Installing Red Hat Enterprise Linux on IBM Power System LC servers with virtual media
Version 1.0.6

Quick Start Guide for installing Linux on IBM Power System LC servers

This guide helps you install Red Hat Enterprise Linux on a Linux on Power Systems server.

Overview

Use this information to install Red Hat Enterprise Linux 7.x or 8.x on a non-virtualized or bare metal IBM Power System LC server. This procedure follows these general steps:

- Connect to the BMC firmware to set up network connection
- Connect to the BMC firmware with IPMI
- Access the BMC Advanced System Management interface
- Create virtual media from the ISO file
- Use the virtual media to install Red Hat Enterprise Linux

Download your ISO file from the Red Hat Enterprise Linux website.

1 Step 1: Completing the prerequisites and booting your firmware

Before you power on the system, ensure that you have the following items:

- Red Hat Enterprise Linux ISO file
- Ethernet cable
- VGA monitor. The VGA resolution must be set to 1024x768-60Hz.
- USB Keyboard
- Power cords and outlet for your system.
- PC or notebook that has IPMItool level 1.8.15 or greater. Find instructions to determine your level of IPMItool and how to update at the end of the guide.

For a list of supported distributions, see Supported Linux distributions and virtualization options for POWER8 and POWER9 Linux on Power systems.

Complete these steps:

- If your system belongs in a rack, install your system into that rack. For instructions, see IBM Power Systems information at https://www.ibm.com/support/knowledgecenter/.
- Connect an Ethernet cable to the embedded Ethernet port next to the serial port on the back of your system. Connect the other end to your network.
- Connect your VGA monitor to the VGA port on back of system.
- Connect your USB keyboard to an available USB port
- Connect the power cords to the system and plug them into the outlets.

At this point, your firmware is booting. Wait for the green LED on the power button to start flashing, indicating that it is ready to use. If your system does not have a green LED indicator light, then wait 1 to 2 minutes.

2 | Step 2: Configuring the firmware IP address

To set up or enable your network connection to the BMC firmware, use the Petitboot bootloader interface. Follow these steps:

a. Power on your server using the power button on the front of your system. Your system will power on to the Petitboot bootloader menu. This process takes about 1 to 2 minutes to complete. Do not walk away from your system! When Petitboot loads, your monitor will become active and you will need to push any key in order to interrupt the boot process.

b. At the Petitboot bootloader main menu, select Exit to Shell.

c. Run `ipmitool lan print 1`. If this command returns an IP address, verify that is correct and continue. To set a static IP address, follow these steps:

  i. Set the mode to static by running this command: `ipmitool lan set 1 ipsrc static`

  ii. Set your IP address by running this command: `ipmitool lan set 1 ipaddr` *ip_address* where *ip_address* is the static IP address that you are assigning to this system.

  iii. Set your netmask by running this command: `ipmitool lan set 1 netmask` *netmask_address* where *netmask_address* is the netmask for the system.

  iv. Set your gateway server by running this command: `ipmitool lan set 1 defgw ipaddr` *gateway_server* where *gateway_server* is the gateway for this system.

  v. Confirm the IP address by running the command `ipmitool lan print 1` again.

  Note: This network interface is not active until after you perform the following steps.

d. To reset your firmware, run the following command: `ipmitool mc reset cold`.

This command must complete before continuing the process; however, it does not return any information. To verify that this command has completed, ping your system BMC address (the same IP address used in your IPMItool command). When the ping returns successfully, continue to the next step.

Note: If your ping does not return successfully within a reasonable amount of time (2 - 3 minutes), try these additional steps:

  i. Power your system off with this command: `ipmitool power off`.

  ii. Unplug the power cords from the back of the system. Wait 30 seconds and then apply power to boot BMC.

3 | Step 3: Powering on your server with IPMI

Intelligent Platform Management Interface (IPMI) is the default console to use when connecting to the OPAL firmware. Your level of IPMItool must be at 1.8.15 or greater.

Use the default values for IPMI:

- Default user: ADMIN
- Default password: admin

Note: After your system powers on, the Petitboot interface loads. If you do not interrupt the boot process by pressing any key within 10 seconds, Petitboot automatically boots the first option.

To power on your server from a PC or notebook that is running Linux, follow these steps:

a. Open a terminal program on your PC or notebook.
b. To power on your server, run the following command:

```
ipmitool -I lanplus -H server_ip_address -P ipmi_password chassis power on
```

where *server_ip_ipaddress* is the IP address of the BMC firmware and *ipmi_password* is the password set up for IPMI.

Note: If your system is already powered on, continue to active your IPMI console.
c. Activate your IPMI console by running this command:

```
ipmitool -I lanplus -H server_ip_address -P ipmi_password sol activate
```

Note: Use your keyboard up arrow to display the previous ipmitool command. You can edit previous commands to avoid typing the entire command again. If you need to power off or reboot your system, deactivate the console by running this command:

```
ipmitool -I lanplus -H server_ip_address -P ipmi_password sol deactivate
```

To reboot the system, run this command:

```
ipmitool -I lanplus -H server_ip_address -P ipmi_password chassis power reset
```

At this point, your IPMI console should be paused at the Petitboot bootloader menu. You will return to this window after you have configured your virtual media.

4	**Step 4: Access BMC Advanced System Management interface to configure virtual media**

Baseboard Management Controller (BMC) Advanced Systems Management is a remote management controller used to access system information, status, and other process for your server. You can use the BMC Advanced Systems Management to set up your installation and provide the CD image as virtual media to the Power System. However, the actual installation requires a serial-over-LAN (SOL) connection through IPMI.

To access the BMC Advanced Systems Management, open a web browser to http://*ip_address* where *ip_address* is the IP address for the BMC. Log in using these default values:

- Default user name: ADMIN
- Default password: admin

In order to fully use the BMC Advanced Systems Management, you need to add the IP address of the BMC firmware to the Exceptions list in the Java Control Panel of your laptop or PC. On a Windows system, this is usually located by selecting **Control Panel** > **Control Panel for Java**. On a Linux system, this is usually located by selecting the **Control Center** and then selecting the Java web browser plugin. After accessing the Control Panel for Java, select Security tab. Then add the IP address of the BMC firmware to the Exceptions list, by clicking Edit Site List and then clicking Add. Enter the IP address and click OK.

To create a virtual CD/DVD, follow these steps:

a. Log into the BMC Advanced Systems Management interface from a PC or notebook using the default user name and password.
b. Select **Remote Control** > **Console Redirection**.
c. Select **Java Console**. As the console opens, you might need to direct your browser to open the jviewer.jnlp file by selecting to **Open with** Java Web Start and click OK. Accept the warning and click **Run**.
d. In the **Console Redirection** window, select **Media** > **Virtual Media wizard** from the menu.
e. In the **Virtual Media wizard**, select **CD/DVD Media:1**. Select **CD Image** and the path to the Linux distribution ISO file. For example, /tmp/RHEL-7.2-20151030.0-Server-ppc64el-dvd1.iso. Click **Connect CD/DVD**. If the connection is successful, the message Device redirected in Read Only Mode is displayed.
f. Verify that CD/DVD is shown as an option in Petitboot as sr0:

```
CD/DVD: sr0
        Install
        Repair
```

Note: Select Rescan devices if CD/DVD does not appear.
g. Select Install. After selecting Install, your remote console may become inactive. Open or reactivate your IPMI console to complete the installation.

Note: Be patient! It can sometimes take a couple minutes for the installation to begin.

5	**Step 5: Completing your installation**

After you select to boot the Red Hat Enterprise Linux installer, the installer wizard walks you through the steps.
a. Follow the installation wizard for Red Hat Enterprise Linux to set up disk options, your user name and password, time zones, and so on. The last step is to restart your system.
b. After the system restarts, Petitboot displays the option to boot the Red Hat Enterprise Linux with Linux *release number*. Select this option and press Enter.

Notes:
- Red Hat Enterprise Linux 7.2 may not contain the latest version of IPMItool. To update your version of IPMItool, use IBM Linux on Power tools repository to download and install the latest version.
- Red Hat Enterprise Linux 7.2 does not contain the opal-prd (Processor Runtime Diagnostics) package. This package is required for runtime detection and handling of Power processor errors on systems that are running OpenPower firmware. You must install the package from the IBM Service and productivity tools website. The installation instructions are at the IBM Service and productivity tools installation instructions website. Red Hat Enterprise Linux 7.3 contains the opal-prd package that gets installed by default.

6   Step 6: Determine your level of IPMItool

In order to connect to the Power server, you must be using IPMItool level 1.8.15 or greater on the PC or laptop that you are using to connect to the Power system.

To determine your current level of IPMItool, run the following command: `ipmitool -V`. If this command returns a version earlier than 1.8.15, update your IPMItool version. Follow these steps:

a. Download the IPMItool file: `wget http://sourceforge.net/projects/ipmitool/files/latest/download/ipmitool-1.8.15.tar.bz2` .

b. Unzip it by running these commands:

```
bzip2 -d ipmitool-1.8.15.tar.bz2
tar xvf ipmitool-1.8.15.tar
```

c. Configure it by running these commands:

```
cd ipmitool-1.8.15
./configure
```

d. Build it by running this command: `make`

e. Install it by running this command: `sudo make install`

f. Validate the installation by checking the version again: `ipmitool -V`

More information

For more information, see the following resources:

- IBM Knowledge center at https://www-01.ibm.com/support/knowledgecenter/
- The Linux on Power® developer portal at Linux on Power developer portal.