Hewlett Packard
Enterprise

HPE Moonshot Provisioning Manager User Guide

Version 1.20

Abstract

The HPE Moonshot Provisioning Manager enables users to deploy operating system images to the nodes on HPE Moonshot systems. This guide contains information about setting up and getting started with HPE MPM, and is for anyone authorized to access HPE Moonshot.

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Acknowledgments

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1 Getting started with HPE Moonshot Provisioning Manager

HPE MPM application features

The HPE Moonshot Provisioning Manager has the following features:

- A First Time Setup Wizard (setup wizard) to configure network parameters of the MPM VM, and provide setup of chassis provisioning network resources
- Automatic or manual discovery of HPE Moonshot 1500 Chassis Management Module, and associated components
- Multi-Chassis discovery and management
- Upload and storage of operating system installation images (ISO files) and automated installation configuration files (Kickstart, AutoYaST, Preseed and Unattended.txt)
- Pre-loaded templates of supported installation configuration files
- Single or multiple node native installation of supported operating systems and installation configuration files
- Backup of deployed operating system to disk image
- Single or multiple node cloning of backed up disk image

Installing HPE Moonshot Provisioning Manager

Process overview:

1. Download HPE MPM.

   The VM image download for the MPM contains two files, each for a different virtual machine player:

   - An OVA file for VMware Player
   - A VHD file for Microsoft Hyper-V (compressed)

2. Install HPE MPM VM on VMware Workstation or install HPE MPM VM on Microsoft Hyper-V.
3. Network the HPE MPM.
4. Configure the HPE MPM VM on the first boot.
5. Complete the first time setup wizard.
6. Configure the uplink, if needed.

Downloading HPE MPM

Download the MPM image from the Hewlett Packard Enterprise Software Depot at:**http://www.hpe.com/info/softwaredepot**.

The VM is a full network installation system, and will provide Dynamic Host Configuration Protocol (DHCP) services on the connected network.

Installing on VMware Workstation

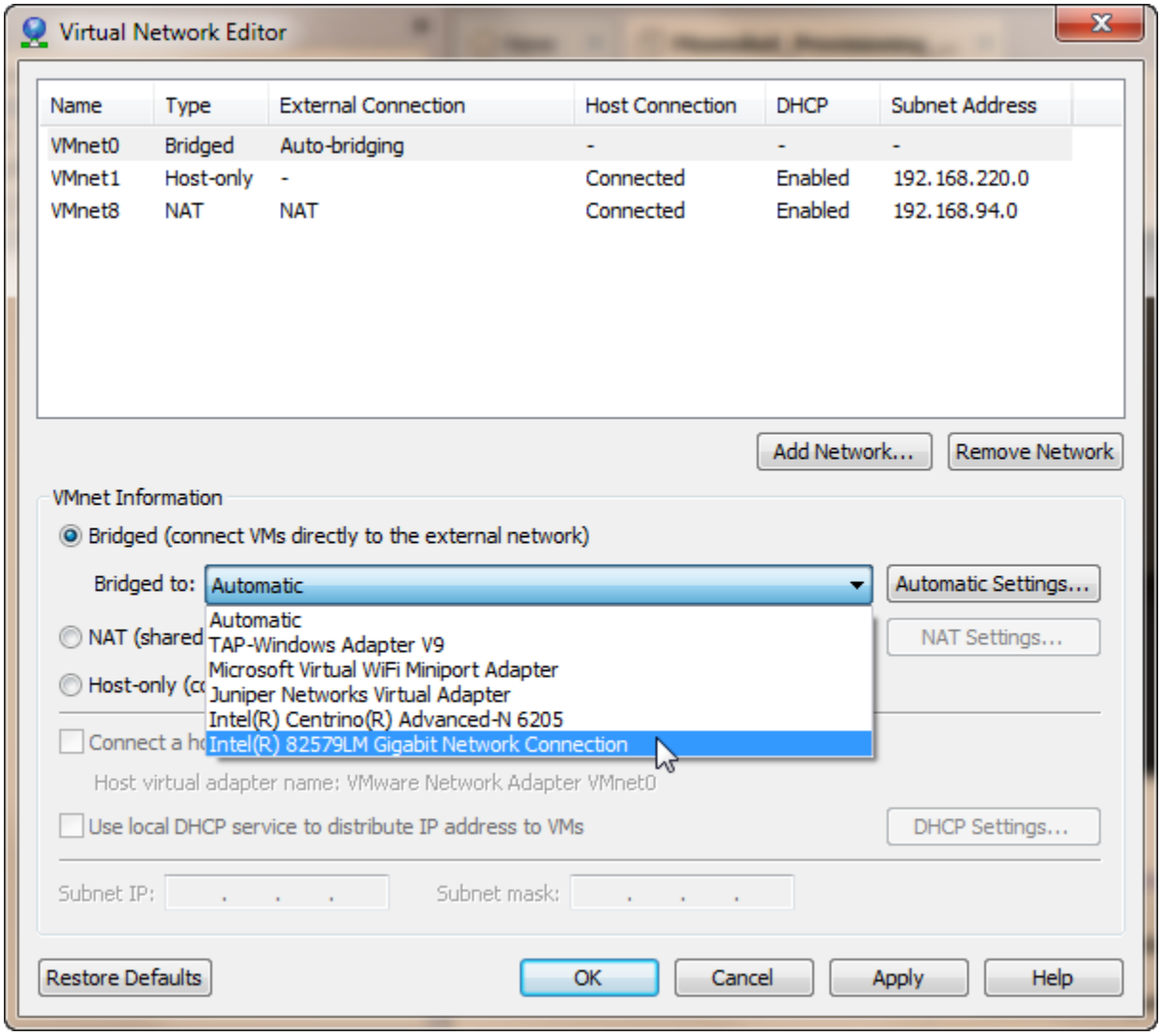
Prerequisites

- Before starting, download and install VMware Workstation according to the manufacturer's instructions.
- Ensure that you are configuring the MPM on a properly isolated network containing only the MPM VM and the Moonshot 1500 Chassis, or are fully aware of the implications of connecting the MPM VM to an existing production network.

Installing HPE MPM on VMware Workstation

1. Start VMware Workstation.
2. Click **Open a Virtual Machine**.
3. Select the OVA file on your local machine.
4. Accept the defaults or choose a new name and storage path.
5. Click **Import** and then wait while the files are imported.

   When finished importing the VM, a new tab is created in VMware Workstation with the name of the new VM.
6. Click **Edit→Virtual Network Editor**.
7. In the **VMnet Information** section, select **Bridged** and then select your wired network connection from the list.



8. Click **Apply**, and then click **OK**.
9. Click **Power on this virtual machine**.
10. Wait for the new VM to power up, and then choose the network connection option appropriate for your environment. See “Networking with HPE MPM ” (page 8).

Installing on Microsoft Hyper-V

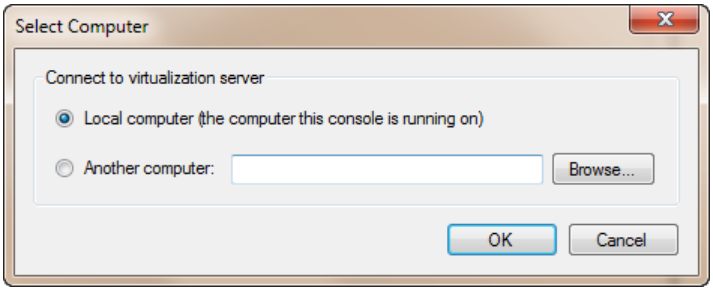
Prerequisites

- If not already present on your system, download Microsoft Hyper-V Manager as part of the Remote Server Administration Tools for Windows 7 with Service Pack 1. Install the RSAT Tools according to the manufacturer's instructions.
- Ensure that you are configuring the MPM on a properly isolated network containing only the MPM VM and the Moonshot 1500 Chassis, or are fully aware of the implications of connecting the MPM VM to an existing production network.

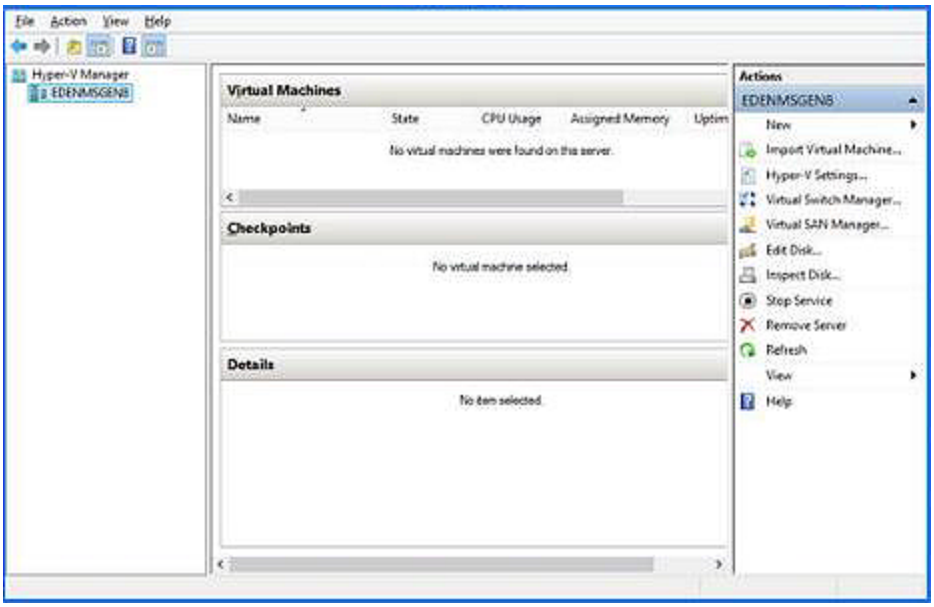
Installing HPE MPM in Microsoft Hyper-V

1. Open the Windows Control Panel, and then click **Turn Windows features on or off**.
2. Scroll down and expand the entry for **Remote Server Administration Tools**.
3. Expand the **Role Administration Tools** entry.
4. Select **Hyper-V Tools**, and then click **OK**.

   Wait while Windows adds the new feature.
5. Open Hyper-V Manager by clicking **Start→All Programs→Administrative Tools→Hyper-V Manager**.
6. In Hyper-V Manager, click **Actions→Connect to Server**.
7. Make sure the **Local computer** option is selected.



8. Click **OK**.
9. Click on the Local computer instance, and the actions pane options change.



10. In the Actions pane, click **Virtual Switch Manager**, and then do the following:
    a. Select **External** for the type of virtual switch to create.
    b. Click **Create Virtual Switch**.
    c. Enter a **Name** for the new virtual switch (for example, *MPM-Virtual-Switch*).
    d. Select the **External network** radio button option.
    e. Click **OK**.
11. Click **Actions→New→Virtual Machine** and then do the following:
    a. Click **Next** if the First Time notification appears.
    b. Enter a **Name** for the virtual machine.
    c. Select **Generation 1** and click **Next**.
    d. For startup memory, enter **2048** MB.
    e. Click **Next**.
    f. For **Connection**, choose the new virtual switch name created earlier (for example, *MPM-Virtual-Switch*).
    g. Click **Next**.
    h. Click the **Use an existing virtual hard disk** radio button.
    i. Click **Browse…** and select the HPE MPM VHD file.
    j. Click **Next**.
    k. Verify the **Description** information.
    l. Click **Finish** to complete the setup.
12. Start the new VM. Wait for the new VM to power up, and then choose the network connection option appropriate for your environment.

More information

Networking with HPE MPM

Networking with HPE MPM

Choose a networking method:

1. Isolated
2. Externally connected

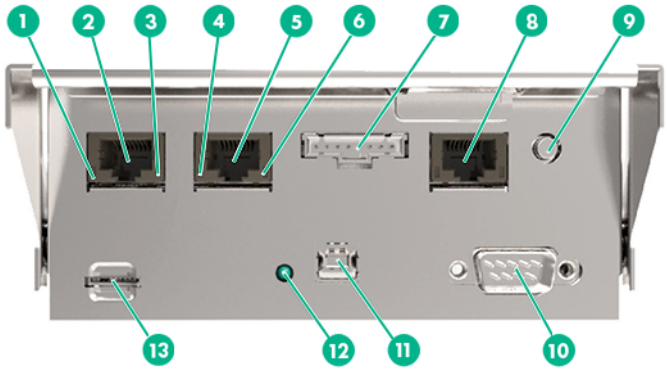
Prerequisites

Connect the power cords to the power supplies and then power on the Moonshot System first. Wait for the chassis to power up, and then connect the networking cables using one of the two networking options.

Best practices for MPM provisioning networks

Moonshot Provisioning Manager includes a network installation system. Configuring networking between the MPM VM, HPE Moonshot iLO Chassis Management Firmware, and the HPE Moonshot switch modules is the key to successfully setting up MPM and deploying operating systems to HPE ProLiant server cartridges.

Figure 1 1 HPE Moonshot 1500 Chassis Management module connectors and LEDs



1. iLO management port link LED
2. iLO management port (10/100/1000 Ethernet)
3. iLO management port activity LED
4. Link port link LED
5. Link port
6. Link port activity LED
7. HPE APM connector
8. Diagnostic port
9. UID LED/button
10. Serial port
11. USB connector
12. Chassis manager health LED
13. MicroSD slot

You must connect the network VM in one of two configurations, based on whether you want to have an isolated provisioning network or not. In either configuration, ensure that all components are in the same VLAN/network.

Moonshot uplink modules provide either a 40 Gbps QSFP, or 10 Gbps SFP+ port to use, depending on the model, and one or more adapters to connect directly to the Moonshot 1500 CM module's Link port. For more information, see the "Adapters, cables, and splitters" chapter in the *HPE Moonshot Networking Cookbook* available from the HPE Moonshot Information Library at **http://www.hpe.com/info/moonshot/docs**.

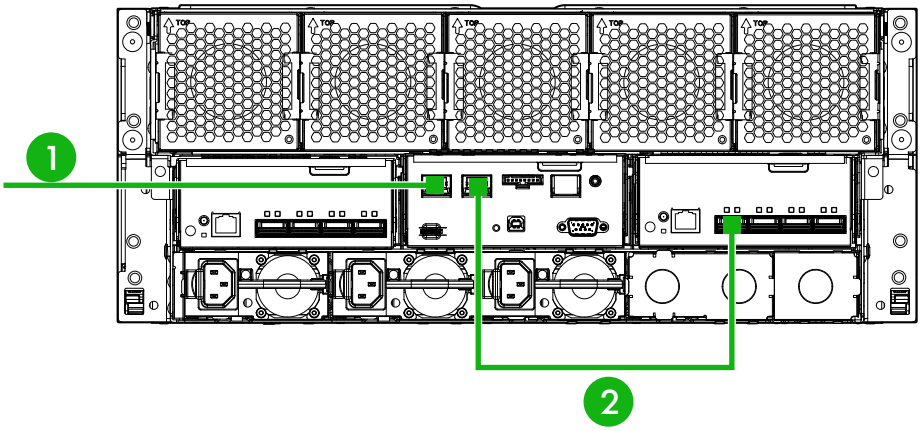
Network option 1: Isolated provisioning using a direct connection

Direct connections

This networking option consists of a direct connection between:

- A computer running the MPM VM (This networking option is ideal for situations in which the MPM VM is installed on a laptop computer.)
- Moonshot Chassis Manager
- The first switch in the Moonshot chassis

Connecting an isolated provisioning network



1. Connect your laptop with an Ethernet cable to the iLO management port (10/100/1000 Ethernet) on the Moonshot 1500 CM module.
2. Connect an Ethernet cable from the Link port on the Moonshot 1500 CM module to port 1/1/1 of uplink module A.

Network option 2: Networked provisioning using an external switch

Networked connections and VLAN tagging

This networking option consists of an indirect connection, using one or more external switches, between:

- A networked computer running the MPM VM
- Moonshot Chassis Manager
- The first internal switch (A) in the Moonshot chassis

This method allows you to integrate MPM and Moonshot into an existing infrastructure, and does not require that you attach a system directly to the chassis.

You must ensure that the MPM VM and the Chassis Manager are connected to the same VLAN within your environment. Additionally, the first NIC of your node(s) must be connected to the same VLAN for provisioning tasks to complete successfully.

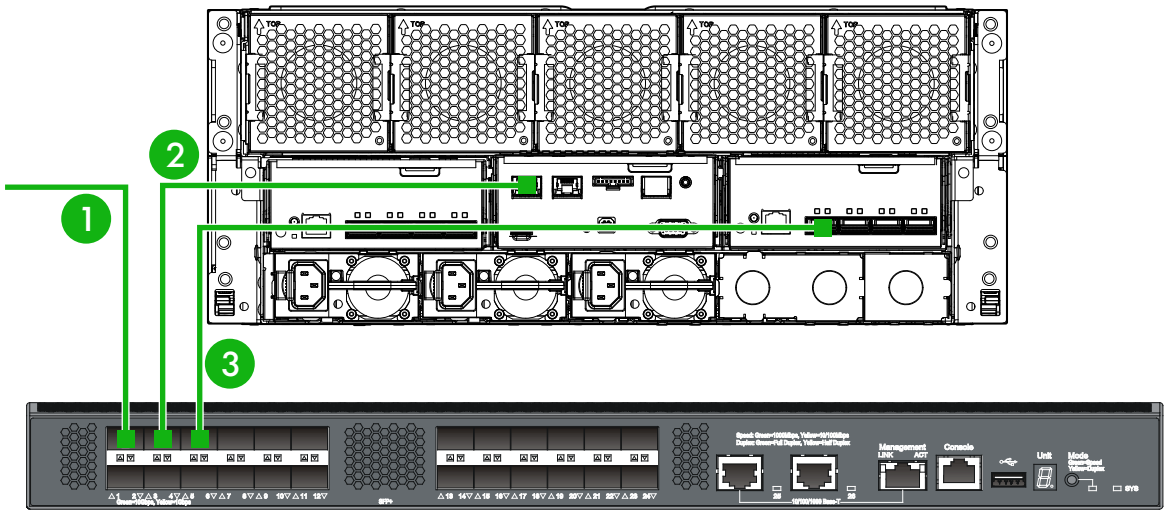
Network configuration is a topic that usually requires a network administrator to be involved prior to connecting a Moonshot Chassis to an existing network, particularly when in a multiple VLAN environment, and when using Ethernet tagging.

More information

Changing HPE MPM configuration settings

Prerequisites

1. Verify that the external switch is configured such that the three ports connected to these devices are all on the same VLAN.
2. Connect the power cords to the power supplies and then power on the Moonshot System first. Wait for the chassis to power up, and then connect the networking cables using one of the two networking options.
3. To change the automatic uplink configuration between tagged and untagged, use the **Edit Network Settings** screen. See “Configuring IPv4 settings ” (page 30).



1. Connect an Ethernet cable from your server or workstation to the external switch (top of rack).
2. Connect an Ethernet cable from the external TOR switch to the iLO management port (10/100/1000 Ethernet) on the Moonshot 1500 CM module
3. Connect an Ethernet cable from the external TOR switch to port 1/1/1 of uplink module A.

NOTE: The uplink module provides either a 40 Gbps QSFP, or 10 Gbps SFP+ port to use, and requires one or more adapters to connect to the top of rack switch. See the “Adapters, cables, and splitters” chapter in the available in the Moonshot Information Library at **http://www.hpe.com/info/moonshot/docs**.

Configuring the HPE MPM VM on first boot

When you boot the VM for the first time, you must create a new user account for access to the Virtual Machine application itself, which is then used for the first login to the web interface. You can add new users later through the **User Administration** page in the web interface. This is different than the user and password you use with the Moonshot iLO Chassis Management Firmware web interface.

Do the following after you boot the MPM VM for the first time:

1. Enter a full name, username, and password, and then press **Enter** to setup a new user:

```
  No Valid User Present. Please Create a new User
  Enter FullName:Sample User
  Enter UserName:SampleUser
  Enter Password:SamplePa$$
================================
  User Create Successfully.
================================
  Please press Enter to continue
```

The **Moonshot Provisioning Manager Setup** menu displays next.

2. Enter **1** and press **Enter** to configure the MPM network settings.

```
Moonshot Provisioning Manager Setup
```

```
You may try the following URL to access the web user interface
https://172.31.0.1

Menu
----
1) Configure Moonshot Provisioning Manager Network
2) Set to Factory Default
3) Reset Password
4) Start Shell
5) Reboot VM
6) Shutdown VM

Enter an option 1 to 6: 1
```

3. You must now complete a series of network configuration items. Press **Enter** after each choice to accept the default value, or enter custom values as appropriate:

Table 1 Configuration items

Field Name	Enter this	Description	Default Value
`Provisioning Manager IP Address`	Enter VM IP	The IP address of the provisioning VM itself on the provisioning network (you are free to configure a second NIC in the VM if necessary)	172.31.0.1
`Netmask Address`	Appropriate netmask for your IP and network	Network mask value for the VM and the provisioning network	255.255.0.0
`Discovery DHCP Start IP Address`	Enter Start IP	The first IP address that the VM will use for DHCP on the provisioning network. These will be used primary for devices such as the Chassis Manager and the Switches	172.31.0.11
`Discovery DHCP End IP Address`	Enter End IP	The last IP address that the VM will use for DHCP	172.31.16.254
`Node Start IP Address`	Enter Node Start IP	The first IP address that will be used for assigning IP addresses to nodes (this should NOT overlap with the DHCP range provided above.) There should be a number of free IP addresses starting at this address, equal to the number of nodes that you will be managing.	172.31.17.1
`Gateway Address`	Enter Gateway	IP Gateway for the VM and provisioning network	None
`DNS1 IP Address`	Enter DNS1	The first DNS server for the VM and provisioning network	None
`DNS2 IP Address`	Enter DNS2	The second DNS server for the VM and provisioning network	None
`DNS3 IP Address`	Enter DNS3	The third DNS server for the VM and provisioning network	None
`Domain Name`	Domain Name	DNS Domain Name for the VM and provisioning network	None

Once the values are accepted or entered, the text console updates the network settings for the MPM and then automatically reboots the VM if necessary.

If the default values were changed, you might notice that the Provisioning Manager Virtual Machine IP address is reflected at the top of the console between the dotted lines.

IMPORTANT: Record this IP address for use later when accessing the MPM web interface.

More information

Changing HPE MPM configuration settings

Completing the setup wizard

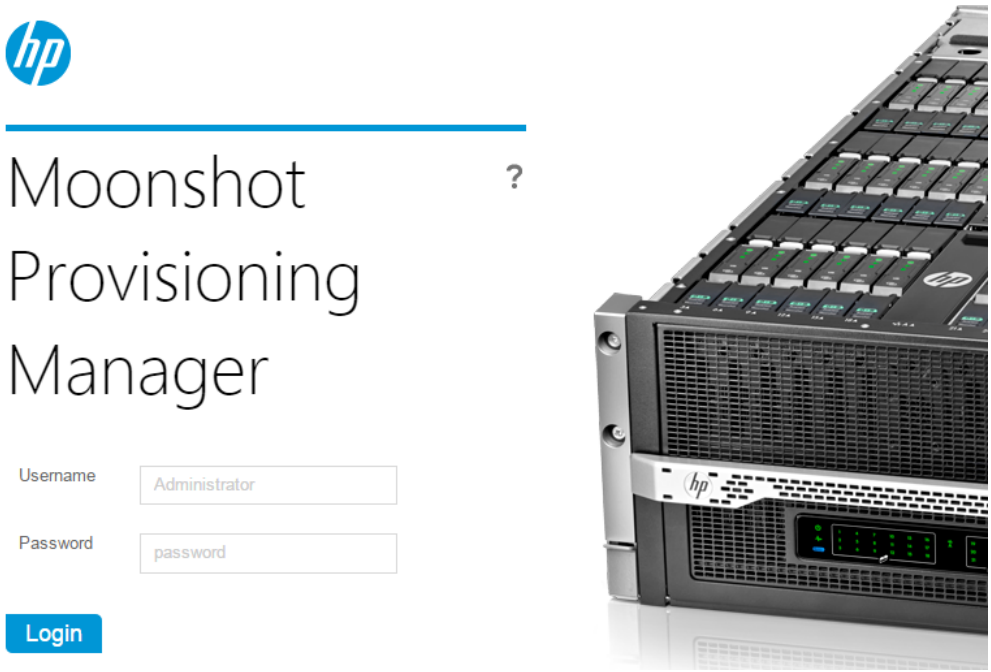
Logging into the HPE MPM web interface for the first time

After the initial text console setup steps, you can start the MPM web interface. You must login, and then verify or change the settings that you chose in the text console.

Follow these steps to complete the setup wizard:

1. Enter the URL you noted in the text console into a web browser on the laptop or server that is connected to the Moonshot System, and then press **Enter**.

   The first login screen that displays is the login for the MPM virtual machine.



2. Enter the **Username** and **Password** you created using the text console, and then click **Login**.

Verifying network information in the setup wizard

After logging in for the first time, the welcome screen of the setup wizard is displayed. Do the following to complete the first time setup:

1. On the welcome screen, click **Next**.

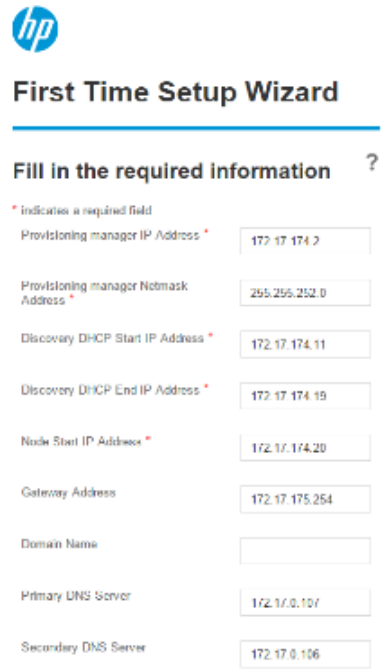
   The setup wizard displays an overview page, which details the different types of uplink modules you may find installed in your Moonshot chassis.

2. Click **Next** to continue.

   The setup wizard displays the two networking options available. If you have not done so already, connect the network cables by following one of the two networking options.

3. Click **Next**.

   The virtual machine settings page displays. This page summarizes the values you entered earlier in the text console. Review the settings; no changes should be needed.



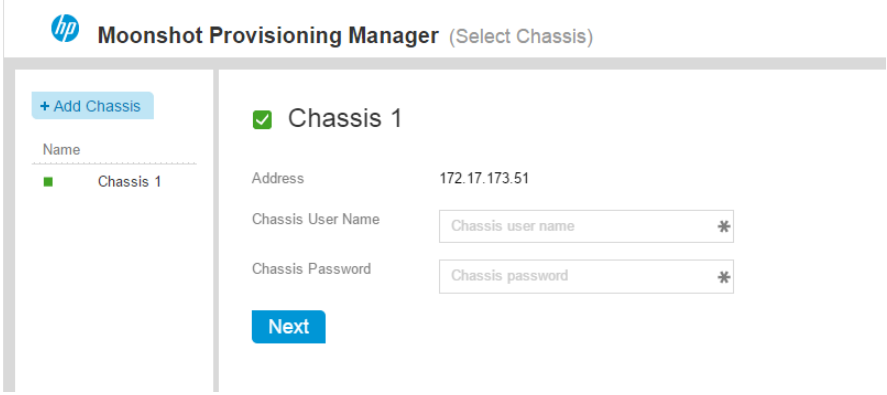
4. Click **Apply**.
5. The iLO Chassis Manager discovery page displays.

   By default, the iLO Chassis Manager (iLO CM) is set to DHCP. There is a short wait while the MPM VM listens for a DHCP request from the iLO CM and then automatically continues to the next screen. In rare cases, you may need to unseat and then reseat the Moonshot 1500 CM module to speed up the automatic discovery process.

   When the Moonshot 1500 CM module is discovered, the MPM **Select Chassis** screen displays.

6. (Optional) Click **Manual Discovery** if the Moonshot 1500 CM module was assigned a static IP address. The **Add Chassis** window appears. Enter the following:
   - The static **Chassis IP Address**
   - An administrator level **Chassis User Name**
   - The **Chassis Password**

   Click **Apply**. The MPM **Select Chassis** screen displays.
7. The IP address for the newly discovered chassis (Chassis 1) displays.



Enter the following to complete the automatic discovery:

- An administrator level **Chassis Manager User Name**
- The **Chassis Manager Password**

NOTE: The **Select Chassis** screen allows you to manage and provision multiple Moonshot Chassis using the same MPM VM. Once a chassis is selected on this screen, the selected chassis is used for all the MPM functions in this session. To provision another chassis, logout, and then return to this page and select a different chassis.

8. Click **Next** to finish the first time setup of the chassis.

   The **OS Upload** screen displays. All of the pages of the MPM are now enabled, allowing you to view many details of the selected Moonshot chassis, to upload operating system ISO images and auto-install files to the VM repository, and to provision the chassis nodes.

More information

Changing HPE MPM configuration settings

Managing Moonshot Provisioning user accounts

The MPM enables you to manage user accounts stored locally. You can create up to 12 local user accounts with custom login names and passwords.

Viewing local user accounts

To view local user accounts, select **User Administration** from the main menu.

The **User Administration** page shows the **Login Name** and **Full Name** of each user. To view the information for a user, select the user in the user list.

Use the following selections from the **Actions** menu to add, or delete users:

- **Add**—Add a new user. For instructions, see Adding local user accounts.
- **Delete**—Delete a user account. For instructions, see Deleting local user accounts.

Adding local user accounts

1. From the main menu, select **User Administration**.
2. Do one of the following:
   - Click **+ Add user**.
   - Select **Actions→Add**.

3. Provide the following details on the **Add User** page:
   - **Full name** appears in the user list on the **User Administration** page. It does not have to be the same as the **Login name**. The **Full name** must use printable characters.
   - **Login name** is the name you use when logging in to the MPM. It appears in the user list on the **User Administration** page. The **Login name** does not have to be the same as the **Full name**. The login name must use printable characters.
   - **Password** and **Password confirm** set and confirm the password that is used for logging in to MPM.

     For more information about passwords, see Password guidelines.
4. Click **Apply** to save the new user.

Password guidelines

Passwords have the following guidelines:

- The maximum password length is 39 characters.
- Passwords can include any characters except for spaces.
- The minimum password length is eight characters.

Deleting local user accounts

You can delete MPM user accounts by doing the following:

1. From the main menu, select **User Administration**.
2. Select a user to remove from the user list.
3. Select **Actions→Delete**.
4. Click **Yes** to delete the new user.

IMPORTANT: There must always be at least one user account in MPM. If there is only a single user account left, add a new account before deleting the first one.

Linux default user accounts

The MPM Linux image provides two default user accounts that are not part of your normal interaction with the application. These are accessible via SSH to the VM, should you wish to access the system directly.

- Default account 1:
  - Username: root
  - Password: moonshot
- Default account 2:
  - Username: moonshot
  - Password: moonshot

When you setup your MPM VM you must provide adequate safeguards at a network level to prevent unauthorized access. The underlying provisioning tool used by MPM also makes use of PXE, NFS and Samba-based network shares and protocols which should not be exposed to an unprotected network.

Uplink configuration

If you connected the MPM uplink (the first uplink of Switch A) using the matching media adapters, along with matching port speed configuration (10 Gbps is connected to a 10 Gbps port, or a 40 Gbps is connected to a 40 Gbps port) then no further uplink configuration is necessary.

However, if you are using a different type of media adapter, to connect to a port of a different speed, additional configuration is necessary.

If you are using...	Then...
An HPE Moonshot-45G Switch Module with the HPE Moonshot-6SFP Uplink Module, and are connecting a 1 Gbps SFP to it	Configure the port for 1 Gbps speed manually.
An HPE Moonshot-180G Switch Module, with a HPE Moonshot-4QSFP Uplink Module, and are not connecting a 40 Gbps connection to it	Split the 40 Gbps connection into four 10 Gbps sub-connections.
A QFSP-to-SFP adapter to connect a 1 Gbps SFP	Configure the sub interface created to run at 1 Gbps. [1]
HPE Moonshot-45XGc Switch Module, with a Moonshot-4QSFP Uplink	The steps are similar steps to those for the Moonshot-180G Switch, but the port identification will be different.

[1] Specific firmware revisions are needed to support 1 Gbps switch speed.

- Moonshot-45G Switch Module: All firmware supports 1 Gbps
- Moonshot-180G Switch Module: Version 2.0.0.19 or later required
- Moonshot-45XGc Switch Module: Version ESS2418 or later required

More information

Changing HPE MPM configuration settings

The *Moonshot Networking Cookbook* available in the Moonshot Information Library at **http://www.hpe.com/info/moonshot/docs**.

Connection speeds and hardware

The hardware and speed capability of the Moonshot system components involved in the provisioning VLAN are as follows:

Table 2 Moonshot component connection speeds

Component	Connection speed (Gbps)
iLO Management Port	10/100/1000 Ethernet
iLO Link Port	10/100/1000 Ethernet
Moonshot switch modules	Varies, 1/10/40 depending on model

2 Uploading and deploying operating system images with HPE MPM

Using HPE MPM to deploy Operating Systems

Process overview:

1. Log into HPE MPM for the first time.
2. Verify network information in the setup wizard.
3. Create user accounts.
4. Configure the uplink (if needed).
5. Upload an OS image to the Moonshot Provisioning Manager repository.
6. Install an Operating System on a node.
7. Back up the node.
8. Clone (deploy) the backup image to equivalent ProLiant server cartridges.
9. Delete repository files as needed.

Uploading files to the Moonshot Provisioning Manager repository

Prerequisites

The **OS Upload** page allows you to upload OS ISO files and auto-install files (such as Windows answer files or Linux Kickstart files) and to remove those files from the repository as needed. Uploaded files are stored in the VM virtual harddisk. HPE provides some auto-install templates which are already present in your VM.

Be sure to configure a harddisk large enough for multiple OS ISO image files, or to configure the harddisk for automatic expansion.

More information

Auto-install template configuration parameters

Server cartridges that require special kISO images

Updating a SLES repository for kISO installation

Uploading OS ISO images

1. From the main menu, select **OS Upload**.
2. Click **Choose file** to browse to the ISO image file, and then click **Open** to select the file.
3. Click **Start upload** to upload the ISO image file to the Moonshot Provisioning Manager repository.

   An upload bar displays the file upload progress.

Uploading auto-install configuration files

You can upload local auto-install files to the Moonshot Provisioning Manager repository.

To upload a local file:

1. From the main menu, select **OS Upload**.
2. In the **Upload Auto-Install file** section, click **Choose file** to browse to the auto-install file, and then click **Open** to select the file.

   The filename appears in the gray box.
3. Click **Start upload** to upload the auto-install file to the Moonshot Provisioning Manager repository.

Deleting files from the Moonshot Provisioning Manager repository

To delete an extracted operating system from the repository:

1. From the main menu, select **OS Upload**.
2. In the **Uploaded Operating Systems** section, or the **Uploaded Auto Install Files** section, click the **Delete** link next to the file to be removed.

Installing an operating system on a node

1. Select **Nodes** from the main menu.
2. Select one or more nodes.
3. Click **Actions→Install OS**.

   The **OS Deployment** window appears.
4. Select an **OS to deploy**. The list contains all of the operating systems available in the repository.
5. Select the appropriate **Auto-install/answer file to use**. The list contains all of the auto-install files available in the repository.
6. Click **Install** to begin the deployment, or click **Cancel**.
7. (Optional) To monitor the progress of the deployment tasks, open a Virtual Serial Port on one or more nodes prior to launching the task.

More information

Viewing OS deployment task status

Backing up a node

Viewing OS deployment task status

1. From the main menu, select **Tasks**.
2. By default, the first time you display this page, the OS Deployment status is displayed. Otherwise, select **OS Deploy** from the menu.
3. The page displays the following information for each deployment:
   - **Task ID**—Automatic number assigned to each task.
   - **Operating system**—The type of operating system being deployed.
   - **Node**—The node to which the OS is deploying.
   - **Status**—The status of the deployment, in process or complete.
   - **%**—For a deployment still in process, this shows the progress of the deployment.
   - **Start Time**—When the deployment was initiated.

Backing up a node

Prerequisites

MPM can back up a node in preparation for deploying (cloning) the backed up image to other nodes in the Moonshot System. Prepare for the backup by determining the node's root device, and then use the Node Backup page in MPM to run the backup.

During a backup, you specify the disk drive a partition used as the system root device.

- You must determine the system root device before you begin the backup process. While there may be multiple storage devices installed on a ProLiant server cartridge node, you

must determine which one has the operating system deployed on it. Usually the first drive, Drive1, or in Linux **sda** (for drive *a*), is the one with the OS installed (the root drive).

- You must also determine which partition contains the root partition of your system. Once this is determined, the information is also used to determine any other partitions that need to be automatically backed up. If you installed the operating system using one of the automatic installation configuration templates provided with MPM, then Windows-based operating systems typically use the first partition. Linux installations typically uses the third partition.

  However, if you modified any the automatic installation templates, or used a template of your own, you can identify the root partition by examining the settings in the installation file, or by logging into the system.

Creating a node backup

Creating a backup of an existing node OS installation allows you to deploy clones of the node.

To create a backup:

1. Select **Nodes** from the main menu.
2. Select a single node. You can backup a single node at a time.
3. Click **Actions→Backup**.

   The **Node Backup** window appears.
4. In the **Enter a filename for the backup** box, enter a new filename.
5. Complete the following selections:
   - **Select backup devices**—This list varies according to the storage currently installed on the node.
   - **Select Root Partition**—Select which partition of the selected backup devices contains the root partition. For more information, see “Determining a Windows custom root drive ” (page 21) or “Determining a Linux custom root drive ” (page 21)

     .
6. Click **Start Backup** to begin the deployment, or click **Cancel**.
7. (Optional) To monitor the progress of the task, open a Virtual Serial Port on one or more nodes prior to launching the task.

Determining a Windows custom root drive

- If the Windows system is on drive C:, select Drive 1 in HPE MPM.
- If the Windows system is on drive D:, select Drive 2 in HPE MPM.
- If the Windows system in on drive E:, select Drive 3 in HPE MPM.

Determining a Linux custom root drive

1. Login to the command line on a running Linux system.
2. Enter the `mount` command.
3. Find the root drive and partition with the mount point of “/”.

   For example:

```
[root@moonshot-node ~]$ mount
/dev/sda3 on / type ext4 (rw)
proc on /proc type proc (rw)
sysfs on /sys type sysfs (rw)
devpts on /dev/pts type devpts (rw,gid=5,mode=620)
tmpfs on /dev/shm type tmpfs (rw)
/dev/sda1 on /boot type ext4 (rw)
/dev/sda5 on /tmp type ext4 (rw)
none on /proc/sys/fs/binfmt_misc type binfmt_misc (rw)
```

Notice the shaded line. This mount point, `/dev/sda3 on /`, indicates that the root (indicated by *on /*) is on Drive-1, or sda, partition 3.

4. Make a note of the root drive and partition. You are now ready to back up the node, and you will need to enter this information in MPM to complete the backup.

   MPM uses this information to locate the system's configuration, and determines the other drives and mount points automatically.

Information not captured during a backup

The image captured from the selected node does not include the following:

- Hostname
- IP address
- Netmask

Viewing node backup task status

To view the status of a node backup, do the following:

1. From the main menu, select **Tasks**.
2. Select **Node Backup** from the menu.
3. The page displays the following information for each task:
   - **Task ID**—Automatic number assigned to each task.
   - **Capture Image**—The filename of the image being captured.
   - **Node**—The node from which the image is being captured.
   - **Status**—The status of the node backup, in process or complete.
   - **Start Time**—When the node backup was initiated.

Cloning a backup

Cloning refers to the deployment of a previous backup. After a clone operation, the selected devices are all clones of the original backup.

1. Select **Nodes** from the main menu.
2. Select single node. You can begin a node backup of only one node at a time.
3. Click **Actions→Cloning**.

   The **Cloning** window appears.
4. Select a previously created backup from the **Select a filename to deploy** list.
5. Click **Start Cloning** to begin the deployment, or click **Cancel**.
6. (Optional) To monitor the progress of the task, open a Virtual Serial Port on one or more nodes prior to launching the task.

Information not deployed in a clone

The image deployed to the selected nodes will be the same as from the captured systems, except for the following:

- Hostname
- IP address
- Netmask

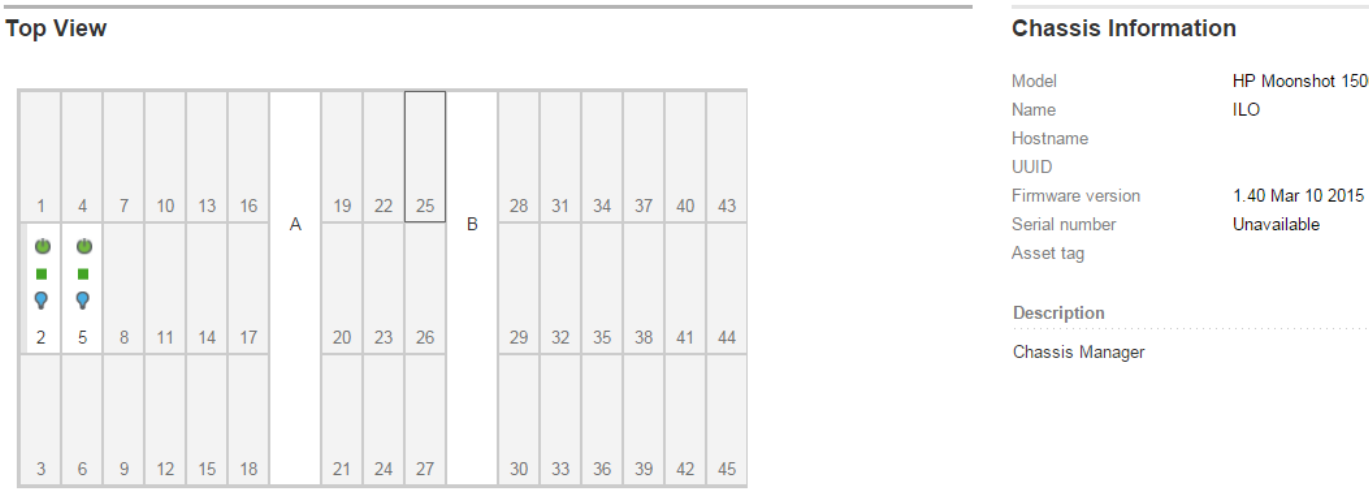
Viewing cloning task status

1. From the main menu, select **Tasks**.
2. Select **Cloning** from the menu.
3. The page displays the following information for each task:
   - **Task ID**—Automatic number assigned to each task.
   - **Capture Image**—The filename of the image being deployed.
   - **Node**—The node from on which the image is being deployed.
   - **Status**—The status of the clone task, in process or complete.
   - **Start Time**—When the clone task was initiated.

3 Using the web interface to view Moonshot System details

Viewing Moonshot general information

From the main menu, select **Chassis** to display high level information about the chassis. It includes general chassis information and a reference image of the chassis.



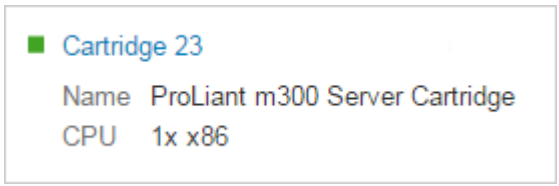
Viewing the Chassis top view

From the main menu, select **Chassis** to view chassis cartridge information.

The **Top View** section includes an interactive image that displays a representation of the cartridge slots of the Moonshot chassis. Unoccupied or locked slots (slots to which you do not have access) are gray, while unlocked populated slots are white and include power, health, and UID indicators. These slots offer more information when rolled over with the mouse.

To view cartridge information

To view cartridge information, roll over a populated cartridge slot with the mouse.



- Health icon—each cartridge displays a health indicator:
  - OK—No health issues
  - Degraded—Significant service issue with possible service degradation
  - Critical—Service lost or imminent service loss, immediate attention needed
  - Unknown
- Cartridge number
- Cartridge name (model)
- CPU number and architecture
- UID status

Viewing general chassis information

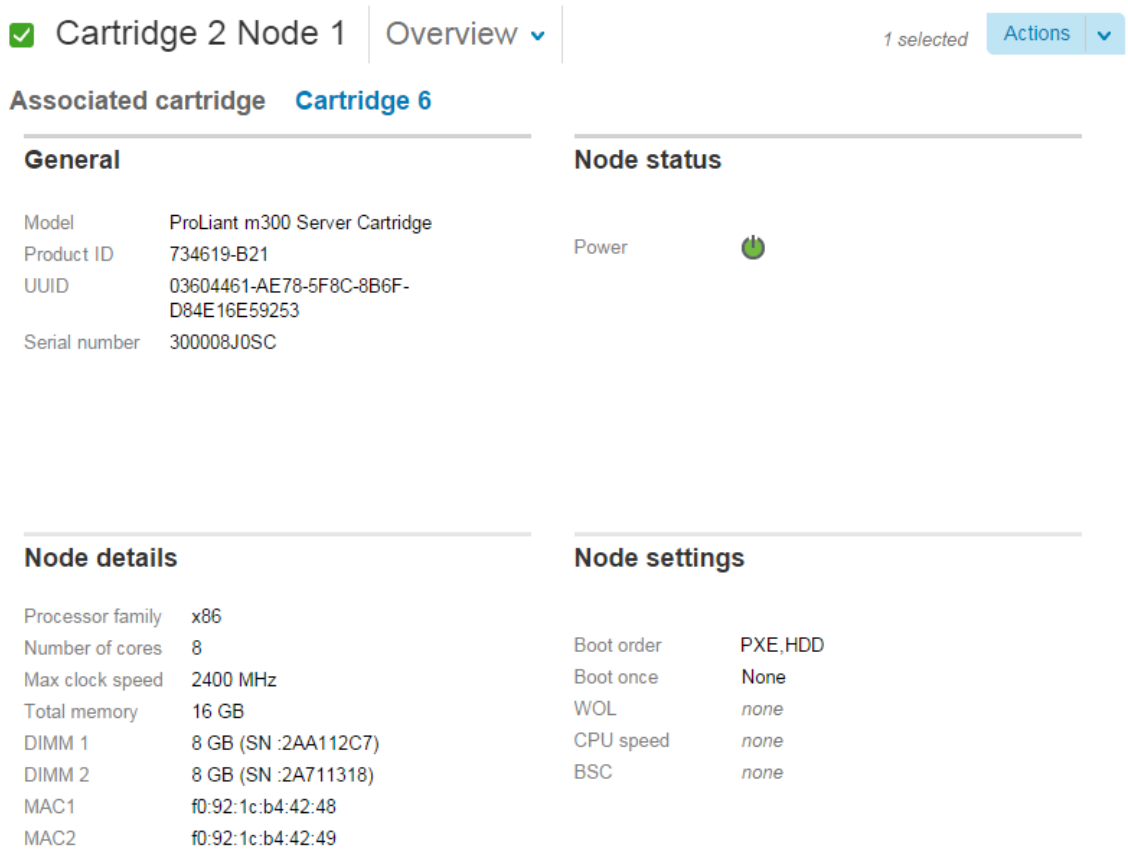
From the main menu, select **Chassis** to view chassis information.

The **Chassis Information** section displays the following information:

- **Model**—The model designation of the chassis.
- **Name**—The chassis name set by the Administrator.
- **Hostname**—The FQDN of the Moonshot system.
- **UUID**—The universally unique identifier for the chassis. This value is assigned when the system is manufactured.
- **Firmware version**—The version and date of the installed iLO CM Firmware installed in the Moonshot 1500 Chassis Management Module.
- **Serial number**—The Moonshot 1500 Chassis serial number.
- **Asset tag**—The asset tracking tag assigned to the Moonshot 1500 Chassis.
- **Description** and **IP**—A description of the connected firmware and its associated IP address.

Viewing ProLiant server cartridge node information

The Moonshot web interface **Nodes** page displays information about the ProLiant server cartridges installed in the chassis.



Viewing ProLiant server cartridge node overview information

From the main menu, select **Nodes** to view node overview information. The page defaults to an overview of the first node in the list shown on the left side of the page.

The **General** section displays the following about the server cartridge on which the node is installed:

- **Model**—The model name of the server cartridge.
- **Product ID**—The product ID of the server cartridge. This value is set by the manufacturer, but can be changed by an Administrator using the iLO CM firmware command line.
- **UUID**—The universally unique identifier for the node. This value is assigned when the system is manufactured.
- **Serial number**—The serial number of the cartridge on which the node resides.

Selecting multiple nodes

You can select more than one node from the node list. Selecting at least two nodes displays the following information about the selected nodes:

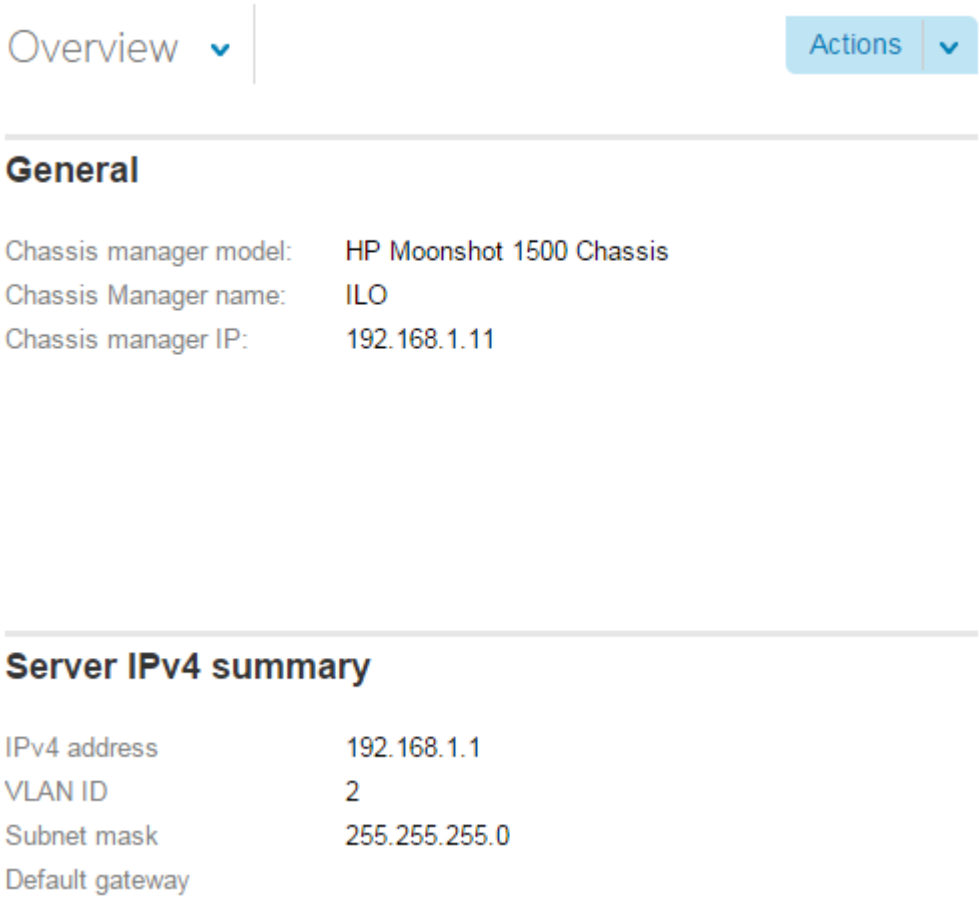
- **Name**
- **Model**
- **Power**
- **UUID**
- **Product ID**
- **Serial number**
- **CPU**
- **MAC Address**

Viewing network configuration details

The **Network Configuration** page displays a summary of the general and IPv4 network configuration settings, and detailed IPv4 settings.

Viewing general network information

To view a summary of the configured network settings, select **Network Configuration** from the main menu.



The General section lists the following:

- **Chassis manager model**—The model of Moonshot System that is associated with the current session of the Provisioning Manager.
- **Chassis Manager name**—The configured name of the Moonshot System associated with the current session of the Provisioning Manager.
- **Chassis manager IP**—The IPv4 address of the iLO Chassis Manager associated with the current session of the Provisioning Manager.

Viewing IPv4 information

To view IPv4 configuration information:

1. From the main menu, select **Network Configuration**.

   The **Server IPv4 summary** section displays the following:

   - **IPv4 address**
   - **VLAN ID**
   - **Subnet mask**
   - **Default gateway**—The default gateway address in use for the IPv4 protocol. If the value is `0.0.0.0`, or blank, the gateway is not configured.

2. Select **IPv4** in the **View** menu in the upper left corner of the page.

   The following information is displayed in the **IPv4 address** section:

   - **Server IP address**—The IPv4 address currently in use.
   - **VLAN ID**—The ID of the VLAN being used as the temporary provisioning network.
   - **Subnet mask**—Matched with the IP address of a packet on the VLAN, it determines which network segment to which a packet is routed.
   - **DHCP start IP address**—The start of the range of which DHCP addresses can be assigned by the temporary provisioning network.
   - **DHCP end IP address**—The end of the range of which DHCP addresses can be assigned by the temporary provisioning network.
   - **Node start IP Address**—The first address available to be assigned to Proliant server cartridge node.
   - **Gateway IP Address**—The default gateway address in use for the IPv4 protocol. If the value is `0.0.0.0`, or blank, the gateway is not configured.

More information

Configuring IPv4 settings

4 Changing HPE MPM configuration settings

Working with multiple HPE Moonshot System chassis

The Select Chassis page

By default, the Select Chassis page displays when you log in to Moonshot Provisioning Manager. You can add or remove Moonshot systems using this page, and select which chassis to provision.

Selecting a chassis for the session

1. Select a chassis from the list on the left side of page.

   For each chassis, the following information is displayed:

   - **IP Address**—The IPv4 address of the selected chassis.
   - **Chassis Name**—The chassis name set by the Administrator.
   - **Chassis MAC Address**—The media access control (MAC) address of the selected chassis.

   The options on this page allow you to select or add Moonshot chassis to Moonshot Provisioning Manager, or to remove a chassis record.
2. Click **Next**.

   Provisioning Manager uses stored credentials to connect to the selected chassis.

Adding a chassis

Prerequisites

If needed, choose **Select Chassis** from the main menu to open the **Select Chassis** page.

Adding an HPE Moonshot System chassis record

1. Do one of the following:
   - Click **+ Add Chassis**.
   - Click **Actions→Add**.

   The **Add Chassis** window displays.
2. In the **Add Chassis** window, enter the following details for the new Moonshot chassis:
   - **Chassis IP Address**—The IPv4 address of the new chassis.
   - **Chassis User Name**—A username with Administrator privileges on the new Moonshot chassis.
   - **Chassis Password**—The password associated with the Administrator-level user name.

   IMPORTANT: The chassis user name and password entered in the **Add Chassis** window must have Administrator-level privileges
3. Click **Apply** to save the new chassis details, or click **Cancel** to close the **Add Chassis** window.

Deleting an HPE Moonshot chassis record

If needed, choose **Select Chassis** from the main menu to open the **Select Chassis** page.

To remove a chassis record from Moonshot Provisioning Manager, do the following:

1. Select a chassis from the list on the left side of the page.

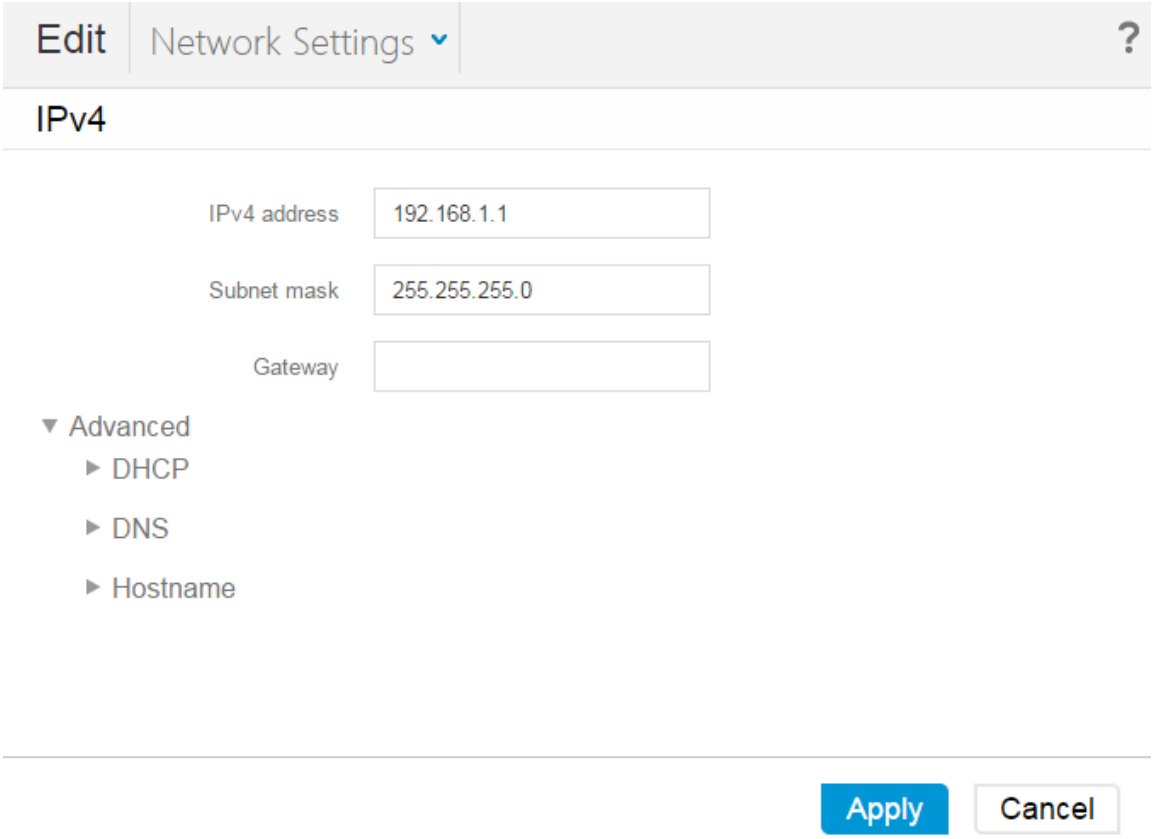
2. Click **Actions→Delete**.

   The **Delete Chassis** confirmation window displays.

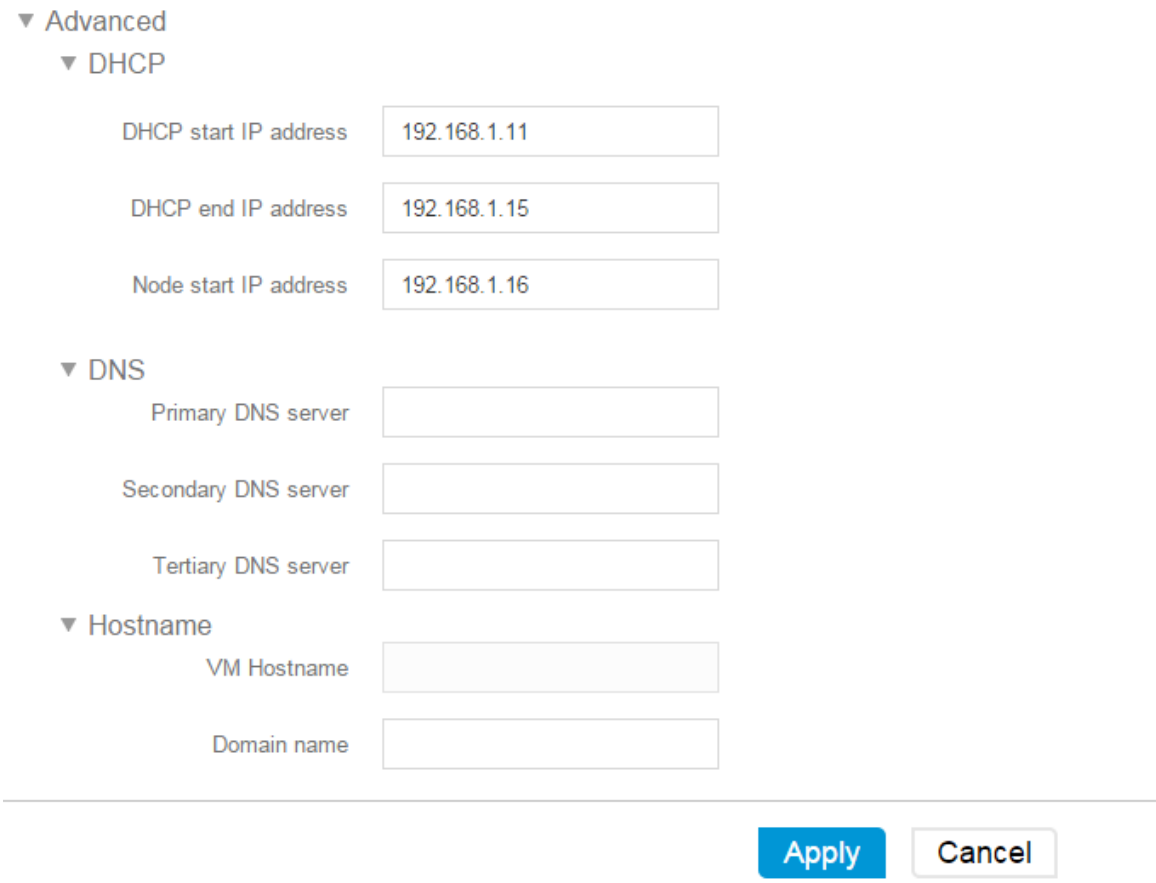
3. Click **Yes** to remove the selected Moonshot chassis record from Provisioning Manager, or click **Cancel**.

Configuring IPv4 settings

1. Select **Network Configuration** from the main menu.
2. Select **Actions→Edit**.



3. Configure the following settings in the **IPv4** section:
   - **IPv4 address**—The Moonshot 1500 CM module IP address.
   - **Subnet mask**—The subnet mask of the Moonshot 1500 CM module IP network.
   - **Gateway**—The Moonshot 1500 CM module gateway IP address.
4. Click **Advanced**, to edit the advanced IPv4 settings.



5. Configure the following settings in the **Advanced** section:
   - DHCP
     - **DHCP start IP address**—The start of the range of which DHCP addresses can be assigned by the temporary provisioning network.
     - **DHCP end IP address**—The end of the range of which DHCP addresses can be assigned by the temporary provisioning network.
     - **Node start IP Address**—The first address available to be assigned to an Proliant server cartridge node.
6. If DHCPv4 is not used for the DNS settings, click **DNS**, and then configure the following settings in the **DNS** section:
   - **Primary DNS server**—If **Use DNS servers** is enabled, this value is supplied automatically. If not, enter the primary DNS server address.
   - **Secondary DNS server**—If **Use DNS servers** is enabled, this value is supplied automatically. If not, enter the secondary DNS server address.
   - **Tertiary DNS server**—If **Use DNS servers** is enabled, this value is supplied automatically. If not, enter the tertiary DNS server address.
   - **Hostname**
     - **VM Hostname**—The configured hostname for the VM client enabling it to accept DHCP client requests.
     - **Domain name**—This optional setting defines a domain to which the Provisioning Manager belongs.
7. Click **Apply** to save the changes.

8. Click **Yes**.

   A reset ends all active sessions. It might take several minutes before you can re-establish a connection.

Upgrading the Moonshot Provisioning Manager

Moonshot Provisioning Manager Upgrade Packages allow you up update the functionality of the MPM as they become available in the future.

1. From the main menu, select **Package Update**.
2. Click **Choose file** to browse to the package file, and then click **Open** to select the file.
3. Click **Start upload** to upload the package file to the Provisioning repository.

   An upload bar displays the file upload progress.
4. Click **Install** to update the MPM with new functionality.
5. After a short pause, the MPM VM reboots into the new version.

Resetting Moonshot Provisioning Manager settings

You can reset the Moonshot Provisioning Manager settings to factory defaults.

⚠ **WARNING!** Resetting Moonshot Provisioning Manager to factory defaults removes all uploaded repository files and removes all provisioning network settings.

Applying factory defaults

To apply the factory default settings to the Moonshot Provisioning Manager, follow these steps:

1. Select **Factory Reset** from the main menu.

   The **Apply Factory Default** box appears.
2. Do one of the following:
   - Click **Yes** to reset the Moonshot Provisioning Manager to and apply factory settings.

     ⚠ **WARNING!** Resetting Moonshot Provisioning Manager to factory defaults removes all uploaded repository files and removes all provisioning network settings.
   - Click **Cancel** to close the Apply Factory Default box without applying default factory settings.

5 Support and other resources

Increase debug logging

If you encounter a problem using MPM, the first step in troubleshooting is to enable debug-level logging:

1. On the MPM VM, open the file `/opt/hp/moonshot/tinkerbell/tinkerbell/settings.py` for editing.
2. Near the end of the file, find the configuration settings for the log files that MPM generates:

```
'handlers': {
        'file': {
            'level': 'INFO',
            'class': 'logging.FileHandler',
            'filename': '/opt/hp/moonshot/logs/moonshot.log',
            'formatter': 'verbose',
        },
        'switch_file': {
            'level': 'INFO',
            'class': 'logging.FileHandler',
            'filename': '/opt/hp/moonshot/logs/switch.log',
            'formatter': 'verbose',
        },
    },
```

3. Change the shaded `INFO` items to **`DEBUG`**.
4. Save and close `settings.py`.
5. At the command line, enter the following commands to restart services and activate the changes you made:

```
/etc/init.d/httpd restart
/etc/init.d/moonshot-tasks restart
```

Debug mode causes a significant amount of information to be logged. The log files are located in the directory `/opt/hp/moonshot/logs`. The following logs can be found:

Filename	Description
access.log	Apache web server access log
error.log	Apache web server error log
moonshot.log	Primary location for debugging information from the MPM applications
worker.log	Debugging information from the task system used by MPM
worker-extraction.log	Debugging information from the task system related to OS extraction tasks
worker-provisioning.log	Debugging information from the task system related to provisioning tasks

To disable extended logging:

To disable extended logging, change the logging configuration in `settings.py` back to INFO, and restart the services.

Generating support dumps

If you encounter a problem with MPM and need to contact Hewlett Packard Enterprise Customer Support, you must create a set of support output to help with troubleshooting:

1. Enable debug logging (see “Increase debug logging ” (page 33))

2. Perform the tasks which are causing errors (this may require you to delete the chassis, reboot the VM, and start over) so that logs are created for the errors
3. Capture the log files.
4. On the command line, enter the `support.py` script command along with your chosen optional arguments to create support output. See "`Support.py` command synopsis " (page 34) for complete command information.

   For example, to generate a full listing of support data, enter the command as follows:

   ```
   support.py –u username –p password > output.json
   ```

IMPORTANT: The output file includes decrypted chassis credentials. If you do not want to include that information to Hewlett Packard Enterprise, remove those specific entries from the output file you created before sending it to Hewlett Packard Enterprise.

`Support.py` command synopsis

Description

Enter this command on the command line to generate support output.

Syntax

`support.py` [`-h`] [`--address`] [`--backup`] [`--chassis`] [`--clone`] [`--debug`] [`--configfile`] [`--install`] [`--node`] [`--operatingsystem`] [`--switch`] [`--update`] [`--ip IP`] {`--username USERNAME`} {`--password PASSWORD`}

Optional arguments:

Optional arguments:

`–h, --help`	Show the help message and exit
`--address, -a`	Include address records
`--backup, -b`	Include backup records
`--chassis, -c`	Include chassis records
`--clone, -l`	Include clone records
`--debug, -d`	Enable debugging messages
`--configfile, -f`	Include configuration file records
`--install, -k`	Include install records
`--node, -n`	Include node records
`--operatingsystem, -o`	Include operating system records
`--switch, -s`	Include switch records
`--update, -t`	Include update records
`--ip IP, -i IP`	API IP address
`--username USERNAME, -u USERNAME`	MPM VM username (not iLO CM username)
`--password PASSWORD, -p PASSWORD`	MPM VM password (not iLO CM password)

Accessing Hewlett Packard Enterprise Support

- For live assistance, go to the Contact Hewlett Packard Enterprise Worldwide website:

  www.hpe.com/assistance

- To access documentation and support services, go to the Hewlett Packard Enterprise Support Center website:

  www.hpe.com/support/hpesc

Information to collect

- Technical support registration number (if applicable)
- Product name, model or version, and serial number
- Operating system name and version
- Firmware version
- Error messages
- Product-specific reports and logs
- Add-on products or components
- Third-party products or components

Accessing updates

- Some software products provide a mechanism for accessing software updates through the product interface. Review your product documentation to identify the recommended software update method.
- To download product updates, go to either of the following:
  - Hewlett Packard Enterprise Support Center **Get connected with updates** page:

    www.hpe.com/support/e-updates

  - Software Depot website:

    www.hpe.com/support/softwaredepot

- To view and update your entitlements, and to link your contracts and warranties with your profile, go to the Hewlett Packard Enterprise Support Center **More Information on Access to Support Materials** page:

  www.hpe.com/support/AccessToSupportMaterials

IMPORTANT: Access to some updates might require product entitlement when accessed through the Hewlett Packard Enterprise Support Center. You must have an HP Passport set up with relevant entitlements.

Websites

Website	Link
Hewlett Packard Enterprise Information Library	**www.hpe.com/info/enterprise/docs**
Hewlett Packard Enterprise Support Center	**www.hpe.com/support/hpesc**
Contact Hewlett Packard Enterprise Worldwide	**www.hpe.com/assistance**

Website	Link
Subscription Service/Support Alerts	**www.hpe.com/support/e-updates**
Software Depot	**www.hpe.com/support/softwaredepot**
Customer Self Repair	**www.hpe.com/support/selfrepair**
Insight Remote Support	**www.hpe.com/info/insightremotesupport/docs**
Serviceguard Solutions for HP-UX	**www.hpe.com/info/hpux-serviceguard-docs**
Single Point of Connectivity Knowledge (SPOCK) Storage compatibility matrix	**www.hpe.com/storage/spock**
Storage white papers and analyst reports	**www.hpe.com/storage/whitepapers**

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A Automatic installation templates

Auto-install template configuration parameters

The auto-install templates include a number of key words that are substituted by the installation system when the installation is performed.

MPM provides the following auto-install templates:

Autoinstall template name	Description
autoinst_rh6_rh7.templ	Kickstart template used to autoinstall RHEL 6.x and RHEL 7 distros on Legacy BIOS nodes
autoinst_sles11.templ	Autoyast template used to autoinstall SLES 11 distros on Legacy BIOS nodes
autoinst_sles12.templ	Autoyast template used to autoinstall SLES 12 distros on Legacy BIOS nodes
autoinst_ubuntu_cd.templ	Preseed template used to autoinstall Ubuntu 12.x, 13.x, and 14.x distros on Legacy BIOS nodes using local repository
autoinst_windows_client.templ	Unattended installation template used to autoinstall Windows client distros on supported HPE Moonshot cartridges delivered with the rpm `cmu-windows-moonshot-addon-7.3-1.noarch`.
autoinst_windows_server.templ	Unattended installation template used to autoinstall Windows server distros on supported Moonshot cartridges delivered with the rpm `cmu-windows-moonshot-addon-7.3-1.noarch`.

Below is a table of common key words used in most of the templates.

Column Head	Column Head
CN	Compute node specific keywords
CMU_CN_HOSTNAME	Compute node hostname
CMU_CN_IP	Compute node IP address
CMU_CN_NETMASK	Compute node netmask
CMU_CN_SHORT_NETMASK	Compute node short-format netmask (for example, instead of 255.255.255.0, enter 24)
CMU_CN_DEFAULT_GW	Compute node default gateway
CMU_CN_CFG	Compute node autoinstall file
CMU_CN_MAC	Compute node MAC address
CMU_CN_MAC_COLON	Compute node MAC address, separated by a colon (‘:’) instead of a dash (‘-’)
CMU_CN_SERIAL_PORT	Compute node serial port (for example, ttyS0)
CMU_CN_SERIAL_PORT_SPEED	Compute node serial port speed
CMU_CN_OS_LANG	Compute node operating system language (iso639 — iso 3166 format, recognized by most linux distros)
CMU_CN_OS_TIMEZONE	‘US/Central’

Additional macro values that may be of use when customizing the auto-install configuration files are found in the auto-install section of `/opt/cmu/etc/cmuserver.conf` within the MPM VM itself.

The easiest method to customize an autoinstall file is to download one of the templates provided, make any desired modifications to it, and then upload it back to the MPM with a new name.

NOTE: If you make a configuration that causes an error in the Operating System installation, you must monitor the Virtual Serial Port of the node to identify the error. MPM cannot recover an installation in such situations.

Updating a SLES repository

Server cartridges that require special kISO images

The following server cartridges require a special kISO image to autoinstall SLES 11 SP3:

- HPE ProLiant m300 Server Cartridge
- HPE ProLiant m350 Server Cartridge
- HPE ProLiant m710 Server Cartridge

The kISO image contains an updated kernel, initrd, and other drivers required by the latest hardware.

Updating a SLES repository for kISO installation

1. If needed, upload the `SLES 11 SP3 ISO` using the **OS Upload** page.

   Once the ISO is fully loaded, the MPM VM extracts the image in the background. The repository directory is then available at `/opt/hp/moonshot/repo/<iso_name>`.
2. Download the appropriate SLES SP3 kISO based on the ProLiant server cartridge from Hewlett Packard Enterprise at:

   http://h17007.www1.hp.com/us/en/enterprise/servers/supportmatrix/exceptions/sles_exceptions.aspx#.VgmHv8vnuUI
3. Mount the downloaded SLES 11 SP3 kISO:

   ```
   # mount -o loop <sles11sp3_kiso_name>.iso /mnt/kiso
   ```
4. Copy the kISO contents to a directory:

   ```
   # cp -r /mnt/kiso/* /media/<KISO_REPO_DIR>
   ```

   The `<KISO_REPO_DIR>` directory should be nfs exported. Manually add it to the `/etc/exports` directory.
5. Copy the initrd and kernel from the kISO to the SLES 11 SP3 repository:

   ```
   # cp /media/<KISO_REPO_DIR>/boot/x86_64/loader/initrd
   /opt/hp/moonshot/repo/<SLES11SP3_AUTOINST_REPO_DIR>/boot/x86_64/loader/initrd
   # cp /media/<KISO_REPO_DIR>/boot/x86_64/loader/linux
   /opt/hp/moonshot/repo/<SLES11SP3_AUTOINST_REPO_DIR>/boot/x86_64/loader/linux
   ```
6. On the **OS Upload** page, download the provided `autoinstall_sles11.templ` to your local computer.

7. Modify `autoinstall_sles11.templ` as follows:
   a. Add the kISO repository as an add-on inside the `<profile>` tag:

```
<add-on>
  <add_on_products config:type="list">
   <listentry>
    <media_url>nfs://CMU_CN_MGT_IP/<PATH_TO_KISO_REPO_DIR>/</media_url>
    <product_dir>/</product_dir>
   </listentry>
  </add_on_products>
</add-on>
```

   b. Add the `<signature-handling>` tag inside the `<general>` tag to ignore any signature verification failures during automatic installation:

```
<signature-handling>
  <accept_verification_failed config:type="boolean">true</accept_verification_failed>
  <accept_unknown_gpg_key config:type="boolean">true</accept_unknown_gpg_key>
  <accept_non_trusted_gpg_key config:type="boolean">true</accept_non_trusted_gpg_key>
  <accept_unsigned_file config:type="boolean">true</accept_unsigned_file>
  <import_gpg_key config:type="boolean">true</import_gpg_key>
</signature-handling>
```

   c. Add additional packages available in kISO to the template between the `<software>` and `</software>` tags.
   For example, for ProLiant m300 Server Cartridges, you must add the `intel-igb` and `intel-igb-kmp-default` packages:

```
<software>
  <packages config:type="list">
   <package>intel-igb</package>
   <package>intel-igb-kmp-default</package>
.
.
  </packages>
</software>
```

   NOTE: For the ProLiant m710 Server Cartridge, if the kISO contains any additional rpm packages, add those under the <packages> tag, based on the requirements.

8. Save the new auto-install file, and then upload the new auto-install file to the repository using the **OS Upload** screen. See “Uploading auto-install configuration files ” (page 19) for the required steps.

   The new auto-install file is now ready for use for on HPE ProLiant m300, m350, or 710 Server Cartridges.