Installing Linux servers on IBM Systems, Part 1: Basic Linux server installation and configuration

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Learn how to install and configure Red Hat Enterprise Linux® 4 on IBM standalone rack servers. The examples illustrate installation on x86 systems, but the examples can apply to a variety of hardware architectures, including x86_64, IA64, S/390®, and ppc64.

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Introduction

As you know, Linux use is rapidly increasing, as is the need for knowledge about system administration of Linux-based servers. Linux installation is a popular topic among system administrators unfamiliar with the system. There are multiple ways to perform a fresh Linux installation, and you can find information on the Web about how to install Linux on a variety of hardware. Installing a standalone server is a straightforward process, but there are points to keep in mind to ensure success. The most important thing to consider is whether the system will be used for any service offering, such as DHCP, DNS, or proxy server, or used for hosting, such as databases or applications.

This article focuses on how to install and configure Red Hat Enterprise Linux 4 on IBM rack servers, especially those based on x86 chip architecture. The same information applies to at least some degree for x86_64, IA64, S/390, and ppc64 architectures. However, Red Hat Enterprise Linux distributions are different for each architecture -- the CDs for x86 (32-bit) systems differ from those for x86_64 (64-bit), S/390 (64-bit), or ppc (POWER, 64-bit) systems. Also, the user interface might differ from the figures shown in this article.

Hardware, software, and assumptions

The following hardware and software were used to perform the tasks described in this article:

- IBM System x346
- Red Hat Enterprise Linux Version 4.0, Update 4, for the x86 32-bit version

Installation procedures

This article describes installation in TEXT mode. To perform the installation, follow these steps:
1. Insert CD #1 or the DVD in the computer's CD-ROM device and reboot the system. After reboot, you see the image shown in Figure 1.

**Figure 1. Boot screen**

![Red Hat Enterprise Linux boot screen](image)

- To install or upgrade in graphical mode, press the <ENTER> key.
- To install or upgrade in text mode, type: `linux text <ENTER>`.
- Use the function keys listed below for more information.

![Boot options](image)

2. Type `linux text` on the command line (after `boot:`). You can press F2 for more installation options, such as `linux noprobe` to disable hardware configuration and `linux askmethod` to specify the installation type.

3. Test the CD media, if you want, or just to skip this step by clicking `Skip`, as shown in Figure 2.

**Figure 2. CD found screen**

![CD found dialog](image)

To begin testing the CD media before installation press OK.

Choose Skip to skip the media test and start the installation.

![OK and Skip buttons](image)

You see the welcome message, as shown in Figure 3.
4. Click **OK**. You see a screen as shown in Figure 4 that prompts you to choose the language to use for the installation process.

**Figure 4. Language selection screen**

5. Select **English**, and click **OK**. The next screen (Figure 5) prompts you to choose the keyboard type for the correct key definitions.
6. Select us and click OK. On the next screen, you can select a partition tool from Autopartition or Disk Druid, as shown in Figure 6.

**Figure 6. Disk partitioning setup screen**

Autopartition, or automatic partitioning, sets partitions based on the selected installation type. You also can customize the partitions once they are created. Disk Druid is the manual disk partitioning tool. It enables you to create partitions in an interactive environment. You can use it to set the file system types, mount points, partition sizes, and more. The Disk Druid tool is available only during the installation phase. See Related topics for details about disk partitioning.

7. Click Disk Druid to set up your own partitions. The next screen prompts you to define partitions of your choice, as shown in Figure 7. In Linux, you can have a maximum of four primary partitions. If you need more than four partitions, give away one primary partition to create an extended partition.
8. Create three partitions as follows:
   • /boot i.e. 100MB
   • Swap 1024MB
   • root "/" partition [remaining disk]

   You can also define Software RAID on the same panel. Red Hat Enterprise Linux comes with Software RAID support. See Related topics for more details about RAID implementation.

9. Click OK when you are finished setting up your partitions.

10. Select the appropriate boot loader configuration, as shown in Figure 8. See Related topics for more details.

Figure 8. Boot loader configuration screen

11. Select Use GRUB Boot Loader and click OK. The next step is to customize Boot Loader, which is illustrated in Figure 9.
12. Leave the empty line blank, because you do not need a specific boot time kernel parameter, and click OK.

13. Set the boot loader password, as shown in Figure 10.

**Figure 10. Boot loader configuration password screen**

Setting the GRUB password is important. You can even set it after the system is installed. If the GRUB password is set, on reboot, the system prompts for the password before allowing kernel parameters to be specified, thereby protecting the system. This password can be different from your root password. None is specified in the figure.

14. Click OK. The screen that appears, shown in Figure 11, prompts you to specify which partition to boot from.
Figure 11. Boot loader configuration: boot manager screen

As the screen indicates, you can also use the Red Hat Enterprise Linux AS boot manager to boot other operating systems. For this, you need to specify which partitions to boot from, which operating systems to boot, and what label to use for each of them. For this example, only Red Hat Enterprise Linux is booted.

15. Click OK. The screen that appears prompts you to customize the boot loader configuration, as shown in Figure 12.

Figure 12. Boot loader configuration: boot loader installation screen

16. Indicate where you want to install the boot loader, such as Master Boot Record (MBR), finish your customization, and click OK. Usually your system comes with two Ethernet cards. The system detects the first and second network cards as eth0 and eth1, respectively. You can set the IP addresses for these network cards manually or use a Dynamic Host Control Protocol (DHCP) server. A DHCP server is a server configured to provide IP addresses automatically. For this example, use only the eth0 network card, as described in the next step.

17. Customize network settings for eth0, as shown in Figure 13.
Because the example sets up a new server, specify the IP address manually rather than picking it up automatically from the DHCP server. For this example, set the IP address to 192.168.128.1 and the subnet mask to 255.255.255.0.

18. Click OK. There are still a few more network settings to set on the next screen, such as gateway and DNS details, as shown in Figure 14.

Figure 14. Miscellaneous network settings screen

19. Specify the additional settings as needed. The gateway address could be your router IP address. For this example, specify only the gateway address.

20. Click OK. On the next screen, you define the hostname of the server, as shown in Figure 15.
21. Specify a hostname, and click OK. For this example, the hostname is `netra.ibm.com`. The next screen prompts you to configure firewall settings, as shown in Figure 16. A firewall can help prevent unauthorized access to your computer from the outside world. See Related topics for more details about firewalls.

**Figure 16. Firewall screen**

22. Select a firewall option, and click OK. For this example, select the No firewall option, effectively disabling it. This causes the warning shown in Figure 17 to appear, confirming that the firewall has been disabled.

**Figure 17. Firewall warning screen**
23. Click **Proceed**, because no action is required. The next screen prompts you to customize the Security Enhanced Linux (SELinux) feature on your system, as shown in Figure 18. See Related topics for more details about SELinux.

**Figure 18. Security enhanced Linux screen**

As the screen describes, SELinux provides more security options than what is available with regular Linux.

24. Select security options, and click **OK**. For the example, select **Disabled**. The next screen, shown in Figure 19, prompts you to select additional languages to use on your system.

**Figure 19. Language support screen**

25. Select all applicable languages, and click **OK**.

26. Specify the time zone for your server, as shown in Figure 20.
Figure 20. Time zone selection screen

Time zone identifies the region where your server is located and adjusts the time and date automatically. For this example, select ASIA/Calcutta.

27. Click OK.

28. Set the root password for your system.

Figure 21. Root password screen

29. Click OK. The next screen prompts you to customize the packages to be installed on your server, as shown in Figure 22.
30. Indicate whether you want to install additional packages. For this example, select **customize software selection**.

31. Click **OK**.

32. Select any additional packages to install, as shown in Figure 23.

**Figure 23. Package group selection screen**

For this example, select the Windows® File Server and Network Servers packages.

33. Click **OK**. A message appears, as shown in Figure 24.
34. Click Back to make any changes. If you do not need to make any changes, click OK. The next screen describes the set of media required for the installation, depending upon the packages selected, as shown in Figure 25.

**Figure 25. Required installation media screen**

35. Click continue. Installation begins, as shown in Figure 26.
After all packages are installed, you are prompted to reboot, as shown in Figure 27.

**Figure 27. Complete screen**

36. Click Reboot. After the reboot process is complete, the system displays the FirstBoot screen, as shown in Figure 28.
Figure 28. FirstBoot welcome screen

Figure 29. Login screen

This screen prompts you to launch the FirstBoot script, which enables you to do the following:

- Accept the license
- Set date and time
- Set the display mode
- Register your subscription to get regular updates
- Register new users
- Configure a sound card
- Install third-party plug-ins and applications

37. Click **Next** to launch the FirstBoot script. The login screen appears, as shown in Figure 29.
38. Log in using the root password you set during the installation process. You are done -- your server is ready.

**Conclusion**

This article described how to install Red Hat Enterprise Linux on a standalone server. Before installing a server, you need to determine whether your server will offer only standard Linux services or host additional services like any database or specialized applications. You select only the Red Hat Enterprise Linux packages you need, and you avoid installing unnecessary software and services. Installing only the required packages not only saves precious space on your hard disk, but also enables better performance.
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