

Installing Red Hat Enterprise Linux on IBM Power System (POWER9) servers using network boot



Version 1.0.3

Quick Start Guide for installing Red Hat Enterprise Linux on IBM Power System POWER9 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 on a non-virtualized or bare metal IBM Power System (POWER9) server by using a network boot server. This procedure follows these general steps:

- Connect to the BMC firmware to set up network connection
- Configure Petitboot for a network installation
- Install Red Hat Enterprise Linux from the network connection

1 Step 1: Completing the prerequisites and booting your firmware



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

- Ethernet cable
- VGA monitor. The VGA resolution must be set to 1024x768-60Hz.
- USB Keyboard
- Power cords and outlet for your system

These instructions require that you have a network server set up with Red Hat Enterprise Linux 7.x. Download Red Hat Enterprise Linux 7.x LE ALT at <https://access.redhat.com/products/red-hat-enterprise-linux/#addl-arch>. Take the link for **Downloads for Red Hat Enterprise Linux for Power, little endian**. Log into your Red Hat account (if you have not already done so). Select **Red Hat Enterprise Linux for Power 9** from the Product Variant list. Look for the Red Hat Enterprise Linux for Power 9 (v. 7.x for ppc64le) ISO file. The downloaded ISO file will include ***rhel-alt.....iso*** rather than ***rhel....iso*** in the path name.

For a list of supported distributions, see [Supported Linux distributions 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/POWER9/p9hdx/POWER9welcome.htm>.
- 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 usually takes about 1 - 2 minutes to complete, but **may take 5 - 10 minutes** on the first boot or after a firmware update. 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 step 4. If no IP addresses are returned, 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 interface is not active until after you perform the following steps.

- d. To reset your firmware, run the following command: `ipmitool raw 0x06 0x40`.

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: `poweroff .h`.
- 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 OpenBMC commands

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:

- Default user name: root
 - Default password: OpenBmc (where, OpenBMC is using a zero and not a capital O)
- a. Open a terminal program on your PC or notebook.
 - b. Log in to the BMC by running the following commands.

```
ssh root@<BMC server_ip_address>
root@<BMC server password>
```

where `BMC server_ip_address` is the IP address of the BMC and `BMC server password` is the password to authenticate.

- c. To power on your server, run the following command:

```
$ root@witherspoon:~# obmcutil poweron
```

- d. Connect to OS console and use the default password OpenBmc.

```
ssh -p 2200 root@<BMC server_ip_address>
root@
```

where `BMC server_ip_address` is the IP address of the BMC and `BMC server password` is the password to authenticate.

4 Step 4: Configuring Petitboot



After the system powers on, the Petitboot bootloader scans local boot devices and network interfaces to find boot options that are available to the system. To install Red Hat Enterprise Linux from a network server, you need to set up a network interface (that is not the BMC network interface).

Set up a network connection and provide the network boot detail to Petitboot by following these steps:

- a. Connect an Ethernet cable to the second Ethernet port on the back of your system. Connect the other end to your network.
- b. On the Petitboot main screen, select **c** to configure your system options.
- c. In the Network field of the configuration screen, enter your network information:
 - i. Select your network type
 - ii. Select your network device (remember the interface name and mac address)
 - iii. Specify your IP/mask, Gateway, and DNS server (remember these setting as you will need them in the next step)
 - iv. Select OK to return to the main menu.
- d. Back on the Petitboot main screen, select **n** to create new options.
- e. Choose your boot device or select to **Specify paths/URLs manually** and then enter your boot options:
 - i. In the **Kernel** field, enter the path to the kernel. This field is mandatory. Enter a URL similar to this one for a network:

```
http://<http_server_ip>/ppc/ppc64/vmlinuz
```

- ii. In the **Initrd** field, enter the path to the init ramdisk. Enter a URL similar to this one for a network:

```
http://<http_server_ip>/ppc/ppc64/initrd.gz
```

- iii. In the **Boot parameter** field, set up the set up the repository path and the IP address of the server where the operating system is installed. For example: append `repo=http://<http_server_ip>/root=live:http://<http_server_ip>/os/LiveOS/squashfs.img ipv6.disable=1 ifname=<ethernet_interface_name>:<mac_addr> ip=<os ip>:<gateway>:<2 digit mask>:<hostname>:<ethernet_interface_name>:none nameserver=<anem_server> inst.text`

You can accept the defaults for the rest of the fields.

- f. After you set your netboot options, select **OK** and press Enter.
- g. On the **Petitboot** main window, select User Item 1 as your boot option and press Enter.

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 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 *release number*. Select this option and press Enter.

Note: Be sure to check for firmware updates. See https://www.ibm.com/support/knowledgecenter/POWER9/p9ei8/p9ei8_fixes_kickoff.htm

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](#).