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Sun Fire™ V60x and Sun Fire V65x Server Linux Operating System Installation Guide

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Contents

Installing Red Hat 7.3 Software on Sun Fire V60x and V65x Servers

Note – The system administration procedures in this document are intended for users with at least basic Linux administration experience.

This chapter is organized into the following sections.

- "Installing Red Hat 7.3 Software From CDs" on page 1
- "Installing Red Hat 7.3 From a Network" on page 6

Installing Red Hat 7.3 Software From CDs

This procedure describes how to install Red Hat 7.3 software from CDs. This procedure has been tested using the ISO distribution of the software that is available from Red Hat at the following sites.

```
ftp://ftp.redhat.com/pub/redhat/linux/7.3/en/iso/i386/
http://www.redhat.com/mirrors
```

Note – The server's USB ports are not enabled until Linux is booted and the USB drivers are installed. A PS/2 keyboard is required for initial bootup and configuration.

1. **Power on your Sun Fire™ V60x or V65x server and insert the Red Hat 7.3 CD 1 into its CD tray.**

2. **When you are prompted in the Welcome to Red Hat screen, do *not* press Enter. Instead, instruct the server to use a driver disk by typing the following command:**

Note – You must type this command *before* the prompt times out.

```
linux dd
```

The installation process begins and prompts you for a driver disk, which is required by the server's SCSI controller.

3. **Insert the Sun Fire V60x and Sun Fire V65x SCSI Driver Disk (shipped with your server) into the server's diskette drive, then follow the on-screen prompts to install the driver on the server.**

Note – If the supplied Driver Disk is not available, instructions for creating your own driver disk are included in "Creating a SCSI Driver Disk" on page 5.

Note – Loading install drivers from a diskette might cause the following error message, which you can ignore:
```
reading head error, cpio: read failed
```

---

4. **After the drivers are loaded, remove the SCSI Driver Disk from the server.**

5. **Continue with the Red Hat 7.3 installation by following the on-screen prompts.**

   Make the following selections when you are prompted during the installation:

   - Select Install Custom.
   - Select the Grub boot loader.
   - Select Software Development.
   - Select Kernel Development.
   - Select any other packages that you require.

Note – It is a good practice to make a boot disk for emergency system recovery when prompted, but it is optional.

---

6. **When you are prompted, remove the current CD and insert the next requested CD, then select OK.**

   The installation software unmounts and mounts the CDs with no need for additional commands from the user. The CD requested by the installer software varies, depending on which installation selections you made in Step 4.

7. **Wait for the server to reboot at the end of the operating system installation. After the server restarts, log in to the server as the superuser.**

Note – When Red Hat 7.3 boots, you can safely ignore the message:
```
kmod: failed to exec /sbin/modprobe -s -k scsi_hostadapter,
errno = 2
```

---

8. **Insert the Sun Fire V60x and Sun Fire V65x Resource CD (shipped with your server) into the server's CD tray and ensure that the CD ROM drive is mounted.**

   If it is not, mount the CD by typing the following command:

   `mount /dev/cdrom /mnt/cdrom`

9. **From the Resource CD, copy the e1000 driver file to your server's** `/tmp` **directory by typing the following commands:**

   `cd /mnt/cdrom/drivers/redhat/7.3/src/`
   `cp e1000-4.4.19-rh73.src.rpm /tmp/`
   `cd /`

10. **On your server, install the source RPM file by typing the following command:**

    `rpm -ivh /tmp/e1000-4.4.19-rh73.src.rpm`

11. **Compile the e1000 driver by typing the following command:**

    `rpm -bb /usr/src/redhat/SPECS/e1000.spec`

Note – During the driver compilation, you might see error messages about kernel version mismatches. You can safely ignore these messages.

---

12. **Install the e1000 driver by typing the following command:**

    `rpm -ivh /usr/src/redhat/RPMS/i386/e1000-4.4.19-rh73.i386.rpm`

13. **Remove the Resource CD from the server after you type the following command:**

    `umount /dev/cdrom`

14. **Reboot the server by typing the following command:**

    `reboot`

15. **Configure Network Devices using the Kudzu utility when prompted.**

Note – You must choose to enter the Kudzu utility when prompted.

> **Note –** Red Hat 7.3 refers to network port 2, on the back of the server, as `eth0`. The network adapter for port 2 is the first adapter that you are prompted to configure. Ignore the prompt to configure a second network adapter.

16. **After the server restarts, log in to the server as the root user.**

17. **Update your server with any 7.3 software updates from the Red Hat web site:**

    `http://www.redhat.com`

> **Note –** You must upgrade to kernel version 2.4.18-24 or later for stable operation of your server. For your convenience, the Resource CD contains the recommended operating kernel and related files in the `/kernel/redhat/7.x` directory.

18. **Insert the Resource CD into the server's CD tray and ensure that the CD ROM drive is mounted. If it is not, mount the CD by typing the following command:**

    `mount /dev/cdrom /mnt/cdrom`

19. **From the Resource CD, copy the aic79*xx* driver to your server's** `/tmp` **directory by typing the following commands:**

    ```
    cd /mnt/cdrom/drivers/redhat/7.3/src/
    cp aic79xx* /tmp/
    cd /
    ```

20. **Install the source RPM file by typing the following command:**

    `rpm -ivh /tmp/aic79xx*.rpm`

21. **Compile the aic79xx driver by typing the following command:**

    `rpm -bb /usr/src/redhat/SPECS/aic79xx.spec`

22. **Install the aic79xx driver upgrade by typing the following commands:**

    `rpm -Uvh /usr/src/redhat/RPMS/i686/aic79*`

    `umount /dev/cdrom`

23. **Reboot the server by typing the following command:**

    `reboot`

> **Note –** The Kudzu application starts automatically when the server restarts.

24. **To configure the Red Hat 7.3 operating system for your server, refer to the documentation available at:**

    `http://www.redhat.com/docs/manuals/linux/`

Creating a SCSI Driver Disk

This procedure is optional and describes how to create a SCSI driver disk, in case you lose the Sun Fire V60x and Sun Fire V65x SCSI Driver Disk that is shipped with your server, or in case you want to make backup copies.

You need the following items to complete this procedure:

- A Linux server or workstation with a CD-ROM drive *and* a diskette drive
- One 3.5-inch formatted 1.44 MB diskette

1. **Power on a Linux server or workstation that is equipped with a diskette drive and log in to the server as the superuser.**

2. **Insert the Sun Fire V60x and Sun Fire V65x Resource CD (shipped with your server) into the server's CD tray, and mount the CD by typing the following command.**

   ```
   mount /dev/cdrom /mnt/cdrom
   ```

   Note – If the CD automounts, the mount command is not required. Refer to your server's documentation for mounting a CD-ROM if you require more information.

   ---

3. **Insert a formatted 1.44 MB diskette into the server's diskette drive.**

4. **Create the driver disk by typing the following commands.**

   ```
   cd /mnt/cdrom/images/redhat/7.3/
   dd if=aic79xx-1.3.7-i686-rh73.img of=/dev/fd0
   sync
   cd /
   ```

   The driver diskette creation might take several minutes.

5. **Remove the diskette from the server.**

6. **Remove the Resource CD from the server after you type the following command.**

   ```
   umount /dev/cdrom
   ```

Installing Red Hat 7.3 From a Network

The tasks for installing Red Hat 7.3 from a networked PXE server consist of the following procedures.

1. Configure your network to support PXE installation. See "Preconfiguring Your Network to Support PXE Installation" on page 27. These procedures apply for all Red Hat versions covered in this guide.

2. Create a PXE install image on a system that will be the PXE server, from which the operating system is downloaded to other systems (PXE clients). See "Creating a PXE Install Image on the PXE Server" on page 6.

3. Install the Red Hat 7.3 software to the PXE clients from the PXE server. See "Installing Red Hat 7.3 Software From a PXE Server" on page 10.

Note – The server's USB ports are not enabled until Linux is booted and the USB drivers are installed. A PS/2 keyboard is required for initial bootup and configuration.

Creating a PXE Install Image on the PXE Server

This procedure describes how to create a PXE install image on the same server that is your DHCP server so that it will also act as your PXE server. The PXE server provides the operating system files to your PXE client.

1. **Insert Red Hat 7.3 CD 1 into your server and copy its contents to your PXE server, by typing the following commands:**

   You can use a different target directory than the /home/pxeboot/rh7.3 directory shown below in the examples:

   ```
   mkdir -p /home/pxeboot/rh7.3/
   mount /dev/cdrom /mnt/cdrom
   cp -a /mnt/cdrom/RedHat /home/pxeboot/rh7.3/
   cd /
   ```

2. **When the copy operation is finished, remove CD 1 from the server after you type the following command:**

   ```
   umount /dev/cdrom
   ```

3. **Insert Red Hat 7.3 CD 2 into your server and copy its contents to your PXE server, by typing the following commands:**

```
mount /dev/cdrom /mnt/cdrom
cp -a /mnt/cdrom/RedHat /home/pxeboot/rh7.3/
cd /
```

Note – If you are prompted about overwriting any existing files, type **y** to overwrite the files.

---

4. **Determine whether the** `anaconda-runtime` **package is already installed on the PXE server by typing the following command:**

```
rpm -qa | grep anaconda-runtime
```

5. **If the** `anaconda-runtime` **package is not listed, install it from Red Hat 7.3 CD 2 by typing the following command:**

```
rpm -ivh /mnt/cdrom/RedHat/RPMS/anaconda-images-7.3-6.noarch.rpm
```

6. **Remove CD 2 from the server after you type the following command:**

```
umount /dev/cdrom
```

7. **Insert Red Hat 7.3 CD 3 into your server and copy its contents to your PXE server, by typing the following commands:**

```
mount /dev/cdrom /mnt/cdrom
cp -a /mnt/cdrom/RedHat /home/pxeboot/rh7.3/
cd /
```

Note – If you are prompted about overwriting any existing files, type **y** to overwrite the files.

---

8. **Remove CD 3 from the server after you type the following command:**

```
umount /dev/cdrom
```

9. **Insert the Sun Fire V60x and Sun Fire V65x Resource CD into the server and copy the** `aic79xx*` **RPM files to your PXE server by typing the following commands:**

```
mount /dev/cdrom /mnt/cdrom
cp /mnt/cdrom/drivers/redhat/7.3/aic79xx* \
/home/pxeboot/rh7.3/RedHat/RPMS/
```

10. **Edit and save the** `/home/pxeboot/rh7.3/RedHat/base/comps` **file to add the following entries to it (after the existing line that reads** `anacron`**).**

```
aic79xx
aic79xx-bigmem
aic79xx-smp
```

11. **Download any updates or patches to Red Hat 7.3 from the Red Hat web site,** `http://www.redhat.com`, **to the** `/tmp` **directory of your PXE server.**

12. **If you downloaded updated RPM files in Step 11, copy them to the directory shown in the following command:**

```
cp /tmp/*.rpm /home/pxeboot/rh7.3/RedHat/RPMS/
```

13. **From the Resource CD, copy the script file** `newest.pl` **to your PXE server by typing the following command:**

```
cp /mnt/cdrom/scripts/newest.pl \
/home/pxeboot/rh7.3/newest.pl
```

14. **Remove old kernels from the server by typing the following commands:**

```
cd /home/pxeboot/rh7.3/RedHat/RPMS/
rm -f kernel-2.4.18-*
rm -f kernel-smp-2.4.18-*
rm -f kernel-source-2.4.18-26.7.x.i386.rpm
rm -f kernel-BOOT-2.4.18-26.7.x.i386.rpm
rm -f kernel-bigmem-2.4.18-26.7.x.i686.rpm
rm -f modutils-2.4.18-3.7x.i386.rpm
```

15. **From the Resource CD, copy new kernels to the server by typing the following command:**

```
cp /mnt/cdrom/kernel/redhat/7.x/*.rpm ./
```

16. **On your PXE server, remove any old packages by typing the following commands:**

Note – The following `perl` command must be run from the `/home/pxeboot/rh7.3/RedHat/RPMS` directory.

```
cd /home/pxeboot/rh7.3/RedHat/RPMS/
perl /home/pxeboot/rh7.3/newest.pl
```

17. **On your PXE server, update your disk drive list (**`hdlist`**) by typing the following commands:**

```
/usr/lib/anaconda-runtime/genhdlist --withnumbers \
/home/pxeboot/rh7.3/
```

18. **From the Resource CD, copy the file** `initrd.img` **to your PXE server by typing the following commands:**

    ```
    cp /mnt/cdrom/pxeboot/redhat/7.3/initrd.img \
    /home/pxeboot/rh7.3/
    ```

19. **From the Resource CD, copy the file** `stage2.img` **to your PXE server by typing the following commands.**

    If you are prompted about overwriting an existing `stage2.img` file, select `Yes`:

    ```
    cp /mnt/cdrom/pxeboot/redhat/7.3/stage2.img \
    /home/pxeboot/rh7.3/RedHat/base/
    ```

20. **From the Resource CD, copy the file** `vmlinuz` **to your PXE server by typing the following commands:**

    ```
    cp /mnt/cdrom/pxeboot/redhat/7.3/vmlinuz \
    /home/pxeboot/rh7.3/
    ```

21. **From the Resource CD, copy the kickstart file** `ks.cfg` **to your PXE server by typing the following commands:**

    ```
    cp /mnt/cdrom/pxeboot/redhat/7.3/ks.cfg \
    /home/pxeboot/rh7.3/
    ```

22. **On your PXE server, edit and save the kickstart file** `/home/pxeboot/rh7.3/ks.cfg` **so that the** `nfs` **line is as follows.**

    ```
    nfs --server n.n.n.n --dir /home/pxeboot/rh7.3/
    ```

    Where *n.n.n.n* is the IP address of your PXE server.

23. **On your PXE server, modify and save the file** `/home/pxeboot/pxeboot.cfg/default` **to add the following entry to it.**

    You must type the text block from "`append ksdevice`" through "`ks.cfg`" as one continuous string with no returns.

    ```
    label rh7.3
    kernel rh7.3/vmlinuz
    append ksdevice=eth0 console=ttyS1,9600 console=tty0
    load_ramdisk=1 initrd=rh7.3/initrd.img network
    ks=nfs:n.n.n.n:/home/pxeboot/rh7.3/ks.cfg
    ```

    Where *n.n.n.n* is the IP address of your PXE server.

Installing Red Hat 7.3 Software From a PXE Server

The target server you are downloading the Red Hat 7.3 software to is called a PXE client. After the PXE client requests the download through the DHCP server, the PXE server transfers the boot image file to the PXE client using TFTP. This boot image file is then used to boot the client.

Note – This procedure assumes that you have already preconfigured your network and PXE server install image as described in "Preconfiguring Your Network to Support PXE Installation" on page 27.

---

1. **Connect the PXE client to the same network as the PXE server, and power on the PXE client.**

2. **When the PXE client prompts you for a network boot, press F12.**

   The PXE client connects to the PXE server and attempts to obtain an IP address from the DHCP server.

3. **Press F8 and select Remote Install to begin the network boot and downloading of the PXE boot image.**

   The Red Hat 7.3 installation process begins. Follow the on-screen prompts to continue the installation.

   The installation completes on the PXE client the same as a regular CD-ROM installation.

4. **To configure the Red Hat 7.3 operating system for your server, refer to the documentation available at:**

   ```
   http://www.redhat.com/docs/manuals/linux/
   ```

Installing Red Hat Enterprise Linux 2.1 on Sun Fire V60x and V65x Servers

---

Note – The system administration procedures in this chapter are intended for users with at least basic Linux administration experience.

This chapter is organized into the following sections.

- "Installing Red Hat Enterprise Linux 2.1 From CDs" on page 12
- "Installing Red Hat Enterprise Linux 2.1 From a Network" on page 20
- "Kernel Upgrade" on page 25

Installing Red Hat Enterprise Linux 2.1 From CDs

This section describes how to install Red Hat Enterprise Linux 2.1 software using supplemental drivers provided at `http://www.sun.com`.

Installing from CD consists of the following procedures:

1. Download the SCSI driver disk image, SCSI driver RPMs, and Ethernet driver RPMs from the Sun web site. See "Downloading Required Drivers and Support Files" on page 13.

2. Put the latest SCSI driver disk image onto a diskette. See "Creating a SCSI Driver Disk" on page 14.

3. Install Red Hat Enterprise Linux 2.1 and several optional modules. "Installing Red Hat Enterprise Linux 2.1" on page 15.

4. Configure the network connection. See "Configuring the Network Connection" on page 18.

Required Items

The procedure "Installing Red Hat Enterprise Linux 2.1 From CDs" on page 12 requires the following items.

- A Sun Fire V6*x*x server equipped with:
  - A diskette/CD-ROM combo module
  - A PS/2 keyboard
- Monitor
- Red Hat Enterprise Linux Media CD Set. This can be the AS, ES, or WS version.
- Two 1.44 MB 3.5-in. diskettes (three diskettes if you create an optional repair disk)
- A second Linux server, with Internet access, and with the dd utility installed

---

Note – Do not connect a mouse for the installation.

Optional Item

- Sun Fire V60x and V65x Server Diagnostic CD (Sun part number 705-0602), if you want to install the service partition (refer to the *Sun Fire V60x and V65x Server User Guide* (817-2023) for more information about the service partition).

Downloading Required Drivers and Support Files

This section describes how to download the required supplemental drivers and files that are needed to run Red Hat Enterprise Linux 2.1 on the Sun Fire V60x and V65x servers.

1. **On a system running Linux, use a browser to go to the Sun download site for Sun Fire V60x and V65x servers:**

   ```
   http://www.sun.com/servers/entry/v60x/
   ```
   or
   ```
   http://www.sun.com/servers/entry/v65x/
   ```

2. **Navigate to the download links for Red Hat Enterprise Linux 2.1 and download the following three items to a** `/tmp` **directory on the system.**

   - Adaptec SCSI Driver Disk Image file
   - Adaptec SCSI Driver RPMs tar file
   - Intel Ethernet Driver RPMs tar file

3. **Extract the contents of the two tar files into the** `/tmp` **directory.**

   `tar -zxf /tmp/`*filename*

4. **Continue with "Creating a SCSI Driver Disk" on page 14.**

Creating a SCSI Driver Disk

The Red Hat Enterprise Linux 2.1 Media CD does not contain the correct driver for the SCSI controller installed on the server. An additional diskette, containing the driver source code, is required when installing the operating system onto the server's disk drive.

1. **Insert a formatted diskette to the system that you have downloaded the drivers to in "Downloading Required Drivers and Support Files" on page 13.**

2. **Login as the root user.**

3. **Type the following command to write the disk image to the diskette:**

   `dd if=/tmp/aic79xx-`*version*`.img of=/dev/fd0`

   Where *version* is the highest numeric file available, for example:

   `aic79xx-1.3.10-i686-rh72as.img`

   Note – The output device may vary depending on your server; `/dev/fd0` is typical.

   ---

4. **When the operation is complete, eject the diskette.**

5. **Continue with "Installing Red Hat Enterprise Linux 2.1" on page 15.**

Installing the Service Partition (Optional)

You can optionally install the service partition from the Diagnostics CD as the first step of the Red Hat Enterprise Linux 2.1 installation. The service partition has utilities that might be useful. Refer to the *Sun Fire V60x and Sun Fire V65x Server User Guide* for more information about the utilities provided by installing the service partition, and for instructions on installing it. If you want to install the service partition, it must be installed prior to installing Red Hat Enterprise Linux 2.1.

Installing Red Hat Enterprise Linux 2.1

1. **Connect the keyboard and monitor to the appropriate connectors on the Sun Fire V60x or V65x server.**

Note – Do not connect a mouse for the installation.

---

2. **Power on the server and insert Red Hat Enterprise Linux 2.1 CD 1 into the CD tray.**

3. **When you are prompted in the Welcome to Red Hat screen, do *not* press Enter. Instead, instruct the server to use a driver disk:**

Note – You must type this command *before* the prompt times out.

```
linux dd
```

The installation process begins and prompts you for a driver disk, which is required by the server's SCSI controller.

4. **When you are prompted for whether you have a driver disk, select Yes.**

5. **When you are prompted for the driver disk, insert the SCSI driver diskette you created in "Creating a SCSI Driver Disk" on page 14 and select OK when you are prompted to continue.**

   This will take a few moments as the aic79xx driver is loaded.

6. **The installer does not detect for a mouse; instead a prompt asks whether you want to provide mouse information, or choose text mode installation (no mouse is required and you should *not* have connected a mouse).**
   Choose text mode installation.

7. **Choose the appropriate language.**

8. **Choose your keyboard type.**

9. **Choose None-None for mouse type.**

10. **When the dialog box about Red Hat Linux and registration appears, read it, then select OK.**

11. **When prompted for the Installation Type, choose Custom.**

12. **When prompted for disk partitioning, select Autopartition; a dialog box appears prompting whether you want to keep the existing partitions.**

    The following choices are displayed:

    - Keep all partitions and use existing free space
    - Remove all partitions on this server

    Your choice depends on whether you installed the service partition earlier (see *"Installing the Service Partition (Optional)" on page 14*).

    - If you installed the service partition, select the option Keep all partitions and use existing free space.
    - If you did not install the service partition, choose Remove all partitions on this server.

13. **If you chose Remove all partitions on this server a warning about data being removed from the drives is displayed. Select Yes.**

14. **On the Partitioning screen, tab to OK and press Enter.**

15. **Select a boot manager of your choice, then choose OK.**

    For example, if you choose LILO, use the arrow keys to move the cursor into the check box for LILO, then press the spacebar to select LILO, select OK, and press Enter.

16. **Select MBR for the boot loader configuration.**

17. **Select OK, then press Enter at the Boot Loader Configuration screen.**

18. **Select the default option when prompted for which operating environments to boot.**

19. **Select the firewall configuration that matches your preferred environment (high, medium, or no firewall).**

20. **Select any other additional languages you need to install.**

21. **Select the appropriate time zone.**

22. **Enter the root password of your choice.**

    Note – Forgetting the password might require OS reinstall.

    ---

23. **Add an additional user, if necessary.**

    admin is a recommended user to add to the server by default. Enter all the appropriate information.

24. **You may add additional users in the User Account Setup screen, or choose OK.**

    Passwords must be at least six characters.

25. **Select the Authentication Configuration for your environment.**

26. **In the Package Group Selection setup screen, check the following options, in addition to any other software features that you want:**
    - Utilities
    - Legacy Application Support

    Use the arrow keys to move the cursor, then press the spacebar to check selections.

27. **When prompted, select the default video interface detected by the installer.**

28. **Read the dialog box about the installation log, then choose OK.**

    This installation of the RPMs will take about 10 minutes, depending on what you selected for installation. When you are prompted to switch the CD, the installer automatically ejects the CD. Insert the requested CD and press OK. You might not need CD 3, depending on which options you selected for installation.

29. **When prompted about creating a repair disk, choose whether you want to create one.**

    Note – It is a good practice to make a repair disk for emergency system recovery when prompted, but it is optional.

    ---

30. **Identify the connected monitor and select the best match in the installer.**

31. **At the X-Customization screen, select Text Interface.**

32. **Select OK in the Complete dialog box.**

    Be sure to remove the repair diskette from the diskette drive, if you created one.

33. **Continue with "Configuring the Network Connection" on page 18.**

Installing the Kernel Source (Optional)

This procedure is provided for reference, but is not required.

Check to see if the kernel source is installed by typing:

```
rpm -q kernel-source
```

- If the result shows that kernel source 2.4.9-e.3 is installed, proceed to "Configuring the Network Connection" on page 18.
- If not, install the kernel source from CD2/RedHat/RPMS/. Type the following commands:

```
mount /mnt/cdrom
rpm -ivh /mnt/cdrom/RedHat/RPMS/kernel-source-2.4.9-
e.3.i386.rpm
umount /mnt/cdrom
```

Configuring the Network Connection

1. **Login as the root user on the target Sun Fire V60x or V65x target server to which you are installing Red Hat Enterprise Linux 2.1.**

2. **Determine the kernel level installed on the target server by typing the following command.**

   ```
   uname -a
   ```

3. **Insert a formatted diskette in the system that you have downloaded the drivers to in "Downloading Required Drivers and Support Files" on page 13.**

4. **Mount the diskette by typing the following command.**

   ```
   mount /dev/fd0 /mnt/floppy
   ```

5. **Copy the e1000 network drivers from the /tmp location where you downloaded them to the diskette by typing the following command.**

   ```
   cp /tmp/as-e1000/e1000-version /mnt/floppy
   ```

   Where *version* is the RPM version that corresponds to the kernel version you are using, as determined in Step 2.

6. **When the operation is complete, unmount, then eject the diskette.**

   ```
   umount /dev/fd0
   ```

7. **Insert the diskette with the e1000 network drivers into this target server and mount the diskette by typing the following command.**

   ```
   mount /dev/fd0 /mnt/floppy
   ```

8. **Copy the e1000 network drivers from the diskette to the target server by typing the following command.**

   ```
   cp /mnt/floppy/e1000-version /tmp/
   ```

9. **Install the network driver RPMs by typing the following command:**

   ```
   rpm -Uvh --nodeps /tmp/e1000-version
   ```

10. **Reboot the server.**

11. **Configure Network Devices using the Kudzu utility when prompted.**

   Note – You must choose to enter the Kudzu utility when prompted.

   Note – Red Hat Enterprise Linux refers to network port 2 on the back of the server as `eth0`. The network adapter for port 2 is the first adapter that you are prompted to configure. Ignore the prompt to configure a second network adapter.

   ---

12. **Continue with "Kernel Upgrade" on page 25 to check for more optimal kernel upgrades available.**

Installing Red Hat Enterprise Linux 2.1 From a Network

The tasks for installing Red Hat Enterprise Linux 2.1 from a networked PXE server consist of the following procedures.

1. Configure your network to support PXE installation. See "Preconfiguring Your Network to Support PXE Installation" on page 27. These procedures apply for all Red Hat versions covered in this guide.

2. Download the PXE support tar file from the Sun web site. See "Downloading Required Drivers and Support Files" on page 20.

3. Create a PXE install image on a system that will be the PXE server, from which the software is downloaded to other systems (PXE clients). See "Creating a PXE Install Image on the PXE Server" on page 21.

4. Install the Red Hat software to the PXE clients from the PXE server. See "Installing Red Hat Enterprise Linux 2.1 Software From a PXE Server" on page 24.

Downloading Required Drivers and Support Files

Note – Before you start this procedure, verify that your network has been configured to support PXE installation, as described in "Preconfiguring Your Network to Support PXE Installation" on page 27.

This section describes how to download the required PXE support files that are required for PXE installations.

1. **On a system running Linux, use a browser to go to the Sun download site for Sun Fire V60x and V65x servers:**

   ```
   http://www.sun.com/servers/entry/v60x/
   or
   http://www.sun.com/servers/entry/v65x/
   ```

2. **Navigate to the download links for Red Hat Enterprise Linux 2.1 and download the NeoPXE Support tar file to a** `/tmp/` **directory on the system.**

3. **Uncompress and extract the contents of the tar file into the** `/tmp/` **directory by typing the following command.**

   `tar -zxf /tmp/`*filename*

   When you extract the file, a directory with all required files is created at `/tmp/as-pxefiles/`.

4. **Continue with "Creating a PXE Install Image on the PXE Server" on page 21.**

Creating a PXE Install Image on the PXE Server

This procedure describes how to create a PXE install image on the same server that is your DHCP server so that it will also act as your PXE server. The PXE server provides the operating system files to your PXE client.

1. **Insert Red Hat Enterprise Linux 2.1 CD 1 into your server and copy its contents to your PXE server, by typing the commands listed below:**

   Note – You can use a different target directory than the `/home/pxeboot/SunFire_as2.1/` directory shown below. The examples in this procedure use this directory.

   ```
   mkdir -p /home/pxeboot/SunFire_as2.1/
   mount /dev/cdrom /mnt/cdrom
   cp -a /mnt/cdrom/RedHat /home/pxeboot/SunFire_as2.1/
   ```

2. **Type the following command, then remove CD 1 from the server:**

   `umount /dev/cdrom`

3. **Insert Red Hat Enterprise Linux 2.1 CD 2 into your server and copy its contents to your PXE server, by typing the following commands:**

   ```
   mount /dev/cdrom /mnt/cdrom
   cp -a /mnt/cdrom/RedHat /home/pxeboot/SunFire_as2.1/
   ```

   Note – If you are prompted whether to overwrite any existing files, type **y** to overwrite the files.

4. **Remove CD 2 from the server after you type the following command:**

   `umount /dev/cdrom`

5. **Insert Red Hat Enterprise Linux 2.1 CD 3 into your server and copy its contents to your PXE server, by typing the following commands:**

```
mount /dev/cdrom /mnt/cdrom

cp -a /mnt/cdrom/RedHat /home/pxeboot/SunFire_as2.1/
```

Note – If you are prompted whether to overwrite any existing files, type **y** to overwrite the files.

6. **Remove CD 3 from the server after you type the following command:**

```
umount /dev/cdrom
```

7. **On your PXE server, determine whether the** anaconda-runtime **package is already installed on the server by typing the following command:**

```
rpm -qa | grep anaconda-runtime
```

8. **If the** anaconda-runtime **package is not listed, install it from Red Hat Enterprise Linux CD 2 by typing the following commands:**

```
mount /dev/cdrom /mnt/cdrom
rpm -ivh /mnt/cdrom/RedHat/RPMS/anaconda-*
```

9. **Remove CD 2 from the server after you type the following command:**

```
umount /dev/cdrom
```

10. **Copy the SCSI and network drivers from the temporary directory to the directory shown below:**

```
cp /tmp/as-pxefiles/aic79xx* \
/home/pxeboot/SunFire_as2.1/RedHat/RPMS/

cp /tmp/as-pxefiles/e1000* \
/home/pxeboot/SunFire_as2.1/RedHat/RPMS/
```

The temporary directory /tmp/as-pxefiles/ is the one that was created during the procedure in "Downloading Required Drivers and Support Files" on page 20.

11. **Edit and save the** /home/pxeboot/SunFire_as2.1/RedHat/base/comps **file to add the following entries to it (after the existing line that reads** anacron**):**

```
aic79xx

aic79xx-enterprise

aic79xx-smp
```

12. **Extract and copy the script file** newest.pl **to your PXE server by typing the following commands:**

```
cd /tmp/as-pxefiles

tar -zxf /tmp/as-pxefiles/newest.tar.gz

cp /tmp/as-pxefiles/newest.pl /home/pxeboot/SunFire_as2.1/newest.pl
```

13. **On your PXE server, run the** `newest.pl` **script to remove any old packages by typing the following commands:**

> **Note –** The following perl command must be run from the `/home/pxeboot/SunFire_as2.1/RedHat/RPMS/` directory.

```
cd /home/pxeboot/SunFire_as2.1/RedHat/RPMS/
perl /home/pxeboot/SunFire_as2.1/newest.pl
```

14. **On your PXE server, run the** `genhdlist` **script to update your disk drive list (**`hdlist`**) by typing the following command:**

```
/usr/lib/anaconda-runtime/genhdlist --withnumbers \
/home/pxeboot/SunFire_as2.1/
```

15. **Copy the** `initrd.img` **file to your PXE server by typing the following command:**

```
cp /tmp/as-pxefiles/initrd.img \
/home/pxeboot/SunFire_as2.1/
```

16. **Copy the** `stage2.img` **file to your PXE server by typing the following command:**

    If you are prompted whether to overwrite an existing `stage2.img` file, select Yes.

```
cp /tmp/as-pxefiles/stage2.img \
/home/pxeboot/SunFire_as2.1/RedHat/base/
```

17. **Copy the** `vmlinuz` **file to your PXE server by typing the following command:**

```
cp /tmp/as-pxefiles/vmlinuz \
/home/pxeboot/SunFire_as2.1/
```

18. **Copy the kickstart file** `ks.cfg` **to your PXE server by typing the following command:**

```
cp /tmp/as-pxefiles/ks.cfg \
/home/pxeboot/SunFire_as2.1/
```

19. **On your PXE server, edit and save the kickstart file** `/home/pxeboot/SunFire_as2.1/ks.cfg` **so that the** `nfs` **line is as follows:**

```
nfs --server n.n.n.n --dir /home/pxeboot/SunFire_as2.1/
```

    Where *n.n.n.n* is the IP address of your PXE server. Double check that the location at `--dir` is pointing to the top level of your image.

20. **On your PXE server, modify and save the file**
`/home/pxeboot/pxelinux.cfg/default` **to add the following entry to it:**

Note that you should type the text block from "`append ksdevice`" through "`ks.cfg`" as one continuous string with no returns.

```
default SunFire_as2.1
label SunFire_as2.1
kernel SunFire_as2.1/vmlinuz
append ksdevice=eth0 console=ttyS1,9600 console=tty0 load_ramdisk=1
initrd=SunFire_as2.1/initrd.img network
ks=nfs:n.n.n.n:/home/pxeboot/SunFire_as2.1/ks.cfg
```

Where *n.n.n.n* is the IP address of your PXE server.

Installing Red Hat Enterprise Linux 2.1 Software From a PXE Server

The target server to which you are downloading the Red Hat Enterprise Linux 2.1 software is called a PXE client. After the PXE client requests the download through the DHCP server, the PXE server transfers the boot image file to the PXE client using TFTP. This boot image file is then used to boot the client.

1. **Connect the PXE client (the target server to which you are installing) to the same network as the PXE server, and power on the PXE client.**

2. **When the PXE client prompts you for a network boot, press F12.**

   The PXE client connects to the PXE server and attempts to obtain an IP address from the DHCP server.

3. **Press F8 and select Remote Install to begin the network boot and downloading of the PXE boot image.**

4. **When you are prompted at the** `boot:` **prompt, type in the label you gave the image during Step 20 of the previous procedure.**

5. **To configure the Linux operating system for your server, refer to the manual that is shipped with your Red Hat Enterprise Linux 2.1 media kit.**

6. **Continue with "Kernel Upgrade" on page 25.**

Kernel Upgrade

The kernel that ships with Red Hat Enterprise Linux 2.1 is not as optimally tuned as a later kernel that is provided through an update.

- The kernel installed by default for Red Hat Enterprise Linux is 2.4.9-e.3.
- The kernel that works best with the server is 2.4.9-e.12 or later. To obtain this kernel, you must use the Red Hat Network to access the upgrade.

Note – The updated kernel is obtained by running the up2date program provided with the distribution. You must register and set up the up2date program before proceeding with these instructions. Refer to the Red Hat manual included with your Red Hat Enterprise Linux 2.1 media kit for information about setting up the up2date program. When running up2date, select the kernel packages on the available package updates section. After up2date has completed, reboot the server.

Once the new kernel is installed, the SCSI driver and Ethernet driver should also be reinstalled, because the versions that ship with the e.12 kernel are not recommended for optimal system performance. See "SCSI and Network Driver Upgrades" on page 25.

SCSI and Network Driver Upgrades

The latest kernel update might downgrade the drivers that were installed during the initial installation of the operating environment. Updating the drivers ensures proper system performance.

You can use the drivers that you already downloaded, as described in "Downloading Required Drivers and Support Files" on page 13. Use the procedure in "Copying Driver Upgrade Files" on page 25 to copy the RPMs to the target server.

Copying Driver Upgrade Files

1. **Insert a formatted diskette to the system that you have downloaded the drivers to in "Downloading Required Drivers and Support Files" on page 13.**

2. **Login as the root user.**

3. **Mount the diskette by typing the following command.**

   ```
   mount /dev/fd0 /mnt/floppy/
   ```

4. **Copy the drivers that correspond to your new kernel version onto the diskette by typing the following commands.**

   ```
   cp /tmp/aic79xx-version /mnt/floppy/
   ```

   ```
   cp /tmp/e1000-version /mnt/floppy/
   ```

   Copy the RPMs that correspond to your new kernel version. For example, if you are running the e.12 kernel, copy the following SCSI drivers and network drivers (these examples are current at the time of this publishing):

   - `aic79xx-1.3.10_2.4.9_e.12-rh21as_1.i686.rpm`
   - `aic79xx-enterprise-1.3.10_2.4.9_e.12-rh21as_1.i686.rpm`
   - `aic79xx-smp-1.3.10_2.4.9_e.12-rh21as_1.i686.rpm`
   - `e1000-4.4.19_2.4.9_e.12-rh21as_1.i686.rpm`
   - `e1000-enterprise-4.4.19_2.4.9_e.12-rh21as_1.i686.rpm`
   - `e1000-smp-4.4.19_2.4.9_e.12-rh21as_1.i686.rpm`

5. **When the operation is complete, unmount, then eject the diskette.**

   ```
   umount /dev/fd0
   ```

6. **Login as the root user on the target server.**

7. **Insert the diskette with the drivers into the target server and mount the diskette by typing the following command.**

   ```
   mount /dev/fd0 /mnt/floppy
   ```

8. **Create a directory on the target server by typing the following command.**

   ```
   mkdir /tmp/e12/
   ```

9. **Copy the RPMs from the diskette to the target server by typing the following command.**

   ```
   cp /mnt/floppy/*.rpm /tmp/e12/
   ```

10. **When the operation is complete, unmount, then eject the diskette.**

    ```
    umount /dev/fd0
    ```

11. **Change directory by typing the following command.**

    ```
    cd /tmp/e12/
    ```

12. **Install the drivers to the target server with the following commands.**
    - To install SCSI drivers, type the following command.

      ```
      rpm -Uvh /tmp/aic79xx*
      ```
    - To install network drivers, type the following command.

      ```
      rpm -Uvh e1000*
      ```

13. **Reboot the target server by typing the following command.**

    ```
    reboot
    ```

Preconfiguring Your Network to Support PXE Installation

The procedures provided in this appendix describe how to preconfigure your Linux network to support PXE installation of Linux Software.

Note – These procedures assume that you already have a bootable server that is running the Linux operating system.

Note – Some of the following procedures might not be necessary if you confirm that the server packages are already in place and configured.

This task includes the following procedures:

- "Configuring a DHCP Server" on page 28
- "Installing Portmap" on page 29
- "Configuring the TFTP Service" on page 30
- "Installing and Configuring the neopxe Boot Server Daemon" on page 31
- "Configuring the NFS Service" on page 33
- "Disabling the Firewall" on page 34

Configuring a DHCP Server

Complete the following steps on the server that will be your DHCP server:

1. **Power on the server and log in as the superuser.**

2. **Determine whether the DHCP server package is already installed on the server by typing the following command:**

   ```
   rpm -qa | grep dhcp-
   ```

3. **If the DHCP server package is not listed or is less than version 3, download a newer version from Red Hat.**

   a. **Go to the following URL:**

   ```
   ftp://ftp.redhat.com/pub/redhat/linux/8.0/en/os/i386/RedHat/RPMS/
   ```

   Note – Although the path above includes the string 8.0, it is the correct path for Red Hat Enterprise Linux 2.1 also. If you have trouble with the site being too busy, you can check `www.redhat.com/mirrors` for alternate download sites.

   b. **Download the packages by typing the following command:**

   ```
   rpm -Uvh /tmp/dhcp-version.rpm
   ```

4. **Set up your DHCP configuration file (for example, `/etc/dhcpd.conf`) so that only PXEClient requests receive PXEClient responses. Add the following entry to the DHCP configuration file. Refer to the `dhcp.conf` man page for more information.**

   ```
   class "PXE" {match if substring(option vendor-class-identifier, 0, 9)
   ="PXEClient"; option vendor-class-identifier "PXEClient";}
   ```

   Note – There is a sample DHCP configuration file that you can start with on the Sun Fire V60x and Sun Fire V65x Resource CD, at the following directory: `/mnt/cdrom/pxeboot/redhat/7.3`

5. **Start the DHCP service by typing the following command:**

   ```
   service dhcpd start
   ```

6. **Configure the server to always start DHCP by typing the following command:**

   ```
   chkconfig dhcpd on
   ```

Installing Portmap

Complete the following steps on your DHCP server:

1. **Determine whether the portmap server package is already installed on the server by typing the following command:**

   ```
   rpm -qa | grep portmap
   ```

2. **If portmap is not listed, insert the Red Hat CD 1 and type the following commands to install the package from the CD.**

   The package is contained in CD 1 for Red Hat Linux 7.3 and Red Hat Enterprise Linux 2.1.

   ```
   mount /dev/cdrom /mnt/cdrom

   cd /mnt/cdrom/RedHat/RPMS/

   rpm -ivh portmap-version.rpm

   cd /
   ```

3. **Type the following command and remove the CD from the drive:**

   ```
   umount /dev/cdrom
   ```

Configuring the TFTP Service

Complete the following steps on your DHCP server:

1. **Determine whether the TFTP server package is already installed on the server by typing the following command:**

   `rpm -qa | grep tftp-server`

2. **If the TFTP server package is not listed, insert the Red Hat Linux CD that contains the package and type the following commands to install the package from the CD:**

   The package is contained in CD 3 for Red Hat Linux 7.3 and in CD 2 for Red Hat Enterprise Linux 2.1.

   `mount /dev/cdrom /mnt/cdrom`

   `cd /mnt/cdrom/RedHat/RPMS/`

   `rpm -ivh tftp-server-`*version*`.rpm`

   `cd /`

3. **Type the following command and remove the CD from the drive:**

   `umount /dev/cdrom`

4. **Edit and save the** /etc/xinetd.d/tftp **file to make the following changes:**

   a. **Change the disable attribute to** no.

   b. **Change the directory** -s /tftpboot **to** -s /home/pxeboot.

5. **Restart the** xinetd **service by typing the following command:**

   `service xinetd restart`

Installing and Configuring the `neopxe` Boot Server Daemon

Note – Complete the following steps on your DHCP server. The `neopxe` server is designed for use with a DHCP server that is running on the same system.

---

1. **Insert the Sun Fire V60x and Sun Fire V65x Resource CD (shipped with your system) and install the neopxe files to the system that is your DHCP server by typing the following commands.**

   ```
   mount /dev/cdrom /mnt/cdrom
   cd /tmp/
   tar -xzf /mnt/cdrom/pxeboot/neopxe/neopxe-0.2.0.tar.gz
   cd neopxe-0.2.0/
   ./configure
   make
   make install
   ```

2. **Append the path** `/usr/local/sbin/neopxe` **to the** `rc.local` **file by typing the following command:**

   ```
   echo "/usr/local/sbin/neopxe" >> /etc/rc.d/rc.local
   ```

Note – Ensure that you use two greater-than signs.

---

3. **Copy the PXE Linux image from the Resource CD to your system by typing the following command.**

   ```
   cp /mnt/cdrom/pxeboot/pxelinux.0 /home/pxeboot
   ```

4. **Configure the PXE Linux image by typing the following commands.**

   ```
   mkdir /home/pxeboot/pxelinux.cfg
   touch /home/pxeboot/pxelinux.cfg/default
   ```

5. **Remove the Resource CD from the system after you type the following command.**

   ```
   umount /dev/cdrom
   ```

6. **Edit the** `/usr/local/etc/neopxe.conf` **configuration file, which is read by** `neopxe` **at startup.**

Note – If the `neopxe.conf` file is not at the location shown above, you can copy it from the following location: `/tmp/neopxe-0.2.0/`

Refer to the `neopxe.conf` man page and the sample `neopxe.conf` configuration file that are installed in Step 1.

A valid configuration file must have entries for each of the following lines, including at least one service line.

`ip_addr=`*n.n.n.n*

`prompt=`*boot prompt string*

`prompt_timeout=`*timeout*

`service=`*service number,boot-server,boot-file,label*

Where:

- *n.n.n.n* is the IP address of your PXE server.
- *boot prompt string* is the character string displayed during a network boot that prompts the user to press the F8 key for a boot menu.
- *timeout* is the number of seconds the prompt is displayed before the server defaults to the first service for booting.
- *service number* is an integer in the range of 1 to 254 that identifies the boot service.
- *boot-server* is the IP address of the boot server for that boot service.
- *boot-file* is the name of the boot file that is read from your `/tftpboot` directory.
- *label* is the text string that is displayed when the boot menu is invoked by pressing the F8 key.

For example:

```
ip_addr=192.168.0.1
prompt=Press [F8] for menu...
prompt_timeout=10
service=192.168.0.1,pxelinux.0,Linux
service=192.169.0.1,nbp.unknown,Solaris
```

Configuring the NFS Service

Complete the following steps on your DHCP server:

1. **Determine whether the NFS service package is already installed on the server by typing the following command:**

   ```
   rpm -qa | grep nfs-utils
   ```

2. **If the NFS server package is not listed, insert Red Hat Linux CD 2 and type the following commands to mount the CD and install the package from the CD:**

   The package is contained in CD 2 for Red Hat Linux 7.3 and Red Hat Enterprise Linux 2.1.

   ```
   mount /dev/cdrom /mnt/cdrom

   cd /mnt/cdrom/RedHat/RPMS/

   rpm -ivh nfs-utils-version.rpm

   cd /
   ```

3. **Remove the CD from the server after you type the following command:**

   ```
   umount /dev/cdrom
   ```

4. **Edit and save the** /etc/exports **file to add the following line to it:**

   ```
   /home/pxeboot *(no_root_squash,no_subtree_check,insecure)
   ```

5. **Start the NFS service by typing the following command:**

   ```
   service nfs start
   ```

6. **Configure the server to always start the NFS service by typing the following command:**

   ```
   chkconfig nfs on
   ```

Note – The DHCPD server must be able to reverse-lookup the DHCP client. If you are seeing errors that say cannot access; /tmp/ks.cfg during installation, add the IP address *n.n.n.n* to the /etc/hosts file. Add the address by typing the following command:
echo "192.168.1.200 Clientname" >> /etc/hosts
Where *n.n.n.n* is the lowest address defined in the /etc/dhcpd.conf file entry "range dynamic-bootp" for pxe subnet.

Disabling the Firewall

If you selected Medium or High firewall security when you installed Red Hat software on the system that will be your PXE server, complete the following steps to disable the firewall so that PXE clients can download from the server:

Note – When you disable the firewall protection on the system that is your PXE server, the security of the data on that server cannot be assured. If this server is networked outside of your local intranet, be sure to re enable the firewall after downloading software to PXE clients.

---

1. **Stop the** ipchains **service by typing the following command:**

   `service ipchains stop`

2. **Stop the** iptables **service by typing the following command:**

   `service iptables stop`

3. **Stop the** ipchains **service from starting when you restart the server by typing the following command:**

   `chkconfig ipchains off`

4. **Stop the** iptables **service from starting when you restart the server by typing the following command:**

   `chkconfig iptables off`

Using Other Linux Distributions With Your Sun Fire V60x or V65x Server

This appendix contains information and guidelines that describe how system administrators can build the drivers that are needed to support distributions of Linux other than the officially supported version(s) described in this document. This information is for knowledgeable users who are familiar with Linux and with building drivers. It can also be useful for building custom kernels on a distribution, as well as the necessary support for a kernel update.

Many older, and some more recent, Linux distributions cannot be installed on the Sun Fire V60x or Sun Fire V65x server out-of-the-box. Frequently, drivers for both the Adaptec U320 AIC7902A SCSI Controller (aic79*xx*) and the Intel Etherpro 1000 Network Device (e1000) must be updated to support the Linux distribution.

The Sun Fire V60x and Sun Fire V65x servers currently support only Red Hat 7.3 Linux and Red Hat Enterprise Linux 2.1 Linux.

To determine which new Linux distributions are officially supported on the Sun Fire V60*x* and Sun Fire V65*x* servers, check the Sun Fire V60*x* website at:

`http://www.sun.com/servers/entry/v60x`

The following sections provide guidelines for building the drivers that might be needed:

- "Adaptec SCSI Controller (aic79xx)" on page 36
- "Intel PRO/1000 Network Interface Controller (e1000)" on page 37

Adaptec SCSI Controller (aic79xx)

The Sun Fire V60*x* or V65*x* server has an Ultra 320 SCSI controller that is supported by only the most recent distributions. At present, the latest drivers can be downloaded at:

```
http://people.freebsd.org/~gibbs/linux/
```

If your Linux distribution includes a driver for Adaptec 79*xx* devices, use that driver. Otherwise, you must build the driver yourself, using the source from the preceding location. Because distributions can vary widely, detailed instructions for installing those drivers are beyond the scope of this document.

You can check your current version of the driver by using the `cat` command, as shown in the following example.

```
cat /proc/scsi/aic79xx/0 | grep Adaptec
Adaptec AIC79xx driver version: 1.3.7
Adaptec AIC7902 Ultra320 SCSI adapter
```

Building an Adaptec Driver

If you want to build the driver for yourself, do the following:

1. **Set** `CONFIG_AIC79XX_CMDS_PER_DEVICE` **to** `32` **and disable** `CONFIG_AIC79XX_ENABLE_RD_STRM`**. (These options can cause issues with certain disks if set otherwise).**

2. **Make a backup copy of your desired kernel and make sure that the** `VERSION`, `PATCHLEVEL`, `SUBLEVEL`, **and** `EXTRAVERSION` **options in the kernel Makefile match the kernel you want to use.**

3. **Untar the source into your backup copy of the kernel source, configure the kernel with whatever method you want (use the distributor's configuration, if available), and remember to set the options mentioned in the previous two bullets.**

4. **With 2.4.*x* kernels, you must use the** `make dep` **command to make the dependencies. If you want to build only the module itself, use the following command:**

   ```
   make SUBDIRS=drivers/scsi/aic7xxx modules
   ```

5. **Once complete, copy the resulting** `/scsi/aic7xxx/aic79xx.o` **driver into the appropriate directory under the** `/lib/modules` **directory.**

6. **Add the driver to the initial root disk (initrd) for boot-time.**

Building and packaging for a specific distribution can vary; refer to your distribution's documentation for further details.

Intel PRO/1000 Network Interface Controller (e1000)

The Sun Fire V60x or Sun Fire V65x server has a Gigabit Ethernet controller that might only be supported by the most recent distributions. At present, the latest drivers can be downloaded from Intel's web site.

You can check your current version of the driver by using the `cat` command, as shown in the following example:

```
cat /proc/net/PRO_LAN_Adapters/eth0/Driver_Version
4.4.19
```

Check the README file in the e1000 source tar file for further instructions on building and installing the driver.

Also look at Appendix A of this document for information about setting up your network for installation from a PXE server.