Cisco EPN Manager 3.0 Installation

This chapter provides the information required for planning your installation of Cisco EPN Manager 3.0 and ensuring that you meet all the prerequisites required for the installation. It also provides procedures for installing Cisco EPN Manager 3.0 in a standard, non-high availability environment. For high availability, see Cisco EPN Manager 3.0 High Availability Installation.

Installation Overview

Cisco EPN Manager 3.0 can be installed as a fresh installation either on a virtual machine or a bare metal server. If you are already using a previous version of Cisco EPN Manager, you can upgrade to Cisco EPN Manager 3.0 and thereby retain your data. See Upgrade to Cisco EPN Manager 3.0.

The following topics provide an overview of the Cisco EPN Manager 3.0 installation and upgrade options and provide additional useful installation-related information.

- Installation Options
- Upgrade Options
- High Availability Overview
- Users Created During Installation

Note After installing any release or maintenance pack, it is recommended to check the Software Download site on Cisco.com for point patches and to install the latest available point patch for that release or maintenance pack. Information about the point patch and installation instructions can be found in the readme file supplied with the patch file on the Software Download site on Cisco.com.

Installation Options

You can install Cisco EPN Manager 3.0 either on a virtual machine (VM) or a bare metal server:

- OVA/VM installation—For a VM installation, install the Open Virtual Appliance (OVA) file on a dedicated server that complies with the requirements listed in OVA/VM Requirements. We recommend that you run only one Cisco EPN Manager VM instance per server hardware.
- ISO/bare metal installation—For a bare metal server installation, install the ISO image, which acts as a virtual boot that supports the Cisco Unified Computing System (UCS) server installation. The requirements are listed in Bare Metal Requirements. You can also use the ISO image to install Cisco EPN Manager on a VM. A built-in terminal or console server application called Cisco Integrated Management Controller (Cisco IMC) is used to install Cisco EPN Manager on the bare metal Cisco UCS server hardware.

Note ISO/Bare metal installation is not supported on non-Cisco hardware. To install Cisco EPN Manager on non-Cisco hardware, use VMware and install the OVA file. Using VMware will minimize hardware non-compliance issues, however, you must make sure that your hardware has the resources required to allow provisioning of the VM.

Both OVA and ISO installations include the following:

- RHEL 7.4 operating system
- Oracle Database 12c Enterprise Edition Release 12.1.0.2 (64-bit production)
- EPN Manager

Note Cisco EPN Manager does not support independent user-installed Linux/Oracle patches. Any necessary patches are included in Cisco EPN Manager releases or point patches.

Note Cisco EPN Manager does not support 4K sector disk.

Firmware Upgrade

Cisco EPN manager does not support Firmware or any product upgrades. If you need any support on the upgrades, please contact your Cisco Advanced Services representative.

Dual NIC Installation

These topics describe how to perform Dual NIC installation:

• Remove IP Configuration, on page 3

Prerequisites

In an HA environment:

- Remove High Availability
- Add the configuration needed for the second NIC
- Perform High Availability registration between Primary and Secondary Servers

Configure the Second NIC on Primary

Enter these commands in the admin CLI.

```
storm-ha-194/admin# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
storm-ha-194/admin(config)# interface GigabitEthernet 1
storm-ha-194/admin(config-GigabitEthernet)# ip address 172.23.222.32 255.255.255.0
Changing the hostname or IP may result in undesired side effects,
such as installed application(s) being restarted.
Are you sure you want to proceed? [y/n] y
storm-ha-194/admin(config-GigabitEthernet)# end
```

Add Static Route for Device Subnets in Primary

```
storm-ha-194/admin# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
storm-ha-194/admin(config)# ip route 172.0.0.0 255.0.0.0 gateway 172.23.222.32
storm-ha-194/admin(config)# end
storm-ha-194/admin# write memory
```

Update /etc/hosts in Multi NIC Server

By default, when we add eth1, it gets added to /etc/hosts with the hostname as eth0. We have to update the hostname of eth1 with its value.

Operation of a Multi-NIC Server

Static routes are not migrated as part of Backup restore process. We need to configure it manually after a restore. However, this setting can be retained in the upgraded [Backup Restore Upgrade] server.

In a HA environment:

- Failure of the first interfaces (used for heartbeat (the first interface)) will trigger a HA failover.
- Failure of the 2nd interface (SBI interface) will also trigger a failover.

Remove IP Configuration

```
storm-ha-194/admin# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
storm-ha-194/admin(config)# interface gigabitEthernet 1
storm-ha-194/admin(config-GigabitEthernet)# no ip 172.23.222.32 255.255.255.0
```

Upgrade Options

You can upgrade to Cisco EPN Manager 3.0 by following the valid upgrade path relevant for your existing deployment. See Valid Upgrade Paths.

The following methods are available for upgrading to Cisco EPN Manager 3.0:

- In-Place Upgrade—This option is usually chosen when you are not using new hardware; in other words, you are performing the upgrade on the machine that is running the earlier version of Cisco EPN Manager. There is some downtime with this type of upgrade but after the upgrade, you do not have to restore your data from a backup. For more information, see In-Place Upgrade.
- Backup-Restore Upgrade—This upgrade option generally requires new hardware (although it is possible to use existing hardware). There is less downtime when performing this type of upgrade as the current version of Cisco EPN Manager remains operational while you install the new version on the new hardware. However, after the installation, you must restore your data from a backup. After starting the restore process, there will be a period during which some data will not be available on the new server until all the data has been copied over. For more information, see Backup-Restore Upgrade.

Note Cisco EPN Manager does not support automatic rollback to the previous version after an upgrade but you can manually revert to the previous version. See Revert to the Previous Version of Cisco EPN Manager for more information.

Users Created During Installation

The following types of users are created during the installation process:

- **Cisco EPN Manager CLI admin user**—Used for advanced administrative operations such as stopping and restarting the application and creating remote backup repositories. Provides access to the CEPNM Admin CLI, a Cisco proprietary shell which provides secure and restricted access to the system (as compared with the Linux shell).

  The password for the CLI admin user is user-defined during installation but can be changed at a later stage by entering the following command:

  ```
  admin(config)# username admin <Password>
  ```

- **Linux CLI admin user**—Used for Linux-level administration purposes. Provides access to the Linux CLI, a Linux shell which provides all Linux commands. The Linux shell should only be used by Cisco technical support representatives. Regular system administrators should not use the Linux shell. The Linux shell can only be reached through the Cisco EPN Manager admin shell and CLI. The Linux CLI admin user can get Linux root-level privileges, primarily for debugging product-related operational issues.
- **Cisco EPN Manager web GUI root user**—Required for first-time login to the web GUI, and for creating other user accounts. The root user password is user-defined at the time of installation.
- **ftp-user**—Used for internal operations like image distribution to device or other operations that access external servers using FTP. The password is randomly generated and is changed periodically. Users with Admin privileges can change the ftp user password but this user-defined password will expire after a few months. Use this command to change the ftp user password:

  ```
  admin# ncs password ftpuser username password password
  ```

- **scpuser**—Used for internal operations like image distribution to device or other operations that access external servers using SCP. The password is randomly generated and is changed periodically.
- **prime**—The system-generated account under which all the application processes run. No changes can be made.
- **oracle**—The system-generated account used by the Oracle process. No changes can be made.

Note The first four user accounts are associated with actual network users. Cisco EPN Manager uses the **scpuser**, **prime**, and **oracle** user accounts to perform internal operations and they cannot be changed in any way.

For more information about user types and managing users, see the Cisco Evolved Programmable Network Manager User and Administrator Guide.

System Requirements

The following sections list the requirements that must be met before installing Cisco EPN Manager 3.0:

- Hardware and Software Requirements
- Web Client Requirements
- Scale Requirements (Professional)
- Ports Used by Cisco EPN Manager

Hardware and Software Requirements

- OVA/VM Requirements
- Bare Metal Requirements

OVA/VM Requirements

The following table summarizes the OVA/VM system requirements for the Standard and Professional system size options:

- **Standard:** To be used in a pre-production environment for lab tests, demos, and so on. Not recommended for use in a production environment.
- **Professional:** Recommended for production environments that meet the minimum requirements.

It is not recommended to use the Express and Express Plus system size options. Furthermore, the Compliance functionality is not supported on Express and Express Plus system size options.

Note External storage is supported for OVA/VM installations.

Server Type	Item	Standard	Professional
Virtual Machine	VMWare ESXi version **Note** Installations using an OVA image are supported on VMWare ESXi or ESX, on your own hardware. In all cases your server must meet or exceed the requirements listed in this table.	6.0.x, 6.5	6.0.x, 6.5
	Appliance image format	OVA	OVA
Hardware	Virtual CPU (vCPU)	16	16
	Memory (DRAM)	48 GB	64 GB
	Disk Capacity	900 GB	1200 GB
	Disk I/O speed	350 MBps	Minumum: 350 MBps Full scale: 450 MBps

Bare Metal Requirements

For bare metal installations, Cisco EPN Manager can only be installed on the Cisco UCS server (UCS C220 M4 or M5) as a rack-mounted server with the requirements listed in the following sections.

External storage is not supported for bare metal installations.

Note As opposed to OVA/VM installations, bare metal installations will use the full server resources.

Bare Metal Requirements for Standard Deployments (No High Availability)

These are the minimum requirements for a standard deployment (no high availability).

Item		Requirement
Bare-Metal	Appliance image format	ISO
	Equivalent 1.x Option	Physical Server

Hardware	Cisco UCS server type	Cisco UCS C220 M4, M4S, M5, M5SX and M5L
	CPU (cores/threads)	1 x CPU (10 C/20 T)
	Memory	64 GB
	Disk capacity	4x900 GB
	Disk I/O speed	450 MBps
	RAID Level	RAID 10

Bare Metal Requirements for Remote High Availability Deployments

These requirements are for a remote high availability deployment. A remote deployment is one in which both servers are located on different subnets connected by a WAN. This is typical for deployments when the servers are geographically dispersed. For more information on high availability deployments, see Cisco EPN Manager 3.0 High Availability Installation.

Hardware	Requirement
Cisco UCS server type	Cisco UCS C220 M4, M4S, M5, M5SX and M5L
CPU speed	Intel(R) Xeon(R) CPU E5-2650 v3 @ 2.30GHz or above
Cores/threads	10 C/20 T
Storage adapter	Cisco 12G SAS Modular Raid Controller
Hard Disk	Product ID: Cisco 12G SAS Modular Raid Controller
Interface	SATA (Serial Advanced Technology Attachment)
Hardware Sector Size	512 Native **Note** 4K sector disk is not yet supported
Memory	64 GB
RAID level	RAID 10
Number of NICs	1
Disk capacity	4x900 GB
Virtual hard disk size in RAID controller	1 TB (minimum requirement)
Hard disk controller location	Slot 1
Hard disk I/O speed	450 MBps
Hard disk RPM	Minimum 15k RPM SAS (flash recommended)

Hardware	Requirement
Network bandwidth	Ideal: 977 Mbps Minimum: 255 Mbps or more
Latency	Less than 100 msecs

Web Client Requirements

The following are the client and browser requirements for the Cisco EPN Manager Web GUI:

- Hardware—Mac or Windows laptop or desktop compatible with one of the tested and supported browsers listed below.
- Browsers:
  - Google Chrome versions 44 to 70
  - Mozilla Firefox ESR 38
  - Mozilla Firefox versions 39 to 63
  - Microsoft Internet Explorer (IE) 11.0

Note Internet Explorer users have reported slower performance compared to other browsers, meaning that some GUI pages take longer to load in IE.

- Recommended display resolution—1600x900 pixels or higher (minimum: 1366x768)

Note A maximum of three Cisco EPN Manager tabs can be open simultaneously in a single browser session.

Scale Requirements (Professional)

The following table summarizes the maximum level of support for a professional system size deployment in both OVA/VM and ISO/bare metal installations (based on test results from this example set of devices).

These scale numbers are for a Cisco EPN Manager Professional deployment that uses the default system settings. The numbers represent an example combination of different devices for each device type. Keep in mind that scale considerations depend on a number of factors including interface count, polling frequency, and so on.

Note You are highly recommended to contact your Cisco representative for assistance in determining the number of instances of Cisco EPN Manager you require before purchasing licenses and starting the implementation.

Item	Description	Maximum
Packet devices	Cisco Aggregation Services Routers (ASR) 9000 Series	100
	Cisco Aggregation Services Routers (ASR) 920 Series	1,100
	Cisco Aggregation Services Routers (ASR) 903 Series	500
	Cisco Aggregation Services Routers (ASR) 901 Series	1,100
	Cisco ME 3800X Series Carrier Ethernet Switch Routers	1,100
	Cisco ME 3600X Series Carrier Ethernet Switch Routers	1,100
	Maximum total packet devices	5,000
Optical devices	Cisco Optical Networking Services (ONS) and Cisco Network Convergence System (NCS) 2000 Series devices	3,000
	Cisco Network Convergence System (NCS) 4000 Series	1,000
	Maximum total optical devices	4,000
Optical and packet devices (hybrid)	Maximum total optical and packet devices (hybrid)	5000
Cable devices	Maximum total cBR-8 devices	200
	Maximum total Remote Physical Devices (RPDs) **Note** For information about optimizing Cisco EPN Manager performance, please contact your Cisco representative.	5,000
Monitoring	Sustained rate of events (events/sec)	100
	Maximum interfaces in the system	350000
	Maximum interfaces per device **Note** Limited to 10 devices with the maximum number of interfaces per system.	4000
System users	Concurrent web GUI users	50
	Concurrent API users	5

Ports Used by Cisco EPN Manager

Note The installation process uses the server's eth0 and eth1 Ethernet ports. If you use a different port, the system might not work properly.

The following table lists the ports that Cisco EPN Manager uses to listen for connection requests from devices. For security hardening, this table also specifies whether it is safe to disable the port without any adverse effects to the product.

As a general policy, any ports that are not needed and are not secure should be disabled. You need to first know which ports are enabled, and then decide which of these ports can be safely disabled without disrupting the normal functioning of Cisco EPN Manager. You can do this by listing the ports that are open and comparing it with a list of ports that are safe to disable. The built-in firewall in Cisco EPN Manager does not expose some of the listening ports. To view a list of the ports used in your deployment, log in as a Cisco EPN Manager CLI admin user and run the **show security-status** command. To view a list of all open listening ports, including those that are blocked by the built-in firewall, log in as the Linux CLI admin user and run the **netstat -aln** command.

In addition to the built-in firewall, you can also deploy additional network firewalls to block other unused ports and their traffic.

Table 1: Listening Ports That Are Open Through Built-in Firewall

Port	Protocol	Usage	Safe to Disable?	Notes
21	TCP	To transfer files to and from devices using FTP.	Yes	Disable FTP from the web GUI under **Administration > Settings > System Settings**, then choose **General > Server**. After disabling FTP, as the CLI admin user, stop and restart the server.
22	TCP	To initiate SSH connections with the Cisco EPN Manager server, and to copy files to the Cisco EPN Manager server using SCP or SFTP.	Depends	This might be still needed by older managed devices that only support TFTP and not SFTP or SCP.
69	UDP	To distribute images to devices using TFTP.	Depends	Only if alternative protocols like SCP or SFTP or HTTPS are used for image distribution, and if supported by the managed devices.
162	UDP	To receive SNMP traps from network devices.	No	—
443	TCP	For browser access to the Cisco EPN Manager server via HTTPS.	No	—
514	UDP	To receive syslog messages from network devices.	No	—
1522	TCP	For High Availability (HA) communication between active and standby Cisco EPN Manager servers. Used to allow Oracle JDBC traffic for Oracle database synchronization.	Yes	If at least one Cisco EPN Manager server is not configured for HA, this port is automatically disabled.

Port	Protocol	Usage	Safe to Disable?	Notes
2021	TCP	To distribute images to devices using FTP.	No	—
8082	TCP	For the HA Health Monitor web interface (via HTTP). Used by primary and secondary servers to monitor their health status via HTTP.	No (If HA configured)	—
8087	TCP	To update software on the HA secondary backup server (uses HTTPS as transport).	No	—
9991	UDP	To receive Netflow data packets.	Yes	Cisco EPN Manager does not support Netflow. You should disable this traffic in the network firewall.
9992	TCP	To manage M-Lync using HTTP or HTTPS.	Yes	Cisco EPN Manager does not support M-Lync. You should disable this traffic in the network firewall.
11011 to 11014	TCP	For PnP operations for proprietary Cisco Network Service (CNS) protocol traffic.	Yes	Cisco EPN Manager does not support PnP. You should disable this traffic in the network firewall by entering the following commands in this sequence (as the Cisco EPN Manager CLI admin user): **ncs pnp-gateway disable** **ncs stop** **ncs start**
61617	TCP	For MTOSI NBI notification over Java Message Service (JMS) connections. Also used for PnP operations.	Yes	Cisco EPN Manager does not support MTOSI over JMS or PnP. You should disable this traffic in the network firewall.

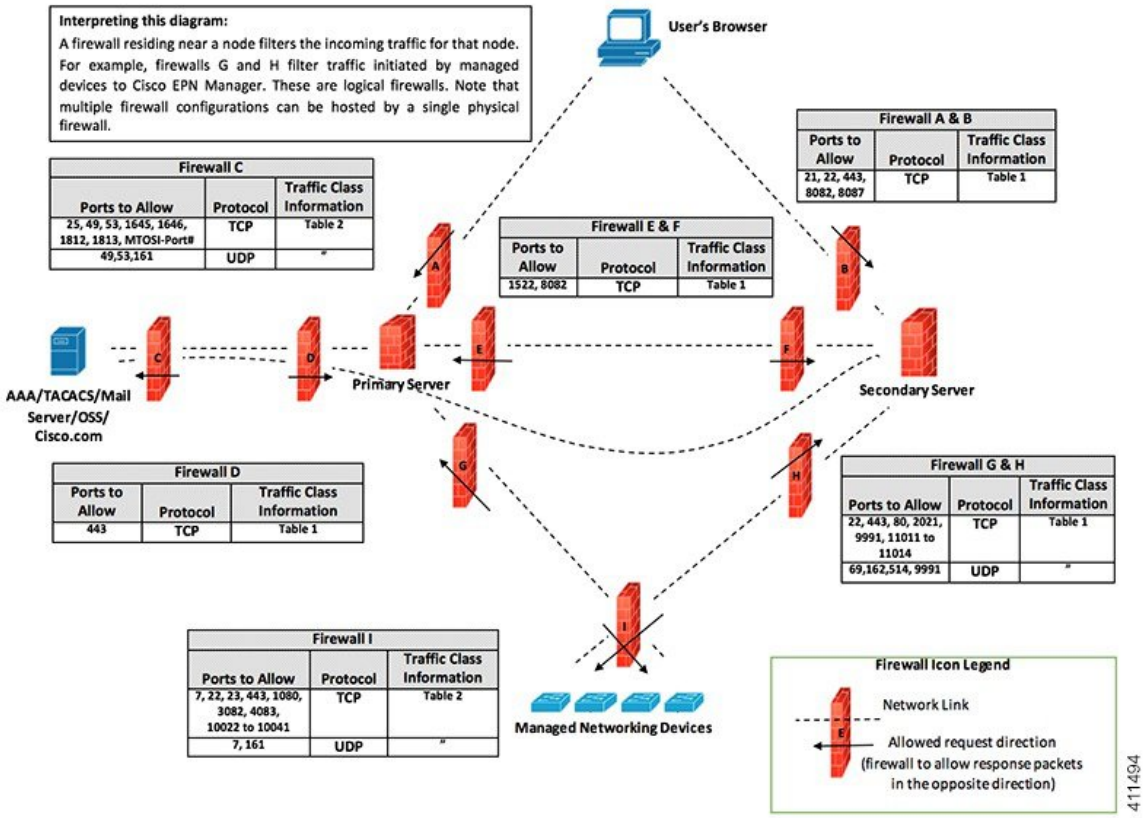
The following table lists the destination ports on external devices that may be protected by a firewall. These ports are used by Cisco EPN Manager to connect to network devices. You must open the required ports to allow Cisco EPN Manager to connect to these devices.

Table 2: Destination Ports Used by Cisco EPN Manager

Port	Protocol	Used to:
7	TCP/UDP	Discover endpoints using ICMP.
22	TCP	Initiate SSH connections with managed devices.

Port	Protocol	Used to:
23	TCP	Communicate with managed devices using Telnet.
25	TCP	Send email using an SMTP server.
49	TCP/UDP	Authenticate Cisco EPN Manager users using TACACS.
53	TCP/UDP	Connect to DNS service.
161	UDP	Poll using SNMP.
443	TCP	Upload or download images and perform configuration backup-restore for Cisco NCS 2000 devices using HTTPS.
1522	TCP	Communicate between primary and secondary HA servers (allows Oracle JDBC traffic for Oracle database synchronization between primary and secondary servers).
1080	TCP	Communicate with Cisco Optical Networking System (ONS) and Cisco NCS 2000 series devices using Socket Secure (SOCKS) protocol.
1645, 1646, and 1812, 1813	UDP	Authenticate Cisco EPN Manager users using RADIUS.
3082	TCP	Communicate with Cisco ONS and Cisco NCS 2000 devices using TL1 protocol.
4083	TCP	Communicate with Cisco ONS and Cisco NCS 2000 series devices using secure TL1 protocol.
8082	TCP	Communicate between primary and secondary HA servers to monitor each other's health using HTTPS.
10022 to 10041	TCP	Passive FTP file transfers (for example, device configurations and report retrievals).
MTOSI/RESTCONF TCP port number	TCP	Listen at NBI client connected to the Cisco EPN Manager server (after this port is configured by NBI client system, a registration notification message containing the port number is sent to Cisco EPN Manager server); refer to the MTOSI or RESTCONF API guide for more information.

The following figure illustrates the ports information listed in the previous tables. Use this illustration to decide on the appropriate firewall configuration (allowing correct incoming traffic) for your network infrastructure. To identify the class of traffic, refer to the Usage column in Table *Listening Ports That Are Open Through Built-in Firewall* . We recommend that you disable the ports that are used by services that are not supported in Cisco EPN Manager.



Installation Prerequisites

Licensing

Cisco EPN Manager includes a 90-day trial license that is automatically activated for first-time installations. To use the application beyond the trial period, you must obtain and install the necessary Cisco EPN Manager licenses for both production and non-production environments, as follows:

For a production environment:

- Base license (required)
- Standby license (optional)—Obtain this license if you will have a high availability deployment with two Cisco EPN Manager servers configured in a redundancy configuration.
- NBI license (optional)—Obtain this license if you will be using MTOSI or RESTCONF northbound interface features
- Right-to-Manage licenses for the types and corresponding numbers of devices to be managed by Cisco EPN Manager

For a non-production environment (e.g., lab validation or development environment), please obtain and install a Cisco EPN Manager lab license for each Cisco EPN Manager lab installation. The lab license covers all Cisco EPN Manager options, including redundancy (HA), and unlimited right-to-manage scope.

Do not make copies of licenses.

To purchase Cisco EPN Manager licenses, please contact your local sales representative.

For more information on the types of licenses available for Cisco EPN Manager, see the information on viewing and managing licenses in the Cisco Evolved Programmable Network Manager User and Administrator Guide.

Prerequisites for OVA/VM Installations

Before installing Cisco EPN Manager on a virtual machine, ensure that:

- Your deployment meets the general hardware and software requirements listed in System Requirements, and specifically in OVA/VM Requirements.
- Hardware resources are reserved for the Cisco EPN Manager server to ensure optimal performance. CPU minimum clock is 2.2 Ghz per CPU.
- VMware ESX/ESXi is installed and configured on the machine you plan to use as the Cisco EPN Manager server. See the VMware documentation for information on setting up and configuring a VMware host.
- The installed VMware ESX/ESXi host is reachable.
- The VMware vSphere client is installed on a Windows host (or laptop). See the VMware documentation for information on how to install the VMware vSphere client. After the virtual host is available on the network, you can browse to its IP address to display a web-based interface from which you can install the VMware vSphere client. The VMware vSphere client is Windows-based, so you must download and install the client using a Windows PC.
- The Cisco EPN Manager OVA is saved to the same machine where your VMware vSphere client is installed.
- The downloaded OVA package has been verified as described in Verify the ISO Image or OVA Package.

Prerequisites for ISO/Bare Metal Installations

Before installing Cisco EPN Manager using an ISO image, ensure that:

- Your deployment meets the general hardware and software requirements listed in System Requirements, and specifically in Bare Metal Requirements.
- The following software is installed:
  - Java with JRE Version 1.6.0.14 or higher
  - Flash Driver v9.0.246 or higher
- The downloaded ISO image has been verified as described in Verify the ISO Image or OVA Package.
- A reliable link is available for accessing the installation file. VPN links are not recommended.

Verify the ISO Image or OVA Package

Before installing Cisco EPN Manager, you need to verify the ISO image or OVA package. You do not need to verify the individual UBF files that are bundled inside the ISO image or OVA package.

Step 1 If you do not have **openssl** installed, download and install it (see http://www.openssl.org).

Step 2 Download the following files from the Software Download site on Cisco.com, and place them in a temporary directory.

- The Cisco EPNM 3.0 product OVA package or ISO image to be verified (*.iso or *.ova)
- The Cisco EPNM 3.0 OVA or ISO signature file (*.signature)
- The Cisco EPNM 3.0 certificate file (*.pem)

(The same certificate file (*.pem) is used to validate OVA and ISO files.)

Step 3 Move the ISO or OVA files, the certificate file, and the signature file to an alternate RHEL machine with openssl capability using a transfer method such as scp.

Step 4 Run the following command:

```
openssl dgst -sha512 -verify cert-file -signature sig-file product-file
```

Where:

- *cert-file* is the certificate file (*.pem)
- *sig-file* is the signature file (*signature)
- *product-file* is the file to be verified

Step 5 If the result is **Verified OK**:

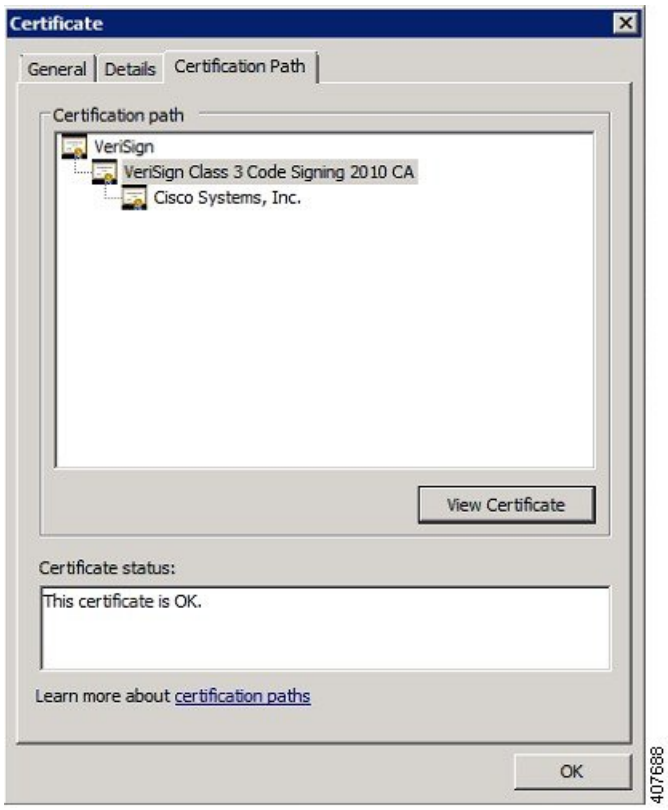
- For an OVA package, proceed to *Step 6*.
- For an ISO file, go to Install Cisco EPN Manager 3.0 (No HA).

Step 6 (OVA packages only) Verify the publisher and certificate chain using the VMware vSphere client.

1. Verify that Cisco Systems is the publisher:
   1. In the VMware vSphere client, choose **File > Deploy OVF Template**.
   2. Browse to the OVA installation file (*.ova) and select it, then click **Next**.
   3. Check whether the Publisher field in the OVF Template Details window displays **Cisco Systems, Inc** with a green check mark next to it. Do not proceed if the Publisher field displays **No certificate present**. This indicates that the image is not signed or the file is not from Cisco Systems or the file has been tampered with. Contact your Cisco representative.

      Note Do not validate the image using the information in the Vendor field. This field does not authenticate Cisco Systems as the publisher.

2. Check the certificate chain:
   1. In the OVF Template Details window, click the **Cisco Systems, Inc.** hyperlink in the Publisher field.
   2. In the Certificate window, click the **Certification Path** tab.
   3. In the Certification Path tab (which lists the certificate chain), ensure that the Certification Path area displays **Cisco Systems, Inc.** and the Certificate Status displays **This certificate is OK**, as shown in the following figure.



Install Cisco EPN Manager 3.0 (No HA)

Install Cisco EPN Manager Using an OVA/VM

1. Make sure your deployment meets the requirements in System Requirements.
2. Make sure your deployment meets the prerequisites in Prerequisites for OVA/VM Installations. This includes verifying the OVA package.
3. Deploy the OVA from the VMware vSphere Client.
4. Set the System Time of the Deployed OVA, on page 17
5. Install Cisco EPN Manager on the Server.
6. Uninstall Cisco EPN Manager.

Deploy the OVA from the VMware vSphere Client

Step 1 Launch the VMware vSphere client.

Step 2 Choose **File > Deploy OVF Template**.

Step 3 In the Deploy OVF Template window, click **Browse**.

Step 4 Navigate to the OVA file, select it, then click **Next**.

Step 5 Accept the End User License Agreement, and in the OVF Template Details window, verify the OVA file details including the product name, version, and size, then click **Accept**.

Step 6 In the Name and Location window:

1. Specify a name and location for the template that you are deploying. The name must be unique within the inventory folder, and can contain up to 80 characters.
2. Select the configuration type as Standard or Professional based on your network size (see System Requirements).
3. Click **Next**.

Step 7 Select the cluster or host on which to install the OVA, then click **Next**.

Step 8 Select the destination storage for the OVA to be deployed, then click **Next**.

Step 9 Select the disk format as **Thick Provision Lazy Zeroed** or **Thick Provision Eager Zeroed**, then click **Next**.

Step 10 Select the network mapping based on the configured IP address, then click **Next**.

Step 11 In the Ready to Complete window:

1. Verify your selections.
2. (Optional) If you want the virtual machine to automatically start after the OVA deployment has finished, check the **Power on after deployment** check box.
3. Click **Finish**.

This process might take a few minutes to complete. Check the progress bar in the Deploying Virtual Application window to monitor the task status. When the deployment task has successfully completed, a confirmation window appears.

Step 12 Click **Close**. The virtual appliance that you deployed is listed under the host, in the left pane of the VMware vSphere client.

What to do next

Proceed to Set the System Time of the Deployed OVA, on page 17.

Set the System Time of the Deployed OVA

Step 1 In the VMware vSphere client, select the VM in the left pane.

Step 2 Access the Boot Settings options (**Edit Settings>VM Options> Boot Settings**.

Step 3 Select the check box in the **Force BIOS Setup** area so that the BIOS setup screen will appear the next time the VM boots.

Step 4 Click **Save**.

Step 5 Boot the VM.

Step 6 In the BIOS setup screen, set the system time and date to the current UTC time.

Step 7 Press **F10** to save your changes and exit the screen.

What to do next

Proceed to Install Cisco EPN Manager on the Server.

Install Cisco EPN Manager on the Server

Step 1 In the VMware vSphere client, click the **Console** tab, and at the localhost login prompt, enter **setup**.

Step 2 Enter the following parameters as you are prompted for them:

Parameter	Description
Hostname	Host name of the virtual machine.
IP Address	IP address of the virtual machine.
IP default netmask	Default subnet mask for the virtual machine IP address.
IP default gateway	IP address of the default gateway.
Default DNS domain	Default DNS domain name.
Primary nameserver	IP address of the primary DNS server. The console will prompt you to add a secondary nameserver. Enter: • **Y** to enter a secondary nameserver. • **N** to proceed to the next step of the installation.
Secondary nameserver	IP address of the secondary DNS server you want to use if the primary server cannot be reached.
Primary NTP server	IP address or host name of the primary Network Time Protocol server you want to use (the default is **time.nist.gov**). The console will prompt you to add a secondary NTP server. Enter: • **Y** to enter a secondary NTP server. • **N** to proceed to the next step of the installation.
Secondary NTP servers	IP address of the secondary NTP server you want to use if the primary NTP server cannot be reached.
System Time Zone	The time zone you want to use.
Clock time	The clock time (based on the selected System Time Zone). This is the time that will be shown in the machine. Check that the time is correct based on your time zone and change it if necessary. See Time Zones Supported by Cisco Evolved Programmable Network Manager. The console will prompt you to change the system clock time. Enter: • **Y** to change the clock time. • **N** to proceed to the next step of the installation.

Parameter	Description
Username	The name of the first administrative user (**admin** by default). This is the Cisco EPN Manager **CLI admin user** that logs into the Cisco EPN Manager server using SSH.
Password	The password for the first administrative user. The password must be at least 8 characters long, and must contain at least one number and one upper-case letter.

When you have entered the necessary values, the installer application tests the network configuration parameters you entered. If the tests are successful, it begins installing Cisco EPN Manager.

Step 3 When the application installation is complete, you will be prompted to choose whether you want the newly-installed server to act as a secondary server in an HA implementation.

- Enter **yes** if you are using HA and you want this server to be the secondary server. Do not continue with the next step; go to Install Cisco EPN Manager 3.0 in a High Availability Deployment.
- Enter **no** if:
  - You are not using HA.
  - You are using HA but you want this server to be the primary server.

Step 4 Enter a password for the Cisco EPN Manager **web GUI root user** (you will have to enter it twice). You will use this password to log into the web GUI for the first time and create other user accounts. (This account should be disabled after you create a new user account with the same level of privileges.)

Step 5 Review your settings and:

- If the settings are correct, select **Y** to apply them.
- If any settings are incorrect, select **N**, edit them, and then apply them.

Step 6 (ISO/Bare Metal deployments) When the installation is complete:

1. After the server reboots and you are presented with a login prompt, log in using the Cisco EPN Manager CLI admin username and password you configured.
2. Synchronize the hardware and NTP clocks as described in Synchronize the Hardware and NTP Clock.

Step 7 (OVA/VM deployments) When the installation is complete and the virtual machine has rebooted:

1. Log into the virtual machine using the Cisco EPN Manager CLI admin username and password you configured in *Step 3*.
2. Stop and restart the Cisco EPN Manager server using the following commands:

```
ncs stop
ncs start
```

Install Cisco EPN Manager Using an ISO/Bare Metal Image

1. Make sure your deployment meets the requirements in System Requirements.
2. Make sure your deployment meets the prerequisites in Prerequisites for ISO/Bare Metal Installations. This includes verifying the ISO/bare metal image.

3. Configure the Cisco IMC Server.
4. Configure the Bare Metal Cisco UCS Server.
5. Install Cisco EPN Manager from an ISO Image.
6. Uninstall Cisco EPN Manager.

Note The installation procedure provided in these sections is specific to the UCS server type and hardware requirements described in Bare Metal Requirements.

Configure the Cisco IMC Server

Cisco Integrated Management Controller (Cisco IMC) is the server management application that you can use to remotely access, configure, administer, and monitor the Cisco EPN Manager server.

Step 1 To access the console, attach a keyboard and monitor to the USB ports on the rear panel of the appliance or by using a KVM cable and connector.

Step 2 Power on the Cisco UCS server.

Step 3 Press **F8** to enter the Cisco IMC configuration utility. You will need to press the function keys (F8, F6 and F2) more than once until the system responds. If you do not press **F8** quickly enough and enter the EFI shell, press **Ctrl-Alt-Del** to reboot the system and press **F8** again.

Step 4 In the Cisco IMC Configuration Utility window, from the IPV4 (Basic) area, enter the following:

- DHCP Enabled—Select this option to enable DHCP for dynamic network settings. Before you enable DHCP, your DHCP server must be preconfigured with the range of MAC addresses for this server.
- Cisco IMC IP—Enter the IP address of Cisco IMC.
- Subnetmask—Enter the subnet mask to append to the Cisco IMC IP address. It must be in the same subnet as the host router.
- Gateway—Enter the IP address of the default gateway router.

Step 5 Press **F5** to refresh the page and display the new settings.

Step 6 (Optional) In the VLAN (Advanced) area, configure VLAN settings.

Step 7 Enter the Cisco IMC password. If you leave the Username and Password fields blank, the system uses the following default login credentials:

- Username: **admin**
- Password: **password**

Step 8 When a prompt is returned, press **F10** to save the configuration.

Step 9 Update the following fields as specified:

- NIC mode—Select **Dedicated**.
- IP (Basic)—Select **IPV4**.
- DHCP—Disable DHCP if enabled.
- CIMC IP—Enter the IP address of the Cisco IMC.

- Prefix/Subnet—Enter the subnet of the Cisco IMC.
- Gateway—Enter the gateway address.
- Pref DNS Server—Enter the preferred DNS server address.
- NIC Redundancy—Null.

Step 10 Press **F1** to view the additional settings.

Step 11 In the Additional Settings window, update the following fields:

- Hostname—Enter the Cisco IMC hostname.
- Dynamic DNS—**Disable**.
- Enter the admin password. If you leave the Password field blank, the default password is **password**.

Step 12 Press **F10** to save the settings.

Step 13 Open a browser and enter the following URL:

`https://Cisco IMC_IP_address`

Where *Cisco IMC_IP_address* is the Cisco IMC IP address that you entered in *Step 9*.

Step 14 Log into the Cisco IMC using the credentials that you entered in *Step 7*.

What to do next

Proceed to Configure the Bare Metal Cisco UCS Server.

Configure the Bare Metal Cisco UCS Server

This procedure is specific to the Cisco 12G SAS Modular Raid Controller. For any other Raid controller please refer to the Cisco UCS Servers RAID Guide.

Step 1 Set the local and UTC time zones and set boot options, as follows:

a) From the left sidebar of the Cisco IMC web interface, choose **Chassis > Summary**.
b) Change the time zone to the correct *local* time zone.
c) Launch KVM and connect to the server.
d) Reset the server (warm boot).
e) When prompted, press F2 to enter CMOS.
f) Change the time to the current UTC time (not the local time) and press F10 to save your change.
g) **For UCS C220 M4 devices only:**Click the **Boot Options** tab. Enable **UEFI Boot options**, and then choose **Bus PCI RAID Adapter** for Boot Option #1.
h) Reboot the host.
i) Reboot Cisco IMC and log in again.
j) Check that the time is correct in **Chassis > Summary**.

Step 2 From the left sidebar of the Cisco IMC web interface, choose **Storage > Cisco 12G SAS Modular Raid Controller (SLOT-HBA)**.

Step 3 In the Cisco 12G SAS Modular Raid Controller (SLOT-HBA) pane, click the **Controller Info** tab.

Step 4 Under Physical Drive Info, make sure that boot drive is not set to true for any physical drives.

Step 5 In the Actions area, click **Create Virtual Drive** from the **Unused Physical Drives** link.

Step 6 In the Create Virtual Drive from Unused Physical Drives window, choose **10** from the RAID Level drop-down list.

Step 7 In the Create Drive Groups area, select the physical drives listed under the Physical Drives area, then add them to the Drive Groups.

Step 8 In the Virtual Drive Properties area, choose **Write Back Good BBU** from the Write Policy drop-down list.

Step 9 Complete the required fields, then click **Create Virtual Drive**.

Step 10 Click the **Virtual Drive Info** tab.

Step 11 Click **Initialize**. A popup window is displayed.

Step 12 Click **Initialize VD** and select **Full Initialize**. Wait for the operation to complete (between 30 and 60 minutes).

Step 13 Follow the steps below to enable Auto-Negotiation to speed up the installation:

1. From the left sidebar, click the **Admin** tab.
2. Click **Network**.
3. In the Network pane, click the **Network Settings** tab.
4. In the Port Properties area, check the **Auto Negotiation** check box.
5. Click **Save Changes**.

Step 14 From the left sidebar, click the **Admin** tab.

Step 15 In the Utilities pane, click the **Actions** area, then click **Reboot Cisco IMC**.

Step 16 Click **OK**.

Step 17 Press **F10** to save and exit.

The system is now prepared to boot from RAID. (The first boot, however, must be done from a remote virtual CD/DVD which is mapped to the ISO image. That process is described in Install Cisco EPN Manager from an ISO Image.)

What to do next

Proceed to Install Cisco EPN Manager from an ISO Image.

Install Cisco EPN Manager from an ISO Image

Step 1 Power up the Cisco UCS Server.

Step 2 Log into the Cisco IMC Server using the credentials you entered when configuring the IMC server. See Configure the Cisco IMC Server.

Step 3 Choose **Chassis > Summary**, then click **Launch KVM** to open the console (in a separate window).

Note Make sure that you are using the Java version of KVM and not the HTML version as the HTML version might be interrupted by the browser causing remote media installations to fail.

Step 4 In the KVM Console window, choose **Virtual Media > Activate Virtual Devices**. A popup window is displayed.

Step 5 Click the **Accept this Session** radio button, then click **Apply**.

Step 6 In the KVM Console window, choose **Virtual Media > Map CD/DVD**.

Step 7 In the Virtual Media - Map CD/DVD window, select the ISO file, then click **Map Device**.

Step 8 In the KVM Console window, choose **Virtual Media** and verify that the **ISO filename .iso Mapped to CD/DVD** option is displayed.

Step 9 Reboot the server by choosing **Power > Reset System** (warm boot).

Step 10 Enter the boot menu by pressing **F6**.

Step 11 From the boot device selection window, select **Cisco vKVM-Mapped vDVD1.22**, then press **Enter**.

Step 12 For the boot option, enter **1** for Keyboard/Monitor or **2** for Serial Console, then press **Enter**. The Cisco EPN Manager installer extracts the content.

You can monitor the progress in the KVM Console by selecting **Tools > Stats**. When the amount transferred is approximately 5 GB, the operation is complete.

Note Do not monitor the screen for install progress because this will cause the transfer to be 50-60% slower. Rather allow the screen to go sleep and display "No Signal".

Step 13 After the extraction is complete, at the localhost login prompt, enter **setup**.

Step 14 Go to *Step 3* in Install Cisco EPN Manager on the Server to complete the installation.

Post-Installation Tasks

Step 1 As the Root user, run the **ncs status** command and make sure that all the processes are up and running.

Step 2 Run the following command to to synchronize all files with the local time on the server:

```
find /opt/CSCOlumos/updates/ -mmin -0 -print0 | xargs -0 touch -t $(($(date +%Y%m%d%H%M)-6))
```

Uninstall Cisco EPN Manager

- Uninstall Cisco EPN Manager (OVA/VM)
- Uninstall Cisco EPN Manager (ISO/Bare Metal)

Uninstall Cisco EPN Manager (OVA/VM)

Before You Begin

Perform a backup. Uninstalling Cisco EPN Manager using the following method will permanently delete all your data on the server, including server settings and local backups. You cannot restore your data unless you have a remote backup. Refer to the backup topics in the Cisco Evolved Programmable Network Manager User and Administrator Guide.

Step 1 In the VMware vSphere client, right-click the Cisco EPN Manager virtual machine.

Step 2 Power off the virtual machine.

Step 3 Click **Delete from Disk** to remove the Cisco EPN Manager virtual appliance.

Uninstall Cisco EPN Manager (ISO/Bare Metal)

Before You Begin

Make sure you have backed up your current data. See the backup and restore topics in the Cisco Evolved Programmable Network Manager User and Administrator Guide.

To ensure information security, Cisco recommends you use either of the following methods to remove Cisco EPN Manager from the Cisco UCS server:

- Digital file shredding—Use the digital file shredding utility to securely delete the files and clean the disk space.
- RAID secure deletion—If you are using a RAID system, use the RAID features to securely delete the files.