads 'Deploy OVF Template'. The main heading is 'Name and Location' with the instruction 'Specify a name and location for the deployed template'. On the left, there is a navigation pane with links for 'Source', 'OVF Template Details', 'End User License Agreement', 'Name and Location' (which is selected), 'Disk Format', 'Network Mapping', and 'Ready to Complete'. The main area contains a 'Name:' text box with the value 'Aruba ClearPass Policy Manager Appliance'. Below the text box is a note: 'The name can contain up to 80 characters and it must be unique within the inventory folder.' At the bottom, there are three buttons: 'Help', '< Back', and 'Next >', and a 'Cancel' button on the right.

7. On the **Disk Format** page, leave the default option of **Thick Provision Lazy Zeroed**, and then click **Next**.

The screenshot shows the 'Deploy OVF Template' wizard window at the 'Disk Format' step. The title bar reads 'Deploy OVF Template'. The main heading is 'Disk Format' with the instruction 'In which format do you want to store the virtual disks?'. On the left, the navigation pane is the same as in the previous step, but 'Disk Format' is now selected. The main area shows 'Datastore:' with a dropdown menu set to 'datastore1' and 'Available space (GB):' with a text box showing '10779.7'. Below these are three radio button options: 'Thick Provision Lazy Zeroed' (which is selected), 'Thick Provision Eager Zeroed', and 'Thin Provision'. At the bottom, there are three buttons: 'Help', '< Back', and 'Next >', and a 'Cancel' button on the right.

- On the **Ready to Complete** page, do not select the Power on after deployment check box. Just click **Finish**.



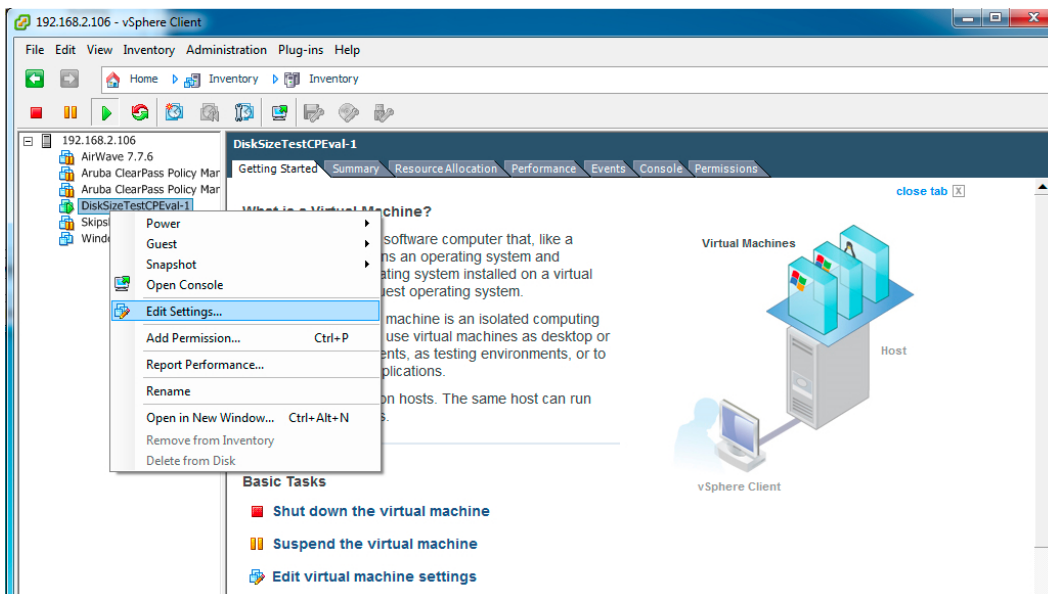
You will need to reconfigure the VM settings by adding a hard disk before you power on.

Add a Hard Disk to the Virtual Machine

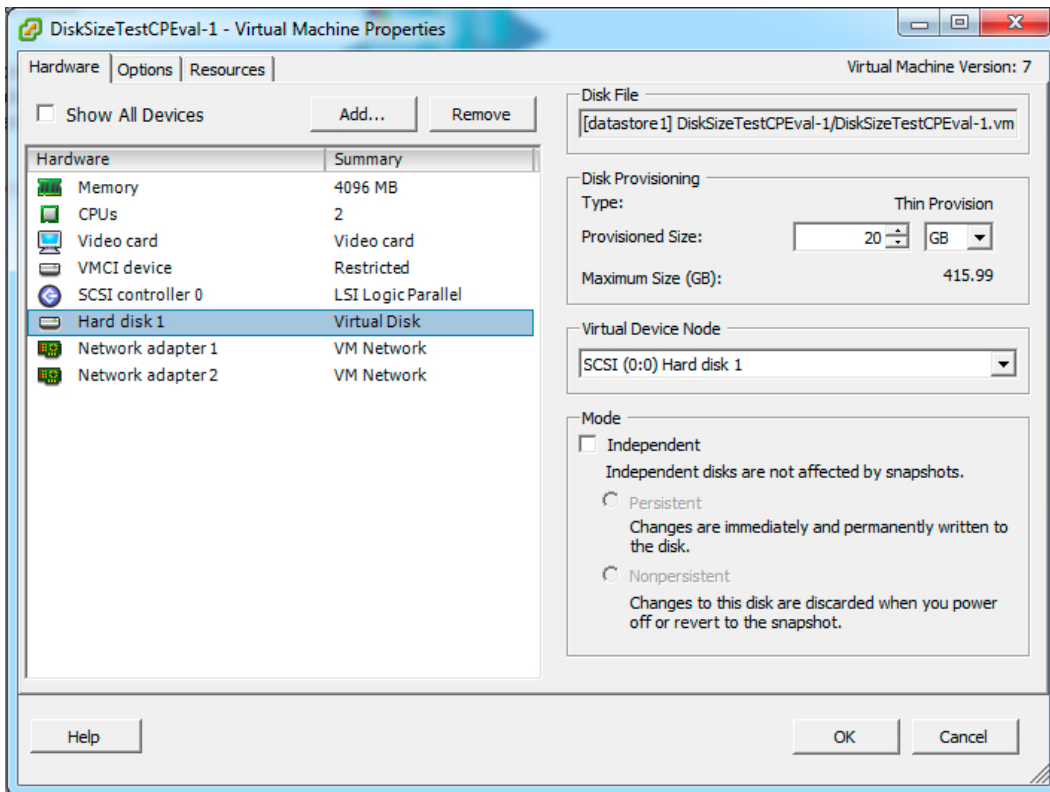


For disk size requirements for the different W-ClearPass models, see "[Recommended ESX/ESXi Server Specifications](#)" on page 1.

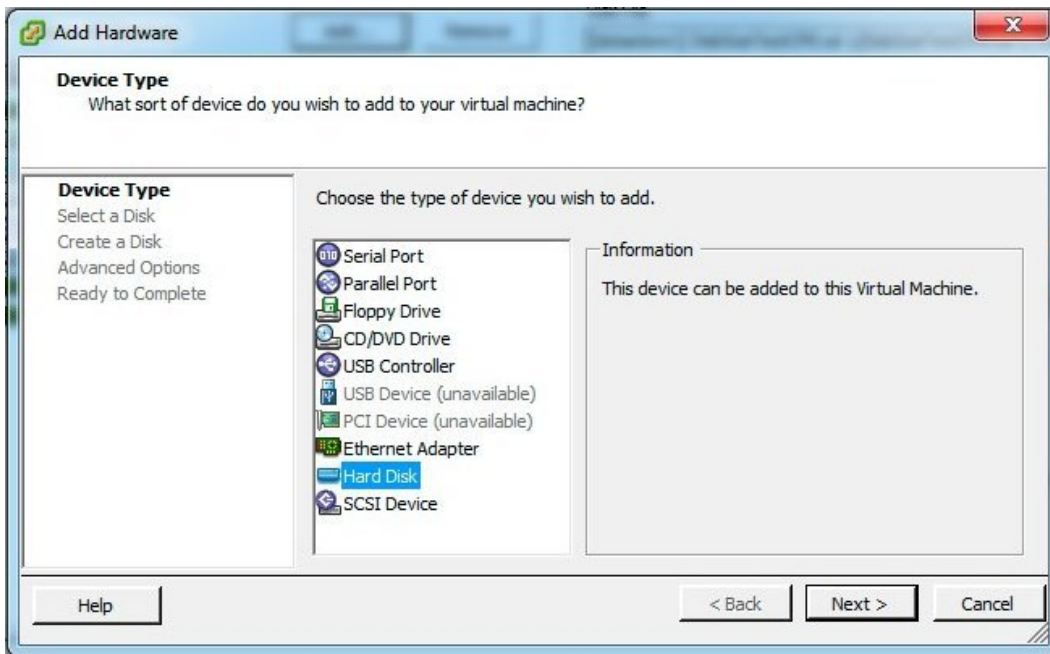
- On the vSphere console, navigate to the deployed virtual machine, right-click on it, and select **Edit Settings**.



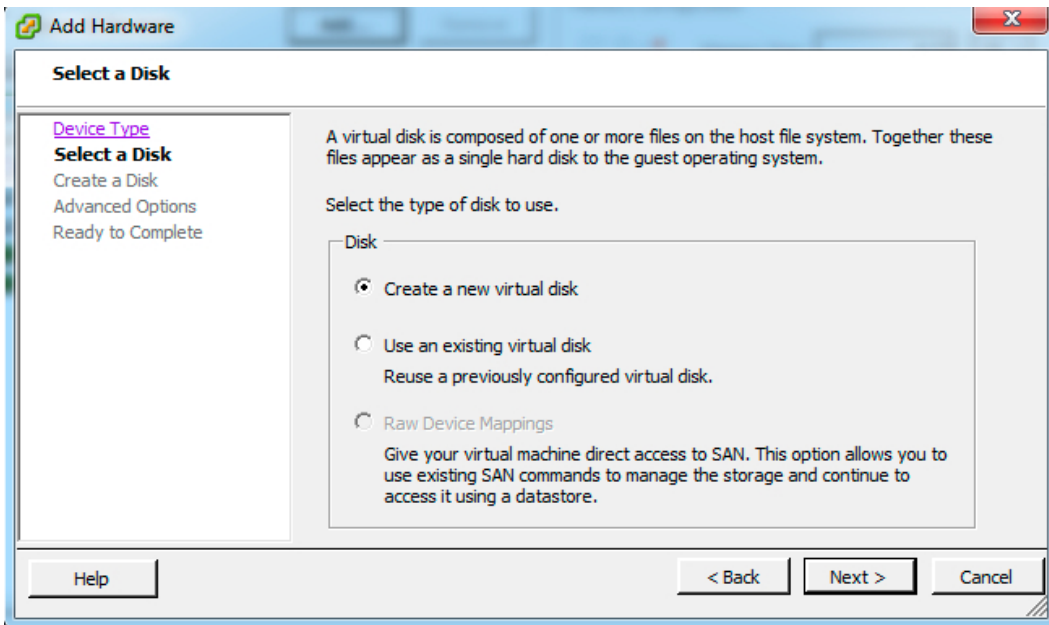
2. Click **Add** to add another hard disk.



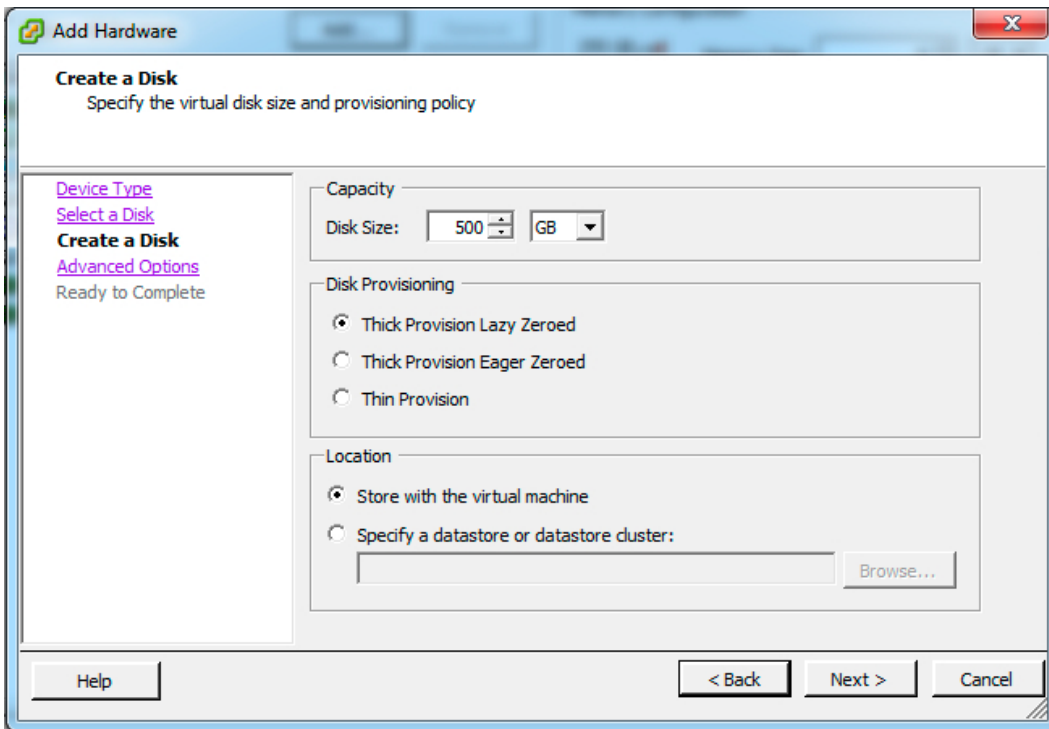
3. On the **Device Type** page of the Add Hardware wizard, select **Hard Disk**, and then click **Next**.



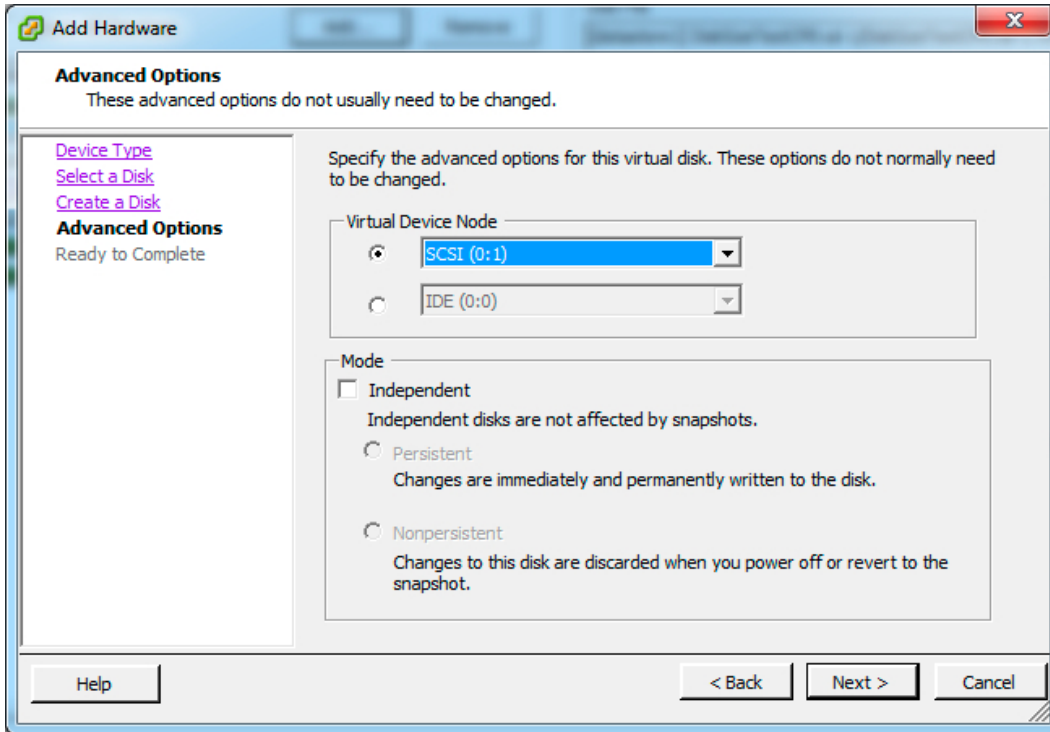
4. On the **Select a Disk** page, select **Create a new virtual disk**, and then click **Next**.



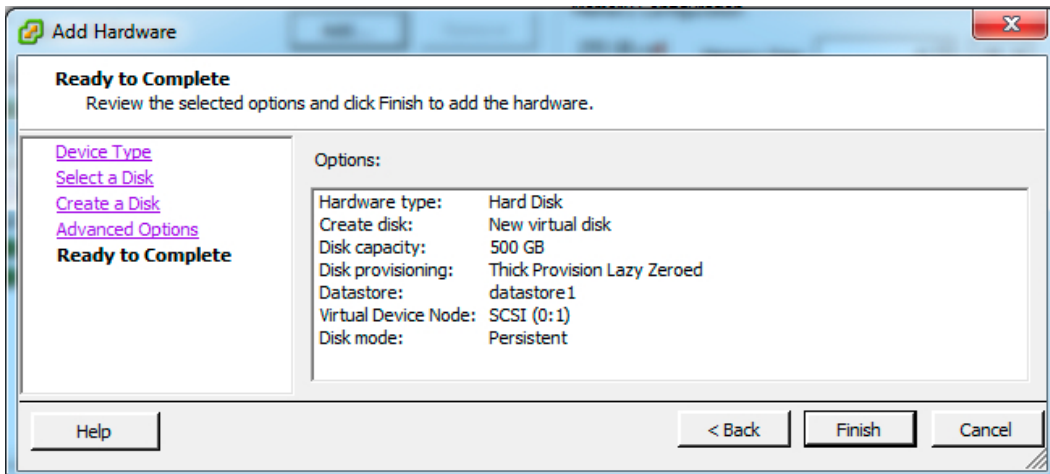
5. On the **Create a Disk** page, set the **Disk Size** to the correct requirements for your virtual appliance version. See "Recommended ESX/ESXi Server Specifications" on page 1.



6. Leave the default settings on the **Advanced Options** page (the Virtual Device Node should be SCSI(0:1)), and then click **Next**.

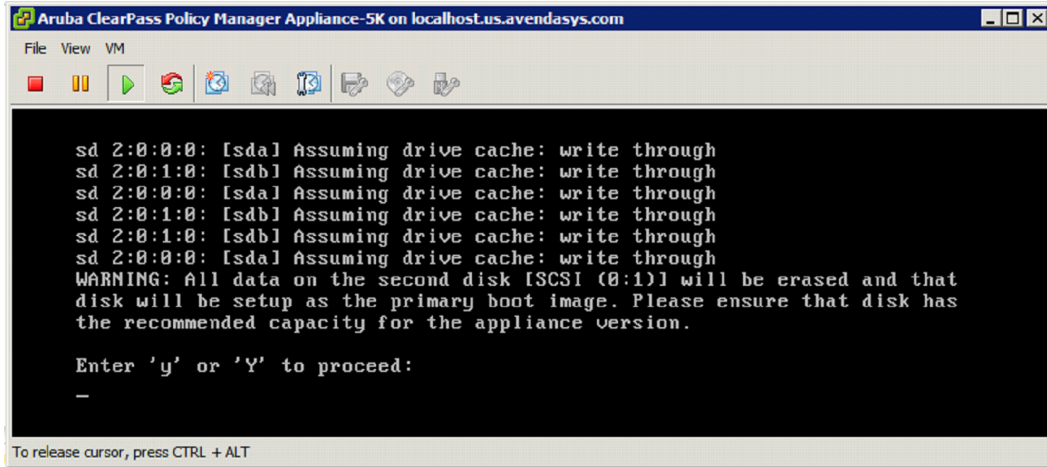


7. The **Ready to Complete** page displays the disk details for verification. If the disk size matches the requirements described in "[Recommended ESX/ESXi Server Specifications](#)" on page 1 and the disk provisioning setting is **Thick Provision Lazy Zeroed**, click **Finish**.



Power On and Configure the VM

1. Power on the virtual machine. You should see the following in the console:

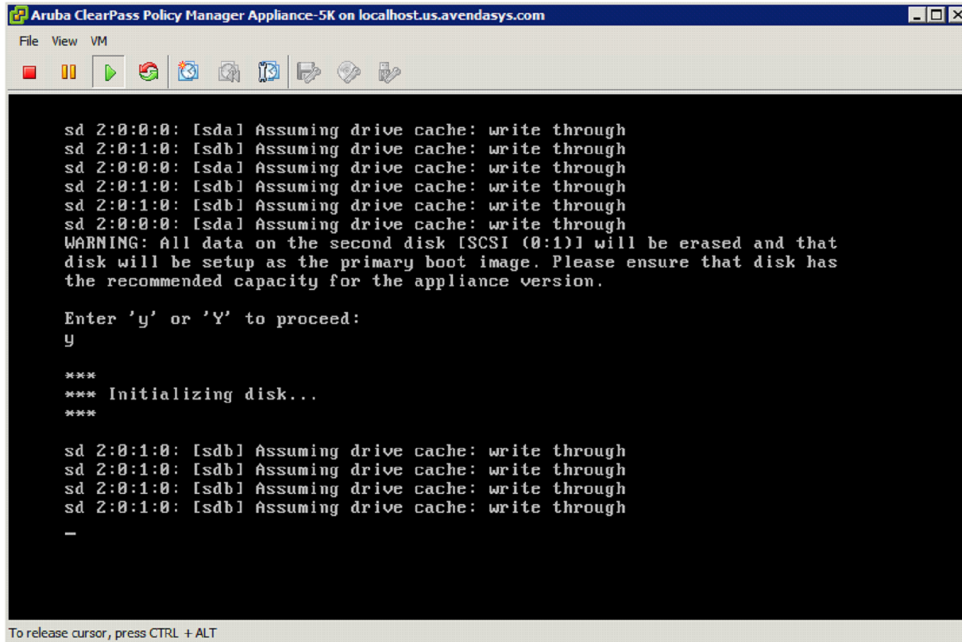


```
Aruba ClearPass Policy Manager Appliance-5K on localhost.us.avendasys.com
File View VM
sd 2:0:0:0: [sda] Assuming drive cache: write through
sd 2:0:1:0: [sdb] Assuming drive cache: write through
sd 2:0:0:0: [sda] Assuming drive cache: write through
sd 2:0:1:0: [sdb] Assuming drive cache: write through
sd 2:0:1:0: [sdb] Assuming drive cache: write through
sd 2:0:0:0: [sda] Assuming drive cache: write through
WARNING: All data on the second disk [SCSI (0:1)] will be erased and that
disk will be setup as the primary boot image. Please ensure that disk has
the recommended capacity for the appliance version.

Enter 'y' or 'Y' to proceed:
_

To release cursor, press CTRL + ALT
```

2. Press **y**. The ClearPass 6.5.0 setup and installation begins. You should see the following in the console, and ClearPass will reboot at least once:



```
Aruba ClearPass Policy Manager Appliance-5K on localhost.us.avendasys.com
File View VM
sd 2:0:0:0: [sda] Assuming drive cache: write through
sd 2:0:1:0: [sdb] Assuming drive cache: write through
sd 2:0:0:0: [sda] Assuming drive cache: write through
sd 2:0:1:0: [sdb] Assuming drive cache: write through
sd 2:0:1:0: [sdb] Assuming drive cache: write through
sd 2:0:0:0: [sda] Assuming drive cache: write through
WARNING: All data on the second disk [SCSI (0:1)] will be erased and that
disk will be setup as the primary boot image. Please ensure that disk has
the recommended capacity for the appliance version.

Enter 'y' or 'Y' to proceed:
y

***
*** Initializing disk...
***

sd 2:0:1:0: [sdb] Assuming drive cache: write through
sd 2:0:1:0: [sdb] Assuming drive cache: write through
sd 2:0:1:0: [sdb] Assuming drive cache: write through
sd 2:0:1:0: [sdb] Assuming drive cache: write through
_

To release cursor, press CTRL + ALT
```

```

Aruba ClearPass Policy Manager Appliance 6.4 500 on vmware33.testlab.avendatest.com
File View VM
sd 2:0:1:0: [sdb] Assuming drive cache: write through
sdb: sdb1
sd 2:0:1:0: [sdb] Cache data unavailable
sd 2:0:1:0: [sdb] Assuming drive cache: write through
sdb: sdb1 sdb2
sd 2:0:1:0: [sdb] Cache data unavailable
sd 2:0:1:0: [sdb] Assuming drive cache: write through
sd 2:0:1:0: [sdb] Cache data unavailable
sd 2:0:1:0: [sdb] Assuming drive cache: write through

***
*** Copying file system contents. This may take a while...
***

EXT4-fs (sdb1): mounted filesystem with ordered data mode. Opts:
Setting up boot targets...

***
*** First boot setup DONE. Ready to reboot.
*** Forcibly killing init. Next boot will use the new disk setup.
***
*** Any error messages that appear below can be ignored.
***

```

After that reboot the W-ClearPass VM is configured, and will power on and boot up within a couple of minutes. The whole process from Deploying the OVF image to the final startup screen should take between 30 and 40 minutes.

3. After the W-ClearPass VM launches correctly, you should see the following banner on the VM console:

```

*****
Aruba Networks PolicyManager 6.4.0.66263
Management IP Address : <not configured>
*****

*****
*
* Policy Manager is running with factory default configuration. Refer to *
* Quick Start Guide for configuration instructions.
*
*****

Policy Manager software version : 6.4.0.66263
Policy Manager model number    : CP-SM-EVAL
Management IP Address          : <not configured>

localhost login: _

```

4. When you see the banner on the virtual machine console, you can log in by following the instructions in the *W-ClearPass Policy Manager Quick Start Guide*.

Upgrading W-ClearPass Policy Manager on an ESX/ESXi Virtual Machine

An evaluation version can be upgraded to a later evaluation version in a manner similar to a production upgrade. After upgrading to 6.5, an ESX/ESXi evaluation version can be morphed to a production VM by using the `morph-vm` command. For more information, see the **Command Line Interface > System Commands** section in the *W-ClearPass Policy Manager User Guide*.

For detailed instructions for upgrading or updating, refer to the **Upgrade and Update Information** chapter of the most recent *W-ClearPass 6.5.x Release Notes*.

Caveats, Upgrading on ESX/ESXi

You can upgrade to W-ClearPass 6.5 from W-ClearPass 6.2.6, 6.3.6, or 6.4.x. Before you proceed with the upgrade, we recommend that you apply the latest available patch updates to your current release.

- For 6.4.x upgrades through the Software Updates portal in the Policy Manager user interface, or through the Web service, upgrade is supported for any 6.4.x version.
- For 6.4.x upgrades through the CLI, there are two options:
 - If you are on 6.4.2 or later, you can upgrade directly to 6.5 through the CLI.
 - If you are on 6.4.0 or 6.4.1, you must first download and install the 6.4.0 CLI updates patch from <http://download.dell-pcw.com>. After you have installed the patch, update to 6.4.2 or higher. You can then upgrade to 6.5 through the CLI.
- For 6.3.x, upgrade is only supported from the latest cumulative patch. You must update to 6.3.6 before upgrading to 6.5.
- For 6.2.x, upgrade is only supported from the latest cumulative patch. You must update to 6.2.6 before upgrading to 6.5.
- For 6.1.x, direct upgrades are not supported. Customers on 6.1.x must intermediately upgrade to 6.2.6, 6.3.6, or 6.4.x first before upgrading to 6.5.
- Upgrade images are available within W-ClearPass Policy Manager from the Software Updates portal at **Administration > Agents and Software Updates > Software Updates**.



If you are upgrading from 6.4.0, the Software Updates portal incorrectly shows a warning during upgrade asking for two hard drives. This message can be ignored. (#27736)

Upgrading to 6.5

Perform the following steps when upgrading from 6.3 or older versions of W-ClearPass to a newer version:

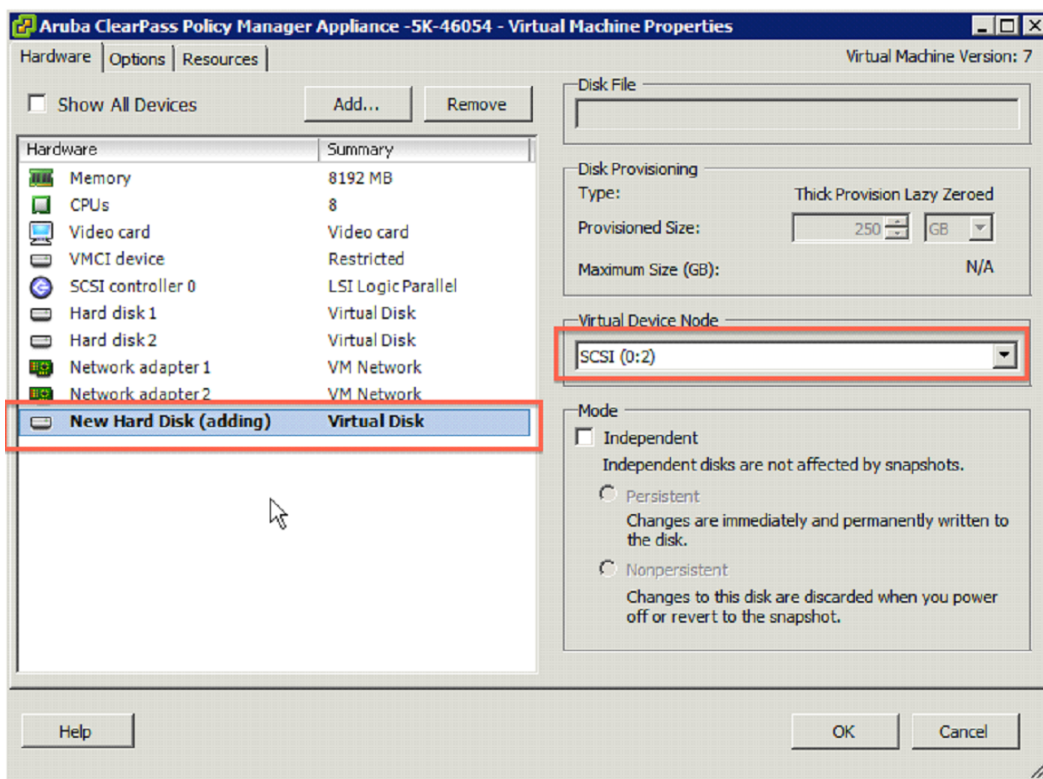
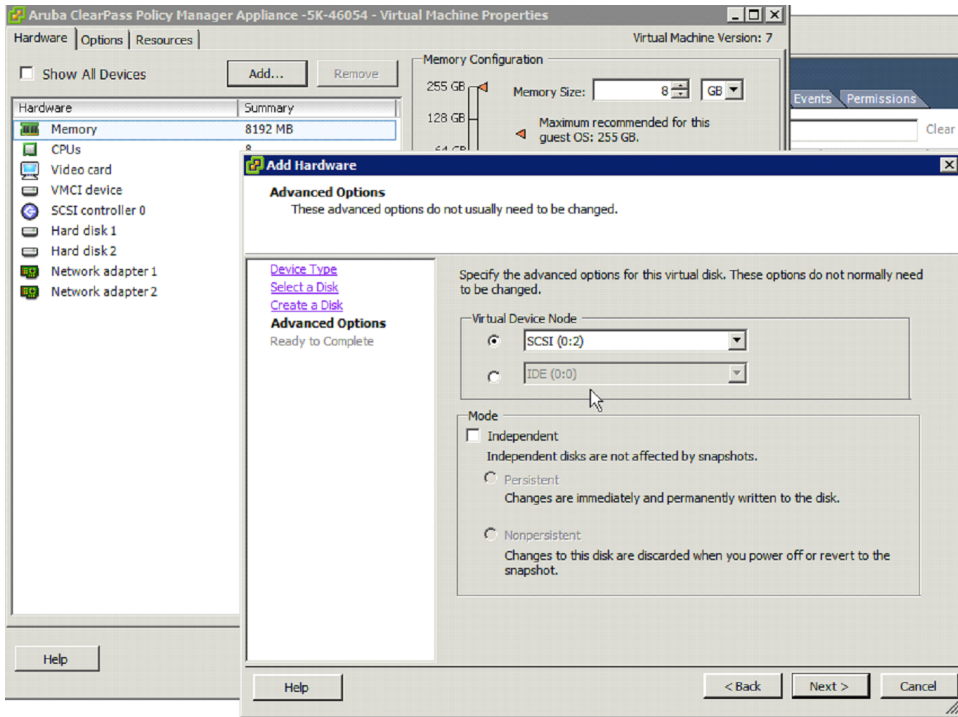
1. Power off the W-ClearPass VMware instance.
2. In VMware, open the W-ClearPass virtual machine properties.
3. If you are upgrading from W-ClearPass 6.1 or 6.2, add a new hard disk to the virtual machine. The **Virtual Device Node** should be **SCSI(0:2)**.

Review the VMware disk requirements first. These are described in "[Recommended ESX/ESXi Server Specifications](#)" on page 1.

This procedure is not required if you are upgrading from W-ClearPass 6.3.



Never remove SCSI 0:0



4. Power on the W-ClearPass Policy Manager instance.
5. Log in to W-ClearPass Policy Manager and navigate to **Administration > Agents and Software Updates > Software Updates**.



A valid Subscription ID is required to download the latest W-ClearPass Policy Manager updates.

6. In the **Firmware & Patch Updates** section, click **Download** next to the upgrade image name.

7. After the upgrade image has downloaded, click **Install** next to the upgrade image name.
8. Click **Yes** in the **Confirm Installation** dialog box. The **Install Update** dialog box opens and shows the progress of the update.



9. When the installation is complete, click **Reboot**.

The updated version of W-ClearPass Policy Manager starts after the reboot and the configuration from the previous version is migrated to the new version.

Hyper-V Installations

This section describes how to install W-ClearPass on a Microsoft Hyper-V virtual machine, including:

- "Hyper-V Installation Process Overview" on page 13
- "Recommended Hyper-V Server Specifications" on page 14
- "Installing W-ClearPass Policy Manager on a Hyper-V Virtual Machine" on page 15
- "Morphing a Hyper-V Evaluation Version" on page 21
- "Caveats, Hyper-V" on page 22

Hyper-V Installation Process Overview

The process of installing W-ClearPass on a Microsoft Hyper-V virtual machine is done in four stages:

1. W-ClearPass 6.5 Hyper-V software packages are distributed as Zip files. Download the software image from the **Download Software > ClearPass > Policy Manager > Current Release > Hyper-V** folder on the Support site (<http://download.dell-pcw.com>) and unzip it to a folder on your server to extract the files.
2. Import the virtual machine and choose the import type.
3. Add the hard disk and configure the format, type, and size, based on the requirement for your VM.
4. Power on and configure the VM.

Instructions for these procedures are provided in "Installing W-ClearPass Policy Manager on a Hyper-V Virtual Machine" on page 15.

Recommended Hyper-V Server Specifications

Please carefully review all VA requirements, including functional IOP ratings, and verify that your system meets these requirements.

Virtual appliance recommendations are adjusted to align with the requirements for W-ClearPass hardware appliances. If you do not have the VA resources to support a full workload, then you should consider ordering the W-ClearPass Policy Manager hardware appliance.

Be sure that your system meets the recommended specifications required for the Policy Manager Virtual Appliance. The W-ClearPass VM ships with a 20 GB hard disk volume. This must be supplemented with additional storage/hard disk through Hyper-V settings by adding a new hard disk. The additional space required depends on the W-ClearPass virtual appliance version.

To ensure scalability, dedicate or reserve the processing and memory to the W-ClearPass VM instance. You must also ensure that the disk subsystem can maintain the IOP's throughput as detailed below. Most virtualized environments use a shared disk subsystem assuming that each application will have bursts of I/O without a sustained high I/O throughput. W-ClearPass Policy Manager requires a continuous sustained high data I/O rate.



If you do not add a new hard disk to the VM before it is powered on, it will continue to restart with kernel panics.

Supported Hyper-V Versions

The following Microsoft Hyper-V versions are supported:

- Microsoft Hyper-V Server 2012 R2
- Microsoft Windows Server 2012 R2 Hyper-V Enterprise

CP-VA-500 (500 Virtual Appliance VHDX)

- 2 Virtual CPUs
- 500 GB disk space
- 4 GB RAM
- 2 Gigabit virtual switched ports
- Functional IOP rating for a 40-60 read/write profile for 4k random read/write = 75

CP-VA-5K (5K Virtual Appliance VHDX)

- 8 Virtual CPUs
- 1000 GB disk space required
- 8 GB RAM
- 2 Gigabit virtual switched ports
- Functional IOP rating for a 40-60 read/write profile for 4k random read/write = 105

CP-VA-25K (25K Virtual Appliance VHDX)

- 24 Virtual CPUs
- 1800 GB disk space required
- 64 GB RAM
- 2 Gigabit virtual switched ports
- Functional IOP rating for a 40-60 read/write profile for 4k random read/write = 350

CP-SW-EVAL (Evaluation VHDX)

- 2 Virtual CPUs
- 80 GB disk space
- 4 GB RAM
- 2 Gigabit virtual switched ports

An evaluation version can be upgraded to a later evaluation version in a manner similar to a production upgrade.

To morph a Hyper-V evaluation version to a production VM by using the morph-vm command, see "[Morphing a Hyper-V Evaluation Version](#)" on page 21.

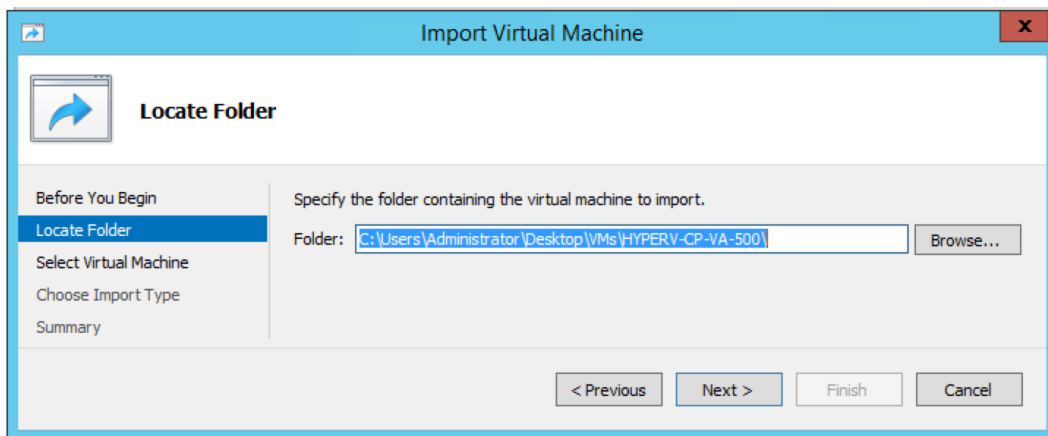
Installing W-ClearPass Policy Manager on a Hyper-V Virtual Machine

After you download and unzip the W-ClearPass 6.5 ESXi software package Zip files, follow the instructions in this section to deploy the W-ClearPass files, add a new hard disk, and power on and configure the VM:

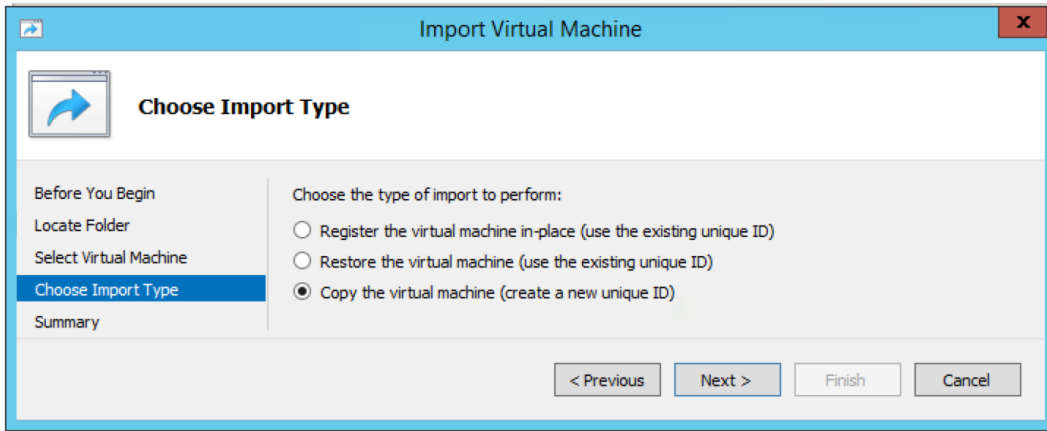
- "[Import the Virtual Machine](#)" on page 15
- "[Add a Hard Disk to the Hyper-V Virtual Machine](#)" on page 16
- "[Power On and Configure the VM](#)" on page 20

Import the Virtual Machine

1. Download and unzip the appropriate Hyper-V package for your application (EVAL, 500, 5K, or 25K) from the **Download Software > ClearPass > Policy Manager > Current Release > Hyper-V** folder on the Support site (<http://download.dell-pcw.com>).
2. From Hyper-V Manager, right-click to select the **Hyper-V server** and select the **Import Virtual Machine** option. The **Import Virtual Machine** window opens.
3. In the **Locate Folder** step, select the folder you unzipped in step 1.



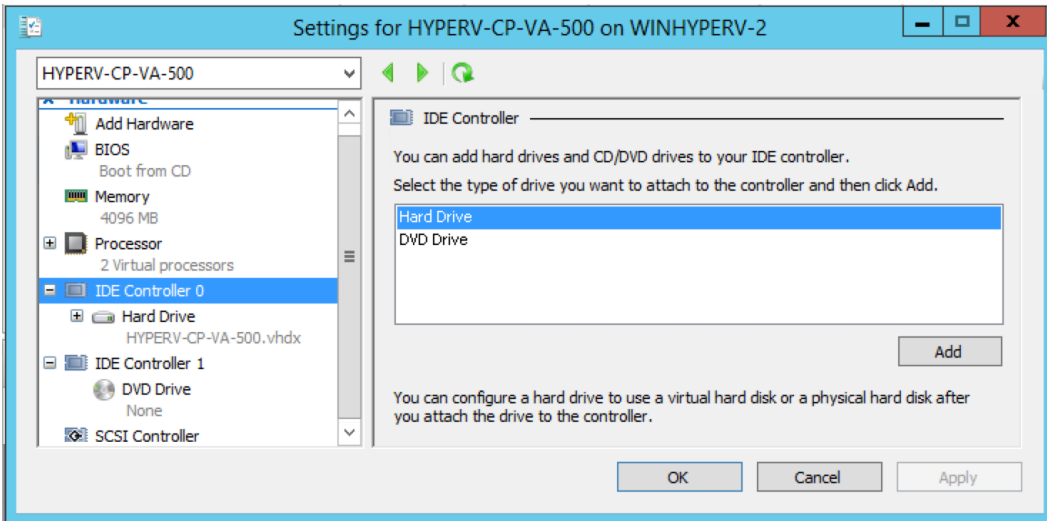
4. In the **Choose Import Type** step, select **Copy the virtual machine**.



5. After it is imported, select the VM, right click, and choose properties. The **Settings** configuration window opens, where you will add the hard disk.

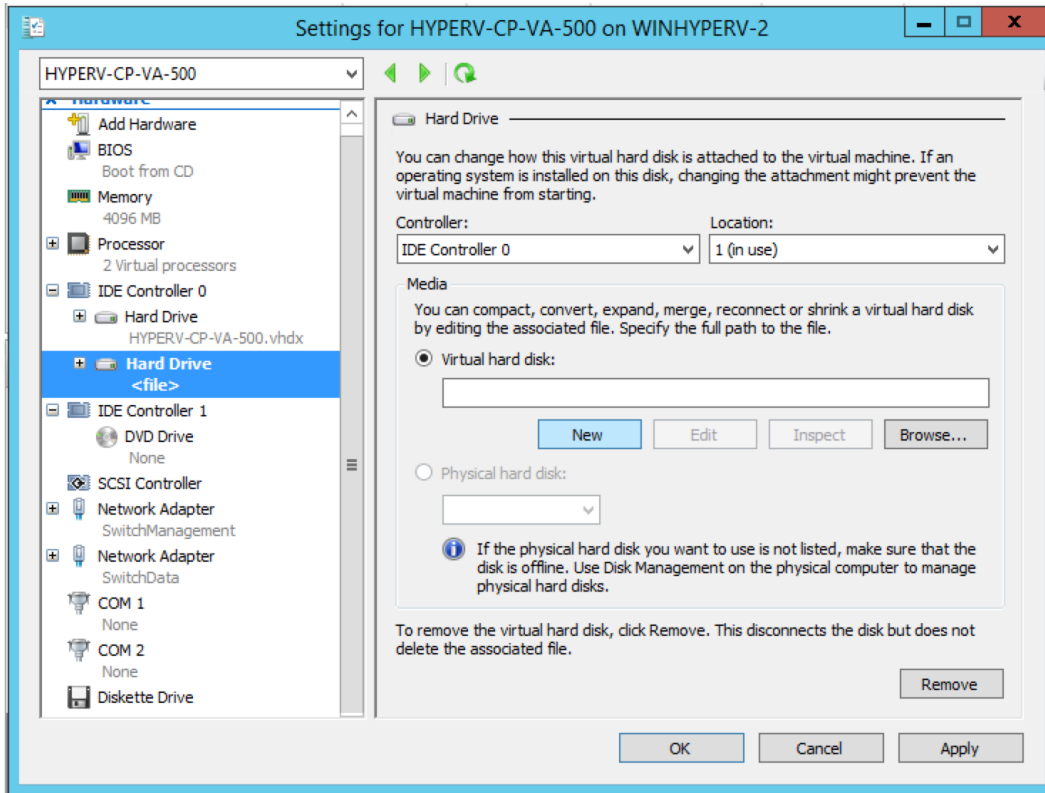
Add a Hard Disk to the Hyper-V Virtual Machine

1. Select the **IDE Controller 0** option.

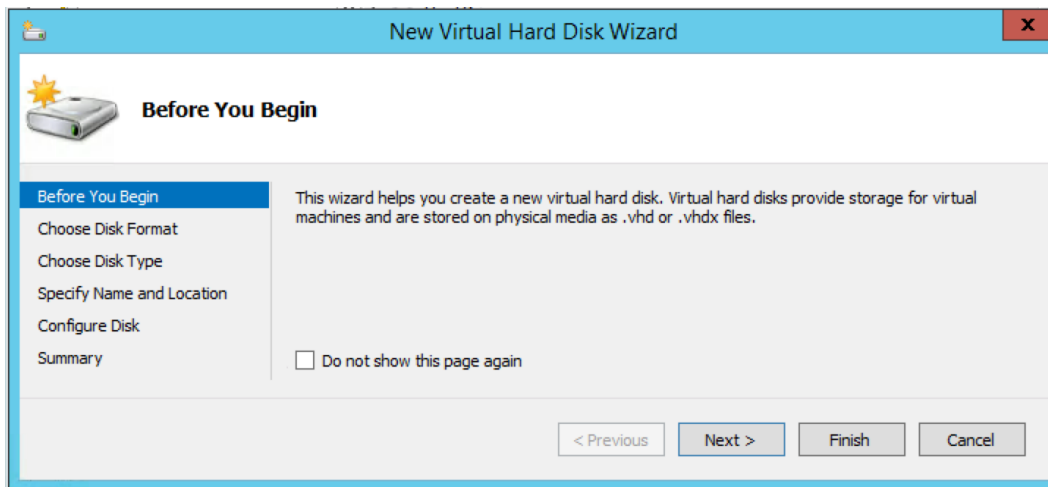


2. Add a hard drive and verify the following values:

- Controller = **IDE Controller 0**
- Location = **1 (in use)**



3. Click **New** below the Virtual Hard Disk option. The **New Virtual Hard Disk** wizard opens.

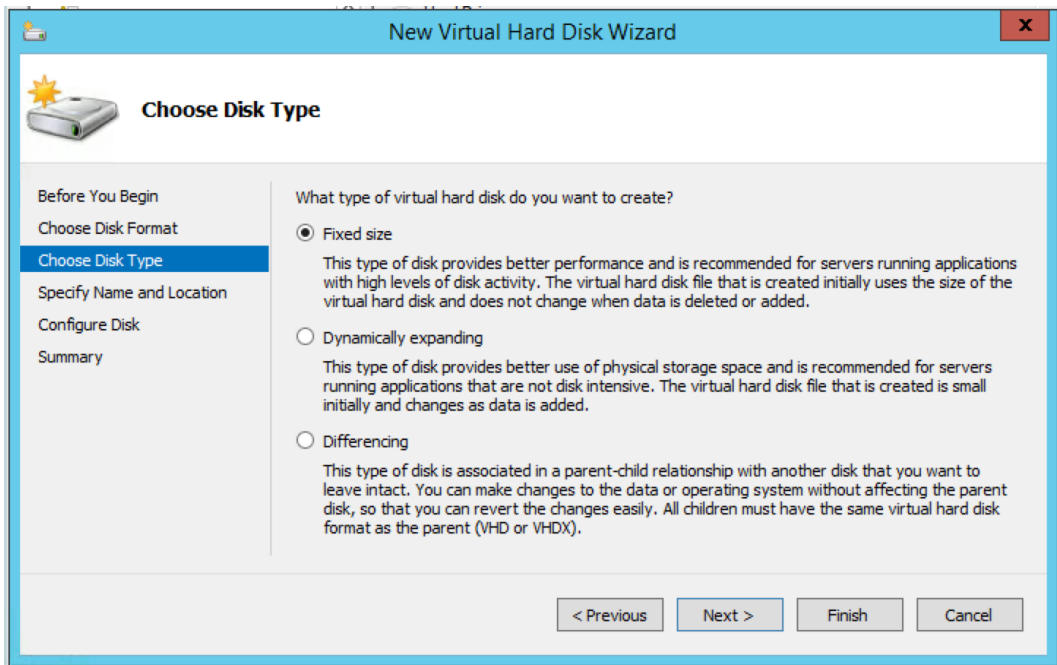


4. Select the following options while creating the disk:

- Disk Format: **VHDX**

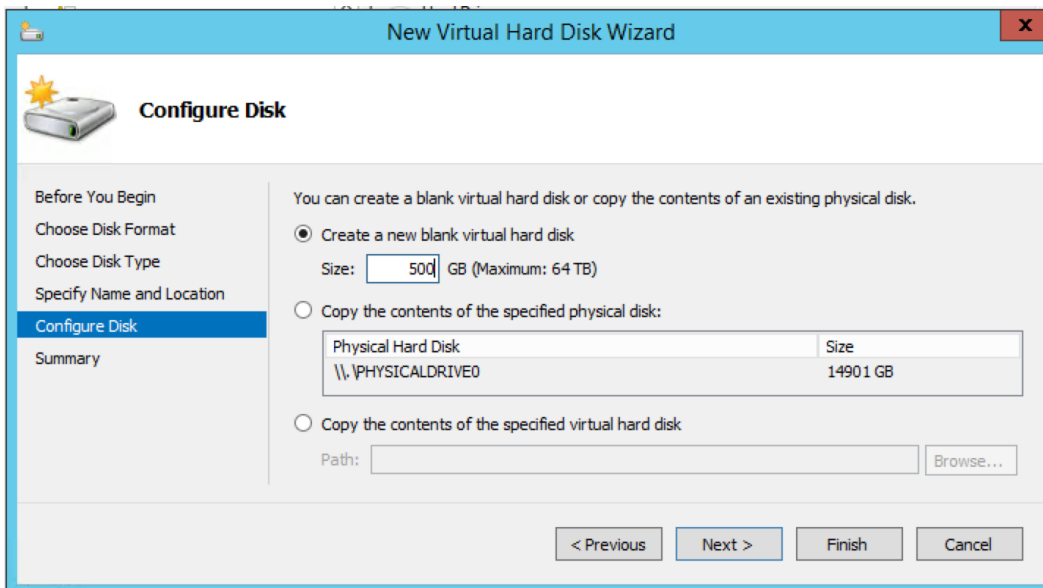
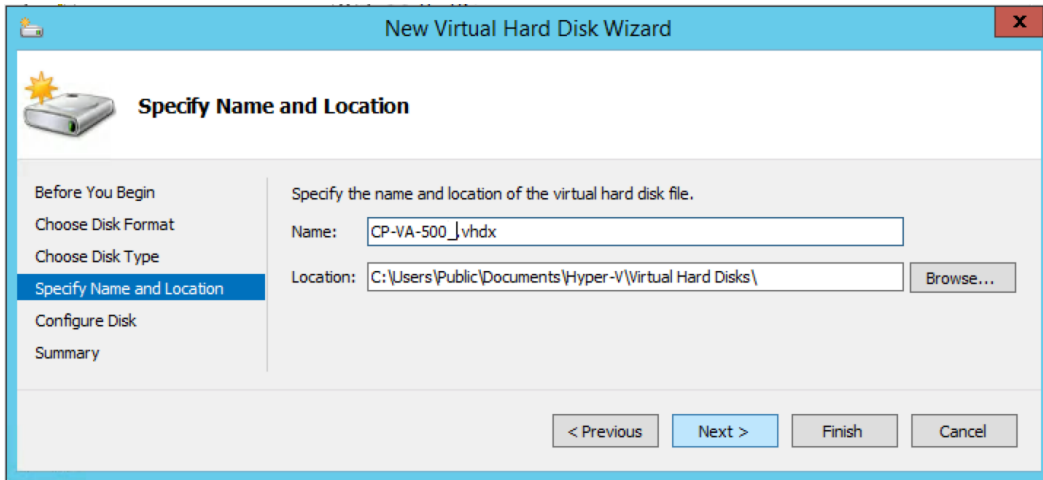


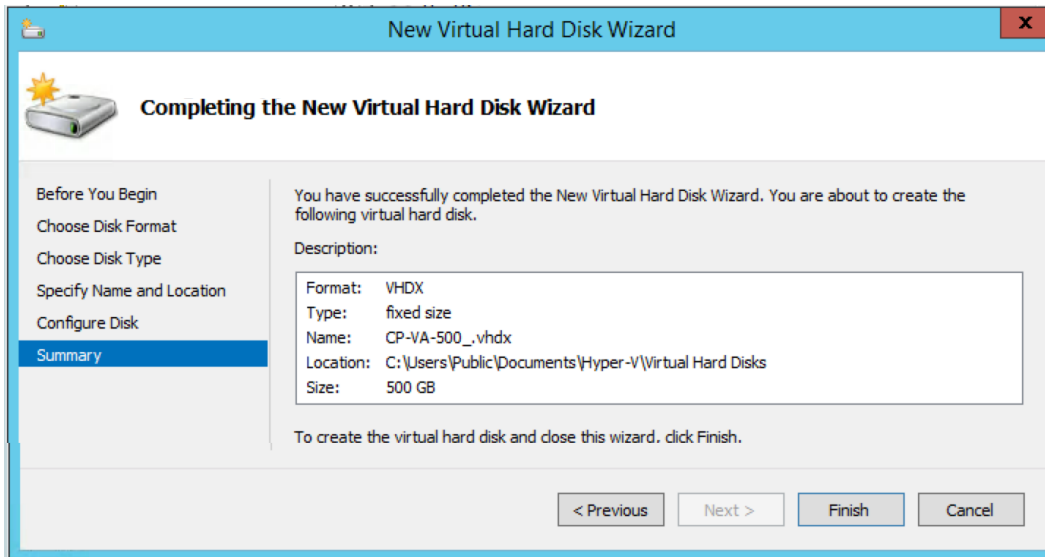
- Disk Type: **Fixed**



- Disk Size:
 - EVAL = **80 GB**
 - 500 = **500 GB**
 - 5K = **1000 GB**
 - 25K = **1800 GB**

Using a CP-VA-500 VHDX as an example, the following images show the name and location, disk configuration, and summary steps. For more information about the correct requirements for your virtual appliance version, see ["Recommended Hyper-V Server Specifications"](#) on page 14.

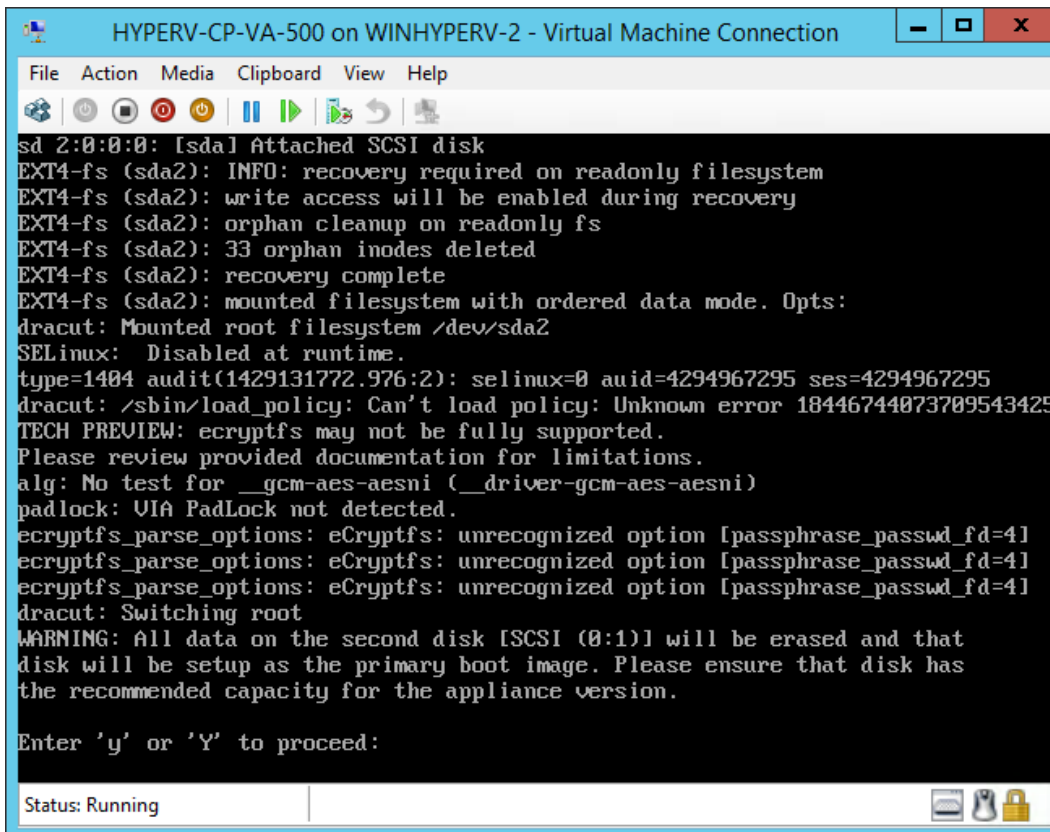




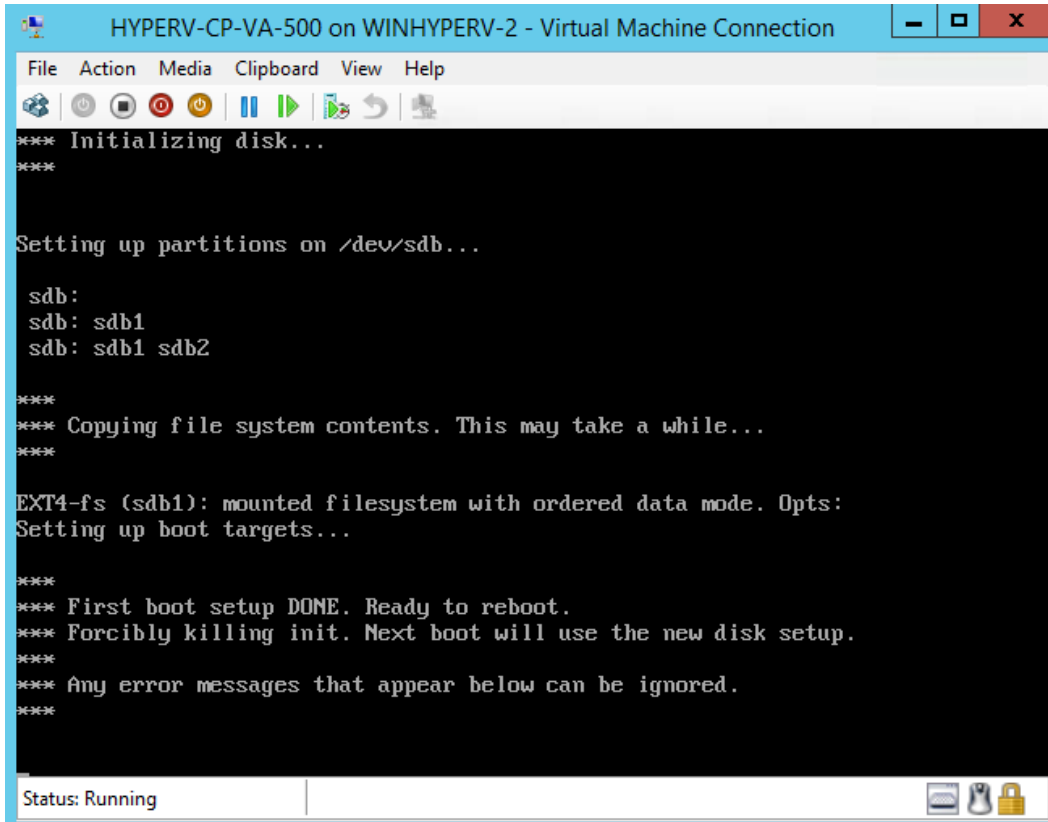
5. Click **Apply** in the main window, and then click **OK**.

Power On and Configure the VM

1. Power on the virtual machine. You should see the following in the console:

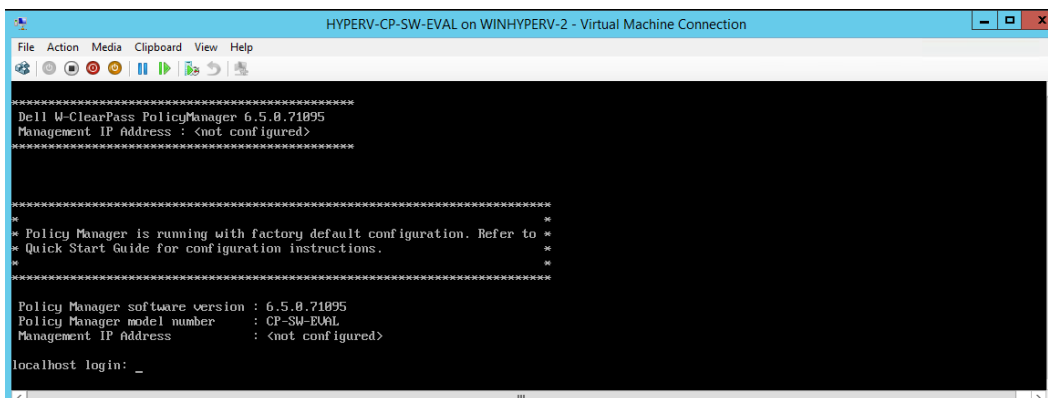


- Press **y**. The W-ClearPass Policy Manager 6.5.0 setup and installation begins. You should see the following in the console:



After that reboot the W-ClearPass VM is configured, and will power on and boot up within a couple of minutes. The whole process from Deploying the OVF image to the final startup screen should take between 30 and 40 minutes.

- After the W-ClearPass VM launches correctly, you should see the following banner on the VM console:



- When you see the banner on the virtual machine console, you can log in by following the instructions in the *W-ClearPass Policy Manager Quick Start Guide*.

Morphing a Hyper-V Evaluation Version

A Hyper-V evaluation version can be morphed to a production VM by using the `morph-vm` command as follows:

- Power off the VM.
- Open **Settings** and make the following modifications:

- a. Modify the **CPU** and **RAM** to match the production VM.
- b. Add an additional disk with the recommended disk size for the production VM:
 - (1) Select **IDE1 Controller**.
 - (2) Select the **Hard Drive** option and then click **Add**.
 - (3) In the next screen, specify the following values:
Controller = **IDE Controller 1**
Location = **1**
 - (4) In the **Media** section, click **New**.
 - (5) Add a new **VHDX** hard disk of **Fixed size**, and size equivalent to the production VM disk size.
3. After adding the hard disk, power on the evaluation VM and, using SSH, log in to it as **appadmin**.
4. Run the command `'system morph-vm <CP-VA-500/CP-VA-5K/CP-VA-25K>` and follow the prompts.

Caveats, Hyper-V

This section describes caveats to be aware of with Hyper-V.

Low Network Performance on Hyper-V Due to NIC Cards

In lab conditions, we noticed that the network latency increases and throughput decreases due to certain features in the NIC not working as expected. This affects network throughput to any OS installed on a Hyper-V server.

In W-ClearPass, we have noticed the following symptoms when the server is handling authentications:

- Drastic increase in network latency to external servers
- Increase in RADIUS timeout packets
- Increase in RADIUS end-to-end processing of authentication requests

If you notice these symptoms with your W-ClearPass server running on Hyper-V, please consult with the NIC vendor about compatibility issues with the Microsoft Hyper-V platform, or update to the latest driver version which might resolve network throughput problems.