DIGITAL Server 9100 Series

System Software Guide

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Preface

Who Should Read This Book

This book is written for the person who installs, administers, and configures the server and its components.

How To Use This Book

This book is organized as follows:

- Chapter 1: Overview – provides an overview of the server and its components
- Chapter 2: Diagnostic Partition Overview and Installation – provides an overview of system-related utilities and applications and explains how to install the Diagnostic Partition
- Chapter 3: Using the Diagnostic Partition – explains how to use the Diagnostic Partition and the System Configuration Utility, which is the primary tool for configuring your server
- Chapter 4: Using the BIOS Setup Utility – explains how to use the BIOS Setup Utility
- Chapter 5: Configuring Adapters – explains how to configure SCSI drives and adapters
- Chapter 6: Updating Flash Memory – shows how to update flash memory using BIOS Flash Utility

Conventions Used

The following conventions are used throughout this guide to help you understand the text.

Symbols

The symbol > is used in showing you how to select a menu item. For example, the entry **System Config Utils>Execute SCU** instructs you to select the **Execute SCU** item in the **System Config Utils** menu.

Acronyms

The first time an acronym is used in a chapter, it is spelled out. Subsequent uses in the chapter show only the acronym. For example, the first time “System Configuration Utility” is used in the chapter, it is shown as System Configuration Utility (SCU). Later references to System Configuration Utility use SCU.

Typography

In this document, special typefaces are used to distinguish certain kinds of information.

`Courier`
Used for operator entry, commands, and screen messages.

Bold
Used for utility names and for emphasis in instructions.

Italics
Used for document names, path names, and file names.

CAPS
Keys are displayed in capital letters.

“Quotes”
Used for chapter and section references within the guide and for menu selections.

Special Notices

This book may contain special notices to the user, which are labeled and described below:

Warnings – Text marked as WARNINGS alert users to situations where personal injury is possible

Cautions – CAUTIONS indicate situations where equipment damage or data loss is possible

Important – Text marked as IMPORTANT notifies users of significant and consequential information.

Related Publications

For additional information, refer to the following books.

- *DIGITAL Server 9100 Series User’s Guide*
- *DIGITAL Server 9100 Series Installation Guide*
- *DIGITAL Server 9100 Series Site Preparation Guide*
- *AMIDiag User’s Guide (available on the Quick Launch CD-ROM)*

Chapter 1

Overview

This manual discusses the software utilities that come with your server. Most of the software utilities reside in a DOS partition on your boot disk known as the Diagnostic Partition. The Diagnostic Partition is created at the factory; you do not have to create the Diagnostic Partition or load the utilities into it.

Terms, Conventions, and Related Documents

Refer to the "Preface" of this document for important information on how to use this book, terms and conventions, and related documents.

When used in this chapter, the term "configuration utility" refers to the System Configuration Utility (SCU). Chapter 3 discusses how to use the SCU in detail.

Platform CD-ROM

You receive a Platform CD-ROM with your server. The Platform CD-ROM contains the same utilities as the Diagnostic Partition. In the case of a disk failure, where the Diagnostic Partition is not available, you can run these utilities from the CD-ROM and not load them on your boot disk; however, it is recommended that you run them from the Diagnostic Partition whenever possible. Some of the utilities save files to disk, and they are not able to do this when you run them from the CD-ROM.

The main purpose of the Platform CD-ROM is to enable you to install the Diagnostic Partition and its utilities (for example, if you have to replace your boot disk).

Software Utilities

The following table lists the software utilities:

Utility	Short Reference	Function	How shipped	Chapter Reference
Power-On Self-Test	POST	Checks BIOS values and adapter information against the actual hardware configuration	Resident in system BIOS.	Chapter 1 of the *DIGITAL Server 9100 Series* Site Preparation Guide
System Configuration Utility	SCU	Configuration of server; add, remove, and edit of add-in boards; setting passwords	Resident in Diagnostic Partition and on the Platform CD-ROM.	Chapter 3
BIOS Setup Utility	Setup	Change system board configuration defaults Stores all configuration values in the memory of the real-time clock/ calendar (RTC)	Resident in system BIOS. Use only under the circumstances described in Chapter 4.	Chapter 4
BIOS Event Log	ELOG	Logs system events	Resident in Diagnostic Partition and on the Platform CD-ROM.	Chapter 4
SCSI*Select* Utility	(none)	Configures Adaptec adapters	Resident in system BIOS, in the Diagnostic Partition, and on the Platform CD-ROM.	Chapter 5
Disk Array Controller Configurator Utility	DACCFG	Configures Mylex disk array adapters	Resident in Diagnostic Partition and on the Platform CD-ROM.	Chapter 5
BIOS Flash Utility	phlash	Use to update the BIOS as new versions become available	Resident in Diagnostic Partition and on the Platform CD-ROM.	Chapter 6

The software includes these features:

- System security – select secure mode options in Setup or the configuration utility to limit access to the hardware. Chapter 3, “System Security,” in the *DIGITAL Server 9100 Series User’s Guide* provides additional information on hardware and software security features.
- Critical event logging – Use server monitoring software in the BIOS to monitor hardware conditions and log events.

General Software Characteristics

This section discusses the following characteristics of your software:

- Critical event logging and server management
- Auto-detection of video adapters

Critical Event Logging and Server Management

Critical events are events that result in the system being shut down to prevent catastrophic side-effects from affecting other parts of the system. Event logging is a BIOS feature that logs critical and informational events to nonvolatile flash memory. You can use the BIOS or the configuration utility to enable or disable this feature:

- In the BIOS Setup Utility: select Server>System Management>System Event Logging.
- In the SCU: select Step 3: Change Configuration Settings>System Board>Management Subsystem Group>Event Logging.

Use the Diagnostic Partition to view system events:

- On the Main Menu, select Run Diagnostics>Access BIOS Event Log>View Event Log.

The following events are considered critical and are logged:

- Multibit Error Checking and Correction (ECC) is enabled in the memory subsystem.
- A System Management Interrupt (SMI) is generated on events that normally generate a Non-Maskable Interrupt (NMI). These include the following:
  - I/O channel check
  - EISA bus time-outs
  - EISA watchdog timer expiration
  - EISA software-generated NMI
  - PCI SERR (system errors) and PERR (parity errors) events
- If the operating system device driver is using a watchdog timer to detect software or hardware failures, and that timer happens to expire, an Asynchronous System Reset (ASR) is generated. An ASR is equivalent to a hard reset, except the hardware limit registers are not reset. As the system reboots, BIOS POST detects this event and logs it.

Event logging is performed by an SMI handler in BIOS. When NMIs should also be generated (for critical events), the SMI routines invoke the NMI, so that the operating system (OS) can respond appropriately.

The following discusses other event logging:

- POST logs the failure of a processor during power-up.
- Other errors detected during POST are logged.
- When “System Management Mode” is enabled using the SCU, the system monitors voltage and temperature values and logs an event when limit thresholds are exceeded. To enable this option in the SCU, select Step 3: Change Configuration Settings>System Board>Management Subsystem Group. See the “Configuring Your Server” section in Chapter 3 for more detail.

You can use the BIOS Event Log utility provided in the Diagnostic Partition and on the Platform CD-ROM to view the event log. For more information on accessing this utility in BIOS, refer to the “Diagnostic Partition Diagnostics Menu” section in Chapter 3.

Auto-detection of Video Adapters

The BIOS looks for video adapters in the following order. Preference is always given to offboard devices.

- ISA or EISA
- PCI
- Primary system board
- Secondary system board

The onboard (or offboard) video BIOS is shadowed starting at address C0000h, and it is initialized before memory tests begin in POST.

PCI video, video capture, and telephony adapters must be installed on the first (PCI 0) bus. This is due to the PCI specification requirement that the video addressing routine be seen from the first bus.

Chapter 2

Diagnostic Partition Overview and Installation

This chapter provides the contents of the Diagnostic Partition and how to access it. It includes the following sections:

- Diagnostic Partition
- Using the Platform CD-ROM
- Installing the Diagnostic Partition from the Platform CD-ROM
- Updating the Diagnostic Partition
- Deleting the Diagnostic Partition

Note: Read Chapter 3, "Using the Diagnostic Partition," for information on the menus and options on the Diagnostic Partition, and how to access and use the system's configuration utility.

Terms, Conventions, and Related Documents

Refer to the "Preface" of this document for important information on how to use this book, terms and conventions, and related documents.

When used in this chapter, the term "configuration utility" refers to the System Configuration Utility (SCU). The "Configuring Your Server" section of Chapter 3 discusses how to use the SCU in detail.

Diagnostic Partition

When you receive your server, the boot disk contains a Diagnostic Partition. This partition is also resident on the Platform CD-ROM. The Diagnostic Partition contains utilities that enable you to configure your server and run diagnostics.

Cautions

Observe the following cautions:

- Do not format your boot disk or remove the Diagnostic Partition when you install your operating system. Removing the Diagnostic Partition may invalidate your support agreement. If you need to re-install the Diagnostic Partition, you must do so before installing your operating system. See the "Installing the Diagnostic Partition from Platform CD-ROM" section later in this chapter for more information.
- Windows NT® recognizes the Diagnostic Partition as an EISA Utilities partition. If you are running Windows NT on your server, do not remove the Diagnostic Partition. Removal of this partition may cause booting problems.

Diagnostic Partition Contents

The Diagnostic Partition contains the following:

- Diagnostic Partition menus
- System Configuration Utility (SCU)
- System and adapter diagnostics
- BIOS Flash utility
- BIOS Event Log utility
- Online documentation

Accessing the Diagnostic Partition from Boot Disk

To access the Diagnostic Partition from boot disk:

1. Turn on your video display monitor and server or, if your server is already running, reboot your system.

   The following prompt displays after BIOS POST completes:

   ```
   Press <D> to boot Diagnostic Partition
   Press <F1> for normal boot, <F2> for BIOS Setup
   Otherwise, <F1> is selected in 30 seconds
   ```

2. Press D immediately to display the MS-DOS Startup menu:

```
1. Run Utilities and Diagnostics (Default - Press “Enter” to accept)
2. Run Additional Diagnostics
```

3. You can run diagnostics by selecting either option. You cannot switch between the two menus without rebooting the server.

   Select **Option 1** for most configuration functions, administrative functions, and system diagnostics. It allows you to run system tests, adapters tests, and access the event log.

   If you select **Option 1**, the system displays the Diagnostic Partition Main menu:

```
System Config Utils
Run Diagnostics
BIOS Flash Utilities
Reboot System
Online and Printed Docs
```

   Choose **Option 2** to run additional SCSI Adaptec diagnostics that require special SCSI drivers to be loaded.

   If you select **Option 2**, the system displays the Diagnostic Main menu:

```
Run Diagnostics
Reboot System
```

Diagnostic Partition Cabinet Check Program

When booting to the Diagnostic Partition or the Platform CD-ROM, the Diagnostic Partition Cabinet Verification Program, **dp_mon**, executes before entering into the Main menu. This program queries the status of the cabinet voltages, temperatures, and fans to make sure these parameters are acceptable before entering the diagnostic environment.

Failures detected by **dp_mon** have two possible severity levels:

- System Warning (non-critical failure)
- System Error (critical failure)

In the case of a System Warning, a beep sounds, a warning message displays on the screen, and the program waits for five seconds before exiting and allowing the Diagnostic Partition menus to run.

In the case of a System Error, a beep sounds, an error message prints to the screen, and the program waits for sixty seconds before initiating a system shutdown. You have the option of overriding the shutdown, and allowing the Diagnostic Partition menus to run. Even if you override the shutdown, the sixty-second delay is still honored. This allows the Server Management subsystem, if present, adequate time to detect and log the error.

In any warning or error situation, the message is logged to the file *\tmp\syslog*, along with the time and date. If the *syslog* file size exceeds 10K, it is renamed *syslog.bak*.

The following table defines the parameters checked and the status reported by **dp_mon**:

Parameter	Description	System Warning	System Error
CheckFanStatus	Checks cabinet fan status	Fans fail but not in same column	Fans fail in same column
CheckAcFail	Checks the AC Fail bit	AC fail true	
CheckPowerSupplyFan	Checks the Power Supply Fan Fail bit	Power supply fan fail true	
CheckPowerSupplyStatus	Checks the Power Supply Fail bits	Power supply fail true	
CheckAdcStatus	Checks the status of temperatures and DC voltages in the INCA chip	Warning limit is exceeded	Fatal limit is exceeded

Note: If System Management Mode and checking of these parameters is "Enabled," these conditions are not detected by **dp_mon**. They will have already been detected, logged, and the limits changed (to prevent recurrence) by the system BIOS.

Running System Diagnostics from the Diagnostic Partition

The Diagnostic Partition creates different run-time environments based on whether you select "Run Utilities and Diagnostics" or "Run Additional Diagnostics" from the MS-DOS Startup menu. You can run system diagnostics from either environment. You cannot switch between environments without rebooting and returning to the MS-DOS Startup menu.

When you select "Run Additional Diagnostics," the Diagnostic Partition loads SCSI drivers. These drivers enable you to run additional SCSI diagnostics that you cannot run if you select "Run Utilities and Diagnostics."

Keys

The following table shows the keys that you use to operate the Diagnostic Partition menus:

Press	To
F2	Refresh the screen
ESC	Go back to an item on a previous menu; also cancels an operation
ENTER	Select an item
↑	Move to the previous item
↓	Move to the next item
←	Go back to previous menu level
→	Go to next menu level

Getting Help

The following table provides a list of different types of help for the Diagnostic Partition:

Help Type	Description
Help for the current menu	The current menu displays a help message box at the top of the screen which outlines the menu options and their functions. A two-line help message displays at the bottom of the screen which provides more detailed information about each menu item.
"About" information for some utilities	For example, you can select "About Redirection" from the Remote Support menu to display a brief overview about console redirection.
Online documentation	Selecting this menu item displays or prints the server release notes.

Exiting from the Diagnostic Partition

To exit from the Diagnostic Partition:

1. Return to the Diagnostic Partition Main menu.
2. Select "Reboot System," and the system displays the "Reboot Now" message.
3. Press ENTER to reboot the server. If necessary, press ESC to cancel the reboot operation.

Using the Platform CD-ROM

When you receive your server, you receive a Platform CD-ROM that includes the configuration utility, diagnostics, and other configuration utilities.

The utilities that are on the CD-ROM also reside in the Diagnostic Partition. You can use the CD-ROM to:

- Install the Diagnostic Partition and the utilities that reside in it
- Run the utilities directly if the Diagnostic Partition has been corrupted or destroyed

  Note: Run configuration utilities from the CD-ROM only if other options are not available. Some of these utilities create backup files on disk. If you run them from CD-ROM, they either cannot create the necessary backup files or create them on a RAMDisk which is then lost at the next system boot.

Platform CD-ROM Contents

The Platform CD-ROM contains the following:

- Diagnostic Partition Installation utility
- System Configuration Utility (SCU)
- System diagnostics
- Adapter diagnostics
- BIOS Flash Utility
- BIOS Event Log utility
- Online documentation

Booting From the Platform CD-ROM

If you attempt to boot from the Diagnostic Partition and the Diagnostic Partition is missing, you must boot from the Platform CD-ROM to access maintenance software.

Important: When booting from the Platform CD-ROM, do not remove the CD-ROM until prompted on the screen. The system uses the Platform CD-ROM just like a hard disk, and it should not be removed while the server is executing from it.

To boot from the Platform CD-ROM:

1. Insert the Platform CD-ROM into the CD-ROM drive.

2. Turn on your video display monitor and your server or, if your server is already running, reboot your system.

   After selecting “Run CD Utilities and Diagnostics” from the MS-DOS Startup menu, if the Diagnostic Partition is not installed on your boot disk, the Diagnostic Partition Main menu displays:

   ```
   Install Partition
   Execute Utils from CD
   Online & Printed Docs
   ```

   If the Diagnostic Partition is installed, then the Diagnostic Partition Main menu, described in the following step, displays.

3. Select “Execute Utils from CD” and the Diagnostic Partition Main menu displays.

   ```
   System Config Utils
   Run Diagnostics
   BIOS Flash Utilities
   Reboot System
   Online and Printed Docs
   ```

   If you select “Run Diagnostics,” the system displays the Diagnostics Main menu.

   ```
   Run System Tests
   Run Adapter Tests
   Access BIOS Event Log
   ```

   Note: When booting the Diagnostic Partition from a new version of the Platform CD-ROM, the following menu displays:

   ```
   Upgrade SW
   View SW Version Info
   Don’t Upgrade
   ```

   Refer to the “Updating the Diagnostic Partition” section for further information.

Installing the Diagnostic Partition from Platform CD-ROM

As noted previously, the boot disk already contains a Diagnostic Partition when you receive your system. If you need to install the Diagnostic Partition (for example, if you replace the boot disk), you can do so using the Platform CD-ROM.

This section tells you how to install the Diagnostic Partition and the utilities that reside in it.

How to Know if You Need to Install

This section discusses messages which indicate to the user the presence or absence of the Diagnostic Partition.

- After you turn the power on and the server performs its Power-On Self-Test (POST) successfully, and if the Diagnostic Partition is present, the server displays the following message:

  ```
  Press <D> to boot Diagnostic Partition
  Press <F1> for normal boot, <F2> for BIOS Setup
  Otherwise, <F1> is selected in 30 seconds
  ```

- This message appears if BIOS does not detect the presence of the Diagnostic Partition:

  ```
  Diagnostic Partition is not present
  ```

  If you receive this message, you must boot from the Platform CD-ROM and install the Diagnostic Partition.

- If a Platform CD is installed, you receive the following message:

  ```
  Bootable CD detected; Diagnostic Partition will not be bootable.
  Press <F1> for normal boot, <F2> for BIOS Setup
  Otherwise, <F1> is selected in 30 seconds
  ```

Note: In the rare situation that the adapter BIOS scans run during POST detect an error (in adapter expansion ROMs), the system displays the following prompt:

```
Press <F1> for normal boot, <F2> for BIOS Setup, <F3> for previous screen
```

The following table shows your options in responding to the prompt.

If you...	Then...
Press the D key	The server boots to the Diagnostic Partition.
Press F1	With Diagnostic Partition installed, the server boots to your operating system environment. If booting from the Platform CD-ROM, the MS-DOS Startup Menu appears.
Press F2	The BIOS Setup Utility appears.
Press F3	The last 25 lines of the adapter BIOS scan messages appear.
Press a key other than D, F1, F2, or F3	The server ignores keystrokes other than D, F1, F2, or F3.
Do not respond to the prompt	The server boots to your normal operating environment after 30 seconds.

When the server “boots to your normal operating environment,” it boots the first device found in the Device Scan Order. See the related section in Chapter 5.

Requirements

Note the following requirements before installing the Diagnostic Partition on a disk:

- You must install the Diagnostic Partition on the first disk in your system [drive C: (80h)].
- The Diagnostic Partition requires approximately 64 MB of free space. You must install the Diagnostic Partition before you install your operating system or any other partition.
- The Diagnostic Partition must reside below 1 GB on the disk.

Diagnostic Partition/Platform CD-ROM Installation Procedure

To create the Diagnostic Partition and install the utilities from the Platform CD-ROM:

1. Insert the Platform CD-ROM into the CD-ROM drive.
2. Turn on your video display monitor and your server or, if your server is already running, reboot your system.

   The system displays the following message:

   ```
   Bootable CD detected; Diagnostic Partition will not be bootable
   Press <F1> for normal boot, <F2> for BIOS Setup
   Otherwise, <F1> is selected in 30 seconds
   ```

3. Press F1 or wait 30 seconds. The MS-DOS Startup Menu displays these options:

   ```
   1. Run CD Utilities and Diagnostics (Default - Press “Enter” to accept)
   2. Run Additional Diagnostics
   ```

   Note: If this menu does not display, there may be a problem with your SCSI configuration or your hardware configuration.

   The following configuration items are required to boot from CD-ROM:

   – SCSI ROM BIOS Scan: Enabled (set via configuration utility or BIOS Setup utility)
   – Host Adapter BIOS: Enabled (set via SCSI*Select* Utility)
   – BIOS Support for Bootable CD-ROM: Enabled (set via SCSI*Select* Utility)

   Refer to Chapter 5, “Configuring Adapters,” for additional information**.**

4. Select “Run CD Utilities and Diagnostics” to display the CD-ROM Main menu. This menu contains the following three choices:

   ```
   Install Partition
   Execute Utils from CD
   Online & Printed Docs
   ```

5. Select “Install Partition.”
6. When the next menu displays, select “Execute DP Install.”

   Note: If an error occurs during the installation of the Diagnostic Partition, you must run **fdisk** manually. The menu notifies you if the Diagnostic Partition installed successfully. Refer to the following section, “Lack of Disk Space/Run fdisk Manually,” for information on running **fdisk** manually.

7. Select “Continue.”

   During the installation, follow the instructions on your screen. If your disk has sufficient space to install the Diagnostic Partition, the installation utility performs the following actions:

   a. Creates the Diagnostic Partition using the **fdisk** utility.

   b. Prompts you to reboot the system.

      Note: The system automatically returns you to the Diagnostic Partition after rebooting. You do not need to press any keys or make any selections.

   The menus should tell you that the Diagnostic Partition is present, but needs to be formatted.

8. Select “Continue” from the pop-up menu to format the Diagnostic Partition.

   A new menu displays that tells you that the Diagnostic Partition is ready to be populated with the system files.

9. Select “Continue” to copy DOS files to the Diagnostic Partition.

   The installation utility copies the system diagnostic and configuration utility files to the Diagnostic Partition. This process can take up to 5 minutes.

   A screen displays that tells you to remove the platform CD-ROM and that the installation is complete. At this point the installation is successful.

10. Reboot the system, from the pop-up menu, after you confirm the prompt to remove the CD-ROM and reboot the system.

    If your disk does not have sufficient space, the system informs you that you must run the **fdisk** utility manually. See the following section for more information.

Lack of Disk Space/Run fdisk Manually

If there is not enough free space on your disk below 2 GB (1 GB for Mylex), you receive an error when you attempt to install the Diagnostic Partition.

You must then perform the following procedure.

CAUTION: This procedure erases all operating system and data files on the disk. You must re-install your operating system and restore the data files after you complete the procedure.

1. Exit from the Diagnostic Partition installation procedure and backup all operating system and data files on the disk.

   Refer to your operating system documentation for additional information about performing a backup.

2. Insert the Platform CD-ROM into the CD-ROM drive.

3. Turn on your video display monitor and your server or, if your server is already running, reboot your system.

   The system displays the following message:

   ```
   Bootable CD detected; Diagnostic Partition will not be bootable
   Press <F1> for normal boot, <F2> for BIOS Setup
   Otherwise, <F1> is selected in 30 seconds
   ```

4. Press F1 to boot from Platform CD-ROM.

   The server displays the MS-DOS Startup menu.

5. Select “Run CD Utilities and Diagnostics,” and the CD-ROM Main menu displays.

6. Select “Install Partition.”
7. Select “Execute DP Install.”

   The system informs you that you must run the **fdisk** utility manually.
8. Select “Continue.”
9. Select “Run FDISK Manually” and press ENTER.
10. Select **fdisk** option 5, “Change current fixed disk drive,” and press ENTER.
11. Select “Fixed Disk Drive number 2” and press ENTER. (The CD-ROM is drive #1, the hard disk is drive #2.)
12. Select option 4, “Display Partition Information,” to display disk information if necessary, press ENTER, and then press ESC.
13. Select option 3, “Delete Partition or Logical DOS Drive,” and press ENTER.
14. Select from options 1 through 4 to delete all partitions on the drive. The Diagnostic Partition is identified as a “non-DOS partition.”
15. Type the partition you want to delete and the volume label (if necessary) and press ENTER.
16. Type Y to delete the partition, press ENTER, and then press ESC. Repeat Step 13 and Step 14 for any other partitions on the disk. **fdisk** tells you if the partition was deleted successfully

    Note: Do not create the Diagnostic Partition manually. Exit **fdisk** and resume the auto-install process.
17. Exit from **fdisk** when you finish deleting partitions. Select “Resume Auto-Install” to resume the automatic installation process, and follow the instructions when prompted.
18. Restore or re-install your operating system and data files.

Updating the Diagnostic Partition

When new releases of the Diagnostic Partition utilities become available, you should update them on your hard drive. This section tells you how to update the Diagnostic Partition.

Before you update the Diagnostic Partition make sure you have an up-to-date backup diskette of your configuration utility (refer to the "Creating a Configuration Utility Backup Diskette" section Chapter 3 for additional information).

A configuration backup diskette is needed in the event of a catastrophic system failure during the Diagnostic Partition update. The current version of the Diagnostic Partition can be reinstalled and the backup diskette used to reinstate the system configuration data. Otherwise, manual reconfiguration will be required.

Release Updates

Release updates to the Diagnostic Partition are distributed on a new version of the Platform CD-ROM. An important update (for example, to flash firmware) might be released on diskette or via the World Wide Web between releases of the Platform CD-ROM.

Diagnostic Partition Update Procedure

To update the Diagnostic Partition to a new release of the Platform CD-ROM:

1. Turn on your video display monitor and your server or, if your server is already running, reboot. Insert the new release of the Platform CD-ROM into the CD-ROM drive, and reboot.

   Note: You must insert the Platform CD-ROM before the Adaptec BIOS scans for the CD.

2. The system displays the following message:

   ```
   Bootable CD detected; Diagnostic Partition will not be bootable
   Press <F1> for normal boot, <F2> for BIOS Setup
   Otherwise, <F1> is selected in 30 seconds
   ```

3. The MS-DOS Startup menu displays.

4. Select "Run CD Utilities and Diagnostics," and the server checks the Platform CD-ROM version against the current version of the Diagnostic Partition utilities and displays the Automatic Upgrade of Diagnostic Partition menu.

5. When prompted, select "Upgrade SW."

   The update utility copies the new versions of the diagnostic and configuration utilities to the Diagnostic Partition. Remove the Platform CD-ROM and any floppy disks from their drives.

6. Select "Reboot Now."

After Completing the Diagnostic Partition Update

After updating the Diagnostic Partition you must:

- Save the new configuration to the *.cms* file
- Create a new configuration utility backup diskette
- Create a new BIOS Flash recovery diskette

Saving the updated configuration file (*.cms* file) to a configuration utility backup diskette ensures that the system configuration can be restored using the updated Diagnostic Partition.

Save the New Configuration

To save the new configuration:

1. Boot to the Diagnostic Partition.
2. When the MS-DOS Startup menu displays, select “Run Utilities and Diagnostics” and press ENTER.
3. Select “System Config Utils” from the Diagnostic Partition Main menu.
4. When the SCU Menu displays, select “Execute SCU.” At the SCU main screen, press any key to continue.
5. Select “Step 4: Save Configuration” to save the new configuration and to create a new *backup.cms* file.

   The Password Menu displays. To exit, press ESC. To set a password, refer to the “Setting Passwords” section of Chapter 3.
6. Select “Step 6: Exit” to exit the utility.
7. Press any key to return to the Diagnostic Partition menu.

Create a Configuration Utility Backup Diskette

To create a backup diskette of the system configuration:

1. Boot to the Diagnostic Partition.
2. When the MS-DOS Startup menu displays, select “Run Utilities and Diagnostics” and press ENTER.
3. Select “System Config Utils” from the Diagnostic Partition Main menu.
4. When the SCU Menu displays, select “Create SCU Backup.”
5. Insert a diskette in the diskette drive and press ENTER. The system copies the *backup.cms* file containing the current configuration to the diskette.
6. At the “Format Another (Y/N)” prompt, type N and press ENTER.
7. Label your diskette and press ESC to continue.

Create a New BIOS Flash Recovery Diskette

To create a backup BIOS Flash Recovery diskette:

1. Boot to the Diagnostic Partition.
2. When the MS-DOS Startup menu displays, select “Run Utilities and Diagnostics” and press ENTER.
3. When the Diagnostic Partition Main menu displays, select “BIOS Flash Utilities” and press ENTER.
4. When the BIOS Flash Menu displays, select “Create Flash Backup” and press ENTER.
5. Insert a diskette into the server diskette drive.
6. Press ENTER.

The system formats the diskette and copies the BIOS Flash Recovery Utility to it.

7. At the “Format Another (Y/N)” prompt, type N and press ENTER.
8. Label your diskette and press ESC to continue.

Deleting the Diagnostic Partition

Removing the Diagnostic Partition from a server running Windows NT Server can cause NT boot problems.

If you must remove the Diagnostic Partition from a server running Windows NT Server, perform the following tasks:

- Reformat the drive.
- Reinstall the Diagnostic Partition.
- Reinstall the NT operating system and data files.

IMPORTANT: The Diagnostic Partition is required to perform support and service of your system. It is strongly recommended that you do **not** remove the Diagnostic Partition.

Chapter 3

Using the Diagnostic Partition

This chapter contains illustrations of the Diagnostic Partition menus, descriptions of the menu options, and information on configuring your server using the System Configuration Utility (SCU). The chapter is organized as follows:

- Diagnostic Partition menus and options
- Diagnostic Partition CD main menu
- Diagnostic Partition main menu
- Diagnostic Partition SCU menu
- Diagnostic Partition diagnostics menu
- Diagnostic Partition BIOS flash menu
- Diagnostic Partition reboot system menu
- Diagnostic Partition online and printed documentation menu
- Configuring your server
- PCI configuration options
- Saving a configuration
- Restoring a configuration
- Security settings and system boot
- Performing common Diagnostic Partition tasks

Note: Read Chapter 2, “Diagnostic Partition Overview and Installation,” for information on the contents of the Diagnostic Partition and how to access it.

Terms, Conventions, and Related Documents

Refer to the “Preface” of this document for important information on how to use this book, terms and conventions, and related documents.

When used in this chapter, the term “configuration utility” refers to the System Configuration Utility (SCU).

Menu names appear at the top left of the screen.

When using the software, notice that default settings for menu options display in bold.

On the Diagnostic Partition menus, user-selectable options display in black. Parameters that appear only for your information display in blue.

Diagnostic Partition Menus and Options

This section briefly describes the options you can select from the Diagnostic Partition menus.

The MS-DOS Startup menu displays when you boot from the Diagnostic Partition or from the Platform CD-ROM. This menu contains the options listed in the following table:

MS-DOS Startup Menu Item	Description
Run Utilities and Diagnostics [Default]*	Perform configuration and administrative functions; run system diagnostics, SCSI diagnostics, and other adapter diagnostics. Displays the Diagnostic Partition Main menu.
Run CD Utilities and Diagnostics (only appears when you boot from the Platform CD-ROM)	Perform configuration and administrative functions; run system diagnostics, SCSI diagnostics, and other adapter diagnostics. Displays the CD Main menu.
Run Additional Diagnostics	Run additional SCSI Adaptec diagnostics. Loads SCSI drivers to enable running of additional SCSI diagnostics. Displays the Diagnostics Main menu.

* If you select this option after booting from the Platform CD-ROM and when the Diagnostic Partition is not resident, the CD Main Menu appears. Refer to the following section for more information.

The Diagnostic Partition creates a different run-time environment depending on the MS-DOS Startup menu option you select. You cannot switch between these environments without rebooting the Diagnostic Partition.

If you do not select an option within 20 seconds, the system selects “Run Utilities and Diagnostics” and displays the Diagnostic Partition Main menu.

CD Main Menu (CD Only, Diagnostic Partition Not Installed)

The CD Main menu displays when you boot from the Platform CD-ROM, the Diagnostic Partition is not installed on your boot disk, and you select “Run Utilities and Diagnostics” from the MS-DOS Startup menu.

The CD Main menu contains the following options:

Menu Item	Description
Install Partition	Install the Diagnostic Partition. Displays the Diagnostic Partition Install Partition menu. Refer to the following section for more information.
Execute Utils From CD	Display the Main menu, with the Install Partition option.
Online & Printed Docs	View or print online documentation. Displays the Online & Printed Docs menu.

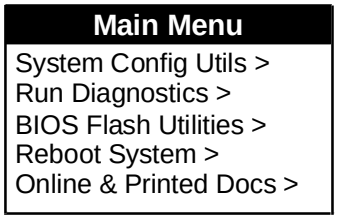
Install Partition Menu

This menu displays when you select “Install Partition” from the CD Main menu. The following table describes the menu options.

Menu Item	Description
Execute DP Install	Begin installing the Diagnostic Partition and the utilities that reside in it.
About DP Install	Display a help message that provides a brief description of how the Diagnostic Partition is installed.

Diagnostic Partition Main Menu

The Main menu displays when you select “Run Utilities and Diagnostics” from the MS-DOS Startup menu. It also displays if you do not make a selection from the MS-DOS Startup menu within 20 seconds.



The following table describes the Diagnostic Partition Main menu options.

Menu Item	Description
System Config Utils	Run the System Configuration Utility (SCU), run Adapter Configuration Utilities, make a SCU backup diskette, or view and edit system configuration, setup, and version information. Displays “SCU Menu - Disk Based.” It is recommended that you run the SCU from the Diagnostic Partition whenever possible. To read about other methods for starting the SCU, refer to the “Starting the SCU” section that follows. For information on these menu options, refer to the “Diagnostic Partition SCU Menu” section.
Run Diagnostics	Run system and adapter diagnostics. Displays “Diagnostics Menu–Disk Based.”
BIOS Flash Utilities	Run the BIOS Flash Utility, create a backup diskette, or learn more about BIOS Flash. Displays “BIOS Flash Menu–Disk Based.”
Reboot System	Reboot the server. Leads to the “Reboot Now” submenu requesting confirmation of the command.
Online & Printed Docs	Access product release notes and view information about the Diagnostic Partition. Displays “Online & Printed Docs” menu.

Starting the SCU

It is recommended that you run the SCU from the Diagnostic Partition whenever possible. If the Diagnostic Partition is not available, the next best option is to run the SCU from diskette. Run the SCU from the Platform CD-ROM only if both the Diagnostic Partition and SCU diskette are not available. Following are the procedures for starting the SCU from diskette or CD-ROM.

Starting the SCU from Diskette

Note: Before performing this procedure, you must first create a bootable SCU diskette. See “Create SCU Backup” in this chapter for details.

To start the SCU from the backup diskette:

1. Insert the SCU backup diskette into the A: drive.
2. Turn on the video display monitor and the server or, if the server is already running, press the reset push-button switch or press CTRL+ALT+DEL to reboot the system from the diskette.

When the BIOS POST process has completed, the system displays the following prompt:

```
Press <D> to boot Diagnostic Partition
Press <F1> for normal boot, <F2> for BIOS Setup
Otherwise, <F1> is selected in 30 seconds
```

3. Press any key other than D or F2 to select normal boot.
4. The MS-DOS Startup menu displays with the following options:

   1. Execute AMISCU
   2. Execute AMISCU For System With PNP OS

   Press 1 to execute the SCU. If you do not take action within 10 seconds, the SCU begins execution.
5. When the SCU title screen displays, press any key to load and execute the SCU.
6. Proceed to "SCU Menu Options" later in this chapter.

Starting the SCU from CD-ROM

To start the SCU from CD-ROM:

1. Insert the Platform CD-ROM into the CD-ROM drive.
2. Turn on the monitor and the server or, if your system is already running, reboot it.

   When the BIOS POST process has completed, the system displays the following prompt:

```
Bootable CD detected; Diagnostic Partition will not be bootable.
Press <F1> for normal boot, <F2> for BIOS Setup
Otherwise, <F1> is selected in 30 seconds
```

3. Press F1 to select normal boot.
4. When the MS-DOS Startup menu displays, select "Run Utilities and Diagnostics" and press ENTER.
5. When the CD-ROM Main menu displays, select "System Config Utils" and press ENTER.
6. When the SCU Menu displays, select "Execute SCU" and press ENTER.
7. When the SCU title screen displays, press any key to load and execute the SCU.
8. Proceed to the next section, "SCU Menu."

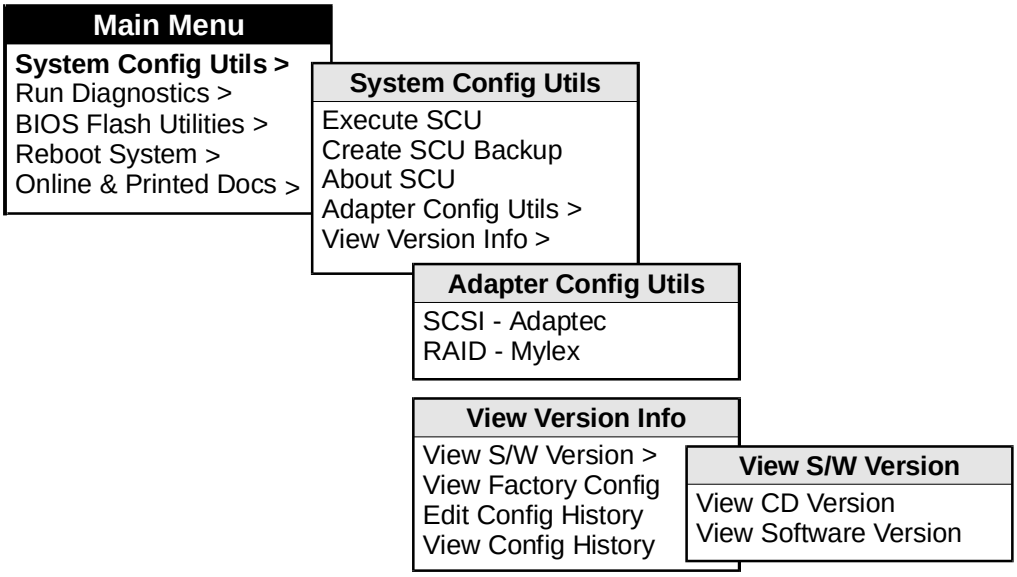
If the CD-ROM does not boot in Step 3, you need to enable BIOS support in the SCSI*Select* Utility. Reboot the system and press CTRL+A when prompted to start the SCSI*Select* Utility. For each bus:device, following the steps below.

1. At the SCSI*Select* Main Menu, select bus:device and press ENTER.
2. Select the "Configure/View Host Adapter Settings" option and press ENTER.
3. When the Configuration Menu appears, select "Advanced Configuration Options." Press ENTER.
4. When the Advanced Configuration Options menu appears, enable the "BIOS Support For Bootable CD-ROM" option. Press ENTER.
5. Enable the "BIOS Support for INT13 Extension" option and press ENTER.
6. Press ESC three times to return to the Main Menu.
7. Repeat these steps for each bus:device on your system. Press ESC twice and select "Yes" to exit utility.

Note: If you are still unable to boot your server, contact your customer service representative.

Diagnostic Partition SCU Menu

A menu offering system configuration utilities displays when you select “System Config Utils” from the Diagnostic Partition Main menu.



The following table describes the SCU Menu options.

Menu Item	Description
Execute SCU	Run the System Configuration Utility (SCU) to configure your primary and secondary system boards and adapters. For details on configuring a server after executing the SCU, refer to the “Configuring Your Server” section later in this chapter.
Create SCU Backup	Create a diskette backup copy of the SCU, including all data and *.cfg* files (strongly recommended). You can run the SCU from this diskette if the Diagnostic Partition is not available. To read about the procedure to create a backup of your configuration utility, refer to the “Create a SCU Backup” section. **IMPORTANT:** This selection is to be used solely for data backup purposes. You are not authorized to copy the program files, nor to use this backup diskette on any other system.
About SCU	Information about what the SCU is, and why you need it.
Adapter Config Utils	Run adapter-specific configuration utilities for Adaptec and Mylex. Displays “Adapter Configuration Utilities” menu. See the “Adapter Configuration Utilities Menu” section for additional information.
View Version Info	Display version information for the Diagnostic Partition, review the factory configuration of your server, or view/edit the system configuration history file. See the “View Version Info Menu” section for additional information.

After selecting the “Execute SCU” option, see the “Configuring Your Server” section later in this chapter for detailed information about using the SCU to configure your system, in addition to information on configuration options and saving and restoring a configuration.

Create SCU Backup

It is strongly recommended that you create a SCU backup diskette. A SCU backup diskette enables you to do the following:

- Run the SCU if the Diagnostic Partition and Platform CD-ROM are unavailable from the SCU backup diskette
- Restore your current system configuration information

When you create a SCU backup diskette, the system copies the SCU and the current configuration to the diskette. Therefore, we recommend that you create a new SCU backup diskette each time you change and save your system configuration.

IMPORTANT: The SCU backup diskette is to be used solely for data backup purposes. You are not authorized to copy the program files, nor to use this backup diskette on any other system.

Procedure to Create SCU Backup

To create a SCU backup diskette from the SCU Menu:

1. When the SCU Menu displays, select “Create SCU Backup” and press ENTER.
2. Insert the diskette with the “Configuration Utility” label in the diskette drive and press ENTER.
3. Remove diskette from the drive. Write in SCU version number on the label.

The system copies the SCU and the current configuration to the diskette.

Adapter Configuration Utilities Menu

This menu displays when you select “Adapter Config Utils” from the SCU Menu. It contains the following options:

Menu Item	Description
SCSI - Adaptec	Execute the Adaptec SCSI*Select* configuration utility for Adaptec SCSI controllers integrated on the system boards.
RAID - Mylex	Execute the DACCFG configuration utility for the Mylex RAID controller.

View Version Info Menu

This menu displays when you select “View Version Info” from the SCU Menu. It contains the following options:

Menu Item	Description
View S/W Version	Use to display CD and Diagnostic Partition utilities version information. Refer to the “View S/W Version Menu” section.
View Factory Config	Use to view a file that contains the original factory configuration.
Edit Config History	Use to change the information in the original factory-configuration file when you install or remove components to include new configuration information. The revised configuration information is saved to a new file. Not available remotely.
View Config History	Use to view the original factory-configuration information and any changes that have been made.

View S/W Version Menu

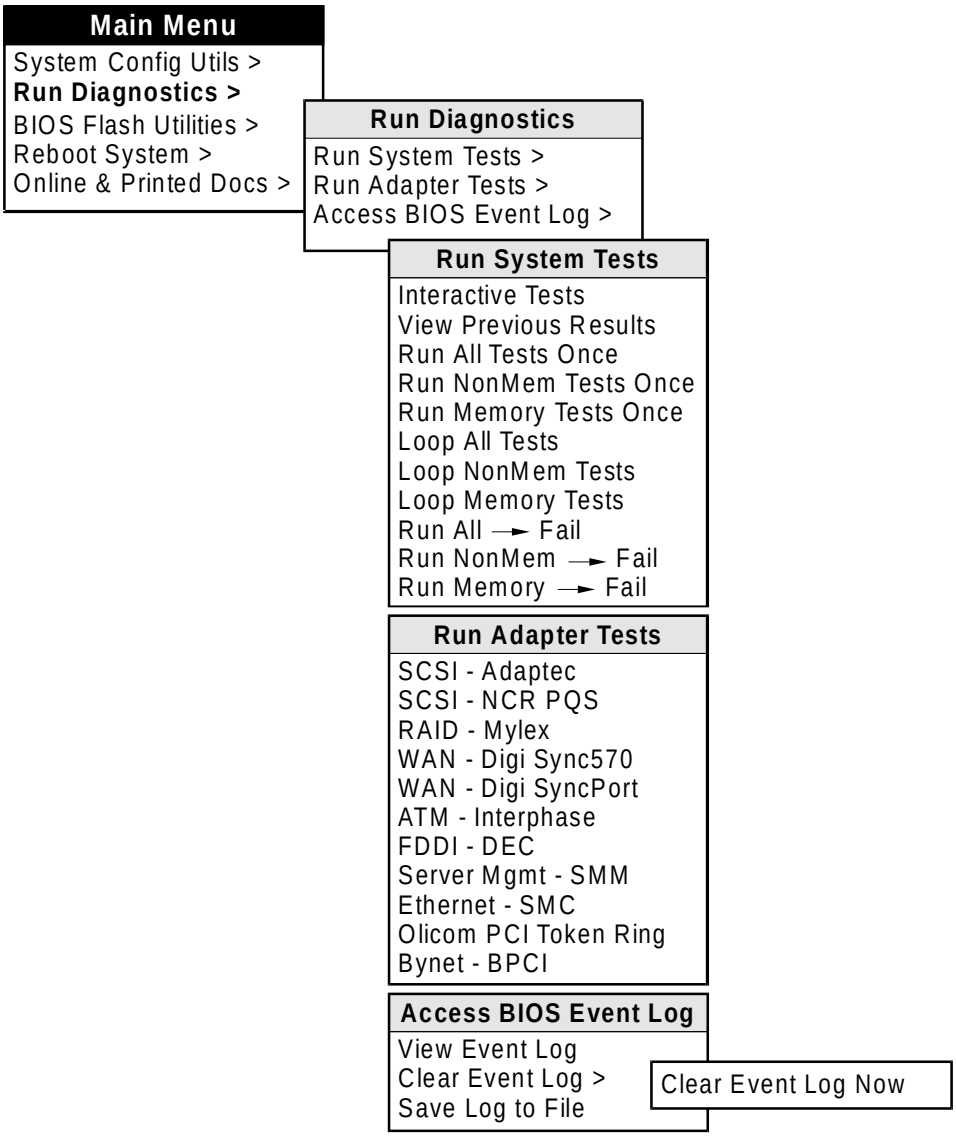
This menu displays when you select “View S/W Version” from the View Version Info menu. The following table lists the menu options:

Menu Item	Description
View CD Version	Use to display the version, description, and date of the Diagnostic Partition on the Platform CD-ROM.
View Software Version	Display version, date, and description about the software installed in the CD or Diagnostic Partition (for example, BIOS, SCU, AMIDiag).

The “Configuring Your Server” section later in this chapter explains the functionality of the System Configuration Utility (SCU).

Diagnostic Partition Diagnostics Menu

This menu displays when you select “Run Diagnostics” from the Main menu.



The following table describes the menu options:

Menu Item	Description
Run System Tests	Run system diagnostics on the system board and cabinet electronics. Displays the “System Diagnostics” menu (in AMIDiag) from which you can select the type of tests to run.
Run Adapter Tests	Run diagnostics for built-in SCSI devices and for PCI, ISA, and EISA adapter cards. Displays the “Other Diagnostics” menu.
Access BIOS Event Log	Run utilities to view, clear, or save the event and error log. Displays the “Event Log Utilities” menu, which permits you to view or clear the BIOS Event Log or save it to a file.

System Diagnostics Menu

This menu displays when you select “Run System Tests” from the Diagnostics Menu. You must scroll down to see the full list of options. The System Diagnostics menu contains the following options:

Menu Item	Description
Interactive Tests	Run user-specified diagnostic tests in interactive mode.
View Previous Results	View the results of previous system diagnostic tests.
Run All Tests Once	Run all system diagnostic tests once.
Run NonMem Tests Once	Run all non-memory system diagnostic tests once.
Run Memory Tests Once	Run memory-related system diagnostic tests once.
Loop Memory Tests Once	Run memory-related system diagnostic tests continuously.
Loop All Tests	Run all system diagnostic tests continuously.
Loop Non-Mem Tests	Run all non-memory system diagnostic tests continuously.
Loop Memory Tests	Run all memory-related system diagnostic tests continuously.
Run All -> Fail	Run all system diagnostic tests until there is a failure.
Run Non-Mem -> Fail	Run all non-memory system diagnostic tests until there is a failure.
Run Memory -> Fail	Run memory-related system diagnostic tests until there is a failure.

For more information on the menu options above, refer to the *AMIDiag User’s Guide*.

Other Diagnostics Menu

This menu displays when you select “Run Adapter Tests” from the Diagnostics menu. It contains the following options:

Menu Item	Description
SCSI - Adaptec	Run the Adaptec SCSI*Select* diagnostic and configuration utilities for controllers integrated on the system boards.
SCSI - NCR PQS	Run diagnostics for PCI Quad SCSI (PQS) controller.
RAID - Mylex	Run diagnostic and configuration utilities for the Mylex DAC960 controller.
WAN - Digi Sync570	Run diagnostics for Digiboard Sync570 series adapters.
WAN - Digi SyncPort	Run diagnostics for Digiboard PCI SyncPort adapters.
ATM - Interphase	Run diagnostics for Interphase ATM adapters.
FDDI - DEC	Run diagnostics for DEC FDDI adapters.
Server Mgmt - SMM	Run diagnostics for Intel Server Management Module adapter.
Ethernet - SMC	Run diagnostics for SMC Ethernet adapters.
Token Ring - Olicom PCI	Run diagnostics for Olicom PCI Token Ring adapters.
BYNET - BPCI	Run diagnostics for BYNET - BPCI adapters.

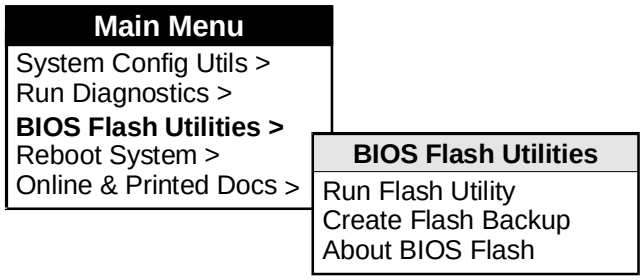
Access BIOS Event Log Menu

This menu displays when you select “Access BIOS Event Log” from the Diagnostics Menu. It contains the following options:

Menu Item	Description
View Event Log	View the BIOS event and error log.
Clear Event Log	Clear all entries from the BIOS event and error log. Leads to the “Clear Event Log Now” submenu requesting confirmation of the command.
Save Log to File	Save the BIOS event and error log to a file.

Diagnostic Partition BIOS Flash Menu

The BIOS Flash Menu displays when you select “BIOS Flash Utilities” from the Main menu.

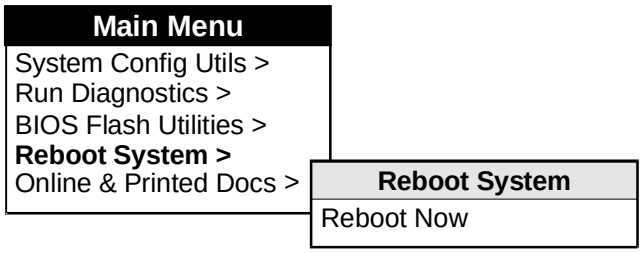


The following table describes the BIOS Flash Menu options.

Menu Item	Description
Run Flash Utility	Run the BIOS Flash Utility to update the BIOS code on your server.
Create Flash Backup	Create a BIOS Flash backup diskette with all BIOS image and recovery files (mandatory). You can run the BIOS Flash Utility from this diskette if the Diagnostic Partition is unavailable. **IMPORTANT:** This selection is to be used solely for BIOS Flash backup purposes in the event you need to perform a Flash recovery operation. You are not authorized to copy program files, nor to use this backup diskette on any other system.
About BIOS Flash	Information about the BIOS Flash Utility and why you need it.

Diagnostic Partition Reboot System Menu

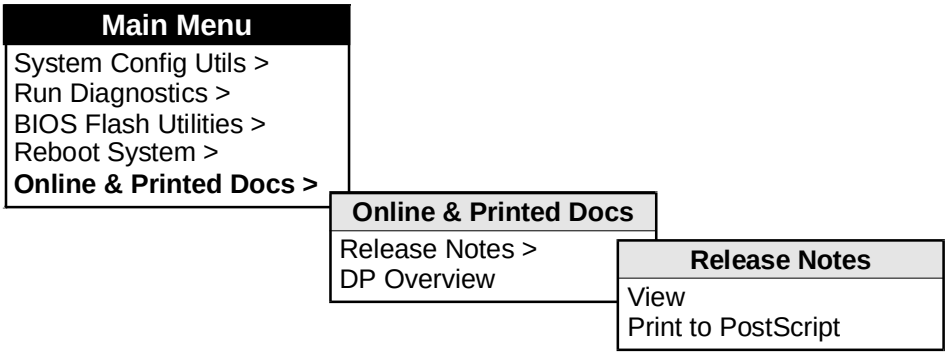
The Reboot Now confirmation message appears when you select Reboot System from the Main menu.



This option lets you reboot your system immediately. Press ESC to cancel.

Diagnostic Partition Online & Printed Docs Menu

The Online & Printed Docs menu displays when you select “Online & Printed Docs” from the Main menu.



The following table describes the Online & Printed Docs menu options.

Menu Item	Description
Release Notes	Displays the Release Notes menu, which permits you to view or print the Diagnostic Partition Release Notes.
DP Overview	Information about what the Diagnostic Partition is, and why you need it.

Release Notes Menu

The following tables describes the menu options on the Release Notes menu.

Menu Item	Description
View	View the server release notes.
Print to PostScript	Print the server release notes to a PostScript printer on LPT1.

Configuring Your Server

This section contains the following information about using the System Configuration Utility (SCU) to configure your server:

- Using the System Configuration Utility
- Setting Passwords
- SCU Menu Options
- Adding/Removing Boards
- Interrupt Sharing
- Changing Configuration Settings
- System Board Configuration Options

Using the System Configuration Utility (SCU)

The SCU lets you check or change your server's configuration. The SCU is PCI-aware and complies with both EISA and ISA plug-and-play standards.

You must run the SCU each time you:

- Add a board
- Remove a board
- Change the resource settings of an add-in board or the system board's PC-compatible hardware

SCU Considerations

Note the following important considerations when running the SCU:

- The default SCU directory on the Diagnostic Partition is *\model2\scu*.
- After you save a configuration, **always** exit the SCU and reboot your server. Within the same SCU session, the program does not allow you to edit any settings after a "Save" operation. Do not exit, re-enter the SCU, and make additional changes to the configuration without rebooting.
- When running the SCU from the Platform CD-ROM and you want to view jumper settings, save any configuration changes by selecting step 4. This step creates an **.inf* file, which is required to view jumper settings.
- If you run the SCU from diskette, do not remove the SCU diskette from the drive until the program either has completely exited and returned you to the DOS prompt or has begun a reboot sequence. Virtual files are stored on the diskette while the program is running. These are used and cleaned up while the SCU is exiting.
- We recommend that you run the SCU from the Platform CD-ROM only if the Diagnostic Partition is unavailable and you cannot run the SCU from diskette. When running from the CD-ROM, the SCU cannot create a permanent backup of the system configuration. See "Starting the SCU" later in this chapter.
- We recommend that you save the SCU and the current system configuration to diskette. This enables you to recover the configuration in the event that both the Diagnostic Partition and CD-ROM are unavailable. See the "Create SCU Backup" section for details.

.cfg Files

All EISA and some ISA add-in boards come with a diskette that contains a configuration (*.cfg*) file. This file describes the board's characteristics and the system resources that it requires. The configuration registers on PCI and plug-and-play add-in boards contain the same type of information that a *.cfg* file does. The system board also comes with a *.cfg* file, and there are other *.cfg* files residing in the *\model2\scu* directory.

The SCU uses the following information to specify a system configuration:

- *.cfg* files
- configuration registers
- non-volatile RAM
- plug-and-play BIOS calls
- the information that you enter.

It configures the system by writing the configuration information to non-volatile memory.

Storing Configuration Values

The SCU stores all configuration values in the battery-maintained storage space of the real-time clock/calendar (RTC). The SCU stores the system board configuration in PC-compatible CMOS RAM and the expansion board configuration in extended Non-Volatile RAM (NVRAM). Both of these storage areas are located physically on the same RTC part.

These values take effect when you boot the system. POST checks the values against the actual hardware configuration; if they do not agree, it generates a configuration error message. You must then run the SCU to specify the correct configuration before the system boots.

CMOS RAM and NVRAM

You must use the SCU to configure your server and its add-in boards. You cannot use the BIOS Setup Utility to do this.

The SCU modifies the CMOS RAM and NVRAM. The BIOS POST routines actually configure the hardware.

The SCU always updates a checksum for both areas so that the BIOS can detect any potential data corruption before the actual hardware configuration takes place. If the data is corrupted, the BIOS resets your configuration to defaults, then requests that you re-configure the system before it can boot.

Note: ISA adapters are not detected by BIOS.

Setting Passwords

When you select steps 2, 3, or 4 from the SCU Menu for the first time, several informational messages display, followed by a window for entering an administrative password. At this Password menu:

Condition	User Action
If no administrative password is defined for your system	Press ESC to exit this window *or* set a password
If this is the first time that you are entering the configuration section of the SCU	Press ESC to exit *or* you can set an administrative password here if desired.
If an administrative password is defined	Enter correct password and press ENTER.

You may enter up to seven alphanumeric characters for a user or administrative password. An administrative password set in either the SCU or BIOS Setup Utility is required whenever you open either utility. For information on settings passwords in BIOS Setup, refer to Chapter 4.

SCU Menu Options

When you select "Execute SCU" from the Diagnostic Partition Main menu, the System Configuration Utility title screen appears. Press ENTER to continue. The SCU Menu displays the following options:

Step 1: About System Configuration
Step 2: Add and Remove Boards
Step 3: Change Configuration Settings
Step 4: Save Configuration
Step 5: View Switch/Jumper Settings
Step 6: Exit

Note: To select an item, use one of the following methods: (1) press ↑ or ↓ to highlight an item and press ENTER; (2) type the step number (1-6) and press ENTER; or (3) if you are using a mouse, point to an item and click the left button. (You must install and start a mouse driver; no driver is provided on the Diagnostic Partition.) Press F1 at any time for help about a selection.

- Select "Step 1: About System Configuration" for information about setting up your computer and how configuration utilities work.
- Select "Step 2: Add and Remove Boards" if adding or removing EISA or ISA boards. See the "Adding/Removing Boards" section that follows. Most boards are automatically detected and added by the SCU.
- Select "Step 3: Change Configuration Settings":
  - to inspect or change the settings of EISA/ISA devices, PCI devices, or system board configurations. If you skip this step, all settings remain set to their default state. Selecting a system board for configuration brings up a large set of options. These options are shown in tables in the "System Board Configuration Options" section later in this chapter.
  - if any adapters are added, moved or removed from the system; this step verifies the adapters' resource settings manually. Also, verify the settings of any adapters whose resources are not locked. These resources may have been modified by the SCU when trying to accommodate a new, moved, or removed adapter.

  Refer to the "Changing Configuration Settings" section in this chapter for more information.

- Always select “Step 4: Save Configuration” after making any changes in the SCU, before exiting the utility. This step saves the configuration settings to non-volatile RAM and into a backup file (the *.cms* file) .

  Note: System board and EISA/ISA adapter configuration settings are written to the *ncc01ac.set* file in the *\model2\scu* directory in the Diagnostic Partition (and the SCU backup diskette). You can use this ASCII file to view or save a current image of your configuration. To view the file, use the DOS *type* and *more* commands:

  ```
  type ncc01ac.set | more
  ```

  PCI-related information in the *ncc01ac.set* file is minimal. Only the slot and board identification are provided. This is due to the fact that a *.cfg* file is not used with PCI devices. The *.cfg* file is the basis for the information in the *ncc01ac.set* file.

  Refer to the “Saving a Configuration” section in this chapter for additional information.

- Select “Step 5: View Switch/Jumper Settings” to view:

  – switches, jumpers, software statements, and connector statements. Software statements are generated by boards that require special drivers or other software to be loaded. Connector statements are read from a *.cfg* file and inform the user about cabling for an adapter. For example, “Floppy Connector, J8 Top Middle.” board information including logical slot, ID, board name, manufacturer, category, and board slot type.

  – the system Global Resource Map and how IRQ, DMA, port, and memory resources are allocated.

  You can save the displayed information to a file or print it by pressing F7.

- Select “Step 6: Exit” to exit the SCU.

Adding/Removing Boards

Use the "Step 2: Add and Remove Boards" selection when adding, removing, or moving adapter boards in the server. Perform this function when defining or modifying ISA board slot locations. The system automatically senses a change in the configuration when PCI, ISA plug-and-play, or EISA adapters are added, moved, or removed.

Note: Before adding, moving, or removing any boards, lock the resource settings for all adapters which should not be modified to accommodate the new board configuration. Refer to the "Changing Configuration Information" section of this chapter for more information.

When you select steps 2, 3, or 4 from the SCU Menu for the first time, several informational messages display, followed by a Password Menu window for entering an administrative password. Refer to the "Setting Passwords" section for more information on setting user or administrative passwords.

Add and Remove Boards Option

When you choose "Step 2: Add and Remove Boards" from the SCU Menu, the Add and Remove Boards screen appears. The two selections which display, at a minimum, are:

- System Board
- PCI Manager

The screen also displays, by name, all EISA and ISA adapters previously added to the system through this option.

To add a board:

- Press the INSERT key. A list displays of available *.cfg* files for all adapters. Select the applicable board from the list provided. Press ENTER and provide system-prompted information.
- You may also add a *.cfg* file from a floppy: use the TAB key to return to the prompt box at the top of the screen. Type:

  `a:\*.cfg.`

  Use the arrow keys to select the appropriate *.cfg* file and press ENTER.

To remove a board:

- Highlight a board on the Add and Remove Boards screen and press the DELETE key.

To change slot positions for add-in boards:

- Highlight the board name and press F7.

When adding an adapter to your server, have the board's *.cfg* file available or already copied to your SCU diskette (or to the *\model2\scu* directory on the Diagnostic Partition). The *.cfg* file identifies the add-in adapter's characteristics and resource requirements.

The PCI Manager option is not available under the "Add and Remove Boards" option.

The following sections provide specific information on adding ISA, EISA, and PCI adapters and discuss interrupt (IRQ) sharing.

Adding ISA Adapters

When adding an ISA adapter to your system, first execute the SCU to configure and account for the ISA card resources. After running the SCU, you can then physically add the card to your server, inserting it into one of the available EISA/ISA slots. Running the SCU first is done to ensure resources (such as IRQ or memory) are available for the card, since resource settings are limited for ISA cards.

For almost all ISA boards, multiple jumpers must be set to define IRQ, DMA, and I/O address settings. It is wise to double-check the ISA card's documentation to understand completely the board's capabilities and available resource settings before executing the SCU.

If your ISA adapter has a *.cfg* file, use the procedure to add a board detailed in the previous section. If the adapter does not have a *.cfg* file, refer to the following section.

When an ISA Adapter Has no *.cfg* File

If your ISA adapter does not have a *.cfg* file, then perform the following steps:

1. On the SCU Main Menu, press F9 to access "Utilities."
2. Press F7 to define an ISA adapter. The "ISA Board Definition" screen displays. This screen permits you to specify the capabilities and resource requirements for your card. This information is used later when adding the adapter to your system and configuring around it. (Use the TAB key to navigate between fields. To view options within a field, press ENTER.)
3. Select "Save" (F10) and press ENTER.

You can also reach the ISA adapter definition screens by using the "Define ISA=F6" selection from the "Add and Remove Boards" window.

IMPORTANT: If you do not have a *.cfg* file and you choose not to define the capabilities and resource requirements of your ISA adapter, take care in configuring your system. Your ISA adapter is jumpered (or its switches are set) to use system resources. If the SCU does not know that the resources used by the adapter are unavailable, it might configure an EISA or PCI device to operate with the same resources. In this case, you must manually configure your EISA and PCI devices to avoid those resources in use by the ISA adapter.

Defining ISA Board Fields

When you define an ISA board (press F7 from the Utilities pop-up or F6 from the "Add and Remove Boards" screen), you can specify the information that follows. (Use the TAB key to navigate between fields; press ENTER to view options within a field.)

- Board name
- Manufacturer
- Board type (List includes video, multifunction board, mass storage, network board, communications board, parallel port, pointing device, memory board, keyboard, numeric coprocessor, operating system, CPU board, joystick board, other.)
- Slot type (8- and/or 16-bit)
- DMA settings (Press ENTER to define the DMA channel, size [byte or word], and timing information.)
- IRQ settings (Press ENTER to define IRQ number and whether level- or edge-triggered.)
- Port settings (Press ENTER to define start/end port information and byte or word data widths.)
- Memory settings (Press ENTER to define size in KB, address, RAM vs. ROM, byte or word data widths, 20- or 24-bit address decoding, and location in expanded, virtual, system, or other memory.)

Defining ISA Board Options

When you define an ISA board, the following actions are available:

- Save the currently displayed adapter definition by pressing F10. (Definitions are saved in the *cfg.isa* file in the *\model2\scu* directory or on your SCU diskette.)
- Load an adapter definition for viewing or modification by pressing F9.
- Define a new adapter by pressing F2.
- Delete an adapter definition from the ISA database file named *cfg.isa* by pressing F4.

After the ISA adapter is defined, you can go to the "Add and Remove Boards" selection from the SCU Menu to declare that the adapter is to be inserted in your system. Press INSERT to add an adapter. Press INSERT again to select the specific ISA adapter to be added. At this point, you can select from all adapters defined in the ISA database file named *cfg.isa*.

Adding EISA and PCI Adapters

EISA boards should be installed and then the SCU should be executed. EISA adapters do not use any system resources until their *.cfg* file is loaded and resource settings defaulted or manually configured via the SCU.

You can also add a PCI board to your system before executing the SCU. PCI devices/adapters do not have a *.cfg* file, but instead use PCI BIOS calls to determine the available system resources and configure themselves appropriately.

IMPORTANT: It is recommended that you always execute the SCU after adding or removing any hardware on your server. Adding or removing adapters acts as an "impetus" for a change in adapter IRQ or other resource settings. Refer to "PCI Configuration Options" later in this chapter.

Note: During POST, you may see an "EISA configuration error" message immediately after adding the card. On the Diagnostic Partition, select the "System Config Utils>Execute SCU" option to configure the card correctly**.**

PCI video, video capture, and telephony adapters must be installed on the first (PCI 0) bus. This is due to the PCI specification requirement that the video addressing routine be seen from the first bus.

Interrupt Sharing

The server supports 15 hardware interrupt levels.

Interrupt sharing is possible for EISA or PCI devices. Up to eight PCI devices can share a single interrupt. Note that the number of PCI devices allowed to share an interrupt exceeds the PCI Specification (value is 4) due to additional circuitry in the Interrupt/Control ASIC.

EISA devices can also share interrupts. Only level interrupts can be shared. Edge-triggered interrupts are not shareable. To support interrupt sharing, the EISA device driver must be written to poll to determine which adapter generated the interrupt and needs service. Usually only equivalent EISA devices, supported by a single device driver, can share an interrupt.

If interrupt sharing is enabled for your EISA adapter, the board's *.cfg* file contains one of the following strings in the block of lines defining the interrupt(s):

SHARE=YES
SHARE=*xxx* (where *xxx* designates the type of adapter)

If the *.cfg* file does not contain SHARE=YES or SHARE=xxx and you believe that interrupt sharing is possible for your hardware, check with the manufacturer of your EISA adapter to determine if you have the appropriate driver and *.cfg* file.

Freeing up Interrupt Resources

The following peripherals and components may be disabled in the SCU to free up IRQ and related resources for reassignment to other devices:

- Onboard Floppy Controller
- Mouse
- Serial Port A
- Serial Port B
- Parallel Port
- SCSI Controllers A, B, and C

Changing Configuration Settings

The “Step 3: Change Configuration Settings” selection is used to configure your server. When you select steps 2, 3, or 4 from the SCU Menu for the first time, several informational messages display, followed by a Password Menu window for entering an administrative password. After the first time that the Password Menu has appeared, it will not appear again. Refer to the “Setting Passwords” section for more information on setting user or administrative passwords.

Configuration File

!xxxxxxx.cfg is the name of the configuration file being examined which potentially contains a configuration change. Use the *.cfg* file name to determine the device, and then verify that device’s resource settings. (*!ncc01ac.cfg* refers to the system board.) In all instances, the resource settings are updated to the values stored in NVRAM.

Change Configuration Settings Option

When this selection is made, the “Change Configuration Settings” menu displays the following items:

- System Board
- PCI Manager

The screen also displays, by name, all EISA and ISA adapters previously added to the system through the SCU.

When you select “System Board” for configuration, a long list of options appears. The “System Board Configuration Options” section of this chapter describes these options.

When you select “PCI Manager” to change configuration settings, the PCI Device Selection Menu displays. On this menu, you can modify the IRQ (interrupt) settings for any PCI device in the system that has editable IRQs. You can also change configuration settings using the F6 key. Refer to the following section for more information.

Changing Configuration Information

After selecting “System Board,” the system board configuration option list appears. To review and update resource settings for a board or device, highlight an option and press F6.

IMPORTANT: Changing resource settings here can cause unexpected results. The preferred method used to modify resource settings is to choose PCI Manager from the “Change Configuration Settings” menu as discussed in the previous section.

Depending on the device, the following resources may appear:

- DMA channel
- IRQ level
- Port addresses
- Memory addresses

If NVRAM was cleared or configuration changes have been made which the SCU does not accept, then the following message displays when you enter the “Change Configuration Settings” screen:

```
This CFG file has been changed since the last configuration. Configuration
settings are reset to defaults for this device.
```

If you see this message, check the window displayed underneath it. It contains the wording:

```
Running in local configuration mode.
Performing syntax check on !xxxxxxxx.cfg.
```

Note: The above *.cfg* file name changes depending upon which device you have modified.

When you press any key, the SCU will reset your configuration to the defaults and display the system board configuration option list.

Locking Devices

The "Change Configuration Settings" screen displays a list of all devices currently known to the system. You can use the arrow keys to move to (and highlight) a particular device. For any EISA or ISA device, press F8 "ISA/EISA Lock Toggle" to lock that adapter's resource settings. When the resources are locked, an asterisk displays to the left of the device name.

A locked board's resources are not reset or rearranged when new adapters are added to the system. The F8 key operates as a toggle switch, turning locking on and off.

If you want automatic conflict resolution to reconfigure a board's resource settings to accommodate a newly added device, switch lock to "Off."

Devices That Are Not Lockable

PCI devices and ISA plug-and-play devices are not lockable. However, once IRQs are set for these devices in the SCU, the settings are **not** modified by the system or the plug-and-play BIOS, unless there is a reason for a change (specifically, the addition or removal of a board from the system).

All ISA plug-and-play memory and I/O port addresses may be modified in the SCU and remain unchanged until another board is added or removed from the system.

Advanced Configuration Options

The "Advanced Options" (F9) key is available from the "Change Configuration Settings" screen. Pressing F9 displays a pop-up menu with the following options:

- Global Resource Map – displays DMA, IRQ, port, and memory usage information by function and logical slot
- Board Details – displays slot-specific information (logical slot, ID, manufacturer, and so on) for the system boards, EISA, ISA, and PCI devices
- System Details – provides EISA slot information including amperage available/used and NVRAM size
- Physical Board ID Map – displays EISA adapter ID information per slot

The Global Resource Map cannot be used to detect resource conflicts among the system components. If two or more components are sharing a resource invalidly, only one of these components is associated with the resource in the map. (The SCU reports a conflict when various system components are individually examined. To examine a component, select it from the device list displayed in the SCU's "Step 3.") If components are sharing a resource validly, then each is listed with the resource in the map.

System Board Configuration Options

When you select "Step 3: Change Configuration Settings," a menu appears with two options: (1) System Board and (2) PCI Manager. (If adapter boards have been added, the board names appear also.)

Note: For more information on setting PCI adapter resources using the PCI Manager option, refer to the "PCI Configuration Options" section later in this chapter.

When you select "System Board," you can view or modify settings under the following categories:

- Systems Group
- Memory Subsystem Group
- On-Board Communication Devices
- Floppy Drive Subsystem Group
- Keyboard and Mouse Subsystem Group
- Console Redirection Group
- Security Subsystems Group
- SCSI ROM BIOS Options Group
- LCD Subsystem Group
- Management Subsystem Group

Use the following tables to help configure the various features and options available on the server system boards.

Default settings are in boldface type. The "Comments" column details recommended settings and additional information.

Note: SCU default settings are defined in the following tables. The SCU defaults are recommended and are automatically set when the BIOS is run for the first time or after clearing CMOS.

Systems Group

The following table describes Systems Group options.

Configuration Feature	Selection Options	Comments
System Identification and Version Information:		
Config and Overlay Version	Auto-detected	Generic information about the SCU and BIOS levels and the server system boards.
BIOS Version	Auto-detected	Contains BIOS version number.
MP Spec Version	**MP Spec V1. 1** MP Spec V1.4	The Multi-Processing Specification (MPS) Version must match the version supported by your operating system. If you try to boot your operating system with the wrong MPS version selected, your operating system may not load or install properly. Use V1.4 only for Windows NT 3.5 or above, with the shipped HAL (Hardware Abstraction Layer).
Primary System Board Processor Information		
Processor 1 in Slot 1 Processor 2 in Slot 1 Processor 1 in Slot 2 Processor 2 in Slot 2	**Enabled** Disabled	For each processor detected on the primary system board, the processor location and speed is displayed.

Configuration Feature	Selection Options	Comments
Secondary System Board Processor Information		
Processor 1 in Slot 1 Processor 2 in Slot 1 Processor 1 in Slot 2 Processor 2 in Slot 2	**Enabled** Disabled	For each processor detected on the secondary system board, the processor location and speed is displayed.
Memory Test on Warm Boots	**Disable** Enable	Determines if memory will be tested on each warm boot (initiated via operating system or by pressing Ctrl+Alt+Del). The system will boot much faster with this test disabled. Other memory tests are available on the diagnostic partition.
Memory Test on Cold Boots	**Disable** Enable	Determines if memory will be tested on each cold boot (initiated by pressing power-on or reset button). The system will boot much faster with this test disabled. Other memory tests are available on the Diagnostic Partition.
PCI Bus Error Detection	Enabled Disabled	When enabled, the error handling logic of the PCI bus is enabled. Set to “Enabled” for NT 4.0.

Memory Subsystem Group

The following table describes Memory Subsystem Group options.

Configuration Feature	Selection Options	Comments
Extended Memory Options	Current values are displayed. ENTER to edit cache mode options: **Write-Back** Disable	The current settings displayed are the total size of extended memory and the size and mode of cache. **CAUTION:** Do not disable this option; can cause unexpected results.

On-Board Disk Controllers

The following table describes the On-board Disk Controllers option.

Configuration Feature	Selection Options	Comments
On-Board Floppy Controller	**Enable** Disable	Disabling this option disables all onboard floppy drives and frees up IRQ 6 and DMA channel 2. Disable this option before installing a floppy controller adapter card.

On-Board Communication Devices

The following table describes On-board Communication Devices options.

Configuration Feature	Selection Options	Comments
Serial Port A Configuration	Disable **3F8h - IRQ 4** 2F8h - IRQ 3 2E8h - IRQ 4 2E8h - IRQ 3 3E8h - IRQ 4 3E8h - IRQ 3	Set I/O address and IRQ for Serial Port A (COM1).
Serial Port B Configuration	Disable **2F8h - IRQ 3** 3F8h - IRQ 4 2E8h - IRQ 4 2E8h - IRQ 3 3E8h - IRQ 4 3E8h - IRQ 3	Set I/O address and IRQ for Serial Port B (COM2).
Parallel Port Configuration	Disable 278h - IRQ 7 **378h - IRQ 7** 378h - IRQ 5 278h - IRQ 5	Set the I/O address and IRQ for the parallel (LPT) port.
Parallel Port Mode	**Output** Bi-Directional EPP ECP DMA 3 ECP DMA 7	Select the mode for the parallel port. EPP stands for Enhanced Parallel Port. ECP stands for Extended Capabilities Port.

Floppy Drive Subsystems Group

The following table describes Floppy Drive Subsystems Group options.

Configuration Feature	Selection Options	Comments
Floppy Drive A Options	**3.5 inch 1.44/1.25 MB drive** 5.25 inch 360 KB drive 5.25 inch 1.2 MB drive 3.5 inch 720 MB drive 3.5 inch 2.88 MB drive Disable or Not Installed	Auto-sensed
Floppy Drive B Options	3.5 inch 1.44/1.25 MB drive 5.25 inch 360KB drive 5.25 inch 1.2 MB drive 3.5 inch 720 MB drive 3.5 inch 2.88 MB drive **Disable or Not Installed**	Auto-sensed

KB and Mouse Subsystem Group

The table below contains the Keyboard and Mouse Options.

Configuration Feature	Selection Options	Comments
Mouse Control Option	Disable **Mouse auto-detected**	

Console Redirection Group

The following table describes Console Redirection options.

Configuration Feature	Selection Options	Comments
COM Port for Redirection	**Disable** Enable Redirection On COM A Port 3F8H/IRQ 4	Character-based redirection is supported as defined in the settings below. You can use the Diagnostic Partition menus to configure your modem. The modem must be strapped to ignore the loss of the DTR signal.
Serial Port Baud Rate	9600 Baud 19.2K Baud **38.4K Baud** 115.2K Baud	BIOS-level redirection can operate at any of the indicated speeds. If you have enabled your modem and change the baud rate, you must also go to the Diagnostic Partition Modem Utilities menu. Select "Enable Auto Answer" to synchronize your modem to the new baud rate.
Flow Control	None CTS/RTS **CTS/RTS & CD**	Flow Control must be set to CTS/RTS & CD (Carrier Detect). CTS/RTS is hardware flow control that directs dedicated wires between the modem and server to carry the Clear To Send and Request To Send signals. Carrier Detect is a signal that indicates it has established a connection with another modem. "CTS/RTS & CD" is the preferred choice for flow control to ensure proper operation of console redirection over modems and direct RS-232 connections.

Security Subsystem Group

The following table describes Security Subsystems Group options.

Security Feature	Selection Options	Comments
Administrative Password Option	Displayed During Configuration	Press ENTER. The Password Menu displays. Type up to a seven-character alphanumeric password. The administrative password controls access to the BIOS Setup Utility.
User Password Option	Displayed During Configuration	When you press ENTER at this option, the Password Menu displays. The user password controls access to the system at boot.
Hot Key Option*	**Disabled** Enabled	The message "Enter New Hot Key: Warning! Don't press CNTL ALT" appears. Use to specify the final key of a CTRL-ALT-? hot key sequence which can be used to immediately lock your server. Use this option only if a user password is defined and if Secure Mode Boot.
Lockout Timer*	Disable 1 minute 2 minutes 5 minutes **10 minutes** 20 minutes 1 hour 2 hours	Time-out setting to secure the server by blanking video and locking the keyboard and mouse. Initiated following no keyboard or mouse activity for time-out period specified. Default is 10 minutes.

Security Feature	Selection Options	Comments
Secure Mode Boot	**Disable** Enable	Secure boot procedures prevent keyboard use or rebooting from diskette without a user password. For more information on the boot effects of this field and the "Floppy Write Protect" field, refer to the "Security Settings and System Boot" section of this chapter. **Note:** When console redirection is enabled, Secure Mode Boot does not prevent remote access of your server. Secure mode boot operates using a keyboard hardware feature. This feature is not available from the serial (COM) port.
Video Blanking*	**Disable** Enable	When enabled, and the "Lockout Timer" period expires, this option blanks the screen until you enter a valid password.
Floppy Write Protect*	**Disable** Enable	When enabled and a user password is defined, does not allow the system to write to the diskette.
Secure Front Panel*	**Enable** Disable	When enabled, allows BIOS to lock the reset and power buttons on the front panel when you enter Secure Mode Boot.
* The "Secure Mode Boot" option must be enabled in order for any of these security features to function.		

SCSI ROM BIOS Options Group

The following table describes SCSI ROM BIOS Options Group options.

Configuration Feature	Selection Options	Comments
SCSI-A ROM BIOS Scan	Disable **Enable**	Enables or disables scanning of SCSI Channel A for SCSI devices.
SCSI-B ROM BIOS Scan	Disable **Enable**	Enables or disables scanning of SCSI Channel B for SCSI devices.
SCSI-C ROM BIOS Scan	Disable **Enable**	Enables or disables scanning of SCSI Channel C for SCSI devices.

LCD Subsystem Group

The following table describes LCD Subsystem Group options.

Configuration Feature	Selection Options	Comments
LCD Display String Before OS Boot	"Default" or user-defined string	When set to default, the BIOS version number displays on LCD. User may modify by entering a 32-character string of their choice.

Management Subsystem Group

The following table describes Management Subsystem Group options.

Configuration Feature	Selection Options	Comments
Temperature/ Voltage Limit Control	Press 'Enter' to modify the System Limits. The Voltage/ Temperature Limits menu appears with the following voltage, switch, and temperature upper and lower limits. Highlight a selection and press ENTER to modify the system limits: - 12 V + 3.3(2) V + 5 V + 12 V Switch V VCC(1) Temp(1) K Temp(2) K	Specific items are enabled for monitoring using the A/D Channel Enable menu (below). Monitoring and alarming is performed by the Interrupt/ Control ASIC in conjunction with System Management Mode features of the processor. For alarming to occur, both the System Management Mode and Event Logging fields (found below) must be enabled. Alarm information is written to flash memory. Note that after editing temperature or voltage values, upon re-entry of this window, some values may be slightly modified. This is due to the granularity of the monitoring support in the Interrupt/Control ASIC. The default values for Switch V (fan fail and chassis intrusion) are set so these events can be detected, and should not be modified.
A/D Channel Enable Switch	Press ENTER. The A/D Channel Switches table appears. Highlight one of the following selections and press ENTER to enable or disable the A/D Channels (INCA 1 and 2) for monitoring/alarming: + 12 V + 5 V 3.3(2) V - 12 V Temp(2) K Temp(1) K VCC(1) Switch V	A menu is presented with keys available to enable all, disable all, load defaults, or toggle individual items. VCC refers to the +3.3V at the CPU card (used for cache only – the CPUs use a DC/DC converter on the CPU card). 3.3(2) V is not used on the server. Temp(2) is the temperature sensor near the CPU cards. Temp(1) is the temperature sensor near the I/O cards. Switch V refers to the combined fan fail and chassis intrusion monitoring. **CAUTION:** "Fatal" values cause your server to shut down when reached or exceeded. If you change the default fatal values, make sure you change them to reasonable values.
Scan User Flash Area	Not supported at this time	
System Management Mode	Disable **Enable**	Generates a special external interrupt (Server Management Interrupt, SMI) to activate the SMM handler in the system BIOS. When an SMI is received, BIOS code isolates the cause of the interrupt, logs the event, logs information about the cause, and returns control.
SMM Time Stamp Source	POST Capture **Real-Time Clock**	
Event Logging	Disable **Enable**	Turns all onboard event logging on or off, including the logging of PCI SERR and ECC memory errors.

PCI Configuration Options

To modify the IRQ (interrupt) settings for an onboard PCI adapter, select “Step 3: Change Configuration Settings,” choose PCI Manager and press ENTER.

PCI Manager shows:

- Various adapters
- Non-VGA device
- RAM
- Host bridge
- PCI-to-PCI bridge
- SCSI AIC-7880 chips (designated as “SCSI Controller”)
- The system board’s Interrupt/Control ASIC (designated as “Undefined PCI Device”)
- The system board memory controller (designated as “Memory Controller”)

Devices are listed by their bus and device number. Device number is defined by the device scan order. You may sort this information by descending/ascending IRQ, bus, etc. Select F1 to view all sort options. See Chapter 5 for information about the device scan order.

To change the IRQ for a device: select device, press space-bar, then select a free IRQ (ones without an asterisk). Devices with non-editable IRQ are denoted by “N/A.”

Refer to the “Interrupt Sharing” section in this chapter for information on setting and freeing up IRQ resources.

A Note on Windows NT IRQ Display

The Windows NT Diagnostics Resources screen does not display the same PCI IRQs that you see when viewing IRQ assignment under the SCU. For example, SCSI channel A normally uses PCI IRQ 12. Windows NT Diagnostics, however, displays IRQ 44 for SCSI channel A. **This difference in how the SCU and Windows NT display IRQs is normal and does not indicate a configuration problem.**

To determine if there is a configuration problem, view the BIOS error log or run the SCU.

Saving a Configuration

When you select “Step 4: Save Configuration,” the SCU saves the configuration in CMOS RAM and non-volatile memory (NVRAM). In addition, the SCU saves configuration information to *.cms*, *.inf*, and *.set* files.

By default, the base file name is *ncc01ac*. To select a different base file name when you save, perform the following steps:

1. Press F9 on the SCU Menu to go to the Utilities menu.
2. Highlight the “Specify name for .cms, .inf, and .set files” option and press the spacebar. A check mark displays next to the option.
3. Press ENTER to close the menu.

If you set the “Specify name for .cms, .inf, and .set files” option, the SCU prompts you for the base name whenever you save a configuration.

Restoring a Configuration

Restoring a configuration involves restoring the adapter and system board resource settings in NVRAM, and restoring CMOS and certain other portions of the NVRAM that pertain to the system board.

The data to be restored is created when you save a configuration in the SCU. When you select "Step 4: Save Configuration," all of the configuration data is saved to the hardware. In addition, a copy is saved to the *ncc01ac.cms* file.

Restoration of the data is a two-step process:

- First, the adapter and system board resource settings in NVRAM must be re-established
- Second, the CMOS and various other system board settings are restored

To restore the adapter and system board resource settings in NVRAM, use the "Utilities=F9" selection at the bottom of the SCU Menu.

Restore Procedure

To begin the restore process:

1. Do a fresh start of the SCU.
2. Press F9 to access the Utilities functions.
3. Press F5 to restore a configuration from a backup (*.cms*) file.
4. Press ENTER to return to main menu.

ncc01ac.cms File

Your last saved configuration information is stored in the file named *ncc01ac.cms*. If this is the only *.cms* file in the *\model2\scu* directory on your hard drive (or on your SCU diskette), the information in this file is written directly to NVRAM.

Multiple *.cms* Files

If you have multiple *.cms* files, you are prompted to specify which of these files should be used for the restore. The information in the selected file is then written to NVRAM. System board configuration data is also written into NVRAM, in preparation for the next step in the restore process.

No *.cms* Files

If there are no *.cms* files, you are prompted to select a *.cms* file. This situation occurs if you are restoring a configuration from a SCU backup diskette while running from the Platform CD-ROM.

Note: A copy is available of the *ncc01ac.cms* file that was created for your server when it was manufactured. The factory configuration data for your server is stored in the *factory.cms* file on the Diagnostic Partition.

After the write to NVRAM, use the Main menu option, “Step 3: Change Configuration Settings.” Before the Password menu displays, a yellow window informs you that NVRAM has been restored and reminds you to complete the restore process by using the CTRL+R command from the Password menu.

At the bottom of the Password menu (which displays as you enter Step 3), the following message displays:

```
Restore Baseboard Settings = Ctrl-R
```

If you have defined an administrative password, enter the password and then press CTRL+R. If no password is defined, use the CTRL+R sequence directly. Press ESC to exit the Password menu.

After the restoration of the system board settings, you can modify system board or adapter configuration settings in the same SCU session.

Always execute the “Save Configuration” selection on the SCU Menu after the restoration process is complete. Then, exit the SCU and reboot your server.

Security Settings and System Boot

Security-related processing on the server involves the following:

- Definition of user and administrative passwords
- Requirement to enter a password (if one is defined) when booting from the diskette drive
- Ability to disable writes to a diskette drive when booting from a diskette
- Keyboard and mouse lock
- Video blanking
- Locking front panel reset and power on switches

User/Administrative Passwords

User and administrative passwords are used to control access to the system, and to the System Configuration Utility (SCU) and BIOS Setup Utility. A user password, if defined in either utility, is required to boot the server. An administrative password, if defined in either utility, is required to make changes with the BIOS Setup Utility or SCU.

There is one exception to the requirement for entering a user password to boot the server. If secure mode boot is defined, the server can boot from the hard drive, but the keyboard is locked (all keyboard input is disabled) until you enter the user password.

Refer to the "Security Menu" section in Chapter 4 for information on setting passwords in the BIOS Setup Utility. Refer to the "Setting Passwords" section earlier in this chapter to learn how to set passwords using the SCU.

Secure Mode Boot

Secure mode boot allows a server to boot the operating system from the hard drive, after a power outage, without waiting for a password. When secure mode boot is defined, keyboard access is disabled pending the input of the user password. If your server is stored in a locked closet or is unattended, this is a valuable and secure operating mode.

IMPORTANT: When console redirection is enabled, secure mode boot does not prevent remote access of your server. Secure mode boot operates using a keyboard hardware feature. This feature is not available from the serial (COM) port.

If These Conditions Are Present	Then…
Secure Mode Boot is enabled + Floppy is in diskette drive + Floppy A is the first boot choice	Keyboard LEDs (NumLock, Scroll Lock, Caps Lock) flash continuously and a message appears requesting you to enter a password. Enter user password to continue.
Secure Mode Boot is enabled + Video Blanking is enabled + No keyboard or mouse activity has occurred for a user-specified amount of time	Keyboard LEDs flash continuously and the screen blanks. Enter user password to continue.
Secure Mode Boot is enabled + no keyboard or mouse response	Keyboard LEDs flash. Enter user password to continue.

The roles of user password and secure mode boot may seem reversed. A user password is required before the system boots. With secure mode boot, the system boots from the hard drive, but a password is required to use the system.

The following table describes security and password processing by the server.

Conditions		Behavior
User Password: **Administrative Password:** **Secure Mode Boot:** **Floppy Write Protect:**	Not Defined Not Defined Irrelevant* Irrelevant**	Server boots from the hard drive or diskette without any password prompts or keyboard locking. Writes to the diskette drive are enabled. Access to the BIOS Setup Utility and SCU is not restricted.
User Password: **Administrative Password:** **Secure Mode Boot:** **Floppy Write Protect:**	Defined Not Defined Disabled Irrelevant**	Server boots without entering a password. Writes to the diskette drive are processed. Access to the SCU is not restricted. Must enter user password to enter BIOS Setup.
User Password: **Administrative Password:** **Secure Mode Boot:** **Floppy Write Protect:**	Defined Not Defined Enabled Enabled	Server boots from the hard drive, but the keyboard is locked and the keyboard LEDs are flashing. Writes to the diskette drive are disabled. The user password must be entered to unlock the keyboard. Server does not boot from the diskette drive until the user password is entered either at the local or a remote console. The “ATTENTION! SECURE MODE IS ACTIVE! PLEASE ENTER USER PASSWORD TO CONTINUE” message appears. A password prompt is generated to obtain this password. Writes to the diskette are processed after the password has been entered. Access to the BIOS Setup Utility and SCU is not restricted.
User Password: **Administrative Password:** **Secure Mode Boot:** **Floppy Write Protect:**	Defined Not Defined Enabled Disabled	Server boots from the hard drive, but the keyboard is locked and the keyboard LEDs are flashing. Writes to the diskette drive are enabled. A user password must be entered to unlock the keyboard. When you boot from the diskette, writes to the diskette are processed after you enter the password. You must enter user password to access to BIOS Setup Utility and SCU.
User Password: **Administrative Password:** **Secure Mode Boot:** **Floppy Write Protect:**	Not Defined Defined Irrelevant* Irrelevant**	Server boots from the hard drive or diskette without any password prompts or keyboard locking. Writes to the diskette drive are enabled. If you press F2 to enter BIOS Setup, a password prompt displays. Configuration changes with the BIOS Setup Utility and SCU require you to enter the administrative password.
User Password: **Administrative Password:** **Secure Mode Boot**: **Floppy Write Protect:**	Defined Defined Disabled Irrelevant**	On the additional condition that the “Password on Boot” option is enabled in BIOS Setup, the server does not boot until a password is entered either at the local or a remote console. A password prompt is generated to obtain this password. Writes to the diskette drive are processed after the password has been entered.

Conditions		Behavior
User Password: **Administrative Password:** **Secure Mode Boot**: **Floppy Write Protect:**	Defined Defined Enabled Disabled	Server boots from the hard drive. The keyboard is locked and the keyboard LEDs are flashing. Writes to the diskette drive are enabled. The user password must be entered to unlock the keyboard. Server does not boot from the diskette drive until the user or administrative password is entered at the local or a remote console. A password prompt is generated to obtain this password. When booting from the diskette, writes to the diskette are processed after you enter the password. If you press F2 to enter BIOS Setup, a password prompt displays. Configuration changes with the BIOS Setup Utility and SCU require you to enter the administrative password. If you exit from the BIOS Setup Utility without making any changes, the keyboard locks and the LEDs flash. You must enter the user password to unlock the keyboard.

* The setting of “Secure Mode Boot” is irrelevant since this is used with a user password.

**The setting of “Floppy Write Protect” is irrelevant since this is only used in the context of “secure boot.”

Performing Common Diagnostic Partition Tasks

The following table lists some common Diagnostic Partition tasks and the Diagnostic Partition menu items to select to perform each task.

In some cases, the table refers you to another chapter or document for more information.

Task	Menu Selections	More Information
Install the Diagnostic Partition (CD-ROM only)	1. "Run CD Utilities and Diagnostics" from MS-DOS Startup menu. 2. "Install Partition" from CD Main menu. 3. "Execute DP Install" from the Install Partition menu.	"Installing the Diagnostic Partition from the Platform CD-ROM" section in Chapter 2.
Display the system's factory configuration **Note:** This information resides in the Diagnostic Partition's *\scu\factcfg.txt* file. You cannot display the factory configuration when running from the Platform CD-ROM.	1. "Run Utilities and Diagnostics" from MS-DOS Startup menu. 2. "System Config Utils" from Diagnostic Partition Main menu. 3. "View Version Info" from SCU Menu. 4. "View Factory Config" from the View Version Info menu.	"View Version Info Menu" section in this chapter
Display current system configu-ration from a local or remote console / Run the System Configuration Utility (SCU)	1. "Run Utilities and Diagnostics" from MS-DOS Startup menu. 2. "System Config Utils" from Main menu. 3. "View Version" from SCU Menu. 4. "View Factory Config" or "View Config History" from View Version menu.	
Create a backup SCU diskette	1. "Run Utilities and Diagnostics" from MS-DOS Startup menu. 2. "System Config Utils" from Main menu. 3. "Create SCU Backup" from the SCU Menu.	"Create SCU Backup" in this chapter
Configure Adaptec SCSI adapters (run SCSI*Select* Utility)	1. "Run Utilities and Diagnostics" from MS-DOS Startup menu. 2. "System Config Utils" from Main menu. 3. "Adapter Config Utils" from SCU Menu. 4. "SCSI - Adaptec" from Adapter Configuration Utilities menu.	Chapter 5
Update BIOS flash memory	1. "Run Utilities and Diagnostics" from MS-DOS Startup menu. 2. "BIOS Flash Utilities" from Main menu. 3. "Run Flash Utility" from BIOS Flash Menu.	Chapter 6

Task	Menu Selections	More Information
Create a backup BIOS Flash Utility diskette	1. "Run Utilities and Diagnostics" from MS-DOS Startup menu. 2. "BIOS Flash Utilities" from Main menu. 3. "Create Flash Backup" from BIOS Flash Menu.	Chapter 6
Run system diagnostics	1. "Run Utilities and Diagnostics" from MS-DOS Startup menu. 2. "Run Diagnostics" from Main menu. 3. "Run System Tests" from Diagnostics Menu. 4. Enter desired run mode from Remote/Local System Diagnostics menu.	*AMIDiag User's Guide*
View the BIOS Event Log	1. "Run Utilities and Diagnostics" or "Run Additional Diagnostics" from MS-DOS Startup menu. 2. "Run Diagnostics" from Diagnostics Main menu. 3. "Access BIOS Event Log" from Diagnostics Menu. 4. "View Event Log" from Event Log Utilities menu.	Chapter 1 and the "Access BIOS Event Log Menu" section in this chapter
Run Adaptec ASPI SCSI disk tests	1. "Run Additional Diagnostics" from MS-DOS Startup menu. 2. "Run Diagnostics" from Diagnostics Main menu. 3. "Run System Tests" from Diagnostics menu. 4. Enter desired run mode from Run System Tests menu. Additional Adaptec SCSI disk tests which ASPI drivers to be loaded are available.	Chapter 5

Chapter 4

Using the BIOS Setup Utility

The BIOS Setup Utility lets you change the system board configuration defaults. It does not permit you to enter or change information about EISA, ISA, or PCI add-in boards.

The setup utility stores all configuration values in the battery-backed memory of the real-time clock/calendar (RTC).

BIOS settings take effect when you boot the system. Power-On Self-Test (POST) checks these values and adapter information against the actual hardware configuration. If they do not agree, an error message is generated. You must then run the BIOS Setup Utility or the configuration utility to specify the correct configuration.

You can run the setup utility with or without an operating system being present.

Terms, Conventions, and Related Documents

Refer to the "Preface" of this document for important information on how to use this book, terms and conventions, and related documents.

When used in this chapter, the term "configuration utility" refers to the System Configuration Utility (SCU). Chapter 3 discusses how to use the SCU in detail.

When to Use the BIOS Setup Utility

Since values entered using the BIOS Setup Utility are overwritten when you run the system configuration utility, you should only run Setup under the following conditions:

- To enable your diskette drive
- If you do not have access to a diskette drive
- If you need to modify the plug-and-play latency timer or the Advanced Chipset configurations

How to Access the BIOS Setup Utility

During the boot process, the following message displays:

```
Press <F2> to enter Setup
```

If you do not press F2, this message remains until POST completes and the boot process continues. If F2 is pressed, the following message displays:

```
Entering Setup ...
```

After this message is shown, the boot process continues. When complete, BIOS Setup Utility runs.

Five Major Menus

When entering the BIOS Setup Utility, you are positioned at the Main menu. This is one of five major menus, which contain several submenus. To move between the major menus, use the left and right arrow (← and →) keys. To move between menu items, use the ↑ and ↓ keys. To display menu options, highlight a menu item and press ENTER. To display the submenus (indicated by a ▶, highlight item and press ENTER. Press ESC to return to the previous menu.

The top line of the BIOS Setup Utility displays the major menu selections. This line is defined as the utility's "action bar." The five major menus on the action bar include:

- Main
- Security
- Server
- Advanced
- Exit

When you are in a major menu window, that window's name is highlighted in the action bar. If you are in a submenu window, the name of the major menu appears at the top, and the submenu name appears below it. Press ESC to return to the previous menu.

Item Specific Help

When a menu item is highlighted, text appears on the right side of your screen under "Item Specific Help." The text instructs the user on menu options or describes the contents of a submenu.

About the Menu Options

Some options are informational only. These values display on the Setup screens but you cannot modify them.

What Displays	What it Means
▶	Press ENTER to display full-screen menu with multiple options.
An option appears in same color as the menu item	You cannot configure the option through BIOS Setup.
The phrase "[Enter]" displays next to the menu item	Press ENTER to display a submenu (a small pop-up menu with two or more choices).

BIOS Setup Utility Keys

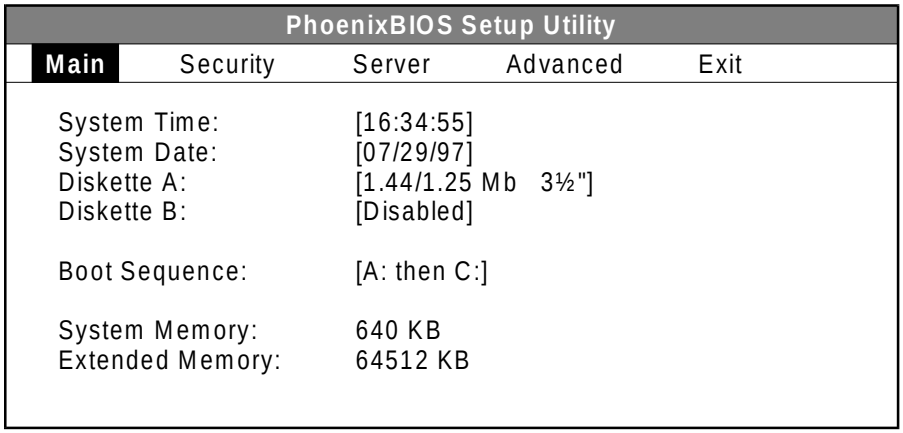
The following table outlines the keys used by the BIOS Setup Utility and their use.

Press	To
F1	Get help about an item
ESC	If in a submenu, return to previous menu; if in a menu, go to Exit menu
ENTER	Select ▶ submenu (in Exit menu only, execute command)
Up Arrow/Down Arrow	Select menu item
Left Arrow/Right Arrow	Select a menu from the action bar
-/+	Change values
F9	Load BIOS Setup defaults
F10	Save and exit BIOS Setup

Main Menu

The following sections describe the Main menu items, and the submenus that display when you select Main menu items.

Default settings are highlighted in bold print, and recommended settings and additional information are discussed in the “Comments” column.



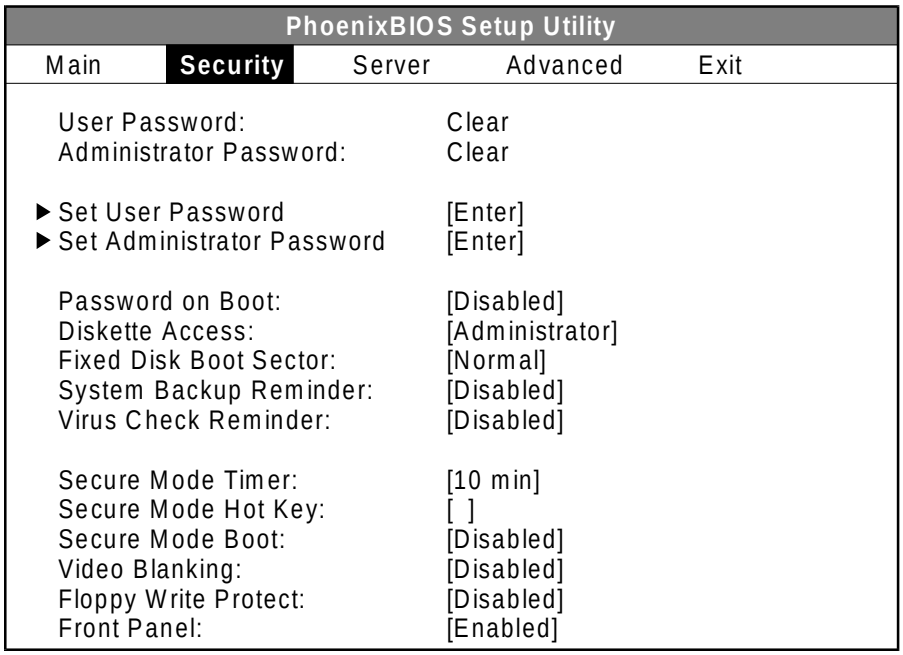
The following table provides additional information on the Main menu items:

Menu Item	Options		Comments
System Time	Current time		To change time, highlight and type over the field containing hours, minutes, or seconds. To move between fields, use the TAB, SHIFT-TAB, or ENTER key. Enter time using military format.
System Date	Current date		To change date, highlight and type over the field containing month, date, or year. To move between fields, use the TAB, SHIFT-TAB, or ENTER key.
Diskette A	Disabled		Selects floppy type. Note that the 1.25 MB, 3½” option references a 1024 byte/sector Japanese media format. To support this option requires a 3½-inch “3-MODE” Floppy Disk Drive.
	360 KB	5¼”	
	1.25 MB	5¼”	
	720 KB	3½”	
	1.44/1.25 MB	**3½”**	
	2.88 MB	3½”	
Diskette B	**Disabled**		Selects floppy type. Note that the 1.25 MB, 3½” option references a 1024 byte/sector Japanese media format. To support this option requires a 3½-inch “3-MODE” Floppy Disk Drive.
	360 KB	5¼”	
	1.2 MB	5¼”	
	720 KB	3½”	
	1.44/1.25 MB	3½”	
	2.88 MB	3½”	
Boot Sequence	**A: then C:**		Selects order in which drives are searched for a boot disk.
	C: then A:		
	C: only		
System Memory	640 KB		Auto-detected.
Extended Memory	64512 KB		Auto-detected. Varies depending on amount of system memory.

Security Menu

The following sections describe the Security menu items, and the submenus that display when you select Security menu items.

Default settings are highlighted in bold print, and recommended settings and additional information are discussed in the "Comments" column.



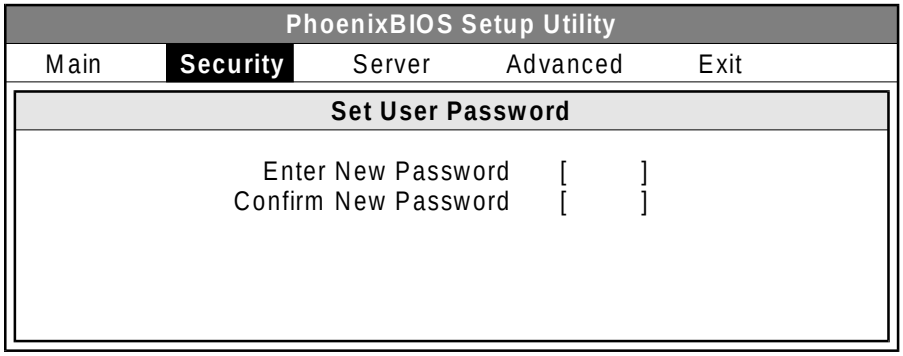
The following table provides more detailed information on the Security menu items:

Menu Item	Options	Comments
User Password	**Clear** Set	Auto-detected as "Clear." When a user password is defined below, this field automatically changes to "Set." Your user password controls access to the system at boot.
Administrator Password	**Clear** Set	Auto-detected as "Clear." When an administrator password is defined, this field automatically changes to "Set." Your administrator password controls access to the Setup Utility.
Set User Password	[Enter]	See "Set User Password."
Set Administrator Password	[Enter]	See "Set Administrator Password."
Password on Boot	**Disabled** Enabled	When enabled, requires password entry on boot. System remains in secure mode until password is entered. Password on boot takes precedence over Secure Mode Boot. For more information on the Secure Mode Boot, refer to the "Configuring Your Server" section in Chapter 3.
Diskette Access	User **Administrator**	Controls access to diskette drives.
Fixed Disk Boot Sector	**Normal** Write Protect	If "Write Protect" is selected, write protects boot sector on hard disk to protect against viruses.
System Backup Reminder	**Disabled** Daily Weekly Monthly	Displays reminder message at boot (daily, every Monday, or first of every month).

Menu Item	Options	Comments
Virus Check Reminder	**Disabled** Daily Weekly Monthly	Displays reminder message at boot (daily, every Monday, or first of every month).
Secure Mode Timer	Disabled 1 min 2 min 5 min **10 min** 20 min 1 hr 2 hr	Time interval selected indicates the period of keyboard and mouse inactivity required before the system automatically activates Secure Mode. Select one of preset options. A user password must be entered for Secure Mode to work.
Secure Mode Hot Key	[one-character field]	Select a key to be the Secure Mode Hot Key (Ctrl+Alt+?). It should not conflict with any application. Available choices are A-Z and 0-9. Use the DELETE key to disable.
Secure Mode Boot	**Disabled** Enabled	When enabled, system boots in secure mode. Requires user password to unlock system. For more information on secure mode boot, refer to “Secure Mode Boot” section in the “Using the Diagnostic Partition” chapter.
Video Blanking	**Disabled** Enabled	When enabled, system blanks video when Secure Mode activates. Requires user password to unlock system.
Floppy Write Protect	**Disabled** Enabled	When enabled, system write protects floppy drive when Secure Mode activates. Requires password to restore floppy writes.
Front Panel	Disabled **Enabled**	When disabled, system disables Front Panel (locks the reset and power buttons on the front of the server) when Secure Mode activates. Requires user password to unlock system.

Set User Password

This pop-up allows you to set, modify, or disable a user password. The user password controls access to the system at boot.



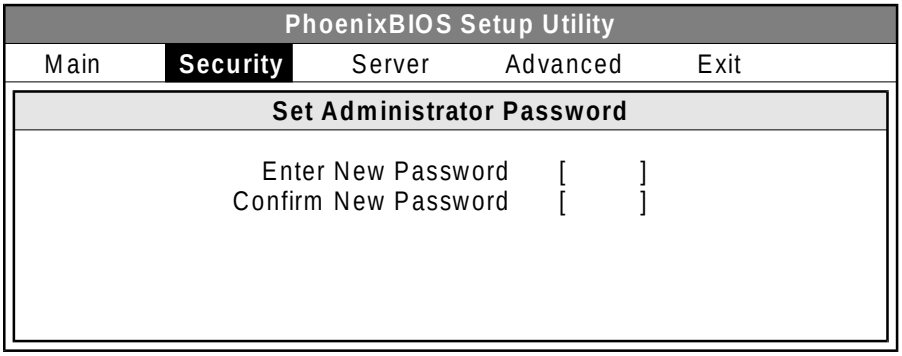
The following table describes the Set User Password options.

Menu Item	Field	Instructions
Enter New Password	[new password field]	When entering a new password, type up to a seven-character password in this field (characters appear as gray boxes), and press ENTER. When disabling a password, press ENTER. When changing a password, enter new password. To abort the operation, press ESC.
Confirm New Password	[confirm password field]	When entering a new password, type your password again, and press ENTER. After you press ENTER, a "Setup Notice" pop-up appears; press ENTER to continue. When disabling a password, press ENTER. When changing a password, enter new password again. After you press ENTER, a "Changes Have Been Saved" pop-up appears; press ENTER to continue. To abort the operation, press ESC.
Enter Current Password	[current password field]	Appears only when a password has been set. When changing or disabling the password, enter current password and press ENTER.

Note: Enter only alphanumeric characters for your password. If an invalid character has been entered, the system beeps.

Set Administrator Password

This pop-up allows you to set, modify, or disable an administrator password. The administrator password controls access to the BIOS Setup Utility.



The following table describes the Set Administrator Password options.

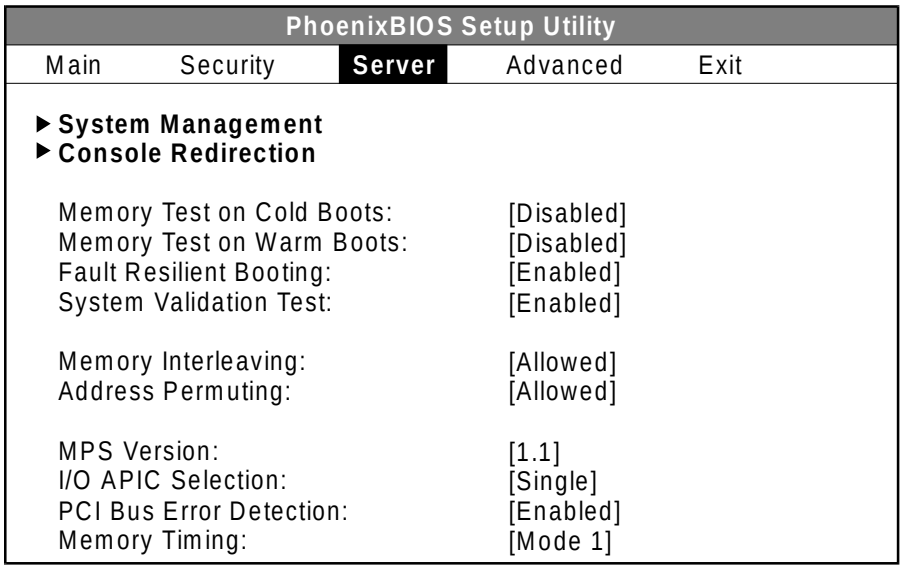
Menu Item	Field	Instructions
Enter New Password	[new password field]	When entering a new password, type up to a seven-character password in this field (characters appear as gray boxes), and press ENTER. When disabling a password, press ENTER. When changing a password, enter new password. To abort the operation, press ESC.
Confirm New Password	[confirm password field]	When entering a new password, type your password again, and press ENTER. After you press ENTER, a "Setup Notice" pop-up appears; press ENTER to continue. When disabling a password, press ENTER. When changing a password, enter new password again. After you press ENTER, a "Changes Have Been Saved" pop-up appears; press ENTER to continue. To abort the operation, press ESC.
Enter Current Password	[current password field]	Appears only when a password has been set. When changing or disabling the password, enter current password and press ENTER.

Note: Enter only alphanumeric characters for your password. If an invalid character has been entered, the system beeps.

Server Menu

The following table describes the Server menu items, and the submenus that display when you select Server menu items.

Default settings are highlighted in bold print, and recommended settings and additional information are discussed in the "Comments" column.



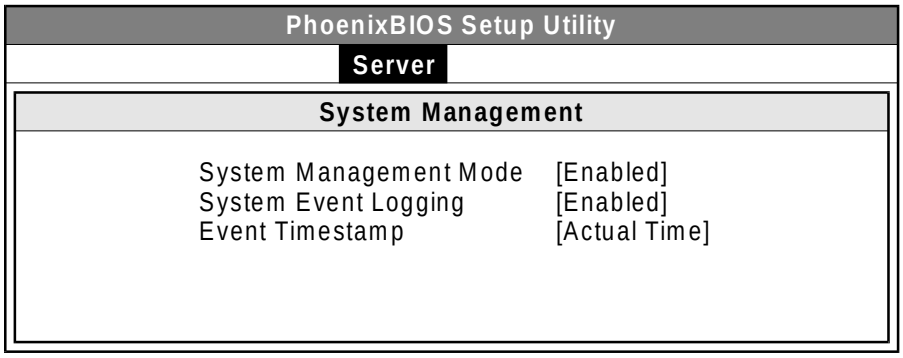
The following table shows the Server menu items:

Menu Item	Options	Comments
System Management		See "System Management Submenu."
Console Redirection		See "Console Redirection Submenu."
Memory Test on Cold Boots	**Disabled** Enabled	Determines if memory is tested on each cold boot (initiated by pressing power-on or reset button). The system boots much faster with this test disabled. Other memory tests are available on the Diagnostic Partition.
Memory Test on Warm Boots	**Disabled** Enabled	Determines if memory is tested on each warm boot (initiated via operating system or by pressing Ctrl+Alt+Del). The system boots much faster with this test disabled. Other memory tests are available on the Diagnostic Partition.
Fault Resilient Booting	Disabled **Enabled**	When enabled, a watchdog timer guards the BIOS boot sequence. If the boot processor fails during this sequence, the system is reset and another processor is selected.
System Validation Test	Disabled **Enabled**	Select "Enabled" to test power supplies and other system components before booting the operating system.
Memory Interleaving	Not Allowed **Allowed**	On systems with two memory boards, Memory Interleaving may enhance memory speed. In most situations, this mode should be set to "Allowed."

Menu Item	Options	Comments
Address Permuting	Not Allowed **Allowed**	Address Permuting may enhance memory speed. In most situations, this mode should be set to “Allowed.”
MPS Version	**1.1** 1.4	The MPS (Multiprocessor Specification) provides system configuration information to the operating system. Select “1.4” for NT systems.
I/O APIC Selection	**Single** Multiple	Set type of Input/Output Advanced Programmable Interrupt Controllers.
PCI Bus Error Detection	Disabled **Enabled**	Enables the PCI bus error handling logic. Set to “Enabled” for NT 4.0 and most other operating systems.
Memory Timing	**Mode 1** Mode 2	Mode 1 gives increased timing margins. If the error log indicates that single-bit errors are occurring, switch to Mode 1. Mode 2 is the higher performance setting.

System Management Submenu

This menu allows the user to modify system management settings.

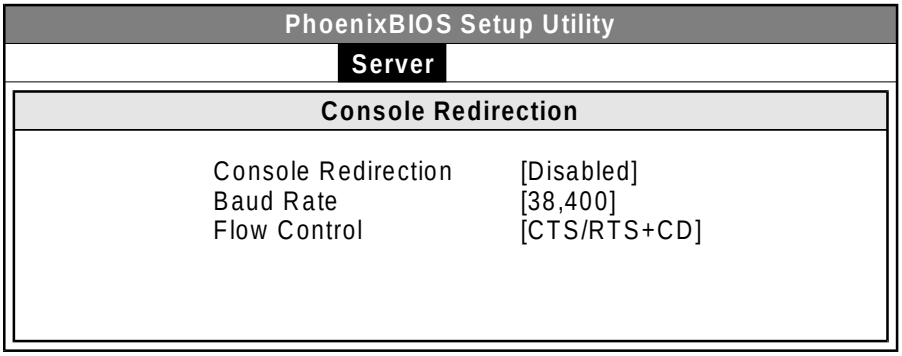


The following table describes the System Management submenu options.

Menu Item	Field	Instructions
System Management Mode	Disabled **Enabled**	Enables hardware error detection and reporting. Generates a Server Management Interrupt (SMI) to activate the SMM handler in the system BIOS. When an SMI is received, BIOS code isolates the cause of the interrupt, logs the event and information about its cause, and returns control.
Event Timestamp	Boot Time **Actual Time**	If “Actual Time” is selected, the system stamps each event with the actual time it occurred. If “Boot Time” is selected, the system stamps each event with the time of last boot.

Console Redirection Submenu

This submenu allows the user to set serial (COM) port address, baud rate, and flow control.

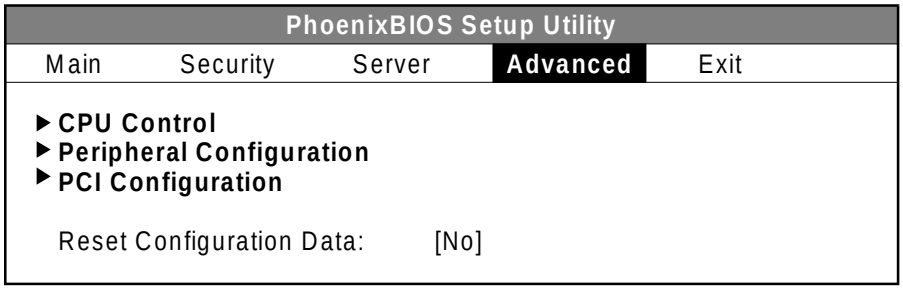


The following table describes the Console Redirection submenu options.

Menu Item	Field	Instructions
Console Redirection	**Disabled** Enabled	If enabled, console redirection occurs over Serial Port A (COM1). For console redirection to function properly, Serial Port A must be set to I/O address 3F8 and IRQ 4. Please see the Peripheral Configuration setup menu for more details.
Baud Rate	9,600 19,200 **38,400** 115,200	Selects the baud rate for console redirection. BIOS-level redirection can operate at any of the indicated speeds. If you have enabled your modem and change the baud rate, you must also go to the Diagnostic Partition Modem Utilities menu. Select “Enable Auto-answer” to synchronize your modem to the new baud rate.
Flow Control	No Flow Control CTS/RTS **CTS/RTS+CD**	Selects the flow control setting for console redirection. CTS/RTS is hardware flow control that directs dedicated wires between the modem and server to carry the Clear To Send and Request To Send signals. Carrier Detect (CD) is a signal that indicates it has established a connection with another modem. “CTS/RTS+CD” is the required choice for flow control to ensure proper operation of console redirection over modems and direct RS-232 connections.

Advanced Menu

The following sections describe the Advanced menu items for the BIOS Setup Utility, and the submenus that display when you select certain menu items.

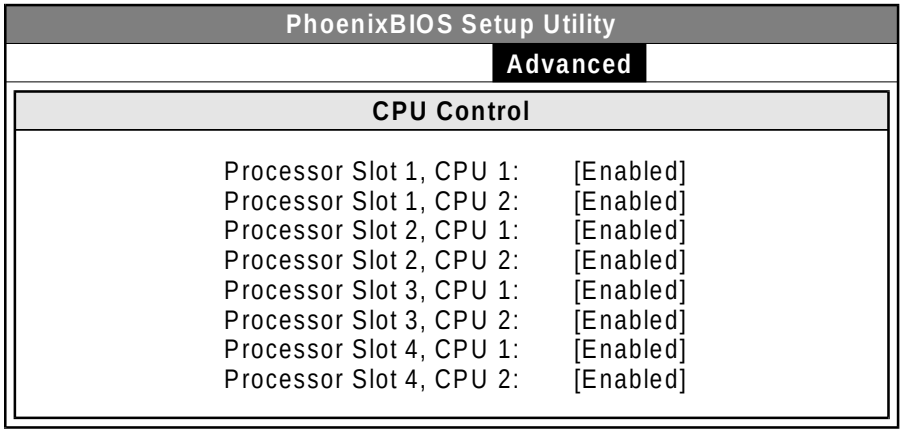


The following table describes the Advanced menu items.

Menu Item	Options	Comments
CPU Control		See “CPU Control Submenu.”
Peripheral Configuration		See “Peripheral Configuration Submenu.”
PCI Configuration		See “PCI Configuration Submenu.”
Reset Configuration Data	**No** Yes	Select “Yes” if you want to clear the EISA system configuration data (as defined by the ESCD Specification). If set to “Yes,” the adapter configuration settings are cleared on the next boot. The CMOS values displayed in Setup are not affected.

CPU Control Submenu

When you select “CPU Control” from the Advanced menu, the CPU Control submenu displays.

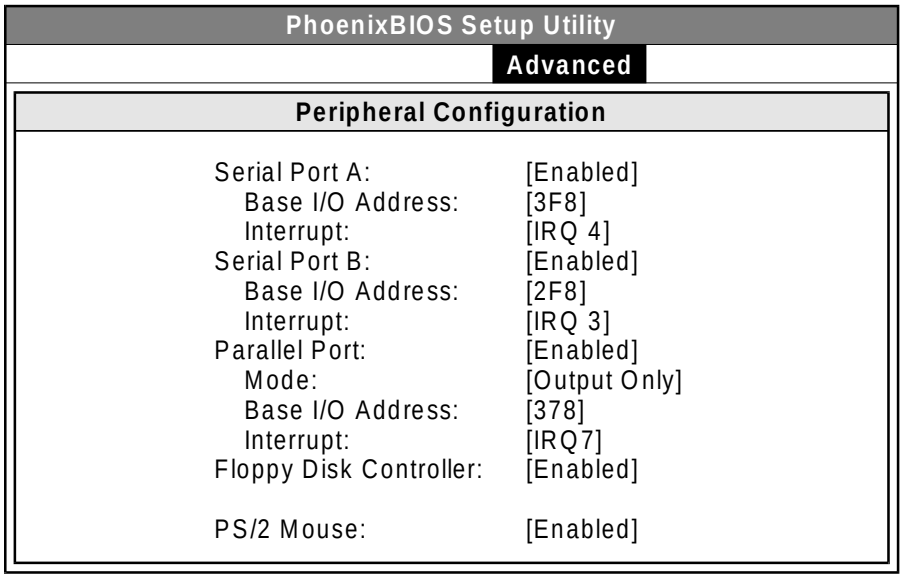


The following table describes the CPU Control submenu options.

Menu Item	Options	Comments
Processor Slot 1, CPU 1	Disabled **Enabled**	Select Enabled to enable this CPU for operating system use.
Processor Slot 1, CPU 2	Disabled **Enabled**	Select Enabled to enable this CPU for operating system use.
Processor Slot 2, CPU 1	Disabled **Enabled**	Select Enabled to enable this CPU for operating system use.
Processor Slot 2, CPU 2	Disabled **Enabled**	Select Enabled to enable this CPU for operating system use.
Processor Slot 3, CPU 1	Disabled **Enabled**	Select Enabled to enable this CPU for operating system use.
Processor Slot 3, CPU 2	Disabled **Enabled**	Select Enabled to enable this CPU for operating system use.
Processor Slot 4, CPU 1	Disabled **Enabled**	Select Enabled to enable this CPU for operating system use.
Processor Slot 4, CPU 2	Disabled **Enabled**	Select Enabled to enable this CPU for operating system use.

Peripheral Configuration Submenu

When you select "Peripheral Configuration" from the Advanced menu, the Peripheral Configuration menu displays.



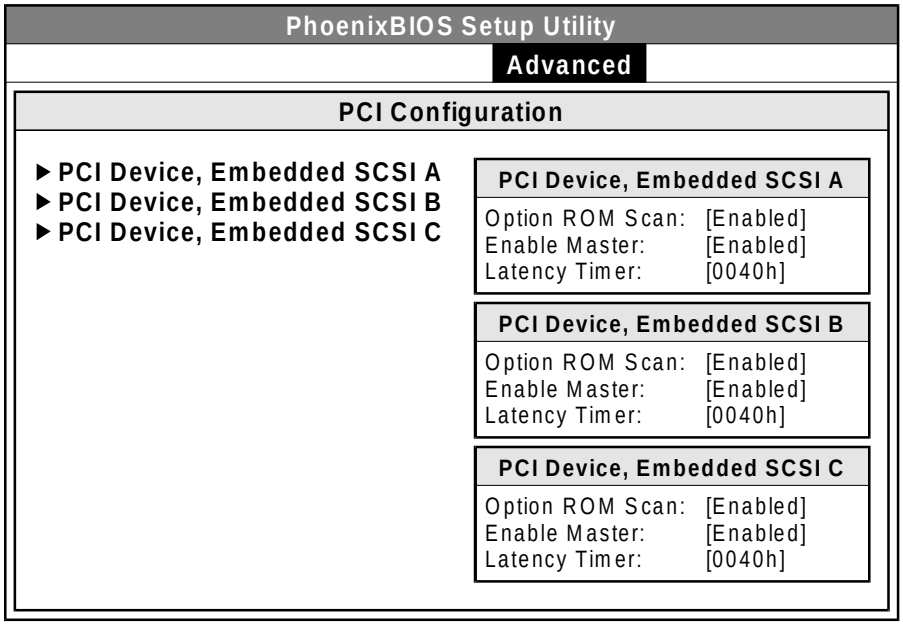
The following table describes the Peripheral Configuration menu options.

Menu Item	Options	Comments
Serial Port A	Disabled **Enabled**	Configure Serial Port A. If you use this serial port for console redirection, you must select I/O address 3F8 and IRQ 4. If disabled, the next two menu items do not appear.
Base I/O Address	**3F8** 2F8 3E8 2E8	Set the base I/O address for Serial Port A.
Interrupt	IRQ 3 **IRQ 4**	Set the interrupt for Serial Port A.
Serial Port B	Disabled **Enabled**	Configure Serial Port B. If disabled, the next two menu items do not appear.
Base I/O Address	3F8 **2F8** 3E8 2E8	Set the base I/O address for Serial Port B.
Interrupt	**IRQ 3** IRQ 4	Set the interrupt for Serial Port B.

Menu Item	Options	Comments
Parallel Port	Disabled **Enabled**	Configure the parallel port.
Mode	**Output only** Bi-directional EPP ECP	Selects the mode for the parallel port. EPP stands for Enhanced Parallel Port. ECP stands for Extended Capabilities Port.
Base I/O Address	**378** 278	Sets the base I/O address for the parallel port.
Interrupt	IRQ 5 **IRQ 7**	Sets the interrupt for the parallel port.
Floppy Disk Controller	Disabled **Enabled**	When enabled, BIOS initializes the floppy disk controller. When disabled, the floppy disk do not function; IRQ 6 and DMA channel 2 become available.
PS/2 Mouse	Disabled **Enabled**	When disabled, IRQ 12 is freed for other devices. When enabled, IRQ 12 is reserved for the mouse.

PCI Configuration Submenu

When you select “PCI Configuration” from the Advanced menu, the PCI Configuration menu displays.



The following table describes the PCI Configuration menu items:

Menu Item	Comments
PCI Device, Embedded SCSI A	See “PCI Device, Embedded SCSI A Submenu.”
PCI Device, Embedded SCSI B	See “PCI Device, Embedded SCSI B Submenu.”
PCI Device, Embedded SCSI C	See “PCI Device, Embedded SCSI C Submenu.”

PCI Device, Embedded SCSI A Submenu

This submenu allows the user to configure the specific PCI device.

When you select “PCI Device, Embedded SCSI A” from the PCI Configuration submenu, the PCI Device, Embedded SCSI A submenu displays.

The following table describes the PCI Device, Embedded SCSI A submenu items:

Menu Item	Options	Comments
Option ROM Scan	**Enabled** Disabled	When enabled, BIOS loads the expansion ROM for this device. When disabled, more memory is available for other devices.
Enable Master	Disabled **Enabled**	Enable selected device as a PCI bus master.
Latency Timer	Default 0020h **0040h** 0060h 0080h 00A0h 00C0h 00E0h	Minimum guaranteed time slice allotted for bus master in units of PCI bus clocks.

PCI Device, Embedded SCSI B Submenu

This submenu allows the user to configure the specific PCI device.

When you select “PCI Device, Embedded SCSI B” from the PCI Configuration submenu, the PCI Device, Embedded SCSI B submenu displays.

The following table describes the PCI Device, Embedded SCSI B submenu items:

Menu Item	Options	Comments
Option ROM Scan	**Enabled** Disabled	When enabled, BIOS loads the expansion ROM for this device. When disabled, more memory is available for other devices.
Enable Master	Disabled **Enabled**	Enable selected device as a PCI bus master.
Latency Timer	Default 0020h **0040h** 0060h 0080h 00A0h 00C0h 00E0h	Minimum guaranteed time slice allotted for bus master in units of PCI bus clocks.

PCI Device, Embedded SCSI C Submenu

This submenu allows the user to configure the specific PCI device.

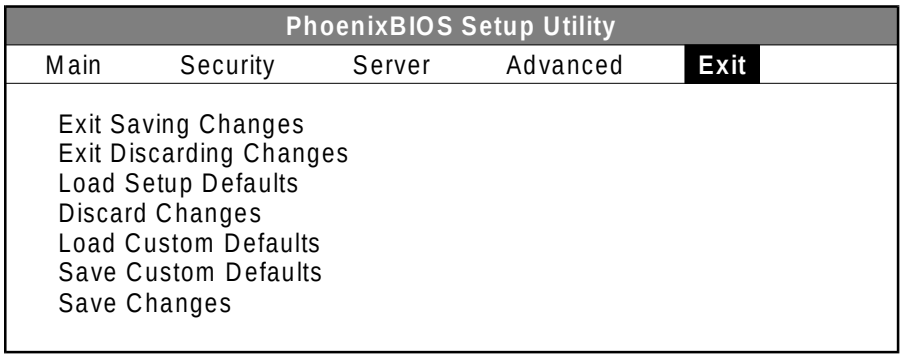
When you select “PCI Device, Embedded SCSI C” from the PCI Configuration submenu, the PCI Device, Embedded SCSI C submenu displays.

The following table describes the PCI Device, Embedded SCSI C submenu items:

Menu Item	Options	Comments
Option ROM Scan	**Enabled** Disabled	When enabled, BIOS loads the expansion ROM for this device. When disabled, more memory is available for other devices.
Enable Master	Disabled **Enabled**	Enable selected device as a PCI bus master.
Latency Timer	Default 0020h **0040h** 0060h 0080h 00A0h 00C0h 00E0h	Minimum guaranteed time slice allotted for bus master in units of PCI bus clocks.

Exit Menu

The Exit menu is used to exit the utility using a variety of methods.



Feature	Comments
Exit Saving Changes	Exit Phoenix BIOS Setup and save your changes to CMOS.
Exit Discarding Changes	Exit Phoenix BIOS Setup without saving changes.
Load Setup Defaults	Load default values for all items.
Discard Changes	Load previous values from CMOS for all items.
Load Custom Defaults	Load settings from Custom Defaults.
Save Custom Defaults	Save your changes to Custom Defaults. Normally, Phoenix BIOS reads setup settings from CMOS, but if your CMOS fails, it uses Custom Defaults if you have set them. If not, it uses the factory defaults.
Save Changes	Save setup data to CMOS.

Chapter 5

Configuring Adapters

This chapter discusses the configuration of SCSI drives and adapters. It includes specific procedures for the following:

- Configuration restrictions for adapters
- Other considerations when adding and removing adapters
- Device scan order
- Configuring Adaptec SCSI host adapters
- Configuring a Mylex disk array adapter

The configuration utilities used to configure the adapter types are shown in the table below:

This Configuration Utility…	Configures This Adapter Type…
SCSI*Select* Utility	Adaptec adapters
Disk Array Controller Configurator (DACCFG) Utility	Mylex adapters

Other utilities are available to configure other types of adapters. Those utilities are not covered in detail in this document. Refer to the adapter documentation for specific information.

Terms, Conventions, and Related Documents

Refer to the “Preface” of this document for important information on how to use this book, terms and conventions, and related documents.

In this section, the terms “add-in boards” and “adapters” are synonymous.

Configuration Restrictions for Adapters

Following are the configuration restrictions for add-in boards:

Type of Adapter or Device Affected	Configuration Restriction
FDDI	Install a maximum of 8 FDDI adapters of any kind on your system.
Single channel SCSI	Maximum number allowed in a system: 4 Adaptec 2940UW adapters or one 2944UW adapter
RAID Controller PCI adapter	Must be installed in the first connector of PCI Bus #1. Maximum number allowed in a system: 4.
Mylex SCSI controller cards	Only four Mylex adapters may be installed in a system. The first Mylex adapter must be installed in slot P4. Remaining adapters may be populated in either PCI Bus #1 (slots P5, P6) or PCI Bus #2 (slots P8, P9, P10, P11). Do not mix different versions of the Mylex Raid controllers within a system. A SIMM memory module must be installed on the Mylex card to enable it to work properly. Consult adapter documentation for more information.
PCI Ethernet	Begin installing in PCI Bus #0. Maximum number allowed: 4.
PCI SCSI adapter	Begin installing in PCI Bus #1.
Server Monitor Module	Must be installed in EISA slot E3.
Token Ring	Maximum number allowed in a system: 4
VGA adapters	Must be installed in PCI Bus #0.

Note: For SCSI devices which are non-boot, you must disable its BIOS. At the BIOS Setup main screen, select Advanced>PCI Configuration and select the applicable SCSI device submenu. Select Option ROM Scan>Disabled. For more information on the BIOS Setup Utility, refer to Chapter 4.

Other Considerations for Adding and Removing Adapters

- When a video controller adapter is present in any of the PCI Bus 0 or EISA slots, then the video monitor cable to the onboard VGA controller is detached and connected to the video controller adapter.
- If at all possible, it is recommended that you not move SCSI adapters to different physical slots after the system has been in normal operation. Moving adapters affects the BIOS scan order and the operating system device ID assignment.
- The cards should be populated in the following order by type: bridged SCSI cards, non-bridged SCSI cards, bridged networking cards, non-bridged networking cards, all other cards.
- In cases of high EISA or VGA activity, improved performance may be gained by populating PCI slots beginning in Bus #1.
- For redundant high-availability (that is, providing two physically separate paths to a multi-ported disk array) configurations, it may improve performance and availability to put redundant boards on different PCI busses.
- For systems using the Windows NT operating system, when NT Disk Administrator is run to place “signatures” on the drives, the virtual device information (drive letter) for a drive (or partition) is written to the device, and remains with it if devices are moved or inserted. If Disk Administrator is not run, then all virtual device assignments will change whenever a device is added or moved. The NT Disk Administrator should always be run to minimize configuration problems.

Device Scan Order

Devices are initialized and identified in the configuration utilities in the following order:

- Diskette drive controller
- EISA/ISA slots 1-4
- Serial and parallel ports
- PCI slots P1, P2, P3, P7, and P4 (Bus 0, Devices B, C, D, and F; Bus 1, Device A)
- Two onboard SCSI-2 AIC-7880, SCSI Channel A and B (Bus 1, Devices B and C)
- PCI slots P5, P6, P8 (Bus 1, Devices D and E; Bus 2, Device A)
- Onboard SCSI-2 AIC-7880, SCSI Channel C (Bus 2, Device B)
- PCI slots P9 through P11 (Bus 2, Devices C, D, and E)
- PCI slots P12 through P15 (Bus 3, Devices A, C, D, and E)

Note: IDE devices are not supported for the server. However, if you add an IDE controller, the system initializes it immediately after initializing the diskette drive controller.

The device scan order results in the following:

- When adding bootable devices, the first such device encountered in the scan order becomes the boot device. Therefore, an EISA disk controller can become the boot device (as opposed to a drive on SCSI Channel A) unless the BIOS for that EISA device is disabled.
- If a PCI bridge device is added on Bus 0, the bus numbering shown above changes. The added (secondary) PCI bus becomes Bus 1, and the dual peer PCI bus (on the server system board) is designated as Bus 2. Alternately, if a PCI bridge device is added on Bus 1, this added bus is designated as Bus 2.

Boot Device

The boot device can be selected using any of the following as determined by the configuration utility:

- Floppy disk
- Hard disk
- CD-ROM
- Network

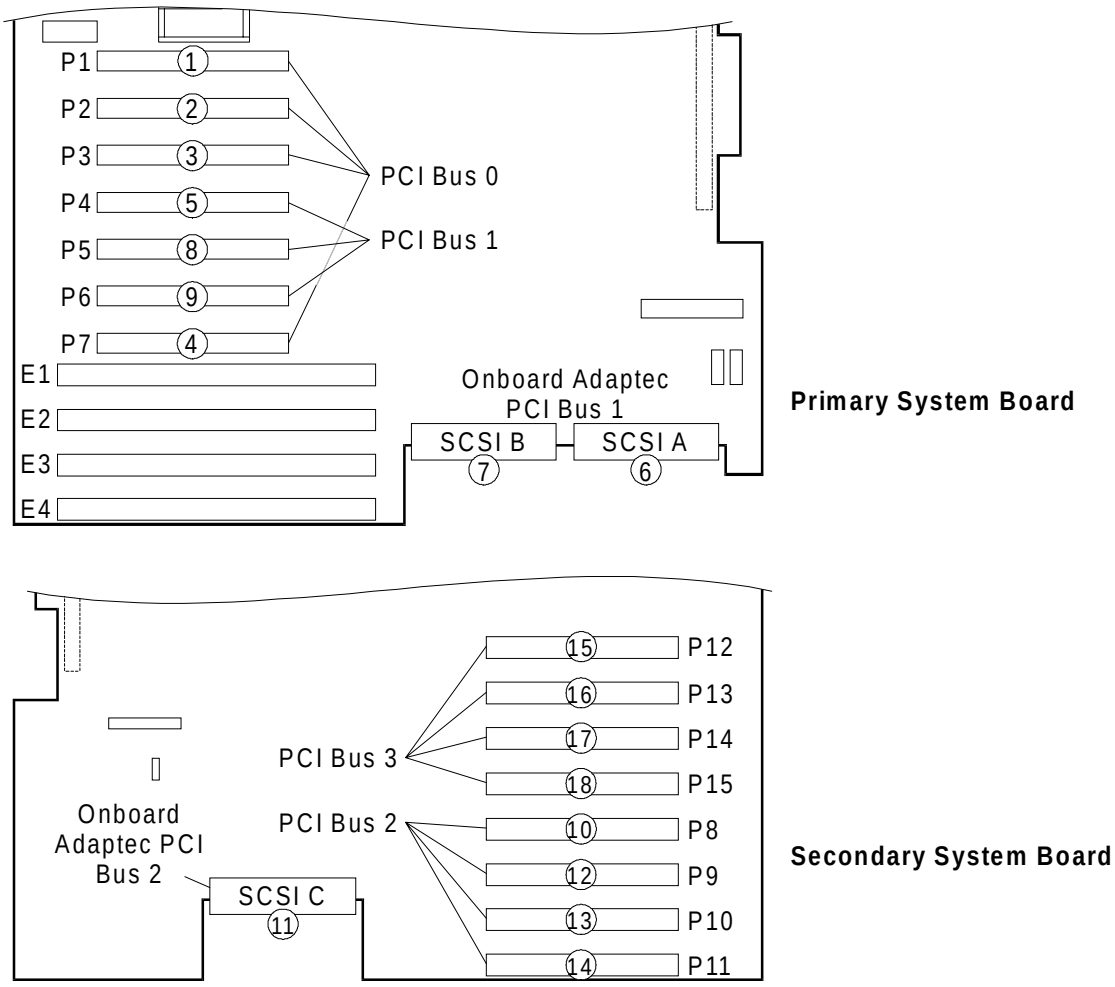
Hard Disk

If the hard disk is selected, the operating system is booted from the first hard drive that contains boot code.

The scan order for these drives are:

- Add-in ISA/EISA/PCI board IDE
- Add-in ISA/EISA board SCSI
- Add-in PCI board SCSI in PCI slots 1, 2, 3, 4, 7
- Onboard SCSI A and B
- Add-in PCI board SCSI in PCI slots 5, 6, and 8
- Onboard SCSI C
- Add-in PCI board SCSI in PCI slots 9 through 15

Slot Scan Order for Booting Hard Disk



PCI Scan Order

The PCI scan order includes how to determine logical bus IDs with bridge chips.

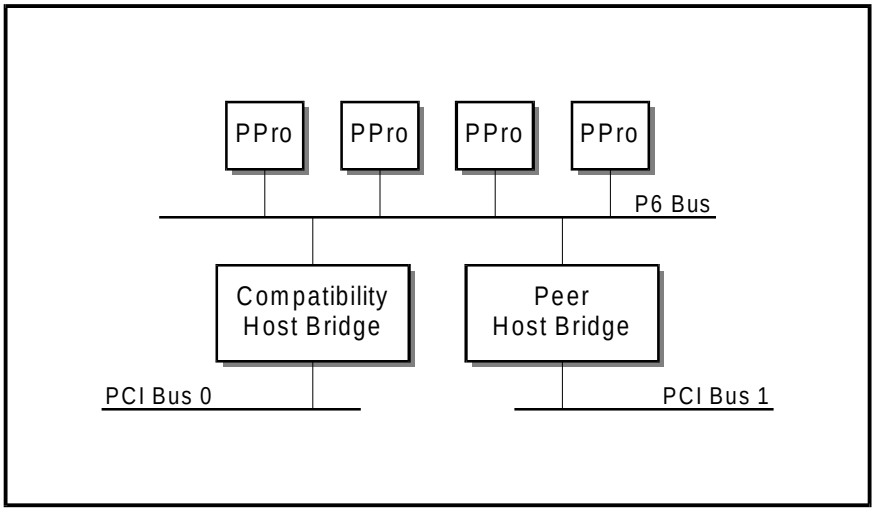
The busses are numbered starting with the compatibility host bridge as “PCI Bus 0.” Then, if there are PCI-to-PCI bridges present, the busses behind the bridges are numbered sequentially in that all busses located behind a PCI-to-PCI bridge must be numbered between the bridge’s Secondary Bus Number and the Subordinate Bus Number (inclusive).

Both host bridges (compatibility and peer) default to PCI Bus 0 after power-on reset. The memory controller is hard coded to PCI bus 0. The logical PCI bus number of the peer (secondary) host bridge may change if PCI-to-PCI bridges are present.

PCI Bus Numbers without PCI-to-PCI Bridges Example

The following figure illustrates how busses are numbered without PCI-to-PCI bridged devices. The PCI bus behind the compatibility bridge is always PCI Bus 0. Because there are no other PCI busses, the peer bus is PCI Bus 1. The term “compatibility bridge” refers to the bridge that contains the PCI compatibility devices and the EISA bus.

PCI Bus Numbers Without PCI-to-PCI Bridges Example



The following figure (PCI Bus Numbers With PCI-to-PCI Bridges Example) illustrates the PCI bus numbering when there are PCI-to-PCI bridges in the system.

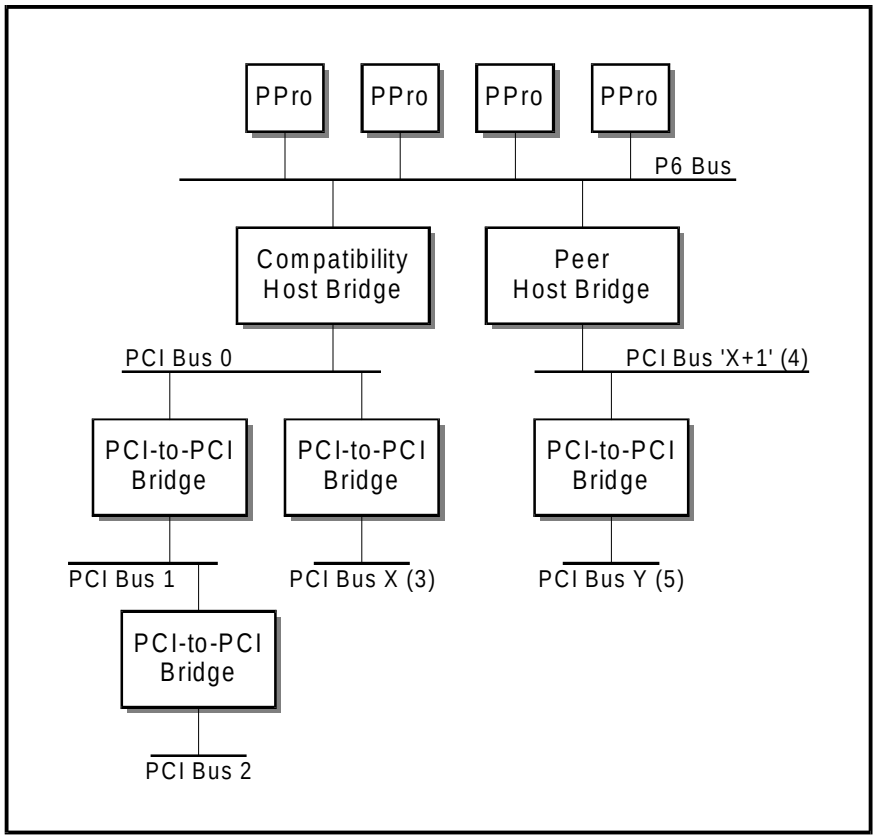
The PCI bus on the secondary side of the compatibility bridge is PCI Bus 0. The secondary side of the first PCI-to-PCI bridge found is PCI Bus 1.

The PCI Bus 1 is scanned (slot P1, then P2, then P3) for other bridges and they are sequentially numbered and then scanned for additional bridges. When the scan does not find any other bridges on the current PCI bus the scan is continued on the primary side of that bridge.

In this example, PCI Bus 0 scan continues and another bridge is found. This in general is numbered as PCI Bus ‘X’ (in this specific case PCI Bus 3). After all the busses are numbered on the compatibility host bridge, the scan continues from the P6 bus for other host bridges. The bus scanning continues for the peer bridge.

Thus, in this example, the peer host bridge PCI bus is PCI Bus 4 and the PCI-to-PCI bridge attached to this host bridge is PCI Bus 5. This bus numbering occurs on every power-up of the server.

PCI Bus Numbers With PCI-to-PCI Bridges Example



Configuring Adaptec SCSI Host Adapters

Using the SCSI*Select* Utility

The SCSI*Select* Utility detects the number of SCSI AIC-7880 host adapters in your system. Use the utility to start, perform low level format, and verify SCSI drives or to configure the SCSI host adapter explicitly to settings other than defaults.

The utility is menu-driven. Follow the screen prompts and information about moving around through the menus and selecting options.

Starting SCSI*Select*

You can start the SCSI*Select* Utility in the following ways:

- During the system boot process (POST)
- From the Diagnostic Partition
- From the Platform CD-ROM

Starting During Boot

To start the SCSI*Select* Utility while the server is booting:

1. Turn on or reboot the server. During boot, the server displays the following prompt at the time the SCSI BIOS is loaded:

   ```
   <<< Press <CTRL><A> for SCSISelect(TM) Utility! >>>
   ```

2. To start the SCSI*Select* Utility, press CTRL+A when you see the prompt.
3. When the Main menu displays, choose the bus:device that you want to configure; each bus accepts up to 15 devices. Refer to “SCSISelect Utility Menus” section for more information.

Starting from the Diagnostic Partition

To boot from the Diagnostic Partition and start the SCSI*Select* Utility:

1. Turn on your video display monitor and your server or, if your server is already running, reboot your system.

   Watch the screen for the following message:

   ```
   Press <D> to boot Diagnostic Partition
   Press <F1> for normal boot, <F2> for BIOS Setup
   Otherwise, <F1> is selected in 30 seconds
   ```

   This message should display after POST completes.

2. Press D immediately.
3. When the MS-DOS Startup menu displays, select “Run Utilities and Diagnostics” and press ENTER.

   The system displays the Main menu.

4. Select “System Config Utils” and press ENTER.
5. Select “Adapter Config Utils” and press ENTER.
6. Select “SCSI-Adaptec” and press ENTER.
7. When the SCSI*Select* Main menu displays, choose the bus:device that you want to configure. Refer to the “SCSISelect Utility Menus” section for additional information.

Starting from the Platform CD-ROM

To boot from the Platform CD-ROM and start the SCSI*Select* Utility:

1. Insert the Platform CD-ROM into the CD-ROM drive.
2. Turn on your video display monitor and your server or, if your server is already running, reboot your system.

   Watch the screen for the following message:

   ```
   Bootable CD detected; Diagnostic Partition will not be bootable
   Press <F1> for normal boot, <F2> for BIOS Setup
   Otherwise, <F1> is selected in 30 seconds
   ```

   This message should display after POST completes.

3. Press F1 to select a normal boot path.
4. When the MS-DOS Startup menu displays, select “Run Utilities and Diagnostics” and press ENTER.

   The system displays the Main menu.

5. Select “System Config Utils” and press ENTER.
6. Select “Adapter Config Utils” and press ENTER.
7. Select “SCSI-Adaptec” and press ENTER.
8. When the SCSI*Select* Main menu displays, choose the bus:device that you want to configure. Refer to the “SCSISelect Utility Menus” section for more information.

SCSI*Select* Utility Keys

The following table describes the keys used to move around in the SCSI*Select* Utility and to select options.

Press	To
ESC	Exit the current screen or Exit Utility (from Main menu)
ENTER	Select an option
↑	Return to a previous option
↓	Move to the next option
F5	Switch between color and monochrome
F6	Reset to host adapter defaults (from configuration menus only)

SCSI*Select* Utility Menus

This section contains tables that describe the options available from the SCSI*Select* Utility menus. The factory default settings are highlighted in boldface.

Main Menu

The following table shows the Main menu options. To select an option, highlight the appropriate selection and press ENTER.

Menu Item	Options	Comments
Bus:Device	01:0Bh → ChA	Select this option to configure the SCSI devices on SCSI Channel A. Channel A connects to the upper SCSI drive backplane.
	01:0Ch → ChB	Select this option to configure the SCSI devices on SCSI Channel B. Channel B connects to the removable media bay, which may contain a CD-ROM, tape, or other removable device.
	02:0Bh → ChC	Select this option to configure the SCSI devices on SCSI Channel C. Channel C connects to the lower SCSI drive backplane.

Bus:Device 01:0Bh/01:0Ch/02:0Bh Menu

The following table shows the Bus:Device menu options. The PCI bus number (01) can change if any cards with PCI bridge chips have been installed.

Menu Item	Options	Comments
Bus:Device 01:0Bh, 01:0Ch, or 02:0Bh	Configure/View Host Adapter Settings	See “Configuration Menu.”
	SCSI Disk Utilities	See “SCSI Disk Utilities Menu.”

Configuration Menu

The following table shows the Configuration menu options.

Menu Items	Option	Comment
SCSI Bus Interface Definitions		
Host Adapter SCSI ID	0-15 (**7**)	SCSI ID 7 has the highest priority on the SCSI bus, and is normally assigned to the host adapter.
SCSI Parity Checking	**Enabled** Disabled	Default (“Enabled”) should typically be used. Should only be disabled if a device on the SCSI bus does not support SCSI parity.
Host Adapter SCSI Termination	**Enabled** Disabled	When enabled, automatically determines if the adapter needs to terminate the SCSI bus. When disabled, adapter will not provide termination and will be located in the middle of the SCSI chain. Termination should only be on each end of the SCSI bus.
Additional Options		
Boot Device Options	Press ENTER	See “Boot Device Configuration Menu.”
SCSI Device Configuration	Press ENTER	See “SCSI Device Configuration Menu.”
Advanced Configuration Options	Press ENTER	See “Advanced Configuration Options Menu.”

Boot Device Configuration Menu

The following table shows the Boot Device Configuration menu options.

Menu Item	Options	Comments
Boot Target ID	0-15 (**0**)	Boot device's physical SCSI ID.
Boot LUN Number	0-7 (**0**)	Boot device's logical ID. This is required if the boot device has multiple LUNs. (Multiple LUN support must be enabled to define this option. This can be enabled from the Advanced Configuration Options menu.)

SCSI Device Configuration Menu

The following table shows the SCSI Device Configuration menu options for SCSI devices IDs 0-7 (across upper half of screen) and IDs 8-15 (across the bottom half of screen). Options are set for each individual SCSI device ID.

Menu Item	Options	Comments
Initiate Sync Negotiation	**Yes** No	By default, the adapter initiates synchronous negotiation with the SCSI device. This may need to be set to "no" to support high-speed CD-ROMs.
Maximum Sync Transfer Rate	**40.0** 32.0 26.8 20.0	Determines the maximum synchronous data transfer rate the adapter negotiates with the device. If "Initiate Sync Negotiation" is set to "no," this is the maximum rate at which the adapter accepts data from the device during negotiation.
Enable Disconnection	**Yes** No	If the adapter connects to only one SCSI device, setting this to "no" can achieve slightly better performance.
Initiate Wide Negotiation	**Yes** No	The internal disks are wide SCSI. This should be enabled to support them. The adapter does not attempt wide negotiation with 8-bit devices if these are present on the bus.
Send Start Unit Command*	**Yes** No	**IMPORTANT:** Must **always** be set to "Yes" for hot-swap drives and in order for internal SCSI hard disks to spin up during the BIOS scan process.
Include in BIOS Scan*	**Yes** No	Used to enable scanning for active devices. Initialization can be speeded up by disabling this option for IDs in which no device is attached.

* Selections for these menu items have no effect if SCSI BIOS is disabled. SCSI BIOS is enabled under the "Host Adapter BIOS" menu item in the Advanced Configuration Options menu.

Advanced Configuration Options Menu

The following table shows the Advanced Configuration Options menu options.

Menu Item	Options	Comments
Reset SCSI Bus at IC Initialization	**Enabled** Disabled	Provides a SCSI bus reset at power on. Select “Disabled” in a LifeKeeper configuration.
Host Adapter BIOS (Configuration Utility Reserves BIOS Space)	**Enabled** Disabled	Must be enabled to boot from a SCSI disk connected to this adapter. Also must be enabled to enable any of the remaining options in this menu.
Support Removable Disks Under BIOS as Fixed Disks*	**Boot Only** All Disks Disabled	**CAUTION:** Do not remove media from a removable media drive if drive is under BIOS control.
Extended BIOS Translation for DOS Drives > 1 Gbyte*	**Enabled** Disabled	This setting must be enabled to support DOS on drives with capacity greater than 1 GB.
Display CTRL+A Message During BIOS Initialization*	**Enabled** Disabled	No effect if the SCSI BIOS is disabled.
Multiple LUN Support*	Enabled **Disabled**	Enable this option if any devices have multiple logical.
BIOS Support for Bootable CD-ROM*	**Enabled** Disabled	When enabled and a bootable CD ROM is installed, the server boots from the CD-ROM.
BIOS Support for INT 13 Extension*	**Enabled** Disabled	When enabled the SCSI BIOS supports INT 13h extensions, which are necessary for CD-ROM boot. Has no effect when booting from other devices.
Support for Ultra SCSI Speed*	Enabled **Disabled**	Reset to “Enabled” **only** if server is set up for ultra speeds with new internal SCSI cables.
* Selections for these menu items have no effect if SCSI BIOS is disabled. SCSI BIOS is enabled under the “Host Adapter BIOS” menu item.		

SCSI Disk Utilities Menu

The SCSI Disk utilities scan the SCSI bus for devices. After scanning the bus, they report a description of each device connected to the SCSI bus or indicate that “no device” is present.

Select a device (SCSI ID 0 to 15) and press ENTER to bring up the following menu:

```
Format Disk
Verify Disk Media
```

Note: SCSI ID #7 is your SCSI host adapter. SCSI ID is determined from previous menu selections and may be any SCSI ID (7 is the default).

Exit Menu

The following table shows the Exit menu options.

Menu Item	Options	Comments
Exit Utility?	Yes No	When you finish configuring your SCSI devices, select “Yes” and press ENTER. When the following message displays, press any key and your server reboots: `Please press any key to reboot`

Configuring a Mylex Disk Array Adapter

This section tells you how to use the Disk Array Controller Configurator (DACCFG) Utility to configure a Mylex Disk Array Adapter.

SCSI Drive ID Jumper Settings

The Mylex Disk Array Adapter (DAC960PL) only recognizes drives with SCSI IDs from 0 to 7. The SCSI drive ID jumpers (J3 and J4) on the SCSI drive backplane control the assignment of SCSI IDs. If these jumpers have been changed from the factory default settings, the Mylex Disk Array Adapter will not recognize all of the drive bays in the SCSI backplane.

If you are using a Mylex Disk Array Adapter, with a single SCSI backplane, its J3 jumper must be on pins 1 and 2 and the J4 jumper on pins 2 and 3. These jumper settings configure SCSI backplane bays 1 through 6 as SCSI IDs 0 through 5, respectively.

Starting the DACCFG Utility

You can start the DACCFG Utility from either the Diagnostic Partition, the Platform CD-ROM, or from diskette. Use the Quick Launch CD-ROM to create configuration utility diskettes.

Starting DACCFG from the Diagnostic Partition

To start the DACCFG Utility from the Diagnostic Partition:

1. Turn on your video display monitor and your server or, if your server is already running, reboot your system.

   Watch the screen for the following message:

   ```
   Press <D> to boot Diagnostic Partition
   Press <F1> for normal boot, <F2> for BIOS Setup
   Otherwise, <F1> is selected in 30 seconds
   ```

   This message displays after POST completes.

2. Press D immediately.

3. When the MS-DOS Startup menu displays, select “Run Utilities and Diagnostics” and press ENTER.

   The system displays the Main menu.

4. Select “System Config Utils” and press ENTER.

5. Select “Adapter Config Utils” and press ENTER.

6. Select “RAID - Mylex” and press ENTER.

After an initial scan of the attached busses to determine what devices are attached, the configuration utility displays its Main menu. For further information on using the DACCFG utility, refer to the Mylex user documentation on the Quick Launch CD-ROM.

Starting DACCFG From the Platform CD-ROM

To boot from the Platform CD-ROM and start the DACCFG Utility:

1. Insert the Platform CD-ROM into the CD-ROM drive.
2. Turn on your video display monitor and your server or, if your server is already running, reboot your system.

   Watch the screen for the following message:

   ```
   Press <D> to boot Diagnostic Partition
   Press <F1> for normal boot, <F2> for BIOS Setup
   Otherwise, <F1> is selected in 30 seconds
   ```

   This message displays after POST completes.
3. Press F1 to select a normal boot path, or wait 10 seconds and the server will automatically select normal boot.
4. When the MS-DOS Startup menu displays, select “Run Utilities and Diagnostics” and press ENTER.

   The system displays the Main menu.
5. Select “System Config Utils” and press ENTER.
6. Select “Adapter Config Utils” and press ENTER.
7. Select “RAID - Mylex” and press ENTER.

After an initial scan of the attached busses to determine which devices are attached, the configuration utility displays its Main menu.

For further information on using the DACCFG utility, refer to the Mylex user documentation.

Starting DACCFG From Diskette

To boot from diskette and start the DACCFG Utility, you must have a DOS-bootable diskette installed in the diskette drive.

1. Turn on your monitor and server or, if your server is already running, reboot your system.

   Watch the screen for the following message:

   ```
   Press <D> to boot Diagnostic Partition
   Press <F1> for normal boot, <F2> for BIOS Setup
   Otherwise, <F1> is selected in 30 seconds
   ```

   This message displays after POST completes.
2. Press F1 to select a normal boot path.
3. At the prompt, type the text that follows and press ENTER: 4.

   ```
   a:\cd\daccfg
   ```
5. Then type the following text and press ENTER:

   ```
   a:\daccfg\>DACCF-0
   ```
6. The Mylex Disk Array Controller Configurator (DACCFG) utility main menu appears.

For further information on using the DACCFG utility, refer to the Mylex user documentation.

Configuring New Drives

Note: Use the "Automatic Configuration" option only if you have less than 32 GB of disk space and want to create a single RAID-5 logical drive using three or more disks. Select the "Tools/Clear Configuration" menu items when installing a new system for the first time.

To configure new drives:

1. Select option 3, "View/Update Configuration," by moving your arrow key down to it and pressing ENTER.
2. Select option 1, "Define Pack." This option permits you to group physical disk drives together into logical drives, or "packs."
3. Select option 1, "Create Pack." This option permits you to select which drives to include in the logical drive you are currently defining. Press ENTER to include the currently highlighted drive in the current pack. (The highlighted pack is indicated by a light blue cursor around the drive's status, which usually reads "RDY" for "ready.") To move from drive to drive, press TAB until you highlight the desired drive. After you select all of the drives you want to include, press ESC to return to the Pack Definition menu.

   Note: If you make a mistake in defining a drive, you can cancel the pack. BE CAREFUL when canceling a defined pack because the pack could contain something you do not want to cancel - like the Diagnostic Partition.

   If you do want to cancel a pack, select option 2, "Cancel Pack." To cancel a defined pack, use the TAB key to move the cursor to a drive in the pack you want to cancel, and press ENTER. If you are canceling more than one pack, you must begin with the pack that was created last and progress forward. After you cancel a pack, your cursor returns to the Pack Definition menu.
4. After you have created all of the packs, you must arrange them in the order you want the drives to be seen by the system. To do this, select option 3, "Arrange Pack." Press TAB to highlight the various packs. Pressing ENTER while any drive in the pack is highlighted causes that pack to be the first drive seen by the system. Use this procedure to order the remaining packs.
5. When you have arranged the last pack, the system returns you to the View/Update Configuration menu.
6. Select option 2, "Define System Drive." This permits you to create system (or logical) drives from the packs you have just created and arranged.
7. Select option 1, "Create System Drive."

8. The “System Drive Definition” menu displays. Below it is a “RAID Level” menu.

   Note: You are only permitted to select valid configurations for the number of drives actually present in the pack. For example, if there is only one drive in the pack, you are not permitted to select RAID-5, since that configuration requires a minimum of three drives.

   Specify the RAID level of the system drive you are creating by moving the cursor using the arrow keys to the correct RAID level, and pressing ENTER.

   Note: The RAID levels defined for the Mylex Configuration Utility differ slightly from the standard. Supported RAID levels are as follows:

   – RAID-0: Stripe set with no redundancy
   – RAID-1: Mirrored drives
   – RAID-5: Stripe set with parity redundancy
   – RAID-6: Mirrored stripe sets (like RAID-1, except with stripe sets)
   – RAID-7: JBOD (Just a bunch of drives)

9. The “Enter Size (MB)” menu pops up. Enter the size of the system drive (in MB) in this menu. The default value given is the largest size possible for the pack and RAID level selected. Press ENTER to accept the default.

   Note: The value you enter is the raw capacity. The actual capacity is derated by the amount necessary to support the RAID level. For example, if you select RAID level 1 and a size of 1000 MB, the actual capacity is 500 MB.

10. The system drive #, RAID level, and capacity of the system drive to be created displays. (The capacity may be different than the drive size above, if the RAID level selected calls for parity redundancy.) At the “Do you want to create this system drive” message, select “Yes,” and press ENTER.

11. Repeat steps 6 through 10 for each system drive you want to create. The entire first pack must be utilized as system drives before the next pack can be accessed to be configured as system drives.

12. After creating the system drives, you can select “Toggle Write Policy” and switch the system drives from “Write-thru” to “Write-back” mode. Do this by pressing ENTER as each system drive is selected. Write-back mode improves system performance in some cases, and takes full advantage of the Mylex controller’s onboard cache. The preferred option is “Write-thru.” When using “Write Back” be sure the battery backup module is installed and enabled with DACCF.

    Note: To preserve data integrity in the event of a loss of power, the Mylex controller must include the optional battery backup system when “Write Back” mode is enabled. If no battery system is present, use “Write thru” mode.

13. When finished, press ESC. The “Save Configuration” menu box displays.

14. Select “Yes” and press ENTER. The “New Configuration” menu displays. Press ESC to return to the “View/Update Configuration” menu.

15. Next, press ESC to exit from the “View/Update Configuration” menu, and you are prompted to save the configuration. If you want to save the configuration, highlight “Yes” and press ENTER. Configuration information is stored in the non-volatile RAM on the Mylex controller board, and you are returned to the Main menu.

16. Select option 5, “Initialize System Drive,” and press ENTER.

17. Select the system drives to initialize with your arrow keys, and press ENTER to select each drive. A checkmark displays by each drive to be formatted.

    Note: Always initialize all new system drives.

    CAUTION: Initializing a drive signifies that you want to perform a format. All data on each of the physical disks is destroyed. Be certain you have no valuable data on the disk before proceeding to the next step. Initialization also stripes the drives to the specific RAID configuration selected.

18. After you have checked all of the drives to initialize, highlight the "Start" option, and press ENTER. Multiple drive selections initialize simultaneously up to a maximum of eight drives.

19. At the "Do you want to proceed with initialization?" message, select "Yes" and press ENTER to initialize the drives. The drives are formatted concurrently. Depending on the size of drives, this can take anywhere from a few minutes to a few hours.

20. After initialization has completed, a message displays indicating "Initialization Completes Successfully. Press any key to continue."

21. After displaying the message "Saving configuration. Please wait," the utility returns to the Main menu. Press ESC to exit from the utility.

22. A message appears: "Remember to save your configuration to a floppy disk before exiting. Do you really want to exit config utility?" Select "Yes" and press ENTER. You are returned to the A: prompt.

Miscellaneous Information Concerning the Mylex Disk Array

To poll the bays to detect newly installed drives, use the Tools Utility. This utility permits you to add new drives to the array.

The hard drives in the hot-swap bays only power up when a Start Unit command is received. This setting is found under "Advanced Options" in the DACCFG Utility. Two drives spin up simultaneously, with a six-second delay.

Adding a Mylex Adapter to an Existing Windows NT Server System

If you add a Mylex adapter to an existing Windows NT Server system, configure the disk drives using the DACCFG Utility. Then use the Windows interface to add the adapter to the system as follows:

1. Access the control panel.
2. Access Windows Setup.
3. Select "Add SCSI Drivers."
4. Insert the Mylex driver diskette in the diskette drive.
5. Add the new driver to the system.
6. Reboot your system.

Chapter 6

Updating Flash Memory

This chapter describes the procedure for updating the system BIOS. The BIOS is stored in nonvolatile memory (NVRAM) in a flash EPROM device on the primary system board. You can update the BIOS without replacing the device. Use the BIOS Flash Utility to update the BIOS as new versions become available.

This chapter also covers creating a Backup BIOS Flash Recovery Diskette.

Terms, Conventions, and Related Documents

Refer to the "Preface" of this document for important information on how to use this book, terms and conventions, and related documents.

When used in this chapter, the term "configuration utility" refers to the System Configuration Utility (SCU). Chapter 3 discusses how to use the SCU in detail.

Before Updating BIOS

Before performing a system BIOS flash memory update:

- Record your configuration settings and back them up on a diskette. This enables you to re-create your configuration if the update fails for any reason. For instructions on creating a backup configuration utility diskette, see "Procedure to Create SCU Backup" in Chapter 3.
- Create a Backup BIOS Flash Utility recovery diskette

One way to record your configuration settings is to print out or copy the *ncc01ac.set* file. This file is located in the *\model2\scu* directory in the Diagnostic Partition or on your system configuration utility diskette, depending on whether you ran the configuration utility from the Diagnostic Partition or from diskette.

In addition, the *ncc01ac.cms* file contains a backup of the CMOS and nonvolatile RAM configuration settings, and can be restored using the configuration utility.

Creating a Backup BIOS Flash Utility Diskette

You must create a backup BIOS Flash Utility diskette before you update the system BIOS.

If there is a power failure before the system BIOS update completes successfully, you cannot reboot your server from the Diagnostic Partition or the Platform CD-ROM. If this situation occurs, you must use the backup BIOS Flash Utility diskette to boot your server and restore the BIOS.

IMPORTANT: The backup diskette is to be used solely for BIOS Flash backup purposes, in the event you need to perform a Flash recovery operation. You are not authorized to copy program files, nor to use this backup diskette on any other system.

Procedure for Creating a BIOS Flash Utility Diskette

To create a backup BIOS Flash Utility diskette:

1. Turn on your video display monitor and your server, or, if your server is already running, reboot it.

   When the BIOS POST process completes, the server displays the following prompt:

   ```
   Press <D> to boot Diagnostic Partition
   Press <F1> for normal boot, <F2> for BIOS Setup
   Otherwise, <F1> is selected in 30 seconds
   ```

2. Press D immediately to boot the Diagnostic Partition.
3. When the MS-DOS Startup menu displays, select “Run Utilities and Diagnostics” and press ENTER.
4. When the Diagnostic Partition Main menu displays, select “BIOS Flash Utilities” and press ENTER.
5. When the BIOS Flash menu displays, select “Create Flash Backup” and press ENTER.
6. Insert a diskette into the server diskette drive and press ENTER.

The server formats the diskette and copies the BIOS Flash Utility to the diskette.

Updating the System BIOS

This section contains procedures for running the BIOS Flash Utility and updating the system BIOS.

Running the BIOS Flash Utility

You can run the BIOS Flash Utility from any of the following:

- Diagnostic Partition
- BIOS Flash Recovery diskette
- Platform CD-ROM

It is recommended that you run the BIOS Flash Utility from the Diagnostic Partition whenever possible. If the Diagnostic Partition is not available, the next best option is to run it from a backup BIOS Flash backup diskette. Run the BIOS Flash Utility from CD-ROM only if both the Diagnostic Partition and diskette are not available.

Updating Flash Memory from the Diagnostic Partition

To update flash memory from the Diagnostic Partition:

1. Turn on your video display monitor and your server, or, if your server is already running, reboot it.

   When the BIOS POST process has completed, the server displays the following prompt:

   ```
   Press <D> to boot Diagnostic Partition
   Press <F1> for normal boot, <F2> for BIOS Setup
   Otherwise, <F1> is selected in 30 seconds
   ```

   Note: If the server does not display this prompt, you must run the BIOS Flash Utility from diskette or CD-ROM.

2. Press D to boot the Diagnostic Partition.
3. When the MS-DOS Startup menu displays, select “Run Utilities and Diagnostics” and press ENTER.
4. When the Diagnostic Partition Main menu displays, select “BIOS Flash Utilities” and press ENTER.
5. When the BIOS Flash menu displays, select “Run Flash Utility” and press ENTER.
6. When the “Attention/Continue” window appears, press “Q” to bypass the screen. The following message appears:

   ```
   WARNING:  You are about to Flash the BIOS.  Press Y to continue flashing,
   any other key to abort.
   ```

   Then, press “Y” to flash the BIOS or any other key to skip it.

7. From the BIOS Flash Utility Main menu, select “Update FLASH Memory Area from a File.”
8. Press any key to restart the server.

Updating Flash Memory from Diskette

You should create a BIOS Flash Utility diskette when you install your system. This diskette enables you to run the BIOS Flash Utility if the Diagnostic Partition is unavailable. See “Creating a Backup BIOS Flash Utility Diskette” in this chapter for details.

To update flash memory from diskette:

1. Insert the BIOS Flash Utility diskette into the drive and power on or reset the server.

   When the BIOS POST process has completed, the server displays the following prompt:

   ```
   Press <D> to boot Diagnostic Partition
   Press <F1> for normal boot, <F2> for BIOS Setup
   Otherwise, <F1> is selected in 30 seconds
   ```

2. Press F1 or wait 30 seconds to select normal boot.

   After DOS boots, the BIOS Flash Utility executes automatically. The following message displays:

   ```
   WARNING! You are about to flash the BIOS. Press Y to continue flashing, any
   other key to abort.
   ```

3. Press any key to continue (reboot the server).

Updating Flash Memory from CD-ROM

To update flash memory from the Platform CD-ROM:

1. Insert the Platform CD-ROM into the CD-ROM drive.
2. Turn on the monitor and the server, or, if your server is already running, reboot it.

   When the BIOS POST process has completed, the server displays the following prompt:

   ```
   Bootable CD detected; Diagnostic Partition will not be bootable
   Press <F1> for normal boot, <F2> for BIOS Setup
   Otherwise, <F1> is selected in 30 seconds
   ```

3. Press F1 to select normal boot. (See note that follows.)
4. When the CD-ROM main menu displays, select “Run CD Utilities and Diagnostics” and press ENTER.
5. Select “Execute Utils from CD.” When this menu displays, select “BIOS Flash Utilities.”
6. When the BIOS Flash menu displays, select “Run Flash Utility” and press ENTER. The following message displays:

   ```
   WARNING: You are about to Flash the BIOS. Press Y to continue flashing, any
   other key to abort.
   ```

7. Press any key to continue (reboot the server).

   Note: If the CD-ROM does not boot in Step 3, reboot the server and press CTRL+A when prompted to run the SCSI*Select* Utility. Make sure that the “BIOS Support For Bootable CD-ROM” option is enabled on the SCSI*Select* Advanced Configuration Options menu.

BIOS and Configuration Utility Compatibility

When updating your flash memory BIOS to a different revision, be aware that a new version of the system configuration utility is also required.

Clearing CMOS

On rare occasions, you may be instructed to reset system CMOS and NVRAM values to the manufacturing defaults after a BIOS update. Clearing CMOS is not recommended unless service personnel instructs you to do so.

IMPORTANT: If CMOS is cleared manually, you must run the system configuration utility to re-configure your server. See “Configuring Your Server” in Chapter 3.

BIOS Update Considerations

To ensure the smooth update of the system BIOS, there are a few areas where you must exercise caution.

If anything happens to the server during the flash update process, the system BIOS may be corrupted. Normal system operation can be restored only through a BIOS recovery procedure. Contact your Support Center if your system BIOS is corrupt and you need to recover it.

To ensure a safe and successful flash update of the system BIOS, follow these guidelines:

- DO NOT touch the reset button during the flash process.
- DO NOT touch the power on/off button during the flash process.
- DO NOT touch the keyboard during the flash process unless server prompts you to do so.
- DO NOT remove power from the server during the flash process.
- DO have patience. The server resets when the flash process has completed.

BIOS Corrupted During System BIOS Upgrade

If the BIOS is corrupted during a flash memory upgrade procedure (for example, due to a power failure or an inability to read the BIOS diskette which results in a fatal BIOS upgrade error) and the server cannot be booted at all:

- Place the restore jumper in the “Recovery” position on the primary system board.
- Insert the backup BIOS diskette into the diskette drive and power on the server.

  Note: There is no indication that system BIOS recovery is actually taking place. When the recovery cycle for the flex begins, there is a single beep. At the completion of BIOS recovery there are two beeps. The screen remains blank during the recovery process so you will know that it has successfully completed when you hear two beeps and there is no more flex activity.
- After the BIOS recovery is complete, power down the server and reposition the flash recovery jumper to the normal position. Refer to above referenced section in the Service Guide for additional information.

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