Cisco MSE Virtual Appliance Installation and Configuration Guide

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CONTENTS

Preface

This preface contains the following sections:

- Audience
- Document Conventions
- Related Documentation
- Obtaining Documentation and Submitting a Service Request

Audience

This publication is for experienced network administrators who plan to install the Cisco MSE virtual appliance. This guide also describes the system requirements for the Cisco MSE virtual appliance.

Document Conventions

This document uses the following conventions:

Table 1   Conventions

Convention	Indication
bold font	Commands and keywords and user-entered text appear in **bold** font.
italic font	Document titles, new or emphasized terms, and arguments for which you supply values are in *italic* font.
[ ]	Elements in square brackets are optional.
{x | y | z}	Required alternative keywords are grouped in braced and separated by vertical bars.
[x | y | z}	Optional alternative keywords are grouped in braced and separated by vertical bars.
string	A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.
`courier` font	Terminal sessions and information the system displays appear in `courier` font
<>	Nonprinting characters such as passwords are in angle brackets.

Table 1   Conventions

Convention	Indication
[ ]	Default responses to system prompts are in square brackets.
!, #	An exclamation point (!) or a pound sign (#) at the beginning of a line of code indicates a comment line.

Note   Means reader take note.

Tip   Means the following information will help you solve a problem.

Caution   Means reader be careful. In this situation, you might do something that can result in equipment damage or loss of data.

Warning   This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. (To see translations of the warnings that appear in this publication, refer to the appendix "Translated Safety Warnings.")

Related Documentation

For more information about the Mobility Services Engine and related products, see the following URL:
http://www.cisco.com/c/en/us/support/wireless/mobility-services-engine/tsd-products-support-series-home.html

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, submitting a service request, and gathering additional information, see the monthly *What's New in Cisco Product Documentation*, that also lists all new and revised Cisco technical documentation, at:

http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html

Subscribe to the *What's New in Cisco Product Documentation* as an RSS feed and set content to be delivered directly to your desktop using a reader application. The RSS feeds are a free service. Cisco currently supports RSS Version 2.0.

Cisco MSE Virtual Appliance Overview

Overview

The Cisco Mobility Services Engine (MSE) is offered as a virtual appliance, to support lower-end, standard, and high end deployments.

The following are the MSE virtual appliance standard templates:

- Open Virtualization Format (OVF) for VMware
- Virtual Hard Disk (VHD) for Microsoft Hyper-V
- Open Virtualization Format (OVF) for Citrix XenServer

Cisco MSE Virtual Appliance Reference Hardware Configurations

Table 1-1 lists the available MSE virtual appliance reference hardware configurations.

Table 1-1 Reference Hardware Configurations

	MSE Low-End Virtual Appliance	**MSE Standard Virtual Appliance**	**MSE High-End Virtual Appliance**
Processor	UCS-CPU-E5-2609 (qty 1)	UCS-CPU-E5-2660 (qty 1)	UCS-CPU-E5-2660 (qty 2)
RAM	UCS-MR-1X082RX-A (qty 1) - 8 GB	UCS-MR-1X082RX-A (qty 2) - 16 GB	UCS-MR-1X041RX-A (qty 4) - 24 GB
Disk	UCS-HDD300GI2F208 (qty 2, in RAID 1 configuration)	UCS-HDD300GI2F208 (qty 4, in RAID 10 configuration)	UCS-HDD300GI2F208 (qty 4, in RAID 10 configuration)
RAID	UCS-RAID-9266CV	UCS-RAID-9266CV	UCS-RAID-9266CV

Table 1-2 lists example Cisco Unified Computing System™ (Cisco UCS) configurations that match the minimum requirements.

Table 1-2   Example Cisco UCS Configurations that Match the Minimum Requirements

MSE Low-End Virtual Appliance	MSE Standard Virtual Appliance	MSE High-End Virtual Appliance
UCSC-C240-M3L UCS C240 M3 LFF w/o CPU, memory, HD, PCIe, PSU w/rail kit, expdr	**UCSC-C240-M3L** UCS C240 M3 LFF w/o CPU, memory, HD, PCIe, PSU w/rail kit, expdr	**UCSC-C240-M3L** UCS C240 M3 LFF w/o CPU, memory, HD, PCIe, PSU w/rail kit, expdr
UCS-CPU-E5-2609 2.4 GHz E5-2609/80W 4C/10MB Cache/DDR3 1066MHz	**UCS-CPU-E5-2660** 2.20 GHz E5-2660/95W 8C/20MB Cache/DDR3 1600MHz	**UCS-CPU-E5-2660** 2.20 GHz E5-2660/95W 8C/20MB Cache/DDR3 1600MHz
UCS-MR-1X082RX-A 8GB DDR3-1333-MHz RDIMM/PC3-10600/2R/1.35v	**UCS-MR-1X082RX-A** 8GB DDR3-1333-MHz RDIMM/PC3?10600/2R/1.35v	**UCS-MR-1X041RX-A** 4GB DDR3-1333-MHz RDIMM/PC3?10600/1R/1.35v
UCS-HDD300GI2F208 300GB SAS 15K RPM 3.5 inch HDD/hot plug/drive sled mounted	**UCS-HDD300GI2F208** 300GB SAS 15K RPM 3.5 inch HDD/hot plug/drive sled mounted	**UCS-HDD300GI2F208** 300GB SAS 15K RPM 3.5 inch HDD/hot plug/drive sled mounted
UCS-RAID-9266CV MegaRAID 9266CV-8i w/TFM + Super Cap	**UCS-RAID-9266CV** MegaRAID 9266CV-8i w/TFM + Super Cap	**UCS-RAID-9266CV** MegaRAID 9266CV-8i w/TFM + Super Cap
UCSC-PSU-650W 650W power supply for C-Series rack servers	**UCSC-PSU-650W** 650W power supply for C-Series rack servers	**UCSC-PSU-650W** 650W power supply for C-Series rack servers
R2XX-DMYMPWRCORD No power cord option	**R2XX-DMYMPWRCORD** No power cord option	R2XX-DMYMPWRCORD No power cord option

Resource Management

Resource management depends on the license that you want to deploy. Table 1-3 lists the different levels at which you can configure the virtual appliance.

Table 1-3   Virtual Machine Sizing Chart

Primary MSE	Resources		Supported License (Individually)		
Virtual Appliance Level	Total Memory	Virtual CPUs	Base License (APs)	CMX License (APs)	wIPS License (APs)
Low End	8G	4	200	Not supported	2000
Standard	16G	8	2500	2500	6000
High End	24G	16	5000	5000	8000

CHAPTER **2**

Cisco MSE Virtual Appliance Licensing

The Cisco MSE Virtual Appliance is downloaded from the Software Center on Cisco.com at http://software.cisco.com/download/navigator.html. Each MSE virtual appliance instance requires an MSE Virtual Appliance Activation license (L-MSE-7.0-K9). Without an activation license, the Mobility Services Engine (MSE) starts in evaluation mode that is valid for 120 days. Even if service licenses are present on the host, it rejects them if the activation license is not installed. The evaluation licenses are limited by the AP count and the end device count. Contact the Cisco sales team for additional evaluation licenses.

You must activate the virtual appliance using a virtual appliance activation license. You can get the Unique Device Identifier (UDI) from the virtual appliance (run **show udi** on the appliance) or from the MSE General Properties page in the Prime Infrastructure UI. Use this information to purchase the virtual appliance activation license and permanent service licenses.

You can add a virtual appliance license to the Prime Infrastructure using the following options:

- Using the Add Mobility Service Engine page when you are installing MSE for the first time. See *Configuring MSE on the Prime Infrastructure, page 3-21* for more information.
- Using the License Center page. See the *Connected Mobile Experiences Configuration Guide*, *Release 8.0* for more information on adding a license file to the MSE.

Adding a License File by Using the License Center

To add a license to the Cisco MSE Virtual Appliance, follow these steps:

Step 1 Install the MSE Virtual Appliance. For more information, see the Downloading the Cisco MSE Virtual Appliance OVA File.

Step 2 Add the MSE to the Prime Infrastructure. For more information, see the http://www.cisco.com/c/en/us/td/docs/wireless/mse/7-6/MSE_CAS/7_6_MSE_CAS/7_4_MSE_CAS_chapter_010.html#ID136.

Step 3 Choose **Administration** > **License Center** in the Prime Infrastructure UI to access the License Center page.

Step 4 Choose **Files** > **MSE Files** from the left sidebar menu.

Step 5 Click **Add** to add a license.

The Add A License File dialog box appears.

Step 6   Select the MSE from the MSE Name drop-down list.

Step 7   Click **Choose File** to browse to the activation license file.

Step 8   Click **OK**.

Once you submit, the license is activated and license information appears in the License Center page.

This image shows recent changes to the License Center UI for the virtual appliance.

C H A P T E R **3**

Installing the Cisco MSE Virtual Appliance on the VMware Virtual Machine

This chapter describes how to install the Cisco Mobility Services Engine (MSE) Open Virtual Appliance (OVA) components and includes the following sections:

- Information About the Cisco MSE OVA, page 3-1
- Virtualization Concepts, page 3-1
- Overview of the Process for Installing the Cisco MSE Virtual Appliance on the VMware Virtual Machine, page 3-2

Information About the Cisco MSE OVA

An Open Virtual Appliance (OVA) is a prebuilt software solution that comprises one or more virtual machines (VMs) that are packaged, maintained, updated, and managed as a single unit.

The following versions of Cisco MSE OVA are available:

- MSE virtual appliance OVA with 250GB+ disk space for low end vMSE.
- MSE virtual appliance OVA with 500GB+ disk space for standard and high end vMSE.

Virtualization Concepts

Refer to these documents for information on virtualization:

- https://www.vmware.com/pdfvirtualization.pdf
- Virtualization Basics
- Setting Up ESXi

Overview of the Process for Installing the Cisco MSE Virtual Appliance on the VMware Virtual Machine

Table 3-1 describes the steps to be followed while deploying the Cisco Mobility Services Engine (MSE) virtual appliance.

Table 3-1   MSE Virtual Appliance Installation Workflow

Process	Description
1. Verify the requirements and prepare for Cisco MSE VA installation.	See the Verifying Prerequisites, page 3-2 for more information.
2. Download the Cisco MSE VA OVA file from Cisco.com.	See the Downloading the Cisco MSE Virtual Appliance OVA File, page 3-3 for more information.
3. Setting up the high end Virtual Appliance.	See the Setting up the High End Virtual Appliance, page 3-3 for more information.
4. Deploy the OVA as an OVF template. A step-by-step template in the VSphere Client guides you through this process. After you have completed the step-by-step template, you can review all of the information that you provided, make any corrections, and then deploy the OVA.	See the Deploying the Cisco MSE OVA File as an OVF Template, page 3-5 for more information.
5. Configure the basic settings.	See the Configuring the Basic Settings to Start the MSE Virtual Appliance VM, page 3-12 for more information.
6. Configure the MSE on Prime Infrastructure.	See the Configuring MSE on the Prime Infrastructure, page 3-21 for more information.
7. Synchronize the network design and tracking parameters.	See Synchronizing the Network Designs, page 3-24 for more information.

Verifying Prerequisites

Before installing the Mobility Services Engine (MSE) in a virtual machine, you must ensure the following:

- Latest version of VMware ESX/ESXi is installed and configured on the machine you plan to use as the MSE server host. See the VMware documentation for information on setting up and configuring your host machine.

- The installed VMware ESXi host is reachable.

- You can use the latest version of vSphere Client to manage the small deployments.

- Latest version of vCenter Server is installed on a Windows host in order to manage the ESXi hosts.

Downloading the Cisco MSE Virtual Appliance OVA File

The Mobility Services Engine (MSE) Open Virtualization Archive (OVA) is saved to the same machine where your vSphere Client or vCenter server is installed.

To download the.ova file, follow these steps:

Step 1 Access the Cisco MSE Virtual Appliance image at the following location: http://software.cisco.com/download/navigator.html.

Step 2 In the **Product/Technology Support** section, choose **Download Software**.

Step 3 In the **Select a Product** section, navigate to the Wireless software by choosing **Products** > **Wireless** > **Mobility Services** > **Cisco Mobility Services Engine Virtual Appliance**.

A list of the latest release software for Cisco Mobility Services Engine Virtual Appliance is available for download.

Step 4 In the **Latest** list, choose 7.6.100.0 or the latest 7.6 Release version to download.

Step 5 You can select any of the following ova files to download:

- **MSE-VA-8-0-x-x.ova**—Use this file to deploy MSE on a medium and high end VMware ESXi machine. This OVA is configured by default for the standard appliance. You need to make some modifications for OVA to work as high end appliance. See Setting up the High End Virtual Appliance for more information.

- **MSE-VA-8-0-x-x-LowEnd.ova**—Use this file to deploy MSE on a low end VMware ESXi machine.

Step 6 Save the installer to your computer in a place that will be easy to find when you start to deploy the OVF template.

Setting up the High End Virtual Appliance

Use the `MSE-VA-8-0-x-x.ova` file to deploy both the medium and high end virtual appliance.

To setup the installed standard ova as high end ova, follow these steps:

Step 1 Follow the steps given in Deploying the Cisco MSE OVA File as an OVF Template to deploy the OVA file.

Step 2 You must upgrade the virtual hardware on the latest ESXi server while the Virtual Machine (VM) is powered off before increasing the CPU count. To assign more than 8 cores to the Virtual Appliance, you need to upgrade the virtual hardware. See Figure 3-1.

Figure 3-1   Upgrade Virtual Hardware
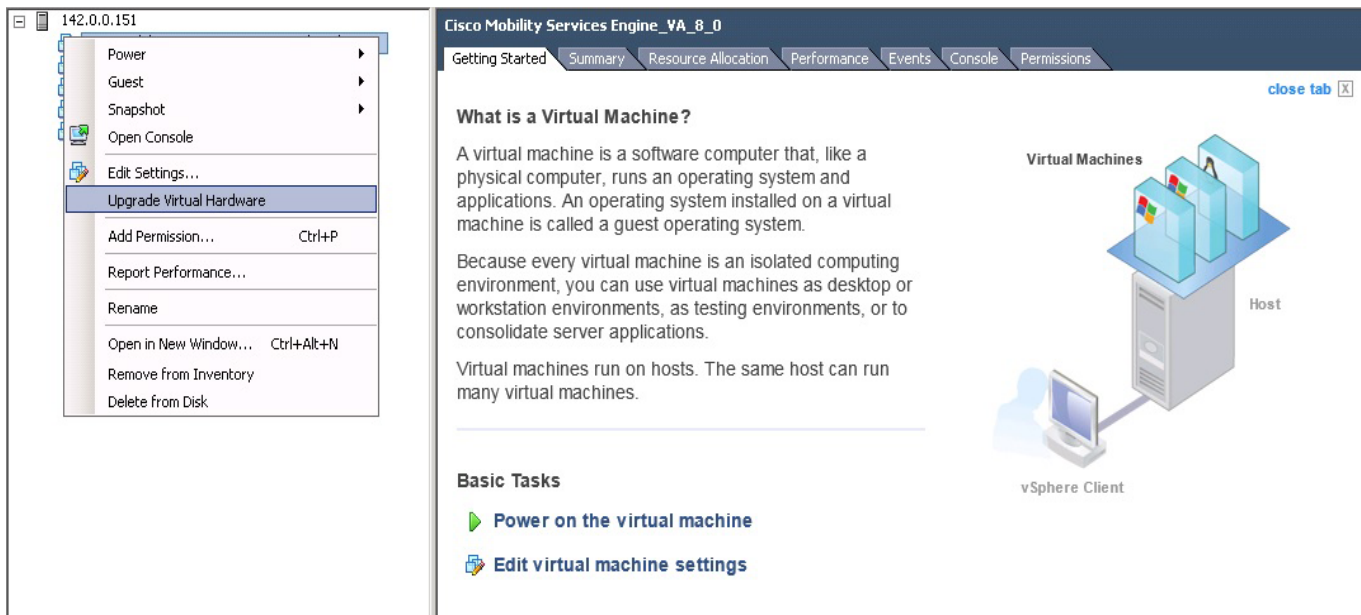
Step 3   Edit the memory allocation and ensure that proper resources are assigned. See Table 3-2.

Note   These levels are configurable on the virtual appliance and corresponding requirements. Allocate dedicated cores to the appliance and not hyper threaded virtual cores. The performance is affected if you assume host has more virtual cores and deploy more appliances.

Table 3-2   Configuring Virtual Appliance Levels

Primary MSE	Resources		Supported License (Individually)	
Virtual Appliance Level	Total Memory	CPU	CAS License (APs)	wIPS License (APs)
Level 2	8G	4	200	2000
Level 3	16G	8	2500	6000
Level 4	24G	16	5000	10000

Deploying the Cisco MSE OVA File as an OVF Template

The Mobility Services Engine (MSE) virtual appliance is distributed as n Open Virtualization Archive (OVA) file. The OVA is a single file distribution of an OVF package as an TAR format. After you download the OVA file, you will deploy the Open Virtualization Format (OVF) template from the vSphere Client application.

> **Note**   Make sure that all of the system requirements are met before you deploy the OVA. Review the Verifying Prerequisites, page 3-2.

> **Note**   After a fresh OVA deployment, you must reboot the Virtual Machine (VM) once.

Step 1   Open the VMware VSphere Client application on your desktop.

Step 2   Log in to your VSphere Client or VCenter Server (see Figure 3-2).

Figure 3-2   VMware VSphere Client
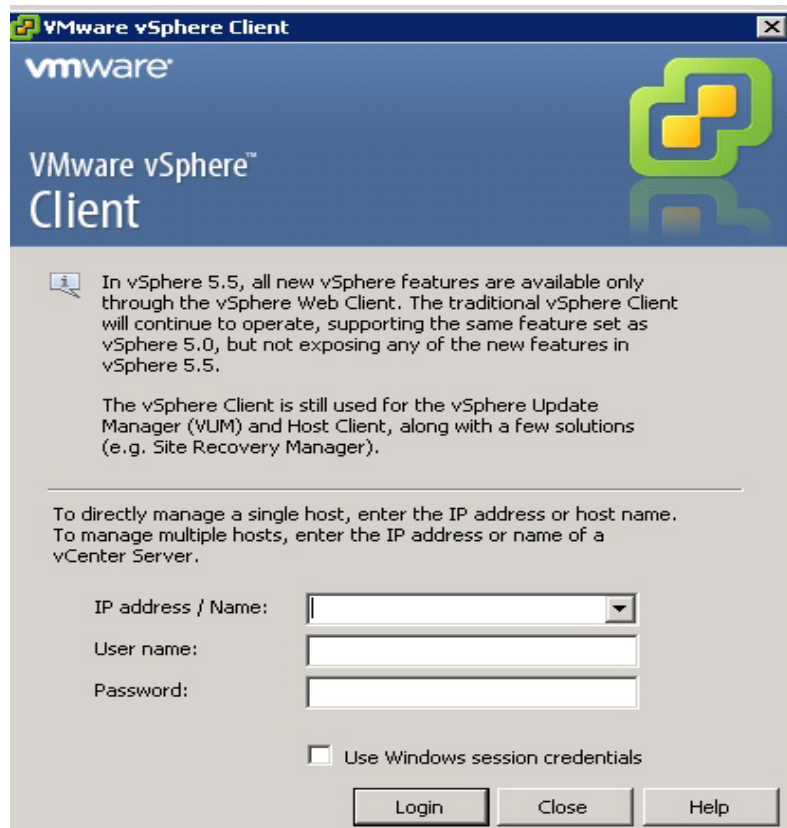
Step 3   Use the vSphere Client to access the OVF template:

    a.   Choose **Home** > **Inventory** > **Hosts and Clusters**.

    b.   Choose the host on which the OVF template will be deployed.

    c.   Choose **File** > **Deploy OVF Template** from VSphere toolbar bar.

       The Deploy OVF Template dialog box appears (see Figure 3-3).

Figure 3-3   Deploy OVF Template
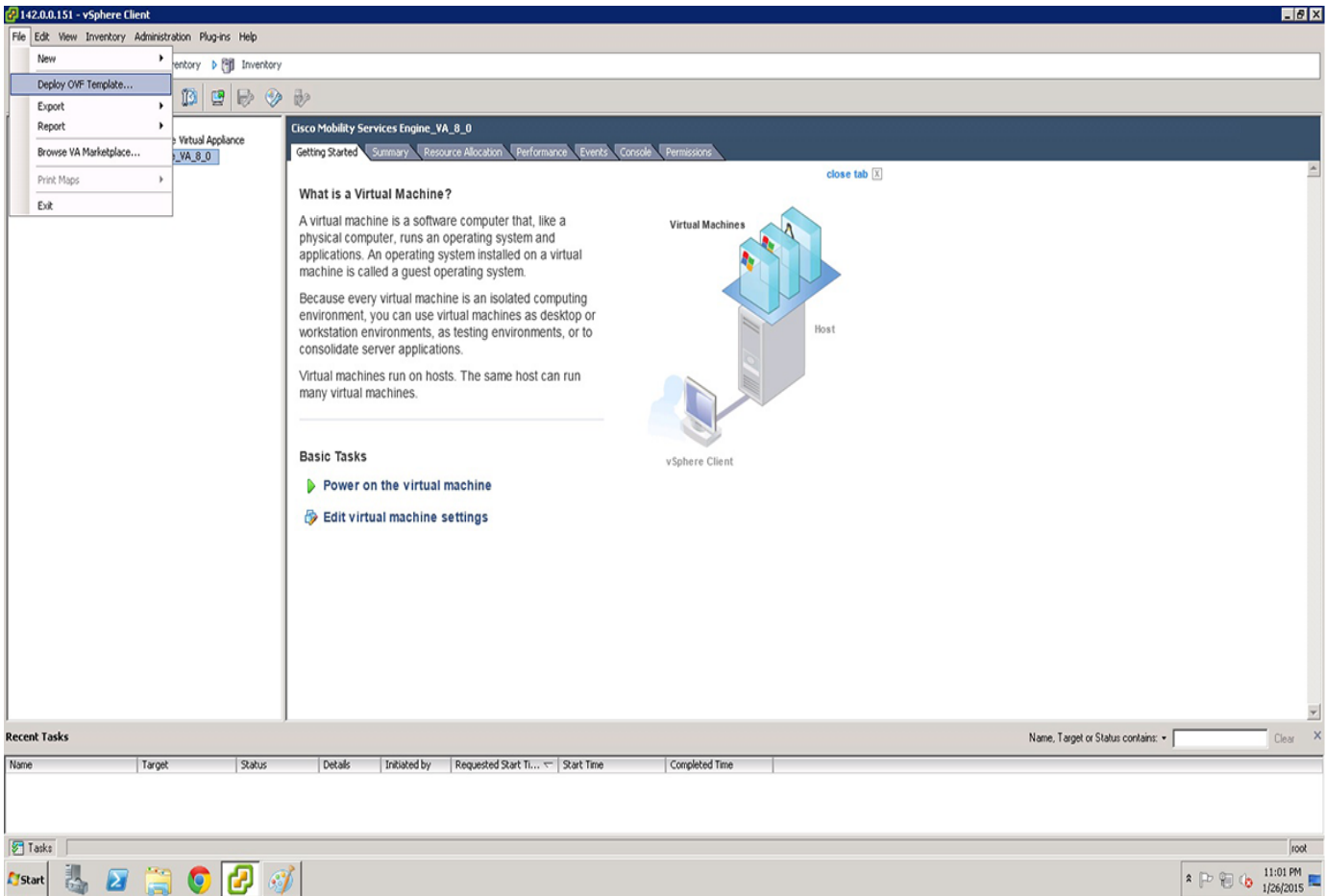
Step 4   Choose the Source location (see Figure 3-4).

      a. Click **Browse**. The Open dialog box opens.

      b. From the Open dialog box, locate the appropriate .ova file that you downloaded to your computer and click **Open**.

Figure 3-4   *Deploy From a File or URL*
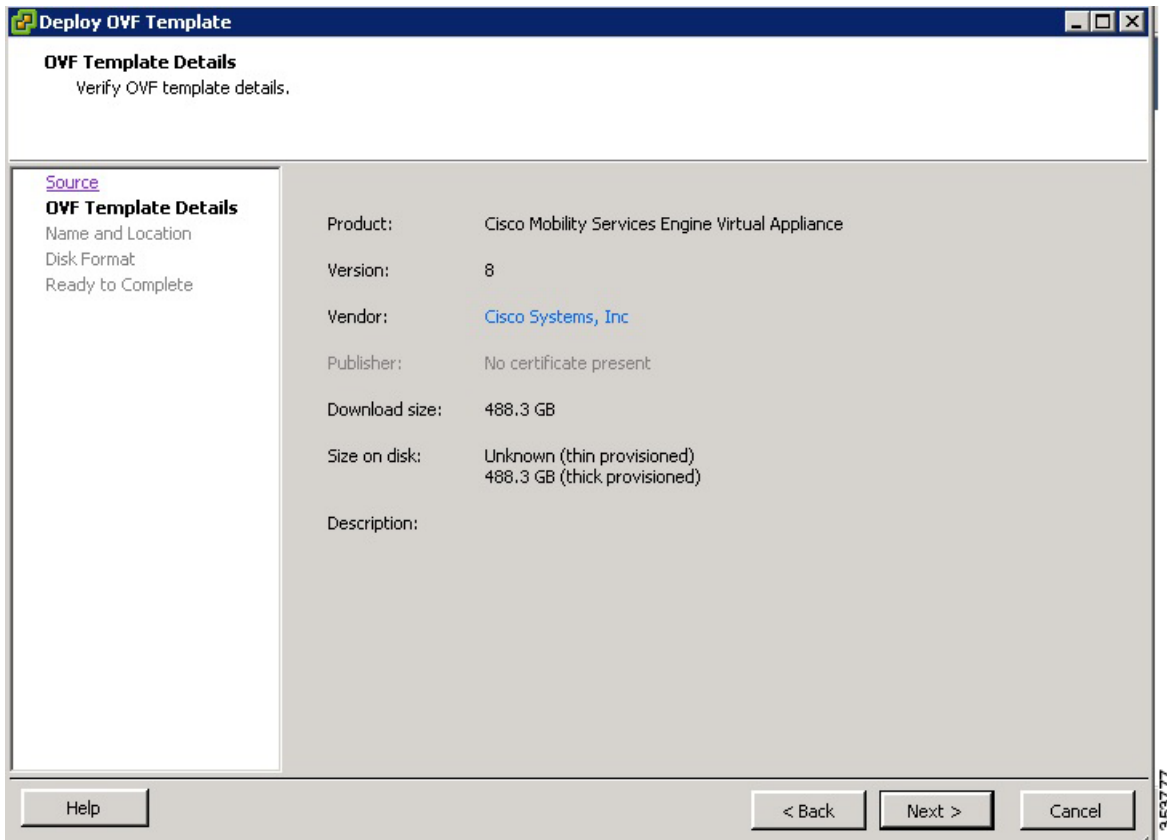
Step 5   Click **Next**.

The OVF template details window appears (see Figure 3-5).

Step 6   Review the OVF template details. Some of the details about the Cisco MSE virtual appliance include:

- Version number
- Download size
- Size on disk
  - Thin provision for the amount of disk space consumed by the virtual appliance immediately after deployment. It is the minimum amount of disk space needed to deploy the virtual appliance.
  - Thick provision for the maximum amount of disk space the virtual appliance can consume.

Note   For more information on thick and thin provision, see "Step 10" task.

Figure 3-5   *Review OVF Template Details*
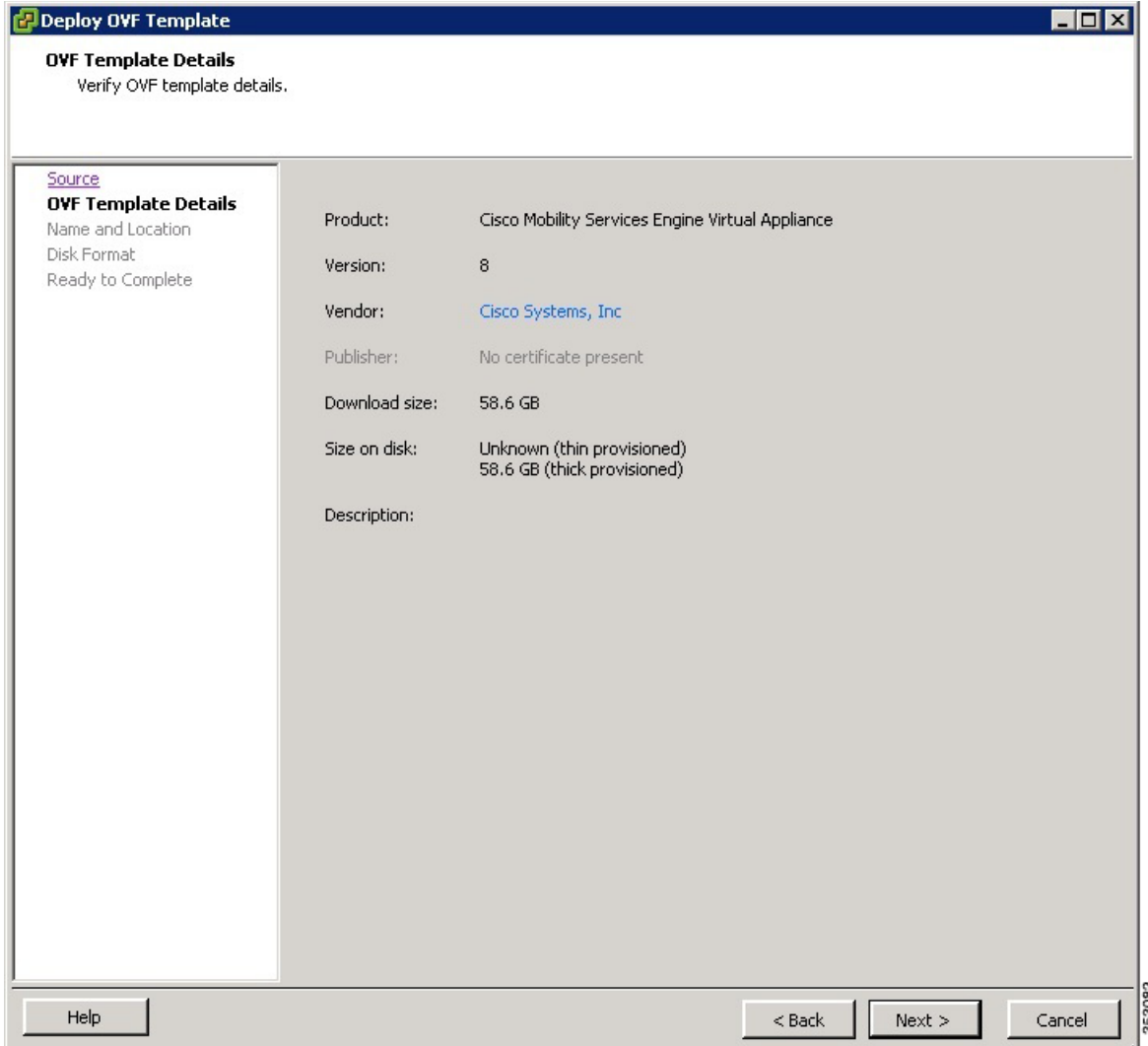
Step 7   Click **Next**. The Name and Location window appears (see Figure 3-6).

Step 8   In the Name field, enter a template name for the new virtual appliance. If you are using the vCenter to manage the virtual machine, then you will have the option of selecting the location of the inventory.

Figure 3-6   Name and Location Window
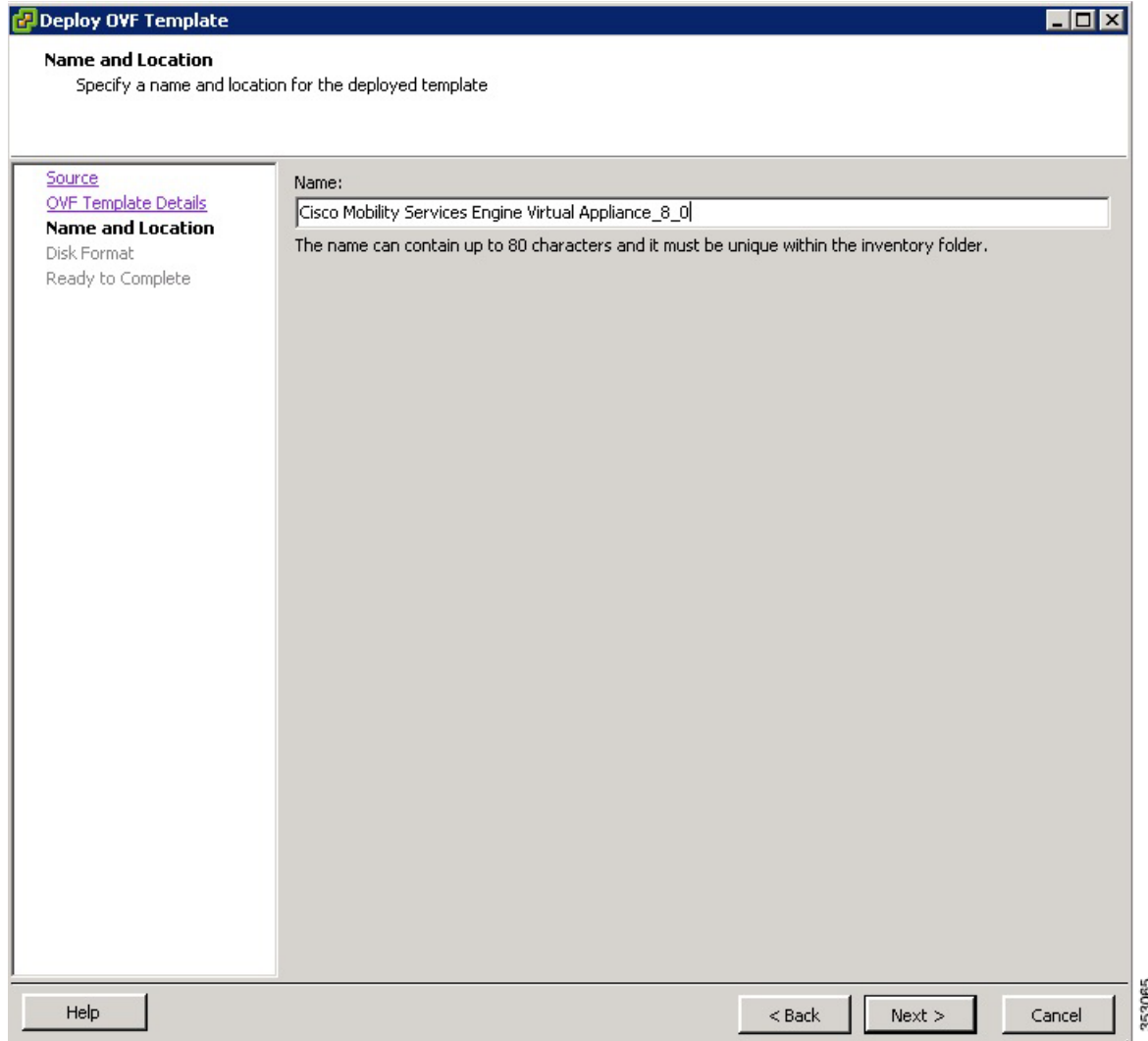
Step 9   Click **Next**. The Disk Format window appears.

Step 10   Choose the disk format:

- Choose one of the thick provision types if you have enough storage capacity as required by the virtual appliance and want to set a specific allocation of space for the virtual disk.

  – **Thick Provision Lazy Zeroed**—The space that is required for the virtual disk is allocated when the virtual disk is created. The data that remains on the physical device is not erased when the virtual disk is created but is zeroed out on demand at a later time on first write from the virtual disk.

  – **Thick Provision Eager Zeroed**—The space that is required for the virtual disk is allocated when the virtual disk is create. Unlike the Lazy Zeroed option, the data that remains on the physical device is erased when the virtual disk is created.

- **Thin Provision**—Unlike with the thick format, space required for the virtual disk is not allocated during creation, but is supplied, zeroed out, on demand at a later time.

Step 11   Click **Next**. The Network Mapping window appears.

Step 12   For each network specified in the OVF template, select a network by right-clicking the Destination Network column in your infrastructure to set up the network mapping.

Step 13   Click **Next**.

The Ready to Complete window appears (see Figure 3-7).

Step 14   Review each of the deployment settings that you have established (see Figure 3-7).

Figure 3-7   Ready to Complete Window
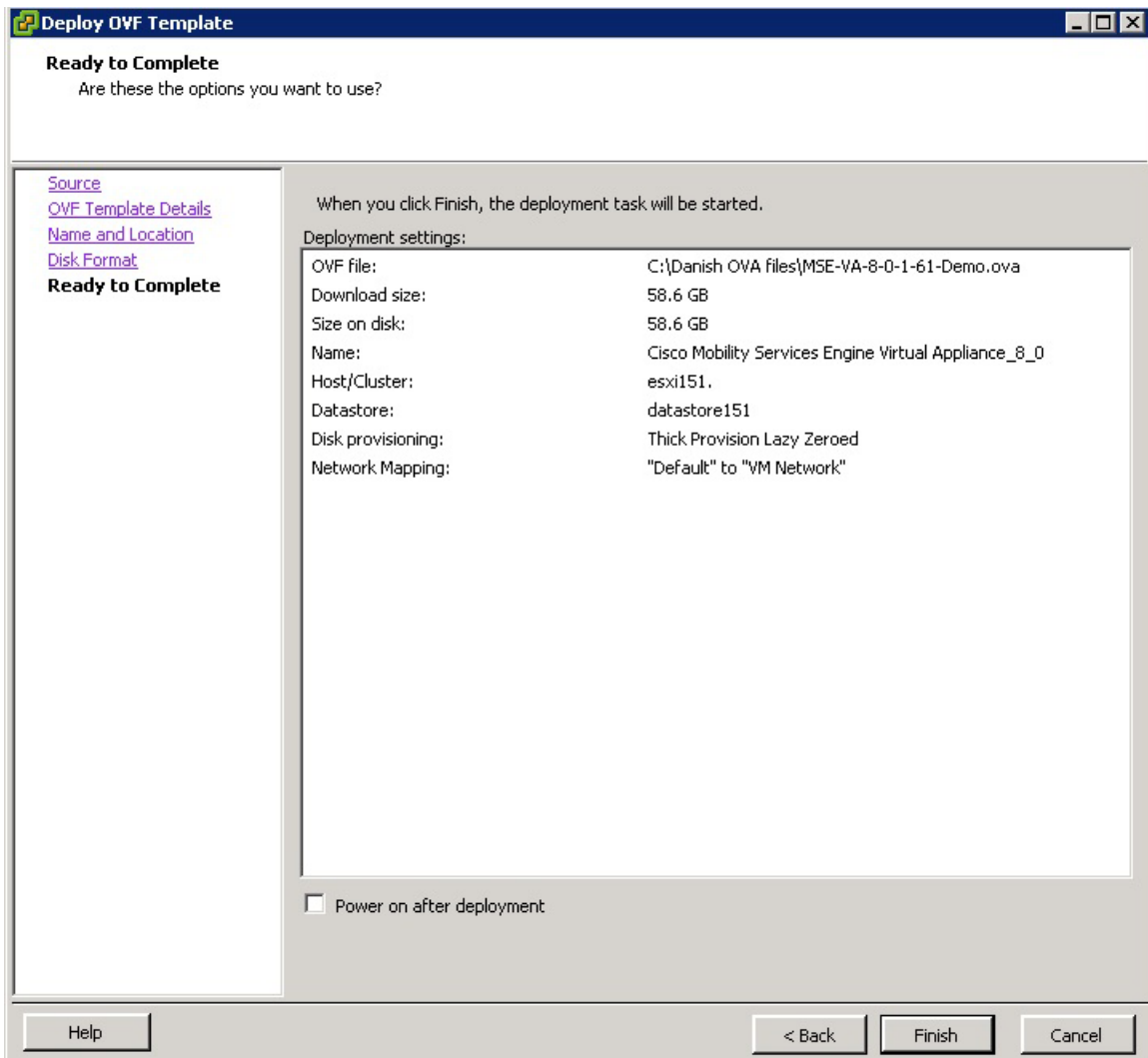
Step 15 Press **Back** to make any changes to the settings and click **Finish** to complete the deployment.

A progress bar keeps pace with your Cisco MSE virtual appliance deployment, which can take from 5 to 10 minutes to finish depending on the network latency (see Figure 3-8). When the deployment is finished, the Deployment Completed Successfully dialog box opens.

Figure 3-8   ***Deploying Dialog Box***
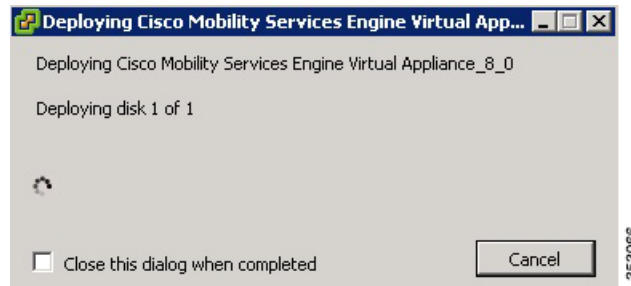
Step 16 Click **Close** to dismiss the dialog box.

Figure 3-9   ***Deployment Completed Successfully Dialog Box***

Step 17 On the Summary tab in the VSphere Client, review the information about the Virtual Machine.

Step 18 The virtual appliance that you deployed is listed under the host, in the left pane of the VSphere Client.

Step 19 Edit the MSE virtual appliance template to map the management and data interfaces network interfaces to the desired configuration before powering up the MSE virtual appliance.

Step 20 Proceed with installing and configuring the MSE. See Configuring the Basic Settings to Start the MSE Virtual Appliance VM, page 3-12 for more information.

Configuring the Basic Settings to Start the MSE Virtual Appliance VM

You have completed deploying the Mobility Services Engine (MSE) virtual appliance on a new virtual machine. A node for the virtual machine now appears in the resource tree in the VMware VSphere Client window. After deployment, you need to configure basic settings for the MSE virtual appliance.

To start the MSE setup, follow these steps:

Step 1   In the VSphere Client, click the **MSE virtual appliance** node in the resource tree. The virtual machine node should appear in the Hosts and Clusters tree below the host, cluster, or resource pool to which you deployed the MSE virtual appliance.

Step 2   If you have not powered on the virtual machine while deploying the OVA file, then right-click on the virtual appliance that is listed in the left pane of the VSphere Client, and choose **Power > Power on**.

The Recent Tasks window at the bottom of the VSphere Client pane indicates the status of the task associated with powering on the virtual machine. After the virtual machine successfully starts, the status column for the task shows Completed.

Step 3   Click the **Console** tab, within the console pane to make the console prompt active for keyboard input. The VM starts booting.

Step 4   Press **Enter** for the login prompt to appear to initiate the MSE Installation Wizard. The following is displayed:

> **Note**   The installation process takes approximately 45 minutes to complete.

```
------------------------------------------------------------------
Cisco Mobility Service Engine
mse login: root
Password: password

Running the Cisco Mobility Services Engine installer. It may take several minutes to
complete.
CISCO-MSE-L-K9-8-0-x-x-64bit.bin
MSE_PUB.pem
signhash.bin
Preparing to install...
Extracting the JRE from the installer archive...
Unpacking the JRE...
Extracting the installation resources from the installer archive...
Configuring the installer for this system's environment...

Launching installer...

Preparing SILENT Mode Installation...


================================================================
Cisco Mobility Services Engine (created with InstallAnywhere by Macrovision)
------------------------------------------------------------------
Auto Startup
------------
```

The Cisco MSE is configured to startup automatically at system boot up. You can modify
this setting using setup.shafter installation is completed.

```
==================================================================
Installing...
-------------
[================|================|================|============]
[----------------|----------------|----------------|------------]


====================================================================
Database Installation
--------------------

The installer will now install the database. This may take a long time (up to 30 minutes).
Do not cancel the installer during this setup.

Installing Database files

Step 1/3 - Installing Database files
Step 1/3 Completed
Step 2/3 - Configuring Database
Step 2/3 Completed
Step 3/3 - Updating patches

Step 3/3 Completed
Installation of database completed


====================================================================
--------------------------------------------------------------------]


Starting Health Monitor, Waiting to check the status
Health Monitor successfully started
Starting Admin process...
Started Admin process...
Starting database .....
Database started successfully. Starting framework and services .......
```

> **Note**   After the initial installation, you are logged off the newly created VM and you must login to the
> console panel again.

Step 5   The MSE virtual machine shuts down and reboots.

```
GRUB Loading stage2...
Press any key to continue.
Press any key to continue.
```

Step 6   Configure the MSE.

```
[Login as root and password]
-------------------------------------------------------------
Cisco Mobility Services Engine

mse login: root
password: password
Last login: Mon Apr 7 04:11:50 on tty1
```

[Configuration starts as soon as you log in]

```
Would you like to setup initial parameters using menu options (yes/no) [yes]:
```

[Press Enter to use the default values (yes) to use the Menu options]

```
Please select a configuration option below and enter the
requested information. You may exit setup at any time by
typing <Ctrl+C>.

You will be prompted to choose whether you wish to configure a
parameter, skip it, or reset it to its initial default value.
Skipping a parameter will leave it unchanged from its current
value.

Please note that the following parameters are mandatory and must be configured at lease
once.
        -> Hostname
        -> Network interface eth0
        -> Timezone settings
        -> Root password
        -> NTP settings
        -> Prime Infrastructure password

You must select option 24 to verify and apply any changes made during this session.
-------------------------------------------------------------

PRESS <ENTER> TO CONTIBNUE:


-------------------------------------------------------------

Configure MSE:


1) Hostname *                               13) Remote syslog setting
2) Network Interface eth0 settings *        14) Host access control settings
3) Timezone settings *                      15) Audit rules
4) Root password *                          16) Login banner
5) NTP settings *                           17) System console restrictions
6) Prime Infrastructure configuration       18) SSH root access
7) Display current configuration            19) Single user password check
8) Domain                                   20) Login and password settings
9) High availability role                   21) GRUB password
10) Network interface eth1 settings         22) Root access control
11) DNS settings                            23) Auto start MSE on system boot up
12) Future restart time                     24) ## Verify and apply changes ##
```

✎
Note It is highly recommended that all relevant items be configured during initial setup to ensure optimum operation of the mobility services engine in your network. The hostname and either the Ethernet-0 (eth0) or the Ethernet-1 (eth1) port must always be configured during the automatic installation.

✎
Note You can rerun the automatic installation script at any time to add or change parameters using this command:
`[root@mse]# /opt/mse/setup/setup.sh`.
There is no need to re-enter values that you do not want to change during one of these updates.

✎
Note If you do not want to configure an item, enter **skip** and you are prompted for the next configuration step. Any setting skipped is retained and not modified.

✎
Note Minimal configuration is done for the mobility services engine as part of installation using the console. All configurations beyond the initial setup using the automatic installation is done with the Cisco Prime Infrastructure.

Step 7 Configure the hostname.

```
Please enter your choice [1 - 24]: 1

Current Hostname=[mse]
Configure Hostname?  (Y)es/(S)kip/(U)se default [Skip]: y
The host name should be a unique name that can identify
the device on the network. The hostname should start with
a letter, end with a letter or number, and contain only
letters, numbers, and dashes.

Enter a Host name [mse]:
```

Step 8 Configure eth0 network settings.

```
Please enter your choice [1 - 24]: 2

Current eth0 interface IP address=[10.0.0.1]
Current eth0 interface netmask=[255.0.0.0]
Current IPv4 gateway address=[172.20.104.123]
Configure eth0 interface parameters? (Y)es/(S)kip/(U)se default [Skip]:y

Enter an IP address for first ethernet interface of this machine.

Enter eth0 IP address  [10.0.0.2]:

Enter the network mask for IP address 172.21.105.126

Enter network mask [255.255.255.224]:

Enter the default gateway address for this machine.

Note that the default gateway must be reachable from
the first ethernet interface.

Enter default gateway address [172.20.104.123]:
```

Cisco MSE Virtual Appliance Installation and Configuration Guide ■

Step 9   Configure the DNS Settings.

```
Please enter your choice [1 - 24]: 11

Domain Name Service (DNS) Setup

Enable DNS (yes/no) [no]: y
Default DNS server 1=[8.8.8.8]
Enter primary DNS server IP address:
DNS server address must be in the form #.#.#.#, where # is 0 to 255 or hexadecimal :
separated v6 address

Enter primary DNS server IP address [8.8.8.8]:
Enter backup DNS server IP address (or none) [none]:
```

Step 10   Configure the Timezone settings.

> ✎
>
> **Note**   If your wIPS deployment consists of a Cisco MSE and other devices (such as Cisco WLCs and access points), set the Cisco MSE and the other devices to the same time zone.

```
Please enter your choice [1 - 24]: 3

Current Timezone=[America/New_York]
Configure Timezone? (Y)es/(S)kip/(U)se default [Skip]: y

Enter the current date and time.

Please identify a location so that time zone rules can be set correctly.
Please select a continent or ocean.
 1) Africa
 2) Americas
 3) Antarctica
 4) Arctic Ocean
 5) Asia
 6) Atlantic Ocean
 7) Australia
 8) Europe
 9) Indian Ocean
10) Pacific Ocean
11) UTC - I want to use Coordinated Universal Time.
#? 2
Please select a country.
 1) Anguilla              27) Honduras
 2) Antigua & Barbuda     28) Jamaica
 3) Argentina             29) Martinique
 4) Aruba                 30) Mexico
 5) Bahamas               31) Montserrat
 6) Barbados              32) Netherlands Antilles
 7) Belize                33) Nicaragua
 8) Bolivia               34) Panama
 9) Brazil                35) Paraguay
10) Canada                36) Peru
11) Cayman Islands        37) Puerto Rico
12) Chile                 38) St Barthelemy
13) Colombia              39) St Kitts & Nevis
14) Costa Rica            40) St Lucia
15) Cuba                  41) St Martin (French part)
16) Dominica              42) St Pierre & Miquelon
17) Dominican Republic    43) St Vincent
18) Ecuador               44) Suriname
19) El Salvador           45) Trinidad & Tobago
```

```
20) French Guiana            46) Turks & Caicos Is
21) Greenland                47) United States
22) Grenada                  48) Uruguay
23) Guadeloupe               49) Venezuela
24) Guatemala                50) Virgin Islands (UK)
25) Guyana                   51) Virgin Islands (US)
26) Haiti
#? 47
Please select one of the following time zone regions.
 1) Eastern Time
 2) Eastern Time - Michigan - most locations
 3) Eastern Time - Kentucky - Louisville area
 4) Eastern Time - Kentucky - Wayne County
 5) Eastern Time - Indiana - most locations
 6) Eastern Time - Indiana - Daviess, Dubois, Knox & Martin Counties
 7) Eastern Time - Indiana - Pulaski County
 8) Eastern Time - Indiana - Crawford County
 9) Eastern Time - Indiana - Pike County
10) Eastern Time - Indiana - Switzerland County
11) Central Time
12) Central Time - Indiana - Perry County
13) Central Time - Indiana - Starke County
14) Central Time - Michigan - Dickinson, Gogebic, Iron & Menominee Counties
15) Central Time - North Dakota - Oliver County
16) Central Time - North Dakota - Morton County (except Mandan area)
17) Mountain Time
18) Mountain Time - south Idaho & east Oregon
19) Mountain Time - Navajo
20) Mountain Standard Time - Arizona
21) Pacific Time
22) Alaska Time
23) Alaska Time - Alaska panhandle
24) Alaska Time - Alaska panhandle neck
25) Alaska Time - west Alaska
26) Aleutian Islands
27) Hawaii
#? 21

The following information has been given:

        United States
        Pacific Time

Therefore TZ='America/Los_Angeles' will be used.
Local time is now:     Sun Apr  6 18:45:27 PDT 2014.
Universal Time is now:  Mon Apr  7 01:45:27 UTC 2014.
Is the above information OK?
1) Yes
2) No
#? 1
```

Step 11   Configure the Root password.

> **Note**   If you do not set the root password, a warning message is displayed when you apply the settings.

```
Please enter your choice [1 - 24]: 4

Root password has not been configured
Configure root password? (Y)es/(S)kip/(U)se default [Skip]:
Changing password for user root.

You can now choose the new password.

A valid password should be a mix of upper and lower case letters, digits, and other
characters. You can use an 8 character long password with characters from all of these
classes. An upper case letter that begins the password and a digit that ends it do not
count towards the number of character classes used.

Enter new password:
```

Step 12   Configure the NTP Setup.

```
Please enter your choice [1 - 24]: 5

Network Time Protocol (NTP) Setup.

If you choose to enable NTP, the system time will be
configured from NTP servers that you select.  Otherwise,
you will be prompted to enter the current date and time.

NTP is currently disabled.
Configure NTP related parameters? (Y)es/(S)kip/(U)se default [Skip]: y

Enter whether or not you would like to set up the
Network Time Protocol (NTP) for this machine.

If you choose to enable NTP, the system time will be
configured from NTP servers that you select.  Otherwise,
you will be prompted to enter the current date and time.

Enable NTP (yes/no) [no]: y
Default NTP server 1=[time.nist.gov]
Enter NTP server name or address:
NTP server address must be in the form #.#.#.3, where # is 0 to 255 hexadecimal :
separated v6 address.
Enter NTP server name or [time.nist.gov]:
Enter another NTP server IP address (or none) [none]:
Configure NTP Authentication ? (Y)es/(S)kip/(U)se default [Skip]: y
Enter NTP Auth key Number [1]:
Enter NTP Auth key Value (String) [Secret]:
Do you want to continue (yes/no) [no]: y
```

Step 13   Configure the Prime Infrastructure password.

> ✎
>
> **Note**   If you do not set the password, a warning message appears when you apply the settings. The
> default PI communication password is *admin*.

```
Please enter your choice [1 - 24]: 6

Cisco Prime Infrastructure communication password has not been configured.
Configure Prime Infrastructure password? (Y)es/(S)kip/(U)se default [Yes]:

Enter a password for the admin user.
The admin user is used by the Prime Infrastructure and other northbound systems to
authenticate their SOAP/XML session with the server. Once this password is updated, it
must correspondingly be updated on the NCS page for MSE General Parameters so that the
Prime Infrastructure can communicate with the MSE.

Enter Prime Infrastructure password:
```

Step 14   Verify the setup information and apply the changes.

```
Please enter your choice [1 - 24]:      24

Please verify the following setup information.

---------------------------BEGIN---------------------------

    Hostname=mse8-0
    Eth0 IP address= , Eth0 network mask=255.255.254.0
    Time zone=America/Los_Angeles
    Enable DNS=yes, DNS servers=8.8.8.8
    Enable NTP=yes, NTP servers=time.nist.gov
    Time zone=America/Los_Angeles
    Root password is changed.
    Cisco Prime Infrastructure password is changed.

----------------------------END----------------------------

You may enter "yes" to proceed with configuration, "no" to make
more changes.


Configuration Changed
Is the above information correct (yes or no): yes

---------------------------------------------------------------
-----------
Checking mandatory configuration information...

Setup will now attempt to apply the configuration.

Restarting network services with new settings.
Shutting down interface eth0:

The system is minimally configured right now. It is strongly recommended that you run the
setup script under /opt/mse/setup/setup.sh command to configure all appliance related
parameters immediately after installation is complete.
```

```
PRESS <ENTER> TO EXIT THE INSTALLER:
[root@mse8-0 installers]# reboot
Stopping MSE Platform

Flushing firewall rules:                                    [OK]
Setting chains to policy ACCEPT: nat filter                 [OK]
Unloading iptables modules:                                 [ok]

Broadcast message from root (pts/0) (Tue Apr29 14:15:27:2014):

The system is going down for reboot NOW:
```

> ✎
>
> **Note**   The next time you log in using root, only the Linux shell prompt appears and not the setup script.
> You can rerun the setup script at any time to change settings by logging in as *root* and running
> **/opt/mse/setup/setup.sh**.

Step 15   Log in and configure the MSE to automatically launch after boot up.

```
Cisco Mobility Service Engine
mse8-0 login:
Passsword:
```

Step 16   To configure the MSE to automatically launch after boot up, enter the following command:

```
[root@mse8-0]# chkconfig msed on
```

Step 17   Reboot using the following command:

```
[root@mse8-0]# reboot
```

> ✎
>
> **Note**   To start the MSE service manually, enter the following command:
> ```
> [root@mse8-0]# service msed start
> ```
>
> The setup script generates a log file that can be found at **/opt/mse/setup/setup.log**.

Configuring MSE on the Prime Infrastructure

To configure the Mobility Services Engine (MSE) virtual appliance on the Prime Infrastructure, follow these steps:

Step 1 Launch Mozilla Firefox 11.0 or 12.0 or Internet Explorer 8 or 9 with the Chrome plug-in releases or Google Chrome 19.0. The Internet Explorer versions below than 8 are not recommended.

> ✎ **Note** When you use Firefox to log in and access Prime Infrastructure for the first time, the Firefox web browser displays a warning stating that the site is untrustable. When Firefox displays this warning, follow the prompts to add a security exception and download the self-signed certificate from Prime Infrastructure server. After you complete this procedure, Firefox accepts Prime Infrastructure server as a trusted site both now and during all future login attempts.

Step 2 In the address line of browser, enter https://pi-ip-address, where pi-ip-address is the IP address of the server on which you installed and started Prime Infrastructure. Prime Infrastructure uses interface displays the Login page.

Step 3 Enter the username. The default username is root.

Step 4 Enter the root password you created during the PI setup and not the MSE setup and click **Login**.

> ✎ **Note** If any licensing problem occur, a message appears in an alert box. If you have an evaluation license, the number of days until the license expires is shown. You are also alerted to any expired licenses. You have the option to go directly to the licensing page to address these problem.

Step 5 Choose **Services > Mobility Services Engines**.

Step 6 From the Select a command drop-down list, choose **Add Mobility Services Engine**. Click **Go**.

The Add Mobility Services Engine page appears.

Step 7 Enter the following information:

- **Device Name**—User-assigned name for the mobility services engine.
- **IP Address**—The IP address of the mobility services engine.

> ✎ **Note** A mobility services engine is added only if a valid IP address is entered. The Device Name helps you distinguish between devices if you have multiple Prime Infrastructures with multiple mobility services engines, but is not considered when validating a mobility services engine.

- **Contact Name** (Optional)—The mobility service engine administrator.
- **Username**—The default username is admin. This is the Prime Infrastructure communication username configured for MSE.
- **Password**—The default password is admin. This is the Prime Infrastructure communication password configured for MSE.

> ✎ **Note** This refers to the Prime Infrastructure communication username and password created during the setup process.If you have not specified the username and password during the setup process, use the defaults. The default username and password are both *admin*.

Step 8   Select the **Delete synchronized service assignments** check box if you want to permanently remove all service assignments from the mobility services engine.

This option is applicable for network designs, wired switches, controllers and event definitions. The existing location history data is retained, however, you must use manual service assignments to perform any future location calculations.

Step 9   Click **Next**.

The MSE License Summary page appears (see Figure 3-10). You can use the MSE License Summary page to install a license, add a license, remove a license, install an activation license, and install service license.

Figure 3-10   MSE License Summary Page

Step 10   Click **Add License** to add a license. You can install an activation license and service license.

The Add a License File dialog box appears.

Step 11   Click **Choose File** to browse to and select the license file.

Step 12   Click **OK** to add the license. The newly added license appears in the MSE license file list.

Step 13   To remove an MSE license file, click **Remove License**.

Step 14   Choose an MSE license file that you want to remove by selecting the **MSE License File** radio button, and click **Remove**.

Step 15   Click **OK** to confirm the deletion.

Step 16   Click **Next** to enable services on the mobility services engine.

Step 17   To enable a service, select the check box next to the service. These are the available services:

- Context Aware Service
- WIPS
- Mobile Concierge Service
- CMX Analytics
- CMX Browser Engage
- HTTP Proxy Service

✎
Note   Select the services you need and for which you have the licenses. If you select CMX Analytics, you must also select the Context Aware Service.

Step 18   Click **Next**. The Select Tracking & History Parameters page appears.

> **Note**   If you skip configuring the tracking parameters, the default values are selected.

Step 19   You can select the clients to be tracked using the Prime Infrastructure by selecting the corresponding Tracking check box(es). Make sure that wireless clients are tracked.

The various tracking parameters are as follows:

- Wired Clients
- Wireless Clients
- Rogue Access Points
  - Exclude Adhoc Rogue APs
- Rogue Clients
- Interferers
- Active RFID Tags

Step 20   You can enable the history tracking of devices by selecting the corresponding devices check box(es). The different history parameters are as follows:

- Wired Stations
- Client Stations
- Rogue Access Points
- Rogue Clients
- Interferers
- Asset Tags

Step 21   Click **Next** to assign maps to the MSE and view your managed system on realistic campus, building, outdoor area, and floor maps.

> **Note**   The Assigning Maps page is available only if you select Context Aware Service as one of the services to be enabled on the MSE.

Table 3-3 lists the preset filters that are available in the Assigning Maps page. Choose the filter you want to show from the Show drop-down list.

Table 3-3   Maps List Filters

Filter	Results
All	Shows all maps (Campus, Building, Floor, Outdoor area).
Campus	Shows only the campus maps list.
Building	Shows only the building maps list.
Floor	Shows only the floor area maps list.
Outdoor Area	Shows only the outdoor area maps list.

In addition, you can use the filter icon ( ) to filter the maps that match the filter rules. If you want to specify a filter rule, choose **All** from the Show drop-down list before you click ( ).

Step 22   To synchronize the map, select the **Name** check box and click **Synchronize**. Upon synchronization of the network designs, the appropriate controllers that have APs assigned on a particular network design are synchronized with the MSE automatically.

Step 23   Click **Next** to configure the mobile application integration.

Step 24   Click **Done** in the Mobile App Enablement page.

A dialog box appears.

Step 25   Click **OK** to save the MSE settings.

You must synchronize the network designs. See .

Synchronizing the Network Designs

Step 1   Choose **Services > Synchronize Services**.

The Network Designs page appears. The left sidebar menu contains the following options: **Network Designs**, **Controllers**, **Event Groups**, **Wired Switches**, **Third Party Elements**, and **Service Advertisements**.

Step 2   From the left sidebar menu, choose the appropriate menu options.

Step 3   To assign a network design to a mobility services engine, in the Synchronize Services page, choose **Network Designs** from the left sidebar menu.

Step 4   Select the maps to be synchronized with the mobility services engine by selecting the corresponding **Name** check box.

Step 5   Click **Change MSE Assignment**.

Step 6   Choose the mobility services engine to which the maps are to be synchronized.

Step 7   Click CAS in the Choose MSEs dialog box and click Synchronize.

Step 8   Click **Synchronize** to update the mobility services engine(s) database(s).

When items are synchronized, a green two-arrow icon appears in the Sync. Status column for each synchronized entry. You can use the same procedure to assign wired switches or event groups to a mobility services engine.

Assigning an MSE to the Controller

Step 9   In the Network Designs page, choose **Controller** from the left sidebar menu.

Step 10   Select the controllers to be assigned to the mobility services engine by selecting the corresponding Name check box.

Step 11   Click **Change MSE Assignment**.

Step 12   Choose the mobility services engine to which the controllers must be synchronized.

Step 13   Click **CAS** in the Choose MSEs dialog box.

Step 14   Click **Synchronize** to complete the synchronization process.

Step 15   Verify that the mobility services engine is communicating with each of the controllers for only the chosen service. This can be done by clicking the **NMSP** status link in the status page.

> **Note**   After synchronizing a controller, verify that the timezone is set on the associated controller.

> **Note**   Controller names must be unique for synchronizing with a mobility services engine. If you have two controllers with the same name, only one is synchronized. You can use the same procedure to assign Catalyst switches or event groups to a mobility services engine.

Checking the NMSP Connection Status

Step 16   Choose **Services** > **Mobility Services Engine**.

Step 17   Click the name of the mobility services engine whose properties you want to view or edit.

Step 18   Choose System > Status > NMSP Connection Status from the left sidebar menu.

Step 19   Check if NMSP is active under the Summary panel.

CHAPTER 4

Installing the Cisco MSE Virtual Appliance on a XenServer

Citrix XenServer is a complete server virtualization platform, optimized for both Windows and Linux virtual servers with all the capabilities required to create and manage a virtual infrastructure.

Citrix XenServer runs directly on server hardware without requiring an underlying operating system, which results in an efficient and scalable system. XenServer works by abstracting elements from the physical machine and allocates them to the Virtual Machines (VMs) running on it.

Citrix XenCenter is the Windows-native graphical user interface for managing Citrix XenServer. Import of MSE virtual appliance onto the XenServer is done using the XenCenter.

This chapter contains the Overview of the Process for Installing the Cisco MSE Virtual Appliance On a XenServer, page 4-1.

Overview of the Process for Installing the Cisco MSE Virtual Appliance On a XenServer

Table 4-1 describes the steps to be followed while deploying the Cisco Mobility Services Engine (MSE) virtual appliance.

Table 4-1   Workflow for MSE Virtual Appliance Installation

Process	Description
1. Verify the requirements and prepare for Cisco MSE VA installation.	See Verifying Requirements, page 4-2 for more information.
2. Download the Cisco MSE VA OVA file from Cisco.com.	See Downloading the Cisco MSE Virtual Appliance OVA File, page 4-2 for more information.
3. Importing VMs.	See Importing the MSE Virtual Appliance Using the XenCenter, page 4-3 for more information.
4. Configure the basic settings.	See Configuring the Basic Settings to Start the MSE Virtual Appliance VM, page 4-10 for more information.
5. Configure the MSE on Prime Infrastructure.	See Configuring MSE on the Prime Infrastructure, page 4-18 for more information.
6. Synchronize the network design and tracking parameters.	See Synchronizing the Network Design and Tracking Parameters, page 4-18 for more information.

Verifying Requirements

Table 4-2 describes the requirements to verify.

Table 4-2   Requirements

System Requirements	64 bit processor Intel VT/AMD-V
	32 GB RAM Memory
	500 GB HDD
	Ethernet Cards (NIC) of 1 Gbps
Software Requirements	Citrix XenServer 6.1
	Citrix XenCenter 6.1
Licenses	Enterprise edition or advanced edition
Management Tools	• XenServer Version 6.1.x
	• XenCenter Version 6.1.x

Downloading the Cisco MSE Virtual Appliance OVA File

To download the MSE .ova file, follow these steps:

Step 1 Access the Cisco MSE Virtual Appliance image at the following location:
http://software.cisco.com/download/navigator.html

Step 2 In the **Product/Technology Support** section, choose **Download Software**.

Step 3 In the **Select a Product** section, navigate to the Wireless software by choosing **Products** > **Wireless** > **Mobility Services** > **Cisco Mobility Services Engine Virtual Appliance**.

A list of the latest release software for Cisco Mobility Services Engine Virtual Appliance is available for download.

Step 4 In the **Latest** list, choose 7.6.100.0.

Step 5 You can select any of the following ova files to download:

- **MSE-XEN-VA-8-0-100-0-Generic.ova**—Use this file for a new MSE deployment on a Xen platform.
- **MSE-XEN-VA-8-0-100-0-LowEnd.ova**—Use this file for a new MSE deployment on a low-end Xen platform.

Step 6 Save the installer to your computer in a place that will be easy to find when you start the deployment.

Importing the MSE Virtual Appliance Using the XenCenter

You can import and export Virtual Machines (VMs) in XenCenter using the Import and Export wizards.

To import an Open Virtualization Archive (OVA) package, follow these steps:

Step 1 Launch XenCenter Client application on your desktop and log in using the Administrative privileges.

Step 2 Add XenServer to XenCenter if it is not added. You can skip this step if you have already connected the XenCenter to the XenServer host. See this URL for more information:
https://support.citrix.com/servlet/KbServlet/download/32306-102-691299/QuickStartGuide_BasicVersion.pdf.

Step 3 Right-click on XenServer in the XenCenter client and choose **Import** to import the MSE OVA file.

The Import wizard appears.

Step 4 In the Import Source page, click **Browse** to select the MSE OVA file (see Figure 4-1).

Figure 4-1   *Import Source Page*
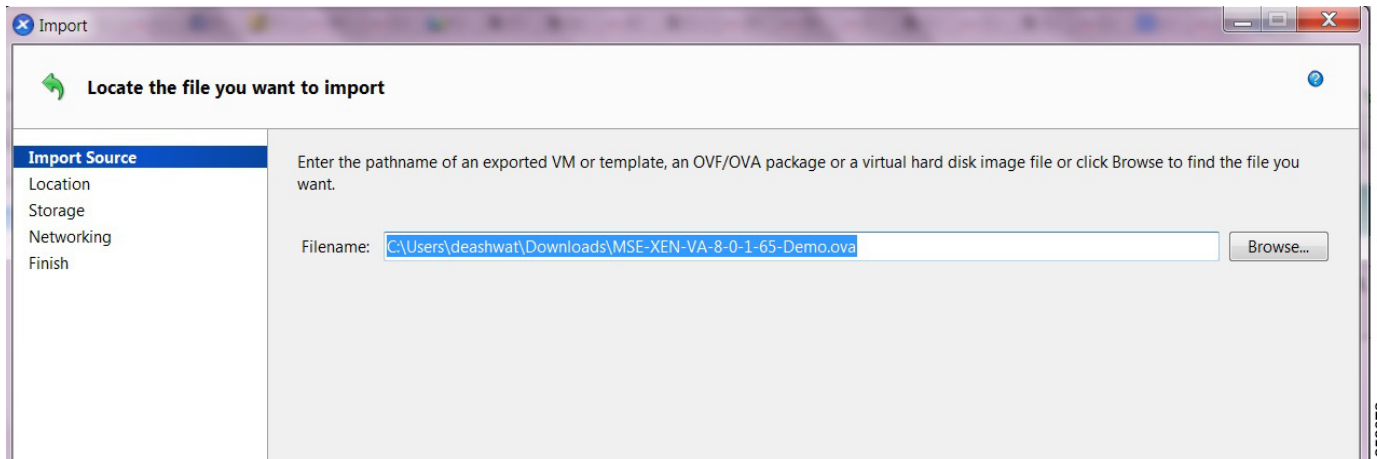
Step 5 From the Open dialog box, locate the appropriate .ova file that you downloaded to your computer and click **Open**.

Step 6 Click **Next**.

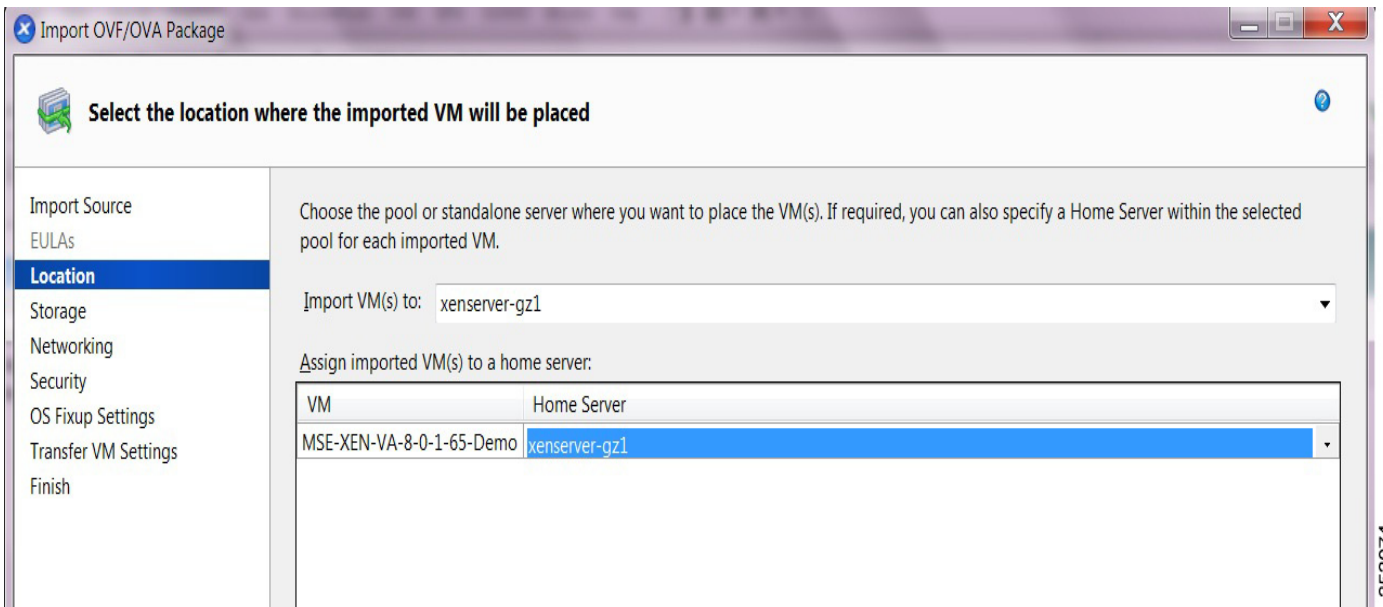The Location page appears (see Figure 4-2).

> **Note** If the package you are importing includes any EULAs, accept them and click **Next** to continue. If there are no EULAs included in the package, the wizard skips this step and goes to the next page. Review and accept End User License Agreement (EULA).

Step 7 In the Location page, choose the pool or standalone server where you want to place the VM(s). You can also specify a Home Server within the selected pool for each imported VM.

- From the Import VM(s) to drop-down list, choose the destination pool or standalone server where you want to place the VMs that you are importing and assign them a home server. The Add New Server window appears.
    - In the Server text box, enter the host name or IP address of the server you want add.
    - In the User name text box, enter the user name for that server.
    - In the Password text box, enter the password.
- To assign imported VM(s) to a home server, select the server from the list in the **Home Server** column (see Figure 4-2). For more information on assigning a home server to new VMs, see the *Home Server documentation* available at the Citrix Website.

Figure 4-2   *Location Page*

Step 8   Click **Next**.

The Storage page appears (see Figure 4-3).

Step 9   Configure storage for the imported VMs.

On the **Storage** page, select one or more storage repositories (SRs) to place the virtual disks (see Figure 4-3).

Figure 4-3   Storage Page
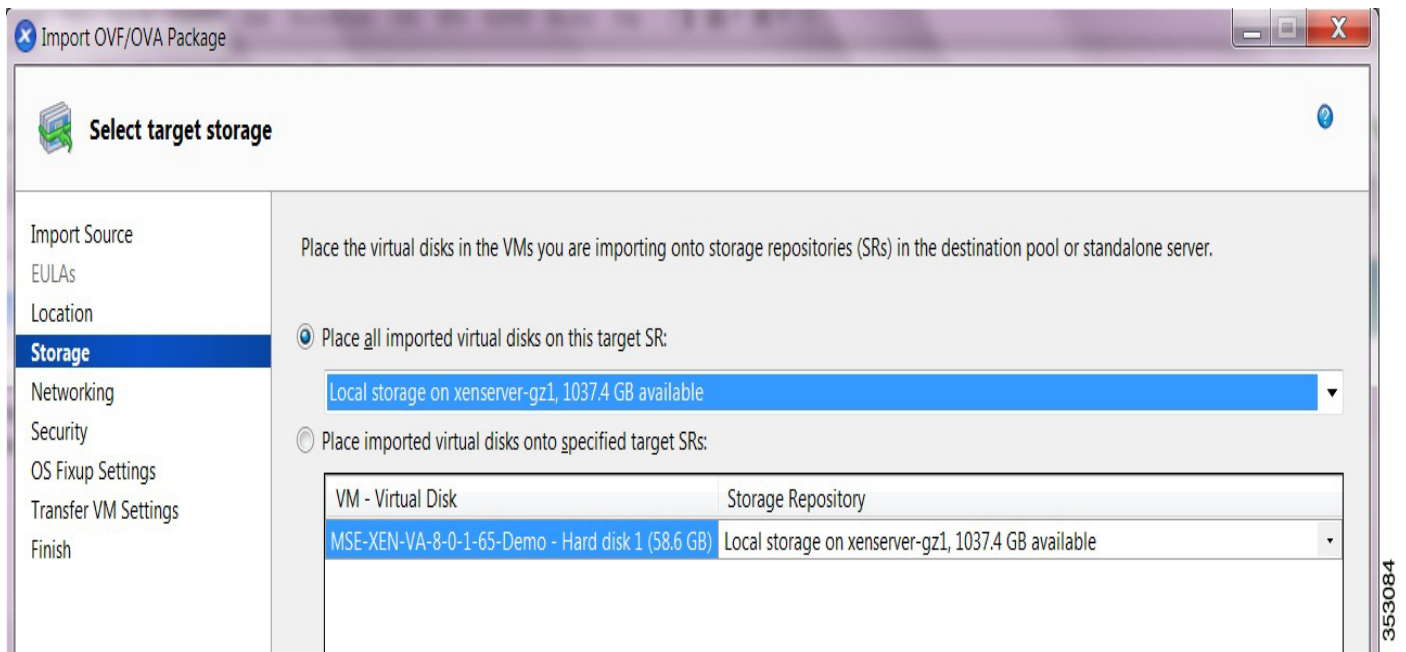
- To place the imported disk images on the same SR, click **Place all imported virtual disks on this target SR** radio button and select an SR from the list.
- To place the disk images of incoming VMs onto different SRs, click **Place imported virtual disks onto specified target SR** radio button and select the target SR from the drop-down list in the **Storage Repository** column.

Step 10   Click **Next**.

The Networking page appears (see Figure 4-4).

Step 11   On the **Networking** page, map the virtual network interfaces in the VMs you are importing to target networks in the destination pool or standalone server.

- Select the virtual network interface in the **VM-Virtual Network Interface** column and select the target network from the drop-down list in the **Target Network** column (see Figure 4-4).

Figure 4-4   Networking Page
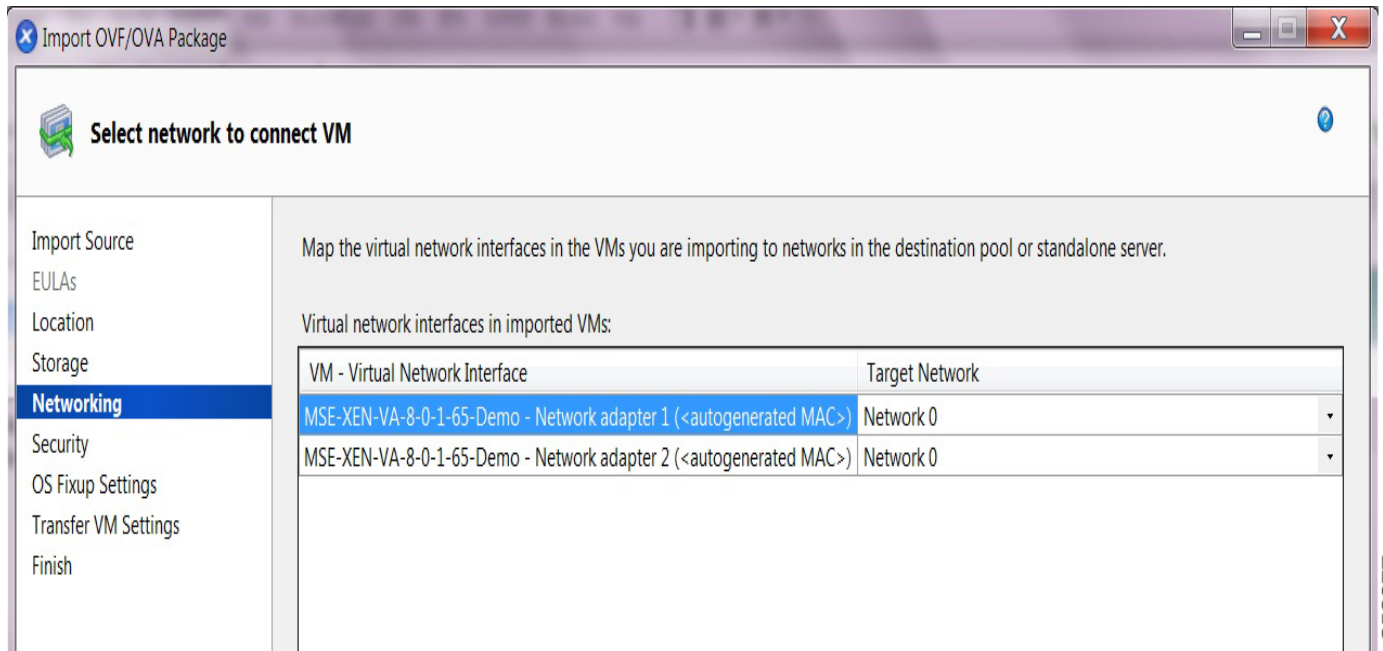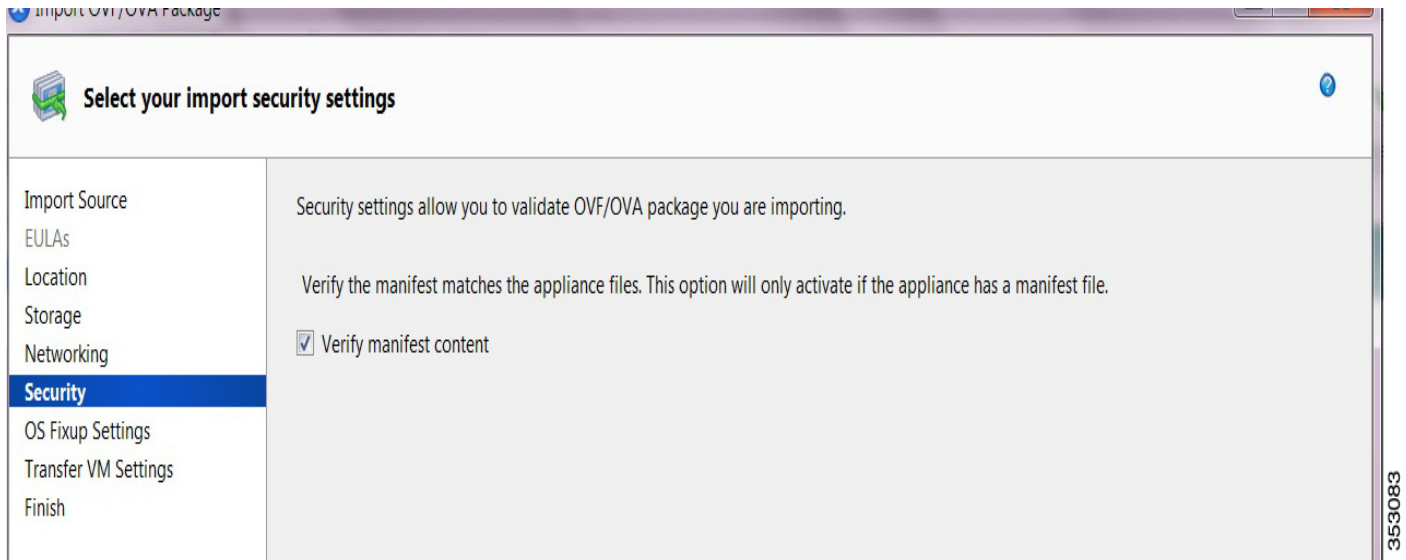
Step 12 Click **Next** to continue.

The Security page appears (see Figure 4-5).

Step 13 On the Security page, you can set the security settings to validate the OVF/OVA package that you are importing.

- Select the **Verify manifest content** check box to verify if the manifest matches with the appliance files.

Figure 4-5   Security Page

Step 14 Click **Next**. The OS Fixup Settings page appears.

Step 15 Configure the following in the OS Fixup Settings page:

- If the VMs in the package you are importing were built on a hypervisor other than XenServer, then select the **Use Operating System Fixup** check box to enable the imported VM to boot correctly on the XenServer. The Operating System Fixup attempts to repair boot device-related problems with imported VMs that might prevent the operating system within the VM from booting in a XenServer environment.

- If you enable the Use Operating System Fixup check box, then you must select an ISO library where the fixup ISO will be copied. Click **New ISO library** to choose the type of new storage and configure.

- Select the type of virtual disk storage:
  - NFS VHD
  - Software iSCSI
  - Hardware HBA
  - StorageLink technology

- Select ISO library type:
  - Windows File Sharing (CIFS)
  - NFS ISO

Step 16   Click **Next**.

- Provide a name and description for your SR in the **Name** and **Description** text box.

Step 17   Click **Next**.

- Provide the name of the share where your SR is located in the Share Name text box. You can optionally specify alternative credentials by setting the server options by providing the username and password.

- Click **Finish**.

Step 18   Click **Next**. The Transfer VM Settings page appears.

Step 19   On the **Transfer VM Settings** page, configure the following networking settings:

- Select the network on which the temporary VM used to perform the import operations from the Network drop-down list.

- Configure either of the following network settings:

    – Automatically obtain network settings using DHCP.

    – Use these network settings.

Step 20   Click **Next** to continue.

Step 21   On the **Finish** page, review all the import settings and click **Finish** to begin the import process and close the wizard.

Step 22   Click the Logs tab in the XenCenter client to check the progress of the OVA import.

Step 23   The MSE OVA gets imported.

Figure 4-6 shows the deployed appliance.

Figure 4-6   Deployed Appliance
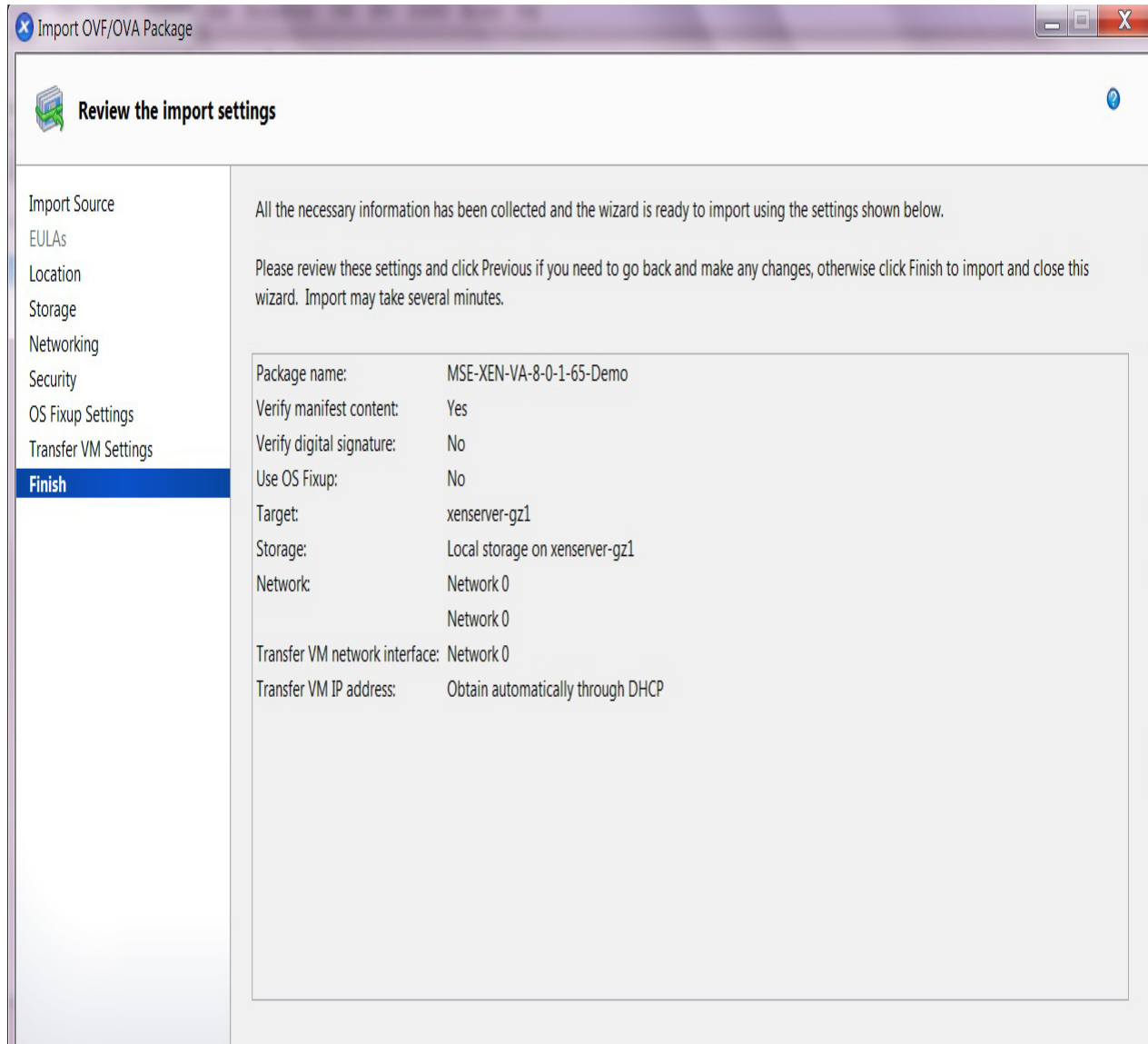
Step 24   The OVA will be in shutdown state as soon as the import is completed.

Step 25   Start the Virtual Machine (VM).

Right-click on the imported file and select **Start**.

Configuring the Basic Settings to Start the MSE Virtual Appliance VM

You have completed deploying the MSE virtual appliance on a new virtual machine. A node for the virtual machine now appears in the resource tree in the XenCenter Client window. After deployment, you need to configure basic settings for the MSE virtual appliance.

To start the MSE setup, follow these steps:

Step 1   In the XenCenter Client, click the **MSE virtual appliance** node in the resource tree.

Step 2   Click the **Console** tab, within the console pane to make the console prompt active for keyboard input. The VM starts booting.

Step 3   Press **Enter** for the login prompt to appear to initiate the MSE Installation Wizard. The following is displayed:

```
---------------------------------------------------------------
Cisco Mobility Service Engine
Xen-8-6-x-x login: root
Password: password


Running the Cisco Mobility Services Engine installer. It may take several minutes to
complete.
CISCO-MSE-K9-8-0-X-X-64bit.bin
MSE-PUB.pem
signhash.bin
Preparing to install...
Extracting the JRE from the installer archive...
Unpacking the JRE...
Extracting the installation resources from the installer archive...
Configuring the installer for this system's environment...

Launching installer...
Preparing CONSOLE Mode Installation...



============================================================
Introduction
------------

InstallAnywhere will guide you through the installation of Cisco Mobility Services Engine.

It is strongly recommended that you quit all programs before continuing with this
installation.

Respond to each prompt to proceed to the next step in the installation. If you want to
change something on a previous step, type 'back'.

Licensing on the Mobility Services Engine is enforced with the release of software version
6.x and greater. Please have the Product Authorization key (PAK) and refer to the
instructions in the User Guide to enable licensing.



PRESS <ENTER> TO CONTINUE:


Installing MSE Version: 8.0.x.x
```

```
================================================================
Installation Check
------------------


================================================================
Cisco Mobility Services Engine Installation Message
----------------------------------------------------------------
Cisco MSE v8.0 upgrade procedure may take several hours to complete, depending on the
amount of data on the system.

During the upgrade process, please ensure that the session to the MSE is not terminated.
User action is needed at the end of the installation process.

    -> 1- Exit
        2- Continue

ENTER THE NUMBER OF THE DESIRED CHOICE, OR PRESS <ENTER> TO ACCEPT THE DEFAULT: ^[



================================================================
Installing...
-------------
[=================|=================|=================|=============]
[-----------------|-----------------|-----------------|-------------]


Database Installation
---------------------


The installer will now install the database. This may take a long time (up to 30 minutes).
Do not cancel the installer during this set up.

Installing Database files

Step 1/3 - Installing Database files
Step1/3 Completed
Step 2/3 = Configuring Database
Step 2/3 Completed
Step 3/3 - Updating patches
Step 3/3 Completed

Installation of database Completed

========================================================================
------------------------------------------------------------------------]

Starting Health Monitor, Waiting to check the status
Health Monitor successfully started
Starting Admin process...
Started Admin process...
Starting database...
Database started successfully. Starting framework and services.......
```

✎

Note   After the initial installation, you are logged off the newly created VM and you must login to the
console panel again.

Step 4   The MSE virtual machine shuts down and reboots.

```
GRUB Loading stage2...
Press any key to continue.
Press any key to continue.

_
-----------------------------------------------------------
Cisco Mobility Services Engine
mse login: root
password: password
Last login: Mon Apr 7 04:11:50 on tty1
```

Note   If the MSE does not prompt for setup, enter the following command: /opt/mse/setup/setup.sh.

```
Would you like to setup initial parameters using menu options (yes/no) [yes]:
```

[Press Enter to use the default values (yes) to use the Menu options]

```
Please select a configuration option below and enter the
requested information. You may exit setup at any time by
typing <Ctrl+C>.

You will be prompted to choose whether you wish to configure a
parameter, skip it, or reset it to its initial default value.
Skipping a parameter will leave it unchanged from its current
value.

Please note that the following parameters are mandatory and must be configured at lease
once.
        -> Hostname
        -> Network interface eth0
        -> Timezone settings
        -> Root password
        -> NTP settings
        -> Prime Infrastructure password

You must select option 24 to verify and apply any changes made during this session.
-----------------------------------------------------------

PRESS <ENTER> TO CONTINUE:

-----------------------------------------------------------


Configure MSE:

-----------------------------------------------------------

1) Hostname *                           13) Remote syslog setting
2) Network Interface eth0 settings *    14) Host access control settings
3) Timezone settings *                  15) Audit rules
4) Root password *                      16) Login banner
5) NTP settings *                       17) System console restrictions
6) Prime Infrastructure configuration   18) SSH root access
7) Display current configuration        19) Single user password check
8) Domain                               20) Login and password settings
9) High availability role               21) GRUB password
10) Network interface eth1 settings     22) Root access control
11) DNS settings                        23) Auto start MSE on system boot up
12) Future restart time                 24) ## Verify and apply changes ##
```

> **Note**   It is highly recommended that all relevant items must be configured during initial setup to ensure optimum operation of the mobility services engine in your network. The hostname and either the Ethernet-0 (eth0) or the Ethernet-1 (eth1) port must always be configured during the automatic installation.

> **Note**   You can rerun the automatic installation script at any time to add or change parameters using this command:
> `[root@mse]# /opt/mse/setup/setup.sh.`
> There is no need to re-enter values that you do not want to change during one of these updates.

> **Note**   If you do not want to configure an item, enter **skip** and you are prompted for the next configuration step. Any setting skipped is retained and not modified.

> **Note**   Minimal configuration is done for the mobility services engine as part of installation using the console. All configurations beyond the initial setup using the automatic installation is done with the Cisco Prime Infrastructure.

Step 5   Configure the host name

```
Please enter your choice [1 - 24]: 2

Current hostname=[Xen-8-0-x-x]
Configure hostname?  (Y)es/(S)kip/(U)se default [Skip]: y
The host name should be a unique name that can identify
the device on the network. The hostname should start with
a letter, end with a letter or number, and contain only
letters, numbers, and dashes.

Enter a host name [Xen-8-0-x-x]:
```

Step 6   Configure eth0 network settings

```
Please enter your choice [1 - 24]: 2

Current IP address=[10.0.0.1]
Current eth0 netmask=[255.0.0.0]
Current IPv4 gateway address=[172.20.104.123]
Configure eth0 interface parameters? (Y)es/(S)kip/(U)se default [Skip]:y

Enter an IP address for first ethernet interface of this machine.

Enter eth0 IP address  [10.0.0.2]:

Enter the network mask for IP address 172.21.105.126

Enter network mask [255.255.255.224]:

Enter an default gateway address for this machine.

Note that the default gateway must be reachable from
the first ethernet interface.

Enter default gateway address [172.20.104.123]:
```

Step 7   Configure the DNS Settings:

```
Please enter your choice [1 - 24]: 11

Domain Name Service (DNS) Setup

Enable DNS (yes/no) [no]: y
Default DNS server 1=[8.8.8.8]
Enter primary DNS server IP address:
DNS server address must be in the form #.#.#.#, where # is 0 to 255 or hexadecimal :
separated v6 address

Enter primary DNS server IP address [8.8.8.8]:
Enter backup DNS server IP address (or none) [none]:
```

Step 8   Configure the Timezone settings:

> ✎
>
> **Note**   If your wIPS deployment consists of a Cisco MSE and other devices (such as Cisco WLCs and access points), set the Cisco MSE and the other devices to the same time zone.

```
Please enter your choice [1 - 24]: 3

Current Timezone=[America/New York]
Configure timezone? (Y)es/(S)kip/(U)se default [Skip]: y

Enter the current date and time.

Please identify a location so that time zone rules can be set correctly.
Please select a continent or ocean.
 1) Africa
 2) Americas
 3) Antarctica
 4) Arctic Ocean
 5) Asia
 6) Atlantic Ocean
 7) Australia
 8) Europe
 9) Indian Ocean
10) Pacific Ocean
11) UTC - I want to use Coordinated Universal Time.
#? 2
Please select a country.
 1) Anguilla             27) Honduras
 2) Antigua & Barbuda    28) Jamaica
 3) Argentina            29) Martinique
 4) Aruba                30) Mexico
 5) Bahamas              31) Montserrat
 6) Barbados             32) Netherlands Antilles
 7) Belize               33) Nicaragua
 8) Bolivia              34) Panama
 9) Brazil               35) Paraguay
10) Canada               36) Peru
11) Cayman Islands       37) Puerto Rico
12) Chile                38) St Barthelemy
13) Colombia             39) St Kitts & Nevis
14) Costa Rica           40) St Lucia
15) Cuba                 41) St Martin (French part)
16) Dominica             42) St Pierre & Miquelon
17) Dominican Republic   43) St Vincent
18) Ecuador              44) Suriname
19) El Salvador          45) Trinidad & Tobago
```

```
20) French Guiana          46) Turks & Caicos Is
21) Greenland              47) United States
22) Grenada                48) Uruguay
23) Guadeloupe             49) Venezuela
24) Guatemala              50) Virgin Islands (UK)
25) Guyana                 51) Virgin Islands (US)
26) Haiti
#? 47
Please select one of the following time zone regions.
 1) Eastern Time
 2) Eastern Time - Michigan - most locations
 3) Eastern Time - Kentucky - Louisville area
 4) Eastern Time - Kentucky - Wayne County
 5) Eastern Time - Indiana - most locations
 6) Eastern Time - Indiana - Daviess, Dubois, Knox & Martin Counties
 7) Eastern Time - Indiana - Pulaski County
 8) Eastern Time - Indiana - Crawford County
 9) Eastern Time - Indiana - Pike County
10) Eastern Time - Indiana - Switzerland County
11) Central Time
12) Central Time - Indiana - Perry County
13) Central Time - Indiana - Starke County
14) Central Time - Michigan - Dickinson, Gogebic, Iron & Menominee Counties
15) Central Time - North Dakota - Oliver County
16) Central Time - North Dakota - Morton County (except Mandan area)
17) Mountain Time
18) Mountain Time - south Idaho & east Oregon
19) Mountain Time - Navajo
20) Mountain Standard Time - Arizona
21) Pacific Time
22) Alaska Time
23) Alaska Time - Alaska panhandle
24) Alaska Time - Alaska panhandle neck
25) Alaska Time - west Alaska
26) Aleutian Islands
27) Hawaii
#? 21


The following information has been given:

        United States
        Pacific Time


Therefore TZ='America/Los_Angeles' will be used.
Local time is now:      Sun Apr  6 18:45:27 PDT 2014.
Universal Time is now:  Mon Apr  7 01:45:27 UTC 2014.
Is the above information OK?
1) Yes
2) No
#? 1
```

Step 9   Configure the Root password:

> ✎
>
> **Note**   If you do not set the root password, a warning message is displayed when you apply the settings.

```
Please enter your choice [1 - 24]: 4

Root password has not been configured
Configure root password? (Y)es/(S)kip/(U)se default [Skip]:
Changing password for user root.

You can now choose the new password.

A valid password should be a mix of upper and lower case letters, digits, and other
characters. You can use an 8 character long password with characters from all of these
classes. An upper case letter that begins the password and a digit that ends it do not
count towards the
number of character classes used.

Enter new password:
```

Step 10   Configure the NTP Setup

```
Please enter your choice [1 - 24]: 5

Network Time Protocol (NTP) Setup.

If you choose to enable NTP, the system time will be
configured from NTP servers that you select.  Otherwise,
you will be prompted to enter the current date and time.

NTP is currently disabled.
Configure NTP related parameters? (Y)es/(S)kip/(U)se default [Skip]: y

Enter whether or not you would like to set up the
Network Time Protocol (NTP) for this machine.

If you choose to enable NTP, the system time will be
configured from NTP servers that you select.  Otherwise,
you will be prompted to enter the current date and time.

Enable NTP (yes/no) [no]: y
Default NTP server 1=[time.nist.gov]
Enter NTP server name or address:
NTP server address must be in the form #.#.#.3, where # is 0 to 255 hexadecimal :
separated v6 address.
Enter NTP server name or [time.nist.gov]:
Enter another NTP server IP address (or none) [none]:
Configure NTP Authentication ? (Y)es/(S)kip/(U)se default [Skip]: y
Enter NTP Auth key Number [1]:
Enter NTP Auth key Value (String) [Secret]:
Do you want to continue (yes/no) [no]: y
```

Step 11   Configure the Prime Infrastructure password:

> ✎
>
> **Note**   If you do not set the password, a warning message appears when you apply the changes. The default PI communication password is *admin.*

```
Please enter your choice [1 - 24]: 6

Cisco Prime Infrastructure communication password has not been configured
Configure Prime Infrastructure communication password? (Y)es/(S)kip/(U)se default [Skip]:
Y

Enter a password for the admin user.
The admin user is used by the Prime Infrastructure and other northbound systems to
authenticate their SOAP/XML session with the server. Once this password is updated, it
must correspondingly be updated on the NCS page for MSE General Parameters so that the
Prime Infrastructure can communicate with the MSE
.
```

Step 12   Verify the setup information and apply the changes:

```
Please enter your choice [1 - 24]:       24

Please verify the following setup information.

---------------------------BEGIN---------------------------

    Hostname=mse8-0
    Eth0 IP address= , Eth0 network mask=255.255.254.0
    Time zone=America/Los_Angeles
    Enable DNS=yes, DNS servers=8.8.8.8
    Enable NTP=yes, NTP servers=time.nist.gov
    Time zone=America/Los_Angeles
    Root password is changed.
    Cisco Prime Infrastructure password is changed.

----------------------------END----------------------------

You may enter "yes" to proceed with configuration, "no" to make
more changes.


Configuration Changed
Is the above information correct (yes or no): yes
```

> ✎
>
> **Note**   The next time you log in using root, only the Linux shell prompt appears and not the setup script. You can rerun the setup script at any time to change settings by logging in as *root* and running **/opt/mse/setup/setup.sh**.

Step 13   To verify the configuration, run the `getserverinfo` command.

```
[root@Xen-8-0-x-x]# getserverinfo
```

Step 14 To configure the MSE to automatically launch after boot up, enter the following command:

```
[root@Xen-8-0-x-x]# chkconfig msed on
```

Step 15 Roboot using the following command:

```
[root@Xen-8-0-x-x]# reboot
```

✎

Note To start the MSE service manually, enter the following command:
`[root@Xen-8-0-x-x]# service msed start`

The setup script generates a log file that can be found at **/opt/mse/setup/setup.log**.

Configuring MSE on the Prime Infrastructure

See Configuring MSE on the Prime Infrastructure, page 3-21 for more information.

Synchronizing the Network Design and Tracking Parameters

See Synchronizing the Network Designs, page 3-24 for more information.

CHAPTER 5

Installing the Cisco MSE Virtual Appliance on a Hyper-V Platform

Hyper-V™ is a Microsoft® technology that enables the deployment of virtual servers. Hyper-V is a role in Windows Server 2008 and Windows Server 2012 that provides the tools and services that can use to create a virtualized server computing environment. This type of environment is useful to create and manage virtual machines, that allow running multiple operating systems on one physical computer and isolate the Operating System from each other.

For more information about Microsoft Hyper-V, see this URL:
http://technet.microsoft.com/en-us/library/cc732470(v=ws.10).aspx

This chapter contains the following sections:

Installation Requirements for Microsoft Hyper-V

For more information on prerequisites for installation, see this URL:
http://technet.microsoft.com/en-us/library/jj647784

Overview of the Process for Installing the Cisco MSE Virtual Appliance on a Hyper-V Platform

Table 5-1 describes the steps to be followed while deploying the Cisco MSE virtual appliance.

Table 5-1 Workflow for MSE Virtual Appliance Installation

Process	Description
1. Verify the requirements and prepare for Cisco MSE VA installation.	See Verifying Prerequisites, page 5-2 for more information.
2. Download the Cisco MSE VA Tar file from Cisco.com.	See Downloading the Cisco MSE Virtual Appliance Tar File, page 5-2 for more information.

Table 5-1   ***Workflow for MSE Virtual Appliance Installation (continued)***

Process	Description
3. Deploying the VHD package.	See Importing MSE Appliance on the Microsoft Hyper-V, page 5-3 for more information.
4. Configure the basic settings.	See Configuring the Basic Settings to Start the MSE Virtual Appliance VM, page 5-11 for more information.
5. Configure the MSE on Prime Infrastructure.	See Configuring MSE on the Prime Infrastructure, page 5-17 for more information.
6. Synchronize the network design and tracking parameters.	See Synchronizing the Network Design and Tracking Parameters, page 5-17 for more information.

Verifying Prerequisites

- Install Hyper-V
- Create and Set up a virtual machine
- Install the guest operating system and integration services
- Configure virtual networks

Refer to these URLs for more information:

- http://technet.microsoft.com/en-us/library/cc732470(v=ws.10).aspx
- http://technet.microsoft.com/en-in/library/gg610610.aspx

Downloading the Cisco MSE Virtual Appliance Tar File

To download the tar file, follow these steps:

Step 1 Access the Cisco Mobility Services Engine (MSE) Virtual Appliance image at the following location: http://software.cisco.com/download/navigator.html

Step 2 In the **Product/Technology Support** section, choose **Download Software**.

Step 3 In the **Select a Product** section, navigate to the Wireless software by choosing **Products** > **Wireless** > **Mobility Services** > **Cisco Mobility Services Engine Virtual Appliance**.

A list of the latest release software for Cisco Mobility Services Engine Virtual Appliance is available for download.

Step 4 In the **Latest** list, choose 8.0.x.x.

Step 5 You can select any of the following files to download:

- MSE-HYPERV-VA-8-0-x-x-Generic.tar.bz2—Use this file for a new MSE deployment on a Hyper-V platform.
- MSE-HYPERV-VA-8-0-x-x-LowEnd.tar.bz2—Use this file for a new MSE deployment on a low-end Hyper-V platform.

Step 6 Save the installer to your computer in a place that will be easy to find when you start the deployment.

Importing MSE Appliance on the Microsoft Hyper-V

Note The Microsoft® Hyper-V 2008 does not support the Open Virtualization Format (OVF). For Hyper-V 2012, you must extract the Virtual Hard Disk (VHD) bundle and deploy the Mobility Services Engine (MSE) appliance on the target Hyper-V.

Step 1 Download the MSE tar file as specified in this procedure: Downloading the Cisco MSE Virtual Appliance Tar File, page 5-2.

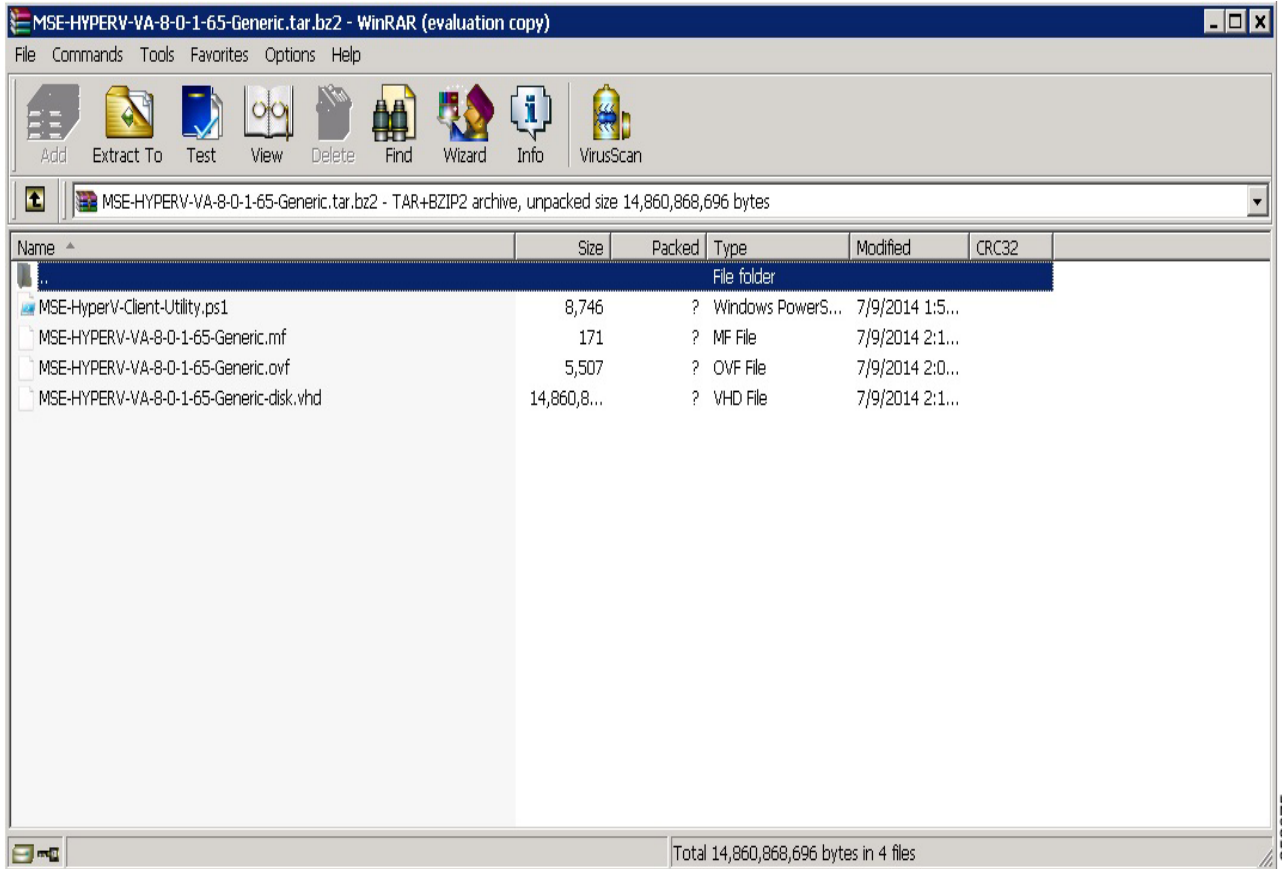**Step 2** Extract the MSE appliance tar file using any of the extract tools that you have (see Figure 5-1).

Figure 5-1 *MSE Tar File*
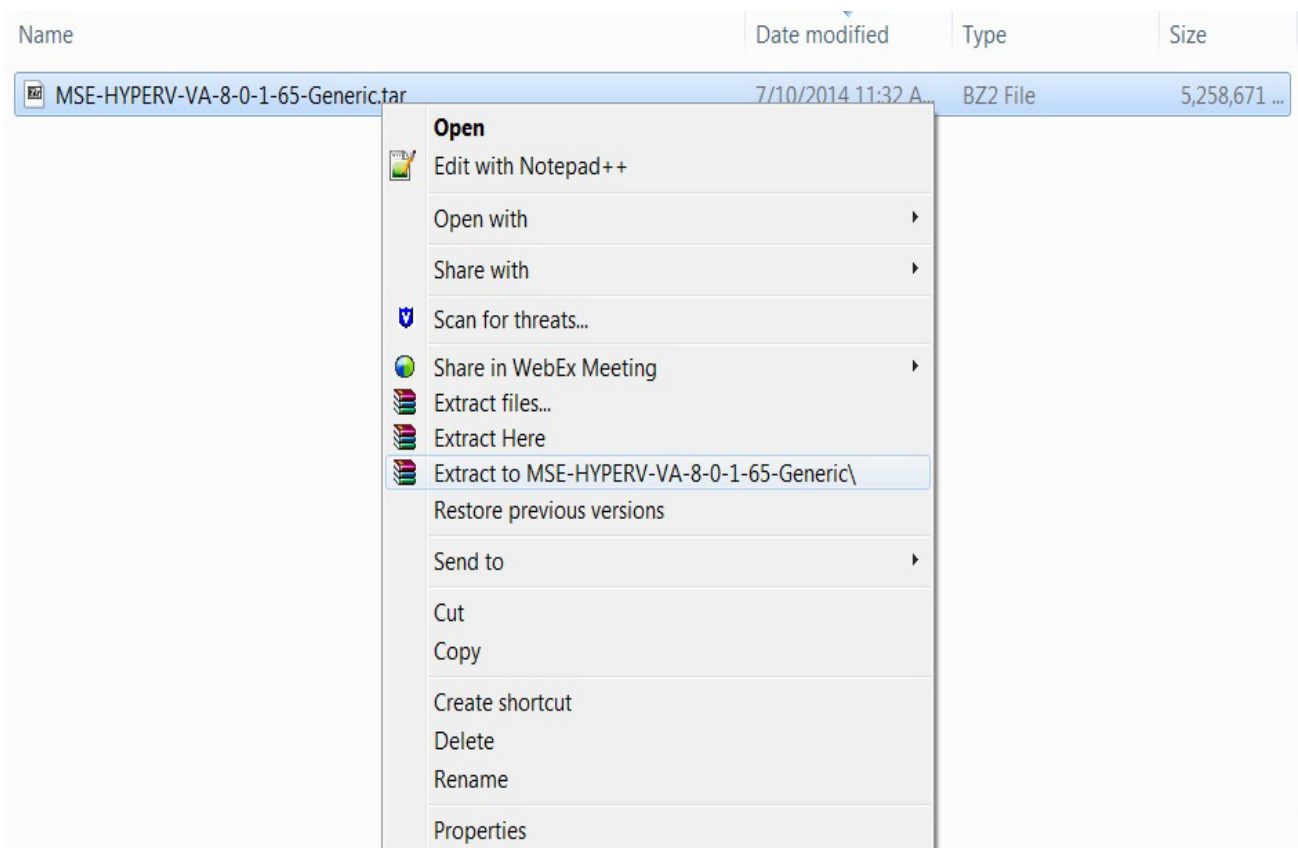
The extracted archive consists of these files (see Figure 5-2):

- HyperV client utility file (.ps1)
- MSE metadata file (.mf)
- MSE disk file (.vhd)
- MSE xml file (.ovf)

Figure 5-2   *Extracted Files*

Note   Do not change the name of any files that are extracted and make sure that the absolute path does not contain any spaces.

Step 3   You can run the **MSE-HyperV-Client-Utility.ps1** file in the following ways:

- Double click the utility.ps1 file and follow Step 4 through Step 8.

- Open the Windows PowerShell Client and go to the location where the archive is extracted and then run this file: ./MSE-hyperv-client-utility.ps1. Follow the steps from Step 9 through Step 19.

Step 4   Double click the **MSE-Hyper-Client-Utility** file.

Step 5   Provide the appropriate Virtual Machine (VM) name.

```
Enter the Virtual Machine name (Press [Enter] to choose Default[]):
```

Step 6   Enter the VHD location.

```
Enter the VHD location to be stored (Press [Enter] to choose Default
[C:\Users\Public\Documents\Hyper-V\]):
```

Step 7   Enter the VM location.

```
Enter the location to store the files for the new virtual machine (Press [Enter]
to choose Default [C:\ProgramData\Microsoft\Windows\Hyper-V\]):
```

Step 8   The MSE appliance is deployed in the Hyper-V server as shown below.

Figure 5-3   Hyper-V Deployment
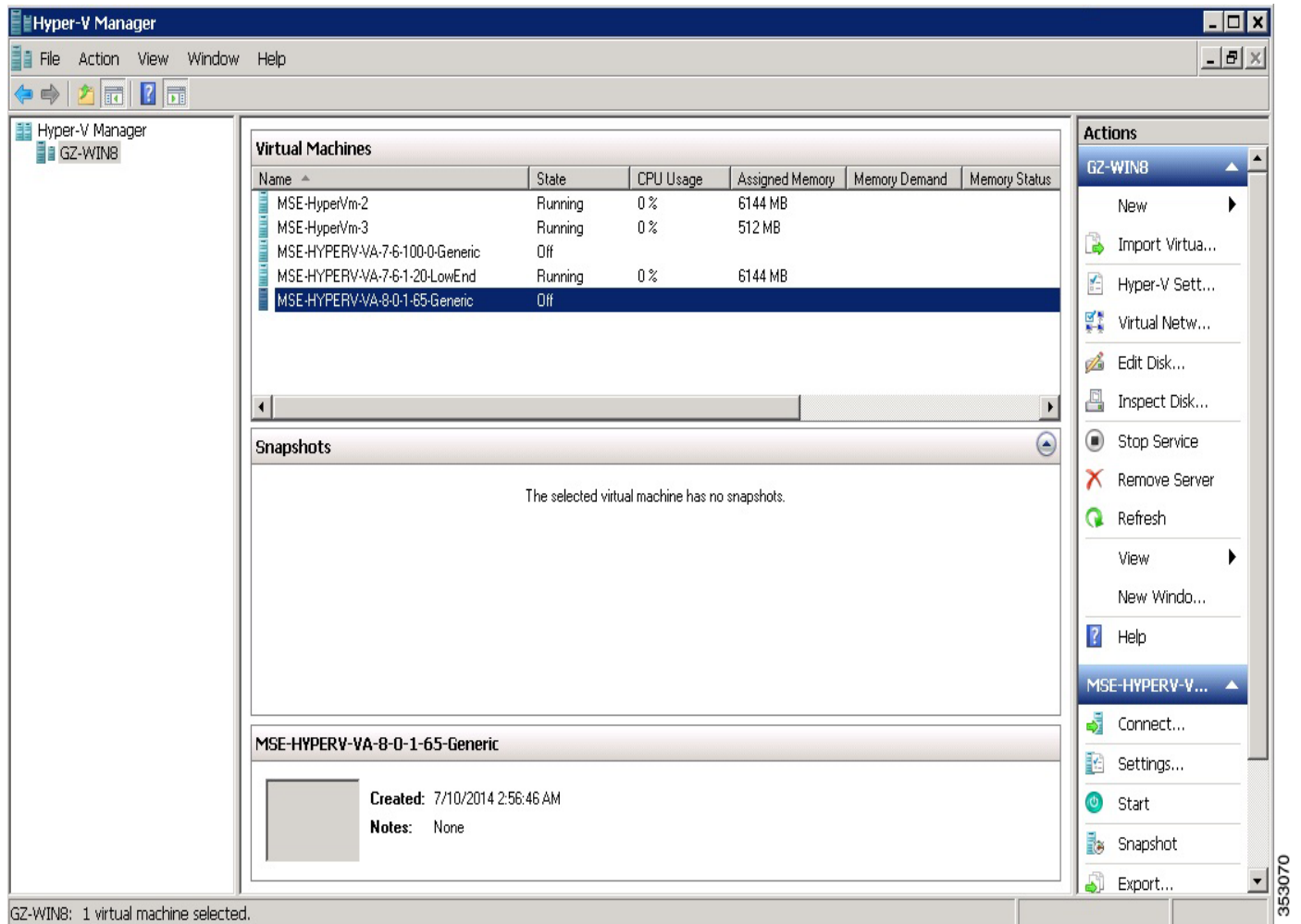
Step 9   Open the power shell and go to the location where the archive is extracted and run the file
./MSE-hyperv-client-utility.ps1 as shown in the figure below.

```
Administrator: Windows PowerShell                                                                    _ □ ×

PS C:\Users\Administrator\downloads> cd MSE-HYPERV-VA-8-0-1-65-Generic
PS C:\Users\Administrator\downloads\MSE-HYPERV-VA-8-0-1-65-Generic> ls


    Directory: C:\Users\Administrator\downloads\MSE-HYPERV-VA-8-0-1-65-Generic


Mode                LastWriteTime     Length Name
----                -------------     ------ ----
-a---         7/9/2014   1:56 PM       8746 MSE-HyperV-Client-Utility.ps1
-a---         7/9/2014   2:11 PM 1486085427 MSE-HYPERV-VA-8-0-1-65-Generic-disk.vhd
                                       2
-a---         7/9/2014   2:13 PM        171 MSE-HYPERV-VA-8-0-1-65-Generic.mf
-a---         7/9/2014   2:05 PM       5507 MSE-HYPERV-VA-8-0-1-65-Generic.ovf


PS C:\Users\Administrator\downloads\MSE-HYPERV-VA-8-0-1-65-Generic> .\MSE-HyperV-Client-Utility.ps1

Security warning
Run only scripts that you trust. While scripts from the internet can be useful, this script can potentially harm your
computer. Do you want to run
C:\Users\Administrator\downloads\MSE-HYPERV-VA-8-0-1-65-Generic\MSE-HyperV-Client-Utility.ps1?
[D] Do not run  [R] Run once  [S] Suspend  [?] Help (default is "D"): R
Enter the Virtual Machine name (Press [Enter] to choose Default[MSE-HYPERV-VA-8-0-1-65-Generic]) : _
```
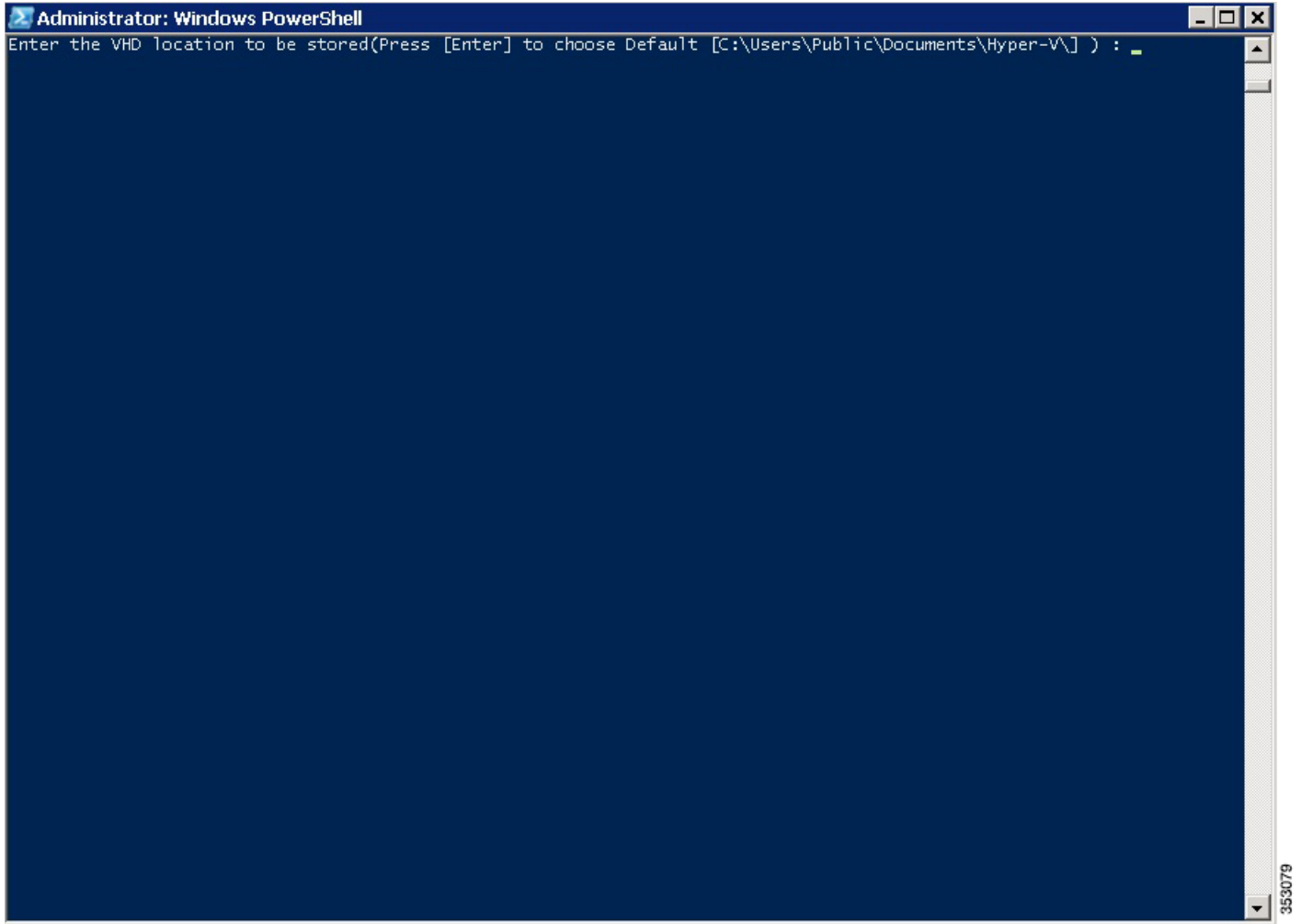
353078

Step 10   Prompts for the name of the VM:

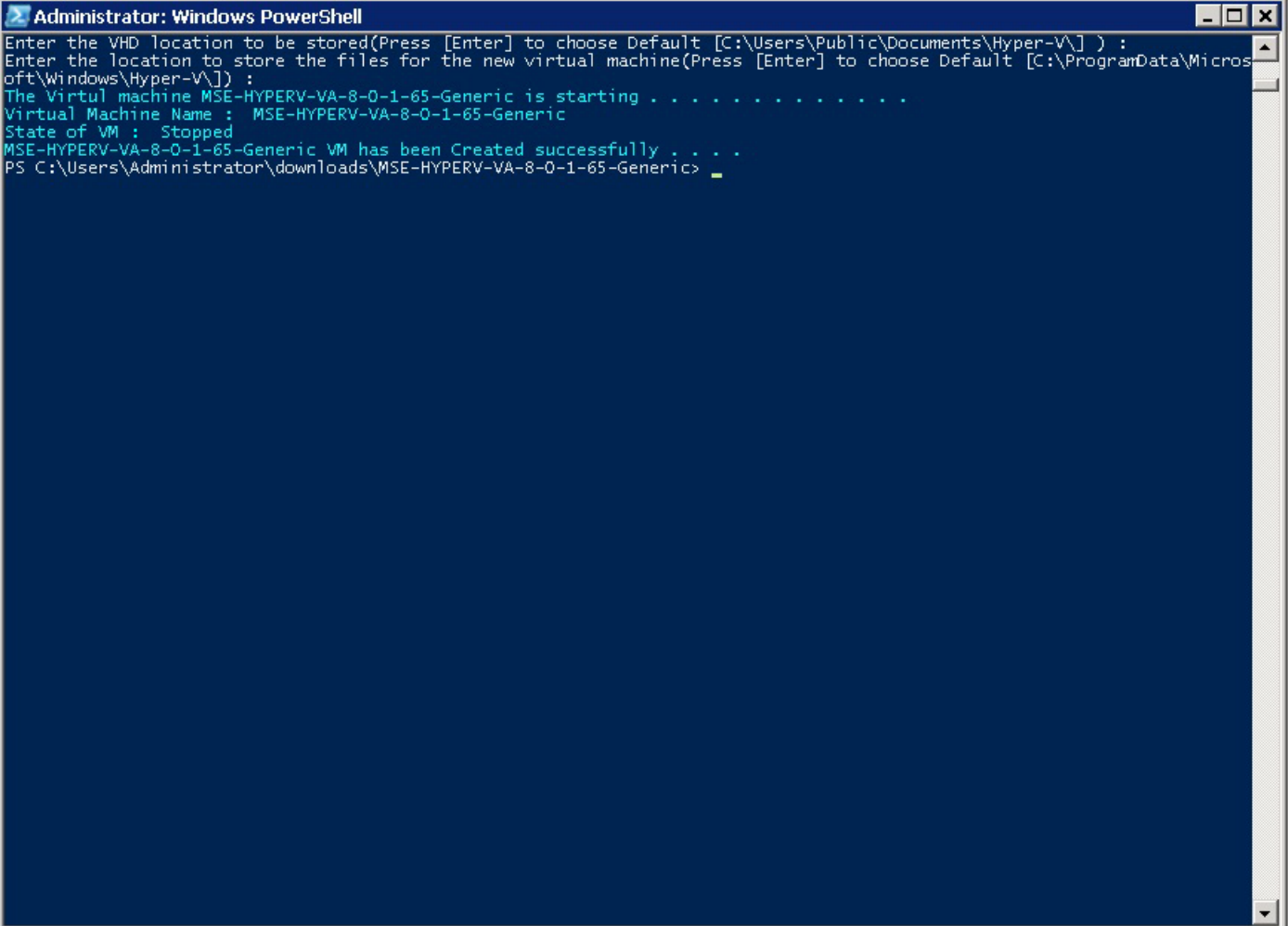- Provide the appropriate name or press Enter for default name.

Step 11   Prompts for the location to store the .VHD file:

- Specify the location to store the .VHD file or press **Enter** to store the file in the default location as shown in the figure below. If you select the default location for storing, select the VHD and make sure that the default location is "C:\Users\Public\documents\Hyper-v\' and has enough space to store the .VHD file.

```
Administrator: Windows PowerShell                                        _ □ ×
Enter the VHD location to be stored(Press [Enter] to choose Default [C:\Users\Public\Documents\Hyper-V\] ) : _
```

Step 12   Prompts for the location to store the VMs. Provide the path to store the virtual machine or press Enter to store at the default location.

**Step 13** The VM with attached VHD is defined into the Hypervisor and starts the VM

```
Administrator: Windows PowerShell
Enter the VHD location to be stored(Press [Enter] to choose Default [C:\Users\Public\Documents\Hyper-V\] ) :
Enter the location to store the files for the new virtual machine(Press [Enter] to choose Default [C:\ProgramData\Micros
oft\Windows\Hyper-V\]) :
The Virtul machine MSE-HYPERV-VA-8-O-1-65-Generic is starting . . . . . . . . . . . .
Virtual Machine Name :  MSE-HYPERV-VA-8-O-1-65-Generic
State of VM :  Stopped
MSE-HYPERV-VA-8-O-1-65-Generic VM has been Created successfully . . . .
PS C:\Users\Administrator\downloads\MSE-HYPERV-VA-8-O-1-65-Generic> _
```

Step 14 The newly created MSE appliance gets imported into the Check if the VM is up and running in the Hyper-V-Manager Client.

Step 15 Open the Hyper-V-Manager and find the newly created VM.
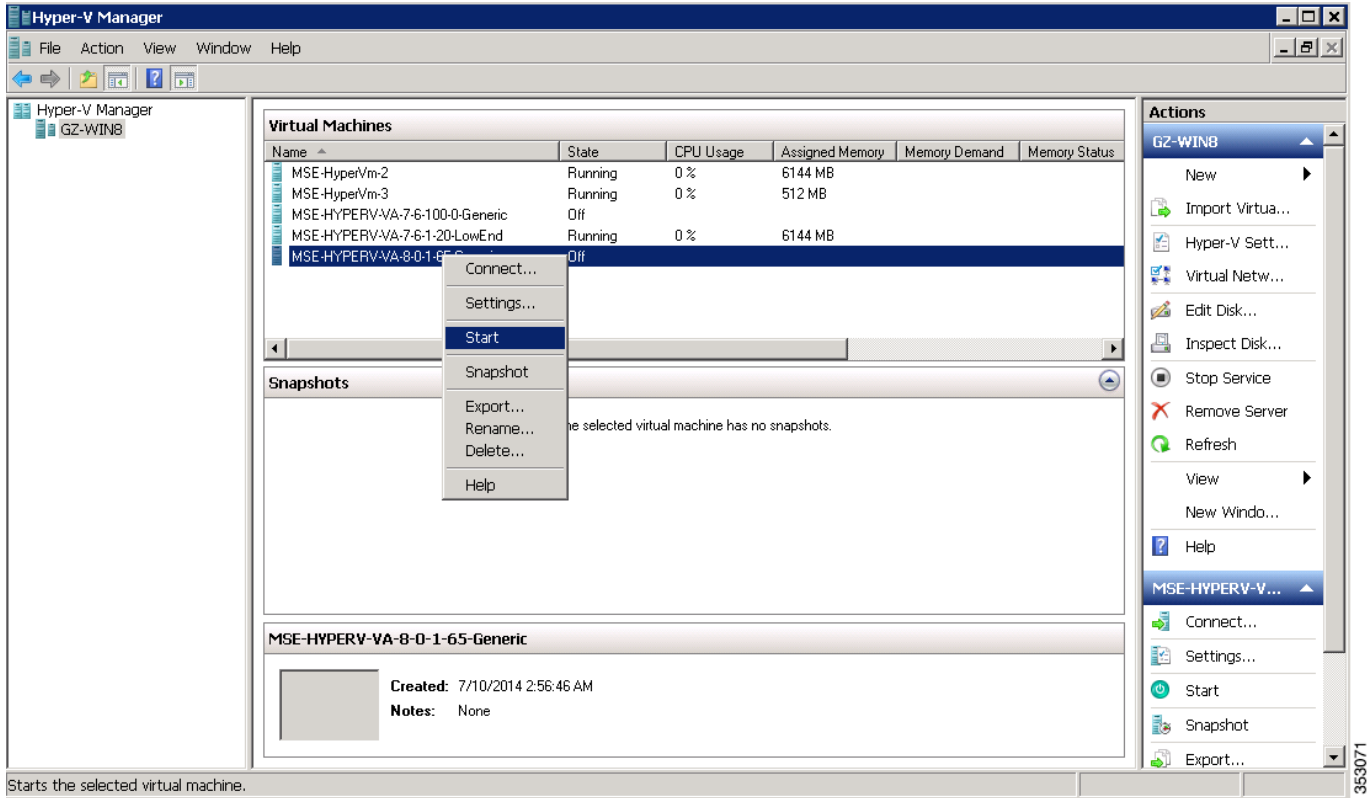
Figure 5-4 *Deployed Appliance*
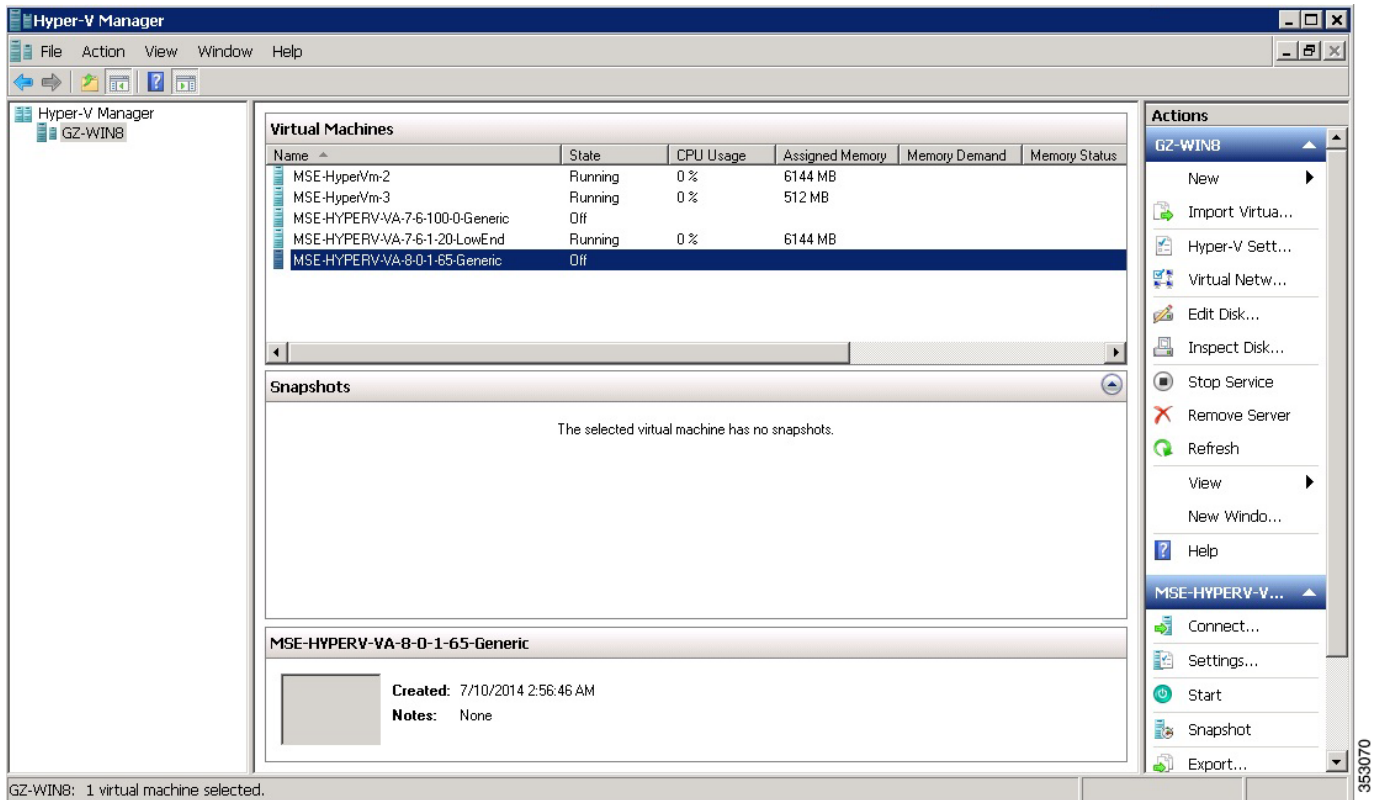
Step 16 The virtual machine will be in shut down state as soon as the deployment is completed.

Step 17   Start the Virtual Machine (VM).

Right-click on the imported file and select **Start** (see Figure 5-5).

Figure 5-5   Starting the Virtual Machine

Step 18   Check the network status of MSE VM.

Right-click on the VM and select Settings.

Step 19   In the Settings window, choose Hardware > IDE Controller 1 > Network Adapter1 to check the network that is attached to the NICs.

Configuring the Basic Settings to Start the MSE Virtual Appliance VM

You have completed deploying the MSE virtual appliance on a new virtual machine. A node for the virtual machine now appears in the resource tree in the HyperV-Manager window. After deployment, you need to configure basic settings for the MSE virtual appliance.

To start the MSE setup, follow these steps:

Step 1   Click the **Console** tab, within the console pane.

Step 2   Press **Enter** for the login prompt to appear to initiate the MSE Installation Wizard. The following is displayed:

```
-------------------------------------------------------------------
Cisco Mobility Services Engine
mse-kw login: root
password: password
Last login: Mon Apr 7 04:11:50 on tty1
```

Note   If the MSE does not prompt for setup, enter the following command: /opt/mse/setup/setup.sh.

```
Would you like to setup initial parameters using menu options (yes/no) [yes]:

Please select a configuration option below and enter the
requested information. You may exit setup at any time by
typing <Ctrl+C>.

You will be prompted to choose whether you wish to configure a
parameter, skip it, or reset it to its initial default value.
Skipping a parameter will leave it unchanged from its current
value.

Please note that the following parameters are mandatory and must be configured at lease
once.
        -> Hostname
        -> Network interface eth0
        -> Timezone settings
        -> Root password
        -> NTP settings
        -> Prime Infrastructure password

You must select option 24 to verify and apply any changes made during this session.
-------------------------------------------------------------

PRESS <ENTER> TO CONTIBNUE:


-------------------------------------------------------------

Configure MSE:

1) Hostname *                                  13) Remote syslog setting
2) Network Interface eth0 settings *           14) Host access control settings
3) Timezone settings *                         15) Audit rules
4) Root password *                             16) Login banner
5) NTP settings *                              17) System console restrictions
6) Prime Infrastructure configuration          18) SSH root access
7) Display current configuration               19) Single user password check
```

```
8) Domain                                20) Login and password settings
9) High availability role                21) GRUB password
10) Network interface eth1 settings       22) Root access control
11) DNS settings                          23) Auto start MSE on system boot up
12) Future restart time                   24) ## Verify and apply changes ##
```

✎
Note   It is highly recommended that all relevant items be configured during initial setup to ensure optimum operation of the mobility services engine in your network. The hostname and either the Ethernet-0 (eth0) or the Ethernet-1 (eth1) port must always be configured during the automatic installation.

✎
Note   You can rerun the automatic installation script at any time to add or change parameters using this command:
`[root@mse]# /opt/mse/setup/setup.sh.`
There is no need to re-enter values that you do not want to change during one of these updates.

✎
Note   If you do not want to configure an item, enter **skip** and you are prompted for the next configuration step. Any setting skipped is retained and not modified.

✎
Note   Minimal configuration is done for the mobility services engine as part of installation using the console. All configurations beyond the initial setup using the automatic installation is done with the Cisco Prime Infrastructure.

Step 3   Configure the hostname

```
Please enter your choice [1 - 24]: 1

Current hostname=[mse-kw]
Configure hostname?  (Y)es/(S)kip/(U)se default [Skip]: y
The host name should be a unique name that can identify
the device on the network. The hostname should start with
a letter, end with a letter or number, and contain only
letters, numbers, and dashes.

Enter a host name [mse-kw]:
```

Step 4   Configure eth0 network settings

```
Please enter your choice [1 - 24]: 2

Current IP address=[10.0.0.1]
Current eth0 netmask=[255.0.0.0]
Current IPv4 gateway address=[172.20.104.123]
Configure eth0 interface parameters? (Y)es/(S)kip/(U)se default [Skip]:y

Enter an IP address for first ethernet interface of this machine.

Enter eth0 IP address  [10.0.0.2]:

Enter the network mask for IP address 172.21.105.126

Enter network mask [255.255.255.224]:
```

```
Enter an default gateway address for this machine.

Note that the default gateway must be reachable from
the first ethernet interface.

Enter default gateway address [172.20.104.123]:
```

Step 5   Configure the DNS Settings:

```
Please enter your choice [1 - 24]: 11

Domain Name Service (DNS) Setup

Enable DNS (yes/no) [no]: y
Default DNS server 1=[8.8.8.8]
Enter primary DNS server IP address:
DNS server address must be in the form #.#.#.#, where # is 0 to 255 or hexadecimal :
separated v6 address

Enter primary DNS server IP address [8.8.8.8]:
Enter backup DNS server IP address (or none) [none]:
```

Step 6   Configure the Timezone settings:

> ✎
>
> **Note**   If your wIPS deployment consists of a Cisco MSE and other devices (such as Cisco WLCs and access points), set the Cisco MSE and the other devices to the same time zone.

```
Please enter your choice [1 - 24]: 3

Current timezone=[America/]
Configure timezone? (Y)es/(S)kip/(U)se default [Skip]: y

Enter the current date and time.

Please identify a location so that time zone rules can be set correctly.
Please select a continent or ocean.
 1) Africa
 2) Americas
 3) Antarctica
 4) Arctic Ocean
 5) Asia
 6) Atlantic Ocean
 7) Australia
 8) Europe
 9) Indian Ocean
10) Pacific Ocean
11) UTC - I want to use Coordinated Universal Time.
#? 2
Please select a country.
 1) Anguilla              27) Honduras
 2) Antigua & Barbuda     28) Jamaica
 3) Argentina             29) Martinique
 4) Aruba                 30) Mexico
 5) Bahamas               31) Montserrat
 6) Barbados              32) Netherlands Antilles
 7) Belize                33) Nicaragua
 8) Bolivia               34) Panama
 9) Brazil                35) Paraguay
10) Canada                36) Peru
11) Cayman Islands        37) Puerto Rico
12) Chile                 38) St Barthelemy
13) Colombia              39) St Kitts & Nevis
```

```
14) Costa Rica              40) St Lucia
15) Cuba                    41) St Martin (French part)
16) Dominica                42) St Pierre & Miquelon
17) Dominican Republic      43) St Vincent
18) Ecuador                 44) Suriname
19) El Salvador             45) Trinidad & Tobago
20) French Guiana           46) Turks & Caicos Is
21) Greenland               47) United States
22) Grenada                 48) Uruguay
23) Guadeloupe              49) Venezuela
24) Guatemala               50) Virgin Islands (UK)
25) Guyana                  51) Virgin Islands (US)
26) Haiti
#? 47
Please select one of the following time zone regions.
 1) Eastern Time
 2) Eastern Time - Michigan - most locations
 3) Eastern Time - Kentucky - Louisville area
 4) Eastern Time - Kentucky - Wayne County
 5) Eastern Time - Indiana - most locations
 6) Eastern Time - Indiana - Daviess, Dubois, Knox & Martin Counties
 7) Eastern Time - Indiana - Pulaski County
 8) Eastern Time - Indiana - Crawford County
 9) Eastern Time - Indiana - Pike County
10) Eastern Time - Indiana - Switzerland County
11) Central Time
12) Central Time - Indiana - Perry County
13) Central Time - Indiana - Starke County
14) Central Time - Michigan - Dickinson, Gogebic, Iron & Menominee Counties
15) Central Time - North Dakota - Oliver County
16) Central Time - North Dakota - Morton County (except Mandan area)
17) Mountain Time
18) Mountain Time - south Idaho & east Oregon
19) Mountain Time - Navajo
20) Mountain Standard Time - Arizona
21) Pacific Time
22) Alaska Time
23) Alaska Time - Alaska panhandle
24) Alaska Time - Alaska panhandle neck
25) Alaska Time - west Alaska
26) Aleutian Islands
27) Hawaii
#? 21


The following information has been given:

        United States
        Pacific Time


Therefore TZ='America/Los_Angeles' will be used.
Local time is now:     Sun Apr  6 18:45:27 PDT 2014.
Universal Time is now:  Mon Apr  7 01:45:27 UTC 2014.
Is the above information OK?
1) Yes
2) No
#? 1
```

Step 7   Configure the Root password:

> ✎
>
> **Note**   If you do not set the root password, a warning message is displayed when you apply the settings.

```
Please enter your choice [1 - 24]: 4

Root password has not been configured
Configure root password? (Y)es/(S)kip/(U)se default [Skip]:
Changing password for user root.

You can now choose the new password.

A valid password should be a mix of upper and lower case letters, digits, and other
characters. You can use an 8 character long password with characters from all of these
classes. An upper case letter that begins the password and a digit that ends it do not
count towards the number of character classes used.

Enter new password:
```

Step 8   Configure the NTP Setup

```
Please enter your choice [1 - 24]: 5

Network Time Protocol (NTP) Setup.

If you choose to enable NTP, the system time will be
configured from NTP servers that you select.  Otherwise,
you will be prompted to enter the current date and time.

NTP is currently disabled.
Configure NTP related parameters? (Y)es/(S)kip/(U)se default [Skip]: y

Enter whether or not you would like to set up the
Network Time Protocol (NTP) for this machine.

If you choose to enable NTP, the system time will be
configured from NTP servers that you select.  Otherwise,
you will be prompted to enter the current date and time.

Enable NTP (yes/no) [no]: y
Default NTP server 1=[time.nist.gov]
Enter NTP server name or address:
NTP server address must be in the form #.#.#.3, where # is 0 to 255 hexadecimal :
separated v6 address.
Enter NTP server name or [time.nist.gov]:
Enter another NTP server IP address (or none) [none]:
Configure NTP Authentication ? (Y)es/(S)kip/(U)se default [Skip]: y
Enter NTP Auth key Number [1]:
Enter NTP Auth key Value (String) [Secret]:
Do you want to continue (yes/no) [no]: y
```

Step 9   Configure the Prime Infrastructure password:

> **Note**   If you do not set the password, a warning message appears when you apply the settings. The default PI communication password is *admin*.

```
Please enter your choice [1 - 24]: 6

Cisco Prime Infrastructure communication password has not been configured.
Configure Prime Infrastructure password? (Y)es/(S)kip/(U)se default [Yes]:

Enter a password for the admin user.
The admin user is used by the Prime Infrastructure and other northbound systems to
authenticate their SOAP/XML session with the server. Once this password is updated, it
must correspondingly be updated on the NCS page for MSE General Parameters so that the
Prime Infrastructure can communicate with the MSE.

Enter Prime Infrastructure password:
```

Step 10   Verify the setup information and apply the changes:

```
Please enter your choice [1 - 24]:       23

Please verify the following setup information.

---------------------------BEGIN----------------------------

    Hostname=mse8-0
    Eth0 IP address= , Eth0 network mask=255.255.254.0
    Time zone=America/Los_Angeles
    Enable DNS=yes, DNS servers=8.8.8.8
    Enable NTP=yes, NTP servers=time.nist.gov
    Time zone=America/Los_Angeles
    Root password is changed.
    Cisco Prime Infrastructure password is changed.

----------------------------END-----------------------------

You may enter "yes" to proceed with configuration, "no" to make
more changes.


Configuration Changed
Is the above information correct (yes or no): yes

----------------------------------------------------------------
------------
Checking mandatory configuration information...

Setup will now attempt to apply the configuration.

Restarting network services with new settings.
Shutting down interface eth0:

The system is minimally configured right now. It is strongly recommended that you run the
setup script under /opt/mse/setup/setup.sh command to configure all appliance related
parameters immediately after installation is complete.

PRESS <ENTER> TO EXIT THE INSTALLER:
[root@mse8-0 installers]# reboot
Stopping MSE Platform

Flushing firewall rules:                                              [OK]
```

```
Setting chains to policy ACCEPT: nat filter                    [OK]
Unloading iptables modules:                                    [ok]

Broadcast message from root (pts/0) (Tue Apr29 14:15:27:2014):

The system is going down for reboot NOW:
The figure below shows an example of the completion screen:
```

> **Note** The next time you log in using root, only the Linux shell prompt appears and not the setup script. You can rerun the setup script at any time to change settings by logging in as *root* and running **/opt/mse/setup/setup.sh**.

Step 11 To verify the configuration, run the getserverinfo command.

```
[mse-kw]# getserverinfo
```

Step 12 To configure the MSE to automatically launch after boot up, enter the following command:

```
[mse-kw]# chkconfig msed on
```

Step 13 Roboot using the following command:

```
[mse-kw]# reboot
```

> **Note** To start the MSE service manually, enter the following command:
> ```
> [mse-kw]# service msed start
> ```
>
> The setup script generates a log file that can be found at **/opt/mse/setup/setup.log**.

Configuring MSE on the Prime Infrastructure

See Configuring MSE on the Prime Infrastructure, page 3-21 for more information.

Synchronizing the Network Design and Tracking Parameters

See Synchronizing the Network Designs, page 3-24 for more information.

APPENDIX **A**

Virtual Machine Setup and Administration

This chapter contains the following sections:

Adding a Hard Disk to a Virtual Machine in the vSphere Client

When you add a hard disk to a virtual machine, you can create a new virtual disk, add an existing virtual disk, or add a mapped SAN LUN.

In most cases, you can accept the default device node. For a hard disk, a nondefault device node is useful to control the boot order or to have different SCSI controller types. For example, you might want to boot from an LSI Logic controller and use a Buslogic controller with bus sharing turned on to share a data disk with another virtual machine.

For more information, refer to the VMware documentation at the following URL: Add a Hard Disk to a Virtual Machine in the vSphere Client.

Configuring the Network

By default, the virtual machine uses the host network settings. Hence, there is no configuration required for VM adapters on ESXi. If you have both public and private networks connected to the host and want the virtual machine to access to both the networks, then you must configure the VM adapters in the vSphere Client.

For more information, refer to the VMware documentation at the following URL: Configuring Networking for Host Machines in the vSphere Web Client.

Upgrading the Virtual Appliance

After configuring the virtual appliance, you should treat it like a physical MSE appliance. Do not deploy a new OVA every time you upgrade to the latest MSE release, instead, you can download the appropriate installer image onto the appliance and follow the steps given for upgrading the physical appliance.

Command Reference

This appendix contains some of the MSE commands that you use while deploying the virtual appliance.

MSE Commands

Use these commands to monitor tasks while deploying the MSE virtual appliance.

Table B-1   MSE Commands

Command	Explanation
service msed status	To determine the status of the MSE services.
service msed start	To start the MSE service manually.
service msed stop	To stop the MSE services.
rundiag	To perform diagnostics. You can use this command to view MSE UDI information that is required in order to obtain the license file for context-aware engine for clients.
ckkconfig msed on	To configure the MSE to automatically launch after boot up.
show udi	To get the Unique Device Identifier (UDI) from the virtual appliance.
getserverinfo	To verify the configuration.
reboot	To reboot the MSE.