Chapter 6
Installing the Operating System Drivers

This chapter outlines driver installation steps to set up the Smart Array 3200 Controller in a server running any of the following operating systems:

- Microsoft Windows NT
- Novell NetWare/intraNetWare
- SCO OpenServer 5
- SCO UnixWare 2.1 or later
- IBM OS/2
- Banyan VINES
- DOS/Windows
- Microsoft Windows 95

This chapter also contains related information for using the Smart Array 3200 with these operating systems. If you are setting up a new system, Compaq recommends using SmartStart to install both the operating system software and the device drivers for the Smart Array 3200.

> **NOTE:** If you install the operating system software from the SmartStart and Support Software CD, all the software, including device drivers, will be installed automatically and configured for the Smart Array 3200. The Smart Array 3200 is supported by SmartStart 4.20 or later. See the documentation that came with SmartStart for installation instructions.

Before installing operating system drivers, you should have:

- Updated your system firmware by running System ROMPaq
- Installed the Smart Array 3200 Controller option board
- Configured the hardware by running the System Configuration Utility
- Used the Array Configuration Utility to configure your drive array(s)

Novell NetWare/intraNetWare

Use the instructions in this section to install the driver for a new Smart Array 3200 Controller installation or to upgrade the driver in a server running NetWare/intraNetWare and using the Smart Array 3200 Controller. If you use SmartStart to install NetWare/intraNetWare and drivers, you do not need to create the Novell Support Software Diskettes (SSD). Skip to the section "Using the Array Configuration Utility for NetWare/intraNetWare."

Installation Requirements

Before installing device drivers, install and load the latest Support Pack or operating system patch kit. Novell's Support Packs and patch kits are available via the Internet. These patches correct known OS-specific problems and provide support for newly developed and enhanced drivers.

Latest Drivers

The latest Novell SSD drivers may be obtained from:

World Wide Web
Go to http://www.compaq.com.

CompuServe
Enter *GO COMPAQ* or go directly to the Compaq Forum.

America Online
Use the navigation keyword *COMPAQ.*

Prodigy
Use the *JUMP* navigation command followed by the keyword *COMPAQ.*

Internet
Go to *FTP.COMPAQ.COM* to access the Compaq anonymous FTP site. Enter "anonymous" for user name at the login prompt. Enter your full Internet e-mail address for the password.

Download Facility
Dial 281-518-1418. Compaq offers direct modem access for downloading drivers and other software. A SoftPaq manager is available to provide information on the latest files.

Materials Needed

To install the Smart Array 3200 driver on your server, you will need:

- Compaq SmartStart and Support Software CD (supplied in the Smart Array 3200 option kit)
- Up to five blank diskettes
- Any server or workstation with a bootable CD-ROM drive

Creating Novell SSD Diskettes

You can use either *CPQARRAY.HAM* for the Smart Array 3200. These drivers are on the Novell SSD Diskettes.

NOTE: To determine the appropriate driver for your version of NetWare/intraNetWare, see the online help file on Disk 2 of the Novell SSD.

To create the diskettes:

1. Boot the server from the Compaq SmartStart and Support Software CD.
2. From the Compaq System Utilities screen, select Create Support Software.
3. From the Diskette Builder screen, select Create Support Software Diskettes from CD only.
4. Scroll down the list and select Support Software for Novell Products.
5. You can create all of the disks in the Novell SSD set or create only disk 4, which contains the driver for the Smart Array 3200. Compaq recommends you create all disks to obtain the support documentation. Follow the instructions on the screen to create the Novell SSD diskette(s).

Additional Information

Novell SSD Disk 2 contains the latest information about using Compaq options in a NetWare/intraNetWare environment, including the driver installation procedure. Locate and read this procedure. If the procedure differs from the one described here, use the one in the *STORAGE.RDM* file on the Novell SSD diskette.

To view and print the readme files:

1. Execute *README.COM*

```
C:\readme
```

2. Select the file(s) to read or print. Important readme files include:
   - *READ1ST.RDM*
   - *STORAGE.RDM*

Installing the Driver

Compaq SmartStart automatically detects the newly installed Smart Array 3200 Controller, then copies the necessary drivers and updates the server *STARTUP.NCF* file. The process for installing or upgrading device drivers is different for intraNetWare and NetWare v3.12.

intraNetWare Driver Installation from Novell SSD

Compaq provides an installation script on the Novell SSD that integrates Novell's *INSTALL.NLM* Product Options menu option. Use this option to install or upgrade Compaq storage adapter and device drivers automatically. The drivers are copied from the Novell SSD to both the DOS server startup directory (typically C:\NWSERVER) and to the SYS:SYSTEM directory.

To install the driver for the Smart Array 3200:

1. Load *INSTALL.NLM* from the server console prompt.
2. Select Product Options from the Main menu.

3. Choose Install a Product Not Listed from the Other Installation Actions menu.
4. If installing from Novell SSD diskettes, make sure that Disk #1, INSTALL, DOS CD SUPPORT & ADVANCED SERVER SUPPORT is in the appropriate drive and press **Enter** to confirm the location of the product (*INSTALL.NLM* defaults to A:\).

   Or

   Select (or deselect) the options/products to be installed. For Compaq NWPA driver support, select the option for Compaq NWPA Storage Support. Compaq recommends that you also select the Compaq Online Configuration Utility.

   NOTE: See section 1.0 of STORAGE.RDM on Novell SSD Disk 4 for a discussion of legacy DDFS versus NWPA device drivers.

5. Press **F10** to accept the selected options and continue the installation or upgrade.
6. Follow the instructions on the screen to complete the installation. You will be warned that the latest intraNetWare Support Pack should be installed. If you have already performed that installation, choose to continue. Otherwise, Compaq recommends that you abort this installation and install the intraNetWare Support Pack first.

NetWare 3.12 Driver Installation from Novell SSD

To install the driver for the Smart Array 3200 on a NetWare v3.12 server, copy the required files from the Novell SSD, Disk #4, to the server startup directory (and to the SYS:SYSTEM directory if desired).

Compaq provides a batch file to automate this process for NWPA driver support. The batch file *NWPA_312.BAT* is in the \NWPA subdirectory on the Novell SSD. It requires one command line parameter, which is the path to the server's startup directory (the directory on the server's DOS partition where *SERVER.EXE* is found). For example:

```
A:\NWPA\NWPA_312.BAT C:\NWSERVER
```

When executed, the NWPA_312.BAT copies all of Compaq's NWPA drivers, corresponding .DDI files, and updated Novell NWPA support modules to the server startup directory.

Driver installation is complete. Refer to NetWare/intraNetWare installation documentation for information about installing and mounting volumes associated with your new disk subsystem. If you are using Compaq Insight Manager, see the next section for information on updating the Insight Agents.

Updating the Compaq Insight Manager Agents

If you are using Compaq Insight Manager, you will need to update the Insight Agents to support the new Smart Array 3200. If you used SmartStart 4.20 or later to install the operating system on a new Smart Array 3200 installation or to upgrade the driver in an existing installation, the agents were updated automatically by SmartStart. You will not have to update the agents manually.

If you did not use SmartStart 4.20 or later as part of your Smart Array 3200 installation, you must update the Insight Agents manually. The correct agents can be obtained from your local Compaq Reseller or Authorized Compaq Service Provider. Refer to the documentation included with Compaq Insight Manager for the correct procedure for updating agents.

Installation of the Compaq Smart Array 3200 Controller is complete. Reboot the server to begin using the array controller.

Software Drive Mirroring with NetWare/intraNetWare

NetWare/intraNetWare recognizes each logical drive in an array as a separate physical drive. If you mirror logical drives on the same array and a physical drive fails, both logical drives in the mirrored pair will fail and your data will be lost.

To avoid this, you must mirror logical drives on separate arrays. Use the Compaq Array Configuration Utility for NetWare/intraNetWare (*CPQONLIN.NLM*) on Novell SSD Disk 1 to view the logical configuration for the Smart Array 3200 Controller. Record the logical drives and the arrays on which they reside. When configuring NetWare/intraNetWare for drive mirroring, select equally sized logical drives on different arrays.

IMPORTANT: Do not use NetWare drive mirroring if you do not have at least two arrays.

Handling Disk Drive Failures

Although drive failures are not common, it is important to protect your critical data. The best way to recover from a failed drive is to configure your drive system with some form of fault tolerance.

To ensure a quick and transparent recovery, Compaq recommends that you configure your Smart Array 3200 with hardware fault tolerance. Another advantage of hardware fault tolerance is that the controller is able to perform a background surface analysis on the hard drives to monitor for bad sectors and to remap data to a new location on the media. This feature enhances the reliability and availability of your data. Compaq also recommends that you use good backup procedures, in case of catastrophic failure.

If you discover a failed drive:

- Identify and document which physical drive has failed. Note the drive type and capacity.
- Note which partition and volume, if any, has failed. This information is provided in the error message on the server console. It is also recorded in the server error log file, which can be viewed using the SYSCON utility (intraNetWare 3.12) or NWADMIN utility (NetWare 4.x).
- Make sure that you have a recent backup. If the drive is part of a fault-tolerant mirrored volume, or a hardware fault-tolerant volume, you will be able to back up the data again in case of a second drive failure.
- Locate a replacement drive of the same type and capacity.
- Follow the instructions in the following sections for replacing a drive for your server configuration.

DOS Partitions and NetWare/intraNetWare Fault Tolerance

NetWare/intraNetWare does not mirror information on DOS partitions. Only hardware fault tolerance supports mirrored DOS partitions. If you have a mirrored drive containing a DOS partition, you need to restore the DOS partition information from another backup source.

If the failed drive contains a DOS partition, NetWare/intraNetWare cannot access information on that partition. For example, files on the DOS partition include *STARTUP.NCF* and Novell disk drivers. To prevent NetWare/intraNetWare from attempting to read from or write to the failed device, execute the following command from the console.

```
REMOVE DOS
```

Recovering a DOS Partition without Hardware Fault Tolerance

If your server is not configured for hardware fault tolerance, and if the failed drive contained the DOS partition used to boot your server, you will not be able to restart the server once it has been powered off. Schedule maintenance time as soon as possible and:

1. Power down your server.
2. Replace the failed drive.
3. Reboot the system with the Compaq System Configuration Utility diskette.
4. Select the option to Install a System Partition on your DOS boot device. This partition should contain the Compaq System Configuration Utility and the Compaq Diagnostic Utility. Exit the System Configuration Utility.
5. Locate a DOS bootable diskette that contains the DOS FDISK and FORMAT programs.
6. Use the FDISK program to create a primary DOS partition on the replaced drive. Compaq recommends that your DOS partition be at least 15 MB.
7. Set the active partition to the DOS partition you just created.
8. Use the FORMAT command to format the DOS partition to include the necessary files to make the partition bootable. For example:

```
FORMAT C: /s
```

9. If you have a backup of your DOS partition, use it to create the previous image. Otherwise, use your NetWare/intraNetWare server diskettes and copy the following files to a NetWare/intraNetWare directory on your DOS partition:

   SERVER.EXE
   INSTALL.NLM
   VREPAIR.NLM
   MONITOR.NLM
   CLIB.NLM
   STREAMS.NLM

10. Copy the required disk drivers, LAN drivers, and utility NLMs that should reside on the DOS partition from the Novell SSD.

11. Copy any other necessary information to the DOS partition, then reboot your system. You can now start your NetWare/intraNetWare server. You may need to create your *STARTUP.NCF* file.

Recovering Drives Configured for NetWare/intraNetWare Fault Tolerance

If you have chosen no fault tolerance for the drives connected to your Smart Array 3200 and have configured NetWare/intraNetWare mirroring or NetWare/intraNetWare controller duplexing, perform the following steps to recover the data after a drive failure:

1. Identify the failed physical drive that caused the NetWare/intraNetWare device to be deactivated. Record the device number and device name of the failed logical drive. For example:

   ```
   NWPA        [V503-A2-D1:0] Compaq SMART-2 Slot 8 Disk 2 NFT
   ```

   Failure messages are recorded on the server console and also in the server error log file, which can be viewed using the SYSCON utility (3.12) or the NWADMIN utility (4.x). You will use this information later to create a valid partition.

2. Load the *INSTALL.NLM* and select the Disk Options Mirroring menu. Select the mirrored logical partition that was affected by the drive failure (see Step 1) . Record the device number and partition number of the operational logical drive in this mirrored group. This information will be used later to remirror the repaired logical drive. For example:

```
NWPA:        [V503-A2-D1:0] Compaq SMART-2 Slot 8 Disk 2 NFT
```

3. Delete the unavailable (possibly out of sync) device from the Mirror Partition group. This device is unavailable due to the drive failure.
4. Record the drive bay location of the failed physical drive. The new physical drive must be inserted in this drive bay.
5. If the failed drive is hot-pluggable, skip to step 6. Otherwise, schedule server down time, take the server offline, and power off the unit.
6. Insert the replacement physical drive in the drive bay where the failed drive was located. The physical drive must be of the same capacity as the failed drive. Be sure that all cable connections are secure.

   For replacements in a ProLiant server or storage system, after you secure the drive in the bay, the LEDs on the drive each light once in an alternating pattern to indicate that the connection was successful. The Online LED turns green, indicating that the controller has recognized and successfully initialized the replacement drive. If the Online LED does not light after a few minutes, verify that you added the new drive in the same slot as the failed drive and that the drive capacity is the same as the failed drive.
7. Activate the replaced device. Use *MONITOR.NLM* Disk Information option to select the device. Some versions of NetWare/intraNetWare will cause a "device activate" to occur automatically when this option is chosen. Other versions of NetWare/intraNetWare require manual activation of the device by changing the operating status to active. If reactivation of the failed logical drive is successful, the driver sends a console alert.
8. Use the *INSTALL.NLM* option Change Hot Fix (look at the information provided about the **mirrored drive**, not the failed drive) to determine the number of Hot Fix Redirection blocks set up for this partition. See the section "Using CPQDAOPT on NetWare 3.12 Servers" in Chapter 5 for more information about optimizing the performance on NetWare 3.12 servers.
9. Use the *INSTALL.NLM* to delete and create the partition on the repaired logical drive.

NOTE: Although the logical drive may have a valid partition table, the data on this logical drive is NO LONGER VALID. Some data may appear valid because the failed physical drive was only a portion of the arrayed logical drive. However, there is a hole in the logical drive data at this point. Delete any old, invalid data and create a new partition on the logical drive.

10. Return to the *INSTALL.NLM* Disk Options menu.

    Use the Mirroring selection to locate the Out of Sync partition. The device number for the Out of Sync partition should match the previously failed device number. Select the Out of Sync partition.

11. Use the **Insert** key to resynchronize this partition. You must resynchronize before deleting the partition. Allow INSTALL to resynchronize this partition. If warning messages indicate the selected partition contains an already-defined volume, select No (do not rename the volume) and press **Esc**. Since you will delete this partition, there is no reason to salvage the volume. Proceed with deleting the partition table.

12. From the *INSTALL.NLM* Disk Options menu, select the Partition Tables Option. In the *INSTALL.NLM* Available Disk Drives menu, select the previously failed logical drive, which has now been repaired. The device information was recorded in Step 1 above. For example:

```
NWPA:        [V503-A2-D1:0] Compaq SMART-2 Slot 8 Disk 2 NFT
```

    Select Delete Partition. INSTALL may display several error messages. Since you will delete this partition, do not update any Volume Definition Table information. Continue until the partition has been deleted.

    If INSTALL reports that it cannot delete the partition because another process has it locked, load MONITOR and look at the System Resources option to determine which NLM has locked the device. It may be *MONITOR.NLM*, so you will need to unload MONITOR and any other NLMs that have the partition locked. After you create the partition and volume information, reload those NLMs.

13. Create the partition on the same logical drive.

14. Return to the Disk Options Mirroring menu. Select the previously mirrored NetWare 386 Partition number (recorded in Step 2).

```
NWPA:        [V503-A2-D1:0] Compaq SMART-2 Slot 8 Disk 2 NFT
```

15. Press **Insert** for a list of partitions available to remirror. Select the partition associated with the repaired device (Step 1). This causes NetWare/intraNetWare to resynchronize the mirrored partitions.

    A console message indicates successful completion of the resynchronization step.

Recovering Drives Configured for No Fault Tolerance

If you configured no fault tolerance, you must recover the data from a backup media. Perform the following steps:

1. Identify the failed physical drive that caused the logical drive to be deactivated. Record the device number and device name of the failed logical drive. For example:

   ```
   NWPA:        [V503-A2-D1:0] Compaq SMART-2 Slot 8 Disk 2 NFT
   ```

   Failure messages are recorded on the server console. They are also recorded in the server error log file, which can be viewed using the SYSCON utility (NetWare 3.12) or the NWADMIN utility (intraNetWare). This information will be used later to create a valid partition.

   For hot-pluggable drives in a ProLiant server or storage system, record the location drive bay of the failed physical drive. The failed physical device can be identified by the illumination of the amber LED on the drive tray. This is where the new physical drive must be inserted.

2. Remove the failed drive.

3. Insert the replacement physical drive in the same drive bay where the failed drive was located. The physical drive must be of the same capacity as the failed drive.

   For hot-pluggable drives, after you secure the drive in the bay, the LEDs on the drive each light once in an alternating pattern to indicate that the connection was successful. The Online LED turns green, indicating that the controller recognized and successfully initialized the replacement drive. If the Online LED does not light after a few minutes, verify that you added the new drive in the same slot as the failed drive, and that the drive capacity is the same as the failed drive.

4. It may be possible to use the *INSTALL.NLM* option Change Hot Fix to determine the number of Hot Fix Redirection blocks set up for this partition. Otherwise, see the section "Using CPQDAOPT on NetWare 3.12 Servers" in Chapter 5 for more information about optimizing the performance.

NOTE: Even though the logical drive may have a valid partition table, the data on this logical drive is NO LONGER VALID. Some data may appear valid because the failed physical drive is only a portion of the arrayed logical drive. However, there is a hole in the logical drive data at this point. Delete any old, invalid data and create a new partition on the logical drive.

5. Return to the *INSTALL.NLM* Disk Options menu. Select the Partition Tables Option. The driver should reactivate the failed logical drive. The driver sends a console alert if reactivation of the failed logical drive is successful. In the *INSTALL.NLM* Available Disk Drives menu, select the previously failed logical drive, which has now been repaired. The device information was recorded in step 1. For example:

```
NWPA:        [V503-A2-D1:0] Compaq SMART-2 Slot 8 Disk 2 NFT
```

   Select the Delete Partition option. INSTALL may display several error messages. Delete the volume associated with this partition. Since you will delete this partition, do not update any Volume Definition Table information. Continue until the partition has been deleted.

   If INSTALL reports that it cannot delete the partition because another process has it locked, load MONITOR and look at the System Resources option to determine which NLM has locked the device. It may be *MONITOR.NLM*, so you will need to unload MONITOR and any other NLMs that have the partition locked. After you create the partition and volume information, reload these NLMs.

6. Create the partition on the same logical drive.

7. Create and mount the volume.

8. Locate the recent backup media and restore the data to this server volume.

Microsoft Windows NT

This section includes instructions for installing the initial driver for a new Smart Array 3200 installation or for upgrading the driver in an existing Windows NT server/Smart Array 3200 system. If you used SmartStart to install Windows NT and drivers on a new server, you do not need to make the Support Software Diskette (SSD) utility diskettes. Skip this section.

NOTE: Windows NT supports using the Compaq Array Configuration Utility to reconfigure your drive arrays online. However, the first use of the Array Configuration Utility on a Windows NT server must be offline to initially set up at least one array. After that, the utility can be used online to change the array configuration.

Materials Needed

To install the Smart Array 3200 Windows NT driver on your server, you will need:

- Compaq SmartStart and Support Software CD (supplied in the Smart Array 3200 option kit)
- Blank diskettes
- Access to a server or workstation with a bootable CD-ROM drive. This may be the system in which you are installing the Smart Array 3200.

Creating the Windows NT SSD Diskettes

The Windows NT driver for the Smart Array 3200 is located on the Compaq SmartStart and Support Software CD that was supplied in the Smart Array 3200 option kit. To access the driver, create the Compaq SSD for Windows NT diskettes. These diskettes contain the latest operating system software, drivers, and support documentation for all Compaq equipment supported by Windows NT. To create the diskettes:

1. Boot the server from the Compaq SmartStart and Support Software CD.
2. From the Compaq System Utilities screen, select Create Support Software.
3. From the Diskette Builder screen, select Create Support Software Diskettes from CD only.

4. Scroll down the list and select Compaq Support Software for Windows NT.
5. Follow the instructions on the screen to create the Windows NT SSD diskettes.

Additional Information

An *NTREADME.HLP* file on the Windows NT SSD diskettes contains the latest information about Windows NT, including the driver installation procedure. Review this information and, where different from the instructions shown here, use the instructions provided in *NTREADME.HLP* file.

To access the *NTREADME.HLP* file, you need a server running Windows NT or a PC running Windows. Perform the following steps:

1. Insert the Windows NT SSD diskettes, one at a time, in the diskette drive.
2. Open a command prompt, make A: the current drive, and type:

```
readme.bat
```

or

From the File pull-down menu in Windows Program Manager, select Run and enter:

```
A:\readme.bat
```

3. Select the help topic(s) to read or print. Important readme files include:
   - Compaq SSD for Windows NT Installation Methods
   - Using the Compaq SSD for Windows NT Setup Program
   - Windows NT Device Driver Specifics
   - Compaq SCSI Controller Support
   - Compaq Drive Array Support

- ❑ Installing the Compaq Drive Array Driver During Windows NT Installation
- ❑ Installing the Compaq Drive Array Driver After Windows NT Installation
- ❑ Updating the Compaq Drive Array Driver
- ❑ Removing the Compaq Drive Array Driver

Installation Procedures

Device drivers can be installed in a Windows NT server using:

- The Compaq SSD for Windows NT Setup program installation

  Or

- The standard Windows NT device driver installation

Both methods are outlined in this chapter. Compaq recommends the Compaq SSD for Windows NT Setup program installation method.

Compaq SSD for Windows NT Setup Program Installation Method

The Compaq SSD for Windows NT Setup program installation method uses device drivers installed via the Setup program located on the Compaq SSD for Windows NT. The Setup program identifies hardware components installed in the machine and suggests device drivers needing installation.

Use the following steps to run the Compaq SSD for Windows NT Setup program:

1. Start Windows NT 3.51 or 4.0 and log in to an account with administrative privileges.
2. Insert the Compaq SSD for Windows NT Support Software Diskettes, one at a time, into the diskette drive.
3. From the Program Manager, select File → Run.
4. Enter the following:

```
A:\setup
```

5. A list of drivers that can be installed on your server appears. The highlighted drivers represent detected systems that will be installed by default. If you have previously installed the Smart Array 3200 Controller board in this server, the Compaq SCSI Controllers Support Install/Remove option will be highlighted.

   If you have not previously installed the Smart Array 3200 Controller, the driver appears on the list but is not highlighted. Highlight the driver.

6. After highlighting all the drivers you want to install, select Continue. Setup installs the selected drivers or prompts you for more information to install, remove, or update a driver.

7. Select Continue. In the SCSI Adapter Setup window, select Add. A Setup dialog box asks you to confirm the addition of a SCSI controller (adapter). Select OK.

8. Scroll through the Adapter list and select Other.

9. When prompted for the path to the SCSI Adapter files, enter:

   ```
   A:\scsi\array
   ```

   Select Continue.

10. Select Compaq Drive Array from the list of drivers to install. Click OK.

11. After the driver has been copied to the system, Setup returns to the SCSI Adapter Setup dialog box. Compaq Drive Array should appear in the list of installed SCSI controllers. Select Close.

12. Exit the program.

13. Remove the Compaq SSD for Windows NT diskette, shut down Windows NT, and reboot the server to load the driver.

Standard Windows NT Device Driver Installation Methods

Standard Windows NT device driver installation includes different methods to install different device drivers on a Windows NT system. Some device drivers install during initial Windows NT installation. Others can be installed through the Windows NT Setup program, the **Network** icon in the Windows Control Panel, or the **Drivers** icon in the Windows Control Panel.

Installing the Smart Array 3200 Driver During Windows NT Installation

This section describes how to install the driver using the Compaq SSD for Windows NT utility during the initial installation of Windows NT 3.51 or 4.0. To install the driver after Windows NT has already been installed, see the section, "Installing the Smart Array 3200 Driver after Windows NT Installation."

1. Begin the Windows NT 3.51 or 4.0 installation process.
2. When prompted for either an Express or a Custom installation, select Custom.
3. When prompted to let Setup detect mass storage devices or to manually select them, press **S** to skip detection.
4. At the next screen, press **S** to specify additional SCSI controllers.
5. From the displayed list, highlight Other (Requires disk provided by a hardware manufacturer) by clicking that line. Press **Enter**.
6. As prompted, insert the Compaq SSD for Windows NT diskettes and press **Enter**.
7. Highlight Compaq Drive Array in the list of displayed controllers and press **Enter**.

   After the driver has been loaded into memory, the Setup program returns to the screen displayed in Step 4. Compaq Drive Array should appear in the list of recognized mass storage devices. To install additional device support, repeat Steps 4-7. Otherwise, continue with step 8.
8. Press **Enter** and continue installation of Windows NT.
9. Reinsert the Compaq SSD for Windows NT diskettes as prompted. The Setup program will copy the drivers to the system.

10. Finish installing Windows NT.

Installing the Smart Array 3200 Driver After Windows NT Installation

Execute the Setup program in the root directory of the Compaq SSD for Windows NT utility to install or update the driver. This installation program copies the appropriate driver and configures the system to use the driver.

1. Start Windows NT 3.51 or 4.0 and log in to an account with administrative privileges.
2. Insert the Compaq SSD for Windows NT diskettes, one at a time, into the diskette drive.
3. From the Program Manager, select File → Run.
4. Enter the following:

```
A:\setup
```

5. The Setup program displays a list of drivers that can be installed. Select Compaq SCSI Controllers Support - Install/Remove.
6. Select Continue. In the SCSI Adapter Setup window, select Add. A Setup dialog box asks you to confirm the addition of a SCSI controller (adapter). Select OK.
7. Scroll through the Adapter list and select Other.
8. When prompted for the path to the SCSI Adapter files, enter:

```
A:\scsi\array
```

9. Click Continue.
10. Select Compaq Drive Array from the list of drivers to install. Select OK.

11. After the driver is copied to the system, Setup returns to the SCSI Adapter Setup dialog box. Compaq Drive Array should appear in the list of installed SCSI controllers. Select Close.
12. Exit the program.
13. Remove the Compaq SSD for Windows NT diskette from the drive, shut down Windows NT, and reboot the server to load the driver.

Updating the Smart Array 3200 Driver

Updating the Smart Array 3200 driver is a two-step process of removing the driver and re-adding the driver. With the new Compaq SSD for Windows NT Setup program, you can skip the remove/add steps and update the driver by following these steps:

1. Start Windows NT and log in to an account with administrative privileges.
2. Insert the Windows NT SSD diskette (Diskette #1) into the diskette drive.
3. Start Setup by entering

   ```
   A:\setup
   ```

   where A: is the letter of the diskette drive.
4. Select Custom Setup.

   NOTE: The Compaq Array Driver displays in the Custom Setup menu only if the Array driver is detected. It displays in the Express Setup menu only if the Array driver is detected **and** not installed or not current.
5. Select the Mass Storage tabbed panel on the Custom Installation screen.
6. Select Compaq Drive Array and click the Update button.

   The Setup program updates the driver on your system from the Windows NT SSD diskettes.
7. Select Close and exit the Setup program or select other tabbed sections to install, update, or remove other software components.
8. Remove the Windows NT SSD diskette, shut down Windows NT, and reboot the system to load the driver.

Removing the Smart Array 3200 Driver

IMPORTANT: **DO NOT** remove this driver if the system is booting from a device attached to a Smart Array 3200 Controller. You will get a dialog box stating the selected controller is marked as a boot device. Removing it may cause the system not to boot.

1. Start Windows NT and log in to an account with administrative privileges.
2. Insert the Windows NT SSD diskette (Diskette #1) into the diskette drive.
3. Start Setup by entering

   ```
   A:\setup
   ```

   where A: is the letter of the diskette drive.
4. Select Custom Setup.

   NOTE: The Compaq Array Driver displays in the Custom Setup menu only if the Array driver is detected. It displays in the Express Setup menu only if the Array driver is detected **and** not installed or not current.
5. Select the Mass Storage tabbed panel on the Custom Installation screen.
6. Select Compaq Drive Array and click the Remove button. After the driver is removed from your system, Setup returns to the Custom Installation window.
7. Select Close and exit the Setup program or select other tabbed sections to install, update, or remove other software components.
8. Remove the Windows NT SSD diskette, shut down Windows NT, and reboot the system to load the driver.

Updating the Compaq Insight Manager Agents

If you are using Compaq Insight Manager, you will need to update the Insight Agents for this monitoring utility to support the new Smart Array 3200.

If you used SmartStart 4.20 or later to install the operating system on a new Smart Array 3200 Controller installation or to upgrade your driver in an existing installation, the agents were updated by SmartStart; you will not have to update the agents manually.

If you did not use SmartStart 4.20 or later as part of your Smart Array 3200 Controller installation, you must update the Insight Agents manually. The correct agents can be obtained from your local Compaq Reseller or Authorized Compaq Service Provider. Refer to the documentation included with Compaq Insight Manager for the correct procedure for updating agents.

Installation of the Smart Array 3200 Controller is now complete. Reboot the server to begin using the array controller.

SCO OpenServer 5

This section includes instructions for getting the latest driver and support information for installing the driver. If you use SmartStart to install SCO OpenServer 5 and drivers, you can skip this section; you do not need to create the Extended Feature Supplement (EFS) diskettes.

If your system has an older SCO operating system, or if you are setting up a new system with SCO OpenServer 5, Compaq recommends you use SmartStart to upgrade your operating system. SmartStart is supplied with the server or may be obtained from your local Compaq Reseller or Authorized Compaq Service Provider.

Getting the Driver and Installation Information

The latest drivers and support files for SCO OpenServer 5 and information about installing the driver are on the Compaq SmartStart and Support Software CD supplied with the Smart Array 3200 option kit. To access these files, create a set of Compaq EFS for OpenServer 5 diskettes from the Compaq SmartStart and Support Software CD.

Materials Needed

To create a set of Compaq EFS for OpenServer 5 diskettes, you will need:

- Compaq SmartStart and Support Software CD (supplied in the Smart Array 3200 option kit)
- Blank diskettes
- Access to a server or workstation with a bootable CD-ROM drive. This may be the system in which you are installing the Smart Array 3200 Controller.

Creating the EFS Diskettes

To create the EFS for SCO OpenServer 5 diskettes:

1. Boot the server from the Compaq SmartStart and Support Software CD.
2. From the Compaq System Utilities screen, select Create Support Software.
3. From the Diskette Builder screen, select Create Support Software Diskettes from CD only.
4. Scroll down the list and select Compaq SCO OpenServer 5.0 EFS (for SCO OpenServer 5)
5. Follow the instructions on the screen to create and label the diskettes.
6. At the SCO Products screen, select SCO Installation Notes for Compaq Servers.
7. Follow the instructions on the screen to create and label the diskettes.

Accessing the Information

Driver installation procedures for SCO OpenServer 5 from Compaq and SCO OpenServer 5 (non-Compaq) are different. Choose the correct procedure below.

Servers Running Compaq SCO OpenServer 5

To access the driver installation information for systems running SCO OpenServer 5 from Compaq:

1. Place the diskette labeled SCO Installation Notes for Compaq Servers in the diskette drive of a server or PC capable of reading a DOS text file.
2. Use a text editor or other DOS utility to read the *INSTALL.TXT* file on the diskette.
3. Follow the instructions in this file to install the Smart Array 3200 driver in a server running SCO OpenServer 5 from Compaq.

Servers Running Non-Compaq SCO OpenServer 5

To access the driver installation information for systems running non-Compaq SCO OpenServer 5:

1. Place the diskette labeled *Documentation Diskette* in the diskette drive of a server or PC.
2. Reboot the system.
3. Select the file named *INSTALL.TXT* to view (**Enter**) or print (**F7**).
4. Follow the instructions in this file to install the Smart Array 3200 driver in a server running a non-Compaq version of SCO OpenServer 5.

Updating the Compaq Insight Manager Agents

If you are using Compaq Insight Manager, you will need to update the Insight Agents to support the new Smart Array 3200.

If you used SmartStart 4.20 or later to install the operating system on a new Smart Array 3200 Controller installation or to upgrade your driver in an existing installation, the agents were updated by SmartStart; you will not have to manually update the agents.

If you did not use SmartStart 4.20 or later as part of your Smart Array 3200 Controller installation you must manually update the Insight Agents. The correct agents can be obtained from your local Compaq Reseller or Authorized Compaq Service Provider. Refer to the documentation included with Compaq Insight Manager for the correct procedure for updating agents.

Installation of the Smart Array 3200 is now complete. Reboot the server to begin using the array controller.

SCO UnixWare 2.1 or Later

The instructions in this section describe where you can find the latest driver and support information necessary to install the initial driver for a new Smart Array 3200 Controller or to upgrade the driver in an existing UnixWare server/Smart Array 3200 system. If you use SmartStart to install UnixWare and drivers on a new server or to upgrade an existing server, you can skip this section and you do not need to create the EFS diskettes.

Getting the Driver and Installation Information

The latest drivers and support files for SCO UnixWare and information about installing the driver are located on the Compaq SmartStart and Support Software CD (supplied with the Smart Array 3200 option kit). To access these files, create a set of Compaq EFS for SCO UnixWare diskettes from the Compaq SmartStart and Support Software CD.

Materials Needed

To create a set of Compaq EFS for SCO UnixWare diskettes, you will need:

- Compaq SmartStart and Support Software CD (supplied in the Smart Array 3200 option kit)
- Blank diskettes
- Access to a server or workstation with a bootable CD-ROM drive. This may be the system in which you are installing the Smart Array 3200 Controller.

Creating the EFS Diskettes

To create the Compaq EFS for SCO UnixWare diskettes:

1. Boot the server from the Compaq SmartStart and Support Software CD.
2. From the Compaq System Utilities screen, select Create Support Software.
3. From the Diskette Builder screen, select Create Support Software Diskettes from CD only.

4. Scroll down the list and select Compaq SCO OpenServer 5 EFS.
5. Follow the instructions on the screen to create and label diskettes.

Accessing the Information

To access the driver installation information:

1. Place the diskette labeled *Documentation Diskette* in the diskette drive of a server or PC.
2. Reboot the system.
3. Select the file named *README.HBA* to view or print the file.
4. Follow the instructions in this file to install the Smart Array 3200 driver in an existing UnixWare server.

Updating the Compaq Insight Manager Agents

If you are using Compaq Insight Manager, you will need to update the Insight Agents to support the new Smart Array 3200.

If you used SmartStart 4.20 or later to install the operating system on a new Smart Array 3200 Controller installation or to upgrade your driver in an existing installation, the agents were updated by SmartStart; you will not have to update the agents manually.

If you did not use SmartStart 4.20 or later as part of your Smart Array 3200 Controller installation, you must manually update the Insight Agents. The correct agents can be obtained from your local Compaq Reseller or Authorized Compaq Service Provider. Refer to the documentation included with Compaq Insight Manager for the correct procedure for updating agents.

Installation of the Smart Array 3200 Controller is now complete. Reboot the server to begin using the array controller.

IBM OS/2

Use the instructions in this section to install the initial driver for a new Smart Array 3200 Controller installation or to upgrade the driver in an existing OS/2 server/Smart Array 3200 system. If you use SmartStart to install OS/2 and drivers on a new server you do not need to create the OS/2 SSD diskettes and you can skip this section.

Materials Needed

To create the OS/2 SSD diskettes, you will need:

- Compaq SmartStart and Support Software CD (supplied in the Smart Array 3200 option kit)
- Two blank diskettes
- Access to a server or workstation with a bootable CD-ROM drive. This may be the system in which you are installing Smart Array 3200.

Creating SSD Diskettes

The OS/2 driver for the Smart Array 3200 is located on the Compaq SmartStart and Support Software CD (supplied in the Smart Array 3200 option kit). To access the driver, create the OS/2 SSD diskettes. These diskettes contain the latest operating system software, drivers, and documentation for all Compaq equipment supported by OS/2. To create the diskettes:

1. Boot the server from the Compaq SmartStart and Support Software CD.
2. From the Compaq System Utilities screen, select Create Support Software.
3. From the Diskette Builder screen, select Create Support Software Diskettes from CD only.
4. Scroll down the list and select Compaq OS/2 Support Software.
5. Follow the instructions on the screen to create the OS/2 SSD diskettes.

Diskettes from CD only.

Additional Information

Readme files with the latest information about OS/2, including the driver installation procedure, are on the OS/2 SSD diskettes. Locate and read this procedure. If the procedure differs from that shown here, use the one on the SSD diskettes.

To view or print the Readme files, you will need a server with a DOS partition or a PC running DOS or Windows:

1. Place the OS/2 SSD diskettes in the floppy drive.
2. From the DOS prompt, type:

```
A:\readme
```

or

From the File pull-down menu in Windows Program Manager, select Run and enter:

```
A:\readme.com
```

3. Select the files to read or print. Important files include:
   - *README.1ST*
   - *WHATSNEW.RDM*
   - *ADDARRAY.RDM*
   - *HISTORY.RDM*

Installing the Driver

To install the driver file to the OS/2 directory on your boot drive:

1. Place the OS/2 SSD diskettes in the floppy drive.
2. From the OS/2 command prompt, change the drive to A: by typing:

```
a:
```

Then type:

```
Ddinstal
```

3. Click the Change button to change the source directory to A:/ADD.
4. Select Compaq Array Driver for OS/2 from the list of drivers. Press OK to continue.
5. The *CPQARRAY.ADD* driver file will be copied to the *x*:\os2 directory (where *x* is the boot drive). The *CONFIG.SYS* file will be updated to load this driver first on boot. This means that the first drive on this controller is the boot drive.
6. If you do not want to boot from a drive on this controller, for instance, if you wanted to boot from a drive attached to the integrated SCSI controller, you must manually change the *CONFIG.SYS* file before you reboot the server. Edit the *CONFIG.SYS* file to reorder the BASEDEV=*CPQARRAY.ADD* statement so that it appears after the BASEDEV statement corresponding to the boot driver.
7. Save the updated *CONFIG.SYS* file and exit the editor.
8. Perform a normal system shutdown and reboot the server to load the new driver.

Controller Ordering

The order in which the ADD driver appears in the *CONFIG.SYS* file determines how each type of controller is ordered relative to other types of controllers.

Each type of controller that a single ADD driver controls will be grouped together. The first ADD driver to appear in the *CONFIG.SYS* file will have its controllers ordered first, the second ADD driver will have its controllers ordered after the first driver, etc.

The slot in which the controller is installed does not affect the loading order; only the order shown in *CONFIG.SYS* affects the order.

Each ADD driver developed by Compaq places its controllers in ascending order based on the controller order assigned by the Compaq System Configuration Utility.

The following rules must be followed for the driver to function properly with other storage controllers configured in the system.

NOTE: These rules are NOT enforced automatically by the Compaq System Configuration Utility. Follow them carefully when configuring the system.

1. All Compaq array controllers should be in consecutive order as a group. If booting from a Compaq Smart Array 3200 Controller, the statement *BASEDEV = CPQARRAY.ADD* must be present.
2. If a Compaq IAES Controller is the only other controller installed in the system, since it cannot be primary, the system must boot from the Smart Array 3200 Controller (controller order = First).

Partitioning

The following are limitations for OS/2 on any computer system:

- Any FAT partition cannot be larger than 2 GB (2048 MB) in size.
- It is recommended that you do not exceed 8 GB for an HPFS boot partition. Exceeding this size makes it possible for the OS/2 system files to end up beyond 8 GB on the disk. This prevents the ROM from loading the system files at boot time.

- This driver has been tested with HPFS partition sizes of up to 40 GB. Do NOT create partitions exceeding 40 GB on any of the RAID volumes when running OS/2.

OS/2 may allow the creation of partitions beyond these boundaries; adhere to these limits to ensure proper functionality.

Booting OS/2 from a Smart Array 3200 Controller

This section includes information on booting a system from a Smart Array 3200 Controller.

The CPQARRAY.ADD driver must be present when booting from a Smart Array 3200 Controller (the Compaq IAES is not a bootable device).

If a Smart Array 3200 Controller is the primary disk controller, edit the *CONFIG.SYS* file and make sure the *BASEDEV=CPQARRAY.ADD* entry in the file is the first BASEDEV entry. This ensures that the CPQARRAY.ADD driver is the first ADD driver loaded causes OS/2 to assign the first hard drive on the first Smart Array 3200 Controller as the boot drive. For example:

```
BASEDEV=CPQARRAY.ADD

BASEDEV=CPQ53CX.ADD
```

For OS/2 to boot from another controller, order the other controller first:

```
BASEDEV=AMSI02.ADD

BASEDEV=CPQARRAY.ADD
```

Command Line Switches

Several command line switches are available to modify the standard behavior of the Compaq ADD driver. The syntax of the command line switches is:

1. /PERF:[memory blocks]

   This command line switch is a non-standard switch implemented for the CPQARRAY.ADD to modify the performance characteristics of the driver when using a Smart Array 3200. Under heavy disk utilization, this command switch allows greater performance based on the number associated with the [memory blocks] parameter. The larger the [memory blocks] parameter, the better the performance under heavy disk utilization. When you increase this parameter, the CPQARRAY.ADD driver will use more memory.

   ```
   BASEDEV=CPQARRAY.ADD /PERF:[memory blocks]
   ```

   [memory blocks] A number in the range of 3 to 9 indicates the amount of memory blocks allocated per Smart Array 3200 Controller in the system. The driver runs at a default value of 5. Use this formula to determine the amount of memory being used:

   Number of Smart Array 3200 Controllers * [memory blocks] * 64-KB

   Example:

   ```
   BASEDEV=CPQARRAY.ADD /PERF:6
   ```

2. /V

   The Verbose mode command line switch is a standard command line switch which causes the driver to print information to the screen when it loads. The driver identifies itself along with the current revision. Then information concerning the adapters and the drives attached to them is displayed. Adapter information includes IRQ, slot number, and controller order number. Drive information includes physical and logical drive count and the geometry information for each logical drive.

   Example:

   ```
   BASEDEV=CPQARRAY.ADD /V
   ```

3. /A:[adapter index] [unit parameters]

   This is a standard command line switch which causes the driver to modify its behavior towards adapters.

   [adapter index] The adapter index is a number used to identify a controller. The index is based on '0' for the lowest controller order number associated with the adapter controlled by this ADD. The index increases by one for each controller in the system as you move up the controller configuration order.

   Example: A system that has three adapters controlled by the *CPQARRAY.ADD*, with the lowest configured adapter the secondary controller.

Controller Order	Adapter Index
2	0
3	1
5	2

   [unit parameters] This ADD only supports the /I parameter to ignore a controller. The following unit parameter is available: /I

   Ignore the specified adapter; do not control the adapter with this driver. This parameter prevents the ADD driver from recognizing the specified adapter. Use this parameter to allow another driver to control a specific adapter.

IMPORTANT: Do not ignore the primary controller or boot controller. The system will not boot.

IMPORTANT: The driver MUST be loaded by a BASEDEV= statement in the *CONFIG.SYS* file. This statement is inserted automatically by the ADDARRAY.CMD installation prodedure.

Example: You are running intraNetWare on your OS/2 2.x system and you want an intraNetWare NLM to control adapter 2 instead of the ADD driver. The following statement would prevent the ADD driver from claiming adapter 2.

```
BASEDEV=CPQARRAY.ADD /A:2 /I
```

Updating the Compaq Insight Manager Agents

If you are using Compaq Insight Manager, you will need to update the Insight Agents to support the new Smart Array 3200.

If you used SmartStart 4.20 or later to install the operating system on a new Smart Array 3200 Controller installation or to upgrade your driver in an existing installation, the agents were updated by SmartStart. You will not have to update the agents manually.

If you did not use SmartStart 4.20 or later as part of your Smart Array 3200 installation, you must update the Insight Agents manually. The correct agents can be obtained from your local Compaq Reseller or Authorized Compaq Service Provider. Refer to the documentation included with Compaq Insight Manager for the correct procedure for updating agents.

Installation of the Smart Array 3200 Controller is complete. Reboot the server to begin using the array controller.

Banyan VINES 6.0 or Later

Use the instructions in this section to install the initial driver for a new Smart Array 3200 installation or to upgrade the driver in an existing Banyan VINES 6.x and 7.x Server/Smart Array 3200 system.

Materials Needed

To install the Banyan VINES driver for the Smart Array 3200 on your server, you will need:

- Compaq SmartStart and Support Software CD (supplied in the Smart Array 3200 option kit)
- Blank diskettes
- Access to a server or workstation with a bootable CD-ROM drive. This may be the system in which you are installing the Smart Array 3200 Controller.

Creating the Peripheral Adapter Support Software Diskettes

The Banyan VINES 6.x and 7.x driver, installation procedures, and other information for the Smart Array 3200 Controller are located on the Compaq SmartStart and Support Software CD (supplied in the Smart Array 3200 option kit). To access the driver, create the Peripheral Adapter Support Software for VINES 6.0 and 7.0 diskettes. These diskettes contain the latest drivers and support documentation for all Compaq equipment (except NICs) supported by Banyan VINES 6.0 and 7.0. To create the diskettes:

1. Boot the server from the Compaq SmartStart and Support Software CD.
2. From the Compaq System Utilities screen, select Create Support Software.
3. From the Diskette Builder screen, select Create Support Software Diskettes from CD only.
4. Scroll down the list and select Peripheral Adapter Support Software for VINES 6.0 and 7.0.
5. Follow the instructions on the screen to create the diskettes.

Additional Information

The last Peripheral Adapter Support Software diskette is a bootable DOS documentation diskette. The *README.SSD* file on this diskette contains a short description of the drivers (a single Compaq driver supports the Smart Array series of controllers) and includes a procedure for installing the Smart Array 3200 Controller driver. To access this file, follow the instructions on the diskette label.

Installing the Driver

To install the Smart Array 3200 driver, follow the installation procedures specified in the *README.SSD* file.

Installation of the Smart Array 3200 is complete. Reboot the server to begin using the array controller.

Microsoft Windows 95

When configuring the hardware using the System Configuration Utility, set these Smart Array 3200 Controller parameters:

- Set the Controller Order of **one** Smart Array 3200 Controller to First (a Smart Array 3200 Controller must be the primary disk controller under DOS).
- Set the Controller Order of all other Smart Array 3200 Controller boards (if any) consecutively, beginning with Second.
- Set the Controller Order of other drive controller types (if any) higher than all Smart Array 3200 Controller boards.
- For best performance, set the Interrupt Selection for all Smart Array 3200 Controller boards to Enabled.

Getting the Driver and Installation Information

Use the instructions in this section to retrieve the latest driver and information necessary to install the initial driver for a new Smart Array 3200 installation or to upgrade the driver in an existing Microsoft Windows 95 server/Smart Array 3200 system.

The latest drivers and support files for Windows 95 as well as information about installing the driver are located on the Compaq SmartStart and Support Software CD (supplied with the Smart Array 3200 option kit). To access these files, create a set of Compaq Windows 95 diskettes from the Compaq SmartStart and Support Software CD.

Materials Needed

To create a set of Compaq Windows 95 diskettes, you will need:

- Compaq SmartStart and Support Software CD (supplied in the Smart Array 3200 option kit)
- Blank diskettes
- Access to a server or workstation with a bootable CD-ROM drive. This may be the system in which you are installing the Smart Array 3200.

Creating the Windows 95 Diskettes

To create the diskettes:

1. Boot the server from the Compaq SmartStart and Support Software CD.
2. From the Compaq System Utilities screen, select Create Support Software.
3. From the Diskette Builder screen, select Create Support Software Diskettes from CD only.
4. Scroll down the list and select Compaq Support Software for Windows 95.
5. Follow the instructions on the screen to create and label diskettes.

Installing the Smart Array 3200 with Windows 95

Use these basic steps to install a Smart Array 3200 Controller in a Windows 95 server to operate in either the Smart Array Controller mode or the Interrupt 13h BIOS support mode.

Smart Array Controller Mode

To install the Smart Array 3200 in a Windows 95 environment using the Smart Array Controller mode:

1. Update your system firmware by running System ROMPaq.
2. Install the Smart Array 3200 Controller option board.
3. Run the System Configuration Utility to configure the hardware. Set these Smart Array 3200 Controller parameters:
   - ❑ Set the Controller Order. If the Smart Array 3200 Controller will be the primary disk controller set this parameter to First.
   - ❑ For best performance, set the Interrupt Selection for all Smart Array 3200 Controller boards to Enabled.
4. Configure your drive array with the Array Configuration Utility. Select Windows 95 as the primary operating system.
5. Install the driver:
   - ❑ Log in to Windows 95.
   - ❑ Select Add New Hardware.
   - ❑ Choose NO when prompted to search for hardware.
   - ❑ Select SCSI Controllers.
   - ❑ Select Have Disk button.
   - ❑ In the Install From Disk menu, enter the path to the array directory \WindowsDir\CPQSYS\ARRAY. The driver copy to the appropriate directory.

     For this step to work properly, these steps must have been followed: (1) a copy of the Windows 95 diskettes was made (2) the instructions in the *README.1ST* file were followed, and (3) diskette files were copied to the hard drive.

- Reboot the server for the new settings to take affect.

NOTE: To install the Smart Array 3200 Controller as a primary controller, you must have the additional *SMRT.SYS* driver in *CONFIG.SYS* before booting. Refer to the *README.TXT* file on the Windows 95 diskettes.

Interrupt 13h BIOS Support

Interrupt 13h BIOS support in the Smart Array 3200 Controller Option ROM provides support for eight logical drives on multiple Smart Array 3200 controllers. To install the Smart Array 3200 in a Windows 95 environment using the Interrupt 13h BIOS support mode:

1. Update your system firmware by running System ROMPaq.
2. Install the Smart Array 3200 Controller option board.
3. Run the System Configuration Utility to configure the hardware. Set these Smart Array 3200 Controller parameters:
   - Set the Controller Order of **one** Smart Array 3200 Controller to First (a Smart Array 3200 Controller must be the primary disk controller).
   - Set the Controller Order of all other Smart Array 3200 Controller boards (if any) consecutively, beginning with Second.
   - Set the Controller Order of other drive controller types (if any) higher than all Smart Array 3200 Controller boards.
   - Set the Option ROM to Enabled (SMART-2DH/E Controller only) for **one** SMART-2DH Controller only. This parameter is always enabled for SMART-2DH Controller boards and is not available for change.
   - For best performance, set the Interrupt Selection for all Smart Array 3200 Controller boards to Enabled.

Configure your drive array with the Compaq Array Configuration Utility. Be sure to select Windows 95 as the primary operating system.