# IBM® ServeRAID™ -4 Ultra160 SCSI Controller Device Driver Installation Instructions

You can use these instructions for the following controllers:

- ServeRAID-4H
- ServeRAID-4M
- ServeRAID-4Mx
- ServeRAID-4L
- ServeRAID-4Lx
- ServeRAID-3HB
- ServeRAID-3H
- ServeRAID-3L
- ServeRAID-II
- ServeRAID

# Installing device drivers

This booklet contains information about the device drivers available for the IBM® ServeRAID™-4 Ultra160 SCSI controllers. You can also use these device drivers for the IBM ServeRAID-3 controllers, the IBM ServeRAID-II controller, and the IBM ServeRAID controller.

This booklet provides instructions for installing the device drivers for the following operating systems:

- Microsoft® Windows® XP Professional
- Microsoft Windows 2000
- Microsoft Windows NT® 4.0
- Novell NetWare (version 4.2 and later)
- IBM OS/2® WARP® Server for E-Business
- Red Hat Linux (version 6.2 and later)
- SuSE Linux 7.1
- Caldera OpenLinux 3.1
- Turbolinux 6.5
- SCO OpenServer 5.0.6a
- Caldera UnixWare 7.1
- Caldera Open UNIX 8.0

The device drivers are contained on the *IBM ServeRAID Support* diskette specific to your operating system. You must create the diskettes using the *IBM ServeRAID Support* CD. For instructions for creating the diskettes, see "Creating ServeRAID diskettes" on page 4.

If you are installing files for an IBM ServeRAID controller that comes as a standard feature on your IBM server system board, use the installation instructions and CDs provided with your server.

If you have multiple ServeRAID controllers in your server and are installing device drivers for Windows 2000 or Windows NT 4.0, refer to "Installing multiple device drivers on Windows 2000 and Windows NT 4.0" on page 5.

| When using: | Go to: |
|---|---|
| Windows XP | "Installing device drivers for Windows XP and Windows 2000" on page 7. |
| Windows 2000 | "Installing device drivers for Windows XP and Windows 2000" on page 7. |
| Windows NT 4.0 | "Installing device drivers for Windows NT 4.0" on page 9. |
| NetWare | "Installing device drivers for NetWare" on page 11. |
| OS/2 | "Installing device drivers for OS/2 WARP Server for E-Business" on page 13. |
| Red Hat Linux | "Installing device drivers for Red Hat Linux" on page 15. |
| SuSE Linux | "Installing device drivers for SuSE Linux" on page 18. |
| Caldera Linux | "Installing device drivers for Caldera OpenLinux" on page 18. |
| Turbolinux | "Installing device drivers for Turbolinux" on page 19. |
| OpenServer | "Installing device drivers for SCO OpenServer" on page 20. |
| UnixWare | "Installing device drivers for Caldera UnixWare or Open UNIX" on page 22. |
| Open UNIX | "Installing device drivers for Caldera UnixWare or Open UNIX" on page 22. |

# Creating ServeRAID diskettes

Images for the following diskettes are in the \DISKETTE directory of the *IBM ServeRAID Support* CD. Each of the operating-system specific diskettes contains device drivers and the IPSSEND utility.

**Note:** The IPSMON utility is available only on the *IBM ServeRAID Support for Novell NetWare* diskette.

| Diskette image | Diskette |
|---|---|
| biosfw1.img | *IBM ServeRAID BIOS and Firmware Update (1 of 2)* for the ServeRAID-4M, ServeRAID-4Mx, ServeRAID-4L, ServeRAID-4LX, ServeRAID-3H, ServeRAID-3HB, and ServeRAID-3L controllers |
| biosfw2.img | *IBM ServeRAID BIOS and Firmware Update (2 of 2)* for the ServeRAID-4H, ServeRAID-II, ServeRAID on-board, and the ServeRAID controllers |
| clusnt.img | *IBM ServeRAID Cluster Solution for Windows NT 4.0 and Windows 2000* |
| winsrv.img | *IBM ServeRAID Support for Windows 2000 Server* |
| winpro.img | *IBM ServeRAID Support for Windows (Professional Editions)* for Microsoft Windows XP Professional and Microsoft Windows 2000 Professional |
| winnt.img | *IBM ServeRAID Support for Windows NT 4.0* |
| os2.img | *IBM ServeRAID Support for IBM OS/2* |
| netware.img | *IBM ServeRAID Support for Novell NetWare* |
| openunix.img | *IBM ServeRAID Support for Caldera UnixWare and Open UNIX* |
| openserv.img | *IBM ServeRAID Support for SCO OpenServer* |
| redhat1.img | *IBM ServeRAID Support for Red Hat Linux (1 of 2)* for Red Hat Linux, versions 6.2 and 7.0 |
| redhat2.img | *IBM ServeRAID Support for Red Hat Linux (2 of 2)* for Red Hat Linux, version 7.1 |
| caldera.img | *IBM ServeRAID Support for Caldera OpenLinux* |
| suse.img | *IBM ServeRAID Support for SuSE Linux* |
| turbo.img | *IBM ServeRAID Support for Turbolinux* |
| dos.img | *IBM ServeRAID Support for DOS* |

# Creating diskettes on Windows

Do the following:

1. Insert the *IBM ServeRAID Support* CD into the CD-ROM drive.
2. At the DOS or command prompt, type the following and press Enter:

   `e:\diskette\tools\dsk4w32 e:\diskette\`*disketteimage a*`:`

   where
   - *e* is the drive letter for the CD-ROM drive
   - *disketteimage* is the name of the diskette image
   - *a* is the drive letter for the diskette drive
3. Remove the *IBM ServeRAID Support* CD from the CD-ROM drive.
4. Remove the diskette from the diskette drive and label the diskette appropriately.

## Creating diskettes on IBM OS/2

Do the following:

1. Insert the *IBM ServeRAID Support* CD into the CD-ROM drive.
2. At the OS/2 prompt, type the following and Press Enter:

   `e:\diskette\tools\dsk4wrp e:\diskette\`*disketteimage a*`:`

   where
   - *e* is the drive letter for the CD-ROM drive
   - *disketteimage* is the name of the diskette image
   - *a* is the drive letter for the diskette drive
3. Remove the *IBM ServeRAID Support* CD from the CD-ROM drive.
4. Remove the diskette from the diskette drive and label the diskette appropriately.

## Creating diskettes on Linux or UNIX

Do the following:

1. Insert the *IBM ServeRAID Support* CD into the CD-ROM drive.
2. Mount the CD-ROM drive by typing the following at a command prompt:

   `mount -t iso9660 /dev/`*cdromdevicefile* `/mnt`

   where *cdromdevicefile* is the specific device file for the CD-ROM block device.
3. Press Enter.
4. At the command prompt, type the following (all on one line):

   `dd if=/mnt/diskette/`*disketteimage* `of=/dev/`*diskettedevicefile* `bs=32k`

   where
   - *disketteimage* is the name of the diskette image
   - *diskettedevicefile* is the specific device file for the diskette block device.
5. Press Enter.
6. Unmount the CD-ROM drive by typing the following:

   `umount /mnt`
7. Remove the *IBM ServeRAID Support* CD from the CD-ROM drive.
8. Remove the diskette from the diskette drive and label the diskette appropriately.

## Installing multiple device drivers on Windows 2000 and Windows NT 4.0

If you install more than one ServeRAID controller in a server, you might need to install two ServeRAID device drivers. The following groups of ServeRAID controllers use two different device drivers.

|  | Group 1 | Group 2 |
| --- | --- | --- |
| Device driver | i960 | powerpc |
| Controllers | ServeRAID-4M<br>ServeRAID-4Mx<br>ServeRAID-4L<br>ServeRAID-4Lx | ServeRAID-4H<br>ServeRAID-3HB<br>ServeRAID-3H<br>ServeRAID-3L<br>ServeRAID-II<br>ServeRAID |

If you install *only* Group 1 or *only* Group 2 ServeRAID controllers in a server, you will only need to install one device driver. However, if you install both Group 1 and Group 2 ServeRAID controllers in a server, you must install two device drivers. In the following procedures, use the i960 device driver for Group 1 controllers and use the powerpc device driver for Group 2 controllers.

# ServeRAID device driver order on Windows 2000 and Windows NT 4.0

If you install a Group 1 and a Group 2 controller in a server, the order in which the devices are listed for Windows 2000 and Windows NT 4.0 might not match the order in which the devices are listed in the startable (bootable) ServeRAID Manager program on the *IBM ServeRAID Support* CD and the ServeRAID Mini-Configuration program.

The startable ServeRAID Manager and the ServeRAID Mini-Configuration programs determine the order in which the controllers are listed in the following way. The programs scan the PCI slots until they detect a ServeRAID controller. The programs, which recognize controllers as members of either Group 1 or Group 2 (see preceding table), then list all the controllers of the first type scanned before the controllers of the other type.

For example, a server has four ServeRAID controllers installed in the following PCI-scan order:
1. ServeRAID-4Mx
2. ServeRAID-4H
3. ServeRAID-4Lx
4. ServeRAID-3HB

Because the first controller scanned is a ServeRAID-4Mx, all ServeRAID-4M, ServeRAID-4Mx, ServeRAID-4L, and ServeRAID-4Lx controllers (Group 1) are listed first. Subsequently, all other ServeRAID models (Groups 2) are listed. In this example, the ServeRAID Manager and ServeRAID Mini-Configuration programs will list controllers in the following order:
1. ServeRAID-4Mx
2. ServeRAID-4Lx
3. ServeRAID-4H
4. ServeRAID-3HB

**Note:** To determine the PCI-slot scan order, refer to your server reference manual.

In contrast, both Windows 2000 and Windows NT 4.0 order SCSI controllers based on the order in which device drivers are loaded. For example, the device driver that is loaded first has its controllers listed first. Then, the device driver that is loaded second has its controllers listed second, and so on.

When you install Windows NT 4.0, the order in which you add device drivers to the server is the order in which the device driver is loaded. You can control the order in which the controllers are listed by installing the device drivers for the controllers in the same order that you want to have them listed.

However, when you install Windows 2000, the powerpc device driver is included on the *Windows 2000* CD and is loaded before any device drivers you add at installation time, such as the i960 device driver. You can change the load order on Windows 2000 *only* by editing the Windows registry after installation.

**Note:** Refer to Microsoft knowledge base articles Q141832 and Q115486 for more information about editing the Windows registry to control the order in which the device drivers are loaded and the order in which the controllers are listed.

## Installing device drivers for Windows XP and Windows 2000

Use the following instructions when you do one of the following:

- Install device drivers while installing Windows XP or Windows 2000
- Install device drivers after installing Windows XP or Windows 2000
- Update device drivers after installing Windows XP or Windows 2000

You will need either the *IBM ServeRAID Support for Windows 2000 Server* diskette or the *IBM ServeRAID Support for Windows (Professional Editions)* diskette. For information about creating the diskettes, see "Creating ServeRAID diskettes" on page 4.

## Installing device drivers while installing Windows XP or Windows 2000

Use the following instructions when you do one of the following:

- Install device drivers for a ServeRAID-4H, ServeRAID-3, ServeRAID-II, or ServeRAID controller
- Install device drivers for a ServeRAID-4Mx, ServeRAID-4M, ServeRAID-4Lx, or a ServeRAID-4L controller

### Installing device drivers for a ServeRAID-4H, ServeRAID-3, ServeRAID-II, or ServeRAID controller

**Note:** These instructions are for Windows 2000 only.

When installing Windows 2000, you must install the ServeRAID device driver that comes on the *Windows 2000* CD. The Windows installation program does not allow you to upgrade the device driver that comes with the installation CD. After installing Windows 2000, you *must* update the ServeRAID device driver to the latest version. Refer to "Updating device drivers after installing Windows XP or Windows 2000" on page 8.

### Installing device drivers for a ServeRAID-4Mx, ServeRAID-4M, ServeRAID-4Lx, or ServeRAID-4L controller

**Note:** Windows XP Professional supports only the ServeRAID-4Lx controller.

To install the ServeRAID device driver for ServeRAID-4Mx, ServeRAID-4M, ServeRAID-4Lx, or ServeRAID-4L controllers while installing Windows XP or Windows 2000:

1. Insert the appropriate *Windows* CD into the CD-ROM drive; then, restart the server.
2. A few seconds after restarting the server, when the message

   ```
   Press F6 if you need to install a third party SCSI or RAID driver...
   ```

   is displayed, press F6.

   **Note:** This message is displayed immediately after the screen changes from black to blue. You have only a few seconds to press F6.

3. After loading some files, Windows will display a screen where you can manually specify a controller. When this screen is displayed, press the S key to specify additional devices.

4. When prompted to insert the manufacturer-supplied hardware support disk, insert the appropriate *IBM ServeRAID Support* diskette into the diskette drive; then, press Enter.

5. From the menu, select the appropriate controller and operating system; then, press Enter. A message similar to the following appears:

    ```
    Setup is loading files (IBM ServeRAID 4M/4Mx/4L/4Lx Controller (Windows 2000
    and XP-Beta Servers))...
    ```

6. When prompted, press Enter to continue.

7. Use the instructions provided in the Windows manual to complete the normal installation process.

8. After you complete the installation, install the latest operating system service pack.

**Note:** On servers running Windows 2000, this procedure also installs the IBM ServeRAID Failover Virtual Adapter.

## Installing device drivers after installing Windows XP or Windows 2000

You can install the ServeRAID device driver *only* when installing a new ServeRAID controller in the server. During that time, Windows detects new hardware. After the "New Hardware Found" window is displayed, do the following:

1. Click **Next**; the Install Hardware Device Drivers window appears.

2. Select the **Search for a suitable driver for my device** check box; click **Next**.

3. The Locate Drivers File window appears. Select the **Floppy disk** check box, and insert the appropriate *IBM ServeRAID Support* diskette into the diskette drive. Click **Next**.

4. The Driver Files Search Results window appears; when Windows finds the appropriate device driver, click **Next**.

    If the Digital Signature Not Found window appears, click **Yes**.

5. The Completing the Found New Hardware Wizard window appears; click **Finish**.

## Updating device drivers after installing Windows XP or Windows 2000

**Note:** (Windows 2000 only) If you have more than one ServeRAID controller installed in the server and the controllers require different device drivers (see "Installing multiple device drivers on Windows 2000 and Windows NT 4.0" on page 5), repeat the following procedure for each device driver you are updating.

To update the ServeRAID device driver after installing Windows XP or Windows 2000:

1. Insert the appropriate *IBM ServeRAID Support* diskette into the diskette drive.

2. Click **Start → Programs → Administrative Tools → Computer Management**. The Computer Management window opens.

3. In the left pane, click **Device Manager**.

4. In the right pane, click the SCSI adapters and RAID controllers to display all the controllers in the server.

5. Right-click the first ServeRAID controller in the tree; then, click **Properties**. The Properties window opens.

   **Note:** (Windows 2000 only) If you have more than one ServeRAID controller installed in the server *and* the controllers require different device drivers, click the first ServeRAID controller in the tree that belongs to the group for which you are installing the device driver.

6. Click the **Driver** tab; then, click **Update Driver**. The Update Device Driver Wizard opens.

7. Click **Next**.

8. Select **Display a list of the known drivers**; then, click **Next**.

9. Click **Have Disk**.

10. In the **Copy manufacturer's files from** field, type one of the following:

| For ServeRAID-4Mx, ServeRAID-4M, ServeRAID-4Lx, and ServeRAID-4L controllers | If you are running Windows 2000 Server, type: `a:\winsrv\driver\i960` |
| --- | --- |
| | If you are running Windows XP Professional or Windows 2000 Professional, type: `a:\winpro\driver\i960` |
| For ServeRAID-4H, ServeRAID-3, ServeRAID-II, and ServeRAID controllers | If you are running Windows 2000 Server, type: `a:\winsrv\driver\powerpc` |
| | If you are running Windows 2000 Professional, type: `a:\winpro\driver\powerpc` |

   where *a* is the diskette drive letter.

11. Click **OK**; the Select a Device Driver window opens.

12. In the **Models** list box, select the appropriate ServeRAID controller; then, click **Next**.

13. The Start Device Driver Installation window opens; click **Next**.

14. After the device driver is installed, remove the diskette or the CD from the drive, and restart the server.

**Note:** On servers running Windows 2000, this procedure also installs the IBM ServeRAID Failover Virtual Adapter.

# Installing device drivers for Windows NT 4.0

Use the following instructions when you do one of the following:

- Install device drivers while installing Windows NT 4.0
- Install *or* update device drivers after installing Windows NT 4.0

You will need the *IBM ServeRAID Support for Windows NT 4.0* diskette. For information about creating the diskette, see "Creating ServeRAID diskettes" on page 4.

# Installing device drivers while installing Windows NT 4.0

To install the ServeRAID device driver while installing Windows NT 4.0:

1. Insert the startable Windows NT 4.0 CD into the CD-ROM drive, or insert the Windows NT 4.0 startup (boot) diskette into the diskette drive.

2. Restart the server.

3. When the message

   ```
   Setup is inspecting your computer's hardware configuration...
   ```

   is displayed, press F6.

   **Note:** After the message is displayed, you have only a few seconds to press F6.

4. After loading some files, Windows displays a screen where you can manually specify a controller. When this screen appears, press the S key to specify additional devices.

5. When prompted in the next window, select **Other** from the list.

6. When prompted to insert the manufacturer-supplied hardware support disk, insert the *IBM ServeRAID Support for Windows NT 4.0* diskette into the diskette drive; then, press Enter.

7. Select **IBM ServeRAID 4M/4Mx/4L/4Lx Controller** if you are installing one of the following controllers: ServeRAID-4M, ServeRAID-4Mx, ServeRAID-4L, or ServeRAID-4Lx. Otherwise, select **IBM ServeRAID Controller (All Others)**.

8. A message similar to the following is displayed:

   ```
   Setup is loading files (IBM ServeRAID 4M/4L Controller (NT 4.0))...
   ```

9. When prompted, press Enter to continue.

10. Use the instructions provided in the Windows NT 4.0 manual to complete the normal installation process.

11. After you complete the installation, install the latest operating system service pack.

## Installing or updating device drivers after installing Windows NT 4.0

**Note:** If you have more than one ServeRAID controller installed in the server and the controllers require different device drivers (see "Installing multiple device drivers on Windows 2000 and Windows NT 4.0" on page 5), repeat the following procedure for each device driver you are updating.

To install or update the ServeRAID device driver after installing Windows NT 4.0:

1. Insert the *IBM ServeRAID Support for Windows NT 4.0* diskette into the diskette drive.

2. Click **Start → Settings → Control Panel**.

3. Select SCSI Adapter; then, click the **Drivers** tab.

4. Click **Add**; then, click **Have Disk**.

5. In the **Copy manufacturer's files from** field, type the following:

   ```
   a:\winnt\driver
   ```

   where *a* is the diskette drive letter.

6. Click **OK**; then in the next window, click **OK** again.

7. Select **IBM ServeRAID 4M/4Mx/4L/4Lx Controller** if you are installing one of the following controllers: ServeRAID-4M, ServeRAID-4Mx, ServeRAID-4L, or ServeRAID-4Lx. Otherwise, select **IBM ServeRAID Controller (All Others)**.

8. After the device driver is installed, remove the diskette from the drive, and restart the server.

# Installing device drivers for NetWare

Use the following instructions when you do one of the following:

- Install device drivers while installing NetWare
- Install *or* update device drivers after installing NetWare

You will need the *IBM ServeRAID Support for Novell NetWare* diskette. For information about creating the diskette, see "Creating ServeRAID diskettes" on page 4.

## Installing device drivers while installing NetWare

To install the ServeRAID device driver while installing NetWare 4.x, 5.x, or 6.x:

1. Use the instructions provided in the NetWare manual to begin the installation.
2. When the `Choose the Server Drivers - Disk Driver` prompt appears during the installation process, insert the *IBM ServeRAID Support for Novell NetWare* diskette.
3. Click **Select additional or modify selected Disk/LAN drivers**.
4. If IPSRAID appears, select **Deselect a selected driver**.
5. Click **Select an additional driver**; then, press the Ins (Insert) key to add an unlisted device driver.
6. Press F3 to specify a path; then, type one of the following:

| | |
|---|---|
| If installing NetWare 4.x | `a:\netware4` |
| If installing NetWare 5.x | `a:\netware5` |
| If installing NetWare 6.x | `a:\netware6` |

   where *a* is the diskette drive letter.

7. Click **IPSRAID.HAM** from the list of device drivers that appears in the window; then, press Enter.

   **Note:** The IPSRAID.HAM and support files will be copied to the system volume.

8. Click **OK** to overwrite the existing files.
9. Follow the instructions in the NetWare manual to complete the installation.

## Installing or updating device drivers after installing NetWare

**Note:** If the device driver and operating system are already installed, do the following before starting this procedure:

1. Type the following and press Enter:

   `Unload IPSRAID`

2. Go to step 1 in the following instructions.

To install or update the ServeRAID device driver after installing NetWare 4.x, 5.x, or 6.x:

1. From the system console, start the NetWare installation utility program by typing one of the following:

| | |
|---|---|
| If installing NetWare 4.x | `load install` |
| If installing NetWare 5.x or 6.x | `load nwconfig` |

2. Press Enter.
3. Insert the *IBM ServeRAID Support for Novell NetWare* diskette into the diskette drive.
4. In the Installation Options list, click **Driver options**.
5. In the Driver Options window, click **Configure disk and storage**.
6. In the Additional Drivers Actions window, select **Select an additional driver**.
7. When the next window opens, press the Ins (Insert) key to install an unlisted driver.
8. When the next window opens, press F3 to specify a different path.
9. In the **Specify a directory path** field, type one of the following:

| | |
|---|---|
| If installing NetWare 4.x | `a:\netware4` |
| If installing NetWare 5.x | `a:\netware5` |
| If installing NetWare 6.x | `a:\netware6` |

   where *a* is the diskette drive letter.
10. When prompted to select a device driver to install, select **IPSRAID.HAM**.
11. Click **Yes** when prompted to copy the IPSRAID.HAM device driver.
12. When the prompt appears to specify the server boot path, type:

    `c:\nwserver`

    **Notes:**
    a. This instruction assumes that you installed NetWare in its default directory. If you did not install NetWare in the NWSERVER directory on drive C, modify step 12 accordingly.
    b. If any of the files you are installing already exist on the server, NetWare will prompt you to save the older files. Although it is not necessary to save the older files, it might be useful to do so.

13. After the installation program copies all the files, verify the ServeRAID slot number using the Driver IPSRAID Parameter Actions window.
14. Click **Save Parameters and load driver** to load the ServeRAID device driver.

    **Note:** If the device driver is not installed already and the operating system is installed, an error message stating that the device driver failed to load should appear after you complete the previous step. If that happens, do the following:
    a. Press Esc to exit from the installation screens.
    b. Shut down the server.
    c. Restart the server by typing the following at the system prompt:
       `server`
    d. The server automatically loads and installs the device driver.

15. Press Esc to exit from the installation screens.

**Note:** If you want NetWare to load the ServeRAID device driver automatically during startup, you must add the appropriate LOAD command (for example, `load ipsraid.ham slot=1`) to the NetWare startup command file (usually C:\NWSERVER\STARTUP.NCF).

# Installing device drivers for OS/2 WARP Server for E-Business

Use the following instructions when you do one of the following:

- Install device drivers while installing OS/2 WARP Server for E-Business
- Install *or* update device drivers after installing OS/2 WARP Server for E-Business

You will need the *IBM ServeRAID Support for IBM OS/2* diskette. For information about creating the diskette, see "Creating ServeRAID diskettes" on page 4.

## Installing device drivers while installing OS/2 WARP Server for E-Business

You can use the following instructions to install the ServeRAID device driver files while installing OS/2.

**Note:** During the OS/2 installation, you might receive the following messages:

```
* Initializing Raid SCSI Subsystem.
* Unable to allocate IRQ resources.
* RMCreate Device Adapter failure.
* RMCreate Device (disk) failure.
* RMCreate Device (disk) failure.
* RMCreate Device (disk) failure.
* RMCreate Device (disk) failure.
```

If you receive these messages, disregard them during installation. The installation will be completed successfully. After the installation is complete, install the updated RESOURCE.SYS file available from the OS/2 Device Driver Pak On-Line Web site:

http://service.software.ibm.com/os2ddpak/index.htm

At this Web site, follow these steps to obtain the updated RESOURCE.SYS file:

1. Scroll down to the bottom, and click **I have read the Program License Agreement and AGREE to its terms**.
2. Scroll down, and select **OS/2 Component Updates** from the list.
3. Select **OS/2 Base Device Driver Updates**.
4. Click **RESOURCE.SYS update; pre-requisite for updated IBM RAID Driver**.
5. Follow the instructions at the Web site for installing the RESOURCE.SYS update after you have installed OS/2.

To install the ServeRAID files while installing OS/2:

1. Make a copy of the *OS/2 WARP Server for e-Business Diskette 1* and label it "Copy of OS/2 Diskette 1."
2. Insert the *IBM ServeRAID for IBM OS/2* diskette into the diskette drive.
3. Copy the IPSRAID.ADD file from the following to the "Copy of OS/2 Diskette 1" diskette:

   `a:\OS2\driver`

   where *a* is the diskette drive letter.

   If there is not enough space, delete files not needed in your installation (such as proprietary CD-ROM or SCSI device drivers). Make sure you remove all entries referring to any device drivers you delete from the CONFIG.SYS file.

**Note:** If you have more than one ServeRAID or SCSI adapter in your server, make sure that the BASEDEV statement for the adapter or controller controlling the startup (boot) device appears first in the CONFIG.SYS file before the BASEDEV statements for other ServeRAID or SCSI adapters.

4. Edit the CONFIG.SYS file on the "Copy of OS/2 Diskette 1" to add the following lines:

```
BASEDEV=IPSRAID.ADD
SET COPYFROMFLOPPY=1
```

5. Install OS/2, but when you are prompted to insert Diskette 1, use the updated "Copy of OS/2 Diskette 1."

6. Edit the CONFIG.SYS file and verify that there is only one copy of the line `BASEDEV=IPSRAID.ADD`.

**Notes:**

a. If you have more than one ServeRAID or SCSI adapter in your server, make sure that the `BASEDEV` statement for the adapter or controller controlling the startup (boot) device appears in the CONFIG.SYS file before the `BASEDEV` statements for the other ServeRAID or SCSI adapters.

b. After you install any service packs, check the path for the IPSRAID.ADD device driver, and verify that the correct device driver is installed.

## Installing or updating device drivers after installing OS/2 WARP Server for E-Business

To install the ServeRAID files after installing OS/2:

1. After you complete the OS/2 installation, insert the *IBM ServeRAID for IBM OS/2* diskette.

2. From an OS/2 window, type the following and press Enter:

```
a:
```

where *a* is the diskette drive letter.

3. Type the following and press Enter:

```
ddinstal
```

4. The OS/2 Device Driver Installation window opens and prompts you for the source and destination drives. The source directory is the diskette drive where the *IBM ServeRAID Device Drivers* diskette is inserted. The destination directory is where the program will copy the device driver files.

5. Click **Install**. The program does the following:

   • Copies the following ServeRAID device driver statement to your CONFIG.SYS file: `BASEDEV=IPSRAID.ADD`

   • Copies the IPSRAID.ADD ServeRAID device driver to the OS/2 subdirectory on your hard disk.

6. Open the CONFIG.SYS file and verify that there is only one copy of the line `BASEDEV=IPSRAID.ADD`.

**Notes:**

a. If you have more than one ServeRAID or SCSI adapter in your server, make sure that the `BASEDEV` statement for the adapter or controller controlling the startup (boot) device appears in the CONFIG.SYS file before the `BASEDEV` statements for the other ServeRAID or SCSI adapters.

b. After you install any service packs, check the path for the IPSRAID.ADD device driver, and verify that the correct device driver is installed.

7. Restart the server.

**Note:** When starting OS/2 after installing the new ServeRAID device driver, you might receive the following messages:

```
* Initializing Raid SCSI Subsystem.
* Unable to allocate IRQ resources.
* RMCreate Device Adapter failure.
* RMCreate Device (disk) failure.
* RMCreate Device (disk) failure.
* RMCreate Device (disk) failure.
* RMCreate Device (disk) failure.
```

If you receive these messages, disregard them during installation. The installation will be completed successfully. After the installation is complete, install the updated RESOURCE.SYS file available from the OS/2 Device Driver Pak On-Line Web site:

http://service.software.ibm.com/os2ddpak/index.htm

At this Web site, follow these steps to obtain the updated RESOURCE.SYS file:

a. Scroll down to the bottom, and click **I have read the Program License Agreement and AGREE to its terms**.

b. Scroll down and click **OS/2 Component Updates** from the list.

c. Click **OS/2 Base Device Driver Updates**.

d. Click **RESOURCE.SYS update; pre-requisite for updated IBM RAID Driver**.

e. Follow the instructions at the Web site for installing the RESOURCE.SYS update after you have installed OS/2.

# Installing device drivers for Red Hat Linux

Use the following instructions when you do one of the following:

- Install device drivers while installing Red Hat Linux, version 6.2 or later
- Install *or* update device drivers after installing Red Hat Linux, version 6.2 or later

You will need one of the following:

- *IBM ServeRAID Support for Red Hat Linux (1 of 2)* diskette
- *IBM ServeRAID Support for Red Hat Linux (2 of 2)* diskette

For information about creating the diskettes, see "Creating ServeRAID diskettes" on page 4.

If you are installing Red Hat Linux, version 6.2 or 7.0, you will also need an *Updated Red Hat Installation* diskette. For information on creating this diskette, see "Creating the Updated Red Hat Installation diskette" on page 16.

# Creating the Updated Red Hat Installation diskette

To create the *Updated Red Hat Installation* diskette on Windows, Linux, or OS/2, do the following:

1. Go to the Red Hat Web site:

   http://www.redhat.com/support/errata/partners/ibm/ibm_netfinity.html

2. Download one of the following diskette images:

| | |
|---|---|
| For Red Hat Linux, version 6.2 | updrh62.img |
| For Red Hat Linux, version 7.0 | Netfinity-bootdisk-rh-7.0.i386.img |

   Note where you download the diskette image.

3. If you are creating the diskette on Linux, go to step 4. Otherwise, insert the *IBM ServeRAID Support* CD into the CD-ROM drive.

   If the ServeRAID Manager Setup program starts, click **Cancel**; then, click **Exit Setup**.

4. Insert a formatted diskette into the diskette drive.

5. Do one of the following:

| | |
|---|---|
| For Windows XP, Windows 2000, Windows NT 4.0, Windows Me, Windows 98, or Windows 95 | At the DOS or command prompt, type the following:<br>`e:\diskette\tools\dsk4w32` *c:\directoryname\disketteimage* `a:` |
| For Linux | At the command prompt, type the following:<br>`dd if=/tmp`*disketteimage* `of=/dev/`*diskettedevicefile* `bs=32k` |
| For OS/2 | At an OS/2 prompt, type the following:<br>`e:\diskette\tools\dsk4wrp` *c:\directoryname\disketteimage* `a:` |

   where
   - *a* is the drive letter of the diskette drive, and *e* is the drive letter of the CD-ROM drive.
   - (For Windows and OS/2 only) *c:\directoryname* is the location of the downloaded diskette image.
   - (For Linux only) *tmp* is the location of the downloaded diskette image.
   - *disketteimage* is the name of the *Updated Red Hat Installation* diskette image.
   - *diskettedevicefile* is the specific device file for the diskette block device. Typically, this is fd0.

6. Press Enter.

7. Remove the diskette from the diskette drive, and label it "Updated Red Hat Installation" diskette.

8. Remove the *IBM ServeRAID Support* CD from the CD-ROM drive.

# Installing device drivers while installing Red Hat Linux

**Notes:**

1. You will need either the *IBM ServeRAID Support for Red Hat Linux (1 of 2)* diskette or the *IBM ServeRAID Support for Red Hat Linux (2 of 2)* diskette. For information about creating the diskettes, see "Creating ServeRAID diskettes" on page 4.

2. If you are installing Red Hat Linux, version 6.2 or 7.0, you will need the *Updated Red Hat Installation* diskette. See "Creating the Updated Red Hat Installation diskette" on page 16 for more information.

To install the ServeRAID device driver while installing Red Hat Linux:

1. If you are installing Red Hat Linux, version 7.1, insert the *Red Hat Installation* CD into the CD-ROM drive. Otherwise, insert the *Updated Red Hat Installation* diskette into the diskette drive.

2. Turn on or restart the server.

3. At the command prompt, type:

   ```
   Linux dd
   ```

   and any other options for your installation; then, press Enter.

4. If you are installing Red Hat Linux, version 7.1, go to step 5. If you are installing Red Hat Linux, version 6.2 or 7.0, insert the *Red Hat Installation* CD into the CD-ROM drive.

5. Follow the prompts to complete the installation.

# Installing or updating device drivers after installing Red Hat Linux

To install or update device drivers after installing Red Hat Linux:

1. Insert the appropriate *IBM ServeRAID Support* diskette into the diskette drive.

2. Type the following and press Enter:

   ```
   mount -t vfat /dev/diskettedevicefile /mnt/floppy
   ```

   where *diskettedevicefile* is the specific device file for the diskette block device. Typically, this is fd0.

3. Type the following and press Enter:

   ```
   cd /mnt/floppy
   ```

4. Type the following and press Enter:

   ```
   sh updrh.sh
   ```

5. Type the following and press Enter:

   ```
   cd /
   ```

6. Type the following and press Enter:

   ```
   umount /mnt/floppy
   ```

7. Remove the diskette from the diskette drive.

8. Restart your server by typing:

   ```
   shutdown -r now
   ```

9. Press Enter.

# Installing device drivers for SuSE Linux

Use the following instructions when you do one of the following:

- Install device drivers while installing SuSE Linux 7.1
- Install *or* update device drivers after installing SuSE Linux 7.1

You will need the *IBM ServeRAID Support for SuSE Linux* diskette. For information about creating the diskette, see "Creating ServeRAID diskettes" on page 4.

**Note:** The ServeRAID device driver is supported using only the 2.2.18 kernel.

## Installing device drivers while installing SuSE Linux

To install device drivers while installing SuSE Linux:

1. Insert the *SuSE 7.1 Installation* CD into the CD-ROM drive.
2. Turn on or restart the server. The opening screen appears.
3. When the message "Have a lot of fun" appears, press the left Alt key.
4. When the installation program displays the message "Driver Update floppy" in the lower right-hand corner of the screen, insert the *IBM ServeRAID Support for SuSE Linux* diskette into the diskette drive and press Enter.
5. Follow the prompts to complete the installation.

## Installing or updating device drivers after installing SuSE Linux

To install or update device drivers after installing SuSE Linux:

1. Insert the *IBM ServeRAID Support for SuSE Linux* diskette into the diskette drive.
2. Type the following and press Enter:

   `mount /dev/`*diskettedevicefile* `/floppy`

   where *diskettedevicefile* is the specific device file for the diskette block device. Typically, this is /dev/fd0.
3. Type `cd /floppy` and press Enter.
4. Type `sh update.sh` and press Enter.
5. Type `cd /` and press Enter.
6. Type `umount /floppy` and press Enter.
7. Remove the diskette from the diskette drive.
8. Type the following and press Enter to restart the server.

   `shutdown -r now`

# Installing device drivers for Caldera OpenLinux

Use the following instructions when you do one of the following:

- Install device drivers while installing Caldera OpenLinux 3.1
- Install *or* update device drivers after installing Caldera OpenLinux 3.1

You will need the *IBM ServeRAID Support for Caldera Linux* diskette. For information about creating the diskette, see "Creating ServeRAID diskettes" on page 4.

# Installing device drivers while installing Caldera OpenLinux

To install the ServeRAID device driver while installing Caldera OpenLinux:

1. Insert the *Caldera 3.1 Installation* CD into the CD-ROM drive.
2. Turn on or restart the server.
3. When the Caldera Systems OpenLinux screen appears, select **Select install mode (recommend)**. Press the E key.
4. Using the Down Arrow (↓) key, select **kernel/vmlinux**. Press the E key.
5. At the end of the line, type the following and press Enter.

   `er=modules`
6. Press the B key.
7. When the "Mounting module disk" message appears, insert the *IBM ServeRAID Support for Caldera OpenLinux* diskette into the diskette drive.
8. Follow the prompts to complete the installation.

# Installing device drivers after installing Caldera OpenLinux

To install or update device drivers after installing Caldera Linux:

1. Insert the *IBM ServeRAID Support for Caldera OpenLinux* diskette into the diskette drive.
2. Type the following and press Enter:

   `mount /dev/diskettedevicefile /mnt/floppy`

   where *diskettedevicefile* is the specific device file for the diskette block device.
3. Type the following and press Enter:

   `cd /mnt/floppy`
4. Type the following and press Enter:

   `sh update.sh`
5. Type the following and press Enter:

   `cd /`
6. Type the following and press Enter:

   `umount /mnt/floppy`
7. Remove the *IBM ServeRAID Support for Caldera OpenLinux* diskette from the diskette drive.
8. Restart your server by typing the following and pressing Enter:

   `shutdown -r now`

# Installing device drivers for Turbolinux

Use the following instructions when you do one of the following:

- Install device drivers while installing Turbolinux 6.5
- Install *or* update device drivers after installing Turbolinux 6.5

You will need the *IBM ServeRAID Support for Turbolinux* diskette. For information about creating the diskette, see "Creating ServeRAID diskettes" on page 4.

# Installing device drivers while installing Turbolinux

To install the ServeRAID device driver while installing Turbolinux:

1. Insert the *Turbolinux 6.5 Installation* CD into the CD-ROM drive.
2. At the boot prompt, type the following and press Enter:

   `install noprobe`

3. When the "Choose a Language" screen appears, select the appropriate language.

4. Insert the *IBM ServeRAID Support for Turbolinux* diskette into the diskette drive.

5. When prompted "Would you like to load any special device driver now," select **Add Device**.

6. For the device type, select **SCSI**.

7. Press F2 to access your driver disk.

8. Select **IBM ServeRAID driver**, and then select **Done**.

9. Follow the prompts to complete the installation.

## Installing or updating device drivers after installing Turbolinux

To install or update device drivers after installing Turbolinux:

1. Insert the *IBM ServeRAID Support for Turbolinux* diskette into the diskette drive.

2. Type the following and press Enter:

```
mount /dev/diskettedevicefile /mnt/floppy
```

where *diskettedevicefile* is the specific device file for the diskette block device. Typically, this is fd0.

3. Type the following and press Enter:

```
cd /mnt/floppy
```

4. Type the following and press Enter:

```
sh update.sh
```

5. Type the following and press Enter:

```
cd /
```

6. Type the following and press Enter:

```
umount /mnt/floppy
```

7. Remove the diskette from the diskette drive.

8. Restart your server by typing the following and pressing Enter:

```
shutdown -r now
```

## Installing device drivers for SCO OpenServer

Use the following instructions when you do one of the following:

- Install device drivers while installing SCO OpenServer
- Install *or* update device drivers after installing SCO OpenServer

You will need the *IBM ServeRAID Support for SCO OpenServer* diskette. For information about creating the diskette, see "Creating ServeRAID diskettes" on page 4.

## Installing device drivers while installing SCO OpenServer

Before you begin the installation, review the following information:

- You must install logical drives as Bus Number 0 when using the MKDEV program, regardless of the channel that the physical drives are on.
- You must install a nondisk device, such as a CD-ROM drive or tape drive, as Bus Number 1, 2, 3, or 4 relative to the channel to which it is attached. Internal Channel 1 is Bus Number 1, Internal Channel 2 is Bus Number 2, External Channel 1 is Bus Number 1, External Channel 2 is Bus Number 2, External Channel 3 is Bus Number 3, and External Channel 4 is Bus Number 4.

To configure the default nondisk devices during the initial installation:

1. Redefine the default tape drive in the initial boot string. For example, to install the boot-time loadable driver IPSRAID BTLD and redefine the tape drive, go to the BOOT prompt and type:

   ```
   link Stp=ips(0, 1, 2, 0)
   ```

   where the numbers in parentheses represent the host adapter number, the bus number, the SCSI ID, and the logical unit number (LUN) respectively.

2. When prompted for the location of the installation CD, change the bus number and SCSI ID, as required.

### Adding IPSRAID BTLD at startup time
To install the ServeRAID device driver for SCO OpenServer 5.0.5 and 5.0.6:

1. At the BOOT prompt, type the following and press Enter:

   ```
   link
   ```

2. When prompted for the name of the package, type the following and press Enter:

   ```
   ipsraid
   ```

3. After the kernel loads but before it runs, the link program prompts you to insert the *IBM ServeRAID Support for SCO OpenServer* diskette.

   While the installation program copies the files, one or both of the following messages might appear:

   - `Extracting BTLD distribution for ipsraid... /etc/uadmin getdev b ips: No such device (error 19)`
   - `dynamic linker: dlvr_audit: Cannot open /dev/zero for file /lib/libprot.so.1`

   You can ignore the first message; if the second message appears, however, you must press Enter when prompted to continue the installation.

4. Keep the *IBM ServeRAID Support for SCO OpenServer* diskette available. You will need it to configure the device driver into the link kit.

For additional information about adding a boot-time loadable driver at boot time, refer to "Using Boot-Time Loadable Drivers" in the *SCO OpenServer Handbook*.

## Adding IPSRAID BTLD after installing SCO OpenServer

1. Start the server in system maintenance mode, and log in as ROOT.
2. Type the following and press Enter:

   ```
   installpkg
   ```

3. Select the diskette drive in which you will insert your installation diskette.
4. When prompted, insert the *IBM ServeRAID Support for SCO OpenServer* diskette.
5. When prompted for the name of the package, type the following and press Enter:

   ```
   ipsraid
   ```

6. Relink the kernel (as described in "Relinking the kernel" in the *SCO OpenServer Handbook*) by typing the following command:

   ```
   cd /etc/conf/cf.d
   ```

7. Press Enter; then, type the following and press Enter:

   ```
   ./link_unix
   ```

8. After the kernel rebuilds, the following message appears:

   `The UNIX kernel has been rebuilt. Do you want this kernel to boot by default?`

   To continue, type `y`

   The system backs up the old kernel by moving /unix to /unix.old.
9. When the system asks for the kernel environment to be rebuilt, type `y`

   The system will respond with a message.
10. Remove the *IBM ServeRAID Support for SCO OpenServer* diskette from the diskette drive.
11. Shut down the server; then, restart the server.

# Installing device drivers for Caldera UnixWare or Open UNIX

Use the following instructions when you do one of the following:

- Install device drivers while installing Caldera UnixWare or Open UNIX
- Install *or* update device drivers after installing Caldera UnixWare or Open UNIX

You will need the *IBM ServeRAID Support for Caldera UnixWare and Open UNIX* diskette. For information about creating the diskette, see "Creating ServeRAID diskettes" on page 4.

# Installing device drivers while installing Caldera UnixWare or Open UNIX

The instructions that you use for installing the ServeRAID files when using Caldera UnixWare or Open UNIX depend on the number of IDE and SCSI disk-storage adapters and controllers installed in the server. If all of the direct-access-storage devices (DASD) in the server are attached to a single disk-storage adapter or controller (such as the ServeRAID controller), you can skip the instructions in this section and go directly to "Installing the device drivers while installing Caldera UnixWare or Open UNIX" on page 25.

## Attaching devices to multiple disk-storage adapters or controllers

If you are attaching devices to multiple disk-storage adapters or controllers (including IDE and SCSI controllers integrated on the system board), use the following instructions.

- If you are installing Caldera UnixWare or Open UNIX on a drive attached to a ServeRAID controller, follow the instructions in "Installing Caldera UnixWare or Open UNIX on a ServeRAID drive".
- If you are installing Caldera UnixWare or Open UNIX on a drive attached to a non-ServeRAID adapter or controller and you intend to store only data on the drives attached to your ServeRAID controllers, follow the instructions in "Installing Caldera UnixWare or Open UNIX on a non-ServeRAID drive" on page 24.

***Installing Caldera UnixWare or Open UNIX on a ServeRAID drive:*** Use the following instructions if you are using multiple disk-storage adapters or controllers and you are installing UnixWare or Open UNIX on a drive attached to a ServeRAID controller.

1. Install all ServeRAID controllers that you intend to use in your server.
2. Using the ServeRAID Manager program, create all of your arrays, and define all of your logical drives.

3. Make a list of all of the ServeRAID controllers, including the order and slot number, installed in the server. To do this:

   a. Turn on the server.

   b. If the ServeRAID Mini-Configuration prompt appears, press Ctrl+I. When a server contains more than one ServeRAID controller, a selection window appears.

   c. The menu lists the ServeRAID controllers in order. Select the first ServeRAID controller from the menu.

   d. Select **Advanced Functions** from the Main Menu.

   e. Select **View Controller and PCI Information** from the Advanced Functions menu.

   f. Record the slot number for the ServeRAID controller; then, press Esc three times to return to the controller-selection window.

   g. Repeat step 3c through step 3f until you record the slot number for each ServeRAID controller that appears on the selection screen.

4. Turn off the server; then, remove all ServeRAID controllers except the first one on your list.

   **Note:** If one of the ServeRAID controllers that you need to remove is on the system board, you must do one of the following:

   - If the CD-ROM drive that you are using to install your operating system is attached to the integrated ServeRAID controller, disconnect or remove all disk drives attached to the integrated controller.

   - If only disk drives are attached to the integrated controller, disconnect the SCSI cable from the ServeRAID connector on the system board. See the label inside the server cover for the location of the ServeRAID connector.

5. Remove all other non-ServeRAID IDE and SCSI disk-storage adapters or controllers.

   **Note:** If one of the disk-storage controllers that you need to remove is on the system board, you must do one of the following:

   - If the CD-ROM drive that you are using to install your operating system is attached to the integrated disk-storage controller, disconnect or remove all disk drives attached to the integrated controller.

   - If only disk drives are attached to the integrated controller, disconnect the cable for the integrated controller from the IDE or SCSI connector on the system board. See the label inside the server cover for the location of the IDE or SCSI controller connector.

6. Follow the instructions in "Installing the device drivers while installing Caldera UnixWare or Open UNIX" on page 25; then, return to this procedure and continue with step 7.

7. Turn off the server.

8. Install any non-ServeRAID disk-storage adapters or controllers in the server; then, attach the drives to the disk-storage adapters and controllers.

9. Install the second ServeRAID controller from the list you created in step 3f; then, attach the drives to the ServeRAID controller.

10. Turn on the server and wait for the operating system to detect the new disk-storage adapters and controllers.

11. Turn off the server.

12. Repeat step 9 on page 23 through step 11 until all ServeRAID adapters, ServeRAID controllers, and drives are installed.

13. You can now partition and format the logical drives attached to the additional ServeRAID adapters and controllers. See the information provided with Caldera UnixWare or Open UNIX for more instructions.

***Installing Caldera UnixWare or Open UNIX on a non-ServeRAID drive:*** Use the following instructions if you are using multiple disk-storage adapters or controllers, you are installing Caldera UnixWare or Open UNIX on a drive attached to a non-ServeRAID adapter or controller, and you intend to store only data on the drives attached to your ServeRAID adapters and controllers.

1. Install all ServeRAID controllers that you intend to use in your server.

2. Using the ServeRAID Manager program, create all of your arrays, and define all of your logical drives.

3. Make a list of all of the ServeRAID controllers, including the order and slot numbers, installed in the server. To do this:

   a. Turn on the server.

   b. When the ServeRAID Mini-Configuration prompt appears, press Ctrl+I. When a server contains more than one ServeRAID controller, a selection screen appears.

   c. The menu lists the ServeRAID controllers in order. Select the first ServeRAID controller from the menu.

   d. Select **Advanced Functions** from the Main Menu.

   e. Select **View Controller and PCI Information** from the Advanced Functions menu.

   f. Record the slot number for the ServeRAID controller; then, press Esc three times to return to the controller-selection screen.

   g. Repeat step 3c through step 3f until you record the slot number for each ServeRAID controller that appears on the selection screen.

4. Turn off the server; then, remove all ServeRAID, IDE, and SCSI disk-storage adapters and controllers except the one attached to the drive where you intend to install Caldera UnixWare or Open UNIX.

   **Note:** If one of the disk-storage or ServeRAID controllers that you need to remove is on the system board, do one of the following:

   - If the CD-ROM drive that you are using to install your operating system is attached to the integrated controller, disconnect or remove all disk drives attached to the integrated controller.

   - If only disk drives are attached to the integrated controller, disconnect the SCSI or IDE cable for the integrated controller from the connector on the system board. See the label inside the server cover for the location of the SCSI and IDE cable connectors.

5. Follow the instructions in "Installing the device drivers while installing Caldera UnixWare or Open UNIX" on page 25; then, return to this procedure and continue with step 6.

6. Turn off the server.

7. Install any non-ServeRAID disk-storage adapters or controllers in the server; then, attach the drives to the disk-storage adapters and controllers.

8. Install the first ServeRAID controller from the list you created in step 3f; then, attach the drives to the ServeRAID controller.

9. Turn on the server and wait for the operating system to detect the new disk-storage adapters and controllers.

10. Turn off the server.

11. Repeat step 8 on page 24 through 10 until all ServeRAID adapters, ServeRAID controllers, and drives are installed.

12. You can now partition and format the logical drives attached to the ServeRAID adapters and controllers. See the information provided with Caldera UnixWare or Open UNIX for more instructions.

### Installing the device drivers while installing Caldera UnixWare or Open UNIX

To install the ServeRAID device drivers while installing Caldera UnixWare or Open UNIX:

1. Use the instructions provided with Caldera UnixWare or Open UNIX to begin the installation.

2. When a message appears asking if you want to install any HBA diskettes, insert the *IBM ServeRAID Support for Caldera UnixWare and Open UNIX* diskette; then, select **Install HBA diskette**.

3. Use the instructions provided in the Caldera manual to complete the normal installation process.

## Installing or updating device drivers after installing Caldera UnixWare or Open UNIX

Use the following instructions when you do one of the following:

- Use the UnixWare Pkgadd to install or upgrade the ServeRAID device drivers after installing UnixWare or Open UNIX.

- Use the UnixWare SCOAdmin utility program to install or upgrade the ServeRAID device drivers after installing UnixWare or Open UNIX.

### Using PKgadd to install device drivers

To install or upgrade ServeRAID device drivers using the PKgadd utility program:

1. Insert the *IBM ServeRAID Support for Caldera UnixWare and Open UNIX* diskette into the diskette drive.

2. Type the following and press Enter:

   `pkgadd -d /dev/dsk/f0t`

3. When the message `Insert diskette into Floppy Drive 1` appears, press Enter.

4. When the message `Installation of IBM ServeRAID SCSI IHV HBA (ips) was successful` appears, type the following and press Enter:

   `q`

5. After the device driver is installed, shut down and restart the server.

### Using SCOAdmin to install device drivers

To install or upgrade ServeRAID device drivers using the SCOAdmin utility program:

1. Insert the *IBM ServeRAID Support for Caldera UnixWare and Open UNIX* diskette into the diskette drive.

2. Start the SCOAdmin utility program by typing `SCOADMIN` at the system prompt.

3. Click **Software_Management**.

4. Click **Application Installer**.

5. Click the **Install From** tab.

6. Click **Disk_A**.

7. If nothing appears in the window, click **Update View**.

8. When the icon labeled "ips" appears in the window, click **Install**.

9. After the device driver is installed, remove the diskette from the diskette drive; then, shut down and restart the server.