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HPE Integrity MC990 X Server System Software Installation and Configuration Guide

Abstract

Use the instructions in this guide to install the Oracle Linux 7, RHEL, or SLES operating system and Foundation Software on an HPE Integrity MC990 X Server system.

Part Number: 855703-002
Published: July 2016
Edition: 2

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Revision History

HPE Part Number	Edition	Publication Date
855703-001	First	March 2016
855703-002	Second	July 2016

Contents

1 Introduction

This chapter contains the following topics:

About installing the operating system software, Foundation Software, and optional features

This guide explains how to install the operating system and Foundation Software on an HPE Integrity MC990 X Server system. You can install the OS and Foundation Software to meet site requirements on a new system or you can reinstall these in the event of a disaster or a system failure.

HPE Integrity MC990 X Server supports the following operating systems on the MC990 X server chassis:

- RHEL 7.1, 6.7, 6.6
- SLES 12 SP1, 11 SP4, 11 SP3
- Oracle Linux 7.1 or 7.2

After the OS and Foundation Software are installed on your MC990 X server chassis, you can configure Foundation Software according to your site needs. For information about Foundation Software components and features, see the *HPE Integrity MC990 X Server User Guide*.

NOTE: HPE recommends that you install new Foundation Software packages as they become available.

HPE requires you to install the Foundation Software on each Integrity MC990 X system. You can install the Foundation Software on the MC990 X server chassis after you install the operating system software.

2 Integrity MC990 X system software installation

HPE installs operating system software, the Foundation Software, and any additional customer-purchased software after the Integrity MC990 X system hardware is installed at the customer site. The operating system can be one of the following:

- RHEL 7.1, 6.7, 6.6
- SLES 12 SP1, 11 SP4, 11 SP3
- Oracle Linux 7.1 or 7.2

If your site practices require you to reinstall the software, or if a disaster occurs at your site, you can use the procedures in this guide to reinstall all the factory-installed software. The procedures in this guide assume the following:

- You are familiar with Linux operating systems, and are familiar with the operating system software update process. The installation instructions describe how to register the operating system installation with the operating system software provider to ensure automatic updates. This guide assumes that your site wants to use the automatic updates. As an alternative, you can use physical media to apply updates.
- You want to reinstall the factory-installed software on the MC990 X server chassis.
- Your Integrity MC990 X system is cabled correctly and attached to the network in accordance with your site practices.

There is a specific order in which you need to install software on an Integrity MC990 X system. This order is as follows:

1. Operating system software, which can be RHEL 7, RHEL 6, SLES 12, SLES 11, or Oracle Linux 7.
2. Foundation Software

Gathering installation materials and information

Gathering needed information in advance for the MC990 X server operating system installation session will help you complete the installation more quickly.

1. Verify your environment.

   Integrity MC990 X system installations require you to have physical access to the MC990 X server chassis and the RMC.

   Depending on your hardware, you might need additional equipment or specific network connections. Make sure that you have access to the RMC and the DVD drive that is included on the server.

2. Locate the software DVDs or CDs that are provided by HPE, or download and create DVDs or CDs.

   This guide assumes that you have DVDs of the operating system and CDs of the software.

   You can obtain the operating system software in one of the following ways:

   - In a media kit from HPE. HPE distributes DVD copies of the operating system releases.
   - As a software download. You can download the OS releases from the Red Hat, SUSE, or Oracle websites and write the software to a DVD.

   You can obtain the Foundation Software from the HPE customer support center. To download the software, complete the following steps:

a. In a browser window, navigate to the following URL:

   www.hpe.com/support/hpesc

b. Select the system (MC990 X) and the OS.
c. View or download the software release notes.
d. Download the software bundle(s) that you need. If you install the OS, also plan to install the Foundation Software. The HPE support center prompts you for your username and password.
e. Write the ISO file to a CD or DVD.

   The instructions in this guide assume that you have hard media. Some procedures explain how to access the release software if you want to install from a network-resident ISO image, but the instructions are not comprehensive. If you downloaded the ISO images to a local network but do not want to copy them to hard media, plan to use your network tools to access the software when the procedures instruct you to insert a DVD or CD.

3. Plan the order in which to install the software.

   Install the OS software first, then install the Foundation Software on the MC990 X server chassis.

4. Gather the information that the installer requires.

   The installation requires you to provide information about passwords, your public (or house) network, and so on. You can complete the installation more quickly if you gather this information before you begin. Obtain the system configuration information that was used when the Integrity MC990 X system was originally configured. The following list shows the information you need to collect:

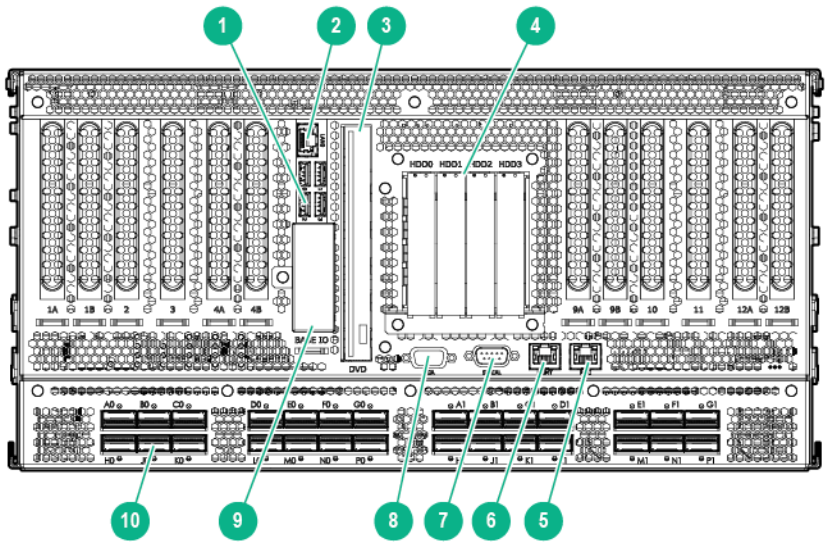
   - MC990 X server FQDN _____
   - MC990 X server hostname _____
   - MC990 X server IP address _____
   - MC990 X server subnet mask _____
   - Site DNS server IP addresses _____
   - Site search domain _____
   - Password for the MC990 X server system administrator (root user) login _____
   - FQDN of your site network time protocol (NTP) server _____
   - IP address of your primary name server _____
   - IP address of your secondary name server _____
   - RMC FQDN _____
   - For RHEL installations, do the following:
     - Verify your site Red Hat Networks (RHN) registration status and your Customer Center registration status.
     - Obtain your RHN login.
     - Obtain your RHN password.

- For SLES installations, do the following:
  - Determine the email address you want to use when you register with the SUSE Customer Center.
  - (Optional) Obtain the activation code for SLES components.
  - (Optional) Determine the system name or description.

5. Familiarize yourself with the hardware components in the rack.

   Identify the base server chassis in the rack and the DVD drive on the chassis. Figure 1 (page 8) shows the location of the DVD drive, along with other components and ports, on the MC990 X server chassis.

Figure 1 MC990 X server chassis



1. USB ports (4)
2. ETH0
3. DVD drive
4. System drive assembly
5. RMC port
6. MGMT port
7. Serial port
8. VGA port
9. Optional 1.8-inch SSD drive bays
10. NUMAlink ports (28)

6. Proceed to one of the following:
   - (Optional) To set an administrative password for the local console, proceed to the following:

     “ (Optional) Setting or changing an administrative password on the system console” (page 9)

     HPE does not require that you set an administrative password, but you can do so if you are logged into a direct-attached, local console. After you set this password, you can proceed with the software installation.
   - To install the operating system and Foundation Software on an MC990 X server, proceed to the following:

     “ Creating an installation environment” (page 10)

(Optional) Setting or changing an administrative password on the system console

The procedure in this topic explains how to set, or change, an administrative password on the console attached to an Integrity MC990 X system. A password is not required.

To delete a console password, enter the following command, which clears the EFI variables:

```
RMC> power -c reset
```

If you delete the password with the `power -c reset` command, you need to go back through the setup screens to set it again.

To set or change an administrative password on the console:

1. log in to the Integrity MC990 X system as the root user.
2. (Conditional) Shut down the system.

   Complete this step if the system is running at this time.

   Enter the following command:

   ```
   # shutdown now
   ```
3. log in to the RMC as the root user.
4. From the RMC, enter the following command to reset the power:

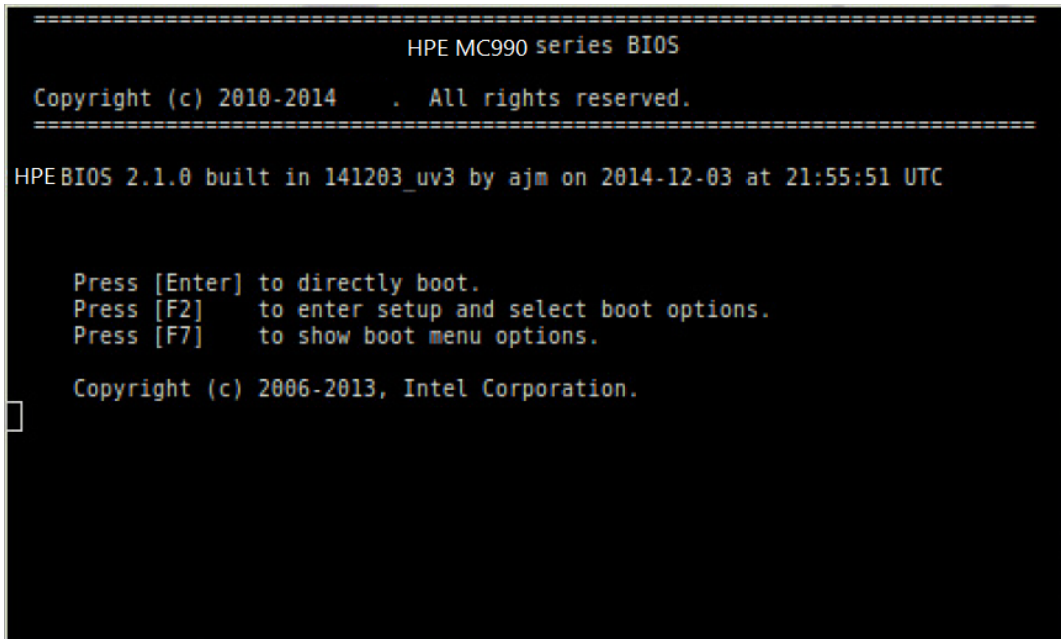
   ```
   RMC> power -s reset
   ```
5. Wait for the reset to complete and enter the following command to start a console session on the base I/O BMC:

   ```
   RMC> uvcon
   ```
6. On the Integrity MC990 X system console BIOS main menu, press **F2**.

   This action selects to enter setup and select boot options.

   Figure 2 (page 9) shows the Integrity MC990 X system BIOS menu options.

Figure 2 Integrity MC990 X system boot options screen



7. On the Boot Manager screen, select **Device Manager** and press **Enter**.

   Figure 3 (page 10) shows the boot manager screen.

Figure 3 Integrity MC990 X system boot manager screen

8. On the Device Manager screen, select **Security** and press **Enter**.

   The following list shows how to navigate the device manager:

   - **F1** scrolls the help.
   - **Shift-6**-(**^**), **v**, or arrow keys highlight a selection.
   - **F9** resets system defaults.
   - **Enter** selects.
   - **F10** saves.
   - **Esc** exits without saving.
   - Plus (**+**) and minus (**-**) keys change setting values.
   - To exit the console, press **CTRL-]**, and then press **q**. This sequence drops you to the RMC console.

9. On the Security screen, select the **Admin Password** option, and press **Enter**.
10. In the **Please type in your new password** field, type the new administrative password, and press **Enter**.

    The minimum password length is 6 characters and the maximum password length is 30 characters. The password is case sensitive.

    The next time you boot the system, the system will prompt you to type the new password at the end of the boot sequence. The system issues this prompt before the `Shell>` prompt appears.

11. Press **F10** to save the change.
12. Press **Esc** twice to return to the boot manager.
13. To return to the RMC console, press **CTRL-]**, and then press **q**.
14. Proceed to “ Creating an installation environment” (page 10).

Creating an installation environment

You can install the MC990 X server software by making a direct connection to the MC990 X server.

1. log in to the RMC as the root user.
2. From the RMC, power-on the server.
3. Put the DVD in to the DVD drive in the MC990 X server chassis that includes the BaseIO riser.
4. From the RMC, enter the following command to perform a quick reset:

   ```
   # power -s reset
   ```

   The quick reset in this step sets the system to its smallest possible configuration. A later procedure includes a step to reset the whole system.
5. Wait for the system to reset.

   The reset is complete when the `RMC>` prompt appears.
6. At the `RMC>` prompt, enter the following command to open a console to the shell:

   ```
   RMC> uvcon
   ```
7. At the MC990 X server chassis BIOS menu, press **F2** to enter setup and select boot options.
8. Use the arrow keys to highlight **Boot Manager Menu**, and press **Enter**.
9. Use the arrow keys to highlight **UEFI JMicron USB to ATA/ATAPI bridge ...**, and press **Enter**.
10. (Conditional -- RHEL 7 or SLES 11 only) Select an installation activity, as follows:
    - For an RHEL 7 installation, use the arrow keys to navigate to the **Install Red Hat Enterprise Linux 7.1**, and press **Enter**.
    - For a SLES 11 installation, on the **SUSE Linux Enterprise Server *x*** screen, press **Enter** to select Installation and start the SLES installation.
11. Proceed to one of the following:
    - To install an RHEL 7 operating system and the Foundation Software on an MC990 X server, proceed to “ RHEL 7 OS installation on an MC990 X server” (page 13)
    - To install an RHEL 6 operating system and the Foundation Software on an MC990 X server chassis, proceed to “ RHEL 6 software installation on an MC990 X server” (page 19)
    - To install a SLES 12 operating system and the Foundation Software on an MC990 X server, proceed to “ SLES 12 OS and foundation software installation on an MC990 X server” (page 24)
    - To install a SLES 11 operating system and the Foundation Software on an MC990 X server chassis, proceed to “ SLES 11 platform installation on an MC990 X server” (page 30)

3 Oracle Linux 7 software installation on an MC990 X server

The instructions for installation of Oracle Linux 7 are nearly identical to those for installing RHEL, with some minor changes (see “ RHEL 7 OS installation on an MC990 X server” (page 13). The minimum version required is Oracle Linux 7.1.

Oracle Linux 7 comes with two kernels:

- RHEL based kernel
- Oracle Unbreakable Enterprise Kernel (UEK) kernel

1. After installing Oracle Linux 7, reboot.
2. From the boot menu, choose the RHEL based kernel
3. Type **e** to edit the boot line
4. Add the boot option **nobau** to the boot line
5. Boot the system
6. When the system comes up, install the System Foundation Software as described in the RHEL instructions (see “ Installing the foundation software on an RHEL 7 platform MC990 X server” (page 17)).
7. Once the System Foundation Software is installed, run the following:

   ```
   # modprobe hwperf
   ```

   ```
   # /usr/sbin/x86config
   ```

8. If the system will be running with the Oracle Unbreakable Enterprise Kernel (UEK), you must also install the `hwperf` kernel module package built for use with the UEK as follows (UEK version of 3.8.13-105 or later is required):

   ```
   # yum -c /tmp/yum-sgi.conf install kmod-hwperf-uek
   ```

   ```
   # yum update kernel-uek
   ```

9. After installing all packages, reboot the system to complete the installation, and boot with optimized kernel command line parameters.

4 RHEL 7 OS installation on an MC990 X server

This chapter explains how to install and configure the following software on an MC990 X server:

- The RHEL 7.1 operating system.
- The Foundation Software. If you install RHEL 7 on the server, HPE requires that you install Foundation software 2.13 or later.

The following procedures explain how to install the RHEL 7 operating system software:

- " Initiating RHEL 7 OS installation and partitioning the disk" (page 13)
- " Configuring the RHEL 7 OS network and rebooting" (page 15)
- " Completing the RHEL 7 OS installation" (page 16)

More information

- The *Red Hat Enterprise Linux 7 Installation Guide* at **http://docs.redhat.com/docs/en-US/Red_Hat_Enterprise_Linux/7/pdf/Installation_Guide/Red_Hat_Enterprise_Linux-7-Installation_Guide-en-US.pdf**
- The Foundation Software release notes file at **www.hpe.com/support/hpesc**

Initiating RHEL 7 OS installation and partitioning the disk

1. Make sure you gathered the information that you need for this installation.

   For more information, see " Gathering installation materials and information" (page 6).
2. On the boot loader menu, complete the following steps:
   a. Use the arrow keys to select **Install Red Hat Enterprise Linux 7.1**.
   b. Press **Enter**.
3. Wait a few moments while the software loads.
4. On the splash screen, which asks **What language would you like to use during the installation process?**, complete the following steps:
   a. Select your language.
   b. Click **Continue**.
5. On the **INSTALLATION SUMMARY** page, click **DATE & TIME**.
6. On the **DATE & TIME** page, complete the following steps:
   a. Select your time zone.
   b. Select the date.
   c. Click **Done**.
7. On the **INSTALLATION SUMMARY** page, click **KEYBOARD**.
8. On the **KEYBOARD LAYOUT** page, complete the following steps:
   a. Select your keyboard layout.
   b. Click **Done**.
9. On the **INSTALLATION SUMMARY** page, click **SOFTWARE SELECTION**.
10. On the **SOFTWARE SELECTION** page, complete the following steps:
    a. Select **Server with GUI**.
    b. Click **Done**.
11. On the **INSTALLATION SUMMARY** page, complete the following steps:
    a. Click **INSTALLATION DESTINATION**.

b. Click the disk under **Local Standard Disks**.
c. Under **Other Storage Options**, click **I will configure partitioning**.
d. Click **Done**.

12. On the **MANUAL PARTITIONING** page, clean the disk.

    The screen's left pane lists the operating system installations that currently reside on the disk. Your goal is to remove all operating system installations, data, and partitions that reside on the disk. You can remove one operating system at a time.

    To remove one operating system, complete the following steps:

    a. Select the operating system name.
    b. Click the minus sign (**-**) at the bottom of the left pane to delete the operating system.
    c. On the **Are you sure ...** popup, complete the following steps:
        i. Select **Delete all other** ....
        ii. Click **Delete it**.
    d. Repeat the preceding steps, as needed, until all operating systems are removed.

13. In the left pane, select **Standard Partition** from the drop-down menu.
14. Create new mount points.

    Your goal is to configure the disks according to Table 1 (page 14).

    Table 1 Disk partitions for an MC990 X Server

Size	Mount Point	File System
512 MB	`/boot/efi`	FAT16
250 GB (256,000 MB)	`/`	XFS
8 GB (8,192 MB)	`swap`	swap
rest of disk	`/data1`	XFS

    Complete the following steps to create new mount points:

    a. In the left pane, click the plus sign (**+**) to add a new mount point.
    b. On the **ADD A NEW MOUNT POINT** popup, complete the following steps:
        i. On the **Mount Point** drop-down menu, select **/boot/efi**.
        ii. On the **Desired Capacity** drop-down menu, enter **`512mb`**.
        iii. Click **Add mount point**.
    c. In the left pane, click the plus sign (**+**) to add a new mount point.
    d. On the **ADD A NEW MOUNT POINT** popup, complete the following steps:
        i. On the **Mount Point** drop-down menu, select **/**.
        ii. On the **Desired Capacity** drop-down menu, enter **`256gb`**.
        iii. Click **Add mount point**.
    e. In the left pane, click the plus sign (**+**) to add a new mount point.
    f. On the **ADD A NEW MOUNT POINT** popup, complete the following steps:
        i. On the **Mount Point** drop-down menu, select **swap**.
        ii. On the **Desired Capacity** drop-down menu, enter **`8gb`**.
        iii. Click **Add mount point**.
    g. In the left pane, click the plus sign (**+**) to add a new mount point.

h. On the **ADD A NEW MOUNT POINT** popup, complete the following steps:
   i. In the **Mount Point field**, enter `/data1`.
   ii. Leave the **Desired Capacity** field blank.
   iii. Click **Add mount point**.
i. Verify that the **Desired Capacity** field shows the rest of the disk.
j. Click **Done**.

15. On the **SUMMARY OF CHANGES** popup, click **Accept Changes**.
16. On the **KDUMP** page, complete the following steps:
    a. Click **Manual**.
    b. In the **Memory to be Reserved (MB)** field, specify `450` MB.
    c. Click **Done**.
17. Proceed to “ Configuring the RHEL 7 OS network and rebooting” (page 15).

Configuring the RHEL 7 OS network and rebooting

1. On the **INSTALLATION SUMMARY** page, click **NETWORK & HOST NAME**.
2. On the **NETWORK & HOST NAME** page, complete the following steps:
   a. Select **Ethernet enp1s0f0**.
   b. In the right pane, in the upper-right corner of the screen, find the **ON/OFF** switch and click the blank box to set the ON/OFF switch to **ON**.
   c. Click **Configure**.
   d. On the **Editing enp1s0f0** popup, select **IPv4 Settings**.
   e. Complete this step according to the following table:

Table 2 Specify dynamic or static addressing

To specify dynamic addressing:	To specify static addressing:
1. In the **Method:** drop-down menu, select **Automatic (DHCP)**.	1. In the **Method:** drop-down menu, select **Manual**.
2. Click **Apply**.	2. In the **Addresses** pane, click **Add**, and complete the following steps: • Enter the IP address. • Enter the netmask. • Enter the IP address of the default gateway.
3. On the **Editing** pop up, click **Save**.	3. In the **DNS servers:** field, enter the IP address of one or more DNS servers. If you specify more than one, use a comma to separate each IP address. 4. In the **Search domains:** field, enter one or more search domains. If you specify more than one, use a comma to separate each domain. 5. On the **Editing** pop up, click **Save**.

3. On the **NETWORK & HOSTNAME** page, in the **Host name** field, complete the following steps:
   a. Enter the hostname of the Integrity MC990 X system.
   b. Click **Done**.
4. On the **INSTALLATION SUMMARY** page, click **Begin Installation**.
5. On the **CONFIGURATION** page, click **ROOT PASSWORD**.
6. On the **ROOT PASSWORD** page, complete the following steps:

a. In the **Root Password** field, enter the password you want to use on this Integrity MC990 X system.
b. In the **Confirm** field, enter the password again.
c. Click **Done**.

If the password is too weak, either specify a stronger password or click **Done** twice.

7. On the **CONFIGURATION** page, complete the following steps:
   a. Wait for the configuration to complete.
   b. Click **Reboot** when the configuration completes.
   c. Wait for the reboot to finish.
8. Proceed to “ Completing the RHEL 7 OS installation” (page 16).

Completing the RHEL 7 OS installation

To complete the installation:

1. On the **INITIAL SETUP** screen, click **LICENSE INFORMATION**.
2. On the **LICENSE INFORMATION** screen, complete the following steps:
   a. Click **I accept the license agreement**.
   b. Click **Done**.
3. Click **FINISH CONFIGURATION**.
4. On the **Subscription Management Registration** page, click **Forward**.
5. On the second **Subscription Management Registration** page, complete the following steps:
   a. Complete the fields appropriately for your site.
   b. Click **Done**.
6. On the **Welcome** page, complete the following steps:
   a. Select your language.
   b. Click **Next**.
7. On the Input **Sources** page, complete the following steps:
   a. Select the language you use.
   b. Click **Next**.
8. On the **Login** page, complete the following steps to create the local user account:
   a. Complete all the fields on this page.
   b. Click **Next**.
9. On the **Location** page, complete the following steps:
   a. Select a location.
   b. Click Next.
10. On the **Thank You** screen, click **Start using Red Hat Enterprise Linux Server**.
11. Click the user account name in the upper right corner of your screen, and select **Log Out** on the menu that appears.

    This action logs out the local user, which is the account you created in this procedure.
12. Proceed to “ Installing the foundation software on an RHEL 7 platform MC990 X server” (page 17).

Installing the foundation software on an RHEL 7 platform MC990 X server

1. log in to the MC990 X server as the root user.
2. On the login page, complete the following steps:
   a. Select **Not Listed?**.
   b. In the **Username** field, enter **`root`**.
   c. In the **Password** field, enter the root user's password.
   d. Click **Log In**.
   e. (Conditional) Initialize the root user account.

      Complete these steps only if this is the first time you are logging in as the root user.

      i. On the **Welcome** page, complete the following steps:
         A. Select your language.
         B. Click **Next**.
      ii. On the **Input Sources** page, complete the following steps:
         A. Select the language you use.
         B. Click **Next**.
      iii. On the **Thank You** screen, click **Start using Red Hat Enterprise Linux Server**.
3. Access the installation software.

   Insert the *HPE Foundation Software* CD into the DVD drive.
4. Click **Applications→System Tools→Terminal** to open a terminal window.
5. Enter the following command to create an installation directory for the files from the CD:

   ```
   # mkdir -p /opt/hpe/Factory-Install/hpe-foundation-2.14/
   ```
6. Enter the following command to create a temporary mount directory:

   ```
   # mkdir /var/sfs2.14
   ```
7. Enter the following command to mount the CD in read-only mode (`-r`), using a loop device:

   ```
   # mount -t iso9660 -ro loop /dev/cdrom /var/sfs2.14
   ```
8. Enter the following command to copy the files from the temporary mount directory to the installation directory:

   ```
   # rsync -avHx /var/sfs2.14/ /opt/hpe/Factory-Install/hpe-foundation-2.14/
   ```
9. Enter the following command to unmount the CD from the temporary directory:

   ```
   # umount /var/sfs2.14
   ```
10. Run the `create-yum-config-file` using:
    `#/opt/hpe/Factory-Install/hpe-foundation-2.14/create-yum-config-file`
11. Enter the following command to remove the temporary mount directory:

    ```
    # rmdir /var/sfs2.14
    ```
12. Use a text editor to create the `/etc/yum.repos.d/foundation2.14-local.repo` file with the following contents:

    ```
    ########################################
    [foundation2.14-repo]
    name=Foundation Software 2.14 - $basearch
    baseurl=file:///opt/hpe/Factory-Install/hpe-foundation-2.14/RPMS
    enabled=1
    gpgcheck=1
    ```

```
gpgkey=file:///opt/hpe/Factory-Install/hpe-foundation-2.14/RPM-GPG-KEY-sgi
########################################
```

13. Enter the following command to retrieve the list of software that you can install:

    ```
    # yum grouplist | grep HPE
    ```

14. Enter the following command to install the Foundation Software group:

    ```
    # yum -c /tmp/yum-sgi.conf groupinstall "System Foundation
    Software"
    ```

15. Enter **y** at the following prompt to confirm the download size:

    ```
    Is this ok [y/N]
    ```

16. Enter **y** at the following prompt to accept the GPG license key:

    ```
    Is this ok [y/N]
    ```

17. Open a terminal window on the booted system.
18. In the terminal window, enter the following command to reboot the system:

    ```
    # reboot
    ```

19. After the system reaches the EFI shell, in the RMC command window, enter the following command to reset the full system:

    ```
    # power reset
    ```

5 RHEL 6 software installation on an MC990 X server

This chapter explains how to install and configure the following software on an MC990 X server chassis:

- The RHEL operating system.
- The Foundation Software.

More information

- The *Red Hat Enterprise Linux 6 Installation Guide* at **http://docs.redhat.com/docs/en-US/Red_Hat_Enterprise_Linux/6/pdf/Installation_Guide/Red_Hat_Enterprise_Linux-6-Installation_Guide-en-US.pdf**.
- The Foundation Software release notes file at **www.hpe.com/support/hpesc**.

Initiating the RHEL 6 OS installation

1. Make sure you gathered the information that you need for this installation.

   For more information, see “ Gathering installation materials and information” (page 6).
2. On the **Disc Found** screen, tab to one of the following, and press **Enter**:
   - **Skip**. Select this option if you are using the standard DVD you received from HPE.
   - **OK**. Select this option if you downloaded the software and created your own DVD. This option checks the integrity of the disk.
3. On the **Red Hat Enterprise Linux 6** splash screen, click **Next**.
4. On the **What language would you like to use during the installation process?** screen, select your language, and click **Next**.
5. On the **Select the appropriate keyboard for the system** screen, select your keyboard, and click **Next**.
6. On the **What type of devices will your installation involve?** screen, select **Basic storage devices**, and click **Next**.
7. (Conditional) Select **Fresh Installation**, and select **Next**.

   Perform this step if a screen with the following information appears: **At least one existing installation has been detected on your system. What would you like to do?**
8. On the **Please name this computer** screen, enter the fully qualified domain name (FQDN) for the SMN or server, and click **Configure Network**.
9. Proceed to “ Specifying the RHEL 6 OS network” (page 19).

Specifying the RHEL 6 OS network

1. On the **Network Connections** popup, select **System eth0**, and click **Edit**.
2. On the **Editing System eth0** popup, complete the following steps:
   a. Select **Connect automatically** to start the network card.
   b. Select the **IPv4 Settings** tab.
3. Complete the **IPv4 Settings** tab.

   This step differs depending on whether you want to use dynamic or static addressing, as follows:

Table 3 Specify dynamic or static addressing

To specify dynamic addressing:	To specify static addressing:
1. Make sure that **Automatic (DHCP)** is selected.	1. In the **Method:** field, pull down **Manual**.
2. Click **Apply**.	2. In the **Addresses** pane, click **Add**, and complete the following steps: • Type the IP address. • Type the netmask. • Type the IP address of the default gateway.
3. On the **Network Connections** pop up, click **Close**.	3. In the **DNS servers:** field, type the IP address of one or more DNS servers. If you specify more than one, use a comma to separate each IP address. 4. In the **Search domains:** field, type one or more search domains. If you specify more than one, use a comma to separate each domain. 5. Click **Apply**. 6. On the **Network Connections** pop up, click **Close**.

4. On the **Please name this computer** screen, click **Next**.
5. On the **Please select the nearest city in your time zone** screen, select a city, and click **Next**.
6. On the **The root account is used for administering the system** screen, complete the following steps:
   a. In the **Root Password** field, enter the password you want to use for the root account.
   b. In the **Confirm** field, enter the root password again.
   c. Click **Next**.
7. On the **Which type of installation would you like?** screen, select **Create Custom Layout**, and click **Next**.

Completing the RHEL 6 OS installation

1. On the **The default installation of Red Hat Enterprise Linux is a basic server install ...** page, complete the following steps:
   a. Select **Desktop**.
   b. Select **Next**.

   Wait for the operating system installation to complete.
2. On the **Congratulations, your Red Hat Enterprise Linux installation is complete** page, click **Reboot** .
3. On the **Welcome** page, click **Forward**.
4. On the **License Information** page, complete the following steps:
   a. Click **Yes, I agree to the License Agreement**.
   b. Click **Forward**.

5. On the **Set Up Software Updates** page, decide whether to register now or whether to postpone registration.

   If your Integrity MC990 X system is connected to the network correctly, you can register now. The following information explains how to proceed:

   - If the screen contains a message that begins with `This assistant will guide you through the process of registering your system with Red Hat to receive software updates ...`, then the Integrity MC990 X system is connected correctly to the network. Complete the following steps:
     1. Select **Yes, I'd like to register now**, and click **Forward**.
     2. On the **Choose Service** page, select **Red Hat Subscription Management**, and click **Forward**.
     3. On the **Subscription Management Registration** page, click **Forward**.
     4. On the second **Subscription Management Registration** page, complete the fields appropriately for your site, and click **Forward**.
     5. On the third **Subscription Management Registration** page, click **Forward**.
   - If the screen includes a warning symbol and a message that begins with `The network connection on your system is not active ...`, then the Integrity MC990 X system is not connected correctly to the network. Complete the following steps:
     1. Click **Forward**.
     2. Continue on to the next step in this procedure.

        You can restart the installer, correct your network configuration, and connect to RHN later.

6. On the **Create User** page, complete the following steps to create an end-user account:
   a. In the **Username** field, enter the username.
   b. In the **Full Name** field, enter the user's full name.
   c. In the **Password** field, enter the user's password. Passwords must be at least eight characters long, contain at least one digit, and contain a mixture of uppercase and lowercase letters.
   d. In the **Confirm Password** field, type the user's password again.
   e. Click **Forward**.
7. On the **Date and Time** screen, configure system clock settings that your site requires and click **Forward**.
8. On the **Kdump** page, specify **`450`** MB, and click **Finish**
9. On the **Changing Kdump ...** pop up, click **Yes**.
10. On the **The system must now reboot ...** pop up, click **OK** to confirm the reboot.
11. Proceed to “ Installing the foundation software on an RHEL 6 platform MC990 X server” (page 21).

Installing the foundation software on an RHEL 6 platform MC990 X server

1. log in to the MC990 X server as the root user.
2. On the login page, complete the following steps:
   a. Select **Other**.
   b. In the **Username** field, enter **`root`**.

c. In the **Password** field, enter the root user's password.
d. Click **Log In**.

3. On the **You are currently trying to run as the root super user ...** pop up, click **Close**.
4. Access the installation software.

   Insert the *HPE Foundation Software* CD into the DVD drive.
5. Click **Applications→System Tools→Terminal** to open a terminal window.
6. Enter the following command to create an installation directory for the files from the CD:

   ```
   # mkdir -p /opt/hpe/Factory-Install/hpe-foundation-2.14/
   ```
7. Enter the following command to create a temporary mount directory:

   ```
   # mkdir /var/sfs2.14
   ```
8. Enter the following command to mount the CD in read-only mode (`-r`), using a loop device:

   ```
   # mount -t iso9660 -ro loop /dev/cdrom /var/sfs2.14
   ```
9. Enter the following command to copy the files from the temporary mount directory to the installation directory:

   ```
   # rsync -avHx /var/sfs2.14/ /opt/hpe/Factory-Install/hpe-foundation-2.14/
   ```
10. Run the `create-yum-config-file` using:
    #/opt/hpe/Factory-Install/hpe-foundation-2.14/create-yum-config-file
11. Enter the following command to unmount the CD from the temporary directory:

    ```
    # umount /var/sfs2.14
    ```
12. Enter the following command to remove the temporary mount directory:

    ```
    # rmdir /var/sfs2.14
    ```
13. Use a text editor to create the `/etc/yum.repos.d/foundation2.14-local.repo` file with the following contents:

    ```
    ########################################
    [foundation2.14-repo]
    name=HPE Foundation Software 2.14 - $basearch
    baseurl=file:///opt/hpe/Factory-Install/hpe-foundation-2.14/RPMS
    enabled=1
    gpgcheck=1
    gpgkey=file:///opt/hpe/Factory-Install/hpe-foundation-2.14/RPM-GPG-KEY-SGI
    ########################################
    ```
14. Enter the following command to retrieve the list of software that you can install:

    ```
    # yum grouplist | grep HPE
    ```
15. Enter the following command to install the Foundation Software group:

    ```
    # yum -c /tmp/yum-sgi.conf groupinstall "System Foundation Software"
    ```
16. Enter **y** at the following prompt to confirm the download size:

    ```
    Is this ok [y/N]
    ```
17. Type **y** at the following prompt to accept the GPG license key:

    ```
    Is this ok [y/N]
    ```
18. Open a terminal window on the booted system.
19. In the terminal window, Enter the following command to reboot the system:

    ```
    # reboot
    ```
20. After the system reaches the EFI shell, in the RMC command window, type the following command to reset the full system:

```
# power reset
```

6 SLES 12 OS and foundation software installation on an MC990 X server

This chapter explains how to install the following software on an MC990 X server:

- The SLES 12 operating system.
- The Foundation Software. If you install SLES 12 on the server, HPE requires that you install Foundation software 2.13 or later.

More information

- The *Installation Quick Start* and the *Deployment Guide* at **https://www.suse.com/documentation/sles-12/** .
- The Foundation Software release notes file at **www.hpe.com/support/hpesc**.

Initiating the SLES 12 OS installation

1. Make sure you have performed the preliminary procedures and satisfied all prerequisites.

   For more information, see the following:

   “ Gathering installation materials and information” (page 6)
2. On the boot loader screen, select **Installation**.
3. On the **Language, Keyboard and License Agreement** page, complete the following steps:
   a. Use the pull-down menu to select your language.
   b. Use the pull-down menu to select your keyboard layout.
   c. Check **I Agree to the License Terms**.
   d. Click **Next**.
4. On the **System Probing ...** screen, monitor the progress.
5. On the **Registration** screen, complete the following steps:
   a. Provide your site credentials.
   b. Click **Next**.
6. On the **Add On Product** screen, click **Next**.
7. On the **Suggested Partitioning** screen, complete the following steps:
   a. Click **Expert Partitioner**.
   b. Click **Next**.
8. Proceed to “ SLES 12 disk partition configuration for an MC990 X server” (page 24).

More information

“ Initiating the SLES 11 OS installation” (page 30)
“ Specifying the SLES 11 network and miscellaneous settings” (page 31)

SLES 12 disk partition configuration for an MC990 X server

Patition disks for Integrity MC990 X system servers according to Table 4 (page 25).

Table 4 Disk partitions for an MC990 X server

Size	Mount Point	File System
512 MB	`/boot/efi`	FAT16
250 GB (256,000 MB)	`/`	XFS
8 GB (8,192 MB)	`swap`	Swap
rest of disk	`/data1`	XFS

More information

“ Configuring SLES 12 disk partitions for an MC990 X server” (page 25)

Configuring SLES 12 disk partitions for an MC990 X server

1. On the **Expert Partitioner** screen, complete the following steps to clean the disk:
   a. Expand **Hard Disks**.
   b. Select the disk you want to use.

      For example, select **sda**.
   c. On the **Expert ...** drop-down in the lower right part of the screen, select **Create New Partition Table**.
   d. On the **YaST2** pop up with the message `Really create a new partition table ...`, click **Yes**.
   e. Proceed to the next step after you have deleted all existing partitions.
2. On the **Expert Partitioner** screen, complete the following steps:
   a. Expand **Hard Disks**.
   b. Select the hard disks you want to use.
   c. Click **Add**.
3. Complete the following steps on the **Add Partition on /dev/*disk*** screen to configure the boot partition:
   a. Under New Partition Size, click Custom Size.
   b. Type `512 MB` in the Size field.
   c. Click Next.
   d. Under the Role list, complete the following steps:
      i. Select Operating System.
      ii. Click Next.
   e. Under Formatting Options, select Format partition.
   f. Under File system, use the pull-down menu to select `FAT16`.
   g. Under Mounting Options, select Mount Partition.
   h. Under Mount point, use the pull-down menu to select `/boot/efi`.
   i. Select Finish.
4. On the **Expert Partitioner** screen, click **Add**.
5. Complete the following steps on the **Add Partition on /dev/*disk*** screen to configure the root partition:
   a. Under **New Partition Size**, click **Custom Size**.
   b. Enter **`250 GB`** in the **Size** field.
   c. Click **Next**.

d. Under the **Role** list, complete the following steps:
    i. Select **Operating System**.
    ii. Click **Next**.
e. Under **Formatting Options**, select **Format partition**.
f. Under **File system**, use the pull-down menu to select **XFS**.
g. Under **Mounting Options**, select **Mount Partition**.
h. Under **Mount point**, use the pull-down menu to select **/**.
i. Click **Finish**.

6. On the **Expert Partitioner** screen, click **Add**.
7. Complete the following steps on **Add Partition on /dev/*disk*** screen to configure the swap partition:
    a. Under **New Partition Size**, click **Custom Size**.
    b. Specify `8 GB` in the **Size** field.
    c. Click **Next**.
    d. Under the **Role** list, complete the following steps:
        i. Select **Swap**.
        ii. Click **Next**.
    e. Under **Formatting Options**, select **Format partition**.
    f. Under **File system**, use the pull-down menu to select **Swap**.
    g. Under **Mounting Options**, select **Mount Partition**.
    h. Under **Mount point**, use the pull-down menu to select **swap**.
    i. Select **Finish**.
8. On the **Expert Partitioner** screen, click **Add**.
9. Complete the following steps on the **Add Partition on /dev/*disk*** screen to configure the data partition:
    a. Under **New Partition Size**, click **Maximum Size**.
    b. Click **Next**.
    c. Under the **Role** list, complete the following steps:
        i. Select **Data and ISV Applications**.
        ii. Click **Next**.
    d. Under **Formatting Options**, select **Format partition**.
    e. Under **File system**, use the pull-down menu to select **XFS**.
    f. Under **Mounting Options**, select **Mount Partition**.
    g. Under **Mount point**, enter `/data1`.
    h. Click **Finish**.
10. On the **Expert Partitioner** screen, in the **Partitions** tab, examine the disk partitions.
    - If the partitions match those in ???, click **Accept**.
    - If the partitions are incorrect, correct the partition specifications.
11. On the **Suggested Partitioning** screen, click **Next**.
12. On the **Clock and Time Zone** screen, complete the following steps:
    a. Select your region.
    b. Select your time zone.
    c. Check the box next to **Hardware Clock Set To UTC**.
    d. Click **Next**.

13. On the **Create New User** screen, create at least one non-root user.

    Complete the following steps:

    a. Complete the following fields:
        - **User's Full Name**
        - **Username**
        - **Password**
        - **Confirm Password**

    b. Click **Next**.

14. On the **Password for the System Administrator** “root” screen, complete the following steps:

    a. In the **Password for root User** field, enter the root user's password.

    b. In the **Confirm password** field, re-enter the root user's password.

    c. Enter a few characters in the **Test Keyboard Layout** field. For example, if you specified a language that includes non-English characters and you include these characters in passwords, enter these characters into this field. This is a plain text field, and you can assure yourself that the operating system recognizes these characters when you enter them.

    d. Click **Next**.

15. On the **Installation Settings** screen, click **Install**.
16. On the **Confirm Installation** pop up, click **Install**.
17. Monitor the installation and be prepared to remove the installation software media before the boot.

    The installation itself can take several minutes. At the end of the installation, the system boots. The installation software notifies you of this boot. If possible, remove the installation DVD before the system boots.

    If you fail to remove the installation DVD before the final boot, the machine boots from the DVD. In this case, complete the following steps:

    a. Remove the DVD after the boot.

    b. Press **CTRL-ALT- DEL** to boot the machine again.

    c. Allow the machine to boot from the hard disk to finish the installation.

18. Proceed to “ Specifying the SLES 12 network and miscellaneous settings” (page 27).

Specifying the SLES 12 network and miscellaneous settings

1. log in to the MC990 X server as the root user.
2. Click **Applications→System Tools→YaST**.
3. On the **Administrator Settings** screen, click **Network Settings**.
4. On the **Network Configuration** screen, click the **Network Interfaces** link.
5. On the **YaST2 -- Network Settings** screen, highlight the network card you want to configure, and click **Edit**.
6. On the **Network Card Setup** screen, specify dynamic or static addressing, as follows:

Table 5 Specify dynamic or static addressing

To specify dynamic addressing:	To specify static addressing:
1. Select the type of dynamic addressing that you want.	1. Verify that `eth0` appears in the **Configuration Name** field, and click **Statically assigned IP Address**.
2. Click Next to accept the default of DHCP.	2. Configure the first NIC (`eth0`) for your house (public) network. On the **Address** tab, specify the following: • The IP Address • The Subnet Mask • The Hostname 3. Click **Next**.

7. On the **Network Settings** screen, complete the following steps:
   a. Click the **Hostname/DNS** tab.
   b. Enter the hostname.
   c. Enter the domain name.
   d. Verify that **Change Hostname via DHCP** is set correctly.

      To assign a static IP address, clear the **Change Hostname via DHCP** checkbox. A later step saves the hostname to the `/etc/hosts` file. Consult your network administrator if you have questions regarding the use of DHCP.

      NOTE: This procedure is an example illustrating how to configure a static address on a network card. If you want a different network configuration, for example if you want to configure DHCP, ensure that the checkbox in this step is checked before you click Next . You can use this procedure as a guide and consult the SLES documentation for more specific steps.

   e. On the **Hostname/DNS** tab, specify the following:
      - The IP address for **Name Server 1**.
      - (Optional) The IP address for **Name Server 2**.
      - (Optional) In the **Domain Search** field, add additional domains.
   f. Click the **Routing** tab.
   g. On the **Routing** tab, enter the Default Gateway, and click **OK**.
8. Proceed to “ Installing the foundation software on a SLES 12 platform MC990 X server” (page 28).

Installing the foundation software on a SLES 12 platform MC990 X server

1. Access the installation software.

   Insert the *HPE Foundation Software* CD into the DVD drive.

   Complete this step in one of the following ways:
2. log in to the MC990 X server as the root user.
3. Click **Applications→System Tools→Computer→YaST** to start the YaST interface.
4. Under **Software**, click **Software Repositories** to start the SLES repository manager.

5. On the **Configured Software Repositories** screen, click **Add**.
6. On the **Add On Product** screen, select **DVD**, and click **Next**.
7. On the **YaST** pop up, click **Continue**.
8. (Conditional) On the **Import Untrusted GnuPG Key**, click **Trust**.

   Perform this step if this is the first time through this process and you need to confirm the security of the digital key.
9. On the **Configured Software Repositories** screen, click **OK**.
10. On the **YaST Control Center** screen, click **Software Management**.
11. Select **View→Patterns**.
12. Scroll down to **Foundation**.
13. Check the box to the left of **Foundation Libraries, Software, and Drivers**, and click **Accept**.
14. On the **Changed Packages** pop up, click **Continue**.
15. Insert CDs into the DVD drive as directed by the prompts on the **Perform Installation** screen.

    If necessary, click **Eject** on the **YaST2** pop up to open the DVD drive. In the **YaST** pop up, you might need to click **Retry** more than once to read a new disc. You can ignore the graphic representation of the file system that appears in a new window during this step.
16. On the **Installation Report** screen, click **Finish**.
17. Close the YaST session.
18. Open a terminal window on the booted system.
19. In the terminal window, enter the following command to reboot the system:

    ```
    # reboot
    ```
20. After the system reaches the EFI shell, in the RMC command window, enter the following command to reset the full system:

    ```
    # power reset
    ```

7 SLES 11 platform installation on an MC990 X server

This chapter explains how to install the following software on an MC990 X server:

- The SLES 11 operating system.
- The Foundation Software.

More information

SLES 11 Installation Quick Start and the *SLES 11 Deployment Guide* at **https://www.suse.com/documentation/sles11/**
Foundation Software release notes file at **www.hpe.com/support/hpesc**
“ Installing the SLES 11 OS software on an MC990 X server” (page 30).
“ Installing the foundation software on a SLES 11 platform MC990 X server” (page 33).

Installing the SLES 11 OS software on an MC990 X server

- “ Initiating the SLES 11 OS installation” (page 30)
- “ Specifying the SLES 11 network and miscellaneous settings” (page 31)
- “ Completing the SLES 11 installation” (page 33)

NOTE: If you use the JViewer, the mouse behavior can be unpredictable during the following procedures:

- “ Initiating the SLES 11 OS installation” (page 30)

After the first boot, the mouse behaves as expected.

Initiating the SLES 11 OS installation

NOTE: If you use the JViewer, the mouse behavior can be unpredictable during the this procedure. After the first boot, the mouse behaves as expected.

1. Make sure you prepared for the installation and selected **Installation** on the boot loader screen.

   For more information, see the following:

   “ Gathering installation materials and information” (page 6)
2. On the Welcome page, complete the following steps:
   a. Select your language.
   b. Select your keyboard layout.
   c. Click **I agree to the license terms**.
   d. Click **Next**.
3. On the **Media Check** page, complete the following steps:
   a. (Conditional) Select **Start Check**.

      Select this option if you want to troubleshoot a failed installation. If a previous installation failed, you can check this option, install the operating system software again, and observe the messages that the installer issues. It is possible that media problems prevented your previous installation from completing correctly.

   b. Click **Next**.

      If this is your first installation session, you can click **Next** safely.

4. On the **System Probing ...** screen, monitor the progress.
5. On the **Installation Mode** screen, accept the default of **New Installation**, and click **Next**.
6. On the **Clock and Time Zone** screen, complete the following steps:
   a. Select your region.
   b. Select your time zone.
   c. Check the box next to **Hardware Clock Set To UTC**.
   d. Click **Next**.
7. On the **Server Base Scenario** screen, accept the default of **Physical Machine**, and click **Next**.

Specifying the SLES 11 network and miscellaneous settings

The following procedure explains how to specify the hostname, networking information, and other miscellaneous settings.

To specify the hostname, networking, and miscellaneous settings:

1. On the **Password for the System Administrator** root screen, complete the following steps:
   a. In the **Password for root User** field, enter the root user's password.
   b. In the **Confirm password** field, re-enter the root user's password.
   c. Enter a few characters in the **Test Keyboard Layout** field. For example, if you specified a language that includes non-English characters and you include these characters in passwords, type these characters into this field. This is a plain text field, and you can assure yourself that the operating system recognizes these characters when you type them.
   d. Click **Next**.
2. On the **Hostname and Domain Name** screen, complete the following steps:
   a. Enter the hostname.
   b. Enter the domain name.
   c. Verify that **Change Hostname via DHCP** is set correctly.

      To assign a static IP address, clear the **Change Hostname via DHCP** checkbox. A later step saves the hostname to the `/etc/hosts` file. Consult your network administrator if you have questions regarding the use of DHCP.

      NOTE: This example procedure explains how to configure a static address on a network card. If you want a different network configuration, for example if you want to configure DHCP, ensure that the checkbox in this step is checked before you click Next . You can use this procedure as a guide and consult the SLES documentation for more specific steps.

   d. Select **Next**.
3. On the **Network Configuration** screen, complete the following steps:
   1. Click the **Network Interfaces** link.
   2. Proceed to the next step in this procedure, which is:

      Step 4
4. On the **Network Settings** screen, highlight the network card you want to configure, and click **Edit**.
5. On the **Network Card Setup** screen, specify dynamic or static addressing, as follows:

Table 6 Specify dynamic or static addressing

To specify dynamic addressing:	To specify static addressing:
1. Select the type of dynamic addressing that you want. 2. Click **Next** to accept the default of DHCP.	1. Verify that **eth0** appears in the **Configuration Name** field, and click **Statically assigned IP Address**. 2. Configure the first NIC (**eth0**) for your house (public) network. On the Address tab, specify the following: • The IP Address • The Subnet Mask • The Hostname 3. Click **Next**.

6. On the **Network Settings** screen, complete the following steps:
   a. Click the Hostname/DNS tab.
   b. On the Hostname/DNS tab, specify the following:
      i. The IP address for **Name Server 1**.
      ii. (Optional) The IP address for **Name Server 2**.
      iii. (Optional) In the **Domain Search** field, add additional domains.
   c. Click the **Routing** tab.
   d. On the **Routing** tab, in the **Default Gateway** field, complete the following steps:
      i. Enter your site's default gateway.
      ii. Click **OK**.
7. (Optional) Examine the Network Configuration screen, and supply additional network information as required by your site.

   For example, you might want to change the following settings:

   - Firewall settings. If you enable a firewall, make sure to enable the firewall only for the public NIC (`eth0`). The firewall is enabled by default.
   - VNC Remote Administration. This setting enables remote administration and is disabled by default.
   - By default, the SSH port is closed, and the menu displays SSH port is blocked (open). Click open to open this port.
8. Click **Next** to advance from the **Network Configuration** screen.

   Wait for the installer to save the network configuration.
9. On the **Test Internet Connection** screen, click **Next**.

   Wait for the internet connection test to complete.
10. On the **Running Internet Connection test** screen, click **Next**.
11. On the **Novell Customer Center Configuration** screen, complete the following steps:
    a. Select **Configure Now (Recommended)**.
    b. Verify that each of the following defaults under **Include for Convenience** are selected:
       - Hardware Profile
       - Optional Information

- Regularly Synchronize With the Customer Center

c. Click **Next**.

For more information about how to register with Novell, see the following website:

www.novell.com

12. On the **YaST2 Manual Interaction Required** pop up, click **Continue**.
13. On the **Novell Customer Center System Registration** screen, complete the fields, and click **Submit**.
14. On the **Novell Customer Center Configuration** screen, click **Next**.
15. On the **Network Services Configuration** screen, click **Next**.
16. Proceed to “ Completing the SLES 11 installation” (page 33).

Completing the SLES 11 installation

1. On the **User Authentication Method** screen, select one of the authentication methods, and click **Next**.
2. On the **New Local User** screen, create at least one non-root user.

   Complete the following steps:

   a. Complete the following fields:
      - User's Full Name
      - Username
      - Password
      - Confirm Password

   b. (Optional) Click **User Management** to specify another non-root user.

   c. Click **Next**.
3. On the **Release Notes** screen, click **Next**.
4. (Conditional) Let the **YaST2** popup time out.

   Complete this step if the system issues a popup here.
5. On the **Hardware Configuration** screen, click **Next**.
6. On the **Installation Completed** screen, click **Finish**.
7. Proceed to “ Installing the foundation software on a SLES 11 platform MC990 X server” (page 33).

Installing the foundation software on a SLES 11 platform MC990 X server

The following procedure explains how to install the Foundation Software on an MC990 X server that hosts the SLES 11 operating system.

To install the Foundation Software on a SLES platform from the direct-attached console:

1. Access the installation software.

   Insert the *HPE Foundation Software* CD into the MC990 X server chassis DVD drive.
2. log in to the computer as the root user.
3. Click **Computer→YaST** to start the YaST interface.
4. Click **Software→Software Repositories** to start the SLES repository manager.
5. On the **Configured Software Repositories** screen, click **Add**.
6. On the **Media Type** screen, select **DVD**, and click **Next**.

7. On the **YaST** pop up, click **Continue**.
8. (Conditional) On the **Import Untrusted GnuPG Key**, click **Import**.

   Perform this step if this is the first time through this process and you need to confirm the security of the digital key.
9. On the **Configured Software Repositories** screen, click **OK**.
10. On the **YaST Control Center** screen, click **Software Management**.
11. Select **View→Patterns**.
12. Scroll down to **Foundation**.
13. Check the box to the left of **Foundation Libraries, Software, and Drivers**, and click **Accept**.
14. On the **Changed Packages** pop up, click **Continue**.
15. Insert CDs into the DVD drive as directed by the prompts on the Perform Installation screen.

    If necessary, click **Eject** on the **YaST2** pop up to open the DVD drive. In the **YaST2** pop up, you might need to click **Retry** more than once to read a new disc. You can ignore the graphic representation of the file system that appears in a new window during this step.
16. Close the YaST session.
17. Open a terminal window on the booted system.
18. In the terminal window, type the following command to reboot the system:

    ```
    # reboot
    ```
19. After the system reaches the EFI shell, in the RMC command window, type the following command to reset the full system:

    ```
    # power reset
    ```

The MC990 X server installation is finished at this time.

8 Additional software features for the Integrity MC990 X system

Additional software features are used to remote manage, configure security, debug and create crash dumps for the Integrity MC990 X system.

More information

“ Remote management through the ipmitool command” (page 35)
“ Configuring Security-Enhanced Linux (SELinux) on RHEL platforms” (page 36)
“ Installation of debuginfo packages” (page 37)
“ Creating a crash dump file on an Integrity MC990 X system server on RHEL 7, SLES 12, and SLES 11 platforms” (page 42)

Remote management through the ipmitool command

From a remote console, you can use ipmitool commands to perform typical system operations.

For the ipmitool command to work, the remote console must be on the same local network as the Integrity MC990 X system. The following shows the ipmitool command format:

```
ipmitool -I lanplus -H <hostname> -U ADMIN -P <password> <command>
```

The arguments to the command parameters are as follows:

Parameter	Meaning
<hostname>	The hostname of the Integrity MC990 X system on your network.
<password>	The system administrative password. The factory-shipped, default password is ADMIN.
<command>	One of the ipmitool commands. There many IPMI commands. The commands that HPE supports for Integrity MC990 X system remote management are as follows: • power off • power reset • power on

Security-Enhanced Linux (SELinux) configuration on RHEL platforms

You can configure SELinux on an Integrity MC990 X system computer that runs the RHEL operating system. SELinux supports Multi-Level Security (MLS) and Multi-Category Security (MCS) modes. When you configure SELinux, you create an MLS-compliant or MCS-compliant environment on an Integrity MC990 X system, and you enable MPI programs to take full advantage of all the features that Accelerate provides on MC990 X hardware. For more information about SELinux, see your RHEL documentation.

NOTE: If you are not interested in MLS or MCS, you do not need to configure SELinux. In this case, do not perform the procedure in this topic.

The SLES operating system does not support SELinux.

To obtain help output for the hpe-selinux-configuration command, type the command name, with no options. For example:

```
# hpe-selinux-configuration
hpe-selinux-configuration
Actions
 -h|--help   Print usage
 -s|--status  Return module(s) status
 -i|--insert  Insert policy module
 -r|--remove  Remove policy module
 -l|--label  Label policy files
 -R|--restart Restart services affected by HPE policies

Select target policy modules (default is all)
 -S|--services Perform operation on services
 -D|--devices Perform operation on devices
   --bigpage
   --gru
   --mmtimer
   --xpmem
   --procset
   --arraysvcs
```

More information

“ Configuring Security-Enhanced Linux (SELinux) on RHEL platforms” (page 36)

Configuring Security-Enhanced Linux (SELinux) on RHEL platforms

1. Log in as root.
2. Type the following commands to load the SELinux software modules from the RHEL distribution:

   ```
   # yum install policycoreutils-python
   # yum install selinux-policy-mls
   hpe_bigpage   1.0.0
   hpe_gru     1.0.0
   hpe_mmtimer   1.0.0
   hpe_xpmem    1.0.0
   hpe_procset   1.0.0
   hpe_arraysvcs  1.0.0
   ```
3. Type the following command to ensure that the modules are loaded correctly:

   ```
   # hpe-selinux-configuration -s
   ```

   If the SELinux software modules are loaded correctly, the command returns a list of the loaded modules.

   If the `hpe-selinux-configuration -s` command returns nothing, then the policy modules did not load correctly. Type the following command to load all HPE policies:

   ```
   # hpe-selinux-configuration -i
   ```
4. Type the following command to apply security labels to the file system for all kernel modules and services:

   ```
   # hpe-selinux-configuration -l
   ```

   Note that the option to the preceding command is a lowercase L character.
5. Type the following command to restart services:

   ```
   # hpe-selinux-configuration -R
   ```

Installation of debuginfo packages

Operating system vendors provide debuginfo packages for each released version. After you install the debuginfo packages, you can debug crash kernels and use other advanced debugging techniques.

More information

“ Installing debuginfo packages on RHEL platforms” (page 37).
“ Installing debuginfo packages on SLES platforms” (page 38).

Installing debuginfo packages on RHEL platforms

NOTE: For general information about RHEL debuginfo, see **https://access.redhat.com/solutions/9907**.

The examples in this procedure have been modified to fit in this documentation.

1. Subscribe to the appropriate debuginfo channel.

   This channel differs, depending on your platform, as follows:

   - For RHEL 7.1, the channel is Red Hat Enterprise Linux Server Debuginfo (v. 7).

     For RHEL 7 debuginfo information, see the following:

     https://access.redhat.com/documentation/en-US/Red_Hat_Enterprise_Linux/7/html/Developer_Guide/intro.debuginfo.html

   - For RHEL 6.*x*, the channel is Red Hat Enterprise Linux Server Debuginfo (v. 6).

     For RHEL 6.*x* debuginfo information, see the following:

     https://access.redhat.com/documentation/en-US/Red_Hat_Enterprise_Linux/6/html/Developer_Guide/intro.debuginfo.html

2. Enter the following command to retrieve the list of repositories:

```
# yum repolist
Loaded plugins: langpacks, product-id, subscription-manager
This system is not registered to Red Hat Subscription Management.
You can use subscription-manager to register.
repo id                repo name                status
!HPE-Foundation-Software       HPE-Foundation-Software         52
!HPE-Foundation-Software-2.14    HPE-Foundation-Software-2.14
    52
!base                RHEL7 -                 4,305
!nightly-hpe-noship         hpe-noship                308
!rh7-nightly             rh7-nightly              5,224
!rh7.1                rh7.1                  4,371
!rh7.1-debug             rh7.1-debug              4,194
!rh7.1-source            rh7.1-source               0
!rhel7-update            RHEL7-updates -            4,390
repolist: 23,105
```

3. Enter the following command to search for the debuginfo packages:

```
# yum search tar-debuginfo
Loaded plugins: langpacks, product-id, subscription-manager
This system is not registered to Red Hat Subscription Management.
You can use subscription-manager to register.
================================ N/S matched: tar-debuginfo ================================
libtar-debuginfo.x86_64 : Debug information for package libtar
star-debuginfo.x86_64 : Debug information for package star
tar-debuginfo.x86_64 : Debug information for package tar

 Name and summary matches only, use "search all" for everything.
```

4. Enter the following command to install the debuginfo packages:

```
# yum install tar-debuginfo.x86_64
Loaded plugins: langpacks, product-id, subscription-manager
This system is not registered to Red Hat Subscription Management.
You can use subscription-manager to register.
HPE-Foundation-Software                                | 3.6 kB 00:00:00
HPE-Foundation-Software-2.14                           | 3.6 kB 00:00:00
base                                                   | 2.9 kB 00:00:00
nightly-hpe-noship                                     | 2.9 kB 00:00:00
rh7-nightly                                            | 951 B 00:00:00
rh7.1                                                  | 4.1 kB 00:00:00
rh7.1-debug                                            | 3.8 kB 00:00:00
rh7.1-source                                           | 3.0 kB 00:00:00
rhel7-update                                           | 2.9 kB 00:00:00
(1/7): HPE-Accelerate-1.11/primary_db                  | 24 kB 00:00:00
(2/7): HPE-Foundation-Software-2.14/primary_db         | 34 kB 00:00:00
(3/7): HPE-Foundation-Software/primary_db              | 34 kB 00:00:00
(4/7): HPE-REACT-1.11/primary_db                       | 12 kB 00:00:00
(5/7): HPE-MPI-1.11/primary_db                         | 25 kB 00:00:00
(6/7): HPE-Management-Center/primary_db                | 70 kB 00:00:00
(7/7): nightly-hpe-noship/primary_db                   | 484 kB 00:00:00
Resolving Dependencies
--> Running transaction check
---> Package tar-debuginfo.x86_64 2:1.26-29.el7 will be installed
--> Finished Dependency Resolution

Dependencies Resolved

================================================================================

 Package          Arch      Version         Repository      Size
================================================================================
Installing:
 tar-debuginfo      x86_64      2:1.26-29.el7     rh7-nightly     693 k

Transaction Summary
================================================================================
Install 1 Package

Total download size: 693 k
Installed size: 2.7 M
Is this ok [y/d/N]: y
Downloading packages:
Running transaction check
Running transaction test
Transaction test succeeded
Running transaction
 Installing : 2:tar-debuginfo-1.26-29.el7.x86_64                  1/1
 Verifying : 2:tar-debuginfo-1.26-29.el7.x86_64                   1/1

Installed:
 tar-debuginfo.x86_64 2:1.26-29.el7

Complete!
```

Installing `debuginfo` packages on SLES platforms

NOTE: The examples in this procedure have been modified to fit in this documentation.

1. Subscribe to the appropriate `debuginfo` channel.

   This channel differs, depending on your platform, as follows:

   - For SLES 12 `debuginfo` information, see the following:

     `https://www.suse.com/documentation/sles-12/book_sle_deployment/data/sec_update_nmm.html`

   - For SLES 11 SP*x* `debuginfo` information, see the following:

     `https://www.novell.com/support/kb/doc.php?id=3074997`

2. Enter the following command to retrieve the list of repositories:

```
# zypper lr
# | Alias                | Name                |Enabled|Refresh
---+----------------------------------+-----------------------------+-------+-------

 1 | HPE-Foundation-Software-2.14     | HPE-Foundation-Software-2.14     | Yes |
```

```
 No
 2 | HPE-noship-stout712          | HPE-noship-stout712          | Yes | No
 3 | SLES12-12-0              | SLES12-12-0              | No | No
 4 | SLES12-Debuginfo-Pool        | SLES12-Debuginfo-Pool        | Yes | No
 5 | SLES12-Debuginfo-Updates       | SLES12-Debuginfo-Updates       | Yes | No
 6 | SLES12-SDK-Updates           | SLES12-SDK-Updates           | Yes | No
 7 | SLES12-Updates             | SLES12-Updates             | Yes | No
 8 | SUSE-Linux-Enterprise-SDK-12-DVD1  | SUSE-Linux-Enterprise-SDK-12-DVD1  |
Yes | No
 9 | SUSE-Linux-Enterprise-SDK-12-DVD2  | SUSE-Linux-Enterprise-SDK-12-DVD2  |
Yes | No
10 | SUSE-Linux-Enterprise-SDK-12-DVD3  | SUSE-Linux-Enterprise-SDK-12-DVD3  |
Yes | No
11 | SUSE-Linux-Enterprise-Server-12-DVD1 | SUSE-Linux-Enterprise-Server-12-DVD1
 | Yes | No
12 | SUSE-Linux-Enterprise-Server-12-DVD2 | SUSE-Linux-Enterprise-Server-12-DVD2
 | Yes | No
13 | SUSE-Linux-Enterprise-Server-12-DVD3 | SUSE-Linux-Enterprise-Server-12-DVD3
 | Yes | No
```

3. Enter the following command to search for the `debuginfo` packages:

```
# zypper search tar*debuginfo Loading repository data...
Reading installed packages...

S | Name      | Summary                | Type
--+-----------+------------------------------------+--------
  | tar-debuginfo | Debug information for package tar | package
```

4. Enter the following command to install the `debuginfo` packages:

```
# zypper install tar-debuginfo
Loading repository data...
Reading installed packages...
Resolving package dependencies...

The following NEW package is going to be installed:
 tar-debuginfo

1 new package to install.
Overall download size: 339.4 KiB. Already cached: 0 B
After the operation, additional 1.2 MiB will be used.
Continue? [y/n/? shows all options] (y): y
Retrieving package tar-debuginfo-1.27.1-2.22.x86_64
          (1/1), 339.4 KiB ( 1.2 MiB unpacked)
Checking for file conflicts: ..........................................[done]
(1/1) Installing: tar-debuginfo-1.27.1-2.22 ...........................[done]
```

Creating boot options

NOTE: HPE supports your ability to install more than one operating system, or operating system release level, on an Integrity MC990 X system. This procedure explains how to create options for non-default operating system boots so you can boot any operating system.

1. Use the procedure shown in the “ File Explorer screen” (page 40) to establish a connection to the RMC and log in.
2. Type the `uvcon` command.

   The `uvcon` command opens a console, and you need the console open in order to see the shell prompt.
3. Monitor the power-on process.

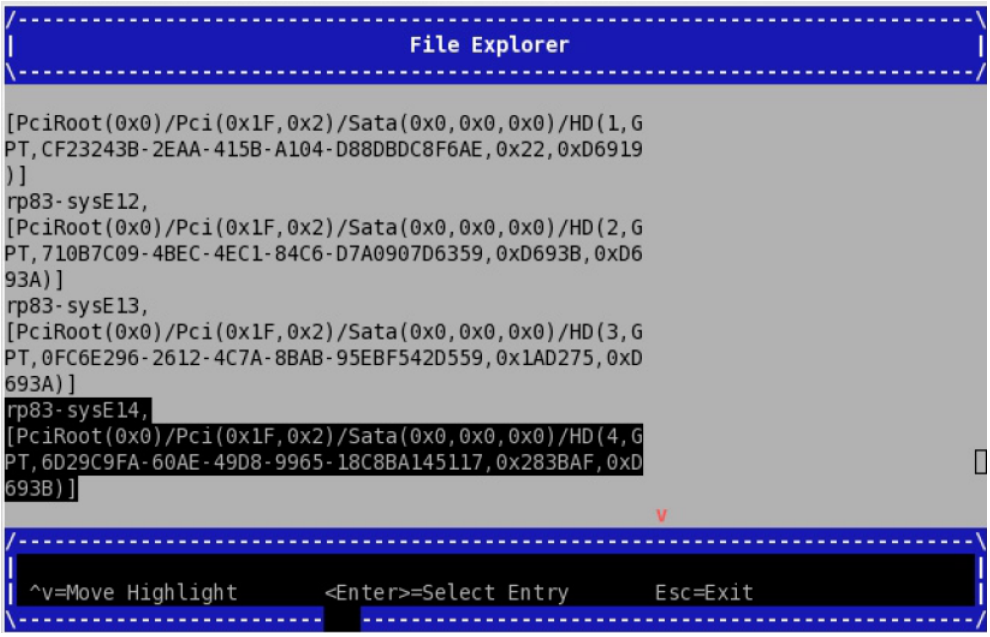
   The power-on takes only a few minutes, but it can take 5 to 10 minutes for the `uvcon` command to return boot-to-shell progress information.
4. After the power-on process completes, type **CTRL---]-q** to exit the console.

   NOTE: The **CTRL---]-q** key sequence closes the `uvcon` console session.
5. When the `Shell>` prompt appears, enter **`exit`** to access the BIOS manager.
6. Use the arrow keys to select **Boot Maintenance Manager**, and press **Enter**.

7. On the **Boot Maintenance Manager** screen, use the arrow keys to select **Boot Options**, and press **Enter**.
8. On the **Boot Options** screen, use the arrow keys to select **Add Boot Option**, and press **Enter**.
9. On the **File Explorer** screen, complete the following steps:
   a. Use the arrow keys to select the disk from which you want to boot, and press **Enter**.

      For example:

      Figure 4 File Explorer screen

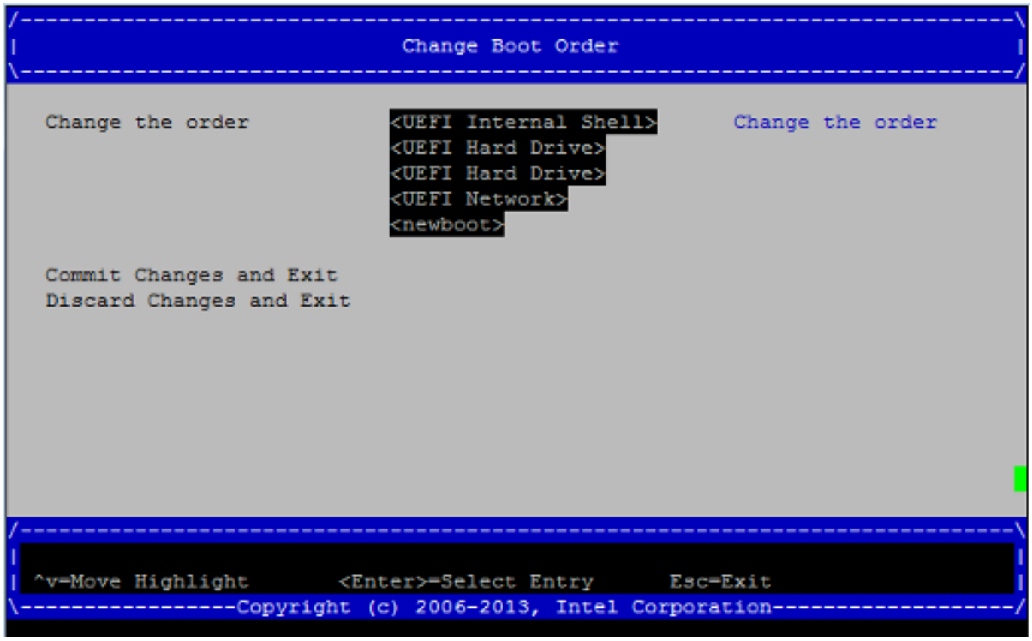
   b. Peruse the directory system, from the disk you selected, through `<efi>` or `<hpe>`, through `<redhat>` or `SUSE`, until you find `grub.efi` (RHEL) or `elilo.efi` (SLES).
   c. Select `grub.efi` (RHEL 7), `elilo.efi` (SLES 11), or `grubx64.efi` (RHEL 7 or SLES 12).
10. On the **Modify Boot Option Description** screen, note that the cursor is at the end of the `Input the description` field.

    Complete the following steps:
    a. Press **Enter**.
    b. In the **Please type in your data** popup, enter a name for this boot option, and press **Enter**. For example, `RHEL 6.6` or `SLES11 SP3`.
    c. Use the arrow keys to select **Commit Changes and Exit**.
    d. Press **Enter**.
11. On the **Boot Maintenance Manager** screen, select **Boot Options**, and press **Enter**.
12. On the **Boot Options** screen, use the arrow keys to select **Change Boot Order**, and press **Enter**.
13. On the **Change Boot Order** screen, complete the following steps:

a. If they are not already selected, select the boot order entries.

   For example:

Figure 5 Change boot order screen



b. Press **Enter**.
c. On the popup that appears, select the boot option you created earlier in this procedure.
d. Press the **+** key to move the recently created boot option to the top of the list.
e. Press **Enter** to commit the changes in this step.
f. Select **Commit Changes and Exit**.

14. Press the **Space** bar to return to the BIOS manager.
15. Notify all system administrators of the current boot order.

    HPE supports the ability to change the default boot order, but some system administration tasks might assume that the default boot option is still EFI Internal Shell. You might need to change the boot order in order to access the EFI shell in the process of performing other tasks that this chapter describes. If you need to change the boot order, complete this procedure again and select one of the other boot options.

Crash dump files on an Integrity MC990 X system server on RHEL 7, SLES 12, and SLES 11 platforms

You can request that the operating system write a crash dump file. The file name includes a timestamp, and the file location depends on your operating system, as follows:

- For the RHEL 7 operating system, the file is as follows:

  `/var/crash/127.0.0.1-`*`year.month.day-hour:minutes:seconds`*
- For SLES 11 and SLES 12 operating systems, the file is as follows:

  `/var/crash/`*`year-month-day-hour:minutes`*

NOTE: This topic does not apply to RHEL 6 platforms. The `power nmi` and `power diag` commands send back traces of CPU tasks to the console but do not create a crash dump file.

More information

“ Creating a crash dump file on an Integrity MC990 X system server on RHEL 7, SLES 12, and SLES 11 platforms” (page 42)

Creating a crash dump file on an Integrity MC990 X system server on RHEL 7, SLES 12, and SLES 11 platforms

1. Log in to the MC990 X server as the root user, and type the following commands to enable the kernel crash dump service, kdump:

   On RHEL 7 and SLES 12, enter the following:

   ```
   # systemctl enable kdump
   # systemctl start kdump
   ```

   On SLES 11, enter the following:

   ```
   # chkconfig boot.kdump on
   # service boot.kdump start
   ```

   The Foundation Software package installation process enables kdump by default. If you are unsure of whether kdump is enabled on your MC990 X server, type the preceding commands. You can enable kdump on your server at any time. kdump must be enabled in order to create a crash dump file.

2. (Conditional) Ensure that the `uv_nmi` default action is `kdump`.

   Complete this step on RHEL 7 and SLES 12 platforms.

   Enter the following command:

   ```
   # echo kdump > /sys/module/uv_nmi/parameters/action
   ```

   As an alternative to this command, you could also boot the kernel with the following parameter:

   ```
   uv_nmi.action=kdump
   ```

3. Send a nonmaskable interrupt (NMI) signal to start the dump.

   You have the option to send an NMI from a remote connection or when logged in directly to the RMC, as follows:

   - To send the NMI signal from a remote connection, enter the following `ipmitool` command:

     ```
     # ipmitool -I lanplus -H uv1-rmc -U ADMIN -P ADMIN chassis power diag
     ```

   - To send the NMI signal while logged in directly to the RMC, complete the following command sequence:

     1. Enter the `ssh` command to connect securely. For example:

        ```
        # ssh root@uv1-rmc
        ```

        Provide the root user password when prompted. For more information about connecting to the RMC, see the following:

        Figure 4 (page 40)

     2. Enter the following command to send the NMI signal:

        ```
        RMC> power nmi
        ```

4. (Conditional) Open a console to the RMC and to initiate a crash dump capture.

   Complete this step on SLES 11 platforms.

   Enter the following commands:

   ```
   > uvcon
   kdb> kdump
   ```

   On SLES 11 platforms, you can type additional `kdb` commands at the `kdb>` prompt. For information about `kdb` commands, see your SLES documentation.

9 Support and other resources

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, Care Packs, 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**
Subscription Service/Support Alerts	**www.hpe.com/support/e-updates**
Software Depot	**www.hpe.com/support/softwaredepot**
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 Connecting to an MC990 X system through a web browser and launching the JViewer console

About JViewer

JViewer is a software interface that you can use on HPE MC990 X systems. The JViewer graphical user interface can facilitate installation and booting.

Starting JViewer

1. Verify that you have Java and an internet browser (Firefox preferred) installed on your local computer.
2. Attach the Base I/O BMC on the MC990 X system to a network that has a DHCP server, and that is accessible from the local computer.

   NOTE: Use the RJ45 connection labeled **MGMT** on the BMC on which the Base I/O is installed.

3. Log in to the MC990 X system's RMC.

   For example:

   ```
   ssh root@uv-rmc
   ```

   Provide the password when prompted.
4. Use the baseiolist command to retrieve the IP address(es) of the MC990 X system's BMC(s).

   For example:

   ```
   # baseiolist
   P000 [r001i01b]: 128.162.243.151 [08:00:69:17:2D:C9]
   P000 [r001i06b]: <No IP addr> [08:00:69:17:2D:C0]
   ```

   Look for the BMC's IP address in the output. In this example, there is only one BMC connected to the network, and its IP address is 128.162.243.151.
5. Start the internet browser on your local computer.
6. In the Firefox address bar, type the IP address of the BMC.

   For example:

   ```
   http://128.162.243.151
   ```
7. From the login screen, log in to the system.

   Type `admin` as the username and the password, and then press **Enter**.
8. From the **Dashboard** screen, click **Launch**.
9. (Conditional) If Firefox displays a message indicating pop ups are not enabled, complete the following steps to enable pop ups.
   a. Click **Preferences**.
   b. Click **Allow pop ups for ip_address**.
   c. Click **Launch**.
10. On the **Opening jviewer.jnlp ...** screen, click **OK**.
11. (Conditional) Consent to the security questions.

    If the system displays security cautions, indicate that you want to proceed with launching the application.

Attaching virtual media to the MC990 X system

1. Connect to the MC990 X system. See Starting JViewer" on page
2. In the top-most JViewer menu bar, click **Media** >**Virtual Media Wizard ...**.

3. Access the media.
   a. To use physical media, such as a DVD or CD, insert the disk into the drive on your local computer. On the **Virtual Media** pop up, under **CD/DVD Media 1**, select **/dev/sr0**.
   b. To access an ISO on your network, click **Browse** on the popup, and navigate to the ISO location. Select the ISO file, and click **Open**.
4. Click **Connect to CD/DVD**.
5. On the **Information** pop up, click **OK**.
6. On the **Virtual Media** pop up, click **Close**.
7. (Optional) Boot the system. See “ Booting from virtual media” (page 47)

Booting from virtual media

1. Log in to the MC990 X system RMC andprovide the password when prompted.

   For example:

   ```
   ssh root@uv-rmc
   ```

2. Enter the `uvcon` command to access the console.
3. (Conditional) Access the main EFI menu. Complete this step if you are at the EFI shell:

   Type `exit` and press **Enter**.
4. Use the arrow keys to select **Boot Manager**, and press **Enter**.
5. On the **Boot Manager** screen, use the down-arrow key to select or highlight **UEFI American Megatrends Inc. Virtual Cdrom Device**, and press **Enter**.

Glossary

ACPI	Advanced Configuration and Power Interface
APPWT	Average Peak Performance in Weighted Teraflops
BMC	Baseboard Management Controller
CLI	Command Line Interface
CNSL	Console abbreviation
CRC	Cyclic Redundancy Check
DSM	Distributed Shared Memory
ECC	Error Checking Code
EFI	Extensible Firmware Interface
FQDN	Fully Qualified Domain Name
GPU	Graphic Processing Unit
IPMI	Intelligent Platform Management Interface
KVM	Keyboard, video, mouse
MCS	Multi-Category Security
MLS	Multi-Level Security
NMI	Nonmaskable Interrupt
NTP	Network Time Protocol
NUMA	Non-Uniform Memory Access
PDU	Power Distribution Unit
QPI	Quick Path Interconnect
RAS	Reliability, Availability, Serviceability
RMC	Rack Management Console
RS	Remote Solutions
SAS	Serial Attached SCSI
SEL	System Error Log
SELinux	Security Enhanced Linux
SID	SAP HANA System Identifier
SMI	Scalable Memory Interconnect
SMN	System Management Node
SMP	Symmetric Multiprocessing
SSD	Solid State Drive
SSI	Single System Image
UID	Unit IDentifier
YaST	Yet another Setup Tool

Index

U

W