555-7101-218

CallPilot

Installation and Configuration
Part 5: 1001rp Server Maintenance and Diagnostics

Product release 2.0 Standard 1.0 October 2002

NORTEL NETWORKS™

P0949455

CallPilot

Installation and Configuration
Part 5: 1001rp Server Maintenance and Diagnostics

Publication number:	555-7101-218
Product release:	2.0
Document release:	Standard 1.0
Date:	October 2002

Printed in Canada

*Nortel Networks, the Nortel Networks logo, the Globemark, and Unified Networks, BNR, CallPilot, DMS, DMS-100, DMS-250, DMS-MTX, DMS-SCP, DPN, Dualmode, Helmsman, IVR, MAP, Meridian, Meridian 1, Meridian Link, Meridian Mail, Norstar, SL-1, SL-100, Succession, Supernode, Symposium, Telesis, and Unity are trademarks of Nortel Networks.

3COM is a trademark of 3Com Corporation.

ACCENT is a trademark of Accent Software International Ltd.

AMDEK is a trademark of Amdek Corporation.

AT&T is a trademark of American Telephone andTelegraph Corporation.

ATLAS is a trademark of Quantum Corporation.

ATRIA is a trademark of Pure Atria Corporation.

BLACKBERRY is a trademark of Research in Motion Limited.

CASEWARE is a trademark of Caseware International, Inc.

CONTINUUS is a trademark of Continuus Software Corporation.

CRYSTAL REPORTS is a trademark of Seagate Software Inc.

DEFINITY is a trademark of Avaya Inc.

DIALOGIC is a trademark of Dialogic Corporation.

EUDORA is a trademark of Qualcomm.

EXCHANGE.NET, INTERNET EXPLORER, LINKEXCHANGE, MICROSOFT, MICROSOFT EXCHANGE SERVER, MS-DOS, OUTLOOK, POWERPOINT, WINDOWS, WINDOWS MEDIA, and WINDOWS NT are trademarks of Microsoft Corporation.

GROUPWISE and NOVELL are trademarks of Novell Inc.

HITACHI is a trademark of Hitachi Limited.

INTEL is a trademark of Intel Corporation.

LOGITECH is a trademark of Logitech, Inc.

NETSCAPE COMMUNICATOR is a trademark of Netscape Communications Corporation.

PCANYWHERE is a trademark of Symantec Corporation.

PROMARK and RHOBOT are trademarks of DMI Promark, Inc.

RADISYS is a trademark of Radisys Corporation.

SLR4, SLR5, and TANDBERG are trademarks of Tandberg Data ASA.

SYBASE is a trademark of Sybase, Inc.

UNIX is a trademark of X/Open Company Limited.

US ROBOTICS, the US ROBOTICS logo, and SPORTSTER are trademarks of US Robotics.

VOICEBRIDGE is a trademark of Voice Technologies Group Inc.

Publication history

October 2002

Standard 1.0 of *CallPilot Installation and Configuration, Part 5: 1001rp Server Maintenance and Diagnostics* is issued for general release.

Contents

Chapter 1

About this guide

In this chapter

Maintenance and diagnostics overview

Introduction

The maintenance and diagnostic activities discussed in this guide are divided into two groups of activities:

- troubleshooting and diagnostics (identifying the cause of and resolving system problems)
- performing hardware maintenance

Who should read this guide

This guide is for administrators, technicians, and engineers responsible for maintaining a CallPilot server. It is intended to act as a guide for

- using system tools to identify the cause of system problems
- installing, replacing, or upgrading hardware components

This guide assumes that you have basic computing skills, and are familiar with necessary safety procedures. For more information about safety, refer to Part 1 of the *CallPilot Installation and Configuration* binder.

Resolving system problems

This guide describes how to use a variety of CallPilot resources for resolving system problems.

If you are not able to resolve your problem with the resources described in this guide, you can also refer to the following documents:

- *CallPilot Administrator's Guide* (NTP 555-7101-301)

- *CallPilot Troubleshooting Reference*

  Note: The *CallPilot Troubleshooting Reference* is written for Nortel Networks distributors and technical support representatives; therefore, it is not part of the customer documentation package. Nortel Networks continually updates the *CallPilot Troubleshooting Reference*, which is available from the Partner Information Center (PIC) at http://my.nortelnetworks.com.

Note: For more details, see “Resolving system problems” on page 14.

Preparing for hardware or software maintenance

The “Starting up and shutting down the CallPilot server” chapter in Part 1 of the *CallPilot Installation and Configuration* binder explains how to restart, shut down, and power up the CallPilot server. You may be asked to perform one or more of these tasks while maintaining your server.

Performing hardware maintenance

Chapters 7 to 14 in this guide explain how to replace hardware components. For more details, see “Replacing hardware components” on page 17.

Rebuilding the CallPilot system

When you purchased your CallPilot server, it came preinstalled with the Windows NT operating system and CallPilot server software. If your CallPilot server no longer functions because of a software problem, you may need to reinstall the CallPilot software or rebuild the system.

To locate instructions for these tasks, refer to Part 4 of the *CallPilot Installation and Configuration* binder.

Resolving system problems

Introduction

Chapters 2 to 6 in this guide describe how to use a variety of CallPilot resources for resolving system problems.

If you are not able to resolve your problem with the resources described in this guide, you can also refer to the following documents:

- *CallPilot Administrator's Guide* (NTP 555-7101-301)
- *CallPilot Troubleshooting Reference*

Using this guide

This guide provides instructions for using the resources provided by your 1001rp server, as follows:

To	See
interpret POST codes and troubleshoot startup problems	Chapter 2, "Troubleshooting your CallPilot system" on page 19
use Windows NT 4.0 diagnostic tools, including Event Viewer and TCP/IP diagnostic tools	Chapter 3, "Using Windows NT online diagnostic tools" on page 39
run diagnostics on the serial ports	Chapter 4, "Using serial port diagnostic tools" on page 63
use the Event Browser, Alarm Monitor, and Maintenance page in CallPilot Manager	Chapter 5, "Using CallPilot Manager to monitor hardware" on page 75

To	See
use the following CallPilot system utilities: ■ Diagnostics Tool ■ System Monitor	Chapter 6, “Using CallPilot system utilities” on page 115

Using the *CallPilot Administrator’s Guide*

The *CallPilot Administrator’s Guide* (NTP 555-7101-301) provides valuable information for monitoring system performance. The *CallPilot Administrator’s Guide* describes how to

- view and filter server events
- monitor the CallPilot server performance, disk space, and database
- monitor and manage CallPilot channels
- troubleshoot CallPilot call service and system operation problems

Using the *CallPilot Troubleshooting Reference*

The *CallPilot Troubleshooting Reference* describes symptoms that can appear on all CallPilot server platforms, and ways to resolve them. Nortel Networks continually updates the *CallPilot Troubleshooting Reference*, which is available on the Nortel Networks Partner Information Center (PIC) at http://my.nortelnetworks.com.

Note: If you are not a Nortel Networks distributor, then contact your Nortel Networks technical support representative for assistance.

Use the *CallPilot Troubleshooting Reference* to resolve the following types of problems:

- server boot cycle failures
- peripheral device problems
- monitor display problems

- server to network connection problems
- remote access connection problems
- CallPilot application problems

Replacing hardware components

Introduction

This guide describes how to replace or install hardware components as follows:

To replace or install	See
basic chassis components: ▪ the server cover or front bezel ▪ air filters ▪ power supply ▪ cooling fan ▪ fuse ▪ alarm board ▪ status display panel	Chapter 7, “Replacing basic chassis components” on page 127
a hard drive, tape drive, CD-ROM drive, or floppy disk drive	Chapter 8, “Replacing a hard drive, tape drive, CD-ROM drive, or floppy drive” on page 151
the RAID card	Chapter 9, “Performing RAID maintenance” on page 169
▪ MPC-8 cards ▪ MPB16-4 boards	Chapter 10, “Replacing or adding voice processing boards” on page 261
the video card the Ethernet network interface card	Chapter 11, “Replacing the video card” on page 275

To replace or install	See
memory modules, the CPU or BIOS	Chapter 13, "Maintaining the Pentium II SBC card" on page 293 or Chapter 14, "Maintaining the Pentium III SBC card" on page 331

Approved replacement parts

Before replacing any parts on your server, refer to the Nortel Networks product catalog for the part codes.

CAUTION

Risk of system damage
The use of parts that are not approved by Nortel Networks can cause serious system problems or void your Nortel Networks warranty.

Preparing for maintenance activities

Before you proceed with hardware maintenance activities, review Part 1 of the *CallPilot Installation and Configuration* binder for the following information:

- required tools and equipment
- recommended safety precautions for electrostatic discharge, handling cards, and handling your server
- instructions for shutting down your 1001rp server or for taking it out of service

Chapter 2

Troubleshooting your CallPilot system

In this chapter

Overview

Introduction

This chapter describes troubleshooting methods and resources for major problems with the CallPilot server, such as an inability to startup the server.

The topics are divided as follows:

- Section A: “Startup diagnostics” on page 21
- Section B: “Troubleshooting startup problems” on page 35

See also

Additional documentation and resources are available for troubleshooting your CallPilot system, as follows:

- Chapters 3 to 6 of this guide, which describe additional diagnostic tools.

  These diagnostic tools can only be used if you are able to start up the CallPilot server. See “Resolving system problems” on page 14 for more details.
- *CallPilot Administrator’s Guide* (NTP 555-7101-301)

  See “Using the CallPilot Administrator’s Guide” on page 15 for more details.
- *CallPilot Troubleshooting Reference*

  This guide is written for Nortel Networks distributors and technical support representatives, and therefore is not part of the customer documentation package. See “Using the CallPilot Troubleshooting Reference” on page 15 for more details.

Section A: Startup diagnostics

In this section

Startup diagnostics overview

Introduction

This section contains procedures for interpreting the startup diagnostics on the 1001rp server.

Types of startup diagnostic

The following types of startup diagnostics are available on the server:

- Basic hardware check (LEDs, and so on)
- Power-On Self-Test (POST) diagnostics
- SCSI controller diagnostics or RAID controller diagnostics

These diagnostics are available at initial system startup, or after any 1001rp server reset.

Basic hardware check

Introduction

This section describes some basic checks that you can do when you start up the server.

To run the confidence test

1 Power on the server and observe the front panel display.

Result: All LEDs on the panel illuminate for a few seconds. The green power LED remains illuminated.

2 Observe the following server actions:

- Cooling fans on the front panel start up, and the red fault LED next to each fan extinguishes.
- Drives spin up, and the amber hard drive activity LEDs over the front panel display, extinguish, and then flash with activity.
- LEDs illuminate temporarily as the system checks the floppy drive, tape drive, and CD-ROM drive.
- The LED on each power supply lights up red as supply fans spin up and components charge. LEDs turn green when the attached power supply is fully operational.

3 Check the monitor for any error messages as the server counts RAM and completes a Power-On Self-Test (POST).

See “Power-On Self-Test diagnostics” on page 24 for more details on POST.

Power-On Self-Test diagnostics

Introduction

The Power-On Self-Test (POST) is a system diagnostic program (stored in the BIOS) that runs each time the 1001rp server is started. POST's function is to test system components and then display status messages.

POST message formats

POST reports on the system status in three ways:

- POST beep codes
- POST error codes and messages

  Note: The on-screen display of POST codes is not supported on CallPilot servers. However, the POST error codes and descriptions are included in this section for reference purposes.
- countdown codes displayed during normal BIOS POST

To run the Power-On Self Test

1 Power up the CallPilot server and monitor.

Result: After a few seconds, POST begins to run.

After the memory test, various screen prompts and messages appear. The screen prompts may be accompanied by a single beep.

2 Observe the screen for any error messages and listen for POST beep codes. When POST completes, the server beeps once.

If the server halts before POST is finished, the server emits a beep code indicating that a fatal system error requires immediate attention. See "Interpreting POST diagnostics" on page 26 for details.

If POST can display a message on the monitor, the server emits two beeps as the message appears.

Record the message that appears on the monitor, and the beep code that you hear. This information is useful if you need assistance from your technical support representative.

Interpreting POST diagnostics

Introduction

This section provides an explanation of the POST diagnostic codes.

POST beep codes

If an error occurs before video initialization, POST emits beep codes that indicate errors in hardware, software, or firmware.

A beep code is a series of separate tones, each equal in length. Record the beep code sequence before calling Nortel Networks technical support.

ATTENTION

Some POST beep codes are fatal and may require that you replace the SBC. See the table below for more information about beep codes.

Beep sequence	Error message and conditions
1-2-2-3	Checksum the BIOS.
1-3-1-1	Verify proper refresh operation.
1-3-4-1	Test the DRAM address lines.
1-3-4-3	Test the base memory.
1-4-1-1	Test lower memory.
2-1-2-3	Verify that the copyright message is intact.
2-2-3-1	Check for any pending hardware interrupts (there should be none).

Beep sequence	Error message and conditions
1-2	ROM checksum error; no/faulty video card. Initialize all ISA and PCI option ROMs.
1	One short beep before boot.

POST error codes and messages

The on-screen display of POST codes is not supported on CallPilot servers. However, the POST error codes and descriptions are included in this section for reference purposes.

Beep code	POST code	Description / test point
1-1-1-3	02	Verify Real Mode
1-1-2-1	04	Get CPU type
1-1-2-3	06	Initialize System Hardware
1-1-3-1	08	Initialize chipset registers with initial POST values
1-1-3-2	09	Set in POST flag
1-1-3-3	0A	Initialize CPU registers
1-1-4-1	0C	Initialize cache to initial POST values
1-1-4-3	0E	Initialize I/O
1-2-1-1	10	Initialize Power Management
1-2-1-2	11	Load alternate registers with initial POST values
1-2-1-3	12	Jump to UserPatch0
1-2-2-1	14	Initialize keyboard controller

Beep code	POST code	Description / test point
1-2-2-3	16	BIOS ROM checksum
1-2-3-1	18	8254 timer initialization
1-2-3-3	1A	8237 DMA controller initialization
1-2-4-1	1C	Reset Programmable Interrupt Controller
1-3-1-1	20	Test DRAM refresh
1-3-1-3	22	Test 8742 Keyboard controller
1-3-2-1	24	Set ES segment to register to 4 Gbytes
1-3-3-1	28	Autosize DRAM
1-3-3-3	2A	Clear 512 kbytes base RAM
1-3-4-1	2C	Test 512 base address lines
1-3-4-3	2E	Test 512 kbytes base memory
1-4-1-3	32	Test CPU bus-clock frequency
1-4-2-1	34	CMOS RAM read/write failure (this commonly indicates a problem on the ISA bus, such as a card not seated correctly)
1-4-2-4	37	Reinitialize the chipset
1-4-3-1	38	Shadow system BIOS ROM
1-4-3-2	39	Reinitialize the cache
1-4-3-3	3A	Autosize cache
1-4-4-1	3C	Configure advanced chipset registers
1-4-4-2	3D	Load alternate registers with CMOS values

Beep code	POST code	Description / test point
2-1-1-1	40	Set Initial CPU speed
2-1-1-3	42	Initialize interrupt vectors
2-1-2-1	44	Initialize BIOS interrupts
2-1-2-3	46	Check ROM copyright notice
2-1-2-4	47	Initialize manager for PCI Options ROMs
2-1-3-1	48	Check video configuration against CMOS
2-1-3-2	49	Initialize PCI bus and devices
2-1-3-3	4A	Initialize all video adapters in system
2-1-4-1	4C	Shadow video BIOS ROM
2-1-4-3	4E	Display copyright notice
2-2-1-1	50	Display CPU type and speed
2-2-1-3	52	Test keyboard
2-2-2-1	54	Set key click if enabled
2-2-2-3	56	Enable keyboard
2-2-3-1	58	Test for unexpected interrupts
2-2-3-3	5A	Display prompt “Press F2 to enter SETUP”
2-2-4-1	5C	Test RAM between 512 and 640 kbytes
2-3-1-1	60	Test expanded memory
2-3-1-3	62	Test extended memory address lines
2-3-2-1	64	Jump to UserPatch1

Beep code	POST code	Description / test point
2-3-2-3	66	Configure advanced cache registers
2-3-3-1	68	Enable external and CPU caches
2-3-3-2	69	Initialize SMI handler
2-3-3-3	6A	Display external cache size
2-3-4-1	6C	Display shadow message
2-3-4-3	6E	Display non-disposable segments
2-4-1-1	70	Display error messages
2-4-1-3	72	Check for configuration errors
2-4-2-1	74	Test real-time clock
2-4-2-3	76	Check for keyboard errors
2-4-4-1	7C	Set up hardware interrupts vectors
2-4-4-3	7E	Test coprocessor if present
3-1-1-1	80	Disable onboard I/O ports
3-1-1-3	82	Detect and install external RS-232 ports
3-1-2-1	84	Detect and install external parallel ports
3-1-2-3	86	Reinitialize onboard I/O ports
3-1-3-1	88	Initialize BIOS Data Area
3-1-3-3	8A	Initialize Extended BIOS Data Area
3-1-4-1	8C	Initialize floppy controller
3-2-1-1	90	Initialize hard-disk controller

Beep code	POST code	Description / test point
3-2-1-2	91	Initialize local-bus hard-disk controller
3-2-1-3	92	Jump to UserPatch2
3-2-2-1	94	Disable A20 address line
3-2-2-3	96	Clear huge Es segment register
3-2-3-1	98	Search for option ROMs
3-2-3-3	9A	Shadow option ROMs
3-2-4-1	9C	Set up Power Management
3-2-4-3	9E	Enable hardware interrupts
3-3-1-1	A0	Set time of day
3-3-1-3	A2	Check key lock
3-3-3-1	A8	Erase F2 prompt
3-3-3-3	AA	Scan for F2 key stroke
3-3-4-1	AC	Enter SETUP
3-3-4-3	AE	Clear in-POST flag
3-4-1-1	B0	Check for errors
3-4-1-3	B2	POST done — prepare to boot operating system
3-4-2-1	B4	One beep
3-4-2-3	B6	Check password (optional)
3-4-3-1	B8	Clear global descriptor table
3-4-4-1	BC	Clear parity checkers

Beep code	POST code	Description / test point
3-4-4-3	BE	Clear screen (optional)
3-4-4-4	BF	Check virus and backup reminders
4-1-1-1	C0	Try to boot with INT 19
4-2-1-1	D0	Interrupt handler error
4-2-1-3	D2	Unknown interrupt error
4-2-2-1	D4	Pending interrupt error
4-2-2-3	D6	Initialize option ROM error
4-2-3-1	D8	Shutdown error
4-2-3-3	DA	Extended Block Move
4-2-4-1	DC	Shutdown 10 error
4-2-4-3	DE	Keyboard Controller Failure (most likely problem is with RAM or cache unless no video is present)
4-3-1-3	E2	Initialize the chipset
4-3-1-4	E3	Initialize refresh counter
4-3-2-1	E4	Check for Forced Flash
4-3-2-2	E5	Check HW status of ROM
4-3-2-3	E6	BIOS ROM is OK
4-3-2-4	E7	Do a complete RAM test
4-3-3-1	E8	Do OEM initialization
4-3-3-2	E9	Initialize interrupt controller

Beep code	POST code	Description / test point
4-3-3-3	EA	Read in bootstrap code
4-3-3-4	EB	Initialize all vectors
4-3-4-1	EC	Boot the Flash program
4-3-4-2	ED	Initialize the boot device
4-3-4-3	EE	Boot code was read OK

Interpreting startup diagnostics from SCSI BIOS

Introduction

The results from the SCSI controller diagnostics appear after the POST results.

Applicable cards

Results of the startup diagnostics appear only if you have the following adapter cards installed on your system:

- Adaptec SCSI controller

  The adapter is integrated in the SBC and can be disabled.
- Mylex DAC960 or AcceleRAID 352 RAID adapter

Section B: Troubleshooting startup problems

In this section

What to do when the server fails to boot into service

Introduction

This section suggests tasks you can perform to determine why the server fails the bootup cycle.

To determine why the server failed to boot to Windows NT

1. Make a note of any diagnostic codes.
2. Try restarting the server by pressing the power button on the server.
3. During the boot sequence, view the diagnostic codes on the monitor for failures.
4. Refer to the *CallPilot Troubleshooting Reference* for other suggestions.

   Nortel Networks continually updates this document, and it is made available on the Nortel Networks Partner Information Center web site at http://www.my.nortelnetworks.com.

   Note: If you are not a distributor, contact your Nortel Networks technical support representative for assistance.
5. If you still cannot determine the cause of the startup failure, call your Nortel Networks technical support representative.

To determine why the server failed to boot into CallPilot

If the System Ready Indicator (see “Checking system readiness by observing the dialog box messages” on page 129 in Part 3 of the *CallPilot Installation and Configuration* binder for a description) indicates that the system is not booting into CallPilot, follow these steps:

1. Make a note of any diagnostic codes.
2. Try restarting the server by pressing the power button on the server.

3 During the boot sequence, view the diagnostic codes on the monitor for failures.

4 View the event logs.

For instructions, see “Viewing event logs” on page 42.

5 Refer to the *CallPilot Troubleshooting Reference* for other suggestions.

Nortel Networks continually updates this document, and it is made available on the Nortel Networks Partner Information Center web site at http://www.my.nortelnetworks.com.

Note: If you are not a distributor, contact your Nortel Networks technical support representative for assistance.

6 If you still cannot determine the cause of the startup failure, call your Nortel Networks technical support representative.

Chapter 3

Using Windows NT online diagnostic tools

In this chapter

Overview

Introduction

This section describes how to access the run-time online diagnostic tools provided by the Windows NT server software. Use these tools when a serious problem prevents the use of the CallPilot diagnostic tools that are available in CallPilot Manager.

CAUTION

Risk of software corruption
Do not run any utilities that are not documented in this guide.

Windows NT Event Viewer

The Windows NT 4.0 Event Viewer provides event logs to help you diagnose and debug system problems.

Windows NT Diagnostics

The Windows NT 4.0 Diagnostics window allows you to view details about the system and network components.

TCP/IP diagnostics

The following TCP/IP diagnostic tools are described in this chapter:

- ipconfig
- ping
- tracert
- arp

- nbtstat
- netstat

These utilities help you to verify network connectivity. They help you to thoroughly test the network interface and isolate any configuration problems. Network connectivity is essential to CallPilot operation.

chkdsk utility

The chkdsk utility checks a specified disk on the server and displays a status report. It is an online utility, but it reduces system performance while it is running.

Viewing event logs

Introduction

When the server startup cycle is complete, and if the CallPilot server has been configured (refer to Part 3 of the *CallPilot Installation and Configuration* binder), messages in dialog boxes on the monitor indicate that CallPilot is ready to accept calls.

If one or more error messages appear on the monitor, a fault has occurred. To determine what happened, you can use the following:

- Windows NT Event Viewer on the 1001rp server (see “To use the Windows NT Event Viewer” on page 44)
- CallPilot Event Browser or Alarm Monitor in CallPilot Manager

  For more information, do one of the following:

  - See “Alarm Monitor” on page 80
  - Refer to the *CallPilot Administrator’s Guide* (NTP 555-7101-301)

Note: The Event Browser and Alarm Monitor include online Help for events, which may help you to resolve the problem. If you cannot log on to the CallPilot system using a web browser due to server problems, then use the Windows NT Event Viewer.

Types of event logs

Three types of event logs are available from the Windows NT Event Viewer, as follows:

Log type	Description
System	Logs events by Windows NT 4.0 components, including RAS or other Windows NT services.
Security	Logs security events, such as logons, logoffs, illegal access, and so on. This option is available only to users with Administrative access.
Applications	Logs events by application, such as database file errors, and so on.

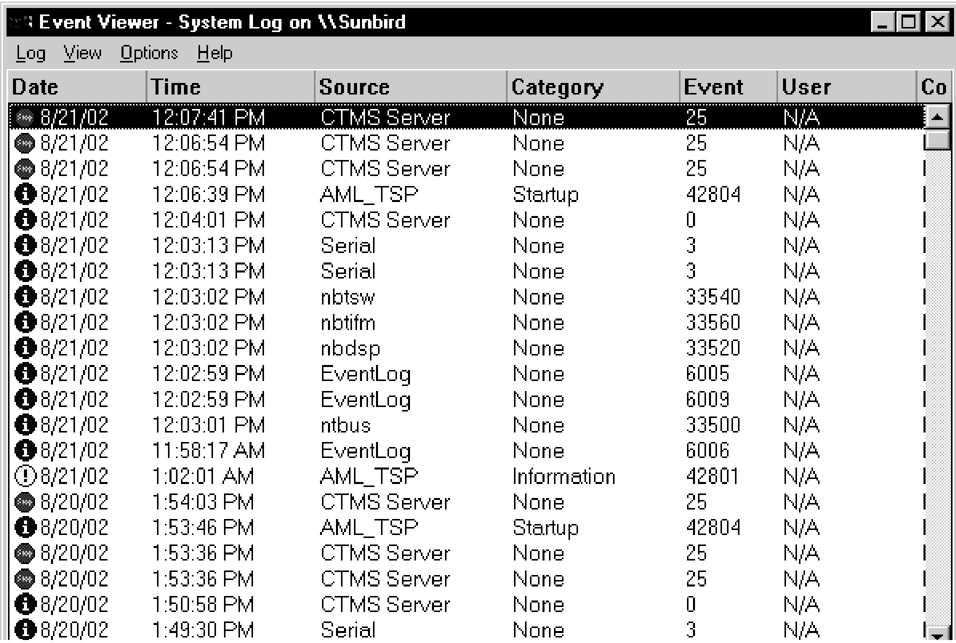
Where to get more information

For more information about using the Windows NT Event Viewer, click Help → Contents in the Event Viewer window. See also "To use the Windows NT Event Viewer" on page 44.

To use the Windows NT Event Viewer

1 Click Start → Programs → Administrative Tools → Event Viewer.

Result: The Event Viewer window appears.



Event Viewer - System Log on \\Sunbird

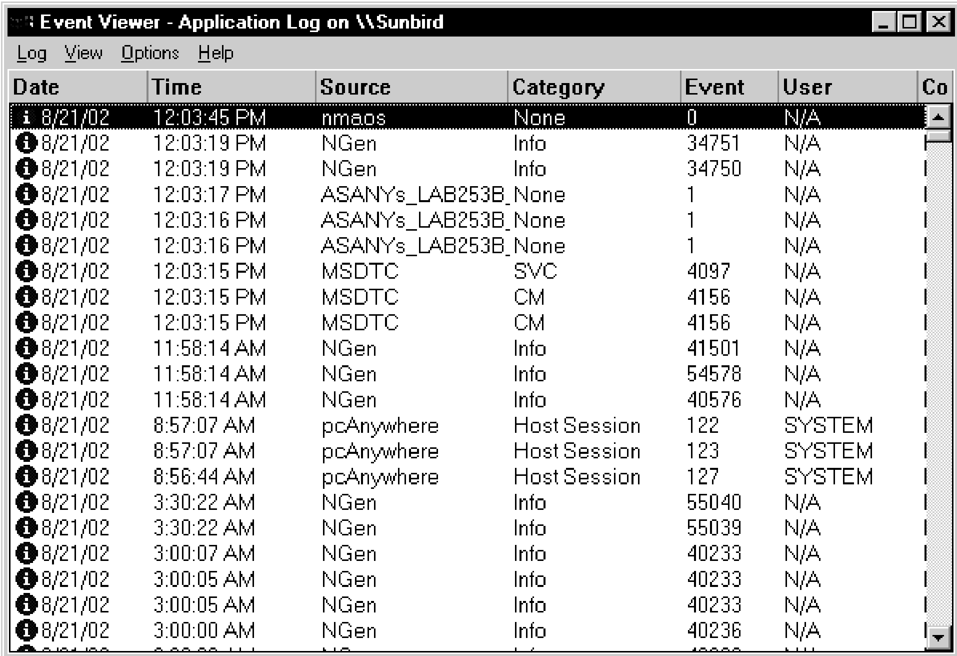
Log View Options Help

Date	Time	Source	Category	Event	User	Co
8/21/02	12:07:41 PM	CTMS Server	None	25	N/A	
8/21/02	12:06:54 PM	CTMS Server	None	25	N/A	
8/21/02	12:06:54 PM	CTMS Server	None	25	N/A	
8/21/02	12:06:39 PM	AML_TSP	Startup	42804	N/A	
8/21/02	12:04:01 PM	CTMS Server	None	0	N/A	
8/21/02	12:03:13 PM	Serial	None	3	N/A	
8/21/02	12:03:13 PM	Serial	None	3	N/A	
8/21/02	12:03:02 PM	nbtsw	None	33540	N/A	
8/21/02	12:03:02 PM	nbtifm	None	33560	N/A	
8/21/02	12:03:02 PM	nbdsp	None	33520	N/A	
8/21/02	12:02:59 PM	EventLog	None	6005	N/A	
8/21/02	12:02:59 PM	EventLog	None	6009	N/A	
8/21/02	12:03:01 PM	ntbus	None	33500	N/A	
8/21/02	11:58:17 AM	EventLog	None	6006	N/A	
8/21/02	1:02:01 AM	AML_TSP	Information	42801	N/A	
8/20/02	1:54:03 PM	CTMS Server	None	25	N/A	
8/20/02	1:53:46 PM	AML_TSP	Startup	42804	N/A	
8/20/02	1:53:36 PM	CTMS Server	None	25	N/A	
8/20/02	1:53:36 PM	CTMS Server	None	25	N/A	
8/20/02	1:50:58 PM	CTMS Server	None	0	N/A	
8/20/02	1:49:30 PM	Serial	None	3	N/A	

Note: The System Log appears by default.

2 To view the Application Log, click Log → Application.

Result: The Application Log similar to the following window appears:



Event Viewer - Application Log on \\Sunbird

Log View Options Help

Date	Time	Source	Category	Event	User	Co
8/21/02	12:03:45 PM	nmaos	None	0	N/A	
8/21/02	12:03:19 PM	NGen	Info	34751	N/A	
8/21/02	12:03:19 PM	NGen	Info	34750	N/A	
8/21/02	12:03:17 PM	ASANYs_LAB253B_	None	1	N/A	
8/21/02	12:03:16 PM	ASANYs_LAB253B_	None	1	N/A	
8/21/02	12:03:16 PM	ASANYs_LAB253B_	None	1	N/A	
8/21/02	12:03:15 PM	MSDTC	SVC	4097	N/A	
8/21/02	12:03:15 PM	MSDTC	CM	4156	N/A	
8/21/02	12:03:15 PM	MSDTC	CM	4156	N/A	
8/21/02	11:58:14 AM	NGen	Info	41501	N/A	
8/21/02	11:58:14 AM	NGen	Info	54578	N/A	
8/21/02	11:58:14 AM	NGen	Info	40576	N/A	
8/21/02	8:57:07 AM	pcAnywhere	Host Session	122	SYSTEM	
8/21/02	8:57:07 AM	pcAnywhere	Host Session	123	SYSTEM	
8/21/02	8:56:44 AM	pcAnywhere	Host Session	127	SYSTEM	
8/21/02	3:30:22 AM	NGen	Info	55040	N/A	
8/21/02	3:30:22 AM	NGen	Info	55039	N/A	
8/21/02	3:00:07 AM	NGen	Info	40233	N/A	
8/21/02	3:00:05 AM	NGen	Info	40233	N/A	
8/21/02	3:00:05 AM	NGen	Info	40233	N/A	
8/21/02	3:00:00 AM	NGen	Info	40236	N/A	

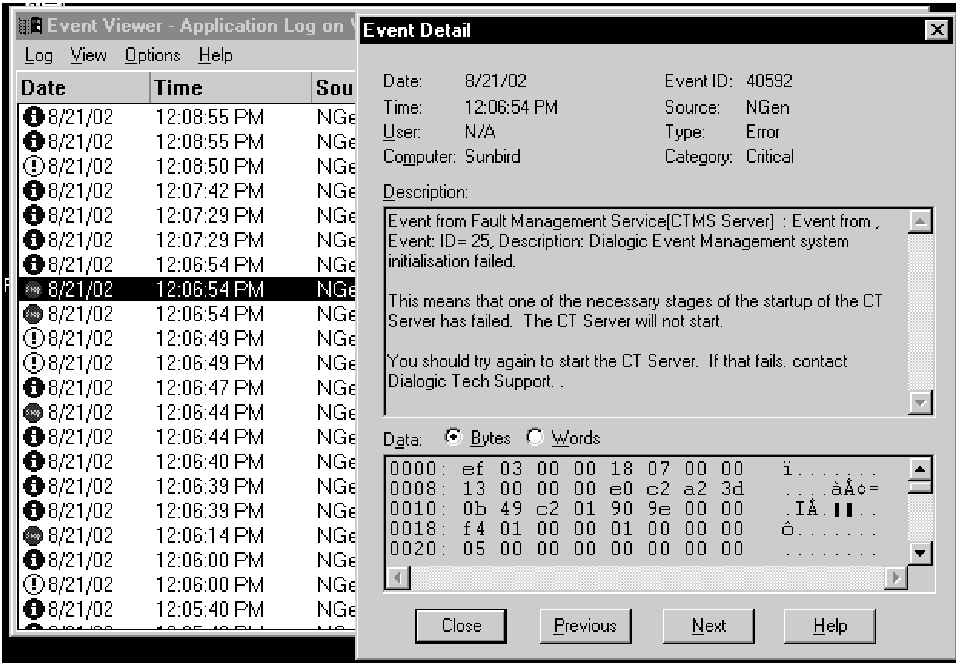
3 Look for error codes flagged with Stop or ! that have occurred since the last startup.

Note: Each error is date and time stamped. Stop indicates major or critical errors. ! indicates minor errors.

4 To determine the cause of the error, select and then double-click the error.

Result: A description of the error appears.

Note: The following Event Detail dialog box is an example of an error description from the Application Log:



5 Use the description to help determine how to resolve errors.

Note: If the error persists or does not suggest a solution, contact your Nortel Networks support representative.

6 Click Close.

Result: The event log reappears.

7 Click Log → Exit.

Result: The Event Viewer closes.

Checking hardware using Windows NT Diagnostics

Introduction

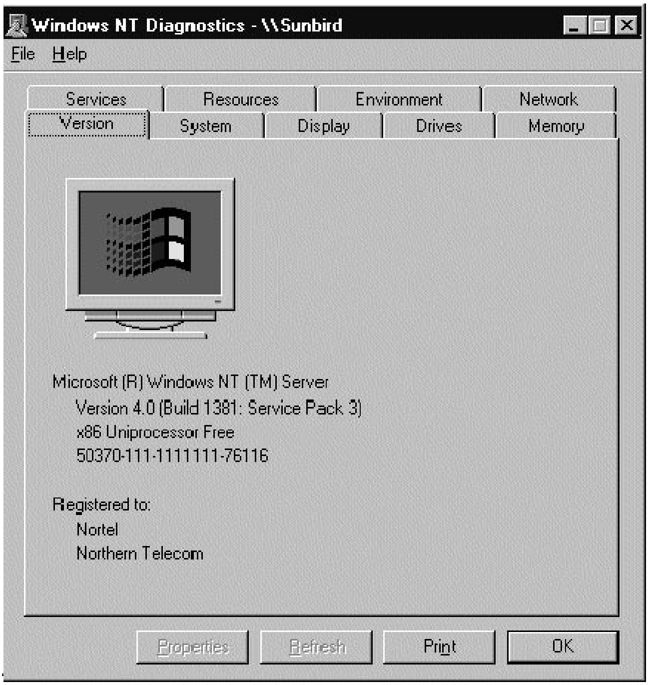
The Windows NT 4.0 Diagnostics window allows you to view details about the system and network components.

To use the Windows NT 4.0 Diagnostics tool

1 Log on to Windows NT.

2 Click Start → Programs → Administrative Tools (Common) → Windows NT Diagnostics.

Result: The Windows NT Diagnostics window appears.



3 Click the appropriate tab to view information concerning the system and network.

The following table identifies the types of details available on each tab:

Select	To display details about
Version	Version Registration
System	System identifier HAL BIOS information Processors
Display	BIOS information Adapter Driver
Drives	Drives by type or letter To view specific details, select a drive, and then click Properties to view details for the drive, including size, labels, and so on.
Memory	Memory, including totals, physical and kernel memory, commit charge, kernel
Services	Service and state for both services and devices To view specific details, select a service, and then click Properties to view details, including pathname, dependencies, service flags, and so on.

Select	To display details about
Resources	Click one of the following buttons to display information about the resources available on the system: ■ IRQ ■ I/O Port ■ DMA ■ Memory ■ Devices To view specific details, select a resource, and then click Properties.
Environment	Variable and value for both system and local user
Network	Click one of the following buttons to display information about the network and components: ■ General ■ Transports ■ Settings ■ Statistics

Using TCP/IP diagnostic tools

Introduction

This section describes the following TCP/IP diagnostic tools available for the network adapter. These tools are useful for diagnosing LAN communication problems. The first three tools are the most useful:

- ipconfig (below)
- ping (page 52)
- tracert (page 53)
- arp (page 55)
- nbtstat (page 56)
- netstat (page 58)

These utilities help you to verify network connectivity. Network connectivity is essential to CallPilot operation. These utilities help you to thoroughly test the network interface and isolate any configuration problems.

The ipconfig command

The ipconfig command displays IP configuration information.

Ipconfig default

If you run the command without flags, it displays the IP address, subnet mask, and default gateway for each adapter bound to TCP/IP.

Ipconfig command syntax

```
ipconfig /[ ]
```

The following flags are available for the ipconfig command:

Flag	**Description**
/?	Displays Help information.
/all	Displays full configuration information.
/release	Releases the IP address for the specified adapter.
/renew	Renews the IP address for the specified adapter.

To run the ipconfig command from Windows NT 4.0

1 Click Start → Programs → Command Prompt to display the MS-DOS command prompt window.

Result: The MS-DOS Command Prompt window appears.

2 At the MS-DOS prompt, type **ipconfig** ***<with appropriate parameters>***.

Example: ipconfig /all

3 Press Enter.

Result: The system runs the ipconfig utility.

4 Type **Exit** to exit MS-DOS and return to Windows NT 4.0.

The ping command

The ping command sends an echo request to a specified host. Use this command to verify network connectivity to the remote device.

Ping command syntax

The ping command uses the following syntax:

```
ping [-t] [-a] [-n count] [-l size] [-f] [-i TTL]
     [-v TOS] [-r count] [-s count]
     [[-j host-list] | [-k host-list]]
     [-w timeout] destination-list
```

Parameter	Description
-t	Pings the specified host until interrupted.
-a	Resolves addresses to host names.
-n count	Specifies the number of echo requests to send.
-l size	Sends buffer size.
-f	Set Don’t Fragment flag in packet.
-i TTL	Time To Live
-v TOS	Type Of Service
-r count	Record route for count hops
-s count	Time stamp for count hops
-j host-list	Loose source route along host list
-k host-list	Strict source route along host list
-w timeout	Time-out in milliseconds to wait for each reply

To run the ping command from Windows NT 4.0

1 Click Start → Programs → Command Prompt to display the MS-DOS command prompt window.

   Result: The MS-DOS Command Prompt window appears.

2 At the MS-DOS prompt, type **ping *<destination IP address>*** (for example, ping 200.286.32.0), or **ping *<computer name>***.

3 Press Enter.

   Result: The system displays the ping results.

4 Type **Exit** to exit MS-DOS and return to Windows NT 4.0.

The tracert command

This utility determines the route taken to a destination.

How tracert works

The tracert utility follows several steps to complete its task:

- Tracert sends Internet Control Message Protocol (ICMP) echo packets with varying Time-To-Live (TTL) values to the destination.
- Each router along the path must decrement the TTL on a packet by at least 1 before forwarding it, so the TTL is effectively a hop count.
- When the TTL on a packet reaches 0, the router sends back an ICMP Time Exceeded message to the source system.
- Tracert determines the route by sending the first echo packet with a TTL of 1, and incrementing the TTL by 1 on each subsequent transmission until the target responds, or the maximum TTL is reached.
- Tracert then examines the ICMP Time Exceeded messages sent back by intermediate routers.

Tracert syntax

```
tracert [-d] [-h maximum_hops] [-j host_list]
        [-w timeout] [target_name]
```

Tracert parameters

The tracert command uses the following parameters:

Parameter	Description
-d	Specifies not to resolve addresses to hostnames.
-h maximum_hops	Specifies the maximum number of hops to search for the target.
-j host-list	Specifies a loose source route along the host list.
-w timeout	Waits the number of milliseconds specified by the time-out for each reply.
target_name	The name of the target host.

To run the tracert command from Windows NT 4.0

1. Click Start → Programs → Command Prompt to display the MS-DOS command prompt window.

   Result: The MS-DOS Command Prompt window appears.

2. At the MS-DOS prompt, type the following command:

   tracert *[-d] [-h maximum_hops] [j host_list] [-w timeout] [target name]*

   Example: tracert 200.286.0.32 210 200.236.0.04

3. Press Enter.

   Result: The system runs the tracert utility.

4. Type **Exit** to exit MS-DOS and return to Windows NT 4.0.

The arp command

The arp command displays and modifies the IP-to-physical address translation tables used by Address Resolution Protocol (arp).

Arp command syntax

The arp command uses the following syntax:

```
arp -s inet_addr eth_addr [if_addr]

arp -d inet_addr [if_addr]

arp -a [inet_addr] [-N if_addr]
```

Parameter	Description
-a	Displays current arp entries by interrogating the current protocol data. If inet_addr is specified, the IP and physical addresses for only the specified computer appear. If more than one network interface uses arp, entries for each arp table appear.
-g	Same as -a.
inet_addr	Specifies an Internet address.
if_addr	Specifies the Internet address of the interface whose address translation table should be modified. If not present, the first applicable interface is used.
eth_addr	Specifies a physical address.
-N if_addr	Displays the arp entries for the network interface specified by if_addr.
-d	Deletes the host specified by inet_addr.

Parameter	Description
-s	Adds the host and associates the Internet address inet_addr with the Physical address eth_addr. The physical address is given as six hexadecimal bytes separated by hyphens. The entry is permanent.

To run the arp command from Windows NT 4.0

1 Click Start → Programs → Command Prompt to display the MS-DOS command prompt window.

Result: The MS-DOS Command Prompt window appears.

2 At the MS-DOS prompt, type **arp** with the required parameters (for example, arp -g 200.286.0.32).

3 Press Enter.

Result: The system runs the arp command.

4 Type **Exit** to exit MS-DOS and return to Windows NT 4.0.

The nbtstat command

The nbtstat command displays protocol statistics and current TCP/IP connections using NBT.

Nbtstat command syntax

The nbtstat command uses the following syntax:

```
nbtstat [-a remotename] [-A IP address] [-c] [-n]
        [-R] [-r] [-S] [-s] [interval]
```

Parameter	Description
-a remotename	Lists the remote computer's name table using its name.
-A IP address	Lists the remote computer's name table using its IP address.

Parameter	Description
-c	Lists the contents of the NetBIOS name cache giving the IP address of each name.
-n	Lists local NetBIOS names. Registered indicates that the name is registered by broadcast (Bnode) or WINS (other node types).
-R	Reloads the LMHOSTS file after purging all names from the NetBIOS name cache.
-r	Lists name resolution statistics for Windows networking name resolution. On a Windows NT computer configured to use WINS, this option returns the number of names resolved and registered through broadcast or through WINS.
-S	Displays both client and server sessions, listing the remote hosts by IP address only.
-s	Displays both client and server sessions, and attempts to convert the remote host IP address to a name using the HOSTS file.
interval	Displays selected statistics, pausing interval seconds between each display. Press Ctrl+C to stop displaying statistics. Without this parameter, nbtstat prints the current configuration information once.

To run the nbtstat command from Windows NT 4.0

1 Click Start → Programs → Command Prompt to display the MS-DOS command prompt window.

Result: The MS-DOS Command Prompt window appears.

2 At the MS-DOS prompt, type **nbtstat** with the required parameters.

3 Press Enter.

Result: The system runs the nbtstat utility.

4 Type **Exit** to exit MS-DOS and return to Windows NT 4.0.

The netstat command

The netstat command displays current TCP/IP network connections and protocol statistics.

Netstat command syntax

The netstat command uses the following syntax:

```
netstat [-a] [-e] [-n] [-s] [-p proto] [-r] [interval]
```

Parameter	Description
-a	Displays all connections and listening ports.
-e	Displays Ethernet statistics. This can be combined with the -s option.
-n	Displays addresses and port numbers in numerical form.
-s	Displays per-protocol statistics.
-p proto	Shows connections for the protocol specified by proto. Proto can be tcp or udp. If used with the -s option, proto can be tcp, udp, or ip.
-r	Displays the contents of the routing table.
interval	Redisplays selected statistics, pausing between each display. Press Ctrl+C to stop redisplaying.

To run the netstat command from Windows NT 4.0

1 Click Start → Programs → Command Prompt to display the MS-DOS command prompt window.

Result: The MS-DOS Command Prompt window appears.

2 At the MS-DOS prompt, type **netstat** with the required parameters.

3 Press Enter.

Result: The system runs the netstat utility.

4 Type **Exit** to exit MS-DOS and return to Windows NT 4.0.

Invoking the chkdsk utility

Introduction

The chkdsk utility checks a specified disk on the server and displays a status report. It can be run on drives C, D, E, or F. It is an online utility, but it reduces system performance while it is running.

The chkdsk utility checks for problems at the Windows NT file system level. Any problems existing at this level can cause problems for CallPilot. Even if there are no problems at the Windows NT file system level, CallPilot can still be affected by problems at the CallPilot file system level.

Note: A version of this utility, called autocheck, automatically runs during Windows NT startup. Output from this utility appears on the startup blue screen.

Chkdsk utility syntax

The chkdsk utility uses the following syntax:

```
chkdsk [drive:][path]filename] [/F] [/V] [/R]
```

Parameter	Description
drive:	The drive letter of the drive that you want to check.
filename	The names of files to check for fragmentation.
/F	Add this parameter to fix errors on the disk.
/V	Add this parameter to display the full pathname of every file on the disk.
/R	Add this parameter to locate bad sectors and to recover readable information.

To run the chkdsk utility from Windows NT 4.0

1 Click Start → Programs → Command Prompt to display the MS-DOS command prompt window.

Result: The MS-DOS Command Prompt window appears.

2 At the MS-DOS prompt, type **chkdsk** ***<drive letter:>*** (for example, chkdsk c:).

3 Press Enter.

Result: The system runs the chkdsk utility.

4 Type **Exit** to exit MS-DOS and return to Windows NT 4.0.

Chapter 4

Using serial port diagnostic tools

In this chapter

Overview

Introduction

You may want to test the serial ports when remote access does not work.

This chapter describes how to run serial port diagnostics on the CallPilot server using the TSTSERIO command. Direct the TSTSERIO command to serial ports on the server after services on these ports have been shut down manually, as described in this chapter.

Shutting down services

Introduction

This section describes how to shut down a service using a specific serial port. Use the procedures below before invoking the TSTSERIO local loopback tests.

CAUTION

Risk of communications loss
By stopping the services on COM 1 or COM 2, you lose the support access feature.

CAUTION

Risk of stopping call processing
By stopping the services on COM 2, you stop call processing on CallPilot.

Services to stop for COM 1 testing

- Routing and Remote Access Service

Services to stop for COM 2 testing

- CallPilot SLEE Service
- CallPilot MWI Service
- CallPilot Access Protocol Emulator
- CallPilot Blue Call Router
- CallPilot Call Channel Router
- CallPilot Time Service

- Routing and Remote Access Service

Net Stop command

Use the Net Stop command to stop a specified service on a serial port.

NET STOP command syntax

The Net Stop command uses the following syntax:

net stop "*service_name*"

ATTENTION

You must restart the services that you shut down through the Net Start command after running the diagnostic. For details, see "Restarting services" on page 72.

To invoke the Net Stop command from Windows NT 4.0

1 Click Start → Programs → Command Prompt to display the MS-DOS command prompt window.

   Result: The MS-DOS Command Prompt window appears.

2 At the MS-DOS prompt, type **net stop "*service_name*",** and then press Enter.

   For example, type **net stop "Routing and Remote Access Service",** and then press Enter.

   Note: The quotation marks are required, as in the example above.

   Result: The system runs the net stop command utility.

3 Type **Exit**, and then press Enter to exit MS-DOS.

Conducting TSTSERIO tests

Introduction

The TSTSERIO command performs local loopback tests of the serial communication ports from the server run-time environment.

Note: Before conducting these tests, shut down the appropriate services. See "Shutting down services" on page 65.

CAUTION

Risk of communications loss

By stopping the services on COM 1 or COM 2, you lose the support access feature.

CAUTION

Risk of stopping call processing

By stopping the services on COM 2, you stop call processing on CallPilot.

TSTSERIO command syntax

The syntax for the TSTSERIO command is as follows:

TSTSERIO [/?] /P:comport [/S:subtstname] [/L:loops]

Flag	Requirement	Description
?	n/a	Displays Help.
/P:comport	Required	Specifies the symbolic port name assigned to the port you want to test.

Flag	Requirement	Description
/S:subtstname	Optional	Specifies a TSTSERIO subtest. See the table below for a description of the available subtests.
/L:loops	Optional	Specifies the number of times (up to a maximum of 65 535) to execute the requested test. The default number of tests is 1. A value of 0 infinitely loops until you enter CTRL+C.

TSTSERIO internal loopback diagnostic subtests

The following internal loopback subtests are available for the TSTSERIO command. For each of these tests, the communications resource must be available:

Subtest name	Description
idata	Internal data bus loopback
imsr	Internal modem status register
baud	Internal data bus loopback at various baud rates
word	Test 5-, 6-, 7-, and 8-bit data lengths
stop	Test 1, 1.5, and 2 stop bits
pari	Test odd/even parity
fifo	Test that device can operate in fifo mode

To invoke the TSTSERIO /P command from Windows NT 4.0

1 Click Start → Programs → Command Prompt to display the MS-DOS command prompt window.

Result: The MS-DOS Command Prompt window appears.

2 At the MS-DOS prompt, type **tstserio** with the required parameters, and then press Enter.

For example, type **TSTSERIO /P com1** or **TSTSERIO /P com 2**, and then press Enter.

3 Type **Exit**, and then press Enter to exit MS-DOS.

TSTSERIO external loopback plug subtests

The following external loopback subtests are available for the TSTSERIO command. For each of these tests, an external loopback connector must be used. For more information, see “Conducting TSTSERIO tests with the loopback plug” on page 71.

Subtest name	Description
edata	External data bus loopback. This test requires an external loopback connector.
emsr	External modem status register. This test requires an external loopback connector.
eint	Test ability of device to generate interrupts. This test requires an external loopback connector.

To invoke the TSTSERIO /S command from Windows NT 4.0

1 Click Start → Programs → Command Prompt to display the MS-DOS command prompt window.

   Result: The MS-DOS Command Prompt window appears.

2 At the MS-DOS prompt, type **tstserio** with the required parameters, and then press Enter.

   For example, type **TSTSERIO /P com1 /S extr**, and then press Enter.

3 Type **Exit**, and then press Enter to exit MS-DOS.

Conducting TSTSERIO tests with the loopback plug

Introduction

The TSTSERIO command requires an external loopback connector plug for its edata, emsr, and eint subtests.

9-pin connector plug

The standard serial loopback connector is a female 9-pin D-sub connector. This connector has the following pins wired together:

- CTS (pin 8) wired to (pin 7) RTS
- SIN (pin 2) wired to (pin 3) SOUT
- DTR (pin 4) wired to (pin 6) DSR

Once the plug is installed on the serial port, TSTSERIO can be invoked according to the procedure outlined in the previous section.

Restarting services

Introduction

This section describes how to restart the services for COM 1 or COM 2 after invoking the TSTSERIO local loopback tests.

Services to restart after COM 1 testing

- Routing and Remote Access Service

Services to restart after COM 2 testing

- CallPilot SLEE Service
- CallPilot MWI Service
- CallPilot Access Protocol Emulator
- CallPilot Blue Call Router
- CallPilot Call Channel Router
- CallPilot Time Service
- Routing and Remote Access Service

Net Start command

Use the NET START command to restart a specified service on a serial port. The syntax for the NET START command is as follows:

```
net start “[service-name]”
```

To invoke the Net Start command from Windows NT 4.0

1 Click Start → Programs → Command Prompt.

   Result: The MS-DOS Command Prompt window appears.

2 At the MS-DOS prompt, type **net start "*service_name*"**, and then press Enter.

   For example, type **net start "Routing and Remote Access Service"**, and then press Enter.

   Note: The quotation marks are required, as in the example above.

3 Type **Exit**, and then press Enter to exit MS-DOS.

Chapter 5

Using CallPilot Manager to monitor hardware

In this chapter

Understanding fault management

Introduction

Fault management is a term that describes how the CallPilot server detects and notifies you of potential or real hardware problems (faults).

The server processes events to detect hardware problems and raises alarms to notify you when these problems occur.

Event processing

An event is any change in system configuration or operational state. An event is also any action taken by the system that requires user notification. Events can be as insignificant as a user logon attempt or as serious as a faulty MPC-8 card switching to disabled status.

All events are reported to the fault management server, a subsystem within the CallPilot server. The fault management server enables the server to listen and respond to its clients. The interaction is called event processing and is the means by which the server detects hardware faults.

Alarm notification

Alarms are warnings generated by events. Alarms communicate the same information as events. However, alarms are reported in the Alarm Monitor instead of the Event Browser, and are managed differently than events.

When an alarm appears in the Alarm Monitor, you must investigate the problem, isolate it, and then fix the cause of the problem. When you fix the problem, the alarm is cleared from the Alarm Monitor.

Section A: Tools for isolating and fixing hardware problems

In this section

Overview

Introduction

This section provides guidelines on how to use the CallPilot Manager tools to detect, isolate, and fix potential or real hardware problems.

Component dependencies

The status of some components are dependent on the operational status of other components. If a component fails or is stopped, the dependent components go out of service.

Note: Based on the CallPilot server type, and the type of switch connected to CallPilot, some of these components may not appear on your system.

Component	Dependent components
Media Bus	All MPBs, MPCs, and all multimedia and call channels.
MPB board	All MPCs, and all multimedia and call channels associated with the MPB board.
Time Switch	All multimedia and call channels associated with the same MPB as the timeswitch.
MPCs	All multimedia (DSP) channels on the MPC-8 card.
DS30X	All DS30X channels associated with the DS30X link.

Detecting hardware problems

Typically, you first become aware of a hardware problem when an alarm is raised. All hardware faults produce an alarm (or series of alarms, depending on the problem) in the Alarm Monitor.

Other indications of a hardware problem include the following:

- user complaints
- call processing difficulties, such as busy signals, static, dropped calls, connection problems, and cross talk (hearing other conversations)
- system administrator logon difficulties
- alert icons on the Maintenance page

Alarm Monitor

Introduction

Use the Alarm Monitor to investigate one or more raised alarms.

About alarms

Alarms are warnings generated by events. Alarms communicate the same information as events. However, alarms are reported in the Alarm Monitor instead of the Event Browser, and are managed differently than events:

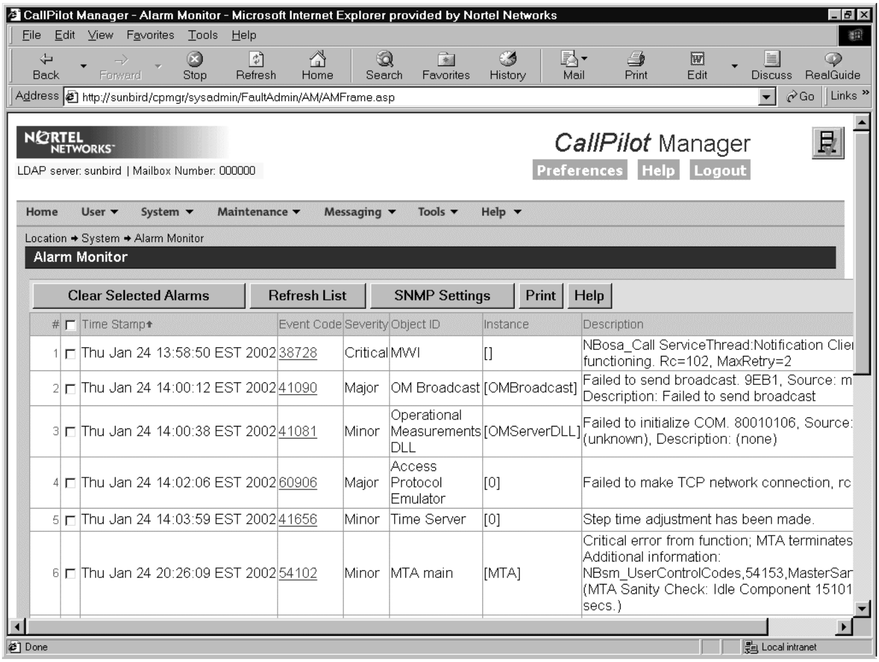
- Alarms appear in the Alarm Monitor only for Minor, Major, and Critical events (not Information events). All events can be reported in the Event Browser (depending on filtering criteria defined in the Event Browser).
- The first time an event occurs, it generates an alarm that appears in the Alarm Monitor. If the same event continues to occur, a new alarm is not generated. Instead, the time and date assigned to the original generated alarm is updated.
- Alarms can be cleared from the Alarm Monitor, but the event that generated the alarm is not cleared from the event log or the Event Browser.

Each alarm in the Alarm Monitor has Help text that often provides a solution to the problem. If the solution is not apparent, use the Event Browser or the Maintenance page to further investigate the problem.

To investigate using the Alarm Monitor

1 In CallPilot Manager, click System→ Alarm Monitor.

Result: The Alarm Monitor page appears.



2 Click the Event Code for the first critical or major alarm.

Result: A description of the event appears in a new web browser window.

3 Review the description and recovery action.

4 Repeat steps 2 and 3 for a few more alarms, if necessary.

5 If the solution to the problem is not apparent, obtain the return code of the first event and continue the investigation by using the Event Browser (see “Event Browser” on page 83).

See also

For detailed information on how to use the Alarm Monitor, refer to the *CallPilot Administrator's Guide* (NTP 555-7101-301), or the CallPilot Manager online Help.

Event Browser

Introduction

Use the Event Browser to investigate a series of events that occurred around the time an alarm was raised. The event listing can help you determine the root cause of a problem.

About events

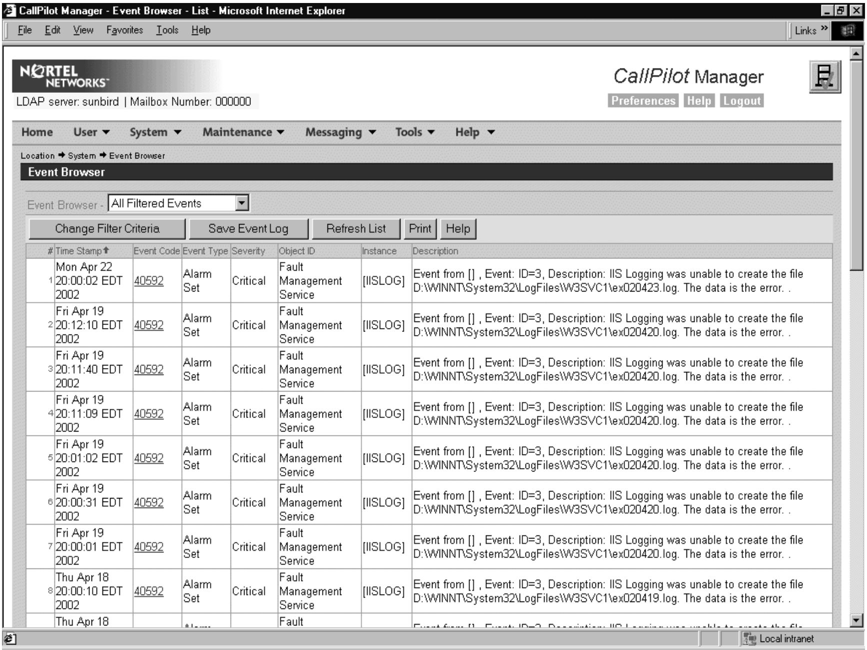
The Event Browser displays events that have been recorded in the server log. Each event identifies the time the event occurred, the object that generated the event, and the cause of the event.

Events are classified as Information, Minor, Major, or Critical. By default, the Event Browser displays only the latest 100 critical events.

To investigate using the Event Browser

1 In CallPilot Manager, click System → Event Browser.

Result: The Event Browser page appears.



2 Click an event that appears to be related to the problem, or an event that occurred near the time the alarm was raised.

Result: A description of the event appears in a new web browser window.

3 View the description and recovery action.

4 Repeat steps 2 and 3 for a few more events, if necessary.

5 If the solution to the problem is not apparent, contact your Nortel Networks technical support representative.

See also

For detailed information on how to use the Event Browser (for example, how to set preferences), refer to the *CallPilot Administrator's Guide* (NTP 555-7101-301) or the CallPilot Manager online Help.

Maintenance page

Introduction

Use the Maintenance page to get status information for any suspect components.

If you suspect or discover a problem with hardware such as an MPC-8 card, MPB board, or the DS30X link, you can use the Diagnostic section on the Maintenance page. You can run a new diagnostic for the component, or review the results of the last diagnostic that was run.

More information

For information on all aspects of the Maintenance page, see Section B: "Working with the Maintenance page" on page 89, or the CallPilot Manager online Help.

Channel and Multimedia Monitors

Introduction

The Channel Monitor shows the status of call channels. The call channels are the connections between the server and the switch that carry the call signals to CallPilot.

The Multimedia Monitor shows the status of multimedia channels. The multimedia channels are the DSP ports that process the calls. They are the voice, fax, and speech recognition channels.

Disabling call channels

If you must take the CallPilot system out of service to perform software or hardware maintenance, Nortel Networks recommends that you disable all call channels first. There are two ways to disable the call channels:

- Courtesy stop the channels (preferred method).

  When you courtesy stop call channels, CallPilot waits until the channels are no longer active before disabling them, instead of suddenly terminating active calls.
- Stop the channels.

  When you stop channels, you suddenly disable them and terminate all active calls.

For information about using the Channel and Multimedia Monitors, see Section C: “Working with the Multimedia and Channel Monitors” on page 109.

Running diagnostics on call channels

If you must run diagnostics for one or more channels, use the Diagnostics section on the Maintenance page. For more information, see “Working with the Maintenance page” on page 89.

Section B: Working with the Maintenance page

In this section

Introducing the Maintenance page

Introduction

Use the Maintenance page in CallPilot Manager to do the following:

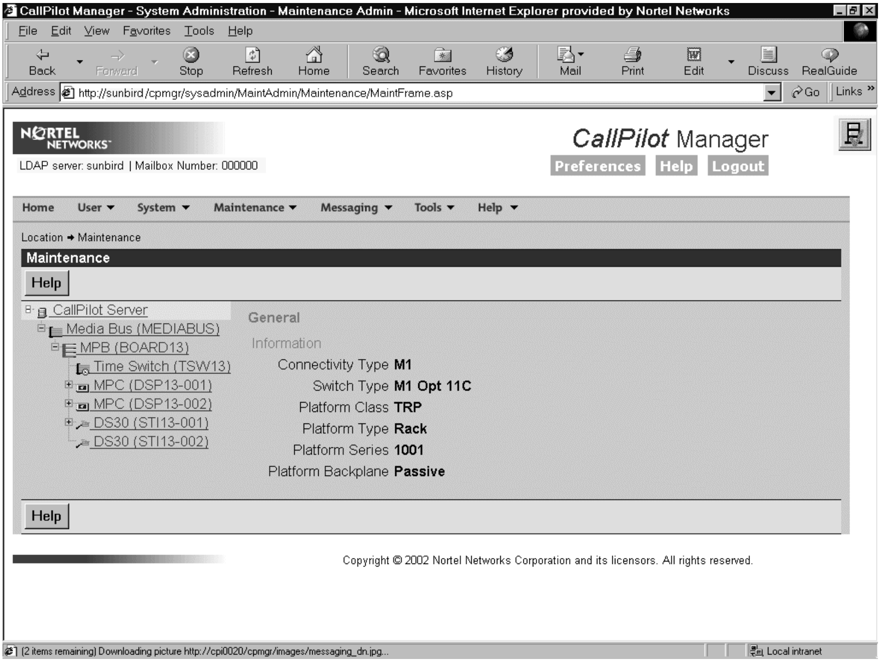
- Obtain general information about components.
- View component states.
- Start and stop components.
- Run integrated diagnostic tests.
- View the results of the last diagnostic test run against a component.

What the Maintenance page provides

The Maintenance page identifies the server platform and switch connectivity type. It also provides a tree that, when expanded, lists the physical and logical hardware components down the left side of the page. To list the server's hardware components, click the plus sign (+) at the top of the tree. To list the subcomponents for each component, click the plus sign (+) beside the component.

Note: The components that are listed on the Maintenance page are based on the CallPilot server type and the switch that is connected to CallPilot. The examples in this chapter are for illustration purposes and may not appear exactly the same on your system.

The following is an example of a partially expanded tree for the 1001rp server:



When you click a component, the page refreshes to show the details about that component. Details are divided into the sections described in the following table:

Section	Description
General	This section shows general technical information about the selected component. This typically includes the following details: ▪ the name, class, type, series, or version of a component ▪ various capabilities of a component (for example, whether a component is removable) **Note:** This section does not appear for all components.

Section	Description
Maintenance	This section shows the state of the selected component. Use this section to start and stop a component before running a diagnostic test. This section appears only for components on which you are allowed to perform maintenance administration. For more information about working with component states, see the following sections: ■ “Viewing component states” on page 94 ■ “Starting and stopping components” on page 97
Diagnostics	Use the Diagnostics section to run one or more diagnostic tests, or to view the results of the last diagnostic tests that were run on the selected component. This section appears only for components on which you are allowed to run diagnostics. For more information about running diagnostics, see the following sections: ■ “Running integrated diagnostics” on page 101 ■ “Viewing the last diagnostic results” on page 106

Maintenance activities for each component

The following table identifies the maintenance activities you can perform for each component that is listed in the component tree:

Component	Start, stop, or courtesy stop?	Diagnostics available?	Replaceable?
Media Bus	Yes	Yes	No
MPB board	Yes	Yes	Yes

Component	Start, stop, or courtesy stop?	Diagnostics available?	Replaceable?
Time Switch	No	No	No
MPCs (embedded on MPB boards or on MPC-8 cards)	Yes	Yes	embedded: No MPC-8 cards: Yes
DSPs	Yes	Yes	No
Channels	Yes	No	No
DS30X link	Yes	No	No

Note: The MGate card and DS30X cable are replaceable. If you are having problems with the DS30X link, determine if either one or both of those items are causing the problem and need to be replaced.

Viewing component states

Introduction

View a component's state to determine the general condition of the component, including whether the component is disabled or off duty. The component's state is shown in the Maintenance section of the Maintenance page.

Component states

You can determine the state of a component by looking at the State box in the Maintenance section.

State	Description
Active	The component is working and currently involved in processing a call.
Disabled	The diagnostic failed.
Idle	The component is working but not currently involved in processing a call.
InTest	A diagnostic is running on the resource or device.
Loading	The component has been started, which takes it out of the Off Duty state. This state occurs quickly and is immediately followed by Idle.
No resources	The hardware required for the component to operate is not installed or is not operating properly.

State	Description
Not Configured	The device is not configured in CallPilot. For example, a DSP is not being used because it was not allocated in the Configuration Wizard.
Off Duty	The component has been stopped.
Remote Off Duty	The component has been taken out of service at the switch.
Shutting Down	The component is in the process of stopping. This state occurs quickly and is immediately followed by Off Duty.
Uninitiated	The call processing component has not initialized the resource.

Alert icons

If one of the following icons appears next to a component in the tree, then the component or one of its subcomponents is experiencing a problem:

Icon	Description
	A problem exists with a subcomponent of the selected component. Expand the tree to locate the subcomponent with the problem.
	A problem exists with the selected component.

To view the state of a hardware component

1 In CallPilot Manager, click Maintenance → Maintenance Admin.

Result: The Maintenance page appears.

2 Click the plus sign (+) beside the CallPilot server to expand the component tree.

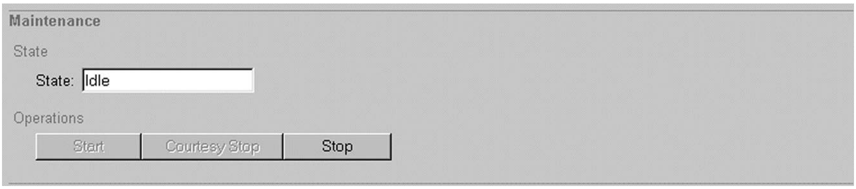
3 Continue clicking the plus sign (+) until the component with which you want to work is visible.

4 Click the hardware component with which you want to work.

Result: The Maintenance page refreshes to show details about the component.

5 Scroll down to the Maintenance section.

The following is an example of the Maintenance section for an MPC-8 card:



6 View the state of the selected component in the State box.

Starting and stopping components

Introduction

When you stop a component, you take it out of service and prevent it from operating. You must stop a component before you can replace it (if the component is replaceable) or run a diagnostic test on it.

To bring an out-of-service component back into service, you must start it.

Start and stop components from the Maintenance section on the Maintenance page.

ATTENTION

Nortel Networks recommends that, if possible, you courtesy stop a component. Courtesy stop is available only at the individual channel level.

To courtesy stop CallPilot, use the following:

- Multimedia Monitor: to courtesy stop a range of multimedia (DSP) channels
- Channel Monitor: to courtesy stop a range of call (DS30X, also known as DS0) channels

For instructions, see Section C: “Working with the Multimedia and Channel Monitors” on page 109.

Stop versus Courtesy stop

The following two methods of taking a component out of service allow you to choose how active calls are affected:

Courtesy stop

A Courtesy stop takes the component out of service only after the component has finished processing the active call.

- If the component is currently processing a call, the call is not dropped; the component remains active until the call is finished.
- If the component is not currently in use, it is taken out of service immediately.

Courtesy stop is preferred over a regular Stop.

Stop

A Stop takes the component out of service immediately, regardless of whether the component is currently processing calls. All active calls are dropped. Typically, you perform a Stop only when severe problems that are affecting a large number of incoming calls occur or if your organization determines a special need for it.

Components that can be started and stopped

Only the following components can be started and stopped:

Note: If you want to start or stop more than one or two multimedia (DSP) or call (DS30X) channels, use the Multimedia Monitor or Channel Monitor. For instructions, see Section C: “Working with the Multimedia and Channel Monitors” on page 109.

Component	Effect of stopping
Media Bus	Takes all call processing resources out of service.

Component	Effect of stopping
MPB board	Takes all call processing resources on the selected board out of service.
Time Switch	You cannot perform maintenance administration on the timeswitch.
MPCs (embedded on MPB boards or on MPC-8 cards)	Takes the selected MPC out of service.
DSPs	Takes the selected DSP out of service.
Channels	Takes the selected DS30X channel out of service.
DS30X link	Takes the selected DS30X link out of service.

To start or stop a component

1 In CallPilot Manager, click Maintenance → Maintenance Admin.

Result: The Maintenance page appears.

2 Click the plus sign (+) beside the CallPilot server to expand the component tree.

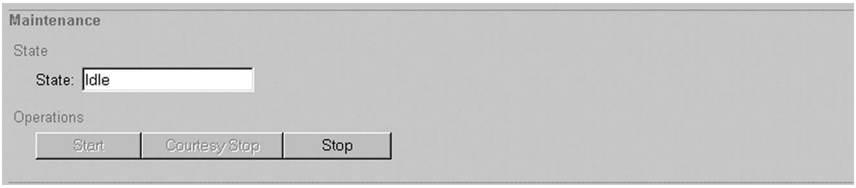
3 Continue clicking the plus sign (+) until the component with which you want to work is visible.

4 Click the hardware component that you want to start or stop.

Result: The Maintenance page refreshes to show details about the component.

5 Scroll down to the Maintenance section.

The following is an example of the Maintenance section for an MPC-8 card:



6 Click Courtesy Stop, Stop, or Start, as required.

Button	Description
Start	If the selected component is out of service, click this button to put it into service.
Courtesy Stop	Click this button to take the selected component out of service. CallPilot waits for the call to be completed before disabling the component. **ATTENTION** If you are courtesy stopping all components (that is, you are taking the entire system down), ensure that you inform all administrators, desktop messaging users, and web messaging users so that they can log off their sessions before you proceed. The system asks you to confirm the Courtesy stop. If you click OK, the component is put out of service after all calls are finished.
Stop	Click this button to take the selected component out of service immediately. All calls that are in progress are disconnected immediately. **ATTENTION** If you are stopping all components (that is, you are taking the entire system down), ensure that you inform all administrators, desktop messaging users, and web messaging users so that they can log off their sessions before you proceed.

Running integrated diagnostics

Introduction

You should run diagnostic tests from the Diagnostics section on the Maintenance page in the following circumstances:

- You want to ensure that a component is operating properly after installing or reinstalling it.
- The CallPilot server is having trouble processing incoming calls and you are hoping that diagnostic results can tell you why.

  Problems include static, dropped calls, and cross talk (hearing another conversation).

Before you begin

ATTENTION

Take the component out of service before you run the diagnostic test. See "Starting and stopping components" on page 97.

Components that have diagnostic tests available

The following table identifies the components on which you can run diagnostics:

Component	Diagnostics available?	Replaceable?
Media Bus	Yes	No
MPB board	Yes	Yes
Time Switch	No	No

Component	Diagnostics available?	Replaceable?
MPCs (embedded on MPB boards or on MPC-8 cards)	Yes	Embedded: No MPC-8 cards: Yes
DSPs	Yes	No
Channels	No	No
DS30X link	No	No

Diagnostic tests available for each component

The diagnostic tests that are available for each component are listed in the Diagnostic section of the Maintenance page. To view the list of diagnostic tests for a particular component, click the component in the component tree.

If a diagnostic test fails or cannot be run

If a warning message appears, the diagnostic test cannot be run because a prerequisite condition has not been met. If a diagnostic test fails, a message appears in a new browser window (see the example on page 105).

In both cases, check the Alarm Monitor to determine the reason and the appropriate action to take. (See "Tools for isolating and fixing hardware problems" on page 77.)

If the Alarm Monitor and Event Browser do not provide a solution to a hardware problem, you may need to replace or service a component. If the problem is with a component that is not replaceable because it is not a physical entity (such as the Time Switch), you must either replace its parent component or contact your Nortel Networks technical support representative, depending on the component.

To run a diagnostic test

ATTENTION

Nortel Networks recommends that you courtesy stop rather than stop a component if possible. For instructions, see "Starting and stopping components" on page 97.

1 In CallPilot Manager, click Maintenance → Maintenance Admin.

   Result: The Maintenance page appears.

2 Click the plus sign (+) beside the CallPilot server to expand the component tree.

3 Continue clicking the plus sign (+) until the component with which you want to work is visible.

4 Click the hardware component for which you want to run diagnostics.

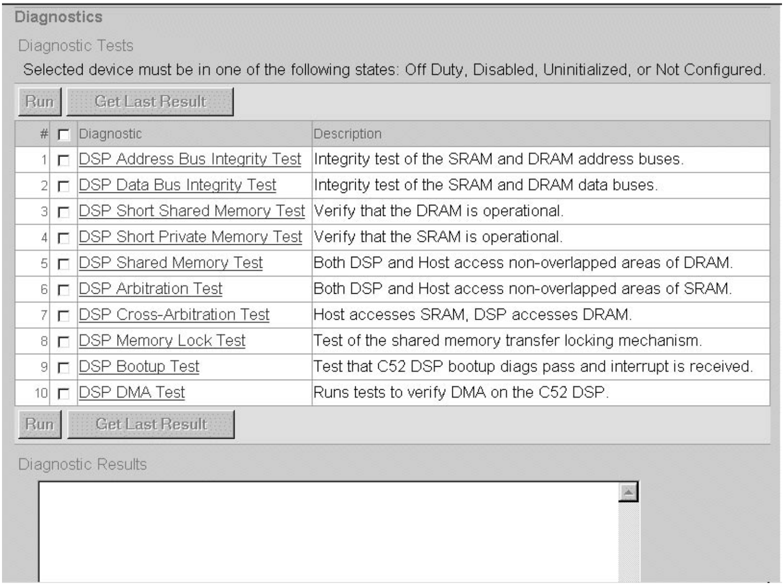
   Result: The Maintenance page refreshes to show details about the component.

5 Scroll down to the Maintenance section, and ensure that the component is out of service.

   Note: For instructions on taking the component out of service, see "To start or stop a component" on page 99.

6 Scroll down to the Diagnostics section.

Result: The following is an example of the Diagnostics section for an MPC-8 card (removable MPC):

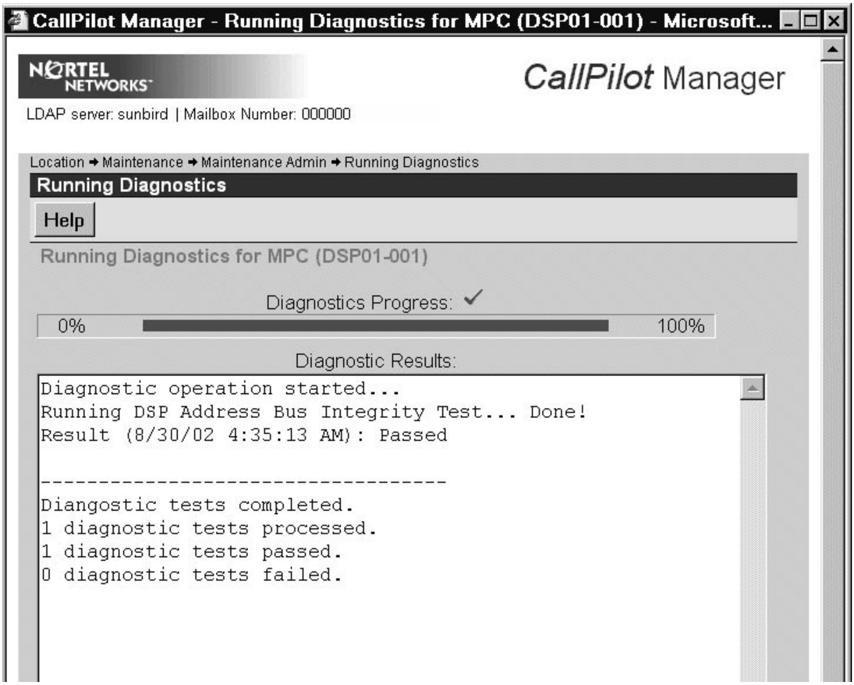


7 Check the check box for each diagnostic that you want to run.

Note: If you want to run all of the diagnostics, check the Diagnostic Description check box at the top of the list.

8 Click Run.

Result: A new web browser window opens to display the progress and results of the diagnostics:



Note: The Diagnostic Results box in the Diagnostics section displays diagnostic results when you click Get Last Result.

Viewing the last diagnostic results

Introduction

You can review the results of previously-run diagnostics by clicking the Get Last Results button for a component.

To view the last diagnostics result

ATTENTION

Nortel Networks recommends that you courtesy stop rather than stop a component if possible. For instructions, see “Starting and stopping components” on page 97.

1 In CallPilot Manager, click Maintenance → Maintenance Admin.

Result: The Maintenance page appears.

2 Click the plus sign (+) beside the CallPilot server to expand the component tree.

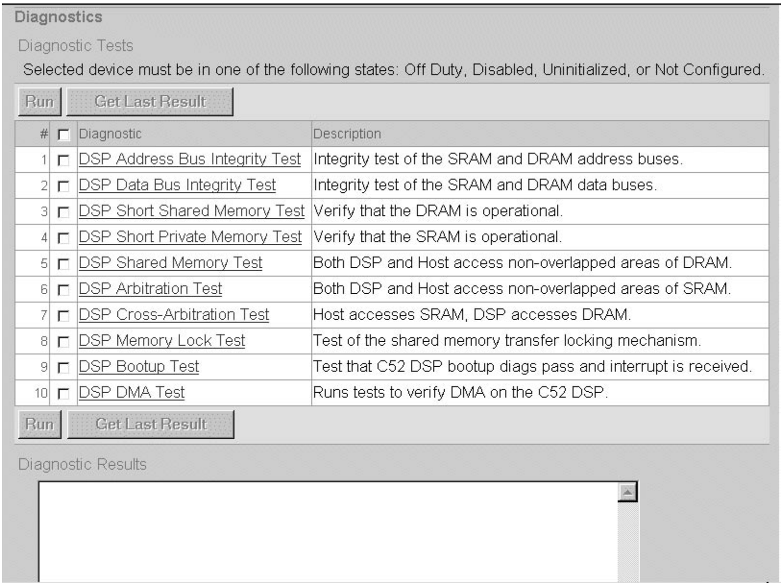
3 Continue clicking the plus sign (+) until the component with which you want to work is visible.

4 Click the hardware component for which you want to run diagnostics.

Result: The Maintenance page refreshes to show details about the component.

5 Scroll down to the Diagnostics section.

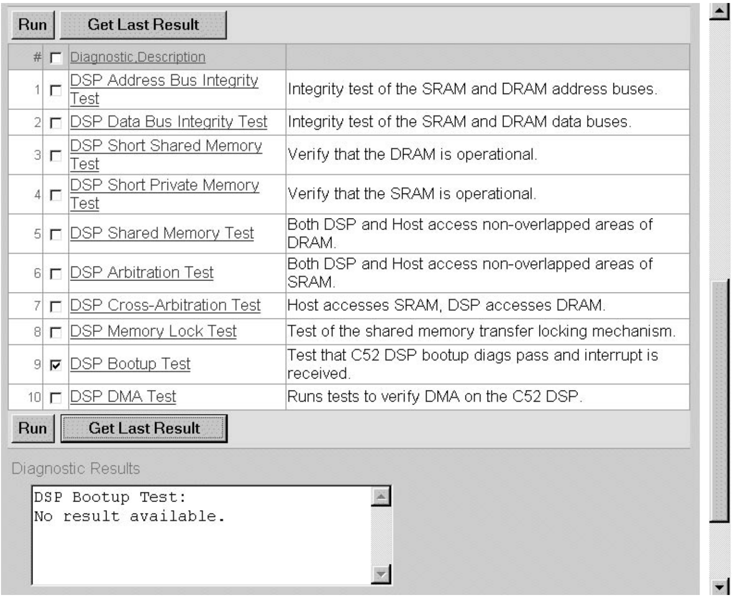
Result: The following is an example of the Diagnostics section for an MPC-8 card (removable MPC):



6 Check the check box for each diagnostic for which you want to review results.

7 Click Get Last Result.

Result: The results appear in the Diagnostic Results box.



Last diagnostic results

The results of the last diagnostic test display the following information in the Diagnostic Results box:

- diagnostic title
- diagnostic result: pass or fail
- the date and time the test was completed

Section C: Working with the Multimedia and Channel Monitors

In this section

Working with the Multimedia Monitor

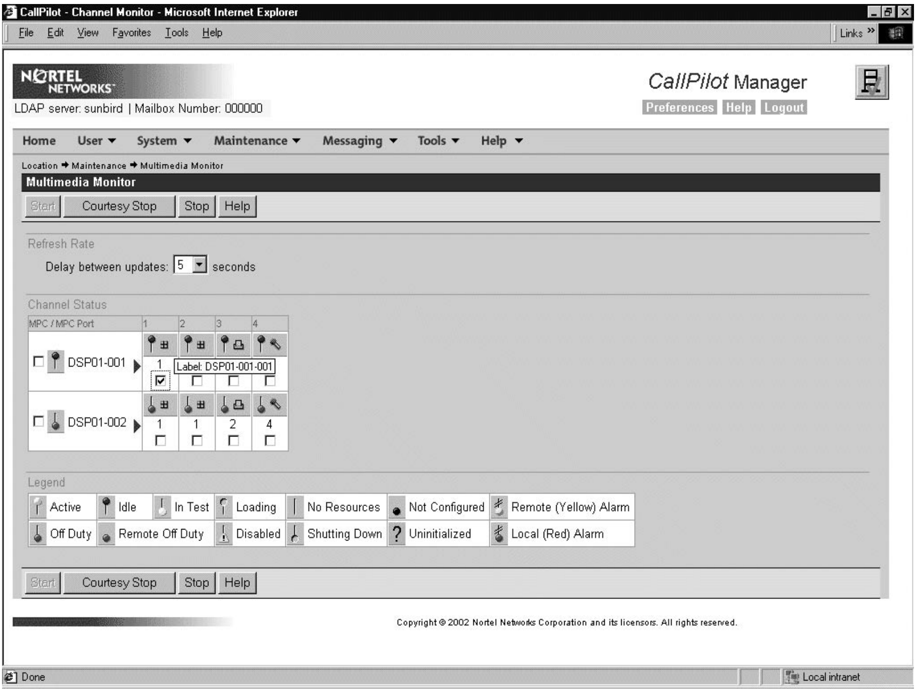
Introduction

The Multimedia Monitor shows the status of multimedia channels. The multimedia channels are the DSP ports that process the calls. They are the voice, fax, and speech recognition channels.

To view or work with multimedia channel states

1 In CallPilot Manager, click Maintenance → Multimedia Monitor.

Result: The Multimedia Monitor page appears, showing the channels associated with each DSP.



Note: For an explanation of the channel states, refer to the CallPilot Manager online Help.

2 Do one of the following:

IF you want to stop or start	THEN
all of the channels associated with a DSP	check the check box to the left of the DSP that you want to stop or start. Repeat this step for each DSP.
only one or several channels that are associated with a DSP	check the check box for each channel that you want to stop or start.

3 Click Courtesy Stop, Stop, or Start as required.

Result: If you clicked Courtesy Stop or Stop, you are asked to confirm the Courtesy Stop or Stop. Click OK.

The selected channels change to off-duty or on-duty status, according to the action you chose.

Note: If the buttons are not available, wait a few seconds for the page to refresh.

Working with the Channel Monitor

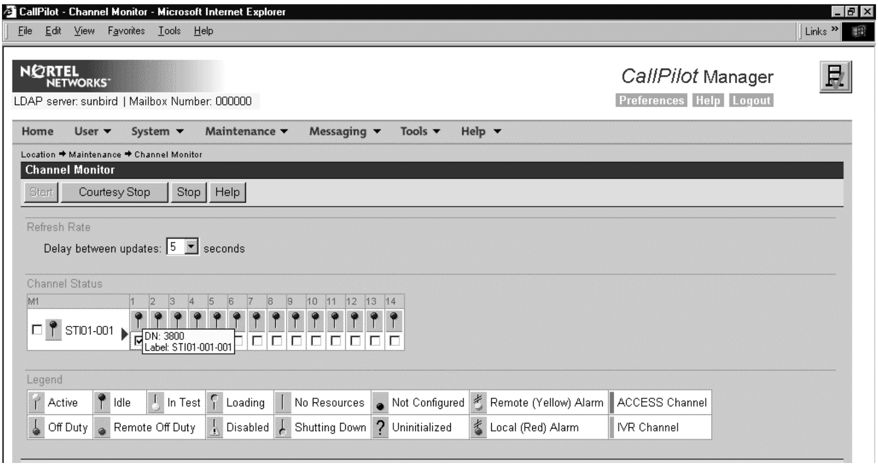
Introduction

The Channel Monitor shows the status of call channels. The call channels are the connections between the server and the switch that carry the call signals to CallPilot.

To view or work with call channel states

1 In CallPilot Manager, click Maintenance → Channel Monitor.

Result: The Channel Monitor page appears, showing the DS30X (also known as DS0) channels associated with each DS30X link.



Note: For an explanation of the channel states, refer to the CallPilot Manager online Help.

2 Do one of the following:

IF you want to stop or start	THEN
all of the channels associated with a DS30X link	check the check box to the left of the DS30X link that you want to stop or start. Repeat this step for each DS30X link.
only one or several channels that are associated with a DS30X link	check the check box for each channel that you want to stop or start.

3 Click Courtesy Stop, Stop, or Start, as required.

Result: If you clicked Courtesy Stop or Stop, you are asked to confirm the Courtesy Stop or Stop. Click OK.

The selected channels change to off-duty or on-duty status, according to the action you chose.

Note: If the buttons are not available, wait a few seconds for the page to refresh.

Chapter 6

Using CallPilot system utilities

In this chapter

Overview

Introduction

The following table lists the CallPilot system utilities:

Utility	Description
Diagnostics Tool	Allows CallPilot startup diagnostics to be enabled or disabled (turned on or off).
PEP Maintenance	Displays a list of installed PEPs and enables PEP uninstall.
System Monitor	Displays the following information: ■ the status of all CallPilot channels ■ the status of all CallPilot services **Note:** This status is more accurate than the status that Windows NT provides in the Services control panel ■ particulars about the CallPilot System, such as names, keycodes, serial numbers, IP addresses, and system numbers

Accessing the system utilities

All CallPilot utilities are accessible from the CallPilot server in the Start → Programs → CallPilot → System Utilities menu.

Diagnostics Tool

Introduction

The Diagnostics Tool allows you to enable or disable CallPilot startup diagnostics.

CallPilot startup diagnostics automatically identify hardware problems that may exist when the system and its services are started (DSP, TimeSwitch, MediaBus).

When you disable startup diagnostics, you can save time during system maintenance operations where restarts or Call Processing services restarts are required.

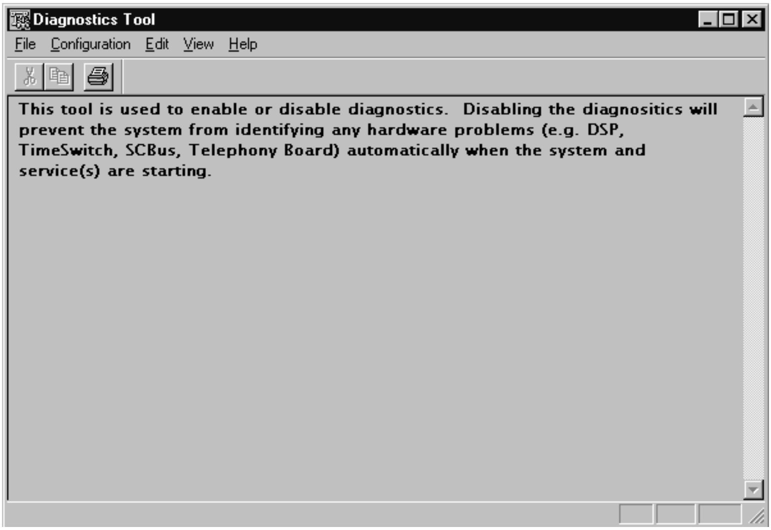
There are three recommended steps:

- Use the Diagnostics tool to turn off CallPilot startup diagnostics.
- Perform system maintenance.
- Use the Diagnostics tool to turn on CallPilot startup diagnostics.

To access the Diagnostics Tool

On the Windows desktop, click Start → Programs → CallPilot → System Utilities → Diagnostic Tool.

Result: The Diagnostics Tool window appears.



To enable startup diagnostics

From the Diagnostics Tool window, select Configuration → Maintenance Startup Diag → Enable.

To disable startup diagnostics

ATTENTION

Nortel Networks recommends that you leave the startup diagnostics turned on.

When you disable CallPilot startup diagnostics, you prevent CallPilot from automatically identifying hardware problems that may exist when the system and its services are started (DSP, TimeSwitch, MediaBus).

On the Diagnostics Tool window, select Configuration → Maintenance Startup Diag → Disable.

PEP Maintenance utility

Introduction

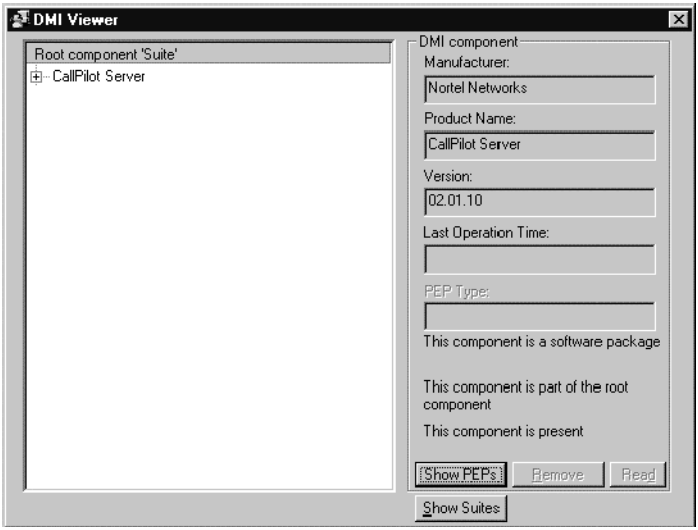
The PEP Maintenance utility displays a list of all installed PEPs on the server and enables you to uninstall PEPS.

For information on installing or uninstalling PEPs, refer to Part 4 of the *CallPilot Installation and Configuration* binder.

To access the PEP Maintenance utility

From the Windows desktop, click Start → Programs → CallPilot → System Utilities → PEP Maintenance Utility.

Result: The DMI Viewer window appears.



To view a list of all installed PEPs

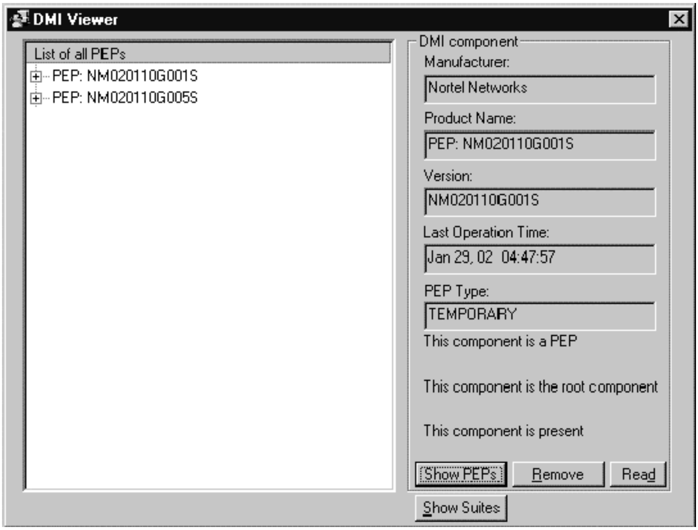
1 Click the component for which you want to display the PEP list.

2 Click **Show PEPs**.

Result: A list of all installed PEPs appears in the left pane.

3 If you want to review the readme file associated with a PEP, click the PEP, and then click **Read**.

Result: The readme file opens in Notepad.



System Monitor

Introduction

The System Monitor consists of three tabs, as described in the table below:

Tab	Description
Channel Monitor	Shows the status of all CallPilot services, multimedia channels (DSP channels), and call channels (DS30X channels).
System Info	Displays particulars about the CallPilot System, such as features purchased, keycode, serial number, and CallPilot server IP addresses.
Legend/Help	Provides a description of icons and terminology displayed in the System Monitor window.

System Monitor is a nondestructive tool that does not alter the behavior of any CallPilot components.

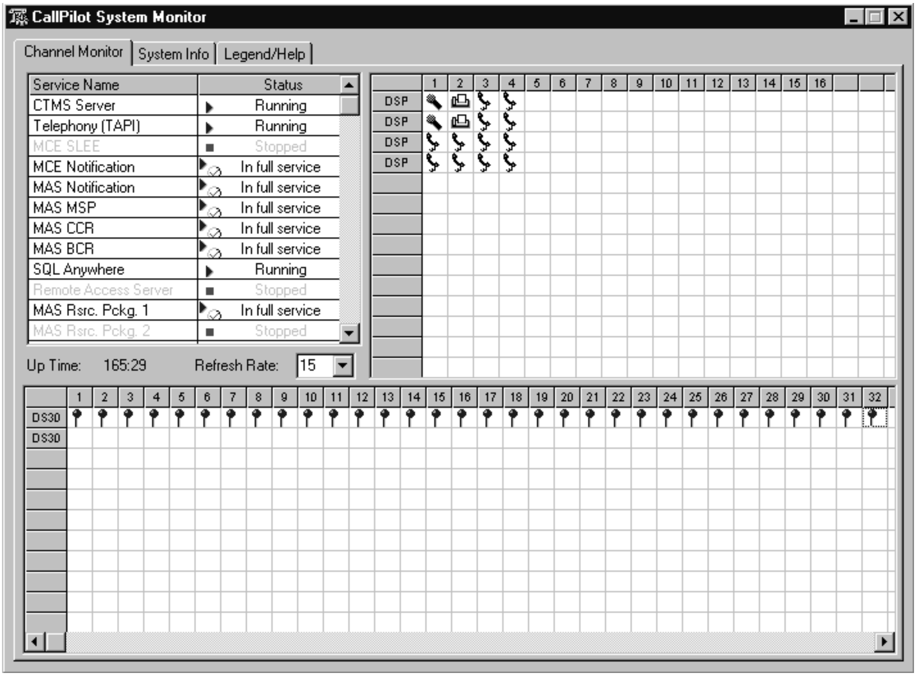
To access the System Monitor

On the Windows desktop, click Start → Programs → CallPilot → System Utilities → System Monitor.

Result: The CallPilot System Monitor window appears. By default, the Channel Monitor tab appears on top. Click the other tabs to view the information on those tabs.

About the Channel Monitor tab

The following is an example of the Channel Monitor tab, followed by a description of its contents:



CallPilot services

The Service Name pane shows the status of services from a CallPilot perspective. The status shown in the Windows NT Services control panel may state that a service is running, but it may not actually be fully running or in service from a CallPilot perspective. Refer to the System Monitor tool Channel Monitor tab for the true status.

The services listed under Service Name should be either running or in full service when CallPilot is functioning optimally. If any CallPilot services are stopped, investigate the cause of this. Call Nortel Networks technical support for assistance.

Note: While any stopped services should be investigated, some services are not critical. CallPilot may continue to handle call processing even with some services stopped.

Critical Services needed for CallPilot Call Processing include the following:

- CT Media Server Service
- Telephony Server (TAPI) Service
- MAS EMCI Service
- MAS Notification Service
- MCE SLEE Service
- MCE Notification Service
- SQL Anywhere Service
- VBPC Load Service (useful in a DSE system)
- Dialogic CT Media Server Core Service
- Dialogic CT Media Server ISE Service
- Call Channel Resource Service
- Blue Call Router Service
- Media Resource Service
- Maintenance Service Provider Service

DSPs

In the DSP pane, each DSP is represented in a separate row. Each box in the row is one DSP channel or multimedia channel. Click the Legend/Help tab to view descriptions of the multimedia channel icons.

For tower and rackmount CallPilot servers, DSPs reside in MPB16-4 boards and MPC-8 cards. DSPs are distributed as follows:

- One MPB16-4 board consists of two embedded DSPs and up to four MPC-8 cards.
- Each MPC-8 card contains a single DSP.

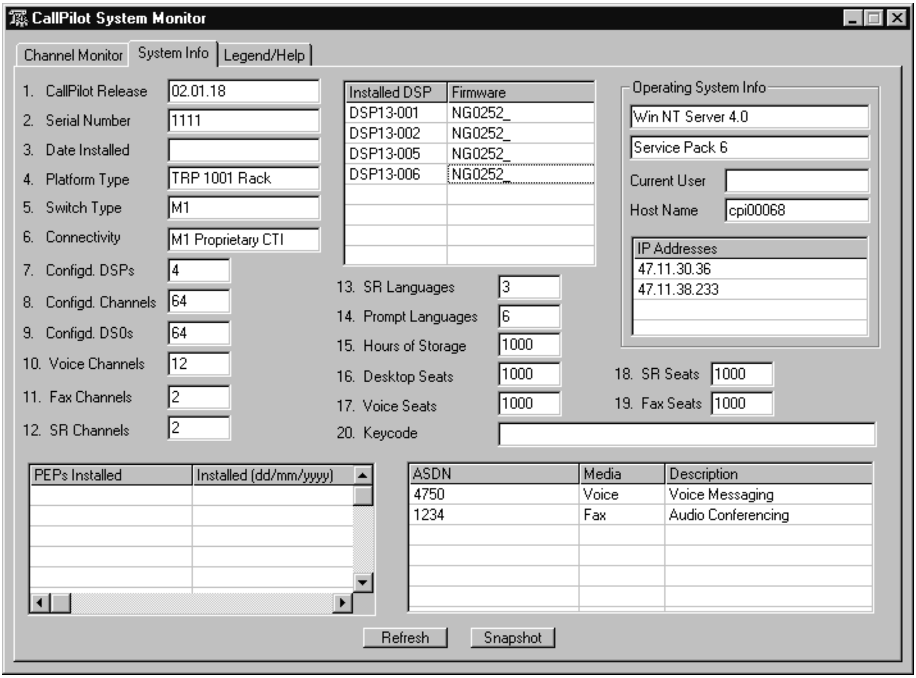
DS30X links

In the DS30X link pane, each DS30 row represents a separate DS30X link (also referred to as a DS30 link). Each box in the row represents one DS30X channel.

The DS30X links connect the CallPilot server to the MGate card in the Meridian 1 switch or Succession CSE 1000 system.

About the System Info tab

The following is an example of the System Info tab, followed by a description of its contents.

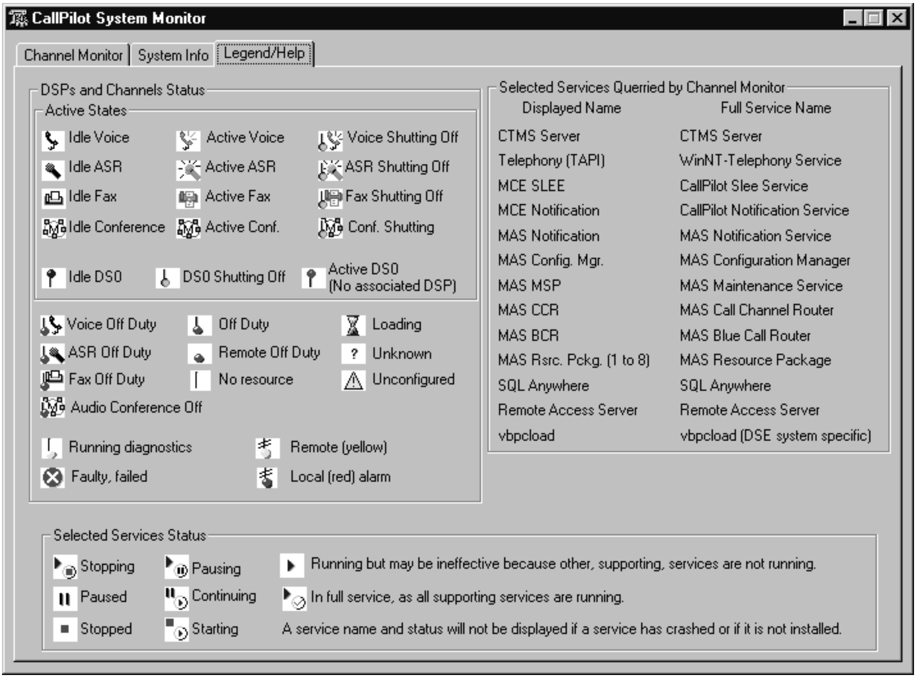


The numbered items provide information about the features purchased. Information about the underlying operating system is provided in the top right corner, including the server IP addresses.

PEP information and configured Service DNs are listed in the bottom part of the window.

About the Legend/Help tab

The following is an example of the Legend/Help tab. Consult this window for descriptions of the icons found in the Channel Monitor tab:



Chapter 7

Replacing basic chassis components

In this chapter

Removing the front bezel and server cover

Introduction

If the maintenance task requires replacing front panel components, you must remove the front bezel. The exception is the hard drives, which can be accessed by simply unlocking and opening the front bezel doors.

If you require access to the server interior, remove both the front bezel and the server cover.

To remove the front bezel, see page 129.

To remove the server cover, see page 130.

To replace the front bezel, see page 131.

Requirements

Before removing the front bezel and server cover, gather the following tools:

- the customer’s chassis keys for the front bezel doors
- flat-blade screwdriver
- antistatic wrist strap

About the front bezel doors

Two locked doors on the front of the server cover the front panel, including the CD-ROM drive and tape drive.

These doors are part of the front bezel, which covers the front of the server. You must unlock the front panel doors before you can remove the front bezel.

To remove the front bezel

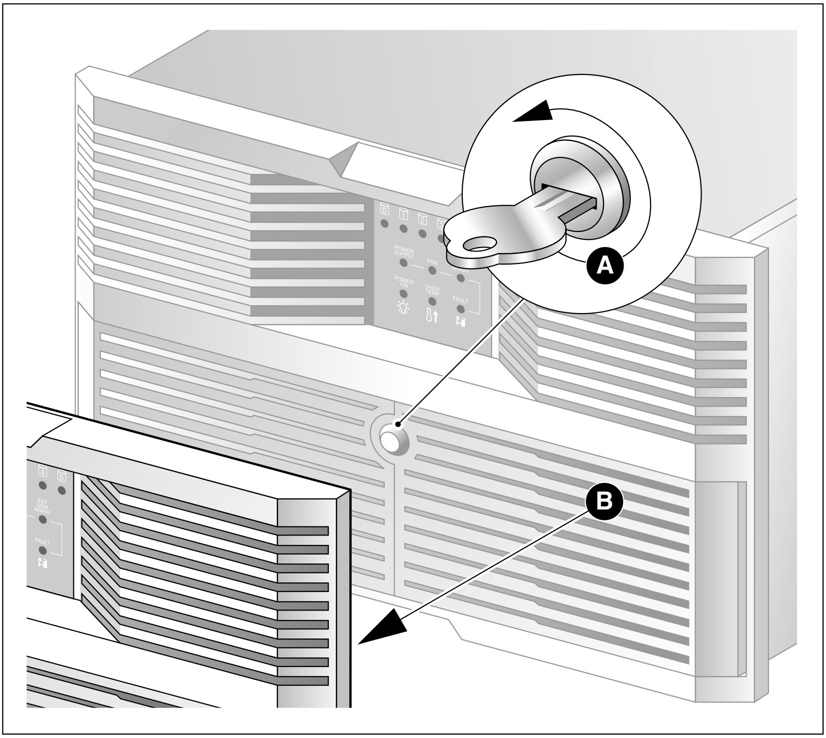
CAUTION

Risk of equipment damage

Do not attempt to move or lift the server before you have removed the front bezel. If the front bezel is attached, the server can disengage from the front bezel and fall.

1 Unlock and open the double doors of the front bezel. See “A” in the diagram below.

2 Firmly grasp the front bezel by the hand-holds on either side of the chassis, and pull the front bezel from the chassis.



G101733

To remove the server cover

DANGER

Risk of electric shock

High current inside the chassis can cause severe injury.

CAUTION

Risk of equipment damage

Take precautions to protect internal components. Electrostatic discharge (ESD) can damage boards and make them unusable. Wear an ESD wrist strap.

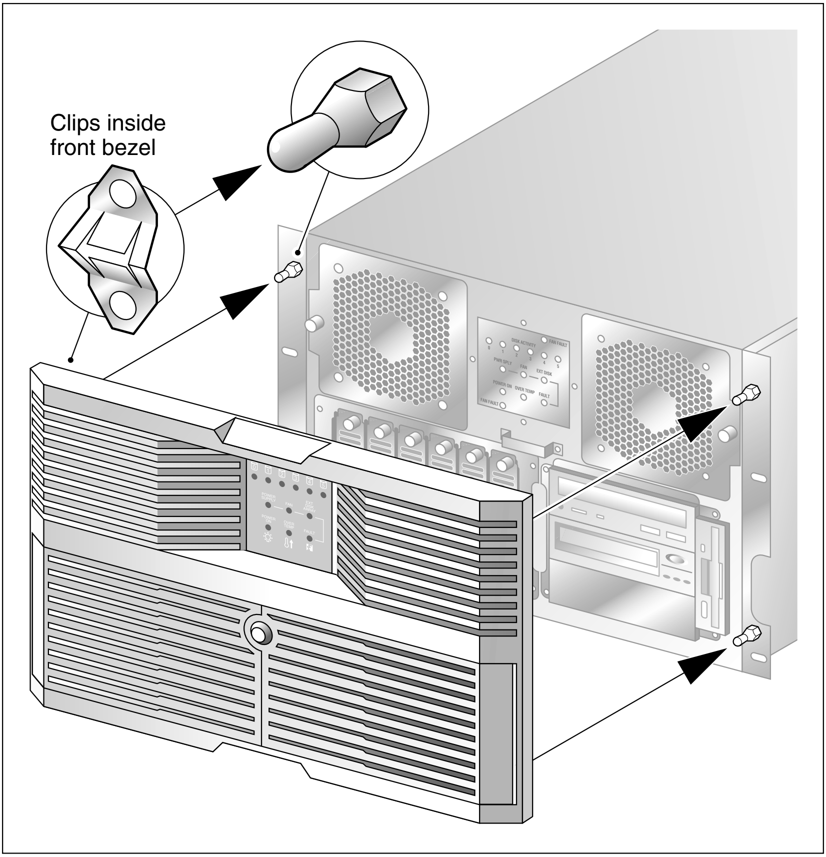
1. Remove the front bezel (see page 129).
2. Power down the server and disconnect all power cords.
3. Loosen the three thumbscrews at the rear of the top cover.
4. Remove the server cover by pulling the cover toward the rear of the chassis, and then lifting it up and off.
5. Clip the lead from your ESD wrist strap to an unpainted metal section of the chassis.

To replace the front bezel after maintenance is complete

When the CallPilot server maintenance is complete, replace the front bezel.

1 Align the front bezel with the ball studs located at each faceplate corner.

See the diagram below:



G101734

2 Apply pressure evenly until the bezel snaps onto each ball stud.

3 Close and lock the double doors of the front bezel.

Replacing air filters

Introduction

To ensure your server cools and functions properly, remove and clean air filters every six months in clean environments and every three months in industrial or dirty environments . If they appear to be damaged or become inefficient, replace the filters.

Locating the air filters

There are four air filters on the 1001rp server — one inside each of the two doors of the front bezel, and two on the top half of the front bezel. They are made of polyester foam material and are flame retardant.

Requirements

You require the customer's chassis keys for the front bezel.

To replace the front bezel air filter

1 Remove the front bezel from the chassis. See "To remove the front bezel" on page 129.

2 Pull the filters away from the Velcro strips that secure them to the bezel.

3 Replace the filter by seating the new filter pads evenly over the Velcro strips and securing them.

4 Install and lock the front bezel on the chassis.

To replace the door air filter

1. Unlock and open the front doors.
2. The air filter is trapped between the inside of the door and the wire. The wire pivots near the key lock. Pull the wire away from the key lock to free the air filter.
3. Remove and replace the air filter.
4. Pivot the wire to trap the filter, ensuring that the ends of the wires are pinched inside the door.
5. Close and lock the doors.

Replacing the power supply

Introduction

The power supply is hot-swappable. This means that you can replace the power supply without powering down the server.

Requirements

Before hot-swapping a power supply, gather the following tools:

- one flat-blade screwdriver
- one Phillips screwdriver
- one antistatic wrist strap
- the replacement power supply

When to hot-swap the power supply

A green LED indicates that the power supply is working properly. If the green LED on the power supply module is unlit or red, the module is failing or has failed. Other indicators of failure are the alarm that sounds and the power supply module LED on status display that turns red.

To hot-swap a power supply

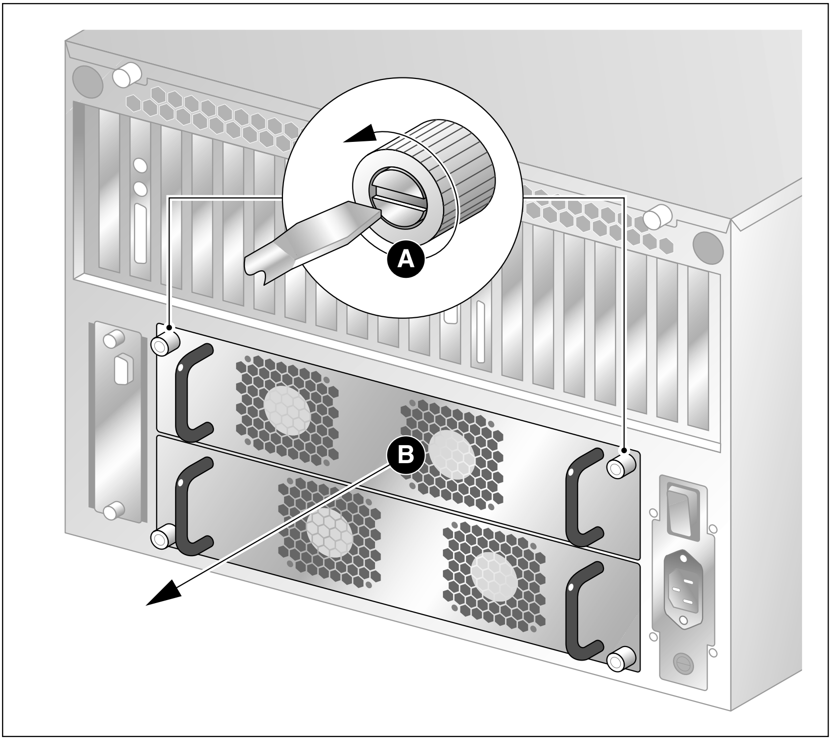
DANGER

Risk of electric shock

High current inside the chassis can cause severe injury.

1 Loosen the thumbscrews at the top right and left of the failed power supply module (see “A” in the diagram below).

If needed, use a flat-blade screwdriver. The thumbscrew must rotate freely and not contact the chassis threads.



G101731

2 Grasp the molded horizontal handles on the power supply module and pull the power supply module free from the chassis (see “B” in the diagram above).

3 Align the replacement module with the empty chassis bay.

4 Slide the replacement power supply module into the bay until the module is secured by its connector. Use some force, if necessary.

5 Secure the power supply module to the chassis with two thumbscrews at the corners of the power supply faceplate.

Result: The power supply LED illuminates green.

Note: If the LED does not illuminate, remove and reinstall the power supply with more force. If this does not work, contact your Nortel Networks customer support representative.

Replacing the cooling fan

Introduction

The cooling fan is hot-swappable, so you can replace the cooling fan without powering down the server.

When to hot-swap the cooling fan

When the LED associated with a cooling fan turns red, the fan requires replacement.

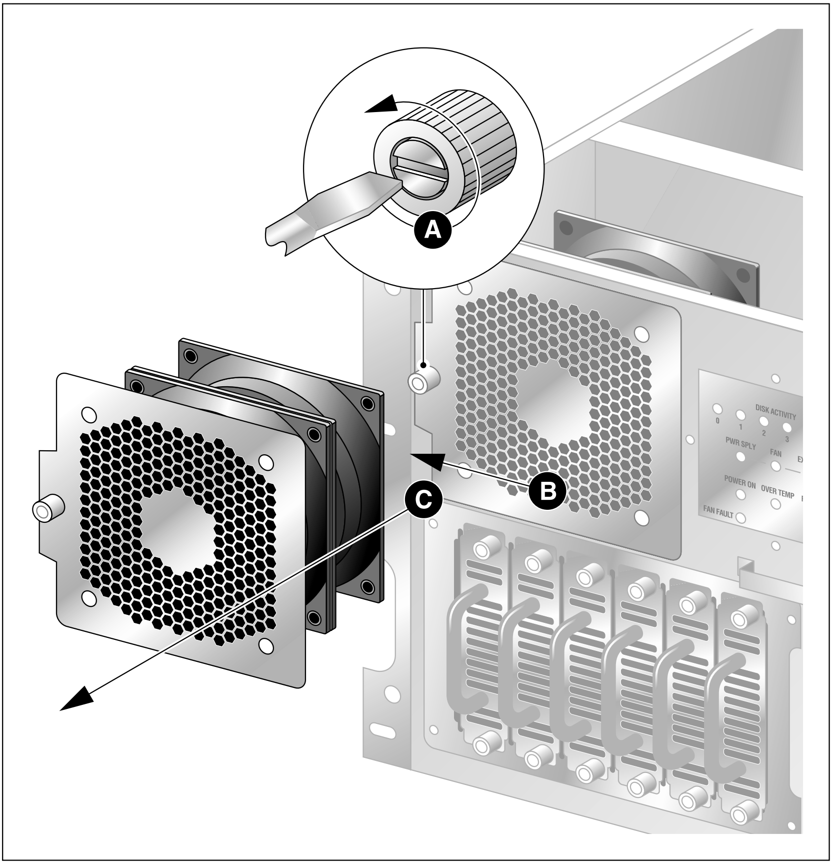
To hot-swap a cooling fan

1 Remove the front bezel.

2 Use the front panel display LED to locate the defective fan.

3 Loosen the thumbscrew located on the outside of the failed cooling fan module (see “A” in the diagram below).

If needed, use a flat-blade screwdriver. The thumbscrew must rotate freely and not contact the chassis threads.



G101728

4 Unseat the cooling fan module by sliding the module horizontally away from the display and toward the rack rail (see “B” in the diagram above).

Result: The module power connector unseats from the power connector located behind the display and LEDs.

5 Slide the failed cooling fan module out of the chassis (see “C” in the diagram above).

6 Align the replacement cooling fan module tabs with the four support slots on the chassis.

Ensure that the module is oriented with the thumbscrew, and insert the tabs into the supporting slots of the chassis.

7 Slide the cooling fan module toward the front panel display and into position.

Result: The fan module connects with slight resistance. The fans rotate and pull air into the chassis. The cooling fan LED goes out.

8 Tighten the module’s thumbscrew and replace the front bezel.

Replacing the fuse (AC system only)

Introduction

The fuse is located below the power input socket on the rear panel. When the server's fuse blows, the server stops operating.

CAUTION

Risk of equipment damage and personal injury
Disconnect power from the server before replacing a fuse.

Requirements

You require the following:

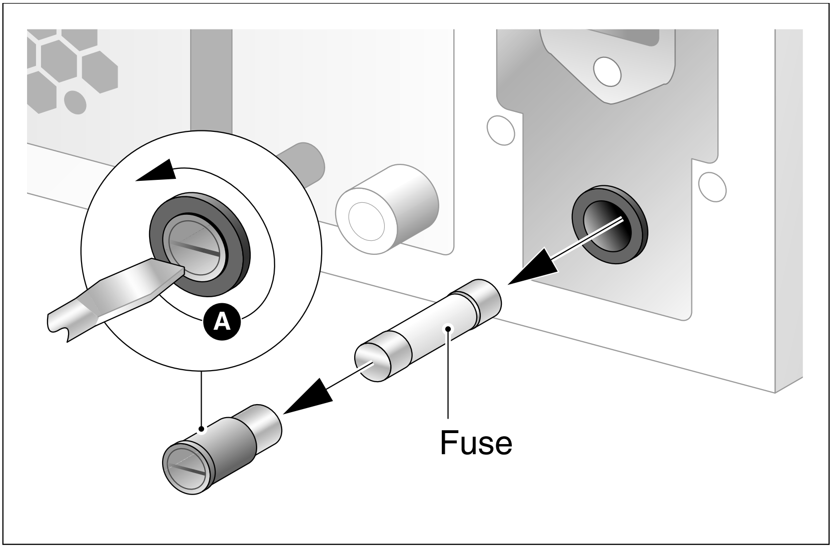
- an approved fuse for replacement

  Two different types of fuses exist: one for North America, and one for international use. Ensure that the fuse you are replacing has been approved by Nortel Networks for your region.
- flat blade screwdriver

To replace the fuse

1. Power off the server.
2. Unplug the power cable from the wall outlet.
3. Unplug the power cable from the power input socket on the server.

4 Unscrew the fuse receptacle (see “A” in the diagram below).



G101732

5 Slide the fuse receptacle out of the fuse chamber.

Note: Observe how the blown fuse is positioned in the receptacle.

6 Remove the blown fuse from the fuse receptacle.

7 Install the approved replacement fuse.

Use a flat-blade screwdriver to screw in the fuse receptacle with a push and 1/4 clockwise turn.

8 Slide the fuse receptacle back into its chamber.

9 Fasten the fuse receptacle with a flat-blade screwdriver.

10 Plug the power cable back into the power input socket on the server.

11 Plug the power cable into the wall outlet.

12 Power on the server.

ATTENTION

If the fuse blows after replacement, swap one power supply module with the other. If this does not work, call your Nortel Networks customer support representative.

Replacing the alarm board

Introduction

The 1001rp server alarm board and status panel are used to monitor and indicate the server status. The basic hardware test on page 23 fails if the board is defective or damaged. When these units are damaged, replace them immediately.

CAUTION

Risk of equipment damage
Take precautions to protect computer boards. Electrostatic discharge (ESD) can damage boards and make them unusable. Wear an ESD wrist strap.

Requirements

Before replacing the alarm board or panel display, gather the following tools:

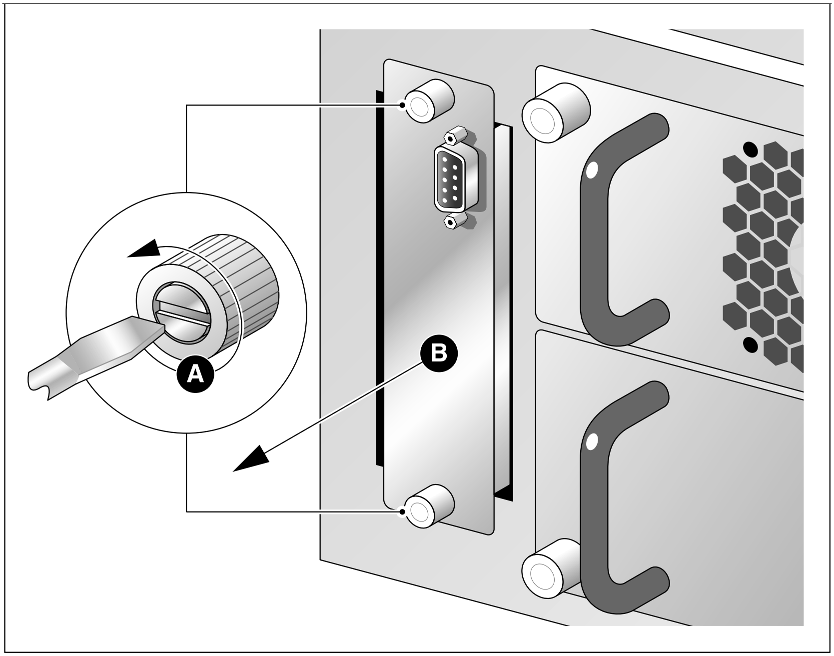
- a Phillips screwdriver
- an antistatic wrist strap
- the replacement component(s)

To replace the alarm board

1 Power off the server.

2 Loosen the two thumbscrews securing the faceplate to the left of the 1001rp server power supply modules (see “A” in the diagram below).

If needed, use a flat-blade screwdriver. The thumbscrew must rotate freely and not contact the chassis threads.



G101729

3 Pull the carrier free from the chassis (see “B” in the diagram above).

4 The alarm board is secured to the carrier by two Phillips-head screws. Remove the defective alarm board from the carrier.

5 Secure the replacement alarm board to the carrier using two Phillips-head screws.

6 Align the carrier with the chassis and slide the board into the chassis.

Note: The card encounters some resistance as it meets the connector.

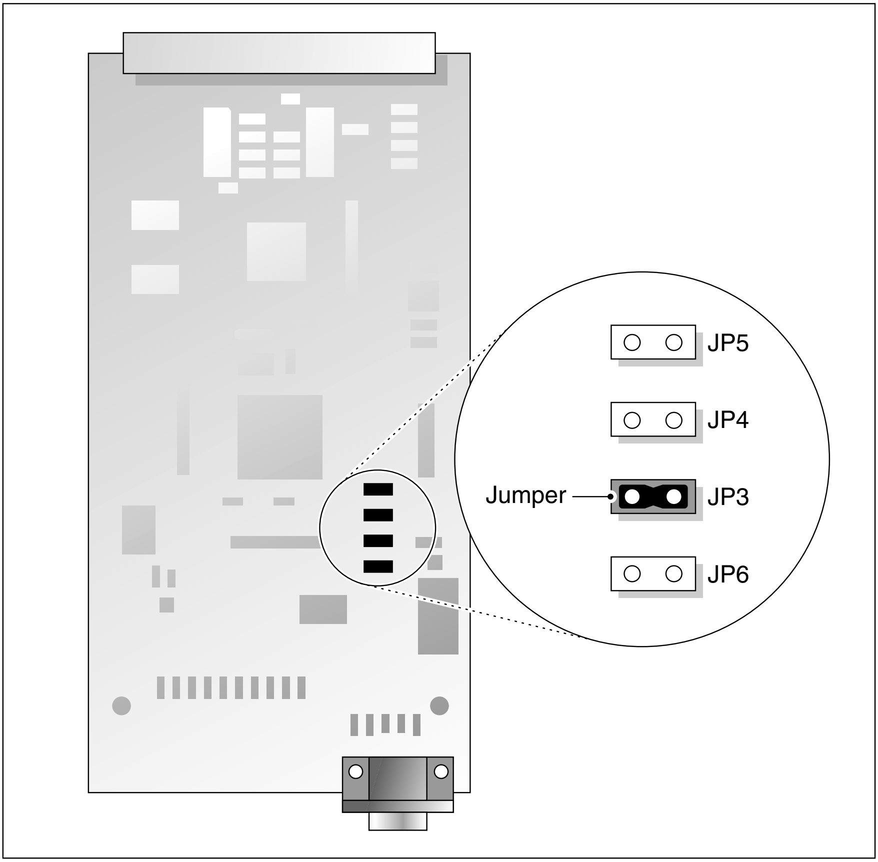
7 Tighten the thumbscrews to secure the faceplate to the chassis.

Setting jumpers on the alarm board

Introduction

The jumpers on the alarm board enable or disable sensing and display functions. This section describes the features that are enabled or disabled by setting jumpers on the alarm board.

The default and recommended setting is to have only JP3 jumpered (see below). This setting enables normal sensing and LED display.



G101730

Jumper descriptions

JP6 - do not change

Leave the jumper installed on JP6.

JP5 - Disarming “No Power” in the bottom bay

If you are operating with one power supply, you can disable sensing of “no power” from the bottom power supply. To do this, install a jumper on jumper block 1, JP5.

Ensure that the functioning power supply is installed in the upper power bay.

JP4

Not used.

JP3 - LED display

Install a jumper on jumper block 1, JP3, to configure the alarm board to send alarm signals to the full array of LEDs. This is the default setting and the required setting for normal server operation.

If this jumper is not installed over both pins, the alarm board does not send the correct format of signals to the front panel display.

Replacing the status display panel

Locating the display

The display is located at the front of the chassis and is cabled to the rear of the chassis and the alarm board.

To replace the status display panel

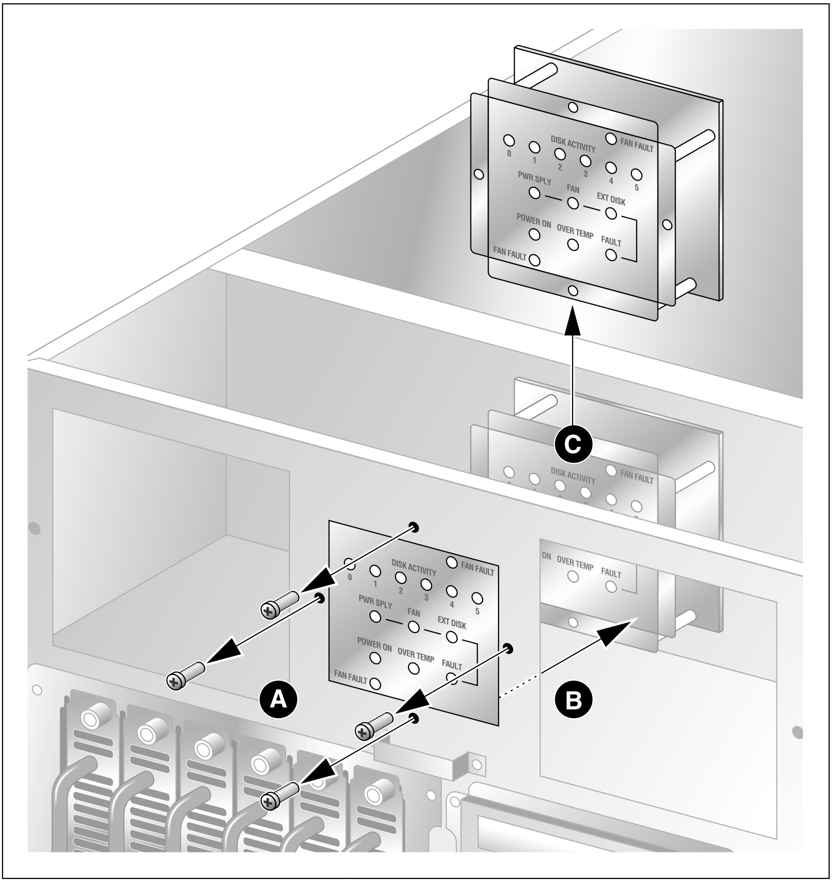
1 Power off the server.

2 Remove the top cover and the front bezel from the chassis.

3 Remove the cooling fans (see “Replacing the cooling fan” on page 137).

The cooling fans block the access to the status panel.

4 Loosen the four Phillips-head screws that secure the status display panel to the front of the chassis (see “A” in the diagram below).



G101727

5 Label and remove the 40-pin flat cable from the back of the status display panel.

6 Move the defective status display panel towards the back of the chassis, and then lift it out of the chassis (see “B” and “C” in the diagram above).

7 Set the replacement status display panel into position, and secure it to the chassis by replacing the Phillips-head screws.

8 Reconnect the cable.

9 Replace the top cover and front bezel.

Chapter 8

Replacing a hard drive, tape drive, CD-ROM drive, or floppy drive

In this chapter

Replacing a hard drive

Introduction

The hard drives are hot-swappable. This means that you can replace a hard drive without powering down the server.

When to hot-swap hard drives

With a RAID controller, hot-swap device drivers, and operating system support, SCA SCSI hard drives can be hot-swapped on the 1001rp server. Without the RAID controller, hot-swap device drivers, and operating system support, replacing a drive during server operation can cause a fatal error and force a system restart. If a RAID controller is not installed, shut down the system first and then replace the drives.

Note: Identify which hard drive to remove using the Windows NT Event Viewer (see “Viewing event logs” on page 42).

RAID SCSI hard drive configuration

The table below indicates proper SCSI drive bay, channel, and ID configurations in the hot-swappable drive bay. The SCSI backplane assigns the SCSI IDs as shown in the table below:

Hard drive bay	SCSI channel	SCSI ID	Logical drive[a]
1 (far left)	1	0	0 (primary hard drive)
2	1	1	1 (primary hard drive)
3	1	2	2 (primary hard drive)
4	1	3	0 (secondary hard drive)

Hard drive bay	SCSI channel	SCSI ID	Logical drive[a]
5	1	4	1 (secondary hard drive)
6 (far right)	1	5	2 (secondary hard drive)

a. RAID pairs (logical drives) consist of the following pairs: hard drives 1 and 4, 2 and 5, and 3 and 6.

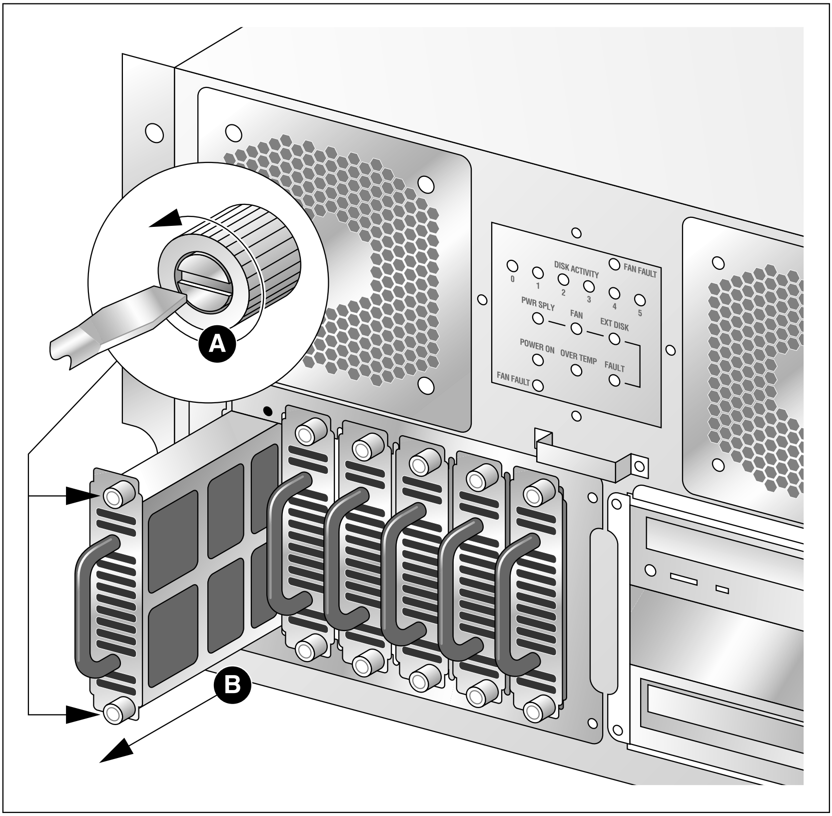
To replace hot-pluggable SCA SCSI hard drives

1 Ensure the new hard drive has the SCSI ID set to 0, termination disabled, and parity checking enabled.

2 Open the front bezel doors.

3 Locate the SCA SCSI drive frame below a cooling fan and beside the media drive.

4 Loosen the two thumbscrews on the faulty hard drive's carrier, and remove the carrier from the chassis.



G101735

5 Remove the faulty drive by loosening the four Phillips-head screws that secure it to the carrier.

6 Attach the new drive to the carrier by four Phillips-head screws.

7 Align the carrier with the drive frame and slide it into the chassis.

Note: Expect resistance as the carrier and backplane connectors meet.

8 Fasten the two thumbscrews.

9 Close the front bezel and lock it.

What's next?

If you have an AcceleRAID 352 RAID controller card, continue with "Rebuilding an AcceleRAID352 RAID hard drive" on page 181.

If you have a DAC960 RAID controller card, continue with "Rebuilding a DAC960 RAID hard drive" on page 220.

About the media drive bay

Overview

Media drive bays contain media devices, including CD-ROM, tape, and floppy drives. If your media drives become damaged or you want to upgrade, you can replace these drives. This section provides procedures for replacing or upgrading any device in the media drive bay.

Procedures

Perform the procedures in the following order to replace media drives:

1. “Removing the media drive carrier from the chassis” on page 157
2. “Replacing a tape, CD-ROM, or floppy drive” on page 162

Removing the media drive carrier from the chassis

Introduction

When replacing the media hard drives, the first step is to remove the media drive carrier from the media drive bay.

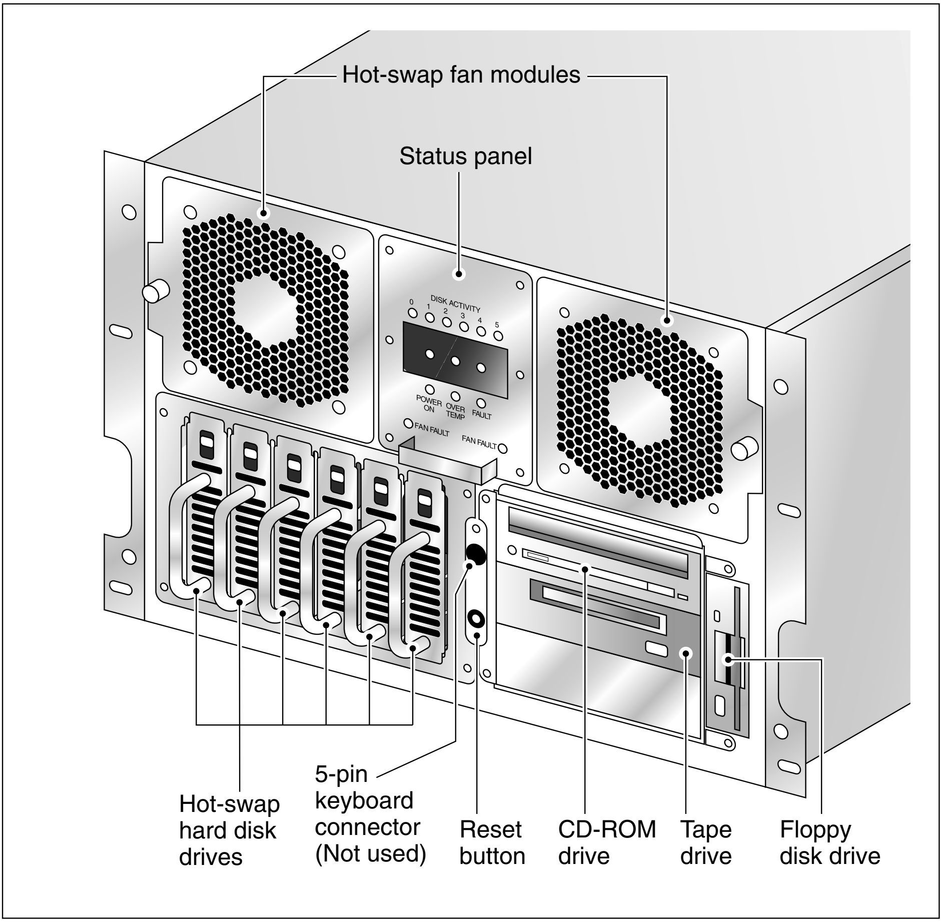
Requirements

To remove the media drive carrier from the media drive bay, you require the following:

- keys for the front bezel doors
- a Phillips screwdriver
- cable identification labels
- a pen or pencil

Locate the media drives

The media drives (CD-ROM drive, tape drive, and floppy drive) are shown in the bottom right corner of the diagram below.



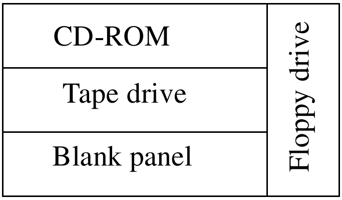
G100697

Media drive carrier

The media drives are housed in a media drive carrier that can be removed from the server, as described later in this section. Where no media device is installed, a blank panel is secured to the media drive carrier for protection.

Media drive carrier slot assignment

The carrier is designed to stack three devices horizontally, and to house the floppy drive vertically to the right side of the carrier frame. The following illustration shows the orientation of the drives, and the standard slot assignment for each of the required devices:



To remove the media drive carrier from the chassis

DANGER

Risk of electrocution

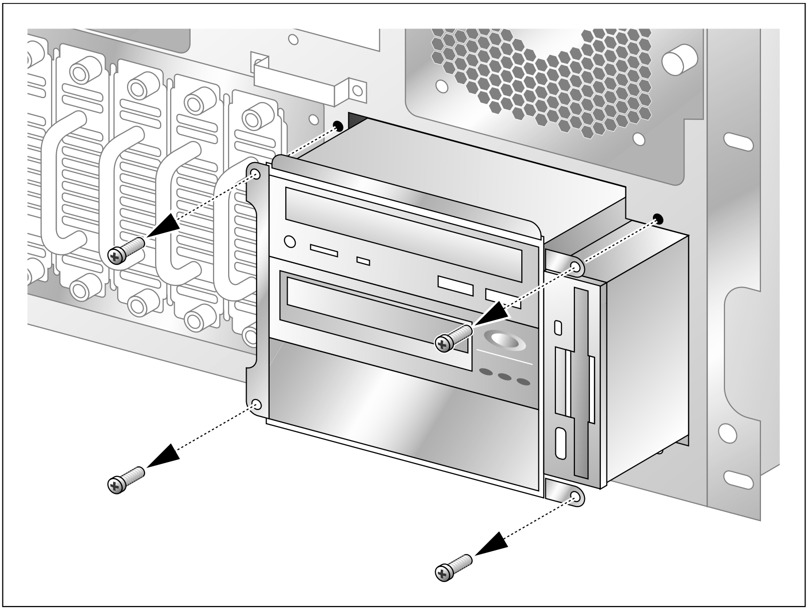
High current inside the chassis can cause severe injury.

CAUTION

Risk of equipment damage

Electrostatic discharge due to improper handling can cause components to be damaged or rendered unusable.

1 Remove the front bezel from the chassis. See "Removing the front bezel and server cover" on page 128.
2 Locate the media drive carrier, and loosen the four Phillips-head screws and washers securing the carrier to the drive bay, as shown in the diagram below:



G100847

3 Hold cables away from the drive bay as you pull the media drive carrier away from the chassis until the connectors attached behind the components can be reached.

CAUTION

Risk of equipment damage

To avoid damaging cables during this procedure, ensure that no cables are crossed when moving the media drive carrier in and out of the drive bay.

4 Label and disconnect cables from installed media drives, and then free the carrier from the chassis.

What's next?

Continue with one of the following:

- "Replacing a tape, CD-ROM, or floppy drive" on page 162
- "Installing a tape drive" on page 165

Replacing a tape, CD-ROM, or floppy drive

Introduction

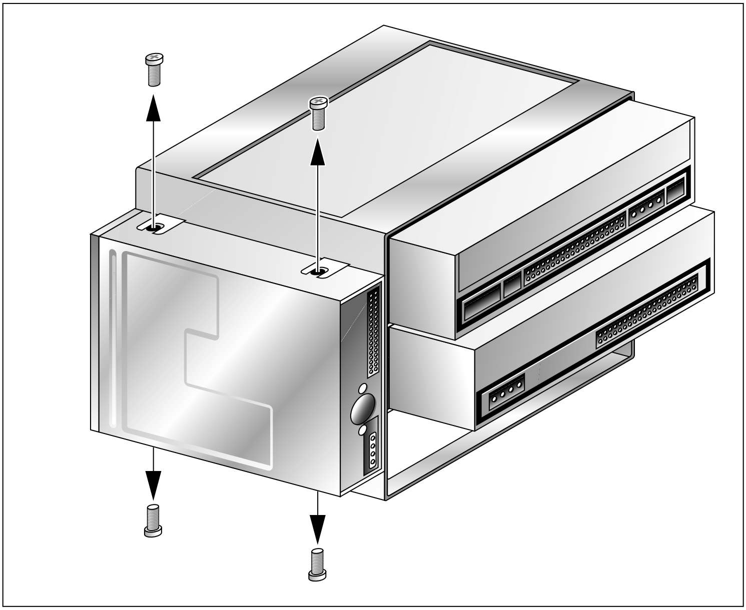
This section describes how to replace a media drive (tape, CD-ROM, or floppy drive) in the media drive carrier.

To replace a media drive

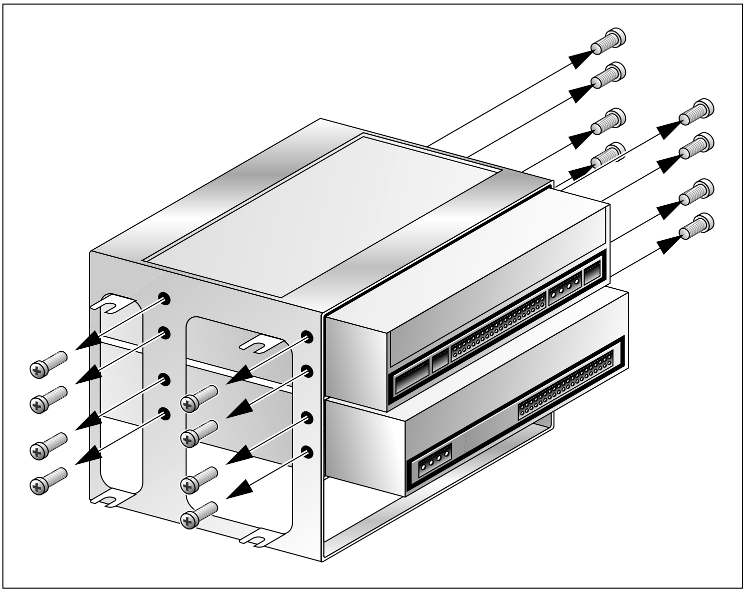
1 Remove the media drive carrier from the chassis (see "Removing the media drive carrier from the chassis" on page 157).

2 Remove the faulty drive from the media drive carrier and save the screws (see the diagrams that follow).

   Note: To remove the tape drive or CD-ROM drive, you must first remove the floppy drive.



G100848



G100849

3 If you are installing a tape drive, configure it as described in “To configure the tape drive” on page 166.

4 Slide the new drive into the media drive carrier, and secure it with the screws that were previously removed.

5 Reattach any media drives that you removed to access a specific media drive slot.

6 Position the media drive carrier in the media drive bay, leaving enough room to reach behind the carrier, and attach the connectors.

7 Carefully connect the existing signal and power cables as shown in “Cabling example” on page 165.

Note: If your tape drive is a narrow device, you require a wide-to-narrow adapter to connect to the wide SCSI cable.

8 Slide the carrier into the media drive bay.

Note: Ensure that the cables are free and undamaged.

9 Secure the media drive carrier to the chassis with four Phillips-head screws.

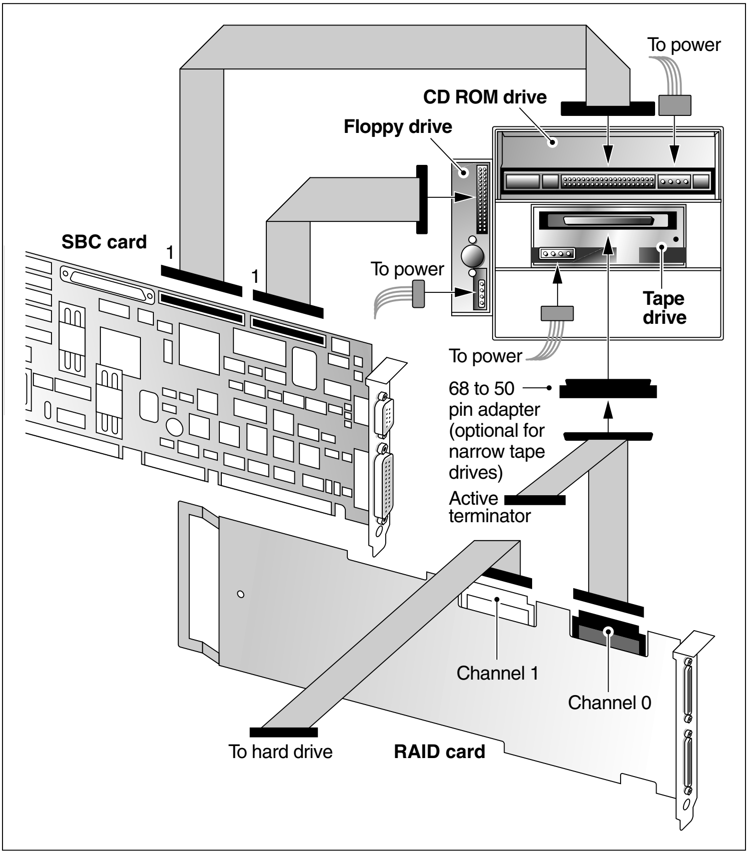
10 Replace and lock the front bezel.

Installing a tape drive

Introduction

This procedure provides instructions for installing a tape drive on a server that currently does not have a tape drive.

Cabling example



G100700

Note: Some tape drives may not require a 68- to 50-pin adapter.

To configure the tape drive

Note: Some settings may already be properly configured. If it is not clear from the drive manufacturer's documentation how to set jumpers, contact your Nortel Networks technical support representative.

1 Set the SCSI ID to 6.

2 Disable the Active Terminators (Term Enable).

   Note: Termination is provided by an Active SCSI terminator that you connect to the end of the SCSI cable (see "Cabling example" on page 165).

3 Enable Parity Checking.

4 Enable Termination power (TPWR).

5 Leave the remaining settings at the default values.

To install a new tape drive (no tape drive previously installed)

1 Courtesy down CallPilot and then power down the server.

2 Ensure that the tape drive settings are as described in "To configure the tape drive" on page 166.

3 Remove the chassis cover.

4 Remove the media drive carrier (see "Removing the media drive carrier from the chassis" on page 157).

5 Slide the new tape drive into the media drive carrier, and secure it with four undercut Phillips-head screws.

   Note: You may need to first remove other media drives from the carrier to access the tape drive slot.

6 Reattach any media drives that you removed in order to access the tape drive slot.

7 Position the media drive carrier in the media drive bay, leaving enough room to reach behind the carrier, and attach the connectors.

8 Carefully connect the existing signal and power cables as shown in "Cabling example" on page 165.

9 Slide the carrier into the media drive bay.

Note: Ensure that the cables are free and undamaged.

10 Secure the media drive carrier to the chassis with four Phillips-head screws.

Result: The tape drive is installed.

11 Replace the chassis cover and front bezel.

12 Test the tape drive.

Chapter 9

Performing RAID maintenance

In this chapter

RAID overview

Introduction

Redundant Arrays of Inexpensive Disks (RAID) is a technology that can combine two or more drives for fault tolerance and performance.

RAID Level 1

The RAID controller is a PCIRAID SCSI card that provides high-performance disk mirroring. CallPilot uses RAID Level 1.

With Level 1 mirroring, two equal-capacity disks mirror one another. One disk serves as the backup copy of the other disk. If one drive fails, the other automatically replaces it. This level prevents loss of information and network time.

System backups

Perform regular tape backups of the CallPilot server. Although RAID provides a high level of data security through redundancy, you must restore from backup tape if the RAID controller card fails or if both hard drives in a RAID system pack fail.

RAID software

The Windows NT operating system supports mirroring in software without a hardware RAID controller. This software-only approach is not supported and is not recommended.

Section A: Replacing the RAID controller card

In this section

Replacing the AcceleRAID 352 RAID controller card

Introduction

This section provides instructions for replacing the AcceleRAID 352 RAID controller card.

Note: CallPilot cannot be upgraded in the field from non-RAID to RAID.

CAUTION

Risk of data loss

If the existing RAID controller card has failed, the data on the hard drives may be corrupted. A procedure for replacing the AcceleRAID controller card is provided here for reference purposes. However, you must contact Nortel Networks technical support for further instructions before you begin.

CAUTION

Risk of system failure

Replacement of a RAID controller card with one that is not identical causes a system failure. You must use Nortel Networks-approved components.

Materials you need

Before replacing the RAID card, gather the following tools:

- a Phillips screwdriver
- an antistatic wrist strap
- the replacement RAID controller card (same model as the current card)

To replace the Mylex AcceleRAID352 RAID controller card

1. Review the manufacturer's documentation for the replacement card.
2. Power down the server and disconnect all power cords.
3. Remove the chassis cover and locate the installed RAID card in PCI slot number 12.
4. Disconnect all cabling from the RAID card.
5. Use an adhesive label or a piece of tape to label each cable with its connection.
6. Loosen the screw located at the top of the card's faceplate.
7. Remove the card from the chassis.
8. Unpack the replacement card.
9. Align the replacement card with PCI slot 12.
10. Apply downward pressure until the card is evenly and securely seated in the slot.
11. Secure the card by tightening the screw at the top of the faceplate.
12. Continue with "Attaching cables to the RAID controller card" on page 174.

Attaching cables to the RAID controller card

Introduction

Once you seat the RAID controller card firmly on the chassis, connect the cables to the card.

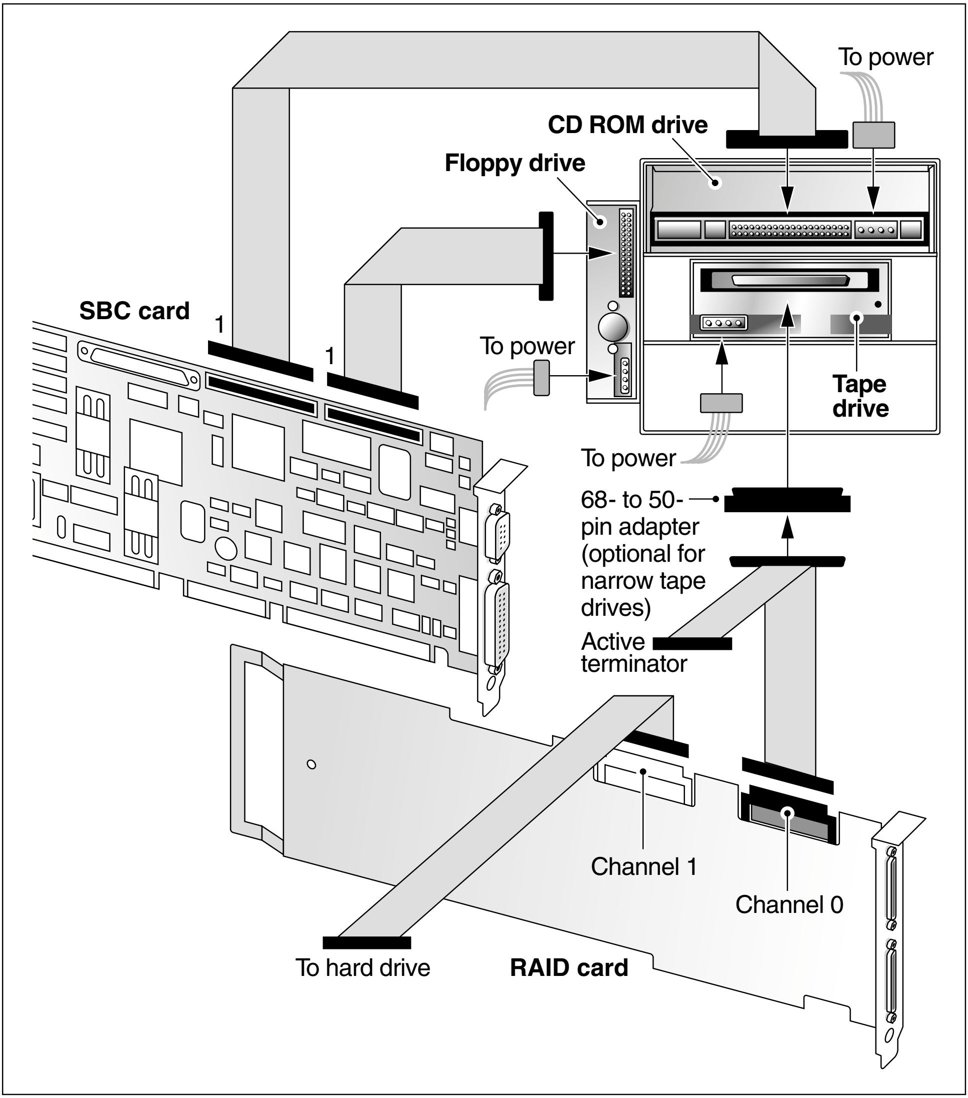
Requirements

To connect the RAID card cabling, you require the following:

- RAID cables for two header connections

  Both header connections must be cabled. Refer to the connections as Channel 0 and Channel 1.
- a properly seated RAID controller card

RAID controller card cabling with a Pentium II or III SBC



G100700

Note: Some tape drives may not require a 68- to 50-pin adapter.

To cable hard disk drives in a RAID system

CAUTION

Risk of equipment damage

Ensure that no cable touches any SBC card component. Heat transfer often causes serious damage to the system.

1. Connect a SCSI cable to Channel 1 on the RAID card.
2. Route the cable to the expansion card area through to the left side of the system, and down to the SCSI backplane.

   Result: The SCSI backplane provides termination for this SCSI channel.

To cable a RAID system for a tape drive

1. Connect a second SCSI cable to Channel 0 on the RAID card.
2. Route the cable between the RAID card and the right side of the system chassis to the front of the chassis, and then down through the system to the tape drive.
3. Attach a wide SCSI active terminator (A0766997) as the last device on the cable.

   Note: The NTRH9034 tape drive cannot provide SCSI bus termination. You must have an Active SCSI terminator as the last device on the SCSI cable. Ensure that the jumper labeled TPWR is enabled on the tape drive. The tape drive must always be connected to the second last connector on the SCSI cable.

What’s next?

Once you have installed and cabled the RAID card, power up the server. The card reads the configuration from the drives and configures itself. If the server does not start properly, contact your Nortel Networks technical support representative.

Upgrading from DAC960 to AcceleRAID352

The DAC960 RAID controller card is no longer being manufactured. It has been replaced with the Mylex AcceleRAID352 controller card.

CAUTION

Risk of data loss

The procedure to upgrade from a DAC960 RAID controller card to an AcceleRAID352 controller card requires assistance from Nortel Networks technical support.

Also note that if the existing RAID controller card has failed, the data on the hard drives may be corrupted.

Contact Nortel Networks technical support for further instructions.

Section B: Maintaining an AcceleRAID352 RAID system

In this section

Installing AcceleRAID352 RAID Global Array Manager software

Introduction

The Global Array Manager (GAM) has several utilities and monitoring functions. Once launched, GAM maintains a real-time Error log and Event Viewer, and also includes functions that can be found in the EzAssist software that is embedded in the controller.

To control and monitor the AcceleRAID352 RAID card controller within Windows NT, you need the Mylex Global Array Manager software installed.

ATTENTION

The Mylex Global Array Manager software is installed at the factory for new CallPilot servers that have the AcceleRAID352 RAID controller card installed.

Unless you find a problem with this software or you are upgrading to an AcceleRAID352 RAID controller card, it is not necessary to install this software at a customer site.

To install the Mylex Global Array Manager software

1. Start the server and log on to Windows NT.
2. Insert the CallPilot 2.0 OS Recovery CD (or Upgrade CD) into the CD-ROM drive.
3. On the My Computer applet, right-click the CD-ROM drive, and then select Explore.
4. Access the \Drivers\Misc\RAID\AR352\GAM\ directory, and then run Setup.
5. Follow the instructions on the screen.

Rebuilding an AcceleRAID352 RAID hard drive

Introduction

In RAID level 1, two equal-capacity disks mirror one another. Both drives run simultaneously with one disk serving as the backup copy of the other disk. If one drive fails, the other continues to run. When you physically replace a failed drive with a new one, the data on the operating drive of the system pack must be copied onto the new drive to rebuild it. RAID automatically performs this rebuild process when the replacement drive is accessed.

If you want to start the initiation process sooner or monitor the rebuilding process, follow the steps in the procedure below.

ATTENTION

The screen captures are provided for illustration purposes only. Based on the configuration of your server, the screens may not be identical.

Before you begin

Perform this procedure in response to the system message that a hard drive has failed. The message displays information about drive location. Perform this procedure while the system is powered on.

To rebuild a hard drive in a RAID system

1 Replace the failed hard drive, as follows:

a. Shut down and power off the CallPilot server.

b. Remove the failed hard drive.

c. Install the replacement hard drive.

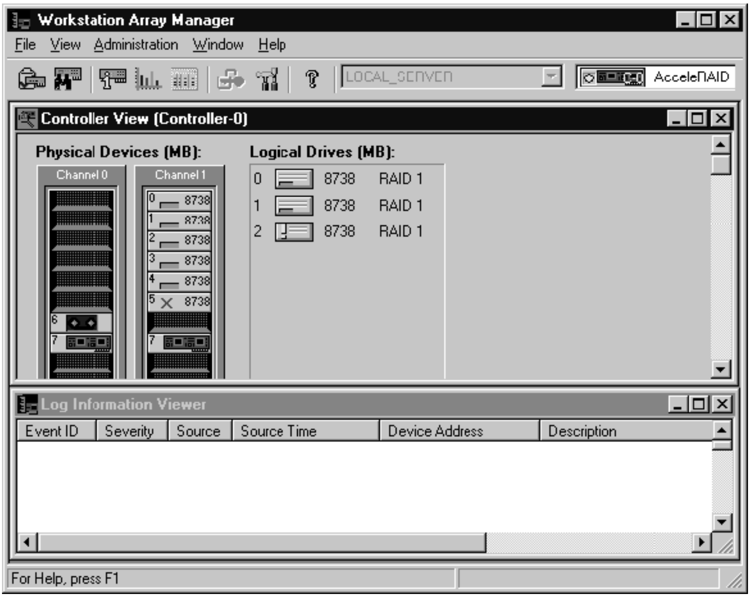
d. Power up the server.

Result: POST messages from the RAID controller warn you that the system is operating in critical mode (that is, with some drives offline).

2 Log on to the CallPilot server as **Administrator** (or any other user ID that has administrative privileges).

3 From the Windows desktop, select Start → Programs → Mylex Workstation Array Manager.

Result: The Workstation Array Manager window appears. In the example below, the secondary hard drive in logical drive 2 (channel 1, ID 5) was faulty and has been replaced. The new hard drive is offline, and logical drive 2 is still in critical state because the new hard drive has not yet been rebuilt.



4 In the Workstation Array Manager window, double-click the offline hard drive (in the example in this procedure, this is the device at channel 1 ID 5).

Result: The Disk Device Information window appears.

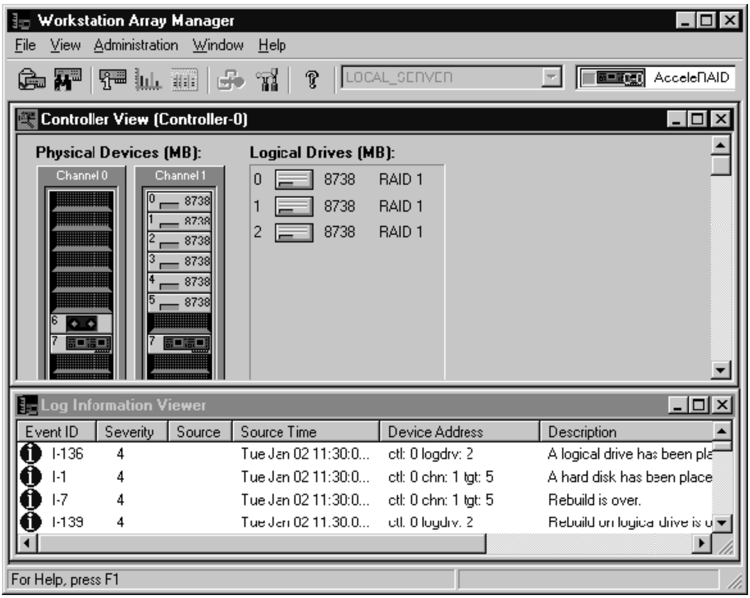
5 In the Disk Device Information window, click Rebuild to start the disk resynchronization process.

Result: The Rebuild Status window appears.

When the rebuild is complete (each drive takes up to 45 minutes), the following dialog box appears to inform you that the rebuild is complete:

6 Click OK in the Rebuild Message dialog box.

Result: The Workstation Array Manager window is updated. In the example in this procedure, the physical drive at Channel 1 ID 5 is now online, as is logical drive 2.



7 Close the Workstation Array Manager window.

Result: You have completed the rebuild procedure.

Configuring an AcceleRAID352 RAID system

Introduction

Before configuring the Mylex PCI RAID card, you must have access to the driver disk.

For firmware updates (see “To flash upgrades in the AcceleRAID352 controller” on page 193), you must also have firmware and utility versions.

The minimum version of the RAID controller BIOS/Firmware and utility is specified below:

AcceleRAID 352	Version
Firmware	6.00.00
EzAssist	2.01-06

Drive coercion

The RAID controller Mylex AcceleRAID352 includes a feature called Drive Coercion. This feature allows drive capacities from different vendors to appear to be the same size.

Drive coercion also allows you to replace a dead existing drive with a drive of the same capacity from a different manufacturer, even if it is slightly smaller physically. This feature rounds up the actual capacity to an integral number of chunks (the truncation factor). The truncation factor is in the range of five percent of the hard drive. System pack sizing is not required while creating system packs with this controller.

RAID EzAssist utility

To configure the AcceleRAID controller, regardless of whether an operating system is installed on your computer, the RAID EzAssist utility can be run from the Mylex controller's BIOS at any system boot time.

To enter the EzAssist utility and configure the RAID, follow the instructions in "To configure RAID using Mylex AcceleRAID 352" below.

To configure RAID using Mylex AcceleRAID 352

Newer Mylex RAID cards have an option that you must set before you configure them. Complete the following steps to properly configure your RAID card.

1 Power on the system.

Result: The AR352 messages appear.

2 When the message `Press Alt-M for BIOS options` appears, press Alt+M simultaneously.

Result: The AR352 BIOS options appear.

3 Use the arrow keys to move to the 2 GB Drive Geometry option, and then press Enter.

Result: The system prompts you to use 8 GB Drive Geometry and to confirm the change.

Note: Your controller may already be configured as 8 GB Drive Geometry. If it is already configured, press Esc to exit and restart.

4 Confirm the change, and then press Esc to escape this menu.

To configure the RAID system packs

1 Power up the system.

Note: If you have BIOS level 14 on the 702t server, press the space bar to skip the memory check and start faster.

Result: The system starts and messages such as the following appear:

```
Mylex AcceleRAID 352 BIOS version x.xx-xx (Month Day,
Year).
Mylex Corporation
```

After the messages appear, the system prompts you to press Alt+R to enter EzAssist.

2 Press Alt+R.

Result: The system restarts and enters EzAssist.

3 Allow EzAssist to scan the SCSI bus(es) and target drives.

Result: After scanning is complete, the following message appears:

```
No existing RAID configuration has been detected.
Would you like to configure a RAID drive now?
```

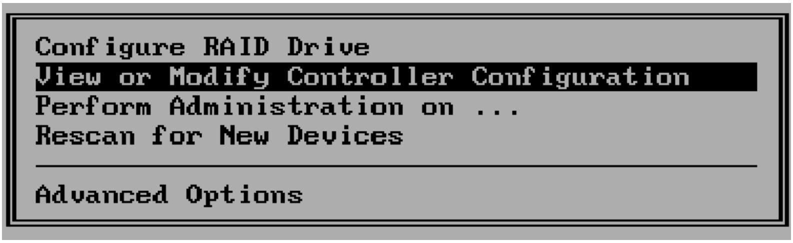
4 Use the arrow keys to select No.

Result: The system prompts you to select the unique controller in the system.

5 Press Enter to select the unique controller.

Result: The main menu appears.

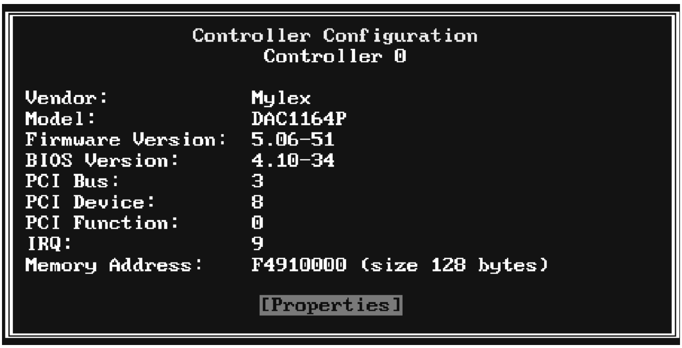
6 From the main menu, use the arrow keys to highlight the View or Modify Controller Configuration option, and then press Enter.



Result: The Controller Configuration window appears.

7 Press Enter to access the Properties.

Result: The Properties menu appears.



8 Press Enter to continue.

9 Use the arrow keys to highlight the menu item “Startup,” and then press Enter.

Result: Ensure the following settings appear (default):

Disk Spin Up: By Controller

Number of Disk Drives per spin: 2

Initial Delay: 0

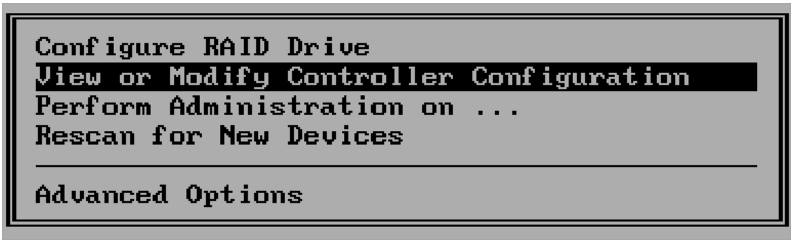
Delay between Spins: 6.

10 Select OK to accept the startup property changes, and then press Enter.

11 Use the arrow key to select Yes at the Save Changes window, and then press Enter.

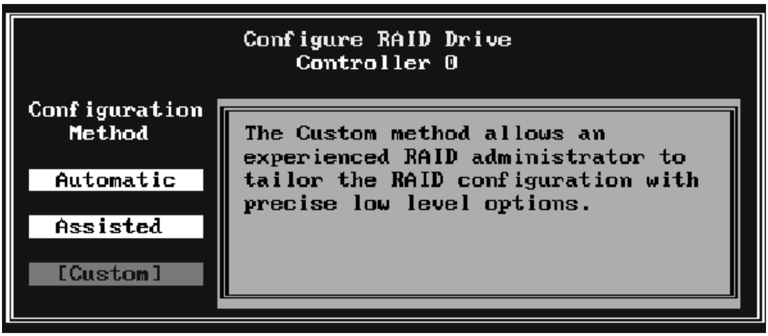
12 Press Esc twice to exit to the Main menu.

13 If no further changes are required, press Esc until the Main menu appears.



14 From the Main menu, choose Configure RAID Drive, and then press Enter.

Result: The Configure RAID Drive menu appears.



15 Select Custom, and then press Enter.

Result: A submenu appears.

16 Select Create a New Disk Array, and then press Enter.

Result: The Disk Array Configuration menu appears.

17 Use the arrow keys to perform the following substeps to set the RAID packs.

1001rp RAID system packs

Hard drive bay	SCSI channel	SCSI ID	System pack/Logical drive[a]
1 (far left)	1	0	0 (primary hard drive)
2	1	1	1 (primary hard drive)
3	1	2	2 (primary hard drive)
4	1	3	0 (secondary hard drive)
5	1	4	1 (secondary hard drive)
6 (far right)	1	5	2 (secondary hard drive)

a. RAID pairs (logical drives) consist of the following pairs: hard drives 1 and 4, 2 and 5, and 3 and 6.

18 Press Tab to select Save Array.

19 Press Enter to create the first logical drive.

Result: The system prompts you to define the logical drive.

20 Select No because you must define two more drives.

21 Define the second drive as shown above for the server.

22 Press Tab to select Save Array.

23 Press Enter to create the second logical drive.

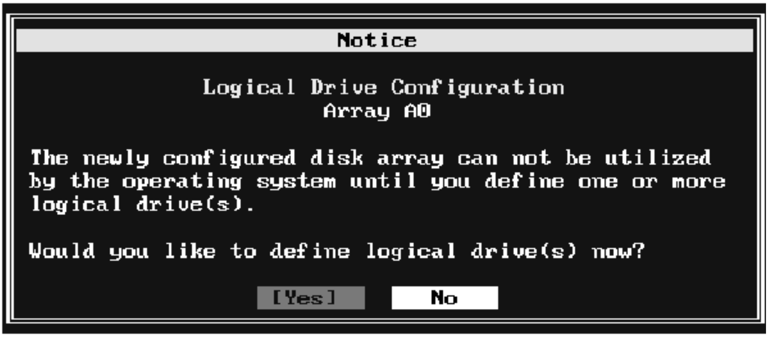
Result: The system prompts you to define the logical drive.

24 If additional drive packs are to be created, select No.

25 Repeat steps 21 to 23 until all packs are created.

26 When the last drive pack has been created, selectYes.

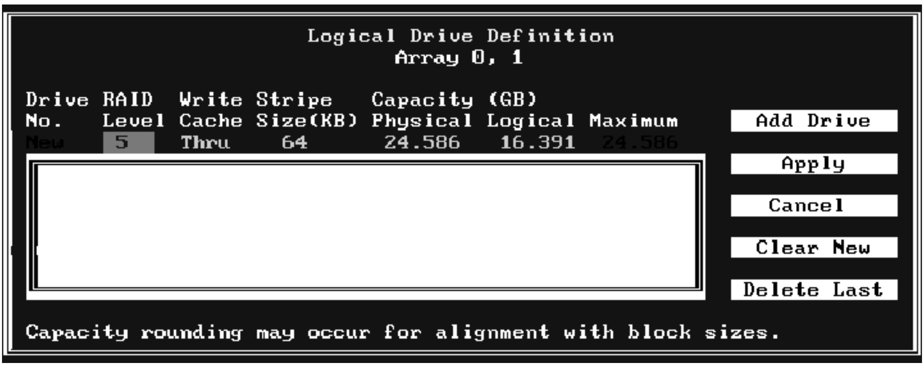
Result: The system prompts you to define the logical drive.



27 Select Yes.

Note: You may be warned that you are combining two drives of different sizes. If this happens, you must ensure that you are using hard drives that are qualified by Nortel Networks for CallPilot.

Result: The Logical Drive Definition window appears.



Note: The preceding window does not reflect a valid CallPilot configuration.

28 Ensure that the RAID Level is 1, and that the Write Cache option is set to Thru (the default).

Note: If these settings differ, you can change them using the +/- keys when the option is highlighted.

29 To add the logical drive, press Tab to switch the focus to the buttons, and then press Enter with Add Drive selected.

Repeat these steps until all logical drives are defined.

30 When all logical drives are defined, apply the configuration to the controller by selecting and pressing Apply.

Result: The System Packs are defined, and the configuration is written to the controller NVRAM.

Note: No drive initialization is necessary if the drives have not been used.

31 Allow the above process to complete, and then press Esc multiple times until the Exit confirmation window appears.

32 Select Yes to exit the EzAssist utility.

Result: The system restarts and is now ready for operating system installation.

To flash upgrades in the AcceleRAID352 controller

Introduction

The RAID card has the supported release of firmware when it is shipped to the CallPilot distributor, so a firmware update at a customer site is not usually required. However, this procedure is provided to support any future circumstances that may require you to upgrade the firmware.

To upgrade the firmware AcceleRAID352 controller

1. Restart the system, and then press Alt+R to enter the EzAssist utility when prompted.
2. On the Main menu, click Advanced Options.
3. Have the disk ready that contains the firmware, BIOS, boot block, or utility image file(s).
4. On the Advanced Options Menu, click Update Flash Code.
5. Insert the disk into the disk drive.
6. Type the path and the name of the file that needs to be flashed in the space provided, and then press Enter.

   Result: The image is read from the floppy disk, and the system prompts you to press Enter.
7. Press Enter to flash the image into the RAID controller.

Splitting AcceleRAID352 RAID drives and upgrading software

Introduction

Use this procedure on a CallPilot server that is configured with an AcceleRAID 352 controller. This procedure breaks the mirroring of the hard drives before an upgrade so that if the upgrade fails, you can quickly return the server to the state it was in before you started the upgrade.

There are three stages to this procedure:

1. Preparing the CallPilot server for the upgrade
2. Performing the CallPilot server software upgrade
3. Resynchronizing the CallPilot server hard drives

ATTENTION

The screen captures are provided for illustration purposes only. Based on the configuration of your server, the screens may not be identical.

Requirements

- As a precaution, ensure that you have a full system tape backup available.
- You need a blank 3.5 inch, 1.44 Mbytes formatted floppy disk to use to back up the RAID configuration.
- The server must have a standard hard drive configuration as documented in “RAID system pack locations and identifications” on page 196.

Tips

- Perform a RAID status check and consistency check (see “To check the status of the RAID system” on page 198, and “To check the consistency of the logical drives” on page 200) at least one day before the planned upgrade date. If you find errors, this early check gives you time to contact Nortel Networks technical support (if necessary), and resolve the errors before you begin the upgrade.

When you do proceed with the RAID splitting and upgrade procedure, ensure that you once again perform the RAID status check and consistency check to ensure that no new errors have been introduced.

- Ignore the “CallPilot is booting” dialog box that appears after you restart the server, and log on to Windows NT. You do not need to wait for CallPilot to boot while you are performing maintenance tasks. Also, disregard any dialog boxes that appear if CallPilot does not boot successfully while you are performing maintenance tasks.
- If you are not sure which RAID controller is installed, restart the server and observe which RAID controller is detected in the POST messages.

Timing and checklist

The following table provides general time estimates for completing the steps in this procedure:

Task	Approximate time to complete	Check
Check the status of the RAID system.	5 minutes	❒
Check the consistency of the logical drives.	30 minutes per drive pair **Note:** You can check only one drive pair at a time.	❒
Perform the pre-upgrade steps.	Varies depending on your system	❒
Back up the existing RAID configuration.	10 minutes	❒

Task	Approximate time to complete	Check
Disconnect the secondary hard drives.	10 minutes	❐
Perform the server software upgrade.	Varies depending on your system	❐
Reconnect the offline hard drives.	10 minutes	❐
Resynchronize (rebuild) the offline hard drives.	up to 45 minutes per drive pair **Note:** You can resynchronize only one drive pair at a time.	❐

RAID system pack locations and identifications

The following tables display information required to identify RAID system packs (logical drives).

1001rp RAID system

The table below indicates the proper hard drive bay, channel, and ID configurations. The SCSI backplane sets SCSI IDs:

Hard drive bay	SCSI channel	SCSI ID	System pack/Logical drive[a]
1 (far left)	1	0	0 (primary hard drive)
2	1	1	1 (primary hard drive)
3	1	2	2 (primary hard drive)
4	1	3	0 (secondary hard drive)
5	1	4	1 (secondary hard drive)

Hard drive bay	SCSI channel	SCSI ID	System pack/Logical drive[a]
6 (far right)	1	5	2 (secondary hard drive)

a. RAID pairs (logical drives) consist of the following pairs: hard drives 1 and 4, 2 and 5, and 3 and 6.

Preparing the CallPilot server for the upgrade

This stage includes the following steps:

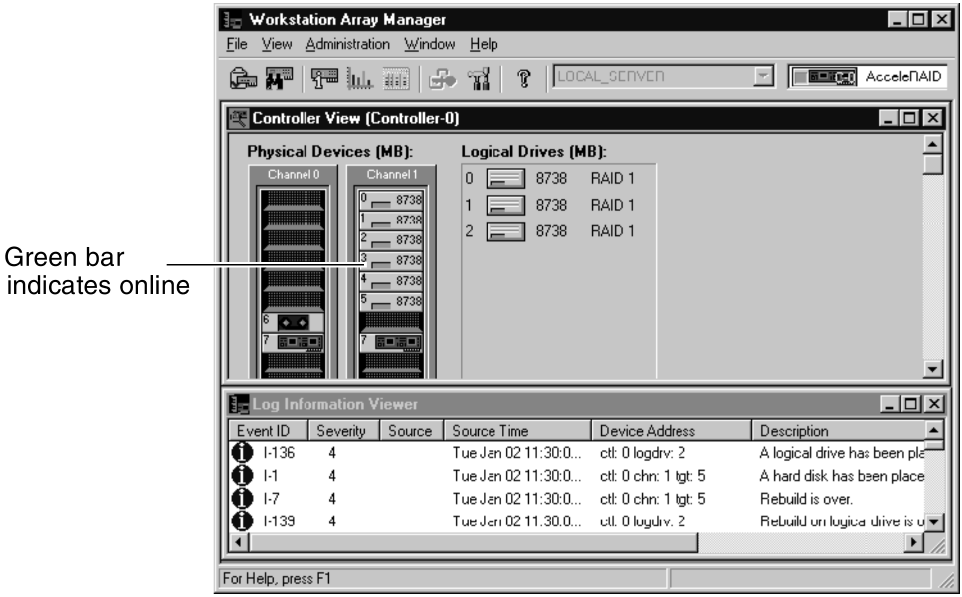
1. Check the status of the RAID system.
2. Check the consistency of the logical drives.
3. Perform the pre-upgrade steps.
4. Back up the existing RAID configuration.
5. Disconnect the secondary hard drives.

To check the status of the RAID system

All the drives configured in the RAID controller must be operating and online. If any of the logical drives are in the critical state, the RAID splitting procedure will not work and data loss can occur if it is used. To ensure that the RAID controller and all drives are fully operational, check their status using the Mylex Workstation Array Manager software, as follows:

1. Log on to the CallPilot server as **Administrator** (or any other user ID that has administrative privileges).
2. From the Windows desktop, select Start → Programs → Mylex Workstation Array Manager.

   Result: The Workstation Array Manager window appears.



3 Check that all hard drives are in the online state. A green bar indicates that a hard drive is online.

If any hard drives are not online, follow steps 3 to 9 in “Resynchronizing the CallPilot server hard drives” on page 207. Then return to this procedure.

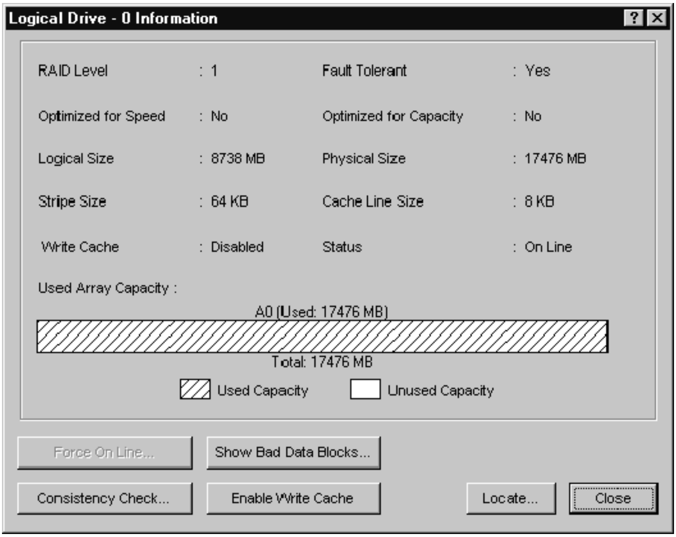
Note: If a hard drive does not successfully go to the online state, verify the hard drive jumper settings and cabling connections, and then try again to rebuild the hard drive. If you cannot make the hard drive go to the online state, replace the faulty hard drive (see “Replacing a hard drive” on page 152 for hard drive configuration instructions and, if necessary, instructions on how to replace the hard drive).

To check the consistency of the logical drives

You must verify that each pair of drives is correctly synchronized before continuing with the RAID splitting procedure. To verify that the drives are correctly synchronized, use the Mylex Workstation Array Manager software. Run a consistency check on each configured logical drive, as follows:

1 In the Workstation Array Manager window, double-click the icon for logical drive 0. Each logical drive represents a mirrored pair of hard drives.

Result: The Logical Drive-0 Information window appears.



2 Click Consistency Check to start a consistency check on the logical drive.

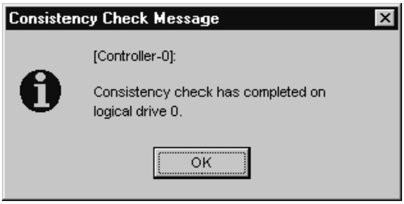
Result: The system prompts you to select what should be done if inconsistent data is found on the logical drive.

3 Click No.

Note: You must not restore the consistency at this time. By selecting No, you only receive a warning if inconsistent data is found on the logical drive.

Result: The consistency check starts and the progress bar starts to advance.

When the consistency check is completed, the following dialog box appears if the consistency check was OK:



Note: If the consistency check reports errors, stop this procedure and contact Nortel Networks technical support to correct the problem.

4 Click OK.

Result: You return to the Logical Drive Information window.

5 Click Close.

Result: You return to the Workstation Array Manager window.

6 Repeat steps 1 to 5 for the remaining logical drives on the server (in this example, drives 1 and 2).

7 After all drives have been checked, close the Workstation Array Manager window to exit the program.

To perform the pre-upgrade steps

Follow the instructions in Part 4 of the *CallPilot Installation and Configuration* binder.

Note: Do not upgrade the server software at this time.

To back up the existing RAID configuration

It is important to back up the current configuration to a floppy disk before you make any changes to the configuration of the RAID controller. This enables you to recover the configuration of the RAID controller if any mistakes are made while executing the procedure.

1 Shut down and restart the CallPilot server.

2 While the server is restarting, the RAID controller is detected, and a prompt appears to “Press Alt-R for RAID Configuration Options.” Press Alt-R to launch the RAID controller configuration program.

   Result: The Mylex Raid EzAssist program starts. A Notice message may appear before the RAID controller selection window appears.

   Note: If you miss the “Press Alt-R” prompt, you can press Reset to restart the server before the system finishes booting to Windows NT. If you reach the Windows NT Operating System selection screen, you have missed the “Press Alt-R” prompt.

3 From the RAID controller selection window, press Enter to select the AcceleRAID 352 controller.

   Result: A pop-up menu appears. The remainder of this document refers to this first menu as the main menu.

4 Insert a floppy disk that you want to use to back up the RAID configuration.

5 Select Advanced Options, and then press Enter.

   Result: The advanced options pop-up menu appears.

6 Select Backup Configuration, and then press Enter.

   Result: The system prompts you to enter a filename for the RAID controller configuration backup.

7 Enter a filename for the RAID controller configuration backup (for example, a:\original.cfg), and then press Enter.

   Result: The RAID configuration is backed up on the floppy disk.

8 Remove the floppy disk from the floppy drive.

9 Press Esc to return to the main menu.

10 Press Esc to return to the RAID controller selection window.

Result: You return to the RAID controller selection window.

11 Press Esc to exit the Mylex RAID EzAssist program.

Result: A message appears indicating that you are about to exit RAID EzAssist and asking for confirmation.

12 Select Yes, and then press Enter.

Result: A message appears indicating that you can either power off the system or select OK to reboot.

13 Select OK to reboot the server.

Result: The server restarts.

14 Disable the secondary drives (see the following procedure).

To disable the secondary hard drives

1 While the server is restarting, the RAID controller is detected and a prompt appears to “Press Alt-R for RAID Configuration Options.” When this prompt appears, press Alt-R.

Result: The Mylex Raid EzAssist program starts.

Note: If you miss the “Press Alt-R” prompt, you can press the Reset button to restart the server before the system finishes booting to Windows NT.

ATTENTION If you reach the Windows NT Operating System selection screen, you have missed the “Press Alt-R” prompt.

2 From the RAID controller selection window, press Enter to select the AcceleRAID 352 controller.

Result: The main menu appears.

3 Select “Perform Administration on”, and then press Enter.

Result: The administration pop-up menu appears.

4 Select Physical Device, and then press Enter.

Result: The Physical Drive Selection window appears. All hard drives are online.

CAUTION

Risk of lost or corrupted data

All hard drives must be online before you continue with the rest of this procedure.

5 In the Physical Drive Selection window, select the fourth hard drive, and then press Enter.

Result: The device pop-up menu appears.

CAUTION

Risk of data corruption

Ensure that you select a pre-upgrade drive for this step. If this is a standard configuration and you have followed the instructions in this procedure, the fourth, fifth, and sixth hard drives are the pre-upgrade drives. If this is not correct for your system, contact Nortel Networks technical support.

6 Select Advanced Options, and then press Enter.

Result: The advanced options pop-up menu appears.

7 Select Make Drive Offline, and then press Enter.

Result: A message appears warning that making a drive offline may cause data corruption. For this procedure, disregard this message.

8 Select Yes, and then press Enter.

Result: The system prompts you to confirm.

9 Select Yes, and then press Enter.

Result: You return to the Physical Drive Selection window. The hard drive that was selected is now set to Offline.

10 Repeat steps 6 to 10 for the fifth and sixth hard drives.

Result: The pre-upgrade hard drives (fourth, fifth, and sixth) are offline.

11 Press Esc to return to the administration pop-up menu.

Result: You return to the administration pop-up menu.

12 Press Esc to return to the main menu.

Result: You return to the main menu.

13 Press Esc to return to the RAID controller selection window.

Result: You return to the RAID controller selection window.

14 Press Esc to exit the Mylex RAID EzAssist program.

Result: A message appears indicating that you are about to exit RAID EzAssist and asking for confirmation.

15 Select Yes, and then press Enter.

Result: A message appears indicating that you can either power off the system or select OK to reboot.

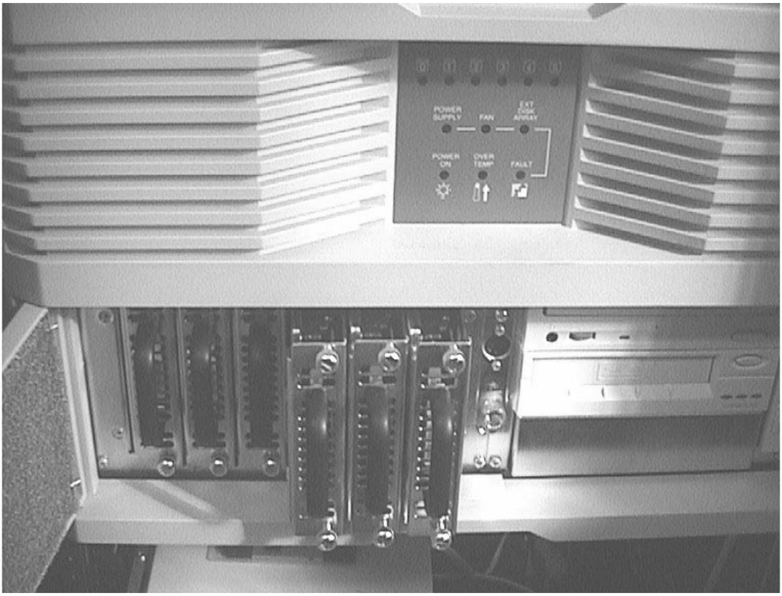
16 Power off the server.

To disconnect the secondary hard drives

Physically disconnect the secondary hard drives to ensure that these hard drives are not updated during the upgrade and are preserved as a backup. The disconnected hard drives are automatically marked as offline when you restart the server.

1 Ensure that you have shut down and powered off the CallPilot server.

2 Disconnect the secondary hard drives, by unseating them from hard drive bays 4, 5, and 6 (counting bays from left to right), but do not remove them. See the following example:



3 Power up the server.

Note: During the bootup, the system reports that three hard drives are offline, and, as a result, three logical drives are running in critical state. This is normal. It indicates that the hard drives are no longer being mirrored.

Performing the CallPilot server software upgrade

You can now perform the upgrade operation. Only one hard drive of each pair is updated. This allows you to maintain a copy of the system in its previous state in case there are problems during the upgrade process.

To perform the CallPilot server software upgrade

1 Upgrade the CallPilot server software. Follow the instructions in Part 4 of the *CallPilot Installation and Configuration* binder.

2 After the upgrade is completed, ensure that you test the upgrade before you resynchronize the hard drives. See "Testing the CallPilot installation" in Part 3 of the *CallPilot Installation and Configuration* binder.

3 Once the upgrade is completed and tested, there are two options available:

- If the upgrade is successful, continue with "Resynchronizing the CallPilot server hard drives" on page 207 to keep the upgraded software.
- If the upgrade fails, follow the steps in "Reverting to the pre-upgrade system (if the upgrade fails)" on page 211.

CAUTION

Risk of data loss

You can run CallPilot for any period of time before making this decision. However, during this time, there is no disk redundancy. Therefore, if a hard drive fails during this time, any new data is lost.

Resynchronizing the CallPilot server hard drives

After you upgrade the server software and test the upgrade, follow the steps below to resynchronize the hard drives.

To resynchronize the CallPilot server hard drives

1 Shut down and power off the CallPilot server.

2 Reconnect the hard drives by reseating them into their drive bays.

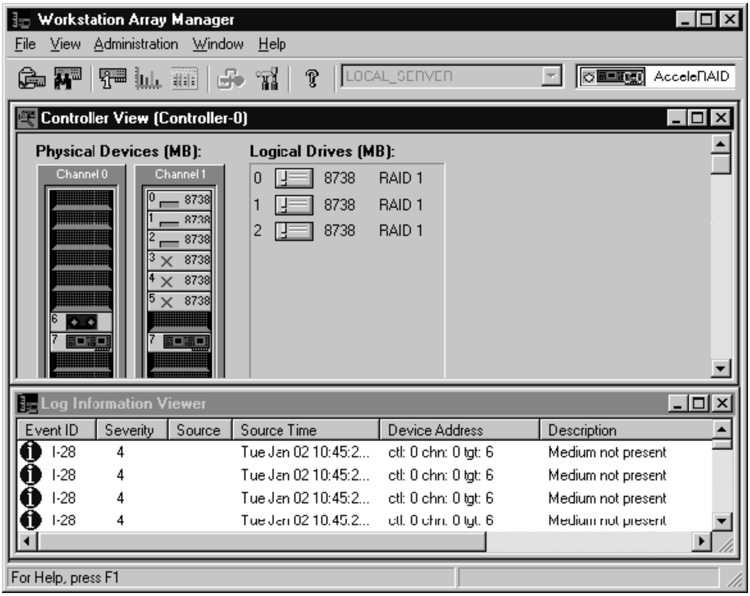
3 Power up the server.

Result: POST messages from the RAID controller warn you that the system is operating in critical mode (that is, with some drives offline).

4 Log on to the CallPilot server as **Administrator** (or any other user ID that has administrative privileges).

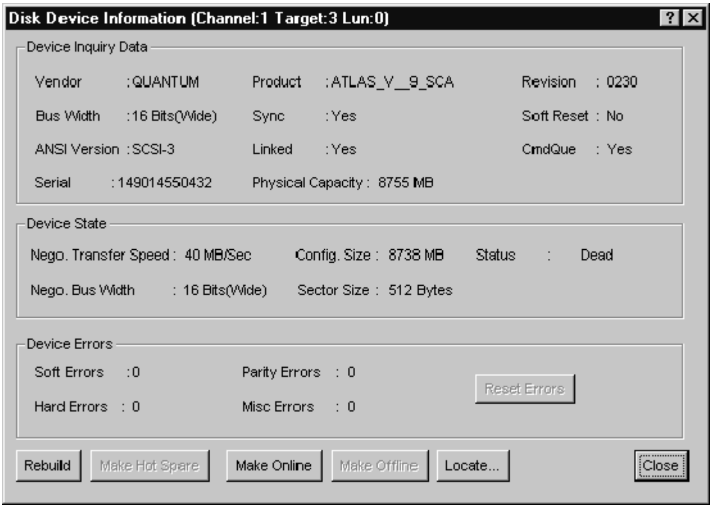
5 From the Windows desktop, select Start → Programs → Mylex Workstation Array Manager.

Result: The Workstation Array Manager window appears. Logical drives 0, 1, and 2 are in critical state because the physical drives are not mirrored. The fourth, fifth, and sixth hard drives are offline.



6 In the Workstation Array Manager window, double-click the first offline hard drive (in the example in this procedure, this is the device at channel 1 ID 3).

Result: The Disk Device Information window appears.



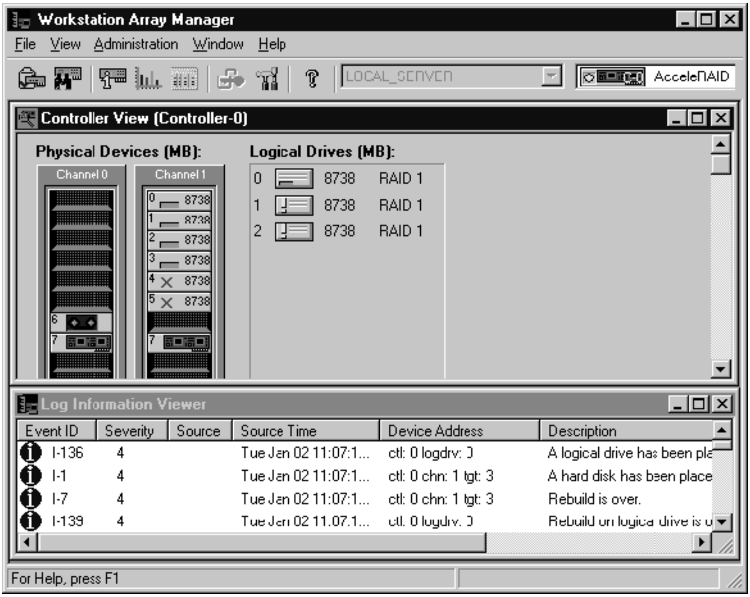
7 In the Disk Device Information window, click Rebuild to start the disk resynchronization process.

Result: The Rebuild Status window appears.

When the rebuild is complete (each drive takes up to 45 minutes), the following dialog box appears to inform you that the rebuild is complete:

8 Click OK in the Rebuild Message dialog box.

Result: The Workstation Array Manager window is updated. In the example in this procedure, the physical drive at Channel 1 ID 3 is now online, as is logical drive 0.



9 Repeat steps 6 to 8 for the remaining two offline drives.

Result: All the physical drives and logical drives are online.

10 Once all drives have been rebuilt, close the Workstation Array Manager window.

Result: You have completed the upgrade procedure.

Reverting to the pre-upgrade system (if the upgrade fails)

This section describes how to restore the CallPilot server to the state it was in before you began the upgrade. This procedure includes the following steps:

1. Disconnect the failed upgrade hard drives.
2. Clear the current RAID configuration.
3. Reconnect the pre-upgrade hard drives.
4. Enable the pre-upgrade hard drives.
5. Verify that the pre-upgrade hard drives are functioning properly.
6. Reconnect the failed upgrade hard drives.
7. Resynchronize the hard drives to finish restoring the pre-upgrade system.

To disconnect the failed upgrade hard drives

1 Ensure that you have powered off the CallPilot server.

2 Disconnect the failed upgrade hard drives by unseating the first, second, and third hard drives.

CAUTION

Risk of lost or corrupted data

Ensure that all hard drives are disconnected before you continue with the rest of this procedure.

To clear the current RAID configuration

1 Power up the CallPilot server.

2 While the server is restarting, the RAID controller is detected and a prompt appears to “Press Alt-R for RAID Configuration Options.” When this prompt appears, press Alt-R.

Result: The Mylex Raid EzAssist program starts.

Note: If you miss the “Press Alt-R” prompt, you can press Reset to restart the server before the system finishes booting to Windows NT. If you reach the Windows NT Operating System selection screen, you have missed the “Press Alt-R” prompt.

3 From the RAID controller selection window, press Enter to select the AcceleRAID 352 controller.

Result: The main menu appears.

4 Select Advanced Options, and then press Enter.

Result: The advanced options pop-up menu appears.

5 Select Clear Configuration, and then press Enter.

Result: A warning message appears stating that this will erase all RAID configuration information. Ignore this message for this procedure.

6 Select YES to continue.

Result: The system erases the RAID configuration.

7 Press Esc to return to the main menu.

Result: You return to the main menu.

8 Press Esc to return to the RAID controller selection window.

Result: You return to the RAID controller selection window.

9 Press Esc to exit the Mylex RAID EzAssist program.

Result: A message appears indicating that you are about to exit RAID EzAssist and asking for confirmation.

10 Select Yes, and then press Enter.

Result: A message appears indicating that you can either power off the system or select OK to reboot.

11 Power off the server.

To reconnect the pre-upgrade hard drives

1 Ensure that you have powered off the CallPilot server.

2 Reconnect the pre-upgrade hard drives for the 1001rp server by reseating the hard drives into their drive bays.

Note: For cabling details, see the diagram in “To disconnect the secondary hard drives” on page 205.

To enable the pre-upgrade hard drives

1 Power up the CallPilot server.

2 While the server is restarting, the RAID controller is detected and a prompt appears to “Press Alt-R for RAID Configuration Options.” When this prompt appears, press Alt-R.

Result: The Mylex Raid EzAssist program starts.

Note: If you miss the “Press Alt-R” prompt, you can press Reset to restart the server before the system finishes booting to Windows NT. If you reach the Windows NT Operating System selection screen, you have missed the “Press Alt-R” prompt.

3 From the RAID controller selection window, press Enter to select the AcceleRAID 352 controller.

Result: The main menu appears.

4 Select “Perform Administration on,” and then press Enter.

Result: The administration pop-up menu appears.

5 Select Physical Device, and then press Enter.

Result: The Physical Drive Selection window appears. All hard drives are offline.

CAUTION

Risk of lost or corrupted data

All hard drives must be offline before you continue with the rest of this procedure.

6 In the Physical Drive Selection window, select the fourth hard drive, and then press Enter.

Result: The device pop-up menu appears.

CAUTION

Risk of data corruption

Ensure that you select a pre-upgrade drive for this step. If this is a standard configuration and you have followed the instructions in this procedure, the fourth, fifth, and sixth hard drives are the pre-upgrade drives. If this is not correct for your system, contact Nortel Networks technical support.

7 Select Advanced Options, and then press Enter.

Result: The advanced options pop-up menu appears.

8 Select Make Drive Online, and then press Enter.

Result: A message appears warning that making a drive online may cause data corruption. For this procedure, disregard this message.

9 Select Yes, and then press Enter.

Result: The system prompts you to confirm.

10 Select Yes, and then press Enter.

Result: You return to the Physical Drive Selection window. The hard drive that was selected is now set to Online.

11 Repeat steps 6 to 10 for the fifth and sixth hard drives.

Result: The pre-upgrade hard drives (fourth, fifth, and sixth) are online, and the first three hard drives are disconnected and offline.

12 Press Esc to return to the administration pop-up menu.

Result: You return to the administration pop-up menu.

13 Press Esc to return to the main menu.

Result: You return to the main menu.

14 Press Esc to return to the RAID controller selection window.

Result: You return to the RAID controller selection window.

15 Press Esc to exit the Mylex RAID EzAssist program.

Result: A message appears indicating that you are about to exit RAID EzAssist and asking for confirmation.

16 Select Yes, and then press Enter.

Result: A message appears indicating that you can either power off the system or select OK to reboot.

17 Power off the server.

To verify that the pre-upgrade hard drives are functioning properly

1 Power up the CallPilot server, and then log on to Windows NT.

2 Wait for the System Ready Indicator dialog boxes to indicate that CallPilot is ready to accept calls. This can take up to 15 minutes.

3 Test the CallPilot system. See Chapter 5, “Testing the CallPilot installation,” in Part 3 of the *CallPilot Installation and Configuration* binder.

4 Do one of the following:

- If the system is still not working properly, then there may be a RAID, hard drive, or software problem with the old data. Contact Nortel Networks technical support.

- If the system is working properly, then continue with "To reconnect the failed upgrade hard drives" below.

To reconnect the failed upgrade hard drives

1 Shut down and power off the CallPilot server.

2 Reconnect the failed upgrade hard drives by reseating the hard drives into their drive bays.

To resynchronize the hard drives to finish restoring the pre-upgrade system

1 Rebuild the offline hard drives by following steps 2 to 10 in "Resynchronizing the CallPilot server hard drives" on page 207.

Result: The CallPilot server is restored to its pre-upgrade state.

2 Test the CallPilot system. See Chapter 5, "Testing the CallPilot installation," in Part 3 of the *CallPilot Installation and Configuration* binder.

Section C: Maintaining a DAC960 RAID system

In this section

Maintaining DAC960 RAID hard drives

Introduction

RAID hard drives must be checked for errors on a weekly basis. Errors can be reviewed with the help of the DAC Admin Windows NT software utility that is installed on the server.

To review errors detected on a RAID hard drive

1 Click the Start Menu.

2 Click Run.

3 Type **dacadm.exe**.

4 Click OK.

Result: This starts the DACAdmin software utility.

5 Click the Configuration menu.

6 Choose Drive Information on the Configuration menu.

Result: A list of all hard drives connected to the RAID controller appears.

Note: Hard drives marked ONL are online and part of a RAID System pack.

7 Click on a drive to see a summary of errors.

a. If there are ten or more soft errors per day, replace the drive.

b. Hard errors should not occur during normal operation. Contact your Nortel Networks customer support representative if errors are accumulating.

c. Miscellaneous Errors are typically due to cabling or termination problems on the SCSI bus. Verify jumper settings on all SCSI devices and ensure that cabling is secure.

d. When the total number of errors reaches 127, the controller marks the drive DED. DED means offline. The drive must be replaced.

8 Repeat step 7 on all hard disk drives listed.

9 Close the configuration menu.

10 Exit from the DAC Admin software utility.

Rebuilding a DAC960 RAID hard drive

Introduction

In RAID level 1, two equal-capacity disks mirror one another. Both drives run simultaneously with one disk serving as the backup copy of the other disk. If one drive fails, the other continues to run. When the failed drive is physically replaced with a new one, the data on the operating drive of the system pack must be copied onto the new drive to rebuild it. RAID automatically performs this rebuild process when the replacement drive is accessed.

If you want to start the initiation process sooner, or monitor the rebuilding process, follow the steps in the procedure below.

ATTENTION

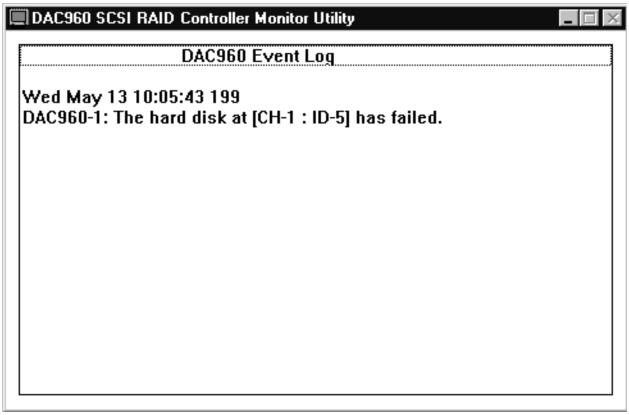
The screen captures are provided for illustration purposes only. Based on the configuration of your server, the screens may not be identical.

Before you begin

Perform this procedure in response to the system message that a hard drive has failed. The message displays information about drive location. Perform this procedure while the system is powered on.

To rebuild a hard drive in a RAID system

1 Observe the warning message given by the DAC Monitor software that indicates a hard drive failure.



2 Record the SCSI channel SCSI ID of the drive that failed from the information in the DAC Monitor window.

3 Identify which drive failed using this information and referring to “RAID system pack locations and identifications” on page 226.

4 Shut down the server, and then power down the server.

5 Remove the failed hard drive.

6 Replace with a new hard drive.

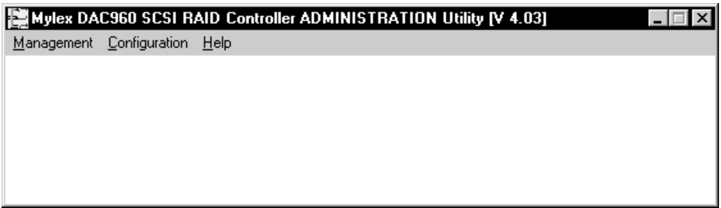
7 Power up the server.

Result: POST messages from the RAID controller warn you that the system is operating in critical mode (that is, with some drives offline).

8 Log on to the CallPilot server as **Administrator** (or any other user ID that has administrative privileges).

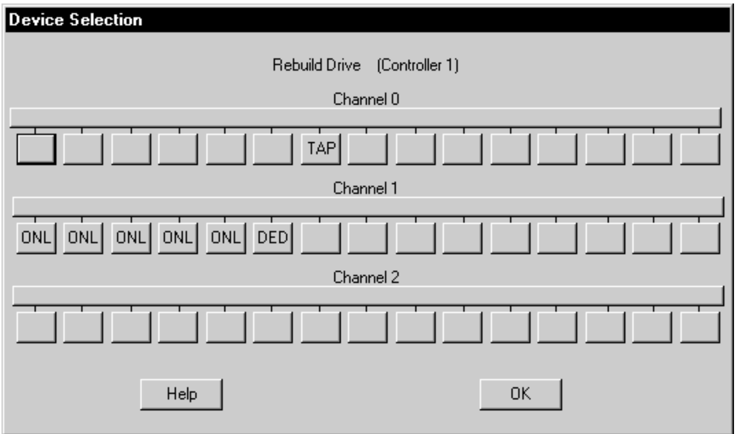
9 Run the DAC Administration utility. If there is no desktop shortcut, run the dacadm.exe program that is located in the directory C:\Winnt\System32 or D:\Winnt\System32 (the program location depends on the location of the Windows NT operating system).

Result: The DAC Administration utility window appears.



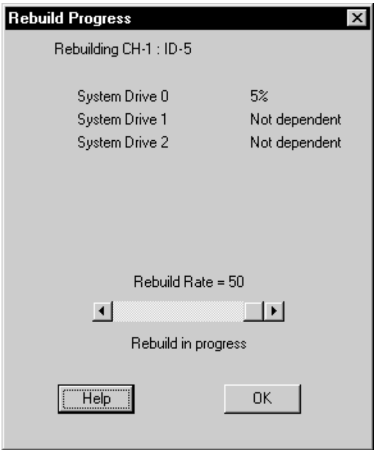
10 From the Management menu, select Rebuild Drive.

Result: The Device Selection dialog box appears.

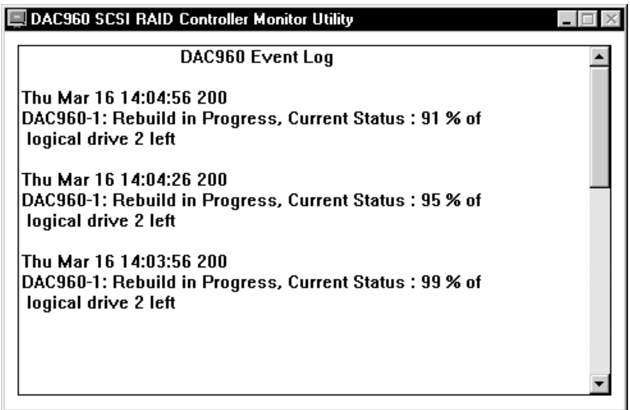


11 Start from the left side of the dialog box and click on the first dead drive (marked DED) to start rebuilding that drive.

Result: The Rebuild Progress dialog box appears.



If you are running the DAC Monitor program, the monitor window pops up and informs you of the progress of the rebuild.



When the rebuild finishes (each drive takes approximately 45 minutes), a dialog box appears to inform you that the rebuild is complete.

12 Click OK in the Rebuild Drive dialog box, and then click OK in the Rebuild Progress dialog box to return to the Device Selection dialog box.

Result: The rebuilt drive is shown as being online (ONL).

13 In the Device Selection dialog box, click OK to return to the DAC Administration utility window.

14 Close the DAC Administration utility window to exit the utility.

Configuring a DAC960 RAID system

Introduction

This section provides instructions for configuring a RAID system. This involves the following main procedures, which are provided in this section:

1. Configure the RAID system packs (create and arrange system packs, and specify system drive sizes).
2. Initialize the RAID system packs.
3. Back up the RAID configuration.

Before you begin

Ensure you review the following sections before you begin:

- “Requirements” on page 225
- “RAID system pack locations and identifications” on page 226
- “RAID system pack sizing” on page 227

Requirements

Before you configure the RAID system, ensure that the file \daccf.exe is on the CallPilot 2.0 OS Recovery or the OS Upgrade CD-ROMs in the \Drivers\Misc\RAID\DAC960\DOSCFG\DACCFG directory, and is version 4.78 or better. You will have the OS Recovery CD if you purchased a new CallPilot 2.0 system. You will have the OS Upgrade CD if you upgraded from CallPilot 1.07 to 2.0.

Note: If your disk is outdated, you must obtain the latest version from your Nortel Networks customer support representative.

CAUTION

Risk of loss of system functionality

You must use the DAC960 Utility provided by Nortel Networks. Other software can cause a loss of system functionality.

RAID system pack locations and identifications

The following tables display information required to identify RAID system packs in the RAID configuration procedure.

1001rp RAID system

The table below indicates proper SCSI drive bay, channel, and ID configurations in the hot-swappable drive bay. The SCSI backplane sets SCSI IDs:

Hard drive bay	SCSI channel	SCSI ID	System pack	System pack label
1 (far left)	1	0	A	A-0
2	1	1	B	B-0
3	1	2	C	C-0
4	1	3	A	A-1
5	1	4	B	B-1
6 (far right)	1	5	C	C-1

RAID system pack sizing

The RAID system limits the actual capacity of any system pack to the size of the smallest drive in its pack. As drives are replaced, a mirrored set may consist of two drives of different sizes, possibly from different manufacturers. To support the replacement of a failed disk drive with that of another manufacturer, an engineering restriction specifies the size of the system pack.

To continue configuring the RAID system, calculate the drive size as follows:

2 x smallest drive in the pack

For example, if System Pack A has a nominal capacity of 4 Gbytes (2 x 2 Gbytes), enter a system drive size of 4096. Since RAID Level 1 (mirroring) is used, the resulting capacity is half of what you calculated.

The following tables specify the system pack sizes to enter when you configure RAID systems. These sizes apply for currently qualified disk drives and may change in the future.

1001rp RAID system

Qualified disk drive make/ model	Physical drive capacity	Size of RAID system pack to specify	Resulting RAID level 1 capacity
Seagate ST34371	4096 Mbytes	8192 Mbytes	4096 Mbytes
Seagate ST34573	4096 Mbytes	8192 Mbytes	4096 Mbytes
Seagate ST39173	8192 Mbytes	16 384 Mbytes	8192 Mbytes
Seagate ST39175	8192 Mbytes	16 384 Mbytes	8192 Mbytes
Quantum XC09J011	8192 Mbytes	16 384 Mbytes	8192 Mbytes

Setting the RAID controller card BIOS options

Newer Mylex RAID cards (with version 3.5x firmware or better) have an option that must be set before configuring them. Complete the following steps to properly configure your RAID card.

1 Start up the server.

Result: When you power on the system, you see the DAC960 messages being output to the display.

2 When you see the message `Press Alt-M for BIOS options`, press the Alt and M keys simultaneously.

Result: You are presented with a DAC960 BIOS options menu.

3 Use the arrow keys to move to the option titled “2 GB Drive Geometry,” and then press Enter.

Result: The system prompts you to use 8 Gbyte drive geometry.

4 You are asked to confirm the change. Confirm, and then press Esc to escape this menu.

Result: Your system can now fully utilize hard drives up to 8 Gbytes in size.

Note: With earlier revisions of the RAID card (v2.6x and lower) , this drive geometry option is not available, and as such, free disk space may show up at the end of the first (primary) disk in the Windows NT Disk **Administrator**. This is normal and can be ignored.

To configure RAID system packs

1 Insert the CallPilot 2.0 OS Recovery or OS Upgrade CD into the CD-ROM drive and then power up the computer.

Note: In order for this procedure to work the computer BIOS must have booting from CD-ROM enabled. You may need to enter the BIOS setup to enable booting from CD-ROM.

Result: The system boots and the "MS-DOS 6.2 Start Menu" is displayed.

2 Use the up and down arrow keys to select "8. Other Utilities (BIOS, firmware, Etc.)..." and press Enter.

Result: The "*** Other Utilities ***" menu is displayed.

3 Press 3 to select "3. Mylex DAC960 RAID Card Configuration Utility".

Result: The DAC960 Configuration Utility main menu appears.

4 Select New Configuration, and then press Enter.

Result: The New Configuration menu appears.

5 Select Define Pack, and then press Enter.

Result: The Pack Definition menu appears.

6 Select Create Pack, and then press Enter.

Result: The cursor control moves to the disk configuration layout so you can select which drives constitute the first system pack.

7 Use the tables in "RAID system pack locations and identifications" on page 226 to identify the SCSI ID and Channel Number for hard drive A-0. Use this information to select the drive that will be A-0, and then press Enter.

Result: The device is labeled A-0 and is the first drive for System Pack A. The drive's state is changed from RDY to ONL.

8 Use the tables in "RAID system pack locations and identifications" on page 226 to identify the SCSI ID and Channel Number for hard drive A-1. Use this information to select the drive that will be A-1, and then press Enter.

Note: You may be warned that you are combining two drives of different sizes. If this happens, you must ensure that you are using CallPilot qualified hard drives, as well as the approved version of the DAC960 Configuration & Utilities disk (see "Requirements" on page 225).

Result: The device is labeled A-1 and is the second drive for System Pack A. The drive's state is changed from RDY to ONL.

9 Press Esc to close this pack.

Result: The cursor control moves to the Pack Definition menu.

10 Repeat steps 6 to 9 for System Pack B (if applicable), and then for System Pack C (if applicable).

Note: There is no need to press Esc after you finish creating the last System Pack. The last System Pack is automatically closed, and the cursor control moves to the Pack Definition menu.

11 Select Arrange Pack, and then press Enter.

12 Select a drive from System Pack A (for example, A-0), and then press Enter.

Result: The System Pack is arranged.

13 Repeat step 12 for a drive in System Packs B and C (if applicable).

Result: When all System Packs are arranged, the system returns you to the New Configuration menu.

14 Select Define System Drive, and then press Enter.

Result: The System Drive Definition menu appears.

15 Select Create System Drive, and then press Enter.

Result: The system prompts you to choose which RAID Level to use.

16 Select RAID 1, and then press Enter.

Result: The system prompts you to enter the size of the first system pack.

17 Enter the size of the system pack as specified in “RAID system pack sizing” on page 227, and then press Enter.

Result: The system prompts you to confirm that you want to create this system drive.

18 Select Yes.

Result: The system pack is created and listed with its settings.

19 Repeat steps 16 to 18 for the remaining system packs. When you finish, press Esc to exit to the Create System Drive window.

Result: The system packs are defined.

20 Press Esc until you return to the DAC960 Configuration Utility main menu.

Result: The system prompts you to save this new configuration.

21 Select Yes, and then press Enter.

Result: The configuration is saved.

To initialize the RAID system packs

The initialization of the system packs (system drives) completes the configuration of the RAID system. This takes from 1 to 5 hours, depending on the size of the hard drives.

1 From the DAC960 Configuration Utility main menu, select Initialize System Drive, and then press Enter.

Result: The Initialize System Drive menu appears.

2 Select “Select System Drive,” and then press Enter.

Result: The configured system packs appear.

3 Use the arrow keys to navigate to a system drive. Press Enter to select the drive. Repeat this step for each system drive.

Result: A check mark indicates a selected drive.

4 Press Esc.

Result: The Initialize System Drive menu appears.

5 Select Start Initialize, and then press Enter.

Result: The system prompts you to confirm that you want to initialize this system drive.

6 Select Yes, and then press Enter.

Result: The system drives are initialized. This takes from 1 to 5 hours, depending on the size of the hard drives and the number of hard drives. All system drives are initialized simultaneously.

When the initialization is complete, the system prompts you to press any key to continue.

7 Press any key to continue.

Result: The configuration is saved.

8 Continue with “To back up the RAID configuration” below.

To back up the RAID configuration

1 Select Tools from the DAC960 Configuration Utility main menu, and then press Enter to display the Tools menu.

2 Select Backup/Restore conf, and then press Enter.

Result: A cautionary message appears.

3 Press any key to acknowledge the cautionary message.

Result: The system displays the Backup and Restore Configuration submenu.

4 Select Backup Configuration, and then press Enter.

Result: The system displays the Enter File Name pop-up window.

5 Type **a:** and the name of the backup file (for example, a:\raidback), and then press Enter.

CAUTION

Risk of data loss

You must save this file to drive A on a floppy disk; otherwise, you may not be able to restore the RAID configuration if the RAID card fails.

Ensure the floppy disk is stored in a safe and accessible location.

Result: The system displays a warning, `Existing file, if any will be overwritten`.

6 Select Yes.

Result: The RAID configuration is backed up on the floppy disk. A message appears when the backup has been successfully completed.

7 Press Esc to return to the Main Menu.

8 Press Esc to exit the DAC960 Configuration Utility.

Result: The system prompts you to confirm that you want to exit.

9 Select Yes, and then press Enter.

Splitting DAC960 RAID drives and upgrading software

Introduction

Use this procedure on a CallPilot server that is configured with a DAC960 RAID controller. This procedure breaks the mirroring of the hard drives before an upgrade so that if the upgrade fails, you can quickly return the server to the state it was in before you started the upgrade.

There are three stages to this procedure:

1. Preparing the CallPilot server for the upgrade
2. Performing the CallPilot server software upgrade
3. Resynchronizing the CallPilot server hard drives

ATTENTION

The screen captures are provided for illustration purposes only. Based on the configuration of your server, the screens may not be identical.

Requirements

- As a precaution, ensure that you have a full system tape backup available.
- You need to have either the CallPilot 2.0 OS Recovery CD or the CallPilot 2.0 OS Upgrade CD
- You need a blank 3.5 inch, 1.44 Mbytes formatted floppy disk to use to back up the RAID configuration.
- The server must have a standard hard drive configuration as documented in “RAID system pack locations and identifications” on page 237.

Tips

- Perform a RAID status check and consistency check (see "To check the status of the RAID system" on page 238, and "To check the consistency of the system drives" on page 241) at least one day before the planned upgrade date. If you find errors, this early check gives you time to contact Nortel Networks technical support (if necessary), and resolve the errors before you begin the upgrade.

  When you do proceed with the RAID splitting and upgrade procedure, ensure that you once again perform the RAID status check and consistency check to ensure that no new errors have been introduced.
- Ignore the "CallPilot is booting" dialog box that appears after you restart the server, and log on to Windows NT. You do not need to wait for CallPilot to boot while you are performing maintenance tasks. Also, disregard any dialog boxes that appear if CallPilot does not boot successfully while you are performing maintenance tasks.
- Use the arrow keys to navigate in the DAC960 Configuration Utility window. You can use the mouse to select items in the DAC Administration Utility window.
- If you are not sure which RAID controller is installed, restart the server and observe which RAID controller is detected in the POST messages.

Timing and checklist

The following table provides general time estimates for completing the steps in this procedure:

Task	Approximate time to complete	Check
Check the status of the RAID system.	5 minutes	❒
Check the consistency of the system drives.	30 minutes per drive pair **Note:** You can check only one drive pair at a time.	❒
Perform the pre-upgrade steps.	Varies depending on your system	❒
Back up the existing RAID configuration.	10 minutes	❒
Mark the hard drives dead.	10 minutes	❒
Disconnect the dead hard drives.	10 minutes	❒
Perform the server software upgrade.	Varies depending on your system	❒
Reconnect the dead hard drives.	10 minutes	❒
Resynchronize (rebuild) the dead hard drives.	up to 45 minutes per drive pair **Note:** You can resynchronize only one drive pair at a time.	❒

RAID system pack locations and identifications

The following tables display information required to identify RAID system packs.

1001rp RAID system

The table below indicates the proper hard drive bay, channel, and ID configurations. The SCSI backplane sets SCSI IDs.

Hard drive bay	SCSI channel	SCSI ID	System pack label
1 (far left)	1	0	A-0
2	1	1	B-0
3	1	2	C-0
4	1	3	A-1
5	1	4	B-1
6 (far right)	1	5	C-1

Preparing the CallPilot server for the upgrade

This stage includes the following steps:

1. Check the status of the RAID system.
2. Check the consistency of the system drives.
3. Perform the pre-upgrade steps.
4. Back up the existing RAID configuration.
5. Mark the hard drives dead.
6. Disconnect the dead hard drives.

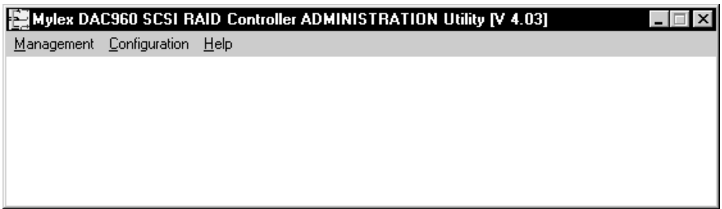
To check the status of the RAID system

All the drives configured in the RAID controller must be operating and online. If any of the system drives are in the critical state, the RAID splitting procedure will not work and data loss can occur if it is used. To ensure that the RAID controller and all hard drives are fully operational, check their status using the DAC Administration Utility, as follows:

1 Log on to the CallPilot server as **Administrator** (or any other user ID that has administrative privileges).

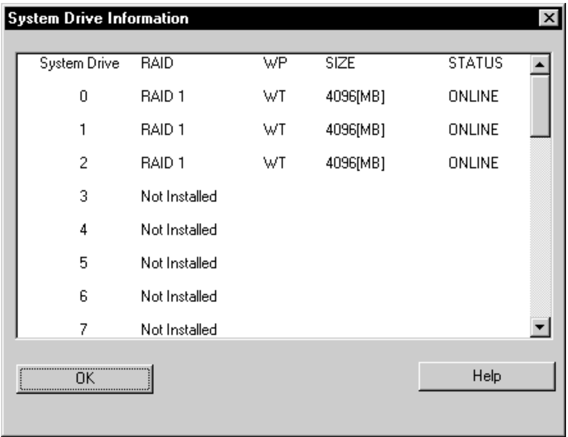
2 Run the DAC Administration Utility. If there is no desktop shortcut, run the dacadm.exe program that is located in the directory C:\Winnt\System32 or D:\Winnt\System32 (the program location depends on the location of the Windows NT operating system).

   Result: The DAC Administration Utility window appears.



3 From the DAC Administration Utility window, select Configuration → System Drive Information.

Result: The System Drive Information dialog box appears.



4 Check that all system drives are in the online state.

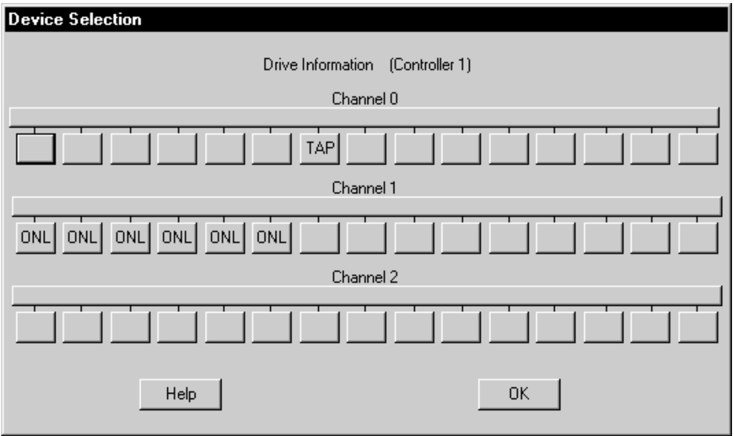
If any system drives are not online, go to the procedure in "Resynchronizing the CallPilot server hard drives" on page 249, and follow steps 6 to 8 to rebuild any hard drives that are not online. Then return to this procedure.

Note: If a hard drive does not successfully go to the online state, verify the hard drive jumper settings and cabling connections, and then try again to rebuild the hard drive. If you cannot make the hard drive go to the online state, replace the faulty hard drive (see "Replacing a hard drive" on page 152 for hard drive configuration instructions and, if necessary, instructions on how to replace the hard drive).

5 Click OK to exit from the System Drive Information dialog box.

6 From the DAC Administration Utility window, select Configuration → Drive Information.

Result: The Device Selection dialog box appears.



7 Verify that all the hard drives are labeled ONL (online state). If any hard drives are in any other state, you must return them to the online state before you continue with this procedure.

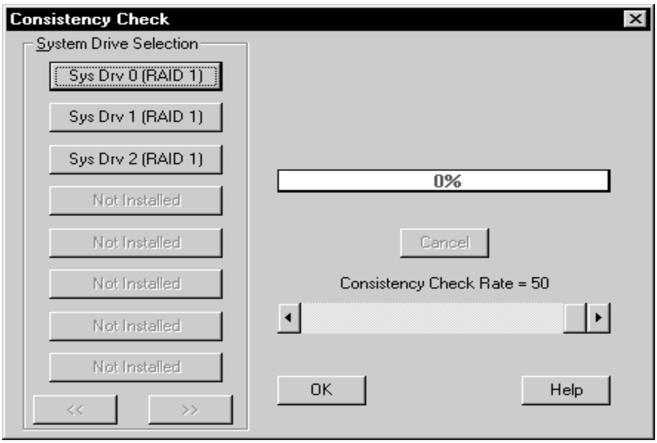
8 Click OK to return to the DAC Administration Utility window.

To check the consistency of the system drives

You must verify that each pair of drives is correctly synchronized before continuing with the RAID splitting procedure. To verify that the drives are correctly synchronized, use the DAC Administration Utility to run a consistency check on each system drive that is configured, as follows:

1 In the DAC Administration Utility window, select Management→ Consistency Check.

Result: The Consistency Check dialog box appears. Each system drive (Sys Drv) represents a mirrored pair of hard drives.



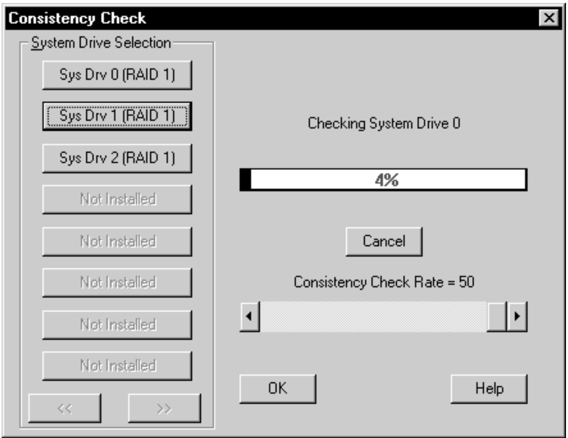
2 Click Sys Drv 0 to initiate a consistency check on the system drive.

Result: The system prompts you to select what should be done if inconsistent data is found on the system drive.

3 Click No.

Note: You must not restore the consistency at this time. By selecting No, you only receive a warning if inconsistent data is found on the system drive.

Result: The consistency check starts, and the progress bar begins to advance.



Note: Messages are also posted to the DACMon application to update the status of the consistency check. If necessary, move the DACMon application window to the side so that the Consistency Check dialog box is visible.

Do not click or select the Consistency Check Rate bar or any other items on the dialog box until the consistency check is completed.

When the consistency check is completed, a dialog box appears with the results of the consistency check. The results should show that the consistency check is OK.

Note: If the consistency check is not OK, stop this procedure and contact Nortel Networks technical support to correct the problem.

4 Click OK.

Result: You return to the Consistency Check dialog box.

5 Repeat steps 2 to 4 for all the system drives on the server.

6 After all hard drives have been checked, click OK in the Consistency Check dialog box to return to the DAC Administration Utility window. Then exit the DAC Administration Utility.

To complete the upgrade readiness checklist

Follow the instructions in Part 4, Chapter 1 of *Upgrading or Installing CallPilot Server Software* in the *CallPilot Installation and Configuration* binder.

Note: Do not upgrade the server software at this time.

To back up the existing RAID configuration

It is important to back up the current configuration to a floppy disk before you make any changes to the configuration of the RAID controller. This enables you to recover the configuration of the RAID controller if any mistakes are made while executing the procedure.

1 Insert the CallPilot 2.0 OS Recovery or OS Upgrade CD into the CD-ROM drive and then power up the computer.

   Note: In order for this procedure to work the computer BIOS must have booting from CD-ROM enabled. You may need to enter the BIOS setup to enable booting from CD-ROM.

   Result: The system boots and the "MS-DOS 6.2 Start Menu" is displayed.

2 Use the up and down arrow keys to select "8. Other Utilities (BIOS, firmware, Etc.)..." and press Enter.

   Result: The "*** Other Utilities ***" menu is displayed.

3 Press 3 to select "3. Mylex DAC960 RAID Card Configuration Utility".

   Result: The DAC960 Configuration Utility main menu appears.

4 Insert the floppy disk that you intend to use for the RAID configuration backup.

5 From the DAC960 Configuration Utility main menu, select Tools and then press Enter to display the Tools menu.

   Note: Use the arrow keys to select menu items in the DAC960 Configuration Utility.

6 Select Backup/Restore conf, and then press Enter.

Result: A cautionary message appears.

7 Press any key to acknowledge the cautionary message.

Result: The system displays the Backup and Restore Configuration submenu.

8 Select Backup Configuration, and then press Enter.

Result: The system displays the Enter File Name pop-up window.

9 Type **a:** and the name of the backup file (for example, a:\raidback), and then press Enter.

CAUTION

Risk of data loss

You must save this file to drive A on a floppy disk; otherwise, you may not be able to restore the RAID configuration if the RAID card fails.

Ensure the floppy disk is stored in a safe and accessible location.

Result: The system displays a warning: `Existing file, if any will be overwritten`.

10 Select Yes.

Result: The RAID configuration is backed up on the floppy disk. A message appears when the backup has been successfully completed.

11 Press any key to continue.

12 Remove the RAID configuration backup floppy disk.

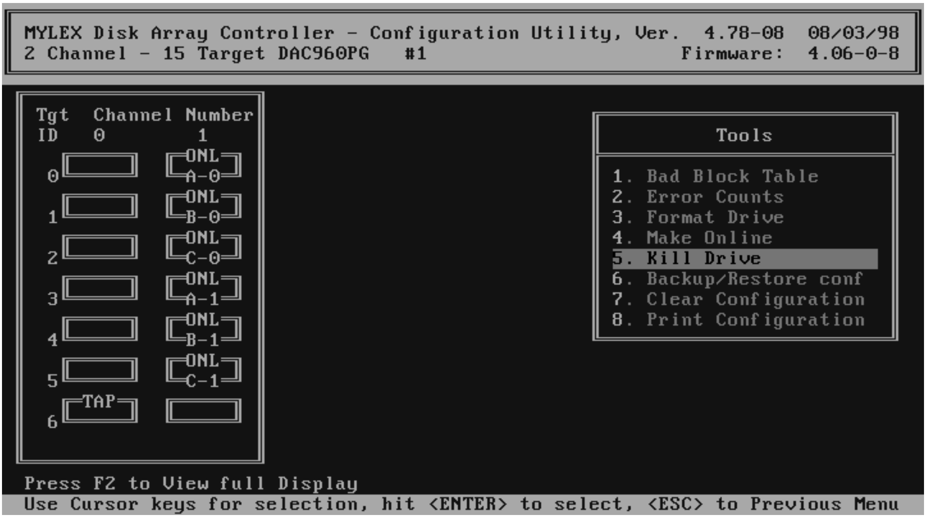
13 Press Esc to return to the Main Menu.

To mark the hard drives dead

Each system drive is made up of a pair of drives that are mirror images of each other. To break the mirroring so that one of the drives of each pair is no longer updated, you must mark one drive dead in each pair.

1 From the DAC960 Configuration Utility main menu, select Tools and then press Enter.

Result: The Tools menu appears.



2 From the Tools menu, select 5. Kill Drive, and then press Enter.

Result: The cursor is active on the left side of the screen so that you can select which drive to kill.

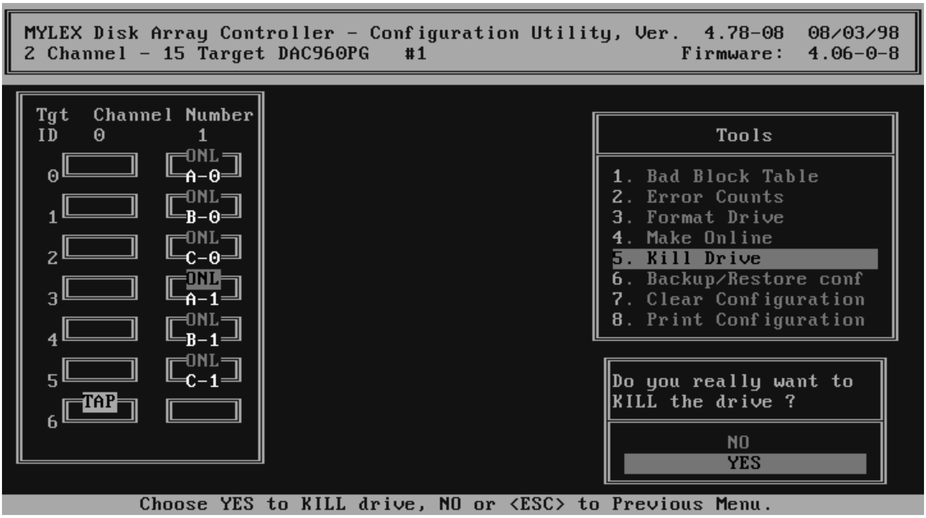
The left side of the screen displays the six physical hard drives in the server. All of the drives should be marked as Online (ONL). The drives form three packs: A, B, and C. Each pack consists of two drives: A-0 and A-1, B-0 and B-1, C-0 and C-1.

3 Select drive A-1, and then press Enter.

Result: A message appears at the bottom of the screen warning you that if this is not a redundant drive, data will be lost. For this procedure, disregard this message. The data on the drive is not destroyed, and you can recover the pre-upgrade system from this drive, if necessary.

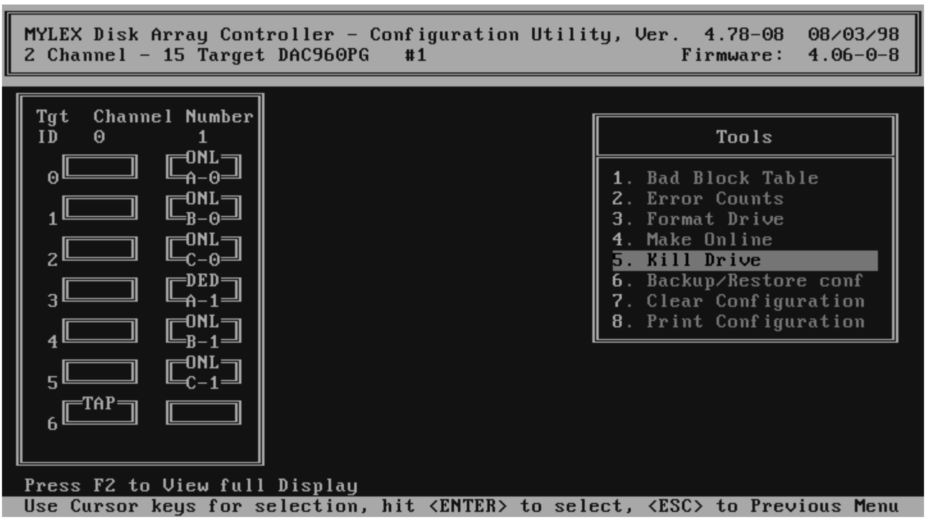
4 Press Enter to continue with the process of marking the drive dead.

Result: A confirmation prompt appears in the bottom right corner.



5 Select YES, and then press Enter to mark the drive dead.

Result: The screen is updated to record that the drive has been marked dead (DED).



6 Repeat steps 3 to 5 for drives B-1 and C-1.

7 Press Esc to return to the main menu.

8 Press Esc to exit the DAC960 Configuration Utility.

Result: A prompt appears in the bottom right corner of the screen asking you to confirm that you want to exit.

9 Disregard the reminder to save the configuration. Select YES, and then press Enter to exit from the RAID configuration software without saving the configuration.

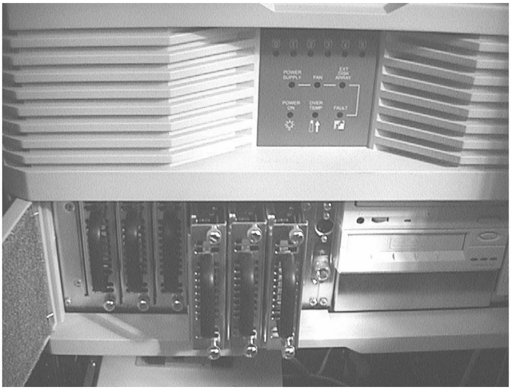
10 Remove the CallPilot 2.0 OS Recovery CD-ROM or the CallPilot 2.0 OS Upgrade CD-ROM.

To disconnect the dead hard drives

Physically disconnect the hard drives marked DED to ensure that these hard drives are not updated during the upgrade and are preserved as a backup.

1 Shut down and power off the CallPilot server.

2 Disconnect the hard drives marked DED by unseating them from the hard drive bays 4, 5, and 6 (counting bays from left to right), but do not remove them. See the following example:



3 Power up the server.

Note: During the bootup, the system reports that three hard drives are dead, and, as a result, three system drives are running in critical state. This is normal. It indicates that the disks are no longer being mirrored. If you run the DACMon Utility, it also reports that three hard drives are dead and that they are not being replaced by a hot standby.

Performing the CallPilot server software upgrade

You can now perform the upgrade operation, and only one disk of each pair will be updated. This allows you to maintain a copy of the system in its previous state in case there are problems during the upgrade process.

To perform the CallPilot server software upgrade

1 Upgrade the CallPilot server software. Follow the instructions in Part 4 of the *CallPilot Installation and Configuration* binder.

2 After the upgrade is completed, ensure that you test the upgrade before you resynchronize the hard drives. See “Testing the CallPilot installation” in Part 3 of the *CallPilot Installation and Configuration* binder.

3 Once the upgrade is completed and tested, there are two options available:

- If the upgrade is successful, continue with “Resynchronizing the CallPilot server hard drives” on page 249 to keep the upgraded software.
- If the upgrade fails, follow the steps in “Reverting to the pre-upgrade system (if the upgrade fails)” on page 252.

CAUTION

Risk of data loss

You can run CallPilot for any period of time before making this decision. However, during this time, there is no disk redundancy. Therefore, if a hard drive fails during this time, any new data is lost.

Resynchronizing the CallPilot server hard drives

After you upgrade the server software and test the upgrade, follow the steps below to resynchronize the hard drives.

To resynchronize the hard drives

1 Shut down and power off the CallPilot server.

2 Reconnect the hard drives by reseating them into their drive bays.

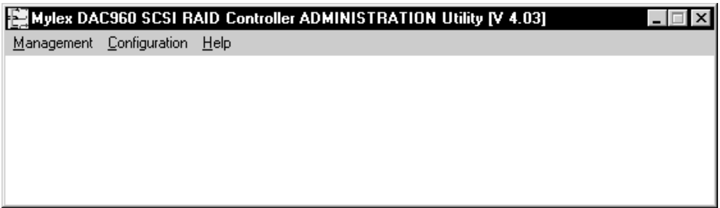
3 Power up the server.

Result: POST messages from the RAID controller warn you that the system is operating in critical mode (that is, with some drives offline).

4 Log on to the CallPilot server as **Administrator** (or any other user ID that has administrative privileges).

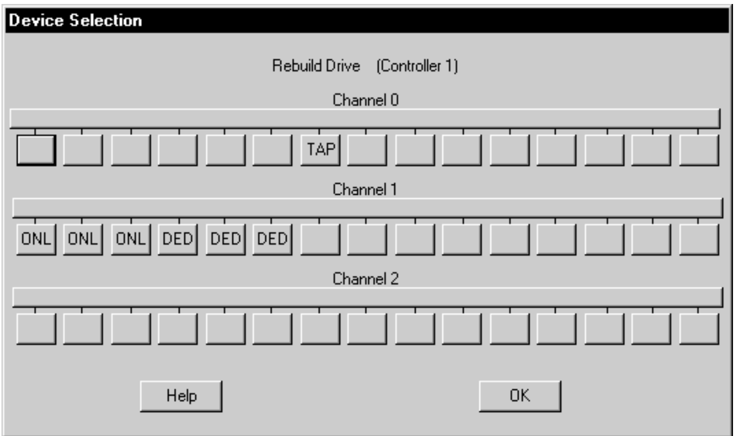
5 Run the DAC Administration Utility. If there is no desktop shortcut, run the dacadm.exe program that is located in the directory C:\Winnt\System32 or D:\Winnt\System32 (the program location depends on the location of the Windows NT operating system).

Result: The DAC Administration Utility window appears.



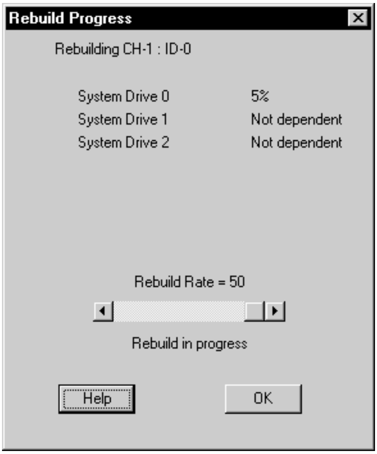
6 From the Management menu, select Rebuild Drive.

Result: The Device Selection dialog box appears.

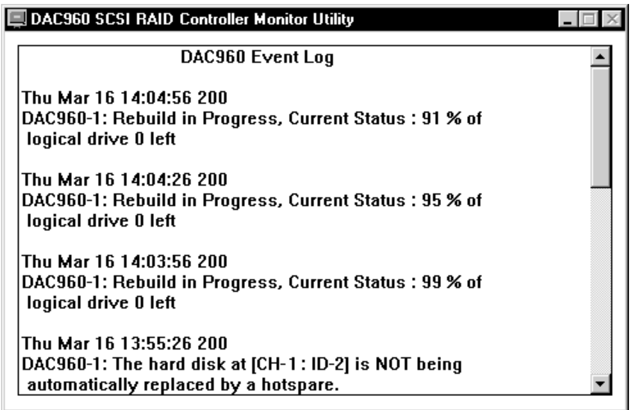


7 Start from the left side of the dialog box and click the first dead drive (marked DED) to start rebuilding that drive.

Result: The Rebuild Progress dialog box appears.



If you are running the DAC Monitor program, the monitor window pops up and informs you of the progress of the rebuild.



When the rebuild finishes (each drive takes up to 45 minutes), a dialog box appears to inform you that the rebuild is complete.

8 Click OK in the Rebuild Drive dialog box, and then click OK in the Rebuild Progress dialog box to return to the Device Selection dialog box.

Result: The rebuilt drive is shown as being online (ONL).

9 Repeat steps 7 and 8 for the remaining two dead drives.

10 Once all hard drives have been rebuilt, click OK in the Device Selection dialog box to return to the DAC Administration Utility window. Then exit the DAC Administration Utility.

Result: You have completed the upgrade procedure.

Reverting to the pre-upgrade system (if the upgrade fails)

This section describes how to restore the CallPilot server to the state it was in before you began the upgrade. This procedure includes the following steps:

1. Mark the failed upgrade hard drives dead.
2. Reconnect the pre-upgrade hard drives.
3. Enable the pre-upgrade hard drives and restore the pre-upgrade software.

To mark the failed upgrade hard drives dead

1 Insert the CallPilot 2.0 OS Recovery or OS Upgrade CD into the CD-ROM drive and then power up the computer.

Note: In order for this procedure to work the computer BIOS must have booting from CD-ROM enabled. You may need to enter the BIOS setup to enable booting from CD-ROM.

Result: The system boots and the "MS-DOS 6.2 Start Menu" is displayed.

2 Use the up and down arrow keys to select "8. Other Utilities (BIOS, firmware, Etc.)..." and press Enter.

Result: The "*** Other Utilities ***" menu is displayed.

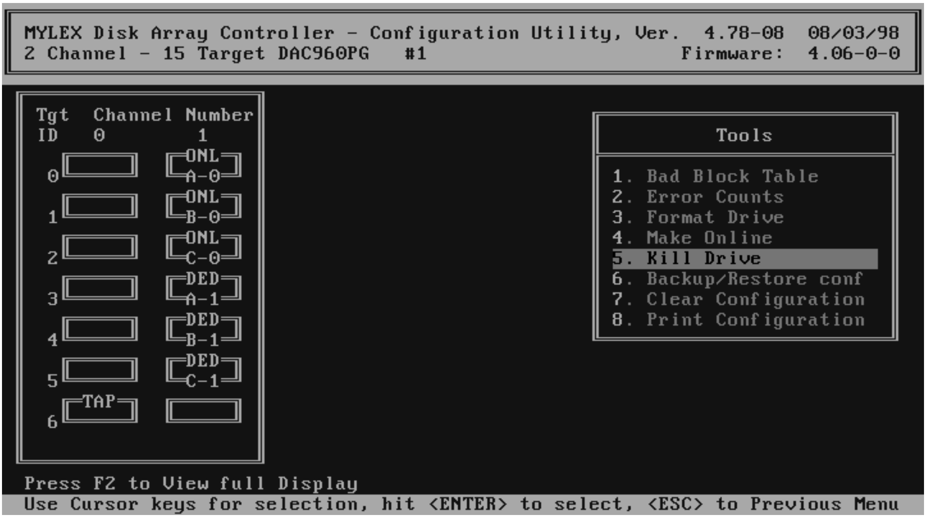
3 Press 3 to select "3. Mylex DAC960 RAID Card Configuration Utility".

Result: The DAC960 Configuration Utility main menu appears.

4 From the main menu, select Tools and then press Enter.

Result: The Tools menu appears.

The left side of the screen displays the six physical hard drives in the server. The drives form three packs: A, B, and C. Each pack consists of two drives: A-0 and A-1, B-0 and B-1, C-0 and C-1. Drives A-0, B-0, and C-0 should be ONL. Drives A-1, B-1, and C-1 should be DED.



5 From the Tools menu, select 5. Kill Drive, and then press Enter.

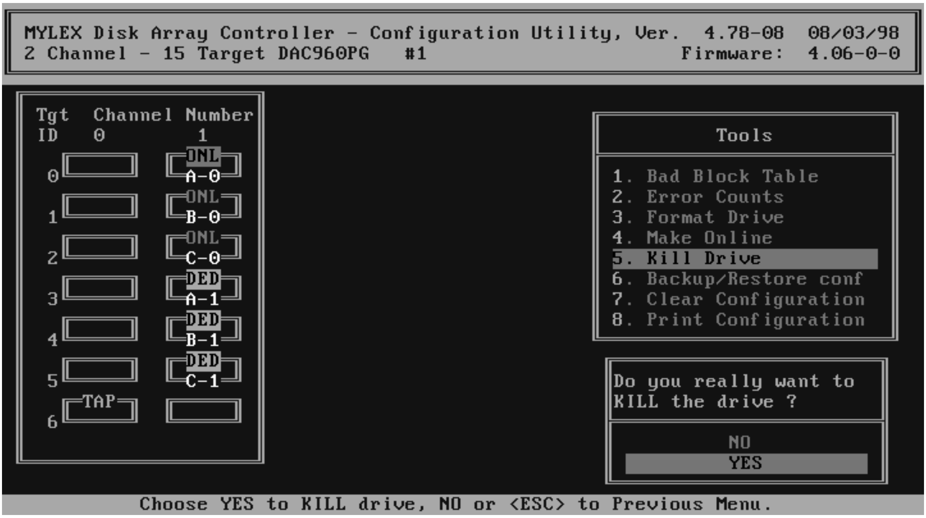
Result: The cursor is active on the left side of the screen so that you can select which drive to kill.

6 Select drive A-0, and then press Enter.

Result: A message appears at the bottom of the screen warning you that if this is not a redundant drive, data will be lost. For this procedure, disregard this message.

7 Press Enter to continue with the process of marking the drive dead.

Result: A confirmation prompt appears in the bottom right corner of the screen.

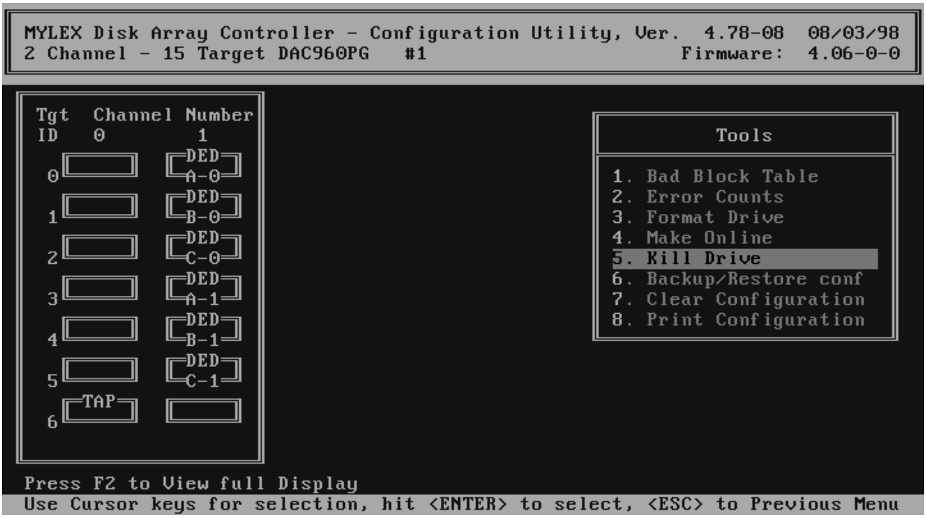


8 Select YES, and then press Enter to mark the drive dead.

Result: The screen is updated to record that the drive has been marked dead (DED).

9 Repeat steps 6 to 8 for drives B-0 and C-0.

Result: All hard drives are marked dead (DED).



10 Press Esc until you exit the utility.

Note: Leave the CallPilot 2.0 OS Recovery CD-ROM or the CallPilot 2.0 OS Upgrade CD-ROM in the CD-ROM drive.

To reconnect the pre-upgrade hard drives

1 Shut down and power off the CallPilot server.

2 Reconnect the pre-upgrade hard drives:

- For a 1001rp server, reseat the hard drives into their drive bays.

To enable the pre-upgrade hard drives and restore the pre-upgrade software

CAUTION

Risk of lost or corrupted data

All hard drives must be dead (DED) before you begin this procedure. If you are not sure if all the hard drives are dead, see “To mark the failed upgrade hard drives dead” on page 252.

Note: Because all the hard drives are marked DED, there is a five minute timeout of the system while the drives are scanned.

1 Insert the CallPilot 2.0 OS Recovery or OS Upgrade CD into the CD-ROM drive and then power up the computer.

Note: In order for this procedure to work the computer BIOS must have booting from CD-ROM enabled. You may need to enter the BIOS setup to enable booting from CD-ROM.

Result: The system boots and the "MS-DOS 6.2 Start Menu" is displayed.

2 Use the up and down arrow keys to select "8. Other Utilities (BIOS, firmware, Etc.)..." and press Enter.

Result: The "*** Other Utilities ***" menu is displayed.

3 Press 3 to select "3. Mylex DAC960 RAID Card Configuration Utility".

Result: The DAC960 Configuration Utility main menu appears.

4 From the DAC960 Configuration Utility main menu, select Tools and then press Enter.

Result: The Tools menu appears.

5 From the Tools menu, select 4. Make Online, and then press Enter.

Result: The cursor is active on the left side of the screen so that you can select which drive to make online.

6 Select drive A-1, and then press Enter.

Result: A warning message appears at the bottom of the screen indicating that this may cause unpredictable results. Disregard this warning for this procedure.

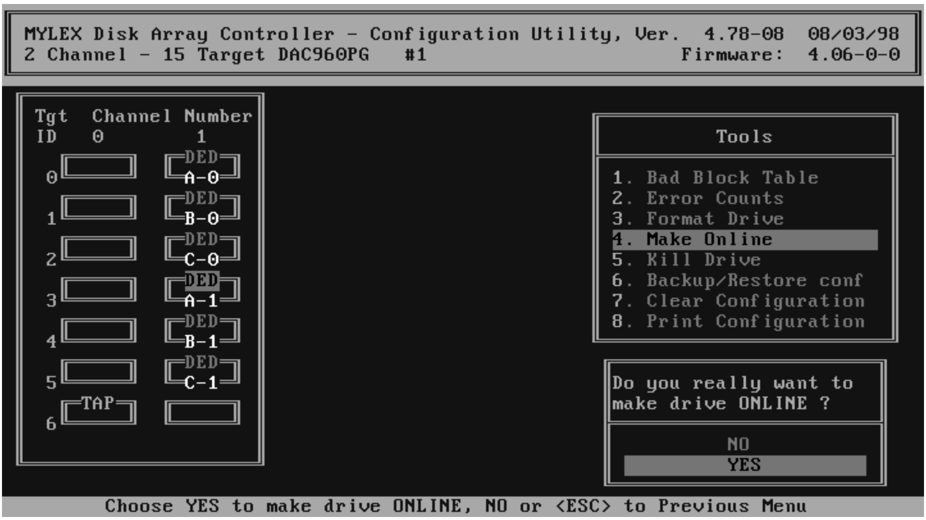
CAUTION

Risk of data corruption

Ensure that you select a pre-upgrade drive for this step. If this is a standard configuration and you have followed the instructions in this procedure, the fourth, fifth, and sixth hard drives are the pre-upgrade drives. If this is not correct for your system, contact Nortel Networks technical support.

7 Press Enter to continue.

Result: A confirmation prompt appears in the bottom right corner of the screen.

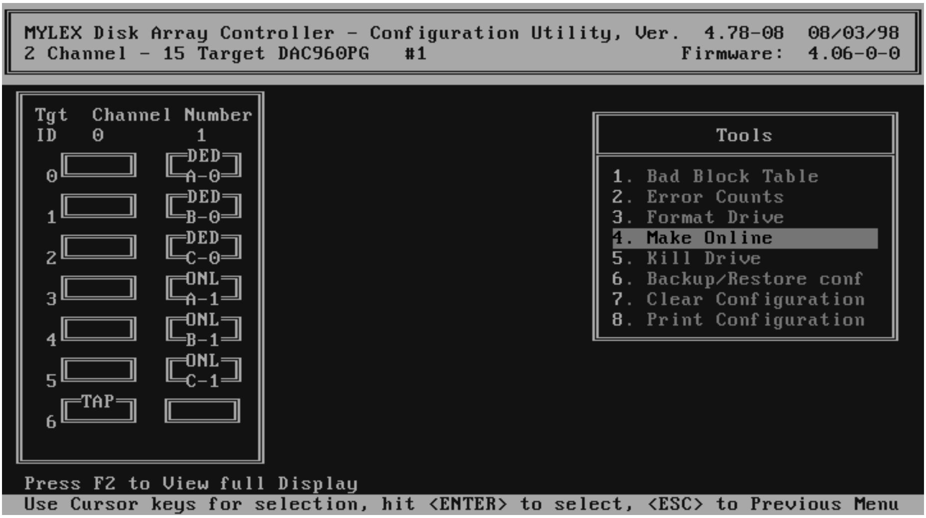


8 Select YES, and then press Enter to bring the drive online.

Result: The left portion of the screen is updated to show that drive A-1 is now online (ONL).

9 Repeat steps 6 to 8 for drives B-1 and C-1.

10 Before continuing, verify that drives A-0, B-0, and C-0 are dead (DED), and drives A-1, B1, and C-1 are online (ONL), as in the following example:



11 Press Esc to return to the main menu.

12 Press Esc again to exit the utility.

Result: A prompt appears in the bottom right corner of the screen asking you to confirm that you want to exit.

13 Disregard the reminder to save the configuration. Select YES, and then press Enter to exit from the RAID configuration software without saving the configuration.

14 Remove the CallPilot 2.0 OS Recovery CD-ROM or the CallPilot 2.0 OS Upgrade CD-ROM.

15 Restart the CallPilot server.

16 Rebuild the DED hard drives by following steps 4 to 10 on page 250.

Result: These steps resynchronize the dead drives with the online pre-upgrade drives. The CallPilot server is restored to its pre-upgrade state.

17 Test the CallPilot system. See the chapter “Testing the CallPilot installation” in Part 3 of the *CallPilot Installation and Configuration* binder.

Chapter 10

Replacing or adding voice processing boards

In this chapter

DSP numbering and location

Introduction

DSPs are the voice processing components of the MPC-8 card and the MPB16-4 board. The DSPs are numbered to distinguish each DSP in CallPilot maintenance programs such as the Maintenance Admin applet in CallPilot Manager.

Each MPC-8 card is referred to as a DSP. The MPB16-4 boards also have built-in or embedded DSPs. Each DSP supports up to eight multimedia channels.

MPB16-4 DSP numbering and location

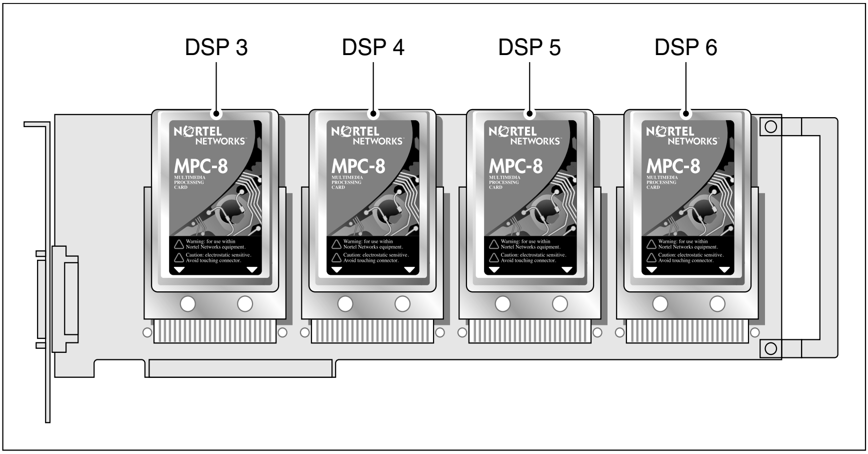
MPB16-4 boards have two embedded DSPs and can support up to four optional MPC-8 (DSP) cards. The DSP numbering starts with the embedded DSPs and then continues with the MPC-8 cards going from left to right.

ATTENTION

Since CallPilot 1.07, the CallPilot server is shipped with the MPB16-4 board fully loaded (all four optional MPC-8 cards installed). The number of multimedia channels actually available for use is controlled by the keycode.

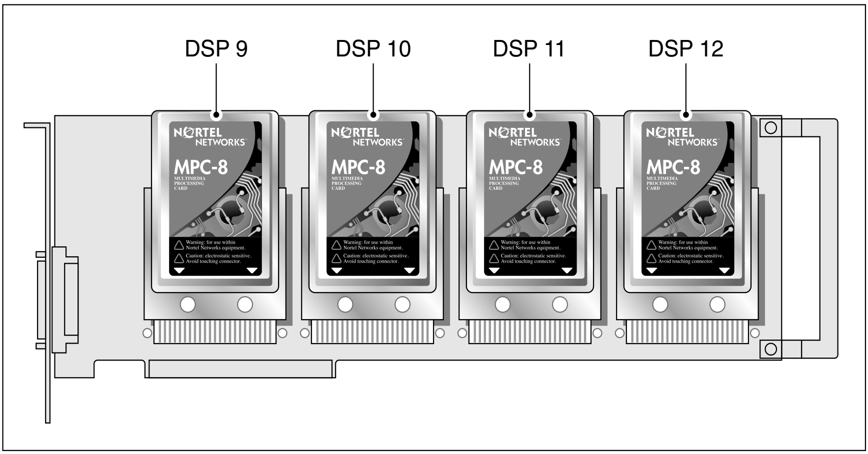
The pictures on the following page illustrate the DSP numbering on the first two MPC16-4 boards.

First MPB16-4



G101756

Second MPB16-4



G101757

SCbus cabling

Introduction

The SCbus cable supports the voice bus for CallPilot servers that use MPB16-4 boards. It is connected to the MPB16-4 boards in the CallPilot server.

Supported SCbus cable

A 2-drop SCbus cable (NTRH2011) is provided. The number of connectors (two) corresponds to the maximum number of MPB16-4 boards supported on this server.

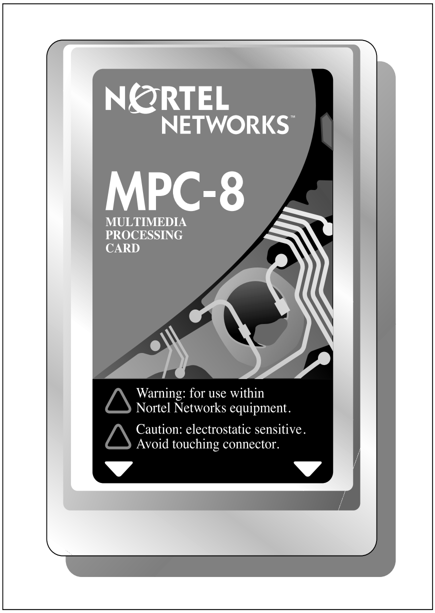
Replacing or adding MPC-8 cards

Introduction

This section describes how to replace or install an MPC-8 card. For help with identifying DSPs, see "DSP numbering and location" on page 262.

MPC-8 card (NTRH01AA)

The MPC-8 card is a credit-card-sized PC card that plugs into an MPB16-4 board. Below is a picture of an MPC-8 card.



G101540

Before you begin

CAUTION

Risk of electrical damage

Wear an antistatic ESD wrist strap when handling cards or boards, or when working inside the server.

Do not touch the components or gold-edge connectors of cards or boards.

Place the card or board on an antistatic surface until you are ready to install it.

1 Courtesy stop all CallPilot channels.

2 Power down the server and all peripheral devices.

3 Disconnect the power cables from the server and from all peripheral devices.

4 Remove the server cover.

For instructions on removing the server cover, see “Removing the front bezel and server cover” on page 128.

To replace or add an MPC-8 card

DANGER

Risk of electrical shock

Ensure the server is powered down and the AC power cords are disconnected, as described in “Before you begin” on page 266.

Note: You have the option of installing the MPC-8 cards into an MPB16-4 board while the board is already installed in the server. However, the board must be secured to the server by its retaining screw for stability. If you cannot easily access the MPC-8 bay, you can remove the MPB16-4 board, and then install the MPC-8 cards into the board outside of the server.

1. If you are replacing a faulty MPC-8 card, remove it from the MPB16-4 board.
2. Slide the new MPC-8 card with its label side up into the first available bay on the MPB16-4 board. Use firm pressure but do not force the card in (the pins may bend).

   Note: See “DSP numbering and location” on page 262 for the order of MPC-8 cards installed in the MPB16-4 board.

   Note: If the card is placed upside down or label side down, it will not slide completely into the bay. Do not force the card in. If you cannot install the card, contact Nortel Networks for a replacement card.
3. Replace the server cover.
4. Reconnect the power cables to the server and to the peripheral devices.
5. Restart the server, and then log on to Windows NT.
6. Run the Configuration Wizard to detect the new hardware. If you have increased the channel capacity or changed the number of different multimedia channels, add the new DNs or update the media allocation as required, or both.

   Result: The MPC-8 card installation procedure is completed.

7 Test the multimedia channels to ensure the new MPC-8 card is functioning properly.

Refer to the chapter “Testing the CallPilot installation” in Part 3 of the *CallPilot Installation and Configuration* binder.

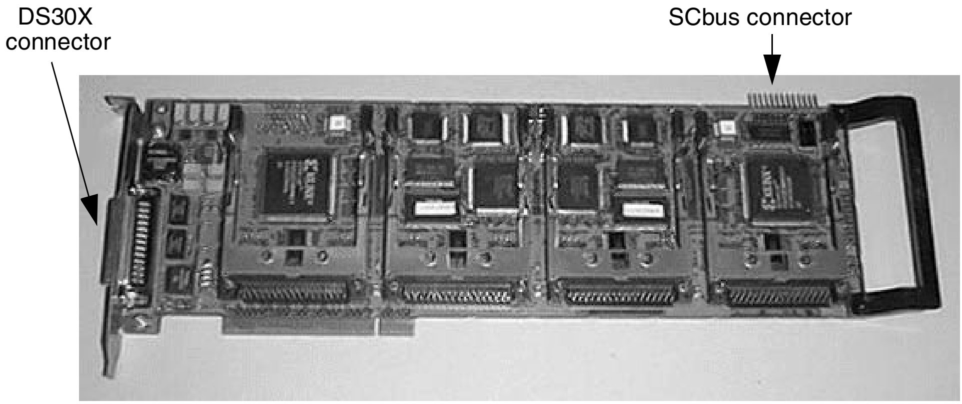
Replacing or adding MPB16-4 boards

Introduction

This section describes how to replace or add MPB16-4 boards.

MPB16-4 (NTRH20BA)

The following picture shows an MPB16-4 board with no optional MPC-8 cards installed.



Before you begin

CAUTION

Risk of electrical damage

Wear an antistatic ESD wrist strap when handling cards or boards, or when working inside the server.

Do not touch the components or gold-edge connectors of cards or boards.

Place the card or board on an antistatic surface until you are ready to install it.

1 Courtesy stop all CallPilot channels.
2 Power down the server and all peripheral devices.
3 Disconnect the power cables from the server and from all peripheral devices.
4 Remove the server cover.

   For instructions on removing the server cover, see “Removing the front bezel and server cover” on page 128.

To replace an MPB16-4 board

DANGER

Risk of electrical shock

Ensure the server is powered down and the AC power cords are disconnected, as described above in “Before you begin.”

1 Unpack the new MPB16-4 board.
2 Disconnect the SCbus cable from the faulty MPB16-4 board.

   Note: If there is only one MPB16-4, there is no SCbus cable installed.
3 Disconnect the DS30X cable from the faceplate of the faulty MPB16-4 board.

4 Remove the faulty MPB16-4 board from its slot, and save the retaining screw.

5 Remove any optional MPC-8 cards from the faulty MPB16-4 board, and install the cards in the new MPB16-4 board.

Note: If some MPC-8 cards were identified as faulty, ensure that these are replaced with new MPC-8 cards in this step.

6 Press the new MPB16-4 board firmly into its slot.

Note: Ensure that you carefully slide the MPB16-4 board past the protective foil strips, as they are easily damaged.

7 Secure the board using the retaining screw that you removed earlier.

8 Reconnect the SCbus cable to the new MPB16-4 board.

Note: If there is only one MPB16-4, the SCbus cable is not used.

9 Reconnect the DS30X cable to the faceplate of the new MPB16-4 board.

10 Replace the server cover.

Note: Be careful not to pinch any cabling when replacing the server cover.

11 Replace the front bezel and lock it.

12 Reconnect the power cables to the server and to the peripheral devices.

13 Restart the server, and then log on to Windows NT.

14 Run the Configuration Wizard to detect the new hardware.

Result: The MPB16-4 board replacement procedure is completed.

15 Test the multimedia channels to ensure the new MPB16-4 board is functioning properly.

Refer to “Testing the CallPilot installation” in Part 3 of the *CallPilot Installation and Configuration* binder.

To install an additional MPB16-4 board

DANGER

Risk of electrical shock

Ensure the server is powered down and the AC power cords are disconnected, as described in “Before you begin” on page 270.

To install an additional MPB16-4 board in a server that already has at least one MPB16-4 board, follow these steps:

1 Unpack the new MPB16-4 board.

2 Install any MPC-8 cards that have been ordered for the new MPB16-4 board.

3 Identify the slot where the new MPB16-4 board will be installed. For slot assignment information, see “Slot assignments” on page 354.

4 Remove the slot cover where the new board will be installed.

Save the retaining screw. You will reuse it to secure the new board.

5 Press the new MPB16-4 board firmly into its slot.

Note: Ensure that you carefully slide the MPB16-4 board past the protective foil strips, as they are easily damaged.

6 Secure the board using the retaining screw you removed earlier.

7 Connect the SCbus cable to the two MPB16-4 boards.

8 Replace the server cover.

Note: Be careful not to pinch any cabling when sliding the server cover back on.

9 Replace the front bezel and lock it.

10 If necessary, reconfigure the DS30X cabling to support the new capacity. Refer to Part 3 of the *CallPilot Installation and Configuration* binder for details.

11 Reconnect the power cables to the server and to the peripheral devices.

12 Restart the server, and then log on to Windows NT.

13 Run the Configuration Wizard to detect the new hardware.

Note: If you have increased the channel capacity or changed the number of different multimedia channels, add the new DNs or update the media allocation as required, or both.

Result: The MPB16-4 board installation is complete.

14 Test the multimedia channels to ensure the new MPB16-4 board is functioning properly.

Refer to “Testing the CallPilot installation” in Part 3 of the *CallPilot Installation and Configuration* binder.

Chapter 11

Replacing the video card

In this chapter

Overview

Introduction

This section describes procedures for handling and replacing video cards on the 1001rp server.

Included procedures

Procedures covered include the following:

- troubleshooting the video card
- identifying the video card
- determining slot assignment
- replacing the video card

Troubleshooting the video card

Video card function

The video card takes information from the computer and displays it on the installed monitor.

Indicators for card replacement

If the monitor appears to be functioning but no display is visible, look for the following indicators of video card malfunction. If the server is consistent with these indicators, replace the video card:

- Brightness and contrast are set at normal level.
- The server is powered on and one long beep is followed by two short beeps.
- The floppy drive light goes on when the server is powered, but no display is visible on the monitor.
- The floppy drive light comes on when the user types dir a: and presses Enter, but no display is visible on the monitor.

Replacing the video card

Introduction

If you determine that a problem exists with your video card, replace the card. You must identify the type of card before you can decide where to install it.

Requirements

To replace the video card, you require the following:

- one Phillips screwdriver
- one antistatic wrist strap
- the replacement video card

Identify the card

Identify a video card from other types of cards by its connector. To identify an installed video card, look at the card to which the installed monitor connects. If no monitor is connected, look for the card to which a monitor normally connects.

To replace the video card

1. Review the manufacturer's documentation for the replacement video card.
2. Power down the server and disconnect all power cords.
3. See "Slot assignments" on page 354 to determine proper slot assignment.
4. Remove the chassis cover to expose the installed cards.
5. Set aside any cables covering the video card.

   Note: The video card has no internal cable connectors itself.

6 Free the card from the faceplate by loosening the screw.

7 Lift the card out of the slot and set it aside.

8 Unpack the replacement card and align it with the proper slot.

9 Apply downward pressure until the card is evenly and securely seated in the slot.

10 Secure the card by tightening the screw located at the top of the faceplate.

11 Replace the chassis cover.

What's next?

Perform system diagnostics procedures after you install or replace any server component.

Chapter 12

Replacing the network cards

In this chapter

Overview

Introduction

This section describes the network cards approved for use in the 1001rp server.

Procedures covered include the following:

- slot assignments for optional cards
- network card installation and configuration

Minimum requirements

Minimum system requirements for all servers include the installation of a network card. Install optional network cards according to server configuration.

Slot assignments described in this section show the proper location for required and optional network cards.

Replacing ELAN cards

Introduction

The ELAN network card is a minimum system requirement for the 1001rp server. Although the card must always be an Ethernet card installed in a PCI slot, it can be either Intel or 3Com.

To replace an ELAN network card

1 See "Slot assignments" on page 354 to determine the proper slot assignment for the ELAN card.

2 Check that the BIOS is configured to assign the correct IRQ to the correct slots.

3 Remove the chassis cover to expose the installed cards.

4 Disconnect external network cables.

5 Check the installed card to ensure that it is the ELAN network card.

6 Set aside any cables covering the card.

Note: The network card has no internal cable connectors.

7 Free the card from the faceplate by loosening the screw.

8 Lift the card out of the slot and set it aside.

9 Unpack the replacement card and insert it into the proper slot.

10 Align the card with the faceplate and secure it by tightening the screw.

11 Replace the chassis cover.

12 Connect the ELAN network cable.

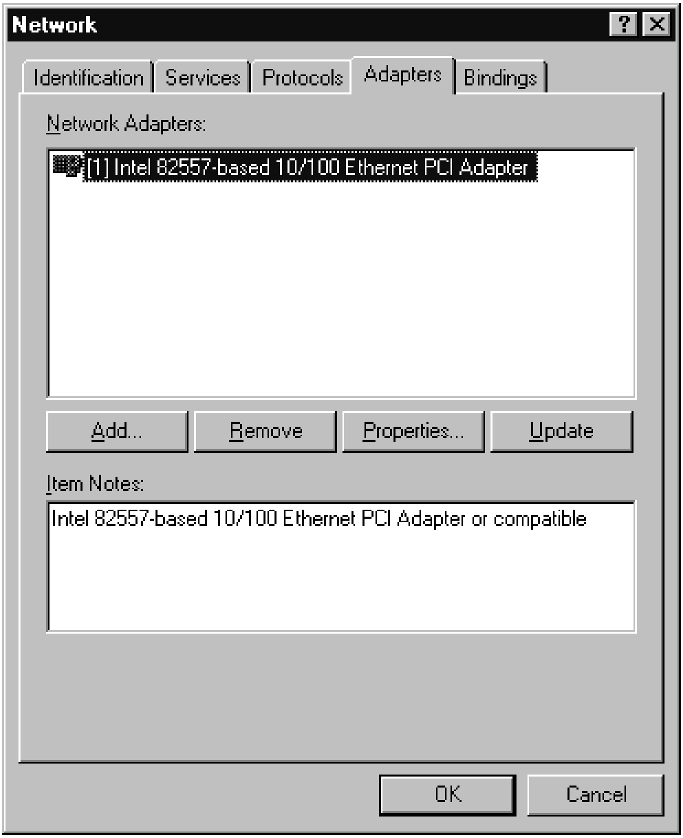
What's next?

- Add the appropriate network card driver if the new installed card is a different make/model from the failed card.

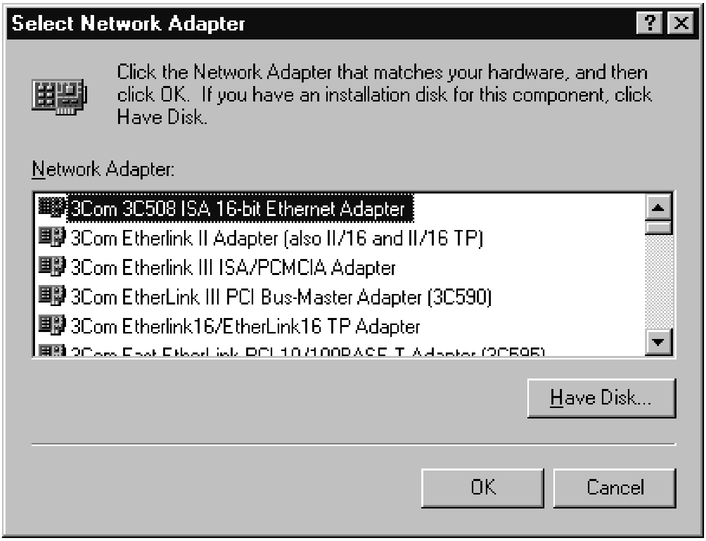
- You must remove the old ELAN card driver if the new installed card is a different make/model from the failed card.
- Run diagnostic software (typically installed with the driver).

To install an ELAN network card driver

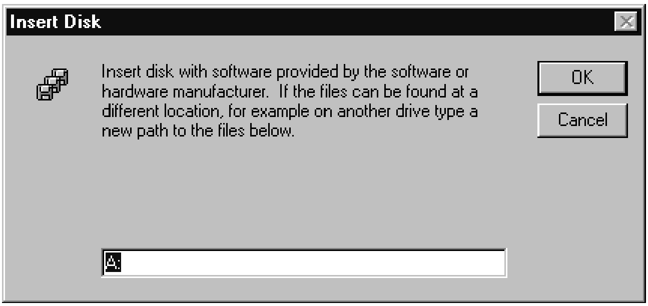
1. Restart and log on to the server as **Administrator**.
2. Open the Network Control Panel and select the Adapters tab.
3. Click Add... to add the adapter.



4 Click Have Disk... to load the device driver.



5 Insert the driver disk for the ELAN network card in the floppy drive, and then press Enter.



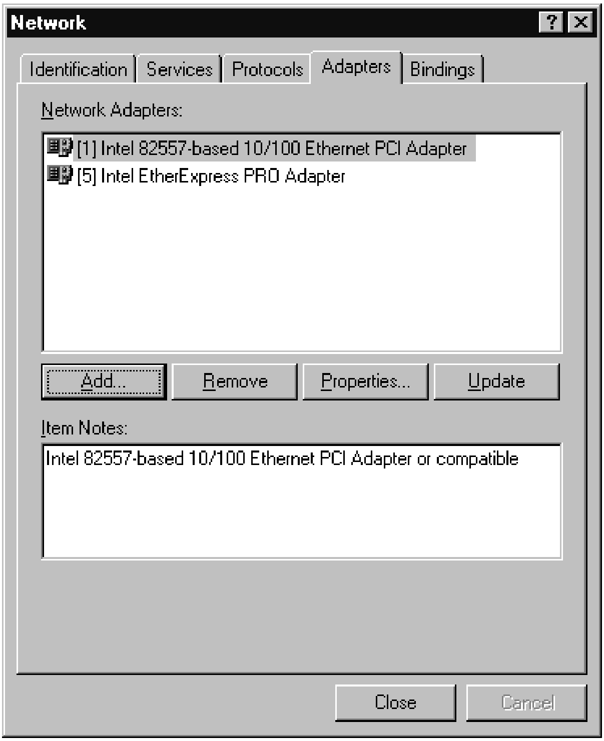
6 If the driver disk contains drivers for more than one network card, the system prompts you to select the driver you want to install. Choose the driver that matches the installed ELAN card, and then click OK.

7 Click OK when the following screen appears:

Note: You only see this if ELAN and CLAN are the same.

Result: Some files are copied to the system and the new network card is listed in the network dialog box.

Note: Screen shots are not included for specific cards as they may be different depending on your configuration. If you need help installing a driver, call your Nortel Networks customer support representative.



8 Click Close to close the network control panel.

9 The TCP/IP properties panel appears.

10 Select the new driver installed in the Adapters box.

11 Enter the customer-supplied IP address.

12 Click OK.

Result: You are prompted to restart the computer.

13 Click Yes.

Replacing Ethernet CLAN cards

To replace the 3Com PCI Ethernet card

1 See “Slot assignments” on page 354 to determine proper slot assignment for the CLAN card.

2 Check that the BIOS is configured to assign the correct IRQ to the correct slots.

3 Power down the server.

4 Unplug the AC power cord.

5 Remove the chassis cover.

6 Locate the CLAN Ethernet card to be removed, and unplug its network cabling.

7 Set aside any cables covering the card.

8 Remove the screw that fastens the card in the chassis.

9 Gently pull the card out (use a slight rocking motion).

10 Remove the new Ethernet card from its protective packaging.

Note: Place the old Ethernet card into the protective packaging.

11 Line up the new Ethernet card with the slot (PCI or ISA, as appropriate).

Note: Make sure the end-plate tab is lined up with the opening in the chassis.

12 Press the card into the slot.

CAUTION

Risk of equipment damage

Ensure that the card is completely seated or the card will short-circuit.

13 Secure the card to the server chassis with the fastening screw.

14 Replace the chassis covers.

15 Plug in the AC power cord.

16 Power up the server.

To install a 3Com PCI Ethernet network card driver

1 Start with Windows NT and log on to the server as **Administrator**.

2 Open the Network Control Panel, select the Adapters tab, and Click Add... to add the adapter.

3 Click Have Disk... to load the device driver.

4 Insert the 3Com device driver disk for the CLAN card, and then press Enter.

5 Select 3Com Fast Ethernet 3C900 card, and then click OK.

6 Click Close to close the network control panel and configure the network card.

7 Enter the TCP/IP information for the card.

Note: The customer must provide this information.

8 Click OK to close the TCP/IP configuration screen.

9 Click Yes to restart the computer.

To replace an Intel PCI Ethernet card

1 See “Slot assignments” on page 354 to determine the proper slot assignment for the CLAN card.

2 Check that the BIOS is configured to assign the correct IRQ to the correct slots.

3 Power down the server.

4 Unplug the AC power cord.

5 Remove the chassis cover.

6 Locate the CLAN Ethernet card to be removed, and unplug its network cabling.

7 Set aside any cables covering the card.

8 Remove the screw that fastens the card in the chassis.

9 Gently pull the card out (use a slight rocking motion).

10 Remove the new Ethernet card from its protective packaging.

Note: Place the old Ethernet card into the protective packaging.

11 Line up the new Ethernet card with the slot (PCI or ISA, as appropriate).

Note: Make sure the end-plate tab is lined up with the opening in the chassis.

12 Press the card into the slot.

CAUTION

Risk of equipment damage

Ensure that the card is completely seated or the card will short-circuit.

13 Secure the card to the server chassis with the fastening screw.

14 Replace the chassis covers.

15 Plug in the AC power cord.

16 Power up the server.

To install an Intel PCI Ethernet network card driver

1 Start with Windows NT and log on to the server as **Administrator**.

2 Open the Network Control panel, select the Adapters tab, and click Add... to add the adapter.

3 Click Have Disk... to load the device driver.

4 Insert the Intel device driver disk for the CLAN card, and then press Enter.

5 Select Intel EtherExpress PRO/100B PCI Ethernet Adapter, and then click OK.

6 Click Close to close the network control panel and configure the network card.

7 Enter the TCP/IP information for the card.

Note: The customer must provide this information.

8 Click OK to close the TCP/IP configuration screen. Click Yes to restart the computer.

Chapter 13

Maintaining the Pentium II SBC card

In this chapter

Dual Inline Memory Modules

Introduction

Dual Inline Memory Modules (DIMMs) are the memory modules located on the SBC. The gold-plated edge connectors on DIMMs are designed to plug into matching edge-connector slots. The design allows you to add or remove these modules repeatedly without tools or damage. Install DIMMs on the Pentium II SBC only.

Capacity

Use 168-pin Fast Page Mode (FPM) parity DRAM utilizing DIMM technology with 60ns access times. A module has a capacity of 32, 64, or 128 Mbytes. DIMMs require only one slot filled to compose a bank. There are four slots or banks on the SBC. Install DIMMs in any slot, combination, or order. It is recommended that bank 0 (DIMM 1) be filled to enable troubleshooting procedures. Install up to 512 Mbytes of memory.

Requirements

To add DIMMs to the card, you require the following:

- an antistatic wrist strap
- DIMMs with gold-plated edge connectors

To add DIMMs to the SBC card

Note: The illustration of “The Pentium II SBC” on page 297 shows the location of the DIMM slots.

1 Remove the SBC card from the server.

Note: To remove old DIMMs, perform steps 2 and 3. To add new DIMMs, go to step 5.

2. Push the DIMM release tab outwards at both sides of the DIMM to be removed.
3. Hold the DIMM by its edges, being careful not to touch its components. Remove the DIMM by lifting it away from its slot. Store it in an antistatic package.
4. Remove other DIMMs as necessary.
5. Orient the DIMM so that the two notches in the bottom edge of the DIMM align with the keyed slot.
6. Insert the bottom edge of the DIMM into the slot, and press down firmly on the DIMM until it seats correctly.

   Note: When the DIMM seats correctly, release tabs lock back to an upright position. If the DIMM does not seat correctly, remove it and reinstall. Do not force the locking tabs to close.
7. Repeat the above two steps to install each additional DIMM.
8. Replace the SBC card in the server.

The Pentium II SBC card

Introduction

This section describes the Pentium II or Pentium III Single Board Computer (SBC) cards. It covers procedures for replacing and configuring the SBC card.

Procedures included

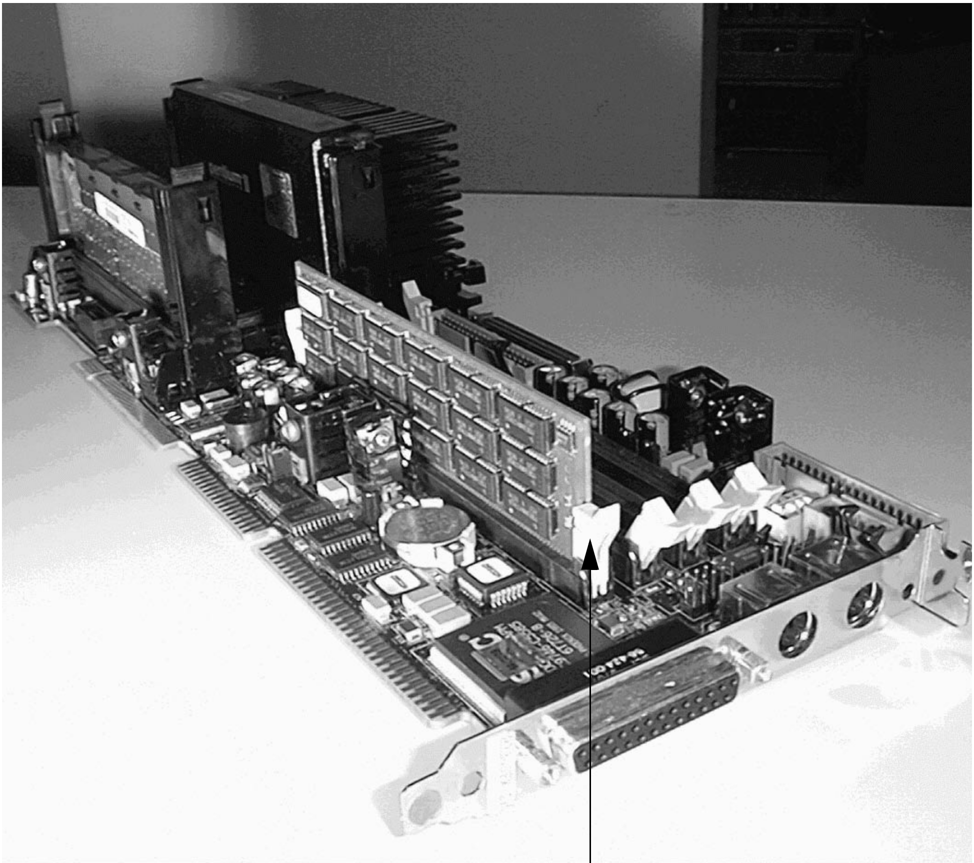
Procedures covered include the following:

- replacing the SBC card
- upgrading and configuring the BIOS
- adding memory DIMMs to the SBC

Intended audience

This section is written primarily for field service technicians. It is intended to act as a guide for installing, repairing, replacing, and upgrading hardware and software components. This section assumes that the reader has basic computing skills, is familiar with necessary safety procedures, and has the hardware documentation provided by the manufacturer available as a reference. This information applies to the 1001rp server only.

The Pentium II SBC



Replacing the Pentium II SBC card

Introduction

You should replace the SBC card when it fails. Use system diagnostic tools and refer to error codes to determine whether the SBC card should be replaced.

The SBC is always installed in the SBC slot located between the ISA expansion slots and the PCI slots on the backplane. The board features headers for peripheral connections, jumper blocks, and DIP switches. It also features four DIMM sockets to support up to 512 Mbytes of Fast Page Mode memory on the Pentium II SBC.

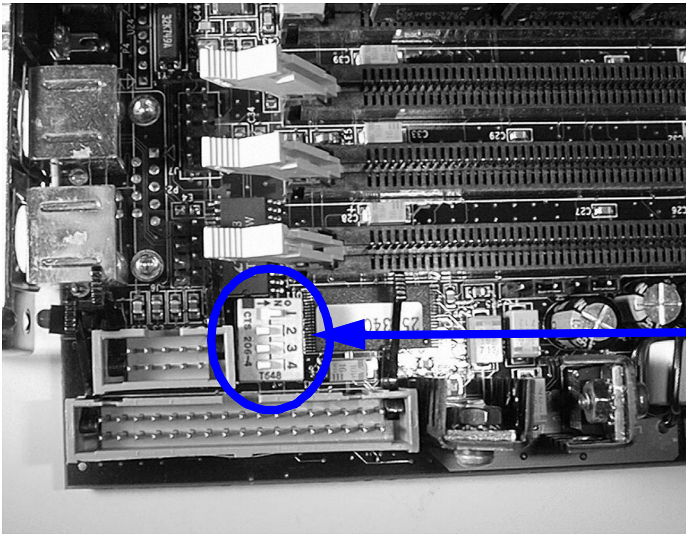
Requirements

Before replacing the SBC card, gather the following tools:

- one Phillips-head screwdriver
- one antistatic wrist strap
- the replacement SBC card
- cable labels

DIP switch block on the Pentium II SBC

The following picture shows the location of the DIP switch block. The switch settings shown are defaults. Do not change them.



DIP switch block (These are the default settings; do not change them.)

To replace the SBC card

1. Power down the server.
2. Disconnect the power cord.
3. Remove the top cover.
4. Free and label all connectors from the SBC card.
5. Loosen and remove the screw located at the top of the I/O bracket.
6. Remove the I/O bracket.
7. Loosen and remove the screw located at the top of the card's faceplate.
8. Loosen the SBC and pull it up from the backplane.
9. Remove the new card from its protective wrapping.

10 Align the card with its slot on the backplane and press it into place.

   Result: The board seats properly in both the ISA-style and PCI-style connectors.

11 Fasten the card down with the screw provided.

12 Install the new I/O bracket.

13 Fasten the I/O bracket using the screw provided.

14 Remove the labels attached to all connectors and reconnect them to the card.

15 Replace the top cover.

Upgrading the BIOS

Introduction

BIOS is the Basic Input/Output System of the computer. It is Flash ROM-based code. The system is equipped with Flash BIOS, which enables you to upgrade by running a single program that writes updated code to the Flash ROM chips.

When to configure the BIOS

BIOS configuration is necessary for first-time setup. Reconfigure the BIOS after a BIOS or CMOS failure and recovery.

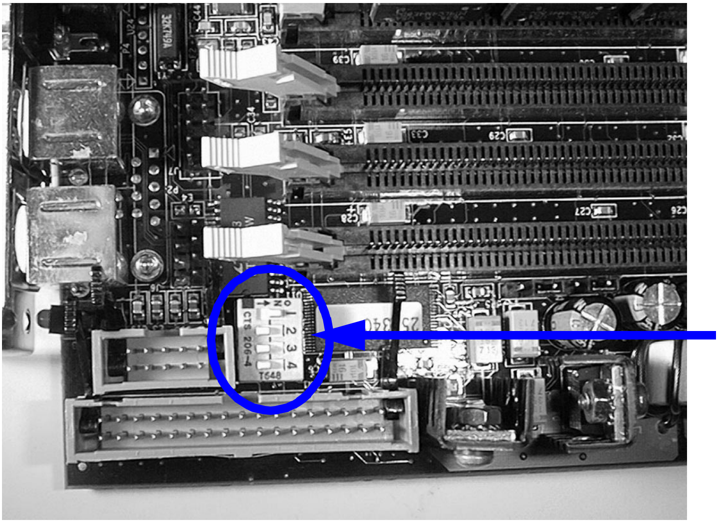
Requirements

- You need a bootable upgrade disk. For the Pentium II SBC, the Texas Micro BIOS release number must be 4.06.1.5c.

  Contact your Nortel Networks customer support representative organization to request a BIOS upgrade disk.
- You must perform both of the following procedures to upgrade the BIOS:
  - upgrading the BIOS
  - configuring the SBC

DIP switch block on the Pentium II SBC

The following picture shows the location of the DIP switch block. To upgrade and configure the BIOS, you must change DIP switch 3 to ON. When you are done, change it back to OFF.



DIP switch block (Change DIP switch 3 to ON only when you need to upgrade and configure the BIOS.)

To upgrade the BIOS

1 Insert the bootable BIOS upgrade disk into drive A and power on the server.

   Note: You can obtain a BIOS upgrade disk from your Nortel Networks customer representative.

2 Allow the flash process to complete.

3 Power down the system.

4 Remove the top cover.

5 Set DIP switch 3 to the ON position.

6 Power on the server.

   Result: A message appears on the boot screen that the system is loading BIOS defaults.

7 Power off the server after seeing the above message.

8 Return DIP switch 3 to the OFF position.

9 Replace the top cover.

10 Restart the system.

11 Configure the BIOS as described in the following procedure.

To configure the Pentium II SBC BIOS

1 Power on the system, and then press F2 to enter the CMOS Setup.

Note: For the following steps, use the arrow keys to navigate menus, and press Enter to make a selection.

Result: The Setup Utility starts. The screen has two areas:

- Options: The Options menu is on the left side of the screen, and is composed of Basic options, Advanced options, and PCI options.
- Summary Information: The current settings appear on the right side of the screen.

2 Press F9 to accept the default values.

3 Press Enter when prompted to confirm this change.

4 Change values as required for CallPilot. Refer to the BIOS tables, starting with "Pentium II BIOS basic options" on page 305.

5 Save and exit the CMOS Setup.

Crisis recovery

There are special cases when the BIOS data is corrupted or an invalid user configuration has been entered because an incorrect BIOS file has been flashed. In some cases, the SBC does not start at all or it displays nothing on the screen.

To recover the BIOS

1 Use the Nortel Network's NTRH8042 disk to create the Crisis recovery disk.

a. In DOS mode, copy the contents of the NTRH8042 disk on a temporary directory.

b. Label a new disk Crisis Recovery.

c. Insert the Crisis Recovery disk into drive A.

d. At the DOS prompt, type **crisdisk**.

e. Press Enter.

f. After the disk is done, at the DOS prompt, type **makeboot**.

g. Press Enter. Power off the server.

2 Identify Switch Block (SW1) on the SBC. The Switch Block contains four M access, CMOS RAM, and configuration ports. Set dip switch number 2 to the closed/on position.

Note: The default position set on the switch is open/off.

3 Insert the Crisis Disk into the floppy drive.

4 Power on the server.

Result: You hear a series of beeps.

Note: During this process, the only devices that work are the floppy controller, floppy drive, and speaker. There is no display.

5 When you do not hear any beeps (approximately 15 seconds), remove the disk and power off the server.

6 Return switch number 2 back to the default position of open/off.

7 Power on the server.

Result: The SBC should restart normally and prompt you to enter into setup.

Pentium II BIOS basic options

Note: Items that require CallPilot-specific settings are in bold.

Item	Option	Default setting	CallPilot setting
Time and Date	**Set time and date**	**N/A**	**Current Date/ Time**
Floppy Disks	Floppy Controller	Enabled	Enabled
	Select drive A Type	3.5” 1.44 Mbytes	3.5” 1.44 Mbytes
	Select drive B Type	Not Installed	Not Installed
IDE Adapter 0	Master	CD-ROM	CD-ROM
	Slave	None	None
IDE Adapter 1	Master	None	None
	Slave	None	None
Fixed Disks	IDE Controller Setup	Primary (1F0-1F7h)	Primary (1F0-1F7h)
	Auto Detect IDE Drives	Enabled	Enabled
	Large Disk DOS Compatible	Enabled	Enabled
	Set Hard Disk 1/2 / 3/4 Type	N/A	N/A

Item	Option	Default setting	CallPilot setting
Cache Memory	Memory Cache	Enabled	Enabled
	Cache System BIOS area	Write protect	Write protect
	Cache Video BIOS area	Write protect	Write protect
	Cache Base 0–512 kbytes	Write back	Write back
	Cache Base 12 kbytes–640 kbytes	Write back	Write back
	Cache Extended Memory area	Write back	Write back
	Cache A000–AFFF	Disabled	Disabled
	Cache B000–BFFF	Disabled	Disabled
	Cache C800–CBFF	Disabled	Disabled
	Cache CC00–CFFF	Disabled	Disabled
	Cache D000–D3FF	Disabled	Disabled
	Cache D400–D7FF	Disabled	Disabled
Boot Options	Summary screen	Enabled	Enabled
	Floppy check	Enabled	Enabled
	Quiet boot	Disabled	Disabled
	Post errors	Disabled	Disabled

Item	Option	Default setting	CallPilot setting
Keyboard features	Numlock	Auto	Auto
	Key click	Disabled	Disabled
	Keyboard auto repeat rate	30/sec	30/sec
	Keyboard auto repeat delay	1/2 sec	1/2 sec
System Memory	Verify only		
Extended Memory	Verify only		

Pentium II BIOS advanced options

Note: Items that require CallPilot-specific settings are in bold.

Item	Option	Default setting	CallPilot setting
Integrated Peripherals	Serial Port A	Enabled	Enabled
	Serial Port A: Base I/O Address	3F8	3F8
	Serial Port A: Interrupt	IRQ 4	IRQ 4
	Serial Port B	Enabled	Enabled
	Serial Port B: Mode	Normal	Normal
	Serial Port B: Base I/O Address	2F8	2F8
	Serial Port B: Interrupt	IRQ 3	IRQ 3
	Parallel Port	Enabled	Enabled
	Parallel Port: Mode	Bidirectional	Bidirectional
	Parallel Port: Base I/O Address	378	378
	Parallel Port: Interrupt	IRQ 7	IRQ 7
	Floppy Disk Controller	Enabled	Enabled
	Floppy Disk Controller: Base I/O Address	Primary	Primary

Item	Option	Default setting	CallPilot setting
Integrated Peripherals (continued)	Local Bus IDE Adapter	Enabled	Enabled
	Adaptec Ultra SCSI Adapter	Disabled	Enabled for non-RAID Disabled for RAID
	SCSI Adapter Frequency **Note**: This is only an option if the Adaptec Ultra SCSI Adapter is enabled.	40 MHz	40 MHz

Item	Option	Default setting	CallPilot setting
Advanced Chipset Control	DRAM Speed	nothing displayed	Do not change.
	ECC/Parity Config	**ECC Gen & Correct**	**Parity Gen & Correct**
	Enable Memory Gap	Disabled	Disabled
	Release E000	Disabled	Disabled
	DMA Aliasing	Enabled	Enabled
	8-bit I/O Recovery	4.5	4.5
	16-bit I/O Recovery	4.5	4.5
	ISA Bus Speed	PCI Clock / 4 (8.33 MHz)	PCI Clock / 4 (8.33 MHz)
	Watchdog Timer Status	Disabled	Disabled
	Watchdog Timer Delay	150 ms	150 ms

Item	Option	Default setting	CallPilot setting
PCI configuration	PCI IRQ Line 1	IRQ 9	IRQ 9
	PCI IRQ Line 2	IRQ 10	IRQ 10
	PCI IRQ Line 3	IRQ 11	IRQ 11
	PCI IRQ Line 4	IRQ 15	IRQ 15
	ISA Graphics Device Installed	No	Yes
	PCI/PNP ISA UMB Region Exclusion C800 - DFFF	Available	Available
	PCI/PNP ISA IRQ Resource Exclusion: IRQ3, IRQ4, IRQ5, IRQ7, IRQ9, IRQ10, IRQ11, IRQ12, IRQ14, IRQ15	**Available**	**Reserve IRQ5 if installing ISA CLAN card.**
PS/2 Mouse		Enabled	Enabled
Onboard Speaker		Enabled	Enabled

Item	Option	Default setting	CallPilot setting
Use Multiprocessor Spec		**1.1**	**1.4**
CPU BIOS Update		Enabled	Enabled
Plug & Play OS		No	No
Secured Setup Configuration		Yes	Yes
Large Disk Access Mode		DOS	DOS

Pentium II BIOS security options

Note: Items that require CallPilot-specific settings are in bold.

Item	Option	Default setting	CallPilot setting
Supervisor Password is		Clear	Clear
User Password is		Clear	Clear
Set Supervisor Password		**Clear**	**Enter**
Set User Password		**Clear**	**Enter**

Item	Option	Default setting	CallPilot setting
Password on Boot		Disabled	Disabled
Fixed Disk Boot Sector		Normal	Normal
Disk Access		Supervisor	Supervisor
Virus Check Reminder		Disabled	Disabled
System Backup Reminder		Disabled	Disabled

Pentium II BIOS power options

Note: Default values are also the required CallPilot settings.

Item	Option	Default setting	CallPilot setting
Power Savings		Disabled	Disabled
Standby Timeout		Off	Off
Auto Suspend Timeout		Off	Off
Hard Disk Timeout		Disabled	Disabled
Video Timeout		Disabled	Disabled
Resume on Modem Ring		Off	Off
Resume on Time		Off	Off

Pentium II BIOS boot options

Note: Items that require CallPilot-specific settings are in bold.

Default settings	CallPilot setting
Disk Drive	Disk Drive
Hard Drive	**ATAPI CD-ROM Drive**

Default settings	CallPilot setting
ATAPI CD-ROM Drive	**Hard Drive**

Hard drive	Option
Hard Drive	SCSI Hard Drive

Pentium II BIOS server options

Note: Items that require CallPilot-specific settings are in bold.

Item	Option	Default setting	CallPilot setting
Console Redirect Port		Disabled	Disabled
Console Redirect Baud Rate		9600	**57600**

IRQ mapping table

Refer to “IRQ mapping table” on page 357.

Replacing a Pentium II with a Pentium III SBC card

Introduction

You should replace the Pentium II SBC card when it fails or when a Pentium III upgrade is desired. Use system diagnostic tools and refer to error codes to determine whether the SBC card should be replaced.

The Pentium III SBC is always installed in the SBC slot located between the ISA expansion slots and the PCI slots on the backplane. The board provides headers for peripheral connections, jumper blocks, and DIP switches. It also provides two DIMM sockets to support up to 512 Mbytes PC100 SDRAM.

DANGER

Risk of electric shock
High current inside the chassis can cause severe injury.

CAUTION

Risk of equipment damage
Take precautions to protect internal components. Electrostatic discharge (ESD) can render boards damaged or unusable. Wear an ESD wrist strap.

CAUTION

Risk of equipment damage
Handle the SBC carefully. If you drop the SBC, it can be damaged irreparably.

Intended audience

This section is written primarily for field service technicians. It is intended to act as a guide for installing hardware and software components. This section assumes that the reader has basic computing skills, is familiar with necessary safety procedures, has knowledge and experience of PC hardware, and has the hardware documentation provided by the manufacturer available as a reference. This information applies to the 1001rp server only.

What this section contains

The section contains the following:

- cautionary guideline (below)
- materials you need (page 318)
- procedure overview (page 318)
- adding memory DIMMs to the Pentium III SBC (page 319)
- replacing the Pentium II SBC card with a Pentium III SBC card (page 322)

When you have completed the SBC card replacement, configure the BIOS on the Pentium III SBC card (see “Configuring the 1001rp Pentium III BIOS” on page 335).

Cautionary guideline

If the SBC crashed, then the operating system and installed applications are probably corrupted. If this procedure is applied as a performance upgrade, you must reinstall the operating system and application, as the new SBC is equipped with a new processor and chipset.

The system may work with a simple swap of boards. However, the stability of the system may be affected and unexpected behavior can occur. Therefore, a full reinstall is always necessary.

CAUTION

Risk of system corruption
A full reinstall of the system as detailed below must be performed. Failure to do so can result in system corruption.

Materials you need

Before replacing the SBC card, gather the following items:

- one Phillips-head screwdriver
- one antistatic wrist strap
- the replacement SBC card
- SDRAM P100 DIMMs with gold-plated edge connectors (these are the memory module(s) for the Pentium III card)
- cable labels

Procedure overview

1. Gather the required materials.
2. Back up the system.

   This is applicable only if an upgrade is being performed. If the original server has had a recent backup, then go to the next step. If the SBC has crashed, then you must use a previous backup. Refer to chapter 6, “Performing system backups,” in the *Monitoring and Security Guide* for details.
3. Install DIMM(s) on the new Pentium III SBC.

   Note: You must place the Pentium III card on a flat surface, and then perform the procedure.
4. Remove the Pentium II SBC.

5 Install the new Pentium III SBC.

6 Configure the BIOS of the new Pentium III SBC.

7 Reconfigure RAID packs.

Note: This is applicable if the system has RAID packs.

8 Install DOS and Windows NT 4.0.

9 Install CallPilot.

10 Restore data from the backup.

Adding 1001rp Dual Inline Memory Modules

Dual Inline Memory Modules (DIMMs) SDRAM P100 are the memory modules that you must add to the SBC before the SBC is installed in the server. The gold-plated edge connectors on DIMMs are designed to plug into matching edge-connector slots. The design allows you to add or remove these modules repeatedly without tools or damage.

Install P100 SDRAM DIMMs on the Pentium III SBC. Installation of any other kind of memory will damage your system.

Capacity

Use a 168-pin Error Correction Control (ECC) SDRAM utilizing DIMM technology. A module has a capacity of 32, 64, 128 , or 256 Mbytes.

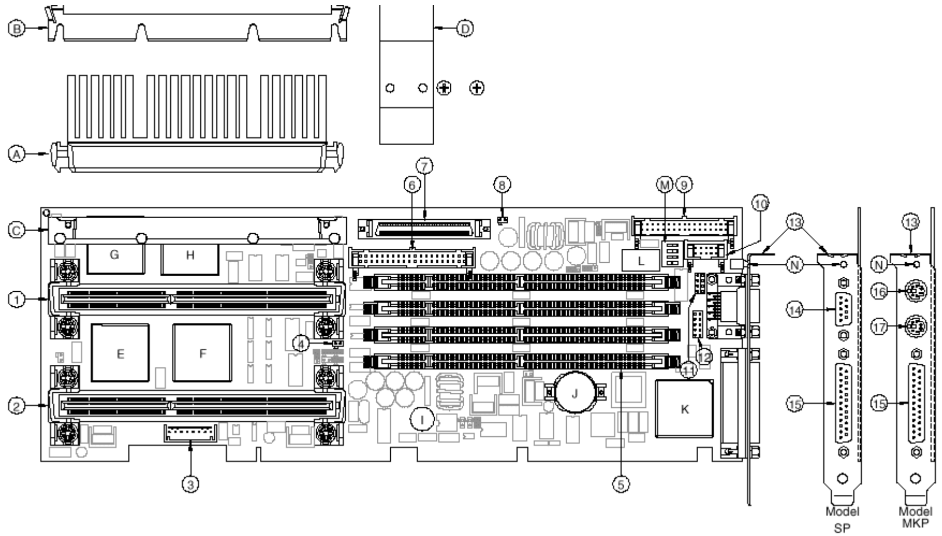
SDRAM DIMMs require only one slot filled to compose a bank. There are two slots or banks on the SBC. Nortel Networks recommends that bank 0 (DIMM 1) be filled to enable troubleshooting procedures.

Install up to 512 Mbytes of memory. These are P100 FSB SDRAM DIMMs, also known as memory modules.

Socket location

To determine the location of the DIMM sockets on the SBC cards, refer to the diagrams that follow.

Pentium II SBC

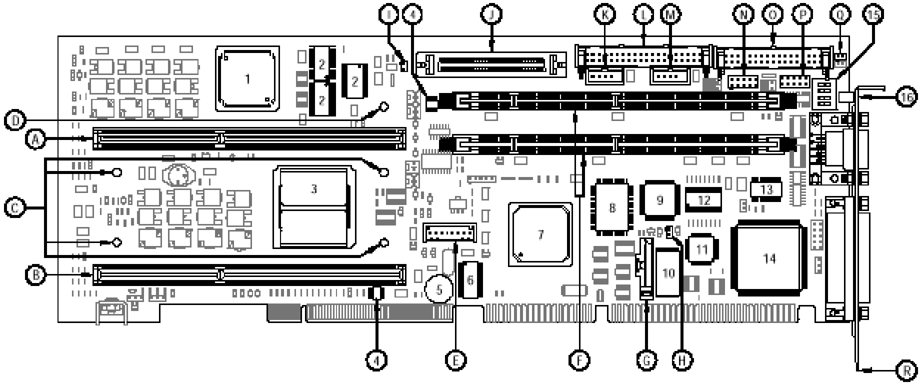


A. Intel Pentium II Processor with Heatsink
B. Heatsink Support Top Bar
C. Heatsink Support Base
D. Heatsink Stabilizer with Mounting Screws
   Note: For dual processors only.
E. Intel 82441FX PCI and Memory Controller (PMC)
F. Intel 82442FX Data and Bus Accelerator (DBX)
G. Adaptec AIC-7880 UltraSCSI Host Adapter
H. Intel 82371SB PCI I/O IDE Accelerator (PIIX3)
I. Speaker
J. Battery for CMOS Real Time Clock
K. SMC FDC37C935APM Ultra I/O Controller with Advanced Power Management
L. Intel 28F002BV-T Flash Device
M. DIP Switch Block
N. Temperature LED

Note: Intel 82093AA I/O Advanced Programmable Interrupt Controller (IOAPIC) is obscured by Heatsink Support Base.

1. Primary Pentium II Processor Socket
2. Secondary Pentium II Processor Socket
3. AT Keyboard Header
4. External Temperature Monitor Header
5. DIMM Sockets
6. EIDE Header
7. SCSI Header
8. IDE/SCSI Drive Activity LED Header
9. Floppy Drive Header
10. Serial Port 2 Header
11. USB Port 1 & Port 2 Headers
12. PS/2 Mouse Header (Model SP), or Serial Port 1 Header (Model MKP)
13. I/O Bracket
14. Serial Port 1 Connector (Model SP)
15. Parallel Port Connector (Models SP & MKP)
16. PS/2 Keyboard Connector (Model MKP)
17. PS/2 Mouse Connector (Model MKP)

Pentium III SBC



1. Adaptec AIC-7890 SCSI Host Adapter
2. Ultra2 LVD/SE SCSI Terminators (3)
3. Intel 82443BX System Controller with Heatsink
4. Maxim MAX1617 Temperature Sensor (2)
5. Speaker
6. ICS 9148CF-20 Clock Synthesizer
7. Intel 82371EB PIIX4
8. Intel 82093AA IOAPIC
9. Altera MAX EPM7128S PLD
10. 4 Mb Flash Memory Device
11. National LM79CCVF System Monitor
12. ICS 9179BF-01 SDRAM Clock Buffer
13. Maxim MAX3185 Serial Port
14. SMSC FDC37C935 Ultra I/O Controller
15. DIP Switch Block
16. Temperature LED

A. Primary Pentium III Processor Connector
B. Secondary Pentium III Processor Connector
C. Processor Retention Base Mounting Holes
D. Mounting Hole (Future Expansion)
E. Keyboard/Speaker/Reset Header
F. DIMM Sockets (2)
G. CR2032 Li/MnO_2 System Battery
H. SM Bus Expansion Header
I. IDE/SCSI Activity LED Header
J. SCSI Header
K. USB0 Header
L. EIDE Header
M. USB1 Header
N. Serial Port 1 / PS/2 Mouse Header
O. FDD Header
P. Serial Port 2 Header
Q. Temperature Monitor Header
R. I/O Bracket

To add SDRAM DIMMs to the SBC card

1 Place the Pentium III SBC on a flat surface.

2 Orient the DIMM so that the two notches in the bottom edge of the DIMM align with the keyed slot.

3 Insert the bottom edge of the DIMM into the slot and press down firmly on the DIMM until it seats correctly.

CAUTION

Risk of equipment damage

When installing a DIMM in slot 1, the IDE locking latch may get in the way and cause a memory chip to snap out of the board.

When the DIMM seats correctly, the release tabs lock back to an upright position. If the DIMM does not seat correctly, remove it and reinstall. Do not force the locking tabs to close.

4 Repeat the above two steps to install an additional DIMM.

To replace the SBC card

1 Power down the server.

2 Disconnect the power cord.

CAUTION

Risk of damage to FDD and IDE cables

When removing or plugging the FDD and IDE cables, ensure that you unlock them first by pressing on the latches holding them in place. If you pull these cables without unlocking them, you can damage them.

3 Remove the top cover.

4 Disconnect and label all connectors from the SBC card.

5 Remove the screw located at the top of the I/O bracket.

Note: This step is optional. The I/O bracket is the same for the Pentium II and the Pentium III SBC; therefore, it is not necessary to replace it. However, you are provided with a new I/O bracket with the Pentium III SBC.

6 Remove the I/O bracket.

Note: You may need to remove additional cards inserted beside the SBC to have access to the bracket. This step is also optional as explained in the note to the previous step.

7 Remove the screw located at the top of the card's faceplate.

8 Loosen the SBC.

Hold the SBC card at the front and rear ends, and slowly pull it halfway up from the slot.

9 Without removing the card completely, do the following:

a. Disconnect the keyboard/reset cable from under the processor unit.

b. Disconnect the serial port cables.

Label and remember where PIN 1 goes.

10 Pull the card out of the chassis.

ATTENTION Ensure that the EMI gasket (where the metal bracket is located) is not damaged when pulling the card out.

11 Unscrew the media drive bay and slide it out a little.

Do not force it out.

12 Disconnect the IDE floppy disk drive, the CD-ROM drive, and the tape drive power and I/O cables.

Label each cable so you remember where to reconnect it when reassembling the pieces.

13 Slide the media drive bay out of the server.

14 Disconnect the IDE CD-ROM cable and discard it.

Note: This is a grey cable 55.9 cm (22 inches) in length. When reconnecting, use the new IDE blue cable provided. The new IDE cable is 78.7 cm (31 inches) in length.

15 Route the new 78.7 cm (31-inch) IDE blue cable from the media bay up through the slot in the metalwork and to the location of the SBC slot.

16 Slide the media drive chassis gently into the media bay.

Leave enough space to reconnect the power and I/O cables for the IDE floppy disk drive, CD-ROM drive, and tape drive.

17 Reconnect the power and I/O cables for the IDE floppy disk drive, CD-ROM drive, and tape drive.

ATTENTION

Ensure that PIN 1 on the I/O cable is in the correct position. PIN 1 on the cable is marked with a colored stripe. PIN 1 on the drive connector is marked with a small square or triangle. The cable is generally keyed.

18 Slide the media drive chassis completely in, and screw it into place.

DANGER

Risk of explosion

The SBC has a lithium battery installed. If you are discarding the SBC, dispose of used batteries according to the manufacturer’s instructions.

19 Ensure that DIMM(s) have been installed on the SBC.

CAUTION

Risk of equipment damage

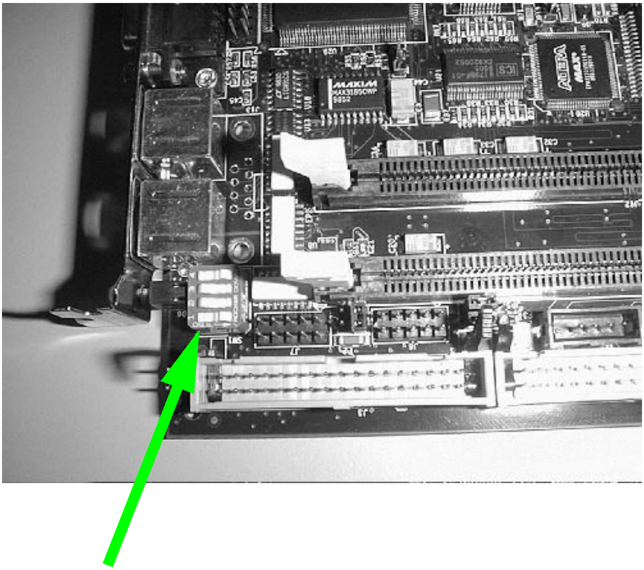
Do not install memory modules (DIMMs) from a Pentium II SBC on a Pentium III SBC.

20 Identify the Switch Block (SW1) location on the SBC with the help of the picture that follows on page 325. The Switch Block contains four DIP switches (1-4) that you configure affecting on-board ROM access, CMOS RAM, and configuration ports.

a. Ensure DIP switch number 1 is set to the closed/on position.

b. Set DIP switch number 4 to the closed/on position. This setting ensures that configuration ports are set to I/O address 370–373.

Note: DIP switches 2 and 3 should be open/off.

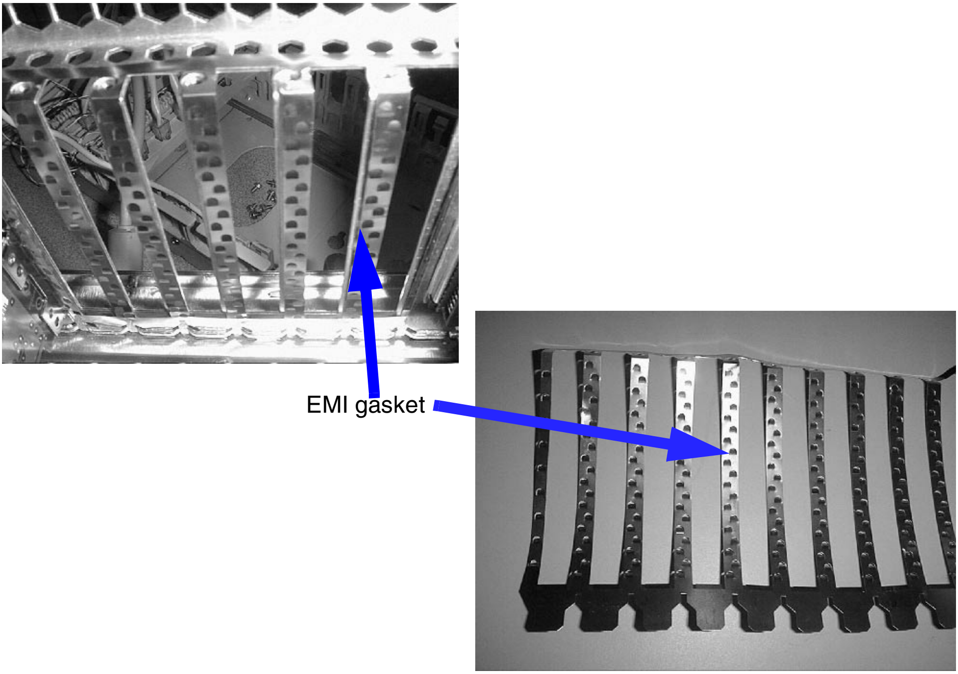


Switch Block (SW1) DIP switch showing the correct configuration

21 Align the card with its slot on the backplane about halfway. This permits reconnection of the keyboard/reset cable and serial port cables.

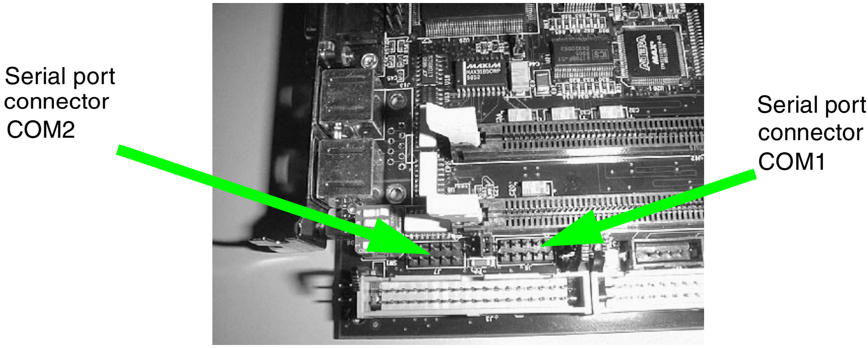
ATTENTION

Ensure that the EMI gasket located near the metal bracket is not damaged in the process.



22 Reconnect the serial port cables.

PIN 1 is the square pad. The square pad can be identified by examining the bottom of the SBC.



CAUTION

Risk of equipment damage

Ensure that you check the jumper block directly under the CD-ROM IDE cable. This is on the SBC card opposite the colored strip. Sometimes the CD-ROM connector lock-latch bends the pins under the IDE connector.

Note that the latest releases or versions of the board may not have latches.

23 Gently reinsert the SBC in the slot and push in firmly until the unit is properly seated.

Result: The board seats properly in both the ISA-style and PCI-style connectors.

24 Fasten the card down with the screw provided.

25 Connect the new IDE blue cable.

Note: This cable was installed at step 15.

26 Install the new I/O bracket.

Note: This step and the next step are optional. You can use the old I/O bracket.

27 Fasten the I/O bracket using the screw provided.

28 Remove the labels attached to all connectors and reconnect them to the card.

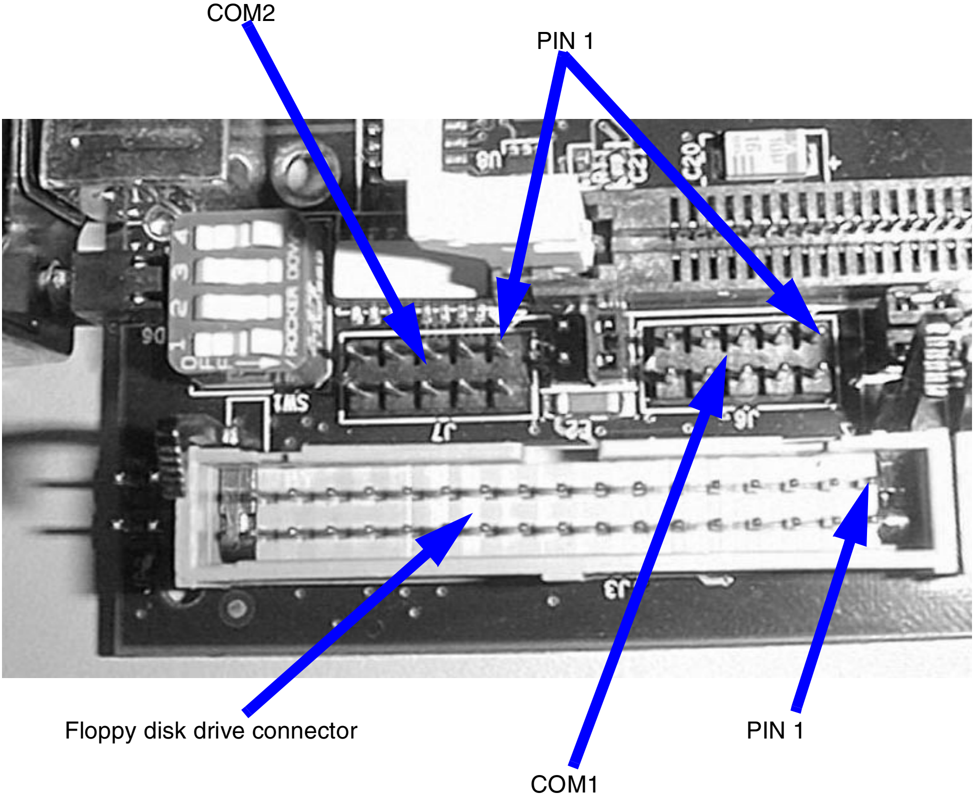
CAUTION

Risk of equipment damage

When plugging cables, ensure that they are correctly keyed and that pins are not bent. For example, if the IDE cable is plugged in reversed, the system will not start.

a. Connect the bottom cable from the COM port I/O to COM1 on the SBC (serial port 1).

Ensure that the red stripe on the cable aligns with PIN 1 on the connector.



b. Connect the top cable from the COM port I/O to COM2 on the SBC (serial port 2).

Ensure that the red stripe on the cable aligns with PIN 1 on the connector. Refer to the picture above for the location of PIN 1.

c. Connect the floppy disk drive cable.

Ensure that the red stripe on the cable aligns with PIN 1 on the connector. Refer to the picture above for the location of PIN 1.

d. Connect the IDE cable.

Ensure that the red stripe on the cable aligns with PIN 1 on the connector. PIN 1 is located towards the rear of the card.

29 Replace the top cover.

What's next?

Configure the BIOS. See "Configuring the 1001rp Pentium III BIOS" on page 335.

Chapter 14

Maintaining the Pentium III SBC card

In this chapter

Overview

Introduction

This section describes the Pentium III Single Board Computer (SBC) card. It covers procedures for replacing and configuring the SBC card.

The SBC card is always installed in the SBC slot located between the ISA expansion slots and the PCI slots on the backplane.

Procedures included

Procedures covered include the following:

- replacing the SBC card (page 333)
- upgrading and configuring the BIOS (page 335)
- adding memory DIMMs to the SBC (page 346)

Intended audience

This section is written primarily for field service technicians. It is intended to act as a guide for installing, repairing, replacing, and upgrading hardware and software components. This section assumes that the reader has basic computing skills, is familiar with necessary safety procedures, and has the hardware documentation provided by the manufacturer available as a reference.

Replacing the Pentium III SBC card

Introduction

Use system diagnostic tools and refer to error codes to determine whether the SBC card should be replaced. This section provides instructions for replacing the SBC card.

Requirements

Before replacing the SBC card, gather the following tools:

- one Phillips-head screwdriver
- one antistatic wrist strap
- the replacement SBC card
- cable labels

To replace the SBC card

DANGER

Risk of explosion

The SBC has a lithium battery installed. If you are discarding the SBC, dispose of used batteries according to the manufacturer's instructions. Replacement of the battery with an incorrect type also raises the risk of an explosion.

1. Power down the server.
2. Disconnect the power cord.
3. Remove the top cover.
4. Free and label all connectors from the SBC card.
5. Loosen and remove the screw located at the top of the I/O bracket.

6 Remove the I/O bracket.

7 Loosen and remove the screw located at the top of the card's faceplate.

8 Loosen the SBC and pull it up from the backplane.

Note: You can now do the following:

- Replace the SBC with a new card. To replace it, continue with step 9.
- Upgrade the SBC by adding DIMM(s) to the card. To upgrade it, refer to the procedure "To add SDRAM DIMMs to the SBC card" on page 346.
- Set dip switch #3 to upgrade the BIOS.

9 Remove the new card from its protective wrapping.

10 Align the card with its slot on the backplane and press it into place.

Result: The board seats properly in both the ISA-style and PCI-style connectors.

11 Secure the card with the screw provided.

12 Install the new I/O bracket.

13 Fasten the I/O bracket using the screw provided.

14 Remove the labels attached to all connectors and reconnect them to the card.

15 Identify the Switch Block (SW1) location on the SBC. The Switch Block contains four DIP switches (1–4) that you configure affecting on-board ROM access, CMOS RAM, and configuration ports. Ensure dip switch number 4 is set to the closed/on position. This setting ensures that configuration ports are set to I/O address 370–373.

Note: The default switch setting is open/off.

16 Replace the top cover.

Configuring the 1001rp Pentium III BIOS

Introduction

BIOS is the Basic Input/Output System of the computer. It is Flash ROM-based code. The system is equipped with Flash BIOS, which enables you to upgrade by running a single program that writes updated code to the Flash ROM chips.

When to upgrade the BIOS

Do not upgrade the BIOS unless specifically instructed to do so by your Nortel Networks representative. The CallPilot server is shipped to the customer with the required minimum BIOS vintage, so an upgrade is only necessary if Nortel Networks deems this necessary to solve a system problem.

When to configure the BIOS

BIOS configuration is performed at the factory before the CallPilot server is shipped to the customer. It may be necessary to reconfigure the BIOS at a customer site after a BIOS or CMOS failure and recovery.

Requirements for upgrading or reconfiguring the BIOS

- You need a bootable upgrade disk. For the Pentium III SBC, the Texas Micro BIOS release number must be 4.06a.1.4aN1.

  If your BIOS release number is not the above version, contact your Nortel Networks customer representative to request a BIOS upgrade disk.
- You must perform both of the following procedures to upgrade the BIOS:
  - Upgrade the BIOS (page 336).
  - Configure the SBC (page 336).

To upgrade the BIOS

CAUTION

Risk of data loss

Perform this procedure only if specifically instructed to do so by your Nortel Networks representative.

1 Insert the bootable BIOS upgrade disk or CD-ROM, and then power on the server.

   Note: You can obtain a BIOS upgrade disk from your Nortel Networks customer support representative.

2 Allow the Flash process to complete.

3 Configure the BIOS as described in the following procedure.

To configure the Pentium III SBC

CAUTION

Risk of data loss

Perform this procedure only if specifically instructed to do so by your Nortel Networks representative.

1 Restart the server, and then press F2 to enter the CMOS Setup when prompted.

   Note: For the following steps, use the arrow keys to navigate menus, and press Enter to make a selection.

   Result: The Setup Utility starts. The screen has two areas:

   - Options: The Options menu is on the left side of the screen, and is composed of Basic options, Advanced options, and PCI options.
   - Summary Information: The current settings appear on the right side of the screen.

2 Press F9 to accept the default values.

3. Press Enter when prompted to confirm this change.
4. Change values as required for CallPilot. Refer to the tables that follow.
5. When you have completed the changes, save and exit the CMOS Setup.
6. Restart the server.

   Result: BIOS reconfiguration is completed.

Pentium III BIOS basic options

Item	Option	Default setting	CallPilot setting
Time and Date	Set time and date	N/A	Current Date/Time
Floppy Disks	Floppy Controller	Enabled	Enabled
	Select drive A Type	3.5” 1.44 Mbytes	3.5” 1.44 Mbytes
	Select drive B Type	Disabled	Disabled
IDE Adapter 0	Master	CD-ROM	CD-ROM
	Slave	None	None
IDE Adapter 1	Master	None	None
	Slave	None	None
Cache Memory	Memory Cache	Enabled	Enabled
	Cache System BIOS area	Write protect	Write protect
	Cache Video BIOS area	Write protect	Write protect
	Cache Base 0–512 kbytes	Write back	Write back
	Cache Base 512–640 kbytes	Write back	Write back
	Cache Extended Memory area	Write back	Write back
	Cache (all ranges)	Disabled	Disabled

Item	Option	Default setting	CallPilot setting
Boot Options	Summary screen	Enabled	Enabled
	Floppy check	Enabled	Enabled
	Quiet boot	Disabled	Disabled
	Post errors	Disabled	Disabled
	Hard disk pre-delay	Disabled	Disabled
Keyboard features	Numlock	Auto	Auto
	Key click	Disabled	Disabled
	Keyboard auto repeat rate	30/sec	30/sec
	Keyboard auto repeat delay	1/2 sec	1/2 sec
Extended Memory	Display only		
Memory Bank 0	Display only		
Memory Bank 1	Display only		
Memory Bank 2	Not installed		

Pentium III BIOS advanced options

Item	Option	Default setting	CallPilot setting
Integrated Peripherals	Serial Port A	Enabled	Enabled
	Serial Port A: Base I/O Address	3F8	3F8
	Serial Port A: Interrupt	IRQ 4	IRQ 4
	Serial Port B	Enabled	Enabled
	Serial Port B: Base I/O Address	2F8	2F8
	Serial Port B: Interrupt	IRQ 3	IRQ 3
	Parallel Port	Enabled	Enabled
	Parallel Port: Mode	Bidirectional	Bidirectional
	Parallel Port: Base I/O Address	378	378
	Parallel Port: Interrupt	IRQ 7	IRQ 7
	Floppy Disk Controller	Enabled	Enabled
	Floppy Disk Controller: Base I/O Address	Primary	Primary
	Local Bus IDE Adapter	Enabled	Enabled

Item	Option	Default setting	CallPilot setting
Integrated Peripherals (continued)	Adaptec Ultra-2 SCSI Adapter	Disabled (for RAID system)	Disabled (for RAID system)
Advanced Chipset Control	ECC ConfigDRAM Speed	ECC	ECC
	Enable Memory Gap	Disabled	Disabled
	Alias ISA 512 –528 Mbytes	Disabled	Disabled
	DMA Aliasing	Enabled	Enabled
	8-bit I/O Recovery	4.5	4.5
	16-bit I/O Recovery	4.5	4.5
	Watchdog Timer Status	Disabled	Disabled
	Watchdog Timer Delay	1.2 sec	1.2 sec
	ISA bus GAT	Disabled	Disabled
	PCI Delayed transactions	Enabled	Enabled

Item	Option	Default setting	CallPilot setting
PCI configuration	PCI IRQ Line 1	IRQ 9	IRQ 9
	PCI IRQ Line 2	IRQ 10	IRQ 10
	PCI IRQ Line 3	IRQ 11	IRQ 11
	PCI IRQ Line 4	IRQ 15	IRQ 15
	USB IRQ Enabled	No	No
	Latency timer	Auto	Auto
	Cache line size	Auto	Auto
	ISA Graphics Device Installed	No	No
	PCI/PNP ISA UMB Region Exclusion C800–DFFF	Available	Available
	PCI/PNP ISA IRQ Resource Exclusion: IRQ3, IRQ4, IRQ5, IRQ7, IRQ9, IRQ10, IRQ11, IRQ12, IRQ14, IRQ15	Available	
System Management	Display Only	Verify	Verify

Item	Option	Default setting	CallPilot setting
System Management Control	System Alarm Temperature	40	60
	CPU Alarm Temperature	110	
	Thermo Duty Cycle	37.5%	
	View Event Log	Enter	
	Clear All Event Logs	No	
PS/2 Mouse		Enabled	Enabled
On-board Speaker		Enabled	Enabled
Use Multiprocessor Spec		1.1	1.4
CPU BIOS Update		Enabled	Enabled
Plug & Play OS		No	No
Secured Setup Configuration		Yes	Yes
Reset configuration data		No	No
Large Disk Access Mode		DOS	DOS

Pentium III BIOS security options

Item	Option	Default setting	CallPilot setting
Supervisor Password is		Clear	Clear
User Password is		Clear	Clear
Set Supervisor Password		Enter	Enter
Set User Password		Enter	Enter
Password on Boot		Disabled	Disabled
Fixed Disk Boot Sector		Normal	Normal
Disk Access		Supervisor	Supervisor
Virus Check Reminder		Disabled	Disabled
System Backup Reminder		Disabled	Disabled

Pentium III BIOS power options

Item	Option	Default setting	CallPilot setting
Power Savings		Disabled	Disabled
Standby Timeout		Off	Off
Auto Suspend Timeout		Off	Off
Hard Disk Timeout		Disabled	Disabled
Video Timeout		Disabled	Disabled
Resume on Modem Ring		Off	Off
Resume on Time		Off	Off
Resume time		00:00:00	00:00:00

Pentium III BIOS boot options

Default settings	CallPilot setting
Diskette Drive	Diskette Drive
Hard Drive	ATAPI CD-ROM Drive
ATAPI CD-ROM Drive	Hard Drive
Removable Devices	Removable Devices
Network Boot	Network Boot

Device	Option
Hard drive	Bootable add-in card
Removable Devices	Legacy floppy drive

Pentium III BIOS server options

Item	Option	Default setting	CallPilot setting
Console Redirect Port		Disabled	Disabled
Console Redirect Baud Rate		9600	

IRQ mapping table

Refer to “IRQ mapping table” on page 357.

Replacing or adding Dual Inline Memory Modules

Introduction

The Dual Inline Memory Modules (DIMMs) are located on the SBC. The gold-plated edge connectors on DIMMs are designed to plug into matching edge-connector slots. The design allows you to add or remove these modules repeatedly without tools or damage. Install DIMMs on the SBC only.

Capacity

The supported memory is the 168-pin Error Correction Control (ECC) SDRAM utilizing DIMM technology. A module has a capacity of 32, 64, 128, or 256 Mbytes.

Ensure that bank 0 (DIMM 1) is filled first to enable troubleshooting procedures. Install up to 512 Mbytes of memory. These are P100 FSB SDRAM DIMMs.

Requirements

To add DIMMs to the card, you require the following:

- an antistatic wrist strap
- DIMMs with gold-plated edge connectors

To add SDRAM DIMMs to the SBC card

1 Remove the SBC card from the server and lay it down on a flat surface.

Note: To remove old DIMMs, perform steps 2 to 4. To add new DIMMs, go to step 5.

2 Push the DIMM release tab outwards at both sides of the DIMM to be removed.

3 Hold the DIMM by its edges, being careful not to touch its components. Remove the DIMM by lifting it away from its slot. Store it in an antistatic package.

4 Remove other DIMMs as necessary.

5 Orient the DIMM so that the two notches in the bottom edge of the DIMM align with the keyed slot.

6 Insert the bottom edge of the DIMM into the slot, and press down firmly on the DIMM until it seats correctly.

CAUTION

Risk of equipment damage

When installing a DIMM in slot 1, the IDE locking latch may get in the way and cause a memory chip to snap out of the board.

When the DIMM seats correctly, release tabs lock back to an upright position. If the DIMM does not seat correctly, remove it and reinstall. Do not force the locking tabs to close.

7 Repeat the above two steps to install each additional DIMM.

8 Replace the SBC card in the server.

Appendix A

1001rp reference material

In this chapter

Server features

Introduction

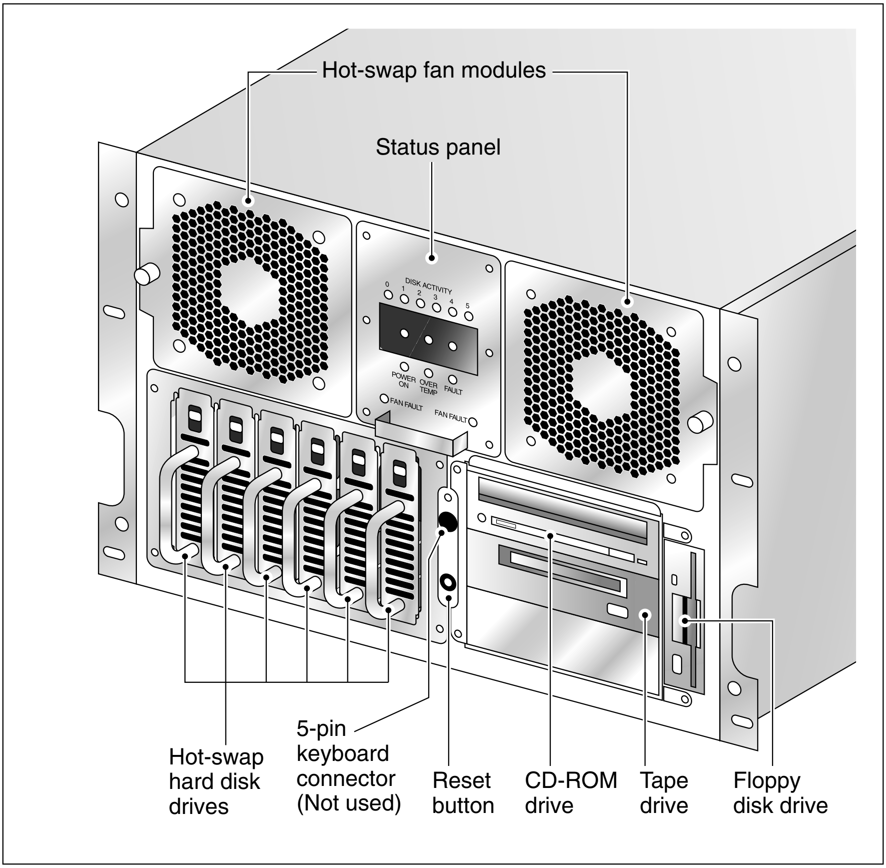
This section provides a general overview of the 1001rp server.

Server dimensions and weight

Height	32 cm (12.5 in.)
Width	48.3 cm (19 in.)
Depth (distance from front to back)	
■ without front bezel	49.5 cm (19.5 in.)
■ with front bezel	53.3 cm (21 in.)
Weight of fully loaded system	45.5 kg (100 lbs)

Front panel features (front view without the front bezel)

The front view of the 1001rp server chassis shows redundant dual fans to the left and the right of the status panel. The left drive bay holds six SCSI hard drives with hot-pluggable carriers. The media drive bay, located to the right, houses the CD-ROM, tape drive, and floppy disk drive.

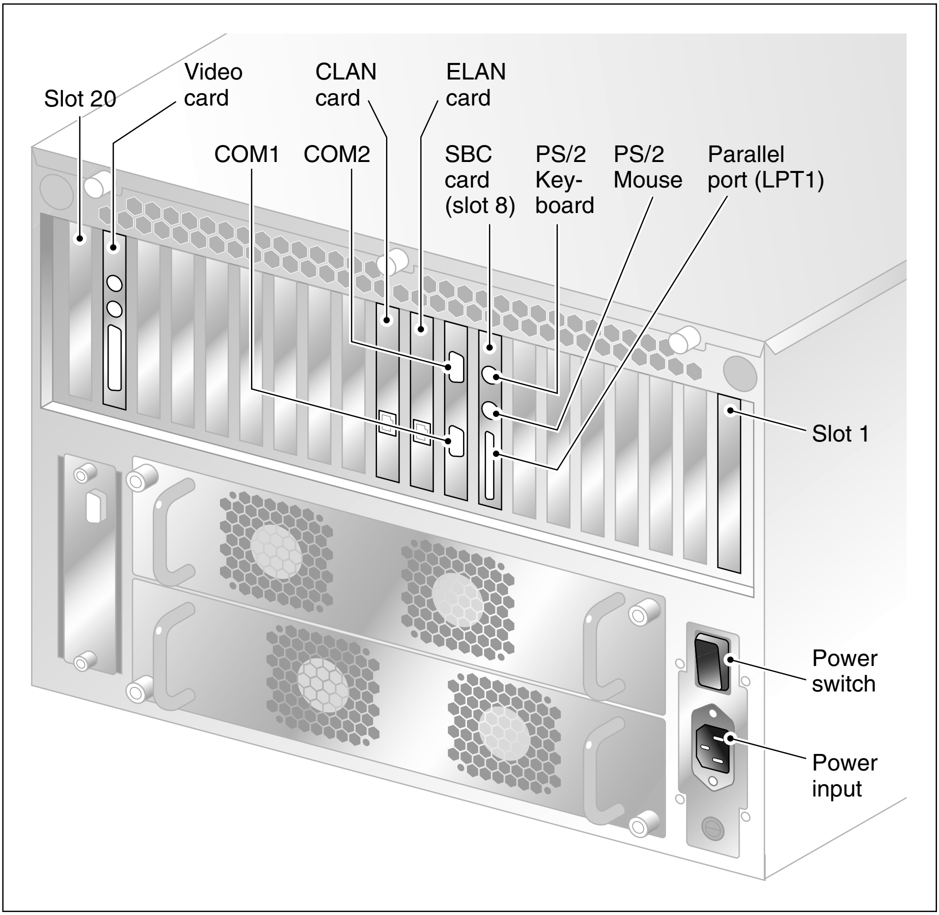


G100697

Rear panel diagram and slot locations

Rear panel diagram

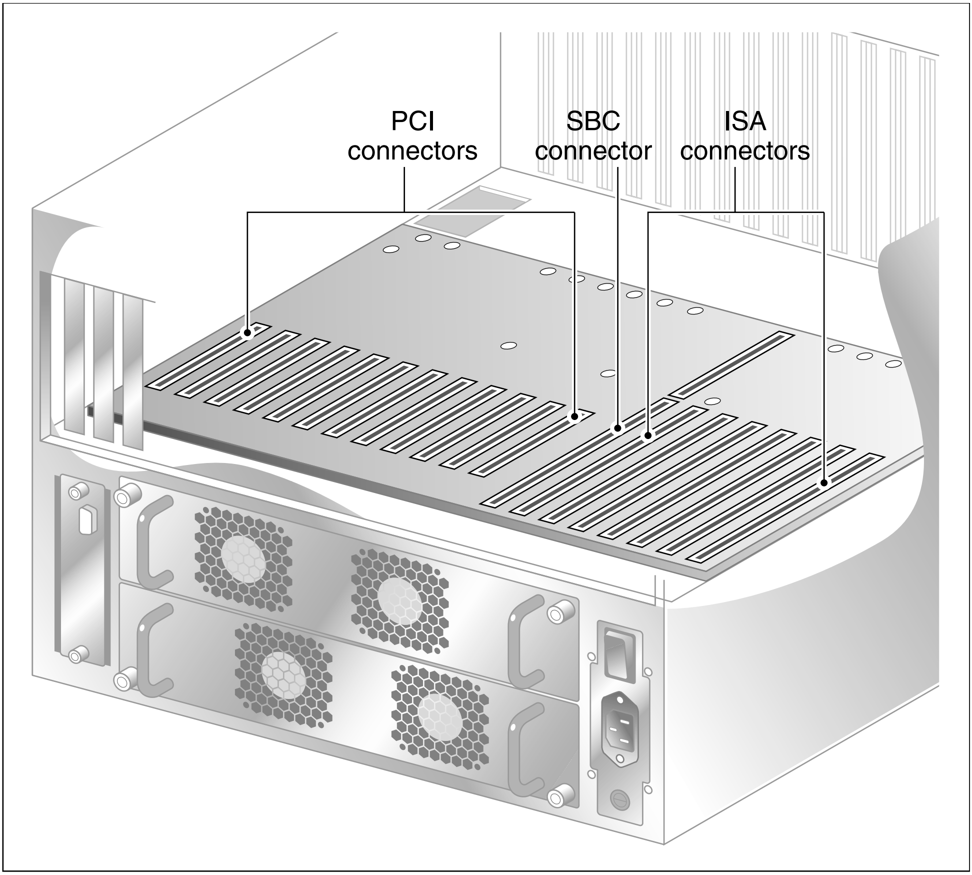
The following diagram shows the slot locations in the rear panel:



G101720

Overhead view of empty server showing PCI and ISA connectors

The following diagram shows the location of the PCI, SBC, and ISA connectors inside the server. The view in the diagram is from the rear of the server. For slot assignments, see "Slot assignments" on page 354.You must be able to identify slot locations for later steps in the CallPilot installation.



G101740

Slot assignments

Introduction

The slot assignment tables show the following:

- the physical location of boards inside the server, relative to other boards
- the order in which boards are installed (for example, board #1, 2, 3, and so on)
- how the boards are represented in some CallPilot Manager applications (such as the Maintenance Administration page)
- the maximum capacity for each switch connectivity

Note: Your server may vary depending on what was ordered from Nortel Networks. Therefore, your server may not have all of the slots populated.

Slot definition and slot numbering

In these tables, the term “slot” refers to the available slot openings in the chassis, not the PCI or ISA connectors inside the server.

Look at the server from the rear (see “Rear panel diagram” on page 352). The slots are numbered from right to left, 1 to 20. Now, look at the server from the front. The slots are numbered from left to right.

Slot assignments

Slot number	CallPilot-assigned board label[a]	Meridian 1	Succession CSE 1000
Slot 1	BRD01	Not used	Not used
Slot 2	BRD02	Not used	Not used

Slot number	CallPilot-assigned board label[a]	Meridian 1	Succession CSE 1000
Slot 3	BRD03	Not used	Not used
Slot 4	BRD04	Not used	Not used
Slot 5	BRD05	Not used	Not used
Slot 6	BRD06	Not used	Not used
Slot 7	BRD07	Not used	Not used
Slot 8	BRD08	Single Board Computer	Single Board Computer
Slot 9	BRD09	Reserved for COM1 and COM2 I/O bracket	Reserved for COM1 and COM2 I/O bracket
Slot 10	BRD10	ELAN Network card	ELAN Network card
Slot 11	BRD11	CLAN Network card	CLAN Network card
Slot 12[b]	BRD12	MPB16-4 board #1	MPB16-4 board #1
Slot 13	BRD13	MPB16-4 board #2 (optional)	MPB16-4 board #2 (optional)
Slot 14	BRD14	Not used	Not used
Slot 15	BRD15	Not used	Not used
Slot 16	BRD16	Not used	Not used
Slot 17	BRD17	Not used	Not used
Slot 18	BRD18	Not used	Not used
Slot 19	BRD19	VGA card (monitor connection)	VGA card (monitor connection)

Slot number	CallPilot-assigned board label[a]	Meridian 1	Succession CSE 1000
Slot 20	BRD20	PCI RAID controller	PCI RAID controller

a. On some CallPilot Manager applications, the CallPilot-assigned board label is displayed. This label corresponds to the slot number. For example, BRD12 refers to the board in slot 12.

b. For Meridian 1 and Succession CSE 1000, the first MPB16-4 board must be installed in slot 12.

IRQ mapping table

Introduction

The following table displays the assignments for each Interrupt Request Line (IRQ) with the associated slot or device. You do not need this information for installation, but you may need it for troubleshooting.

Note: IRQs 9, 10, 11, and 15 are assigned to system PCI slots, rather than to specific devices.

IRQ	Slot or device
0	Timer
1	Keyboard
2	System / Unused
3	Serial port 2 (COM2)
4	Serial port 1 (COM1)
5	Available
6	Floppy controller
7	Parallel port (LPT1)
8	Real Time Clock
9	Assigned to slots 9, 15, and 20
10	Assigned to slots 10, 13, and 19
11	Assigned to slots 11, 14, and 17
12	PS/2 mouse

IRQ	Slot or device
13	Math coprocessor
14	Primary EIDE controller
15	Assigned to slots 12, 16, and 18

Index

Numerics

A

B

C

Q

R

S

T

U

V

W

CallPilot

Installation and Configuration
Part 5: 1001rp Server Maintenance and Diagnostics

Publication number:	555-7101-218
Product release:	2.0
Document release:	Standard 1.0
Date:	October 2002

Printed in Canada

NORTEL NETWORKS™