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CallPilot

Installation and Configuration
Part 5: 1002rp Server Maintenance and Diagnostics

Product release 2.0 Standard 1.0 October 2002

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CallPilot

Installation and Configuration
Part 5: 1002rp Server Maintenance and Diagnostics

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Chapter 1

About this guide

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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 12 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 5 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 1002rp 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 33
run diagnostics on the serial ports	Chapter 4, "Using serial port diagnostic tools" on page 57
use the Event Browser, Alarm Monitor, and Maintenance page in CallPilot Manager	Chapter 5, "Using CallPilot Manager to monitor hardware" on page 69

To	See
use the following CallPilot system utilities: ■ Diagnostics Tool ■ System Monitor	Chapter 6, "Using CallPilot system utilities" on page 109

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 121
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 145
the RAID card	Chapter 9, "Maintaining an AMI MegaRAID Elite 1600 RAID system" on page 163
■ MPC-8 cards ■ MPB16-4 boards	Chapter 10, "Replacing or adding voice processing boards" on page 179
the video card, the Ethernet network interface card	Chapter 11, "Maintaining the onboard video and network cards" on page 193

To replace or install	See
memory modules, the CPU or BIOS	Chapter 12, “Maintaining the Pentium III SBC card” on page 195

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 1002rp server or for taking it out of service

Chapter 2

Troubleshooting your CallPilot system

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Overview

Introduction

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

The topics are divided as follows:

- Section A: "Startup diagnostics" on page 21
- Section B: "Troubleshooting startup problems" on page 29

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

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Startup diagnostics overview

Introduction

This section contains procedures for interpreting the startup diagnostics on the 1002rp 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 1002rp 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 1002rp server is started. POST's function is to test system components and then display status messages.

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 25 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 count	Error message	Description
1	Refresh Failure	The processor board memory refresh circuitry is faulty.
2	Parity Error	A parity error was detected in the base memory (the first block of 64 kbytes) of the system.
3	Base 64KB Memory Failure	A memory failure occurred within the first 64 kbytes of memory.
4	Timer Not Operational	A memory failure occurred within the first 64 kbytes of memory, or Timer #1 on the processor board failed to function properly.

Beep count	Error message	Description
5	Processor Error	The Central Processing Unit (CPU) on the processor board failed to function properly.
6	8042 - Gate A20 Failure	The keyboard controller (8042) contains the Gate A20 switch which allows the CPU to operate in protected mode. This error message means that the BIOS is not able to switch the CPU into protected mode.
7	Processor Exception Interrupt Error	The CPU on the processor board generated an exception interrupt.
8	Display Memory Read/Write Error	The system video adapter is either missing or its memory is faulty. **Note:** This is not a fatal error.
9	ROM Checksum Error	The ROM checksum value does not match the value encoded in the BIOS.
10	CMOS Shutdown Register Read/ Write Error	The shutdown register for the CMOS RAM failed.
11	Cache Memory Bad: Do Note Enable Cache	The cache memory test failed. Cache memory is disabled. **Note:** Do not press <Ctrl><Alt>Shift><+> to enable cache memory.

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.
- AMI RAID adapter

Section B: Troubleshooting startup problems

In this section

What to do when the server fails to boot into service 30

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 131 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 36.

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

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Invoking the chkdsk utility 54

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 1002rp server (see "To use the Windows NT Event Viewer" on page 38)
- CallPilot Event Browser or Alarm Monitor in CallPilot Manager

  For more information, do one of the following:

  - See "Alarm Monitor" on page 74
  - 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.

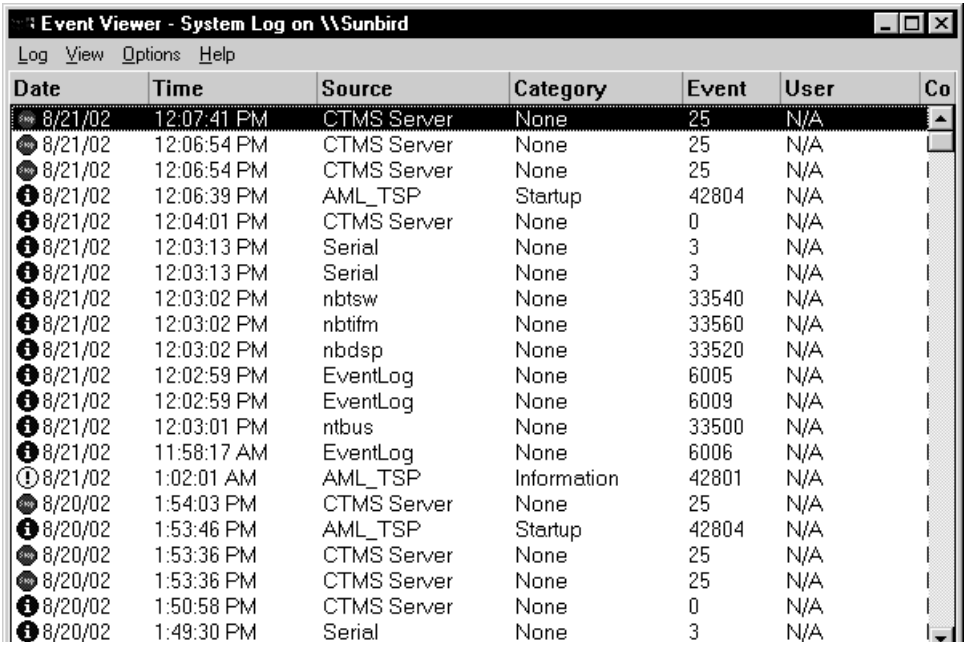
Where to get more information

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 38.

To use the Windows NT Event Viewer

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

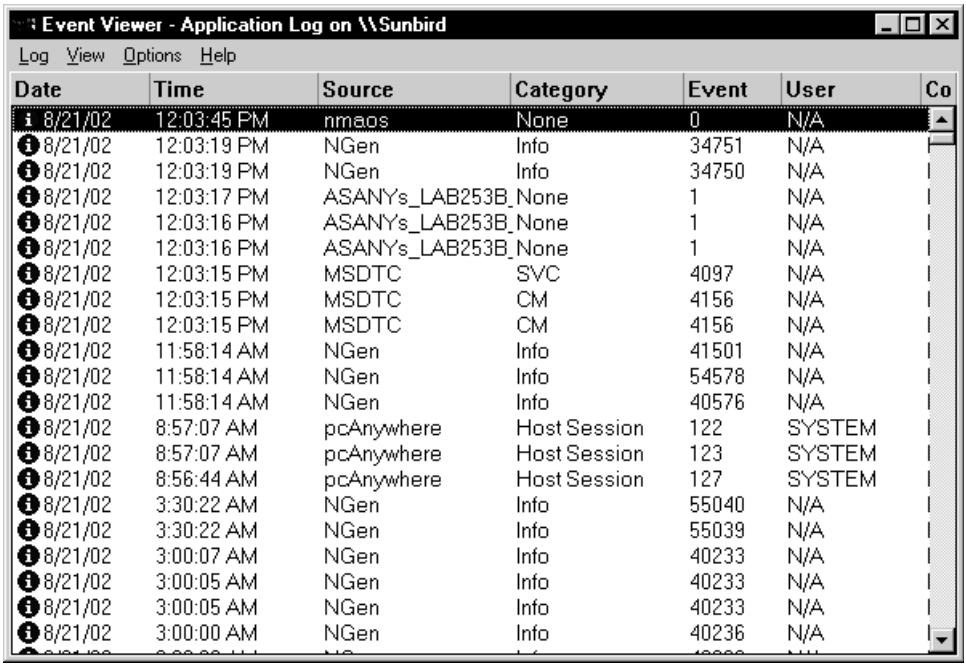
Result: The Event Viewer window appears.



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:



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	

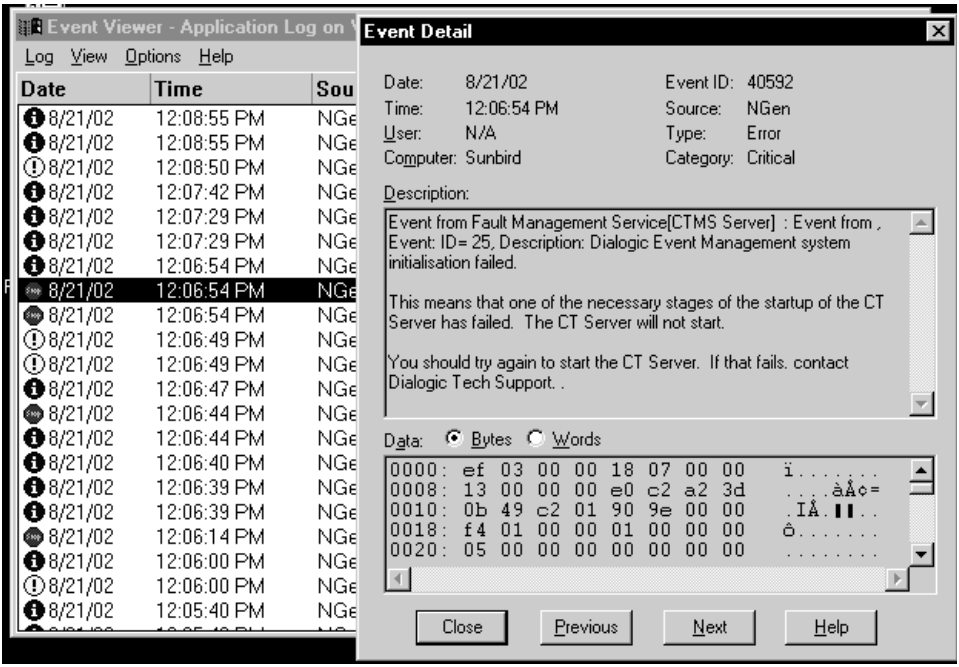
3 Look for error codes flagged with Stop or ! that have occurred since the last startup.

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

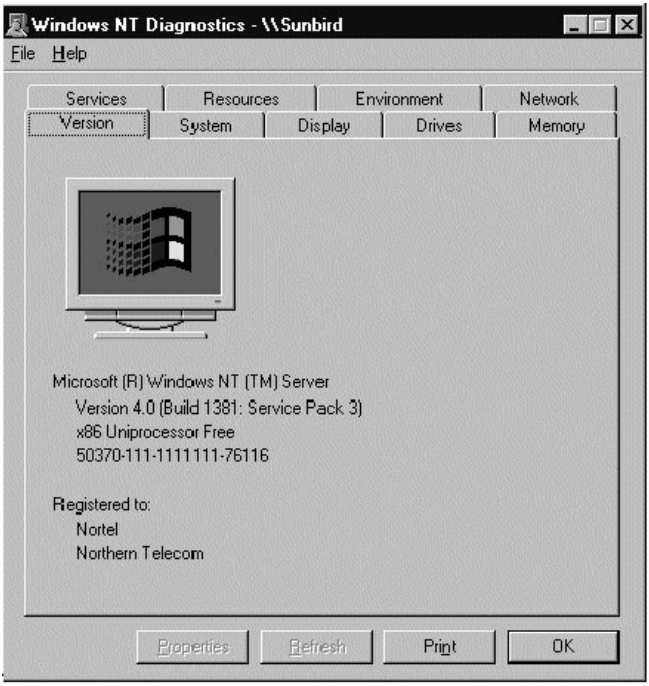
The Windows NT 4.0 Diagnostics window allows you to view details about the system and network components.

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 46)
- tracert (page 47)
- arp (page 49)
- nbtstat (page 50)
- netstat (page 52)

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

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Shutting down services 59

Conducting TSTSERIO tests 61

Conducting TSTSERIO tests with the loopback plug 65

Restarting services 66

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 66.

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 59.



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 65.

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

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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

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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:

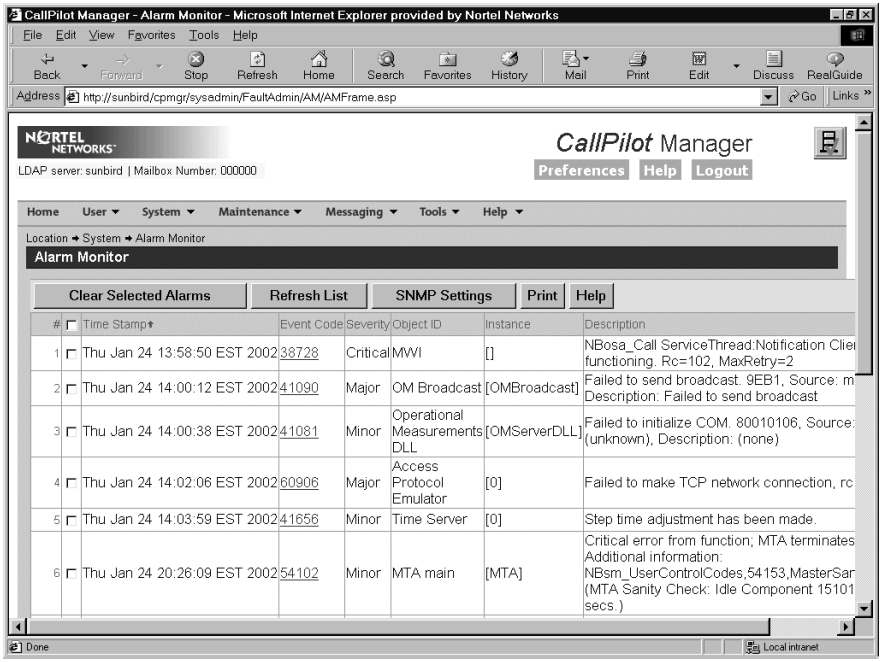
- Alarms appear in the Alarm Monitor only for Minor, Major, and Critical events (not Information events). All events can be reported in the Event Browser (depending on filtering criteria defined in the Event Browser).
- The first time an event occurs, it generates an alarm that appears in the Alarm Monitor. 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 77).

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

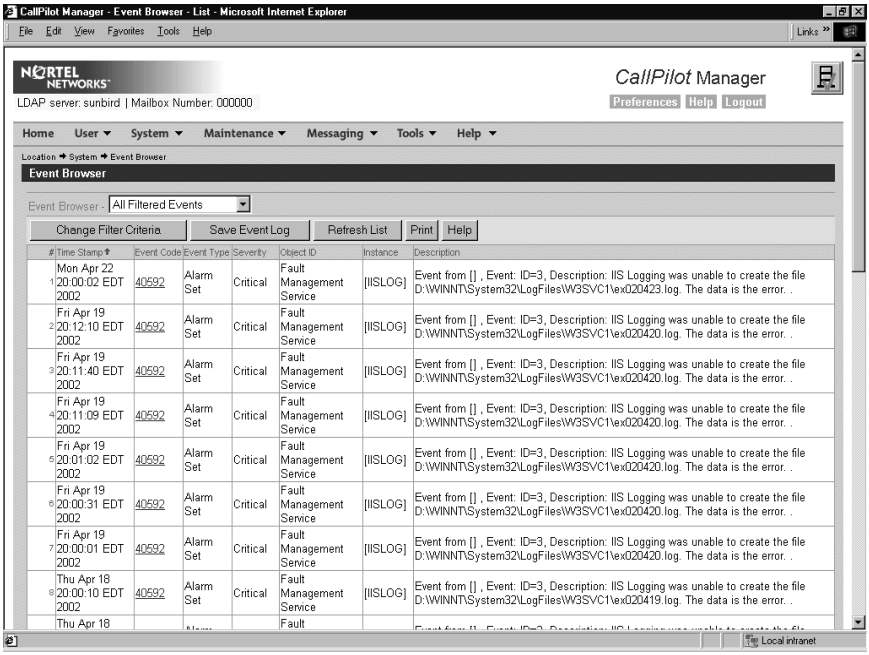
The Event Browser displays events that have been recorded in the server log. Each event identifies the time the event occurred, the object that generated the event, and the cause of the event.

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 83, 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 103.

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 83.

Section B: Working with the Maintenance page

In this section

Introducing the Maintenance page 84
Viewing component states 88
Starting and stopping components 91
Running integrated diagnostics 95
Viewing the last diagnostic results 100

Introducing the Maintenance page

Introduction

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

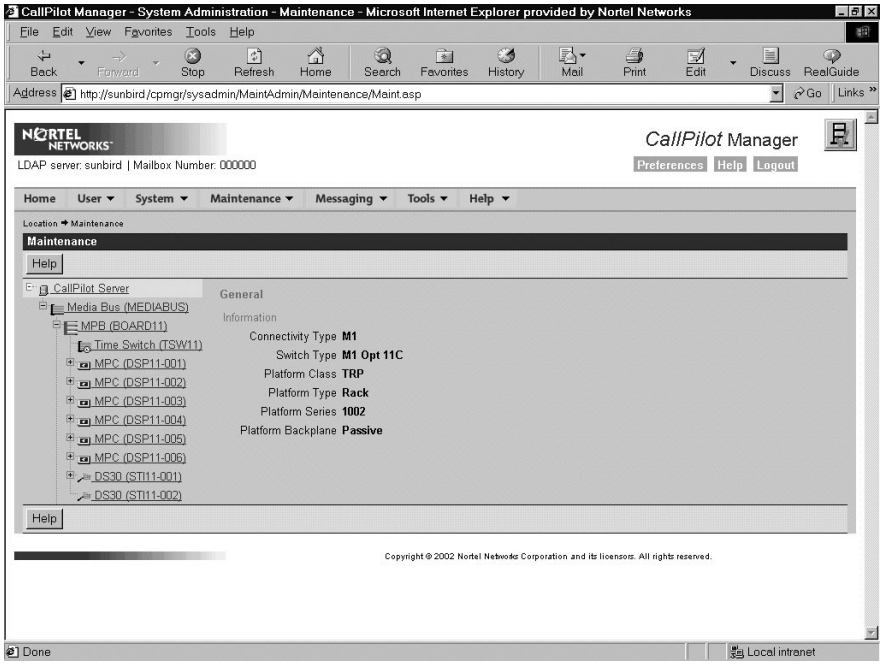
- Obtain general information about components.
- View component states.
- Start and stop components.
- Run integrated diagnostic tests.
- View the results of the last diagnostic test run against a component.

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 1002rp 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 88 ■ "Starting and stopping components" on page 91
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 95 ■ "Viewing the last diagnostic results" on page 100

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.

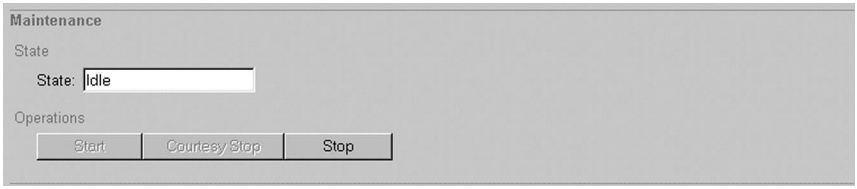
3. Continue clicking the plus sign (+) until the component with which you want to work is visible.

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 103.

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 103.

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.

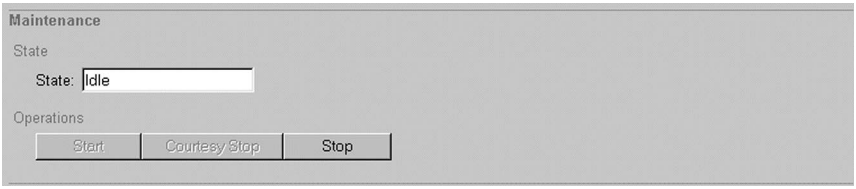
3. Continue clicking the plus sign (+) until the component with which you want to work is visible.

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 91.

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 99).

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 71.)

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 91.

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.

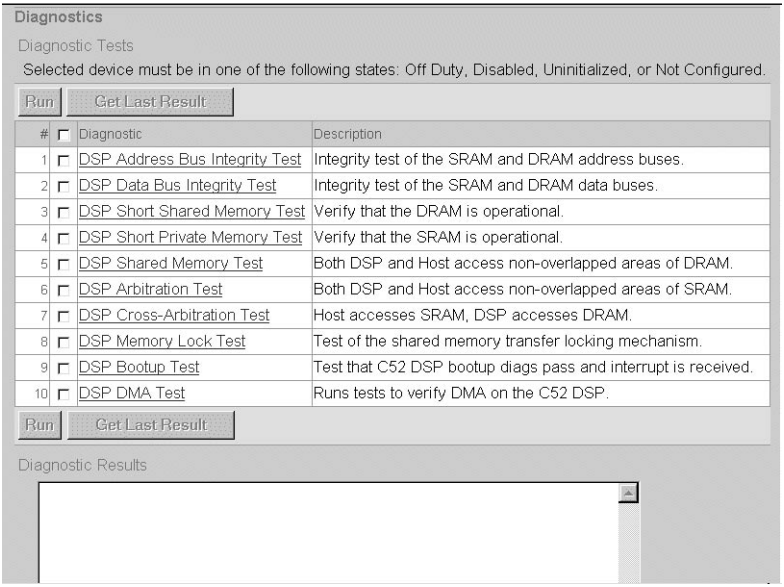
   Result: The Maintenance page refreshes to show details about the component.

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 93.

6 Scroll down to the Diagnostics section.

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

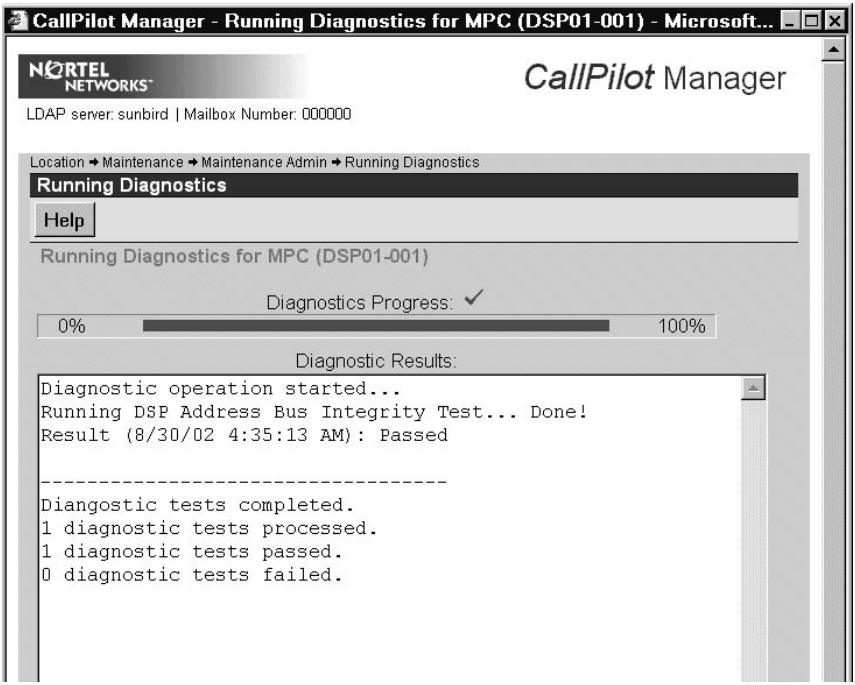


7 Check the check box for each diagnostic that you want to run.

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 91.

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.

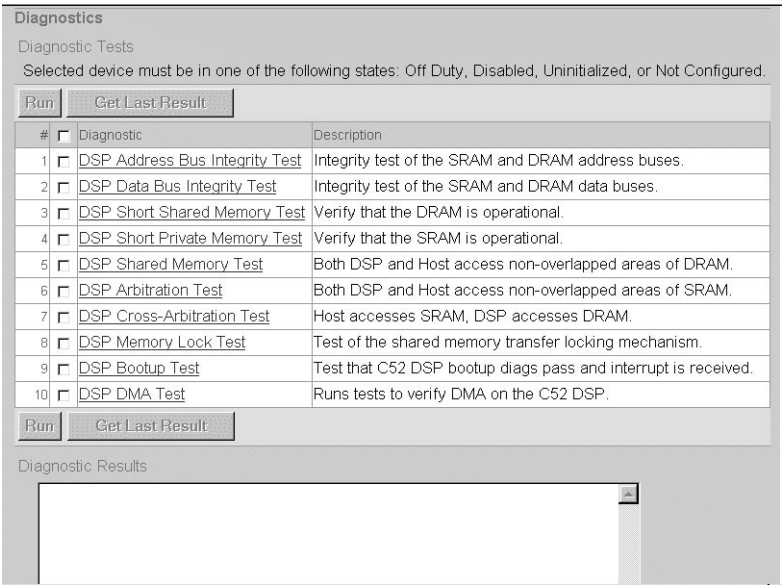
3. Continue clicking the plus sign (+) until the component with which you want to work is visible.

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.

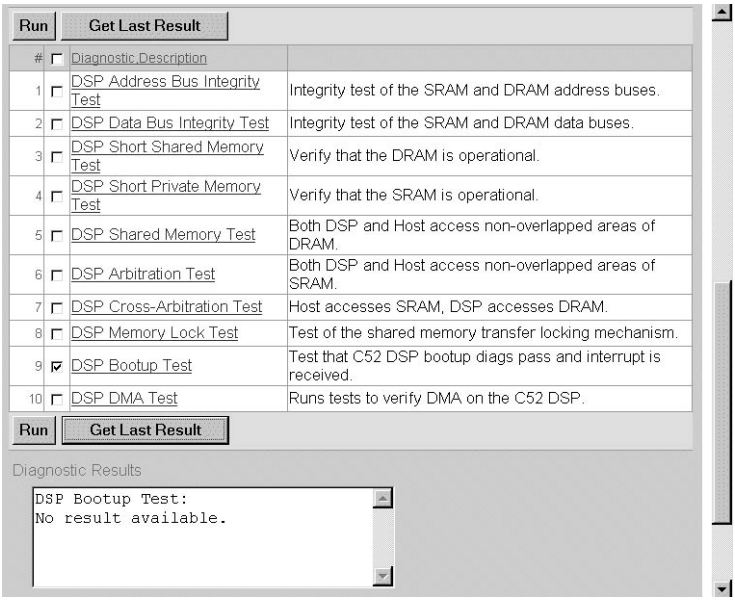
Result: The following is an example of the Diagnostics section for an MPC-8 card (removable MPC):



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 104

Working with the Channel Monitor 106

Working with the Multimedia Monitor

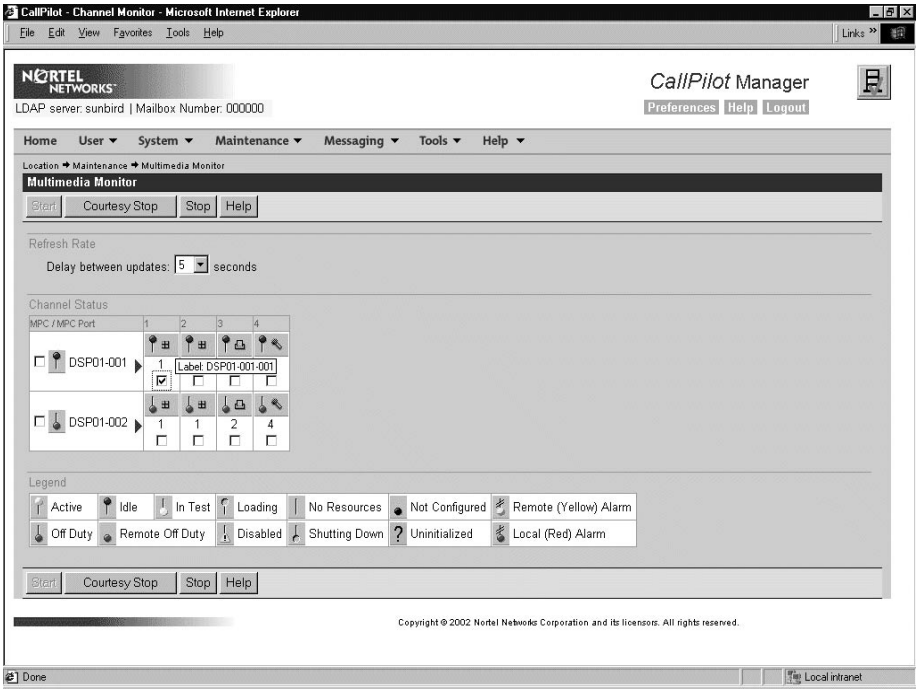
Introduction

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

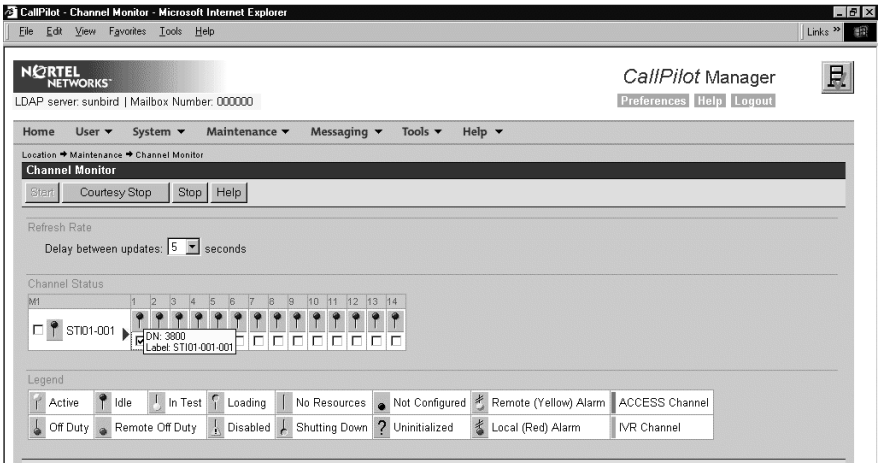
Introduction

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 110

Diagnostics Tool 111

PEP Maintenance utility 114

System Monitor 116

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.

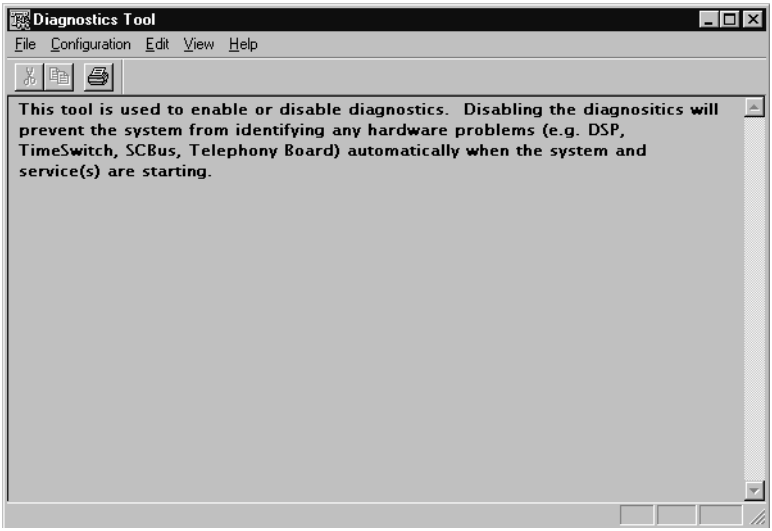
There are three recommended steps:

- 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

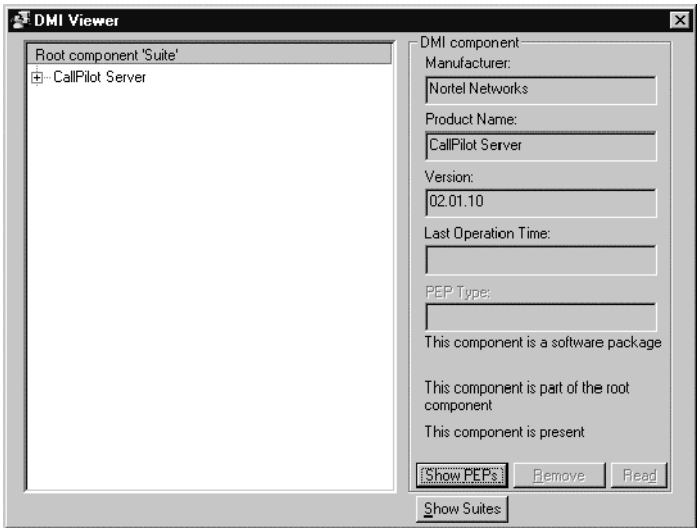
The PEP Maintenance utility displays a list of all installed PEPs on the server and enables you to uninstall PEPS.

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.

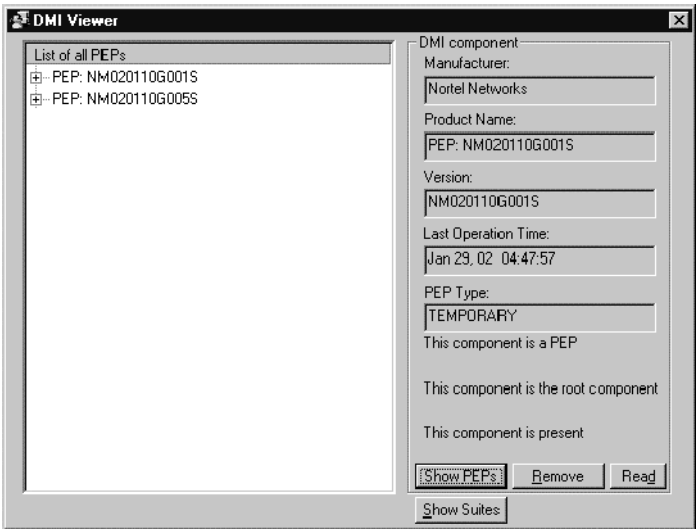


To view a list of all installed PEPs

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.

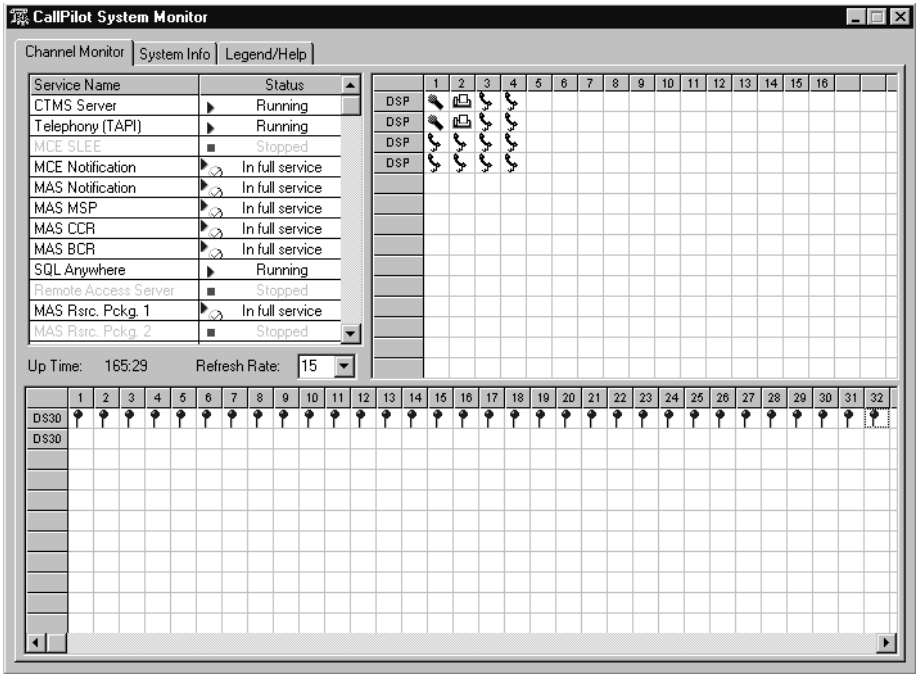
To access the System Monitor

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.

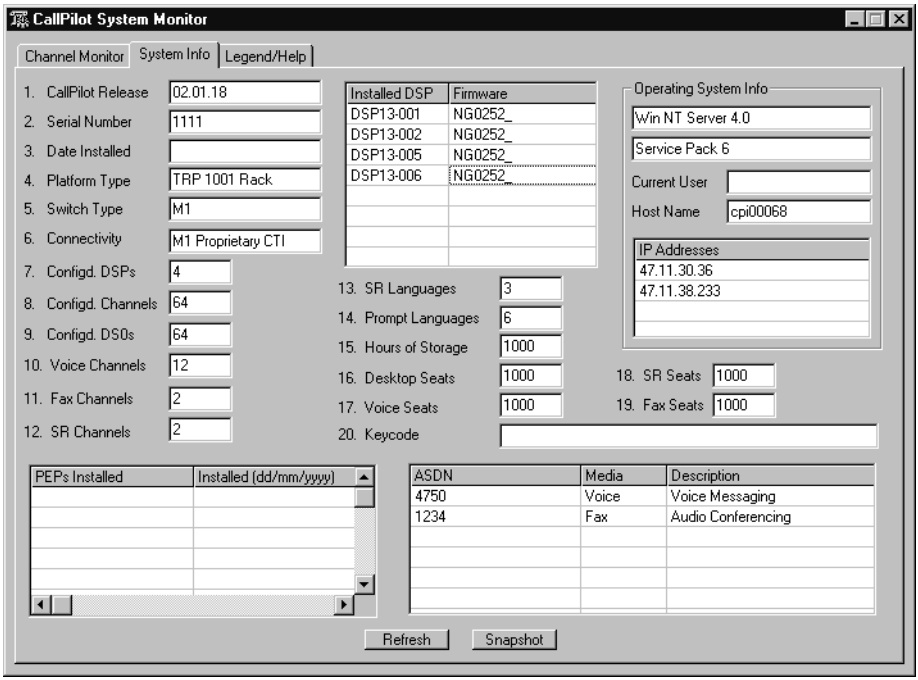
DS30X links

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:

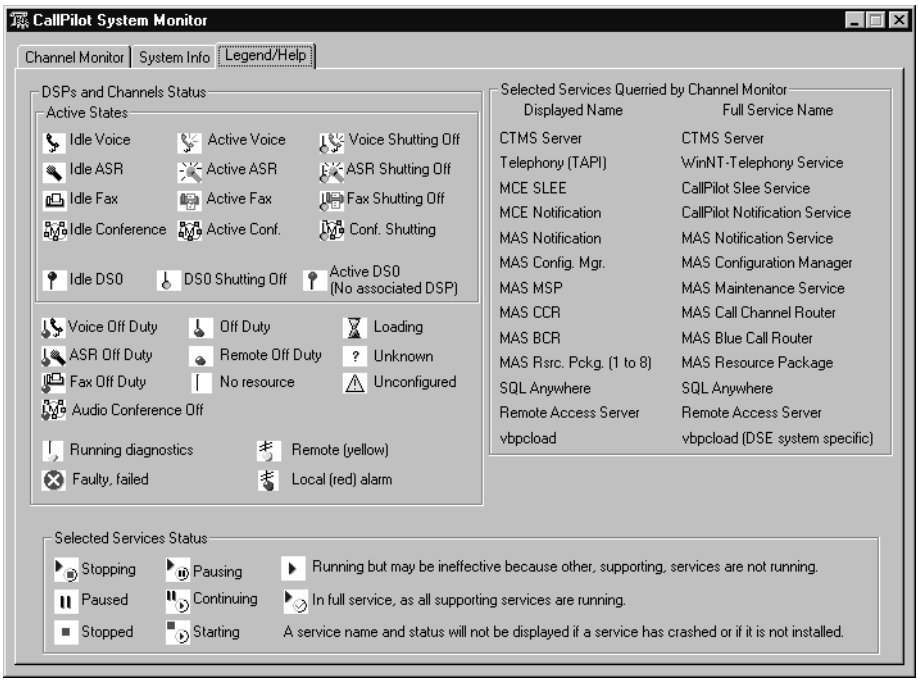


The numbered items provide information about the features purchased. Information about the underlying operating system is provided in the top right corner, including the server IP addresses.

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 122
Replacing air filters 126
Replacing the power supply 128
Replacing the cooling fan 131
Replacing the fuse (AC system only) 134
Replacing the alarm board 137
Setting jumpers on the alarm board 139
Replacing the status display panel 141

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 123.

To remove the server cover, see page 124.

To replace the front bezel, see page 125.

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

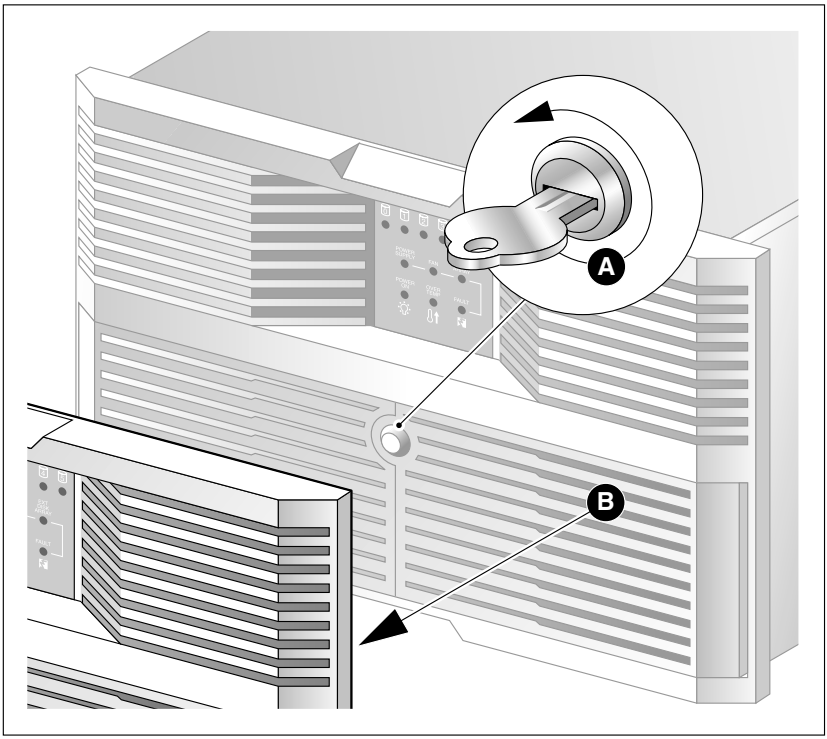
CAUTION

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

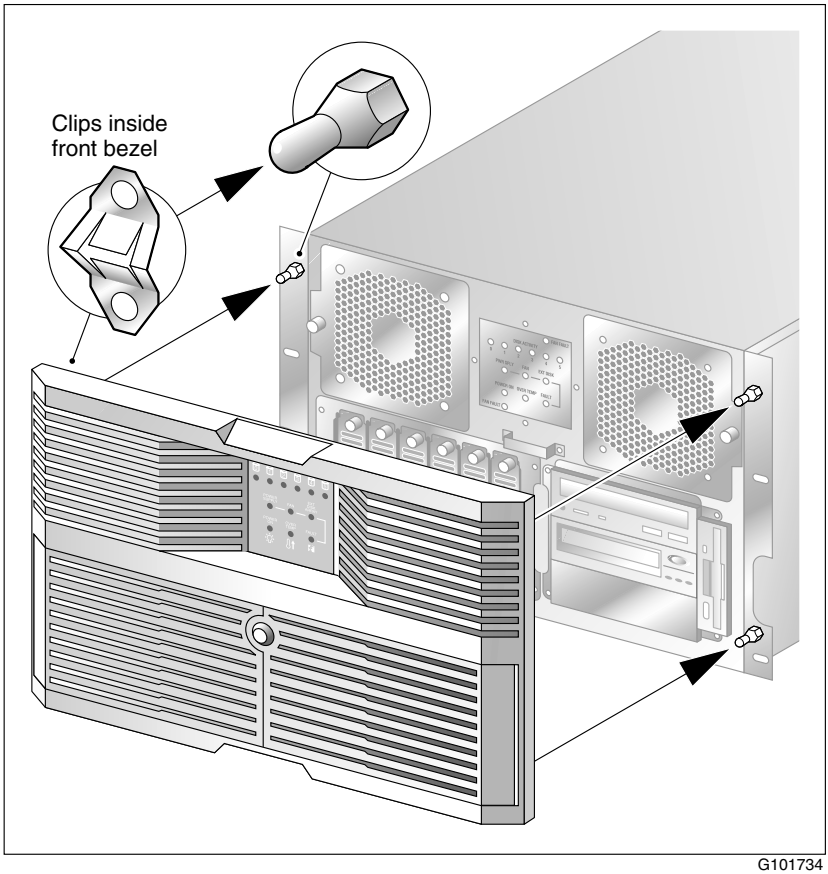
Take precautions to protect internal components. Electrostatic discharge (ESD) can damage boards and make them unusable. Wear an ESD wrist strap.

1. Remove the front bezel (see page 123).
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:



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 1002rp 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 123.
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

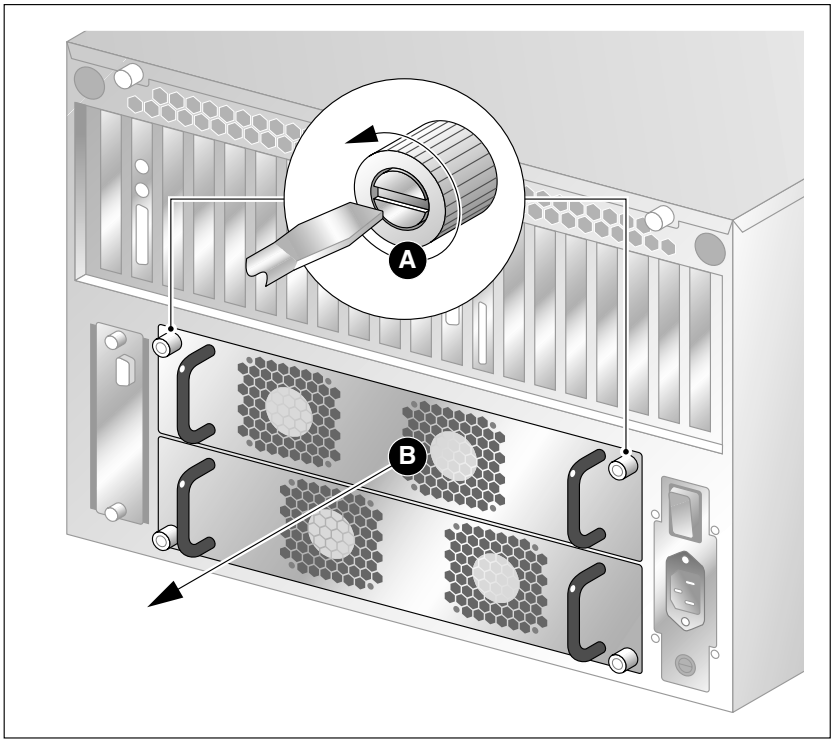
DANGER

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.



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

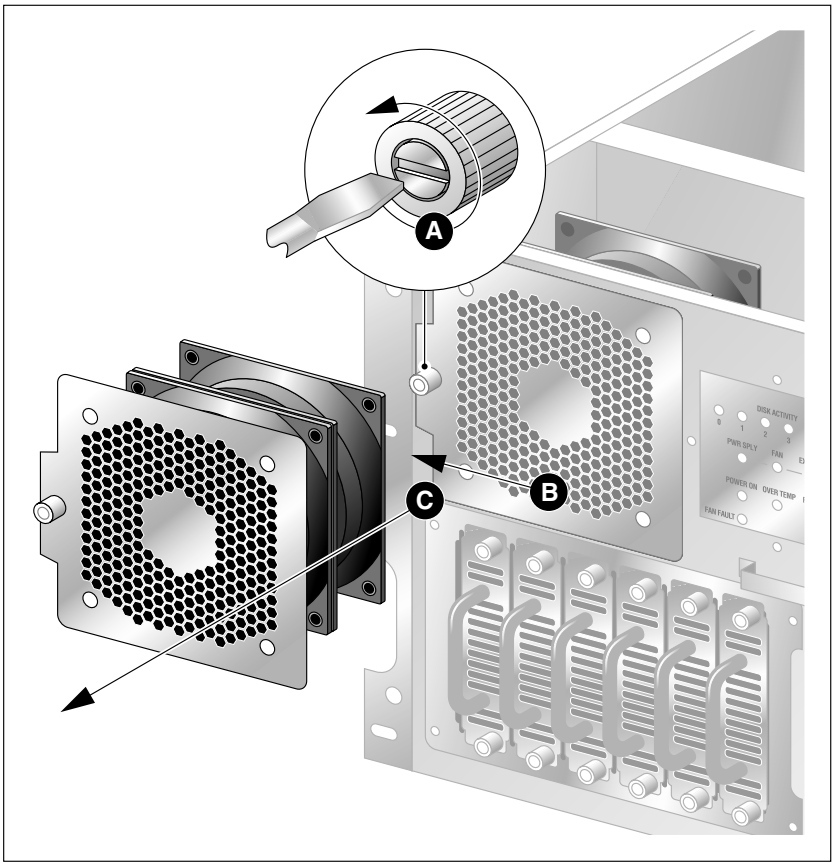
When the LED associated with a cooling fan turns red, the fan requires replacement.

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:

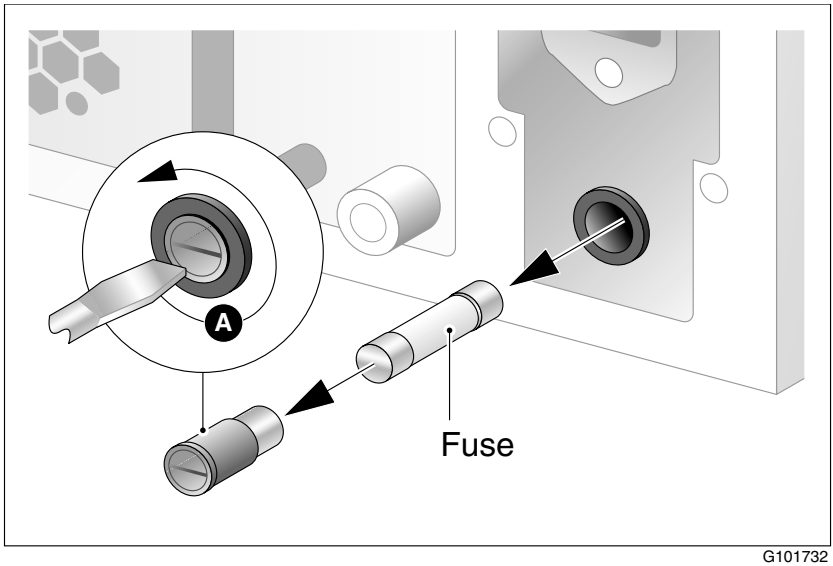
- an approved fuse for replacement

  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).



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 1002rp 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:

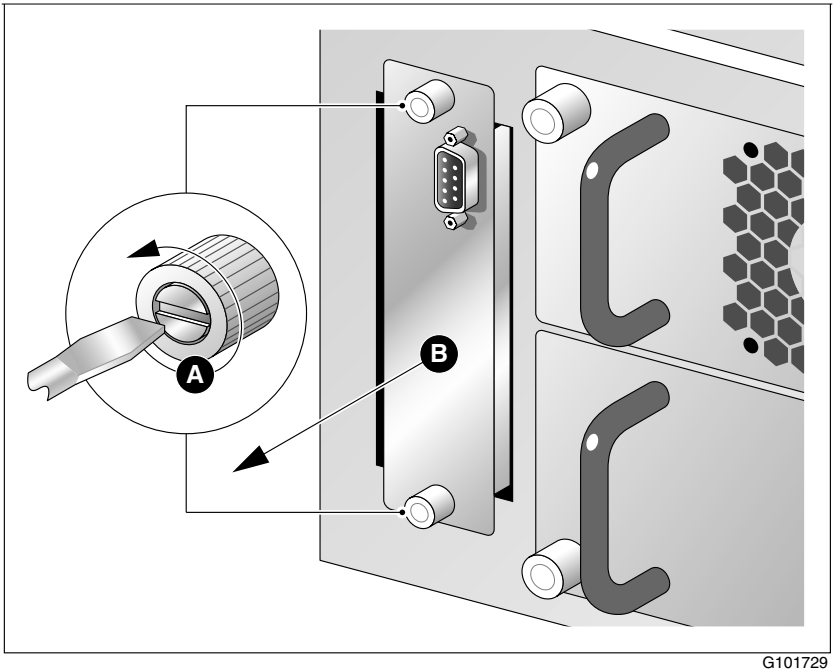
- a Phillips screwdriver
- an antistatic wrist strap
- the replacement component(s)

To replace the alarm board

1 Power off the server.

2 Loosen the two thumbscrews securing the faceplate to the left of the 1002rp 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.



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.

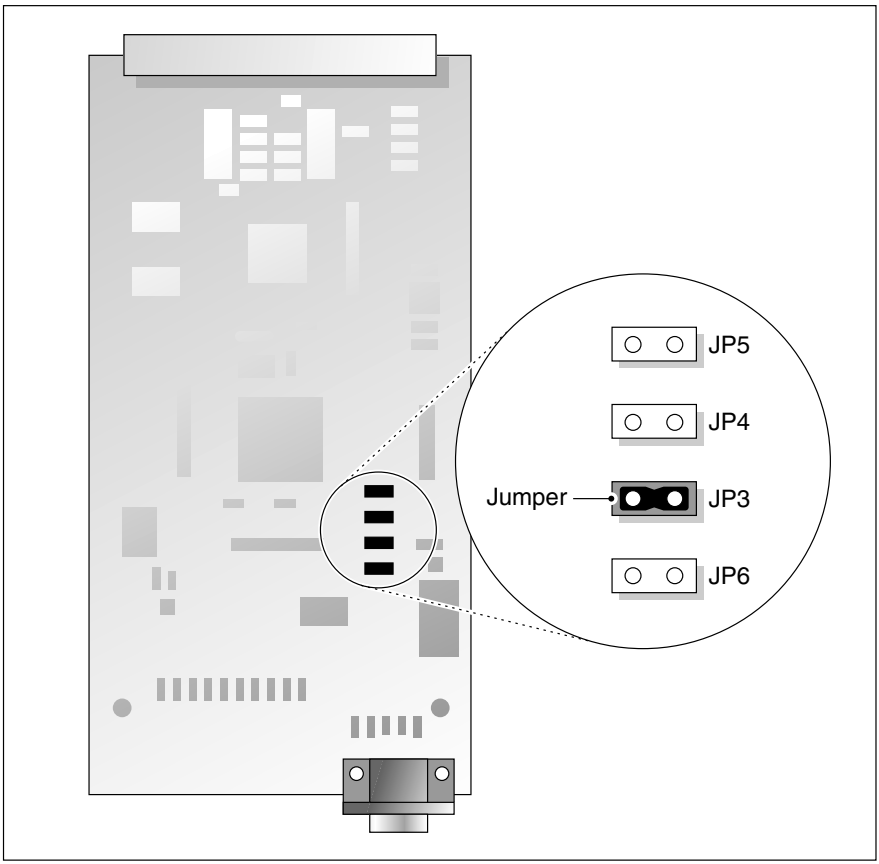
7 Tighten the thumbscrews to secure the faceplate to the chassis.

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.



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

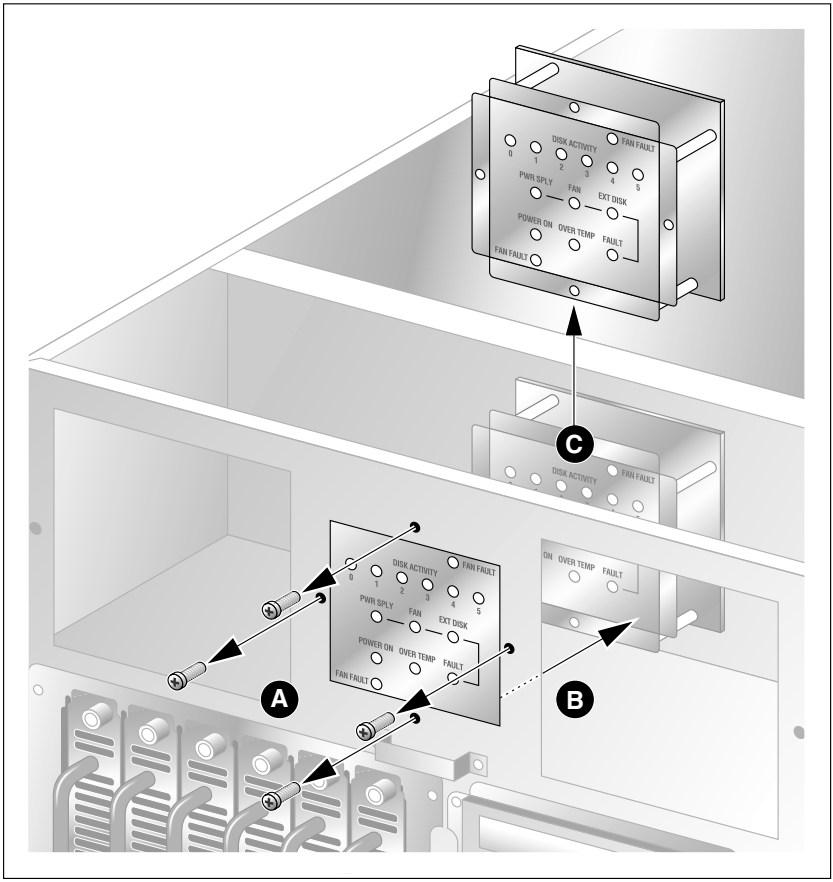
The display is located at the front of the chassis and is cabled to the rear of the chassis and the alarm board.

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 131).

   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 146

About the media drive bay 150

Removing the media drive carrier from the chassis 151

Replacing a tape, CD-ROM, or floppy drive 156

Installing a tape drive 159

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 1002rp 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 36).

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 label[a]
1 (far left)	0	0	A01-01 (primary hard drive)
2	0	1	A02-01 (primary hard drive)
3	0	2	A03-01 (primary hard drive)
4	1	0	A01-02 (secondary hard drive)

Hard drive bay	SCSI channel	SCSI ID	Logical drive label[a]
5	1	1	A02-02 (secondary hard drive)
6 (far right)	1	2	A03-02 (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. These pairs are represented in the software with the labels A01-01 and A01-02, A02-01 and A02-02, and A03-01 and A03-02, where the first number is the logical drive number (for example, A03) and the second number indicates if it is the primary or secondary hard drive (01 for primary and 02 for secondary).

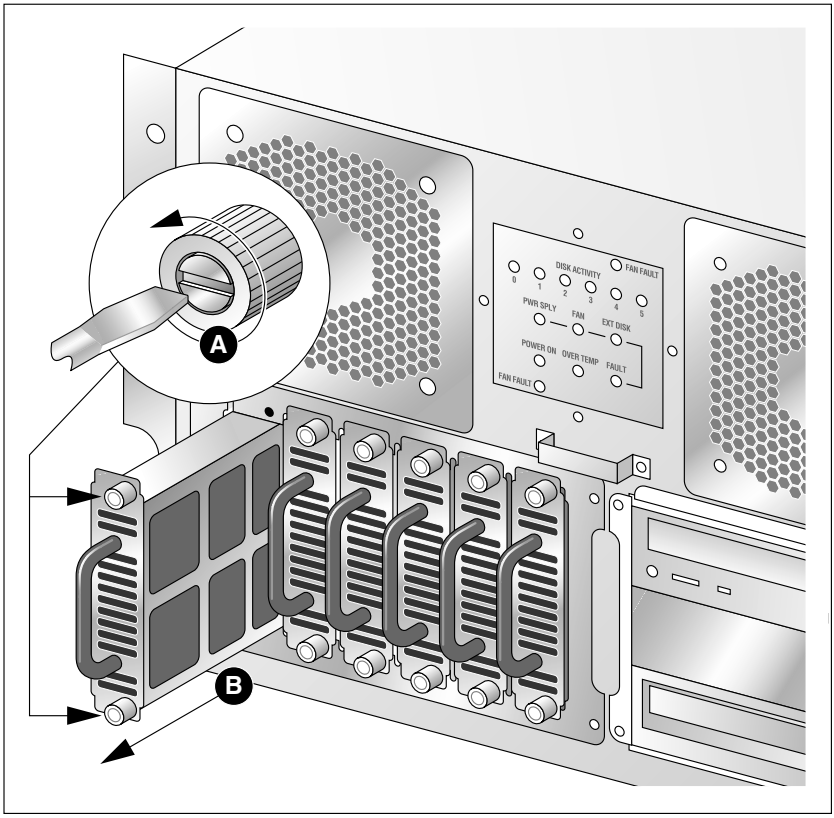
To replace hot-pluggable SCA SCSI hard drives

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.



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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?

Continue with "Rebuilding a RAID hard drive" on page 165.

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 151
2. “Replacing a tape, CD-ROM, or floppy drive” on page 156

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.

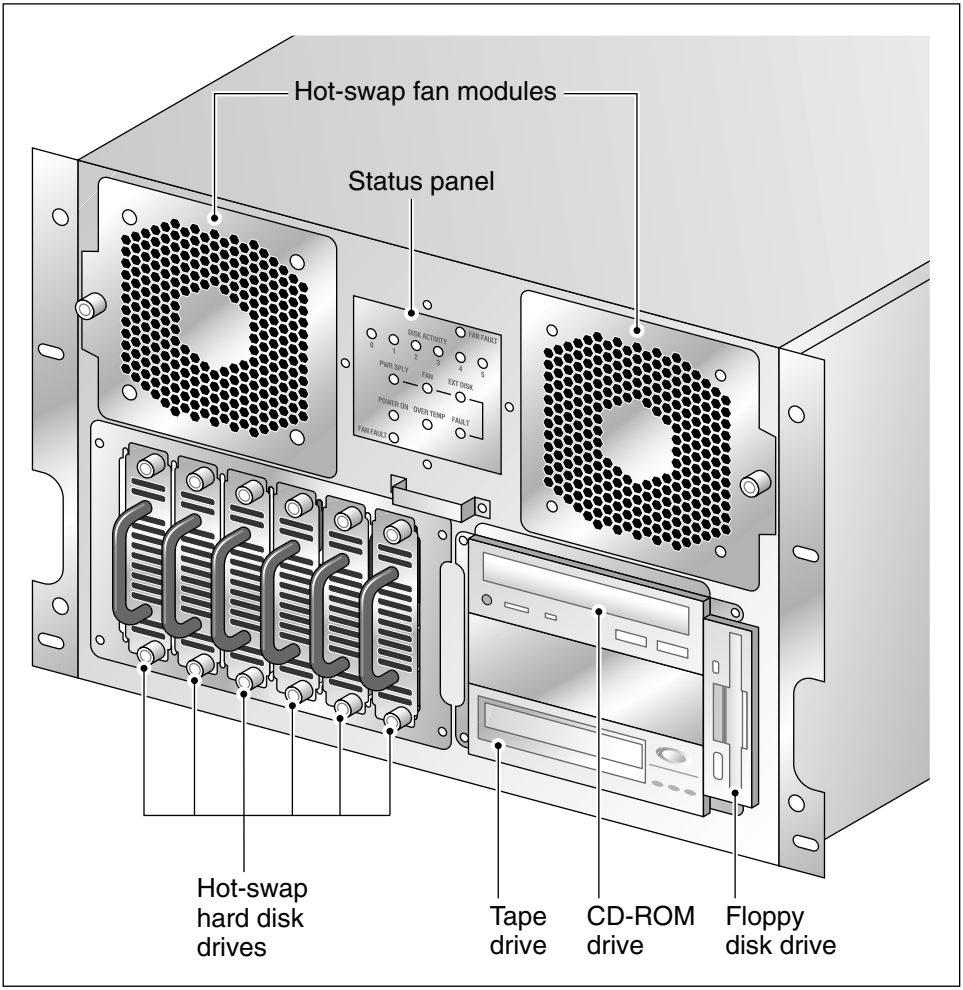
Requirements

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.



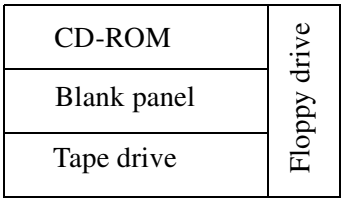
G101750

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.

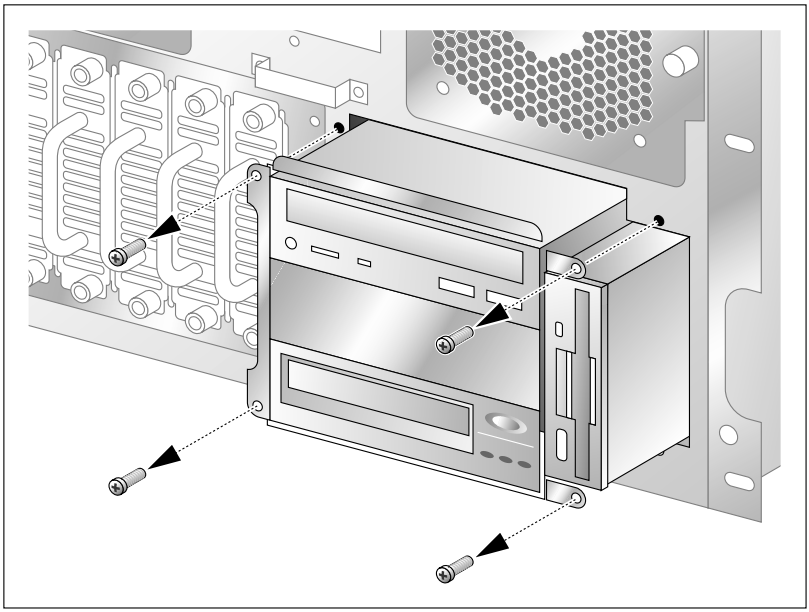
CAUTION

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 122.

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:



G100747

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 156
- "Installing a tape drive" on page 159

Replacing a tape, CD-ROM, or floppy drive

Introduction

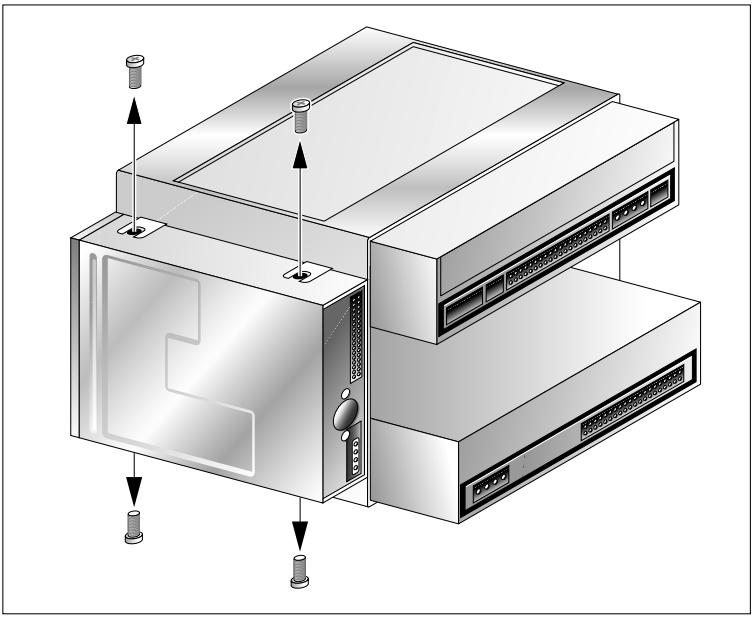
This section describes how to replace a media drive (tape, CD-ROM, or floppy drive) in the media drive carrier.

To replace a media drive

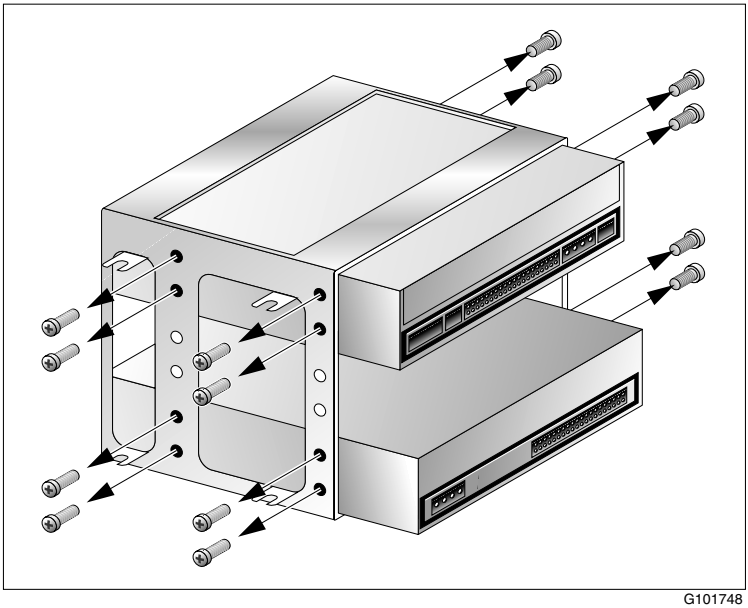
1 Remove the media drive carrier from the chassis (see “Removing the media drive carrier from the chassis” on page 151).

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.



G101739



G101748

3 If you are installing a tape drive, configure it as described in “To configure the tape drive” on page 160.

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 159.

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.

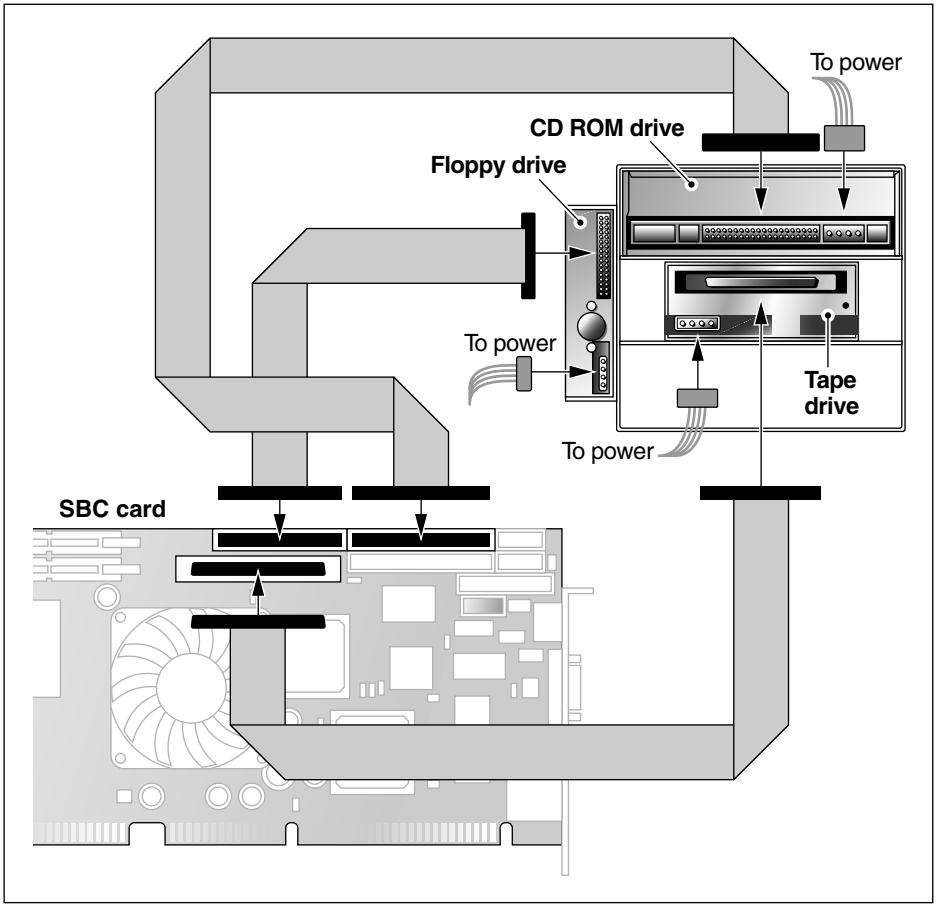
10 Replace and lock the front bezel.

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



G101651

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 159).
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" above.
3. Remove the chassis cover.
4. Remove the media drive carrier (see "Removing the media drive carrier from the chassis" on page 151).
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 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 159.

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

Maintaining an AMI MegaRAID Elite 1600 RAID system

In this chapter

RAID overview 164

Rebuilding a RAID hard drive 165

Configuring the AMI MegaRAID Elite 1600 RAID system 167

Data recovery and backup using the AMI MegaRAID Elite 1600 171

Performing software upgrades with the AMI Elite 1600 RAID 175

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.

Rebuilding a 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.

Before you begin

Do not perform this procedure unless you receive a system message inidicating that a hard drive has failed.

To rebuild a hard drive in a RAID system

1. Shut down and power off the CallPilot server.
2. Remove the failed hard drive. See “Replacing a hard drive” on page 146.
3. Replace with a new hard drive.
4. 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).
5. During the bootup, when the AMI MegaRAID information appears, press Ctrl+M simultaneously to access the MegaRAID BIOS Configuration Utility.

   Note: The AMI MegaRAID information is followed by a prompt to `Press Ctrl-M for BIOS options`. This prompt appears only for a couple of

seconds, along with the message `Press Ctrl-H for WebBIOS options`, which appears in white flashing letters. To avoid missing the prompt, press Ctrl+M after the AMI MegaRAID information begins displaying and before the prompt appears.

Result: The MegaRAID BIOS Configuration Utility is launched, and the Management menu appears.

6 In the Management menu, use the arrow keys to select Rebuild, and then press Enter.

Result: The "Rebuild - PHYSICAL DRIVES SELECTION MENU" appears.

7 Use the arrow keys to navigate to the failed hard drive (the hard drive label becomes highlighted), and then press the space bar to select the failed hard drive.

8 Press F10 to start rebuilding the failed hard drive.

Result: You are prompted to confirm your selection.

9 Select Yes and press Enter.

Result: A status bar appears that displays the rebuild progress. When the rebuild is completed, the status bar indicates "100%," and the message `Press Any Key To Continue` appears at the bottom of the screen.

10 When the rebuild is completed, press any key to continue.

Result: The hard drive label changes to online.

11 Press Esc until you are prompted to confirm that you want to exit the utility.

12 Select Yes, and then press Enter.

Result: The system prompts you to press Ctrl+Alt+Delete to restart the server.

13 Press Ctrl+Alt+Delete to restart the server.

Result: The rebuild procedure is completed.

Configuring the AMI MegaRAID Elite 1600 RAID system

Introduction

The configuration is stored on the RAID card, so typically you are not required to reconfigure RAID unless the RAID card fails or you are making a change to the RAID system (for example, if upgrading to higher-capacity hard drives).

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 label[a]
1 (far left)	0	0	A01-01 (primary hard drive)
2	0	1	A02-01 (primary hard drive)
3	0	2	A03-01 (primary hard drive)
4	1	0	A01-02 (secondary hard drive)
5	1	1	A02-02 (secondary hard drive)
6 (far right)	1	2	A03-02 (secondary hard drive)

a. RAID pairs (logical drives) consist of the following pairs: hard drive 1 and 4, 2 and 5, and 3 and 6. These pairs are represented in the software with the labels A01-01 and A01-02, A02-01 and A02-02, and A03-01 and A03-02, where the first number is the logical drive number (for example, A03) and the second number indicates primary or secondary hard drive (for example, 01 or 02).

Verifying BIOS and Firmware Revision

On the CallPilot 1002rp RAID controller, the BIOS and firmware revision can be determined by powering on the server, and going into the RAID CTRL+M utility under the Objects→Adapter→Adapter Information menu.

Upgrading the BIOS and firmware

ATTENTION This procedure should only be performed if the BIOS and firmware version are not the ones documented.

The BIOS of the CallPilot 1002rp system can be upgraded through a Flash process (running a software utility), to facilitate easy upgrades. CallPilot technology always institutes a minimum version on the BIOS in CallPilot servers. The following table lists the minimum versions of the BIOS for the SBC:

Note: If the BIOS of the server does not meet the minimum version, the BIOS must be upgraded.

AMI RAID Elite 1600	Minimum version
BIOS	3.11
Firmware	D170

To upgrade the server BIOS

1. Retrieve the CallPilot OS Installation CD.
2. Boot from the disk and follow the prompts to launch the RAID BIOS and the firmware flash utility.
3. Choose Y for yes to confirm that the 471gen.rom file is detected, and then program the BIOS and firmware.
4. Allow the flash process to complete.
5. Shut down the system.

To configure a system with RAID installed, the following procedure must be completed to properly configure and initialize the RAID mirror packs. This ensures maximum system redundancy in the case of a hard disk failure.

To configure an AMI MegaRAID Elite 1600 RAID system

In the 1002rp server, only RAID 1 is supported. To configure RAID, follow these steps.

1. If the Adapter has already been reset to factory default as per Step 2, go to Step 3. During the BIOS initialization, when the AMI RAID BIOS is prompting, press CTRL+M to enter the RAID setup utility.
2. Select the Objects menu→ Adapter → Factory Default, and then select Yes to confirm the selection. Press CTRL+ALT+DELETE when prompted to restart the system. Go to step 1.
3. Select Objects → Adapter, and then ensure that the following values are set:

   Flex RAID Power Fail: Enabled

   Fast Initialization: On

   Emulation: Mass Storage

   Auto Rebuilt: Enabled

   Initiator ID: 7

   Cluster Mode: Disabled

   Multiple PCI Delayed Transactions: Disabled

   Force Boot: Off

   Coercion Algorithm: GigaByte Way
4. Select Objects → Channel, and then ensure that the following values are set:

   — Termination State: Enabled

   — SCSI Transfer Rate: 160M

5 In the Configure menu, select New Configuration. PressYes to proceed.

Result: The system should display both SCSI channels, each having three drives. SCSI ID's should be listed in order from 0 to 2 for each channel, starting from the top. All disk drives should be in the READY state to proceed.

6 Use the space bar to create the first logical drive by selecting A01-01 (the first drive from channel 0), and A01-02 (the first drive from channel 1).

Result: After the selection is made, the drives blink.

7 Press Enter to create the first logical drive.

8 Repeat steps 5 to 7 of this procedure to create packs for the second and third logical drives labeled respectively as

- A02-01 and A02-02 as the second pack
- A03-01 and A03-02 as the third pack

9 To configure the logical drives, press F10.

Result: The system prompts you for each of the three logical drives to select consecutively RAID 1; Size.

10 Accept the size displayed. Accept SPAN, and change the last value to NOSPAN.

11 Press Enter to accept these new values. Repeat for all three logical drives.

Result: The system prompts you to save the configuration.

12 Press ESC to save and exit the submenu.

13 In the main menu, choose the Initialize submenu.

14 Press F2 to select all three logical drives.

15 Press F10, and then select YES, to initialize the drive packs.

16 When the initialization is complete, press any key to return to the main menu.

17 Press ESC to exit the utility and save the configuration when prompted.

18 Press CTRL-ALT-DELETE to reboot the server.

Data recovery and backup using the AMI MegaRAID Elite 1600

Introduction

One of the advantages of RAID 1 is that it writes and reads data from and to two identical physical drives configured as one logical drive. This advantage can be used as a backup procedure to avoid data corruption if the following steps are strictly followed. .

ATTENTION

Some of the procedures described in this chapter are not fully supported by the RAID subsystem manufacturer. Therefore they should be considered a last resort for backup in the field.

Note: Classic backup through the supplied tape drive should be performed regularly to avoid data loss due to system failure.

Data redundancy using the RAID subsystem

In the event of a hard drive failure, the system continues to work; however, the RAID subsystem marks the event through the following:

- An audible alarm will sound.
- The OS-based utility changes the status of the failed drive to FAILED, and the color of the icon corresponding to the drive from GREEN to RED.
- An event is placed in the NT Event viewer.

When the failure event is acknowledged, the hard drive that failed should be replaced as soon as possible. The system proceeds with rebuilding the new drive as soon as its presence is detected. During the rebuild process, the alarm continues to sound, the status of the drive changes to REBUILD, and the icon changes to YELLOW on the Windows graphical user interface.

The rebuild process usually takes between 30 to 60 minutes. Nortel Networks strongly suggests that the system should not be restarted during this time. At the end of the rebuild process, the system notifies you about the completion and returns to the original status before the failure occurred. The alarm stops automatically.

Using the RAID subsystem as a backup tool

The price of the hard drives as well as the fast process of backing up data, makes the RAID subsystem a very high-performance and inexpensive backup tool. However, processor load during disk drive intensive activity is very high and can affect overall system performance.

To back up the data

1. Load MegaRAID Client Power console. Ensure all drives are in Online state (GREEN).
2. Label all drives as follows:
   - A01-01 First drive ID0 (PACK 1)
   - A02-01 Second drive ID1 (PACK 2)
   - A03-01 Third drive ID2 (PACK 3)
   - A01-02 Fourth drive ID3 (PACK 1- mirror of first drive)
   - A02-02 Fifth drive ID4 (PACK 2- mirror of second drive)
   - A03-02 Sixth drive ID5 (PACK 3- mirror of third drive)
3. Right-click the Channel 2/first drive (that is, (0) A1-2-Onln).
4. Select Tools → Fail Drive.

   Result: A warning message appears.

5 Ignore the warning message and press OK.

Result: The drive status changes to FAILED, and the color of the icon changes to RED. Also, the alarm starts to sound.

Note: The alarm can be silenced by selecting Objects → Adapter → Alarm Control from the toolbar, but under no circumstances should it be disabled.

6 Repeat step 2 for each of the drives present on Channel 2 (if required to back up all of them).

7 Remove the drives that are marked FAILED.

8 Insert a new set of replacement drives.

Result: The system starts rebuilding them as soon as their presence is detected. When the rebuilding is done, the backup is complete.

To restore the data in the event of a system failure

1 Power the system down.

2 Remove all the hard drives from the failed system and insert backup drives into the vacated bays.

3 Boot up the system, and then press CTRL+M to enter the RAID setup utility.

4 In the main menu select Objects → Physical Drive → Make Online. Ignore the warning message.

5 Repeat step 4 for all drives.

6 Press ESC three times, and then exit the utility.

7 Boot to the OS.

8 Insert replacement drives in the bay corresponding to Channel 1.

Result: The system starts rebuilding and overwriting the data on the new drives (if any) as soon as they are detected through regular disk access.

9 Allow the system to rebuild all three drives.

Note: Nortel Networks strongly recommends that the system not be restarted during the rebuild process.

10 When the rebuild is complete, the alarm should stop automatically.

Note: The rebuilding process can be monitored through the MegaRAID Client application.

Recovering OS bootup data from a system with the AMI Elite 1600 RAID

There are special situations when the RAID system seems to have failed and data is corrupted while backup drives are not available. Typically, the system may not even boot to the operating system. In such situations, in the attempt to bring the system back up, follow the steps below.

Note: Data recovery is not guaranteed, but in most of the cases, this should enable the system to boot up to the operating system.

To recover OS bootup data

1 During the BIOS initialization, when the AMI RAID BIOS is prompting, press CTRL+M to enter the RAID setup utility.

2 In the Configure menu, select Clear Configuration.

Result: This operation clears the NVRAM but leaves the configuration data on the hard drives intact.

3 Wait until this operation is completed.

Note: Completion is confirmed when a the following message appears: Existing configuration is cleared. Press any key to continue.

4 Follow steps 5 to12 in “To configure an AMI MegaRAID Elite 1600 RAID system” on page 169.

5 Exit the utility by pressing ESC.

6 Save the configuration when prompted.

7 Press CTRL-ALT-DELETE as indicated by the menu to reboot.

Result: The system should boot up properly to the operating system.

Performing software upgrades with the AMI Elite 1600 RAID

Introduction

A software upgrade using the RAID subsystem splitting procedure can provide maximum benefit, because the upgrade is fast and is most likely to preserve the original configuration.

When software upgrading is used, none of the previous backup and recovery procedures should be used.

To perform a software upgrade

1. Shut down and power off the CallPilot server.
2. Mark the drives as follows:
   - A01-01 First drive ID0 (PACK 1)
   - A02-01 Second drive ID1 (PACK 2)
   - A03-01 Third drive ID2 (PACK 3)
   - A01-02 Fourth drive ID3 (PACK 1- mirror of first drive)
   - A02-02 Fifth drive ID4 (PACK 2- mirror of second drive)
   - A03-02 Sixth drive ID5 (PACK 3- mirror of third drive)
3. Remove one set of drives belonging to one pack (the original or the mirror drives) that can be used as a backup in case the upgrade fails.

   Example: A01-01, A02-01, A03-01

4 Power up the system.

Result: An audible signal indicates that the system detects the drives are missing or have failed.

ATTENTION

Do not disable the alarm.

Note: You can silence the alarm by going into the Objects → Adapter → Alarm menu from either the flash embedded utility or from the OS-based RAID application (MegaRAID Client).

5 Let the system boot up, and then perform the software upgrade.

If	Then
the procedure is successful	go to step 6.
the procedure is unsuccessful	go to step 7.

6 Without shutting down the server, insert the three drives that originally were the mirror of the first three drives.

Result: The system starts to rebuild them, overwriting the data as soon as their presence is detected. The process can take up to 1 hour.

ATTENTION

Do not shut down the server before the rebuild is complete.

Note: You can monitor the rebuild by opening the Windows RAID application.

7 If the upgrade is unsuccessful, the system must be reverted to the original load by following the next substeps:

a. Shut down and power off the CallPilot server.

b. Remove the set of drives that contain the failed software upgrade.

c. Insert and connect the drives that have the previous software release to their original location.

d. Power up the server.

Result: The system prompts a key to run configuration utility or ALT+F10 to continue.

e. Press any key to enter the configuration utility.

f. Select Objects → Physical Drive → Make ONLINE for each of the three drives.

g. Exit the utility, and then reboot.

Result: The system boots up to the previous configuration used before the software upgrade, and an audible alarm indicates the CRITICAL state of all three drives.

Note: At this time, you can silence the alarm, but do not disable it.

h. Once the system is fully booted, insert the drives that have the failed software upgrade into their original locations. The system starts to rebuild them, overwriting the data as soon as their presence is detected.

8 The software upgrade or the revert from a failed software upgrade is now complete.

Note: The audible alarm, if left on, should stop automatically at this point.

Chapter 10

Replacing or adding voice processing boards

In this chapter

DSP numbering and location 180

SCbus cabling 182

Replacing or adding MPC-8 cards 183

Replacing or adding MPB16-4 boards 187

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

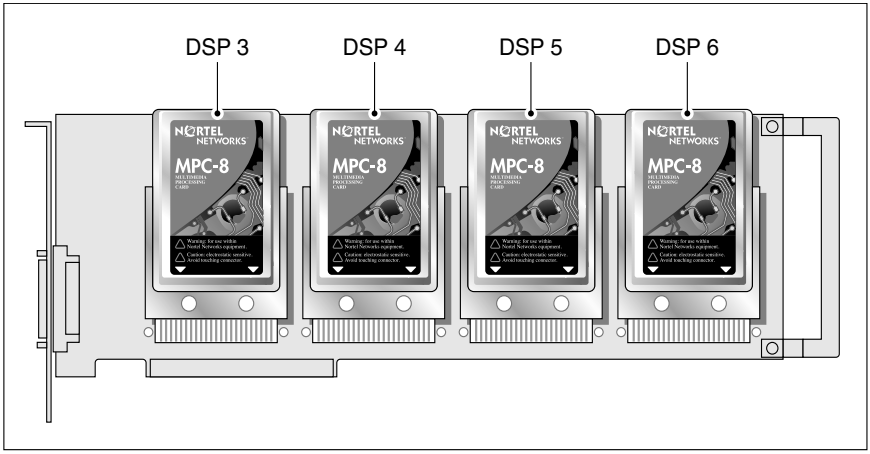
MPB16-4 boards have two embedded DSPs and can support up to four optional MPC-8 (DSP) cards. The DSP numbering starts with the embedded DSPs and then continues with the MPC-8 cards going from left to right.

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.

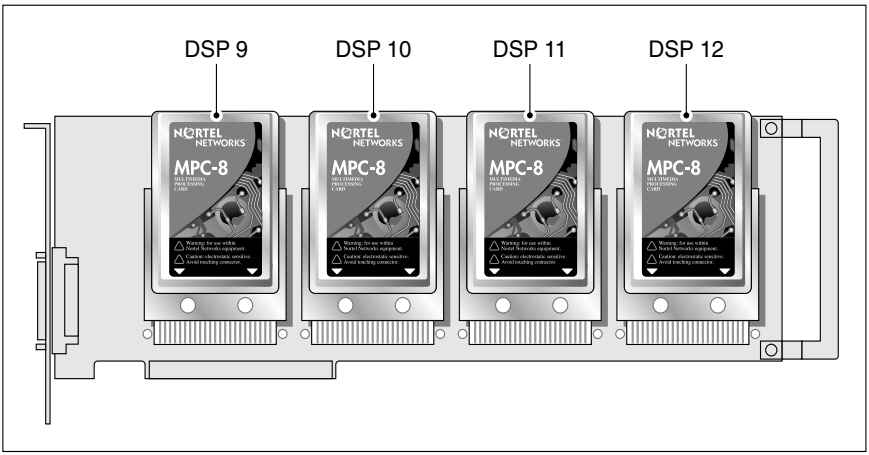
The pictures on the following page illustrate the DSP numbering on the first two MPC16-4 boards.

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.

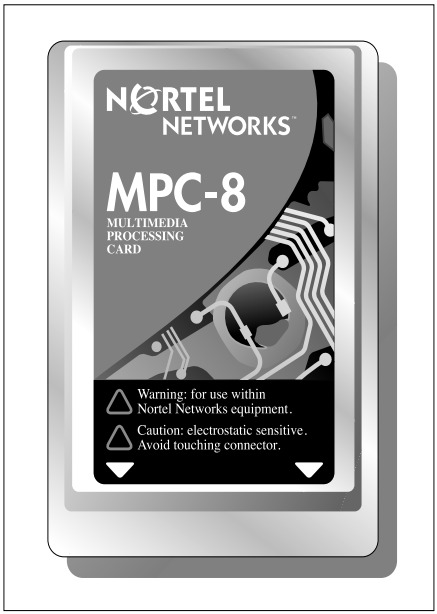
Replacing or adding MPC-8 cards

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 180.

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 122.

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 184.

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 180 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 cannot 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 “Testing the CallPilot installation” in Part 3 of the *CallPilot Installation and Configuration* binder.

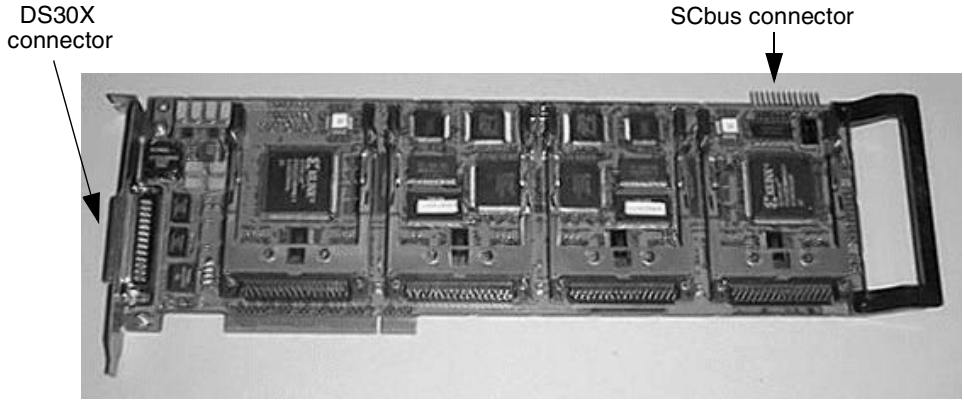
Replacing or adding MPB16-4 boards

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 122.

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 188.

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 212.
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

Maintaining the onboard video and network cards

In this chapter

Maintaining the onboard video and network cards 194

Maintaining the onboard video and network cards

Network card failure

The network cards are integrated into the SBC card (onboard). If the network cards fail, they cannot be replaced by add-in network cards in the expansion slots. Contact technical support for assistance.

Video card failure

The video cards are integrated into the SBC card (onboard). If the video cards fail, they cannot be replaced by add-in video cards in the expansion slots. Contact technical support for assistance.

Indicators for video card failure

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, contact technical support for assistance:

- 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.

Chapter 12

Maintaining the Pentium III SBC card

In this chapter

Overview 196

Replacing the Pentium III SBC card 197

Configuring the 1002rp Pentium III BIOS 201

Replacing or adding Dual Inline Memory Modules 204

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 197)
- upgrading and configuring the BIOS (page 201)
- adding memory DIMMs to the SBC (page 204)

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.

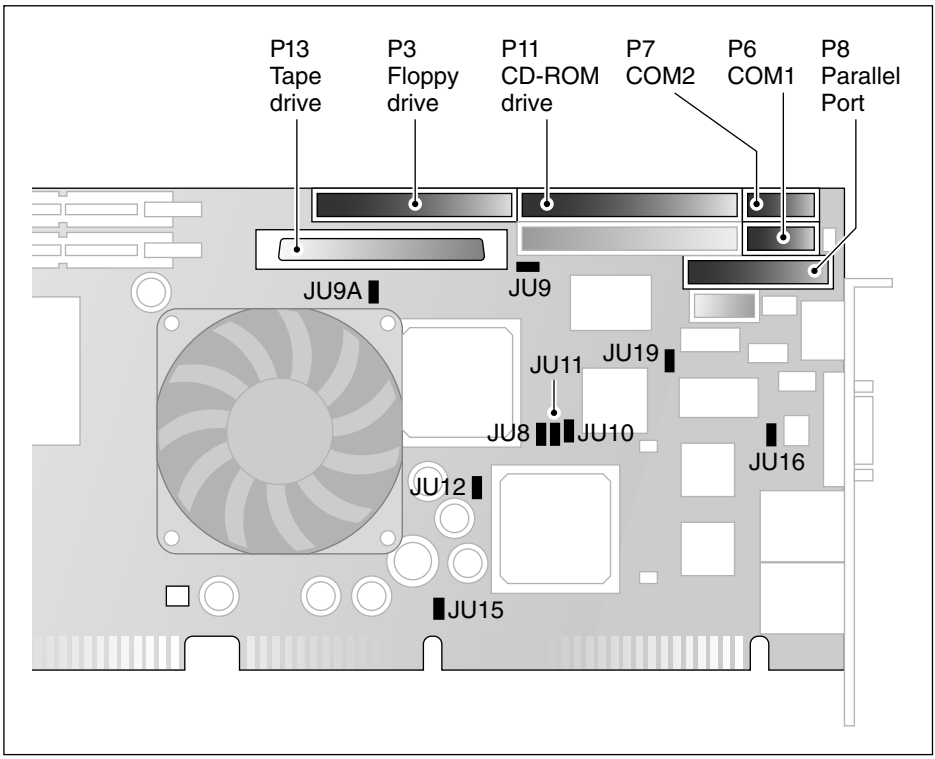
Requirements

Before replacing the SBC card, gather the following tools:

- one Phillips-head screwdriver
- one antistatic wrist strap
- the replacement SBC card
- cable labels

SBC card connectors and jumpers

The following diagram shows the location of connectors where cables must be disconnected or connected as part of the procedure to replace the SBC card. The jumpers shown in this diagram are used in the BIOS configuration procedures:



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. Disconnect and label all cables from the SBC card. See "SBC card connectors and jumpers" on page 198.

   Note: If necessary, refer to "Slot assignments" on page 212 to locate the SBC card.
5. Disconnect and label cables from the SBC card faceplate.
6. Loosen and remove the screw that is securing the SBC card.
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.
   - Increase RAM by adding DIMM(s) to the card. See "To add SDRAM DIMMs to the SBC card" on page 204.
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. See “SBC card connectors and jumpers” on page 198.

15 Replace the top cover.

Configuring the 1002rp 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

- CallPilot Operating System Installation CD
- You must perform both of the following procedures to upgrade the BIOS:
  - Upgrade the BIOS (page 202).
  - Configure the SBC (page 203).

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. Shut down the CallPilot server and power off the server.
2. On the SBC card, ensure that JU10 and JU11 are in the UP position.
3. Start up the CallPilot server and follow the prompts on the screen to launch the BIOS flash utility.
4. Select N when asked if you want to save the old BIOS.
5. Select AMIBOOT.ROM for the filename of the new BIOS.
6. Select Y to confirm the Program Boot Block.
7. Select Y to confirm that you want to program the BIOS.
8. Allow the Flash process to complete.
9. Shut down the system.
10. On the SBC card, set JU12 to ON (put a jumper on the two pins).
11. Power on the server and leave the power on for 5 seconds. Then power off the server.
12. Restore JU12 to its original state by removing the jumper.
13. Configure the BIOS, as indicated in the procedure below.

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 DEL to enter Setup when prompted.
2. Press F9 to accept the default values.
3. Press Enter when prompted to confirm this change.
4. Press F10 to save and exit the BIOS setup.
5. Restart the server.

   Result: BIOS reconfiguration is completed.

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 base CallPilot has one 512 Mbyte DIMM installed in Bank 1. Another 512 Mbyte DIMM can be installed in Bank 2 for total memory of 1 Gbyte. No other memory configurations are supported on this server.

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

1002rp reference material

In this chapter

Server features 208

Rear panel diagram and slot locations 210

Slot assignments 212

IRQ mapping table 215

Server features

Introduction

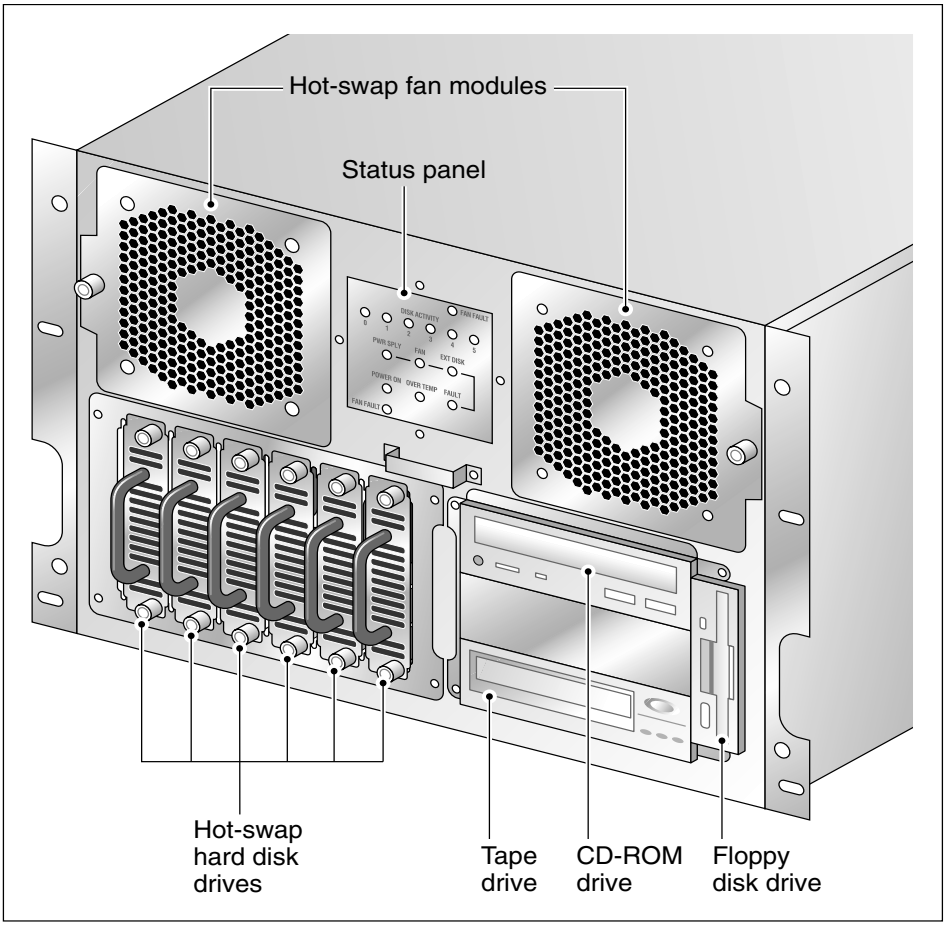
This section provides a general overview of the 1002rp server.

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)

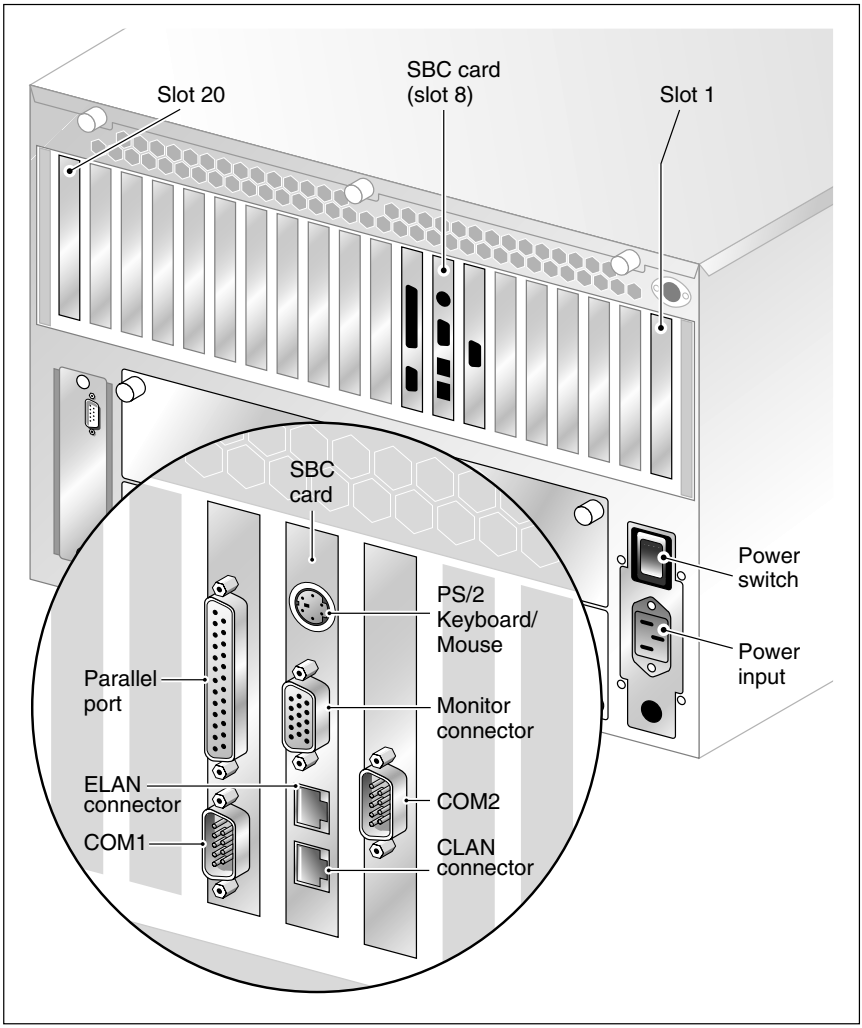
The front view of the 1002rp server chassis shows redundant dual fans to the left and the right of the status panel. The left drive bay holds six SCSI hard drives with hot-pluggable carriers. The media drive bay, located to the right, houses the CD-ROM, tape drive, and floppy disk drive.



Rear panel diagram and slot locations

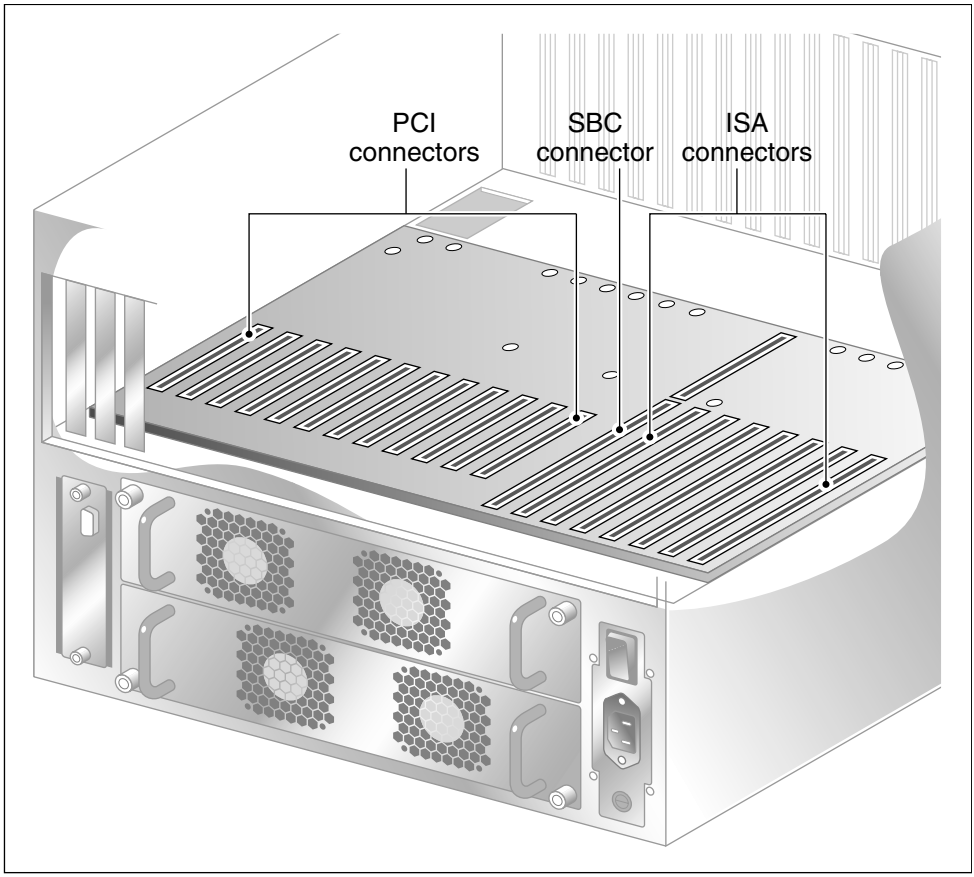
Rear panel diagram

The following diagram shows the slot locations in the rear panel:



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 212. 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 210). 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 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	Reserved for COM2 I/O bracket	Reserved for COM2 I/O bracket
Slot 8[b]	BRD08	Single Board Computer	Single Board Computer
Slot 9	BRD09	Reserved for COM1 and parallel port I/O bracket	Reserved for COM1 and parallel port I/O bracket
Slot 10	BRD10	PCI RAID controller	PCI RAID controller
Slot 11[c]	BRD11	MPB16-4 board #1	MPB16-4 board #1
Slot 12	BRD12	MPB16-4 board #2 (optional)	MPB16-4 board #2 (optional)
Slot 13	BRD13	Not used	Not used
Slot 14	BRD14	Not used	Not used
Slot 15	BRD15	Not used	Not used
Slot 16	BRD16	Not used	Not used

Slot number	CallPilot-assigned board label[a]	Meridian 1	Succession CSE 1000
Slot 17	BRD17	Not used	Not used
Slot 18	BRD18	Not used	Not used
Slot 19	BRD19	Not used	Not used
Slot 20	BRD20	Not used	Not used

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. The SBC card includes two onboard network interface cards (for ELAN and CLAN) and an onboard video card. The NIC and monitor connectors are on the SBC card faceplate.

c. For Meridian 1 and Succession CSE 1000, the first MPB16-4 board must be installed in slot 11.

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

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