

# Setting Up an HP NetServer LPr as a Red Hat Linux 5.2 Web Server

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Hewlett-Packard Company  
Network Server Division  
Technical Marketing / MS 45SLE  
19055 Tantau Ave  
Cupertino, CA 95014 USA

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## Setting Up an HP NetServer LPr as a Red Hat Linux 5.2 Web Server

The Hewlett Packard NetServer LPr can be integrated as an Internet Server in a variety of ways. One of these makes use of the Linux Operating System (OS) for personal computers and the Apache Group Apache Web Server. This application note provides details about how to install Red Hat Linux version 5.2 on the HP NetServer LPr.

## **About Linux**

The Linux OS for personal computers is a UNIX-like OS and meets POSIX standards. It uses a kernel developed and made freely available by Linus Torvalds (for whom it is named). Originally developed over the global Internet, Linux has become a widely-used OS that involves its users in developing new features.

## **General Public License**

Linux is supplied as a set of executable files which are accompanied by the corresponding source code. The files and code can be copied under the terms of a GPL or "General Public License." This means users can install and use it for free. In exchange, under the GPL, users who make changes in the source code (to extend the usefulness of the OS on their own installations) are required to make their changes available to the rest of the user community under the same terms (with source code and free of charge).

## **Linux Support**

Linux installations can be time-consuming and each requires someone skillful in OS programming. Distributors of Linux (like Red Hat Software of Research Triangle Park, NC) have created documentation, service, and support facilities for users who want to install Linux. The kernel and source code are still freely licensed, but the client pays for the convenience of installing the software as a package from a CD-ROM. Other services are also available for a fee.

## **Red Hat Linux 5.2 Supported on the LPr**

HP and Red Hat support Red Hat Linux 5.2 on the tested, approved HP NetServer LPr configuration (See Appendix A.) HP recommends Red Hat Linux version 5.2, the Commercial Server Edition, be purchased directly from Red Hat software or a Red Hat distributor. The Commercial Server Edition comes bundled with 90 days of support. If another version is chosen, Red Hat has support options available for purchase. Hewlett Packard does not provide support for the Linux Operating System, nor for Red Hat software running on its servers. HP does provide support for hardware problems related to installation of Linux, and will assist customers to classify and solve such problems. Please ensure you enlist Red Hat's support directly before you install the software.

## **Benefits Claimed for Linux**

Some of the benefits claimed for the use of Linux include the following:

- Can be run from a disk partition, even if another OS is installed
- Multi-user, multi-tasking, multi-threading operating system adapted originally for Intel PC microcomputers
- Now runs on a wide range of server and computer equipment, including the HP NetServer LPr, Digital Alpha, Sun SPARC, and Apple Power Mac.
- No restrictive control is in place on the OS and improvements; although Linux may be packaged for sale, it is also available for free download

- Packages are freely available for running the Netscape Communicator web browser and for maintaining World Wide Web sites

## How to Get Linux

You can learn how to order Linux by contacting the following:

**Red Hat Software**  
4201 Research Commons, Suite 100  
79 T. W. Alexander Drive  
PO Box 13588  
Research Triangle Park, NC 27709

**Email** [redhat@redhat.com](mailto:redhat@redhat.com)

**World Wide Web** <http://www.redhat.com>

**Support is available in the United States by dialing**  
**(877) 4REDHAT.**

Linux may also be available for purchase at local electronic supply and software stores.

More information is available about Linux from [www.li.org](http://www.li.org).

## Linux 5.2 Installation on an HP NetServer LPr

### Assumptions

The installation user script in this document assumes you are installing Red Hat Linux 5.2 on a Hewlett Packard NetServer LPr. In addition, you need at least one new SCSI hard drive connected to the ultra-wide connector on the installed Symbios SYM53C895 SCSI controller (in a Linux device scan, this controller shows up as NCR 538xx). If you have a NetRAID card, the boot disk must be connected to the card with the NCR 538xx controller. Do not attempt to boot Red Hat Linux 5.2 from any disk that is connected to a NetRAID card.

The networking protocol is assumed to be TCP/IP and the network adapter to be the bundled NIC, HP D5013A Adapter (which shows up in a Linux device scan as the Intel 82558 network interface controller). Refer to Red Hat documentation for details on network protocols and other information, if necessary.

No tape drive is assumed in the server system. However, Hewlett Packard strongly recommends integrating a backup device and running routine backups on any server that is put into production use. In addition, no UPS (uninterruptable power supply) is assumed. As with tape drives, HP also strongly recommends that a UPS be used with any server that contains critical data.

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<b>NOTE</b>	This installation user script assumes you are installing Red Hat Linux 5.2 on a clean (or newly formatted) hard disk. If you are installing on a disk which contains user data or programs, do not use this script. Instead, use documentation that accompanies Red Hat Linux 5.2 or contact the place where you got your software.
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## Textual Key

In the steps which follow, these style conventions are used:

"Screen Title" ("Widget Title") is represented in quotation marks. The same text appears about midway down each screen at the top bar of the box.

If a screen or widget has no title, then

Screen Text looks like this.

---> Highlighted choices are indented and have an arrow pointing to them.

User Inputs (what you should type) and explanations are indented and look like this.

The control keys on your keyboard are represented like this: <Enter>, <Space>, <F3>, and so forth.

## Pre-Installation Steps

To prepare for installation you need the following:

- IP address for the server
- Subnet Mask
- Default Gateway
- Machine Name
- Domain Name

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**NOTE** It is not recommended to use DHCP to assign the IP information of a server.

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**NOTE** HP recommends that you create a boot disk by using the DOS *rawrite* utility on the CD-ROM. For example, assuming your CD-ROM is in the D: drive, you would type:

*d: \dosutils\rawrite -f d:\images\boot.img*

You may need this floppy later if you encounter problems booting from the CD-ROM.

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## Beginning the Installation

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**NOTE** Red Hat Linux 5.2 does not support multi-processor systems. HP does not recommend implementing SMP on Red Hat Linux 5.2

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The following procedure assumes your hard drive does not have any partitions. (Especially, it assumes there is no utility partition installed.)

### Removing All Partitions

The following procedure is used with new hard disks. If you have a hard disk which has been previously used, all partitions must be deleted.

### Linux Installation Procedure

1. Check Appendix A to ensure your configuration matches the Configuration of System Tested. Turn on the HP NetServer LPr. Insert the Red Hat Linux CD-ROM into the CD slot. Press the "reset" button. If the CD-ROM does not boot, use the boot disk made during pre-installation. (See above.)
2. "Welcome to Red Hat Linux" on a black screen with four options showing. Default is install or upgrade. Use the default by pressing <Enter>. (After one minute, the default is automatically selected.)

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**CAUTION** Expert mode can be accessed from this screen. This mode is only for experienced programmers, who use it for debugging new code or changing source code. It is possible to damage your system in expert mode.

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3. A grey-on-blue screen with introductory information entitled "Red Hat Linux" appears.

**OK <Enter>**

4. "Choose a Language"

--->English (or your choice)

**<Enter>**

5. "Type of Keyboard"

--->us (or your choice)

**<Enter>**

6. "Installation Method"

---> Local CD-ROM

**<Enter>**

7. Note to insert CD—it should already be in the slot.

**<Enter>**

8. CD-ROM initialization message—brief pause

9. "Installation Path"

---> Install

**<Enter>**

10. "Installation Class"

---> Custom

**<Tab> to "OK" <Enter>**

---

**NOTE** "Server" and "Workstation" classes may be more limited in flexibility than is "Custom".

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11. "SCSI"—message (such as "Scanning NCR 538xx") and brief pause

12. "SCSI Configuration"—showing "NCR 538xx" (the Linux device scan automatically detects this) and asking whether you want to check for others.

**<Tab> to "No" <Enter>**

13. "Disk Setup"

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**NOTE** You may use either fdisk or Disk Druid to create partitions on your hard disk. Using Disk Druid is somewhat easier, but may involve some trial and error repetition. Before using fdisk, you must erase the master boot record. An example of using fdisk is illustrated in Appendix B.

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Use Disk Druid or fdisk to set up your partitions now.

## Continuing the Linux Installation

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**NOTE** The following discussion assumes you have sda1 as the Linux Native partition and sda2 as the Linux Swap partition.

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14. "Partition Disks"

**<Tab> to "Done" <Enter>**

15. A screen appears showing information about your choices on disk partitioning. From this screen, you need to indicate where the root filesystem will be located. To begin the edit, press

**<F3>**

16. On the edit screen in front of the text string indicating the root file system, type

/

(in Linux, this / indicates the root directory)

**Tab to "OK" <Enter>**

Notice the "/" in front of the main Linux Native partition.

17. "Current disk Partitions"

**Tab to "OK" <Enter>**

18. "Active Swap Space"

**Be sure /dev/sda2 is highlighted. If not, use either the down arrow or tab key to highlight /dev/sda2. Toggle the selection by pressing <space>, and check to see that the asterisk appears indicating that /dev/sda2 has been selected.**

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**NOTE** Also select "check bad blocks during formatting." Doing so will take more time now but may make your system more reliable.

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**Tab to OK <Enter>**

19. "Scanning Packages" Pause while scan is completed. This may take a few moments.

20. "Partitions to Format"

**Be sure /dev/sda1 is highlighted. If not, use either the arrow or tab key to highlight /dev/sda1. Toggle the selection by pressing <space>, and check to see that the asterisk appears indicating that /dev/sda1 has been selected.**

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**NOTE** Also select "check bad blocks during formatting." Doing so will take more time now but may make your system more reliable.

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**Tab to OK <Enter>**

21. "Components to Install"

**Use arrow keys and <Space> to select the packages you want installed on your system. If you want all 561 packages and have plenty of space, scroll all the way to the bottom of the list and select "Everything"**

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**NOTE** If you do not select everything, be sure to select Apache Web Server manually so it will start up at boot time.

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When you are satisfied with your selections, tab to "OK" and press <Enter>.

22. "Install Log" Make a note of the location of your log file, in case you need to refer to or use it.

"OK" <Enter>

23. "Running"

Message shows progress on file system construction.

24. "Install Status"

During the next few minutes, the screen will show the installation status of the Linux system, including any packages you selected for installation.

## Completing the Installation

25. "Probing Result (Configure Mouse)"

"OK" <Enter>

26. "Configure Mouse"

Use <space> to put an asterisk into the check box for "Emulate 3 mouse buttons."

Tab to "OK" <Enter>

27. "PCI Probe"

OK <Enter>

- 28.. "Install Status" brief pause

29. "Monitor Setup"

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**NOTE** This step assumes you have an HP monitor that supports 1280 X 1024 X 72 Hz.

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---> HP 1280 X 1024-72 Hz

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**NOTE** If your monitor is different, select "Custom" here. Also note later in the process "Video Mode" may require different entries for a different monitor.

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Tab to "OK" <Enter>

30. "Screen Configuration"

**"Don't Probe" <Enter>**

31. "Video Memory"

---> 1 Meg

**Tab to "OK" <Enter>**

32. "Clockchip Configuration"

---> No Clockchip Setting

**Tab to "OK" <Enter>**

33. "Video Mode" Use the arrow keys and the space bar to select one from each column, then tab to move to the next choice. Make sure each of the following is selected:

---> 8-bit 1024 X 768

---> 16-bit 800 X600

---> 24-bit 640 X 400

**Tab to "OK" <Enter>**

34. "Network Configuration"

---> Yes

**<Enter>**

35. "Probe"

"An Intel EtherExpress Pro100 card had been found on your system."

**"OK" <Enter>**

36. "Confirm Networking Card"

**<Enter>**

37. "Boot Protocol"

**Provide your addresses or protocols. <Enter>**

38. "Configure Timezones"

---> Select Your Time Zone

**Tab to "OK" <Enter>**

39. "Services"

Use the arrow keys and the space bar to deselect "PCMCIA" and "Sound"

Tab to "OK" <Enter>

40. "Configure a Printer?"

Make choices as needed. Use the <Enter> key to confirm.

41. "Root Password"

Type in your chosen password. <Enter>

Repeat. <Enter>

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**CAUTION** The root password is an important part of the system security. Use standard techniques for choosing a password, and for updating and recording it.

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42. "Boot Disk"

Yes <Enter>

Put disk in drive <Enter>

43. "Creating Bootdisk"

44. "Lilo Installation"

Unless you have a reason to make another choice, use the default. Tab to "OK" <Enter>

45. "Lilo Installation"

The only entry required on this screen is to be sure you have an asterisk selected at "Use linear mode."

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**CAUTION** If you do not select "use linear mode" you may have to begin installation over again after boot failure at the end of the process.

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<Enter>

46. "LILO"

Pause.

47. "Done"

Once you press <Enter> to accept "OK", the original boot screen appears. Take out the CD and boot diskette. The system automatically reboots. If you delay taking

out the CD, the system may fail to reboot. If this happens, make sure the CD and floppy disks are taken out, then press the reset button on the front panel of the computer.

## Restart the System

The screens associated with the HP NetServer BIOS scroll by. Once the reset is completed, you should see the local host login.

You have completed the installation of the Linux 5.2 system. In order to use the Xwindows interface, you only need to type "startx" at the root prompt (or, if you have created user accounts with appropriate permissions, at one of these user prompts) and press <Enter>.

Once Xwindows starts, use the <Ctrl><Alt><+ (plus)> and <Ctrl><Alt><- (minus)> key combination to change screen resolution. Pressing one of the mouse buttons brings up a menu of utilities or programs.

## Setting up the Apache Web Server

The Apache web server service (httpd) should have started at boot time. You should be able to view the Apache default web page on a remote machine by simply typing in the fully qualified domain name (for example [www.mydomain.com](http://www.mydomain.com)). The web documents are stored in the directory /home/httpd by default but all aspects of the web server can be changed through either the graphical tool in the control panel or from editing the configuration files in /etc/httpd/conf/ using an editor like vi or emacs. For additional help visit the Apache web site at [www.apache.org](http://www.apache.org).

## Test Point

Your Web server is now running. You should be able to access it through a browser from a remote machine over the network or Internet. Type in the domain name of the server (for example [www.mydomain.com](http://www.mydomain.com)) or the IP address of the server (for example 10.0.0.1) into your browser. The homepage should appear.

## More Information

Tips and pointers for installing Red Hat Linux 5.2 are included in Appendix C.

To recompile the kernel for use with NetRAID, see the *Red Hat Linux 5.2 Installation Guide*.

# Appendix A

## Configuration of System Tested

### Hardware

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<b>NOTE</b>	Maximum RAM size for this release is 1 GB.
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Baseboard	Hewlett Packard NetServer LPr System Board
Processor	Intel Pentium II microprocessor operating at 400MHz.
Memory	Four 128MB PC compliant DIMM. Always check approved memory list before buying DIMMs for your HP LPr Net Server.
SCSI Controller	Symbios Logic 53C895 SCSI controller (shows up in the Linux device scan as an NCR 538xx controller)
NIC	HP D5013A Adapter, which shows up in the Linux device scan as an Intel 82558 controller
Video	Integrated Cirrus Logic GD 5446 PCI w/1MB of Video RAM
IDE Controller	Integrated dual channel IDE controller
Floppy Controller	Integrated floppy controller
Floppy drive	1.44MB Floppy Drive
CD-ROM	IDE ATAPI Torison CDR U240Z 24XCD-ROM drive
Hard Drives	Two 4.2GB capacity Hewlett Packard Ultra II wide SCSI
Monitor	HP 17-inch monitor
Mouse	PS/2 compatible
Keyboard	PS/2 compatible

### Software

OS	Red Hat Linux 5.2 on CD-ROM
Apps	Apache Web Server

## Appendix B

### Example Hard Disk Setup using fdisk

The following is an example for how to use fdisk to configure a drive. This procedure assumes you used the DOS utility fdisk/mbr to erase the master boot record at the beginning of installation. If not, you must do so before proceeding. See "Preinstallation." The procedure can be used with an HP 4.26 GB disk. It begins after the "SCSI Configuration" screen.

1. "Disk Setup"

`<Tab> to "fdisk" <Enter>`

2. "Partition Disks"—displays a screen message showing the number and types of disk detected

`<Tab> to "Edit" <Enter>`

---

**NOTE** The fdisk program screens are black and white, text-based instructions. You respond to questions by typing in a number or letter, or by accepting the default with `<Enter>`.

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### Using fdisk

3. "This is the fdisk program . . . . Command (m for help) . . ."

`m <Enter>`

`"Command action"—list of commands shown.`

4. "Command (m for help) . . ."—To partition your Linux Native Partition on a 4.26 GB hard disk, make the following choices:

---

**NOTE** This step assumes there is no utility partition on your NetServer.

---

---

**NOTE** The cylinders on your hard disk may be different from this example.

---

`n <Enter>, p <Enter>, 1 <Enter>`

`First cylinder: 1 <Enter>`

`Last cylinder: 980 <Enter>`

5. To partition your Linux Swap Partition on a 4.26 GB hard disk, make the following choices: "Command (m for help) . . ."

---

**NOTE** This step assumes there is no utility partition on your NetServer.

---

---

**NOTE** The cylinders on your hard disk may be different from this example.

---

**n** <Enter>, **p** <Enter>, **2** <Enter>

First cylinder: **981**

Last cylinder: **1008**

---

**NOTE** Administrators with a basic knowledge of disk data storage may want to decide their own usage.

---

6. To check partitions—"Command (m for help) . . ."

**p** <Enter>

---

**NOTE** Both partitions will be "Linux Native" type at this point. No asterisk will be evident in the "Boot" column yet.

---

7. To designate one of the partitions as swap space—"Command (m for help) . . ."

**t** <Enter>, **2** <Enter>, **82** <Enter>

8. To toggle a bootable flag—"Command (m for help) . . ."

**a** <Enter>, **1** <Enter>

9. To check partitions—"Command (m for help) . . ."

**p** <Enter>

---

**CAUTION** If you do not place a bootable flag on the main Linux Native partition (where the OS is installed) at this point, it may later be impossible for Linux to boot up from the hard disk. In that case, you may have to start the installation over.

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10. If you determine everything to be correct—"Command (m for help) . . ."

**w** <Enter>

You might see messages about the disk partition table.

Once you have written the configuration to disk, return to the section on "Continuing the Linux Installation".

## Appendix C

### Installation of Red Hat Linux 5.2 on the HP NetServer LPr

The following notes refer to installation. They are keyed to The Official Red Hat Linux 5.2 Installation Guide.

(3.4.1)

When installing from a CD-ROM, you do NOT need to use a floppy disk. Just enable the BIOS to boot from the CD drive itself. This is much faster and saves about a minute. The full HP NetServer LPr installation time can be brought under ten minutes with this method.

(4.2)

While Server and Workstation installations have their places, Customized installations are probably better for the HP NetServer LPr. Specifics of directory and partition layouts depend on specific roles and tasks.

(4.4)

When creating partitions, most Linux experts employ fdisk and not Disk Druid.

(Chapter 5)

If you miss something during installation you can redo a lot of your work with the following utilities:

mouseconfig, Xconfigurator, mtctf, timeconfig, ntsysv, chkconfig, mkbootdisk

(5.9)

When installing LILO, it is a good idea to streamline things with the "compact" keyword at the top of the lilo.conf file (add during post-config). During the installation, all non-dual-boot systems should install LILO to the Master Boot Record.

(other observations)

To synchronize the PC clock:

```
rdate -s a few time servers here
setclock
then reboot to let the software adjust
```