555-7101-119

CallPilot

Installation and Configuration

Part 5: 201i Server Maintenance and Diagnostics

Product release 2.0 Standard 1.0 September 2002

NORTEL NETWORKS™

P0949451

CallPilot

Installation and Configuration

Part 5: 201i Server Maintenance and Diagnostics

Publication number:	555-7101-119
Product release:	2.0
Document release:	Standard 1.0
Date:	September 2002

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Printed in Canada

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Publication history

September 2002

Standard 1.0 of *CallPilot Installation and Configuration, Part 5: 201i Server Maintenance and Diagnostics* is released for CallPilot 2.0 general availability.

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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 intended 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 12.

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

Chapter 6, "Performing hardware maintenance and mechanical assembly," explains how to replace hardware components. For more details, see "Replacing hardware components" on page 15.

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 201i server, as follows:

To	See
interpret the LEDs on the 201i server	Chapter 2, "Troubleshooting your CallPilot system"
interpret startup sequence and diagnostic codes	Chapter 2, "Troubleshooting your CallPilot system"
use Windows NT 4.0 diagnostic tools, including Event Viewer and TCP/IP diagnostic tools	Chapter 3, "Using Windows NT online diagnostic tools"
use the Event Browser, Alarm Monitor, and Maintenance page in CallPilot Manager	Chapter 4, "Using CallPilot Manager to monitor hardware"

To	See
use the following CallPilot system utilities: ■ Diagnostics Tool ■ System Monitor	Chapter 5, "Using CallPilot system utilities"

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
the 201i server (in the event of a complete system failure)	"Replacing the server" on page 121
the hard drive	"Replacing the IDE hard drive" on page 125
the software feature key (dongle)	"Replacing the software feature key" on page 132
MPC-8 cards	"Replacing Multimedia Processing Cards" on page 134

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 201i server or for taking it out of service

Chapter 2

Troubleshooting your CallPilot system

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Overview

Introduction

This guide provides instructions for using the resources provided by your 201i system. Use these resources to determine the cause of system problems, and then resolve them.

LEDs and HEX display on the 201i server's faceplate

The LEDs indicate when

- the 201i server, MPC-8 card, or SCSI drive are in use
- it is safe to remove the server from the switch, or the MPC-8 card from the server
- network activity is occurring

The HEX display displays messages that appear during startup or normal 201i server operation.

For more information, see "LED and HEX displays" on page 19.

Startup sequence and diagnostic codes

To help you determine if the 201i server started successfully (or if it failed), watch the startup sequence and the diagnostic codes that appear. The entire sequence occurs when you do one of the following:

- Lock 201i server against the switch backplane. When locked against the backplane, the 201i server begins receiving power.
- Restart Windows NT.
- Press Reset on the 201i server's faceplate to perform a hardware restart.

For more information, see "Startup diagnostics" on page 31.

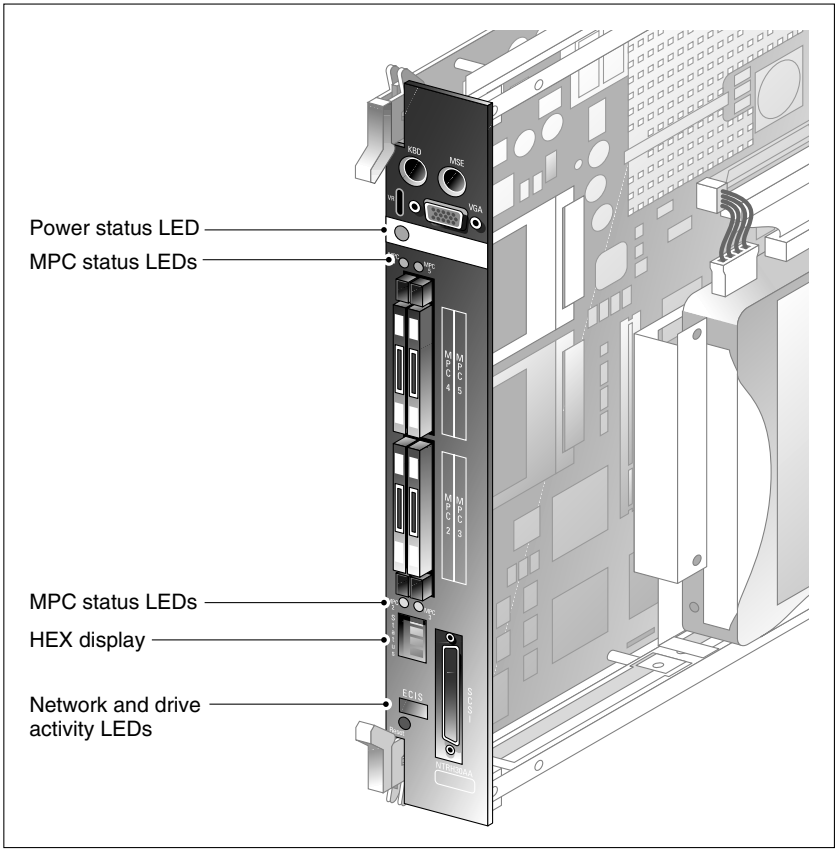
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Status LEDs and HEX display location

The following diagram shows the location of the status LEDs and HEX display on the 201i server's faceplate:



Interpreting the power status LED

Introduction

The power status LED is located on the 201i server's faceplate, directly under the keyboard connector. The LED indicates whether it is safe to remove the server from the switch (which results in a server power down).



CAUTION

Risk of equipment damage or data loss

Do not remove the 201i server during normal operation or certain phases of the startup sequence, as this can damage the operating system files on the hard disk.

To determine if it is safe to remove the 201i server from the switch, see "Power status LED indications" on page 21.

Power status LED functions

The LED indicates two server states:

- The 201i server is in use.
- It is safe to remove the 201i server from the switch.

Power status LED indications

IF the power status LED is	THEN
on	the server is powered on. *It is* safe to remove it from the switch. **Note:** When the LED is lit, the HEX display may display one of the following: T:XX, F:XX, HOST, or DOWN.

IF the power status LED is	THEN
off	*it is not* safe to remove the server from the switch. The server is in one of the following states: ■ The server is in the Windows NT startup sequence. ■ The server has completed the startup sequence and is running. **Note:** You must courtesy down CallPilot, and then shut down Windows NT before you can remove the 201i server from the switch. For instructions, see "Powering down the server" in Part 1 of the *CallPilot Installation and Configuration* binder.

Interpreting the MPC slot LEDs

Introduction

There is an LED for each MPC slot on the 201i server.

MPC slot LED functions

The LEDs indicate two possible MPC slot states:

- The MPC is in use.
- It is safe to remove the MPC from the server.

MPC slot LED indications

IF the MPC slot LED	THEN
is off	the MPC is not receiving power. It is safe to remove the MPC from the server.
is on	the MPC is in use. It is not safe to remove the MPC from the server.
was off, then came on	the MPC was recognized by the 201i software and subsequently powered up.
was on, then went off	the MPC was successfully disabled using the Maintenance page in CallPilot Manager. It is safe to remove the MPC from the server.

Interpreting the network and drive activity LEDs

Introduction

The 201i server provides four LEDs to indicate ELAN, CLAN, SCSI device, and IDE hard drive activity. They are labeled as follows:

LED label	Description
E	ELAN
C	CLAN
I	IDE hard drive
S	SCSI device (CD-ROM or tape drive)

Network LED states

IF the E or C LEDs are	THEN
off	a valid hardware connection with the network has not been established. Ensure that the cable is connected to the respective network hub. If the cable is connected, ensure that the cable is good.

IF the E or C LEDs are	THEN
on	a valid hardware connection with the network has been established. **Note:** Before the 201i server can receive or transmit data, you must configure valid IP settings on the 201i server by running the Configuration Wizard. For instructions, refer to the CallPilot Manager online Help.
blinking rapidly	activity is occurring on the network. **Note:** This does not mean that the 201i server is actually transmitting or receiving packets.

IDE drive LED states

IF the I LED is	THEN
off	the IDE hard drive is idle.
on	the IDE hard drive is being accessed.

SCSI device LED states

IF the S LED is	THEN
off	the SCSI device is idle, or the driver is not loaded.
blinking	the SCSI device is being accessed.
lit solid	the software driver has loaded but the SCSI device is not connected.

Interpreting the HEX display

Introduction

This section describes the codes that can appear on the HEX display during startup or normal 201i server operation.

Note: For a description of the codes that appear during startup diagnostics, see “Startup diagnostic codes” on page 32. For a description of the startup sequence, see “Startup sequence description” on page 36.

HEX display codes

During startup and normal 201i server operation, the HEX display on the server faceplate displays one of the following codes:

HEX display output	Description
Startup codes	
T:XX	The 8051 controller is starting and running diagnostics. These diagnostics are performed during a cold restart (when the server is powered up, or if you press Reset on the 201i server’s faceplate). For more details, see “Startup diagnostic codes” on page 32.
F:XX	At least one diagnostic failed. The displayed error code represents the first failed diagnostic. For more details, see “Startup diagnostic codes” on page 32.

HEX display output	Description
P:XX	An Extended POST error has occurred, where XX represents a two-character code. If the error is a critical error, the start cycle may halt. If the error is a non-critical error, the error code is logged in the Windows NT system event log after the operating system startup completes and the CallPilot 8051 device driver starts. **ATTENTION** POST Terminal errors that result in a system halt do not appear on the HEX display. If you are not able to use the HEX display to determine the cause of a system halt, contact your Nortel Networks technical support representative.
HOST	This appears during the startup sequence and means that BIOS diagnostics have started. HOST also appears on the HEX display when the server has been started to ROM-DOS.
NT	The Windows NT start sequence has started.
OK	The operating system start sequence was successful.
CallPilot and 201i server operation codes	
BOOT	CallPilot is starting and is not yet fully operational.
PASS	CallPilot is fully operational and ready to accept calls.
WARN	CallPilot is ready to accept calls. However, some services failed the start sequence. Review the event log for further information.

HEX display output	Description
FAIL	CallPilot failed the start sequence and cannot accept calls. Review the event log for further information.
MIN	A minor alarm has occurred. Review the event log for further information.
MAJ	A major alarm has occurred. Review the event log for further information.
CRI	A critical alarm has occurred. Review the event log for further information.
???	An alarm of unknown severity occurred. This error should not occur on a properly installed system. The severity of this event is treated as higher-than-critical.
DOWN	Windows NT has been shut down. When the power status LED is on, it is safe to remove the 201i server from the switch. If you perform a cold restart by pressing Reset on the 201i server's faceplate, or by removing and then reinserting the 201i server in the switch, the start sequence starts at stage 1, described on page 36. If you perform a warm restart by selecting Restart on the Windows NT shutdown menu, the start sequence begins at stage 9, described on page 37. However, the HEX display behaves as follows: ■ The DOWN message remains displayed until the Windows NT start sequence begins. ■ The DOWN message does not scroll.

Note: If you observe “???” or anything else on the display, contact your Nortel Networks technical support representative.

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Startup diagnostic codes

Introduction

HEX display diagnostic codes are divided into the following two categories:

- critical startup diagnostics
- noncritical operating system and switch diagnostics

Critical startup diagnostic codes

All critical startup diagnostics must pass before the 201i can proceed with the start sequence. If a critical diagnostic fails, the start sequence indefinitely halts, an error code displays, and a continuous beep is heard.

The following table shows the critical startup diagnostic codes with their corresponding failure codes. Failure of these diagnostics means that there has been a server failure. The start cycle is halted.

Note: When a test is successfully completed, the next test code appears.

Test code	Test description	Failure code
T:01	Internal RAM self-test	F:01
T:02	ALU self-test	F:02
T:03	Address mode self-test	F:03
T:04	Boot ROM self-test	F:04
T:05	Timer self-test	F:05
T:06	Watchdog self-test	F:06
T:07	EEPROM self-test	F:07

Test code	Test description	Failure code
T:08	End of system controller self-tests The power status LED blinks three times.	not applicable
HOST	Start of BIOS diagnostics The monitor displays the BIOS start screen. If a critical error occurs, the start cycle is halted. Examples of critical errors are memory failure or another type of error resulting in no display on the monitor.	HOST continues to scroll across the HEX display

Noncritical operating system and switch diagnostic codes

If a noncritical operating and switch diagnostic test fails, the HEX display stops at the failed test. The remaining diagnostics are not performed. The start sequence continues, but server functionality can be compromised.

The following table shows the noncritical operating system and switch diagnostic codes with their corresponding failure codes.

Note: While the test is in progress, the following codes may appear for a short period. If these messages display temporarily (that is, no longer than one second), a problem does not exist.

Status code	Operation description	Failure code
HOST	Continuation of BIOS diagnostics The monitor displays the BIOS start screen. If a noncritical error occurs, the server continues the start sequence.	P:XX

Status code	Operation description	Failure code
NT	Windows NT start sequence started **Note:** If the CallPilot server software is not installed, the HEX display remains at NT. (This can occur if you are performing a system rebuild.) During CallPilot software installation, the 8051 device driver is copied to Windows NT, at which point the HEX display continues as described below.	P:XX **Note:** For a description, see “P:XX failure codes” on page 35.
CDLN	8051 device driver on Windows NT has started; beginning of Cardlan interface communication (DS30x interface initialization) The system controller communicates with the switch, indicating that two cards are installed, and waits for switch acknowledgement.	CDLN Neither of the DS30x interfaces were initialized (both failed).
C:01	Initialization of the first DS30x interface	C:01 Initialization of the first DS30x interface failed. The second DS30x interface is OK.
C:02	Initialization of the second DS30x interface	C:02 Initialization of the second DS30x interface failed. The first DS30x interface is OK.

Status code	Operation description	Failure code
OK	Switch acknowledgement complete The Windows NT startup is complete, and CallPilot Fault Management takes over.	CRI, FAIL, MAJ, MIN, or WARN

P:XX failure codes

P:XX indicates a BIOS diagnostic error, where XX represents a two-character code. If the error is a critical error, the start cycle may halt. If the error is a noncritical error, the error code is reported in the Windows NT system event log after the operating system start sequence completes and the CallPilot 8051 device driver starts.

Note: If CallPilot is not installed, no event is logged.

ATTENTION

POST Terminal errors that result in a system halt do not appear on the HEX display. If you are not able to use the HEX display to determine the cause of a system halt, contact your Nortel Networks technical support representative.

Startup sequence description

Introduction

The following table describes the startup sequence and the diagnostic stages that occur. The entire sequence occurs when you do one of the following:

- You lock the 201i against the switch backplane and the 201i powers up.
- You press Reset on the 201i server's faceplate to perform a hardware restart.

Note: If you restart Windows NT by clicking the Shut Down and Restart options, the start sequence starts at stage 9. However, the HEX display behaves as follows:

- The DOWN message remains displayed until the Windows NT start sequence begins.
- The DOWN message does not scroll.

Stage	Description	HEX display	Status LED
1	Internal RAM self-test This is the start of critical startup diagnostics for the 8051 system controller. If any of the tests fail, the startup cycle is halted. Approximate duration: less than 1 second	T:01	ON
2	ALU self-test Approximate duration: less than 1 second	T:02	ON
3	Address mode self-test Approximate duration: less than 1 second	T:03	ON

Stage	Description	HEX display	Status LED
4	Boot ROM self-test Approximate duration: less than 1 second	T:04	ON
5	Timer self-test Approximate duration: less than 1 second	T:05	ON
6	Watchdog self-test Approximate duration: less than 1 second	T:06	ON
7	EEPROM self-test This is a noncritical diagnostic. If it fails, this is a noncritical error, and the start cycle continues. Approximate duration: less than 1 second	T:07	ON
8	End of system controller self-tests. No errors were found. Approximate duration: less than 3 seconds	T:08	blinks three times
9	Beginning of BIOS diagnostics **Note:** The BIOS splash screen appears, and HOST scrolls across the HEX display. Approximate duration: 7 seconds	HOST	ON
10	Beginning of Windows NT start sequence The monitor displays the Windows NT start selection menu.	NT	OFF

Stage	Description	HEX display	Status LED

10 (cont)	`Please select the operating system to start:`
	`----------`
	`Windows NT Server Version 4.00`
	`Windows NT Server Version 4.00 (VGA mode)`
	`Previous OS on C`
	`Choose an option[1,2]?1`
	
	A timer counts down from 5 seconds. If you do not press a key within 5 seconds, the start menu times out and, by default, loads Windows NT.
	
	If you press a key, the timeout is disabled. Use the up and down arrow keys to select the start option: Windows NT 4.0 Server or Windows NT 4.0 Server (VGA mode).
	
	Note: Use option 2 only if the monitor is not able to support resolution greater than 640 x 480 pixels.
	
	During the Windows NT startup, the monitor does the following:
	■ switches to blue screen and continues starting
	■ outputs checkdisk information to make sure no sectors are corrupted
	■ displays the Windows NT splash screen and logon prompt
	
	Approximate duration of Windows NT start sequence: 60 seconds
		NT	OFF

Stage	Description	HEX display	Status LED
11	Completion of operating system start sequence. The 8051 system controller is running normally.	OK	OFF
12	The 201i CallPilot software loads. OK means that CallPilot has loaded. CallPilot Fault Management takes over. If FAIL, WARN, CRI, MAJ, or MIN appears instead of OK, a fault has occurred. Use the system and CallPilot Manager event logs and Alarm Monitor to determine what happened. Approximate duration: 5 minutes	One of the following, as applicable: ■ BOOT ■ PASS ■ FAIL ■ WARN ■ CRI ■ MAJ ■ MIN	OFF

Troubleshooting startup problems

Introduction

This section suggests tasks you can perform to determine why the 201i server fails the startup cycle.

To determine why the 201i server failed the 8051 startup

1. Make a note of any diagnostic codes.
2. Try restarting the server by pressing Reset on the 201i server's faceplate.
3. During the restart sequence, view the diagnostic codes on the HEX display for failures.

   For a description, see "Startup sequence description" on page 36.

   Note: Allow 5 minutes for the start cycle to complete.
4. Refer to the *CallPilot Troubleshooting Reference* for other suggestions.

   Note: The *CallPilot Troubleshooting Reference* is intended 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 Nortel Networks Partner Information Center (PIC) at http://my.nortelnetworks.com.
5. If you still cannot find the cause of the failure, call your Nortel Networks technical support representative.

To determine why the 201i server failed to start CallPilot

1. Make a note of any diagnostic codes.
2. Try restarting the server by pressing Reset on the 201i server's faceplate.
3. During the start sequence, view the diagnostic codes on the HEX display for failures.

   For a description, see "Startup sequence description" on page 36.

   Note: Allow 5 minutes for the start cycle to complete.
4. View the event logs.

   For instructions, see "Viewing event logs" on page 46.
5. Refer to the *CallPilot Troubleshooting Reference* for other suggestions.

   Note: The *CallPilot Troubleshooting Reference* is intended 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 Nortel Networks Partner Information Center (PIC) at http://my.nortelnetworks.com.
6. If you still cannot find the cause of the failure, call your Nortel Networks technical support representative.

Chapter 3

Using Windows NT online diagnostic tools

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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.

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), the hex display should show PASS, and messages in dialog boxes on the monitor indicate that CallPilot is ready to accept calls.

If the hex display shows FAIL, CRI, MAJ, MIN, or FAIL or 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 201i server (see "To use the Windows NT Event Viewer" on page 48)
- CallPilot Event Browser or Alarm Monitor in CallPilot Manager

  For more information, do one of the following:

  - See "Alarm Monitor" on page 70.
  - 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.

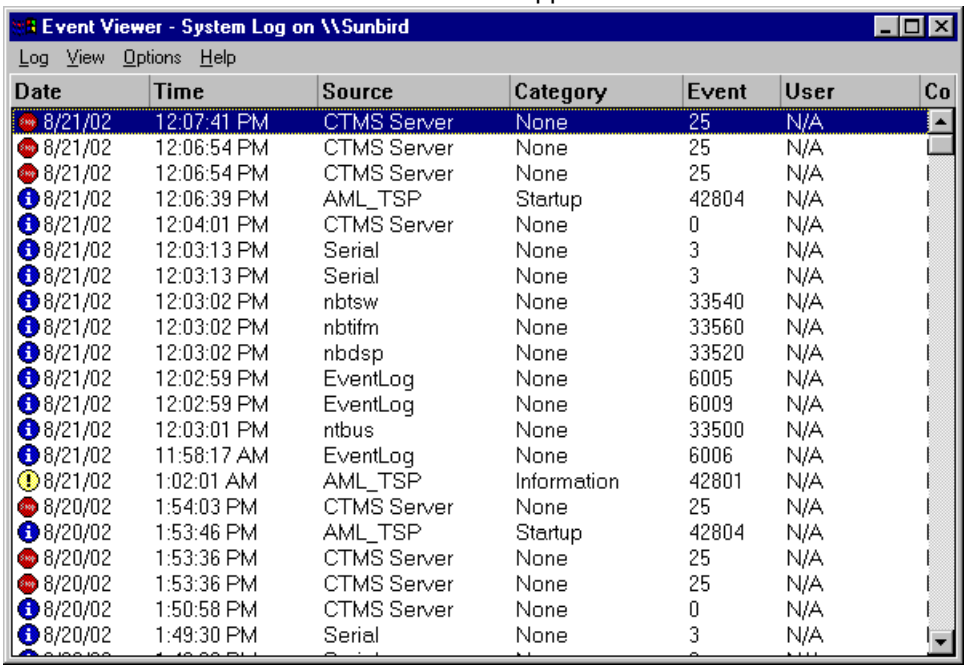
Where to get more information

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 48.

To use the Windows NT Event Viewer

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

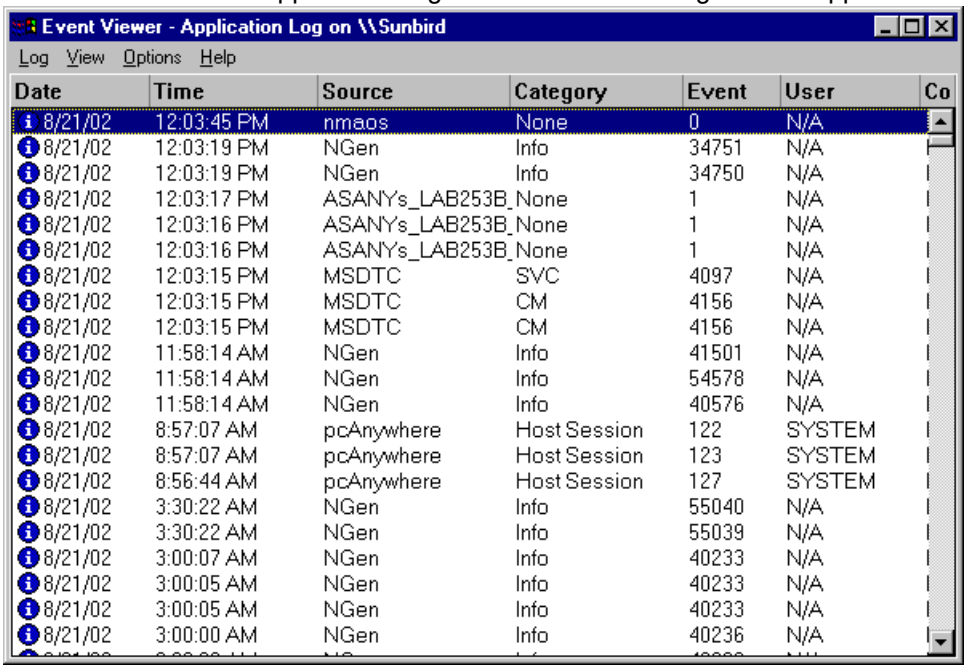
Result: The Event Viewer window appears.



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	

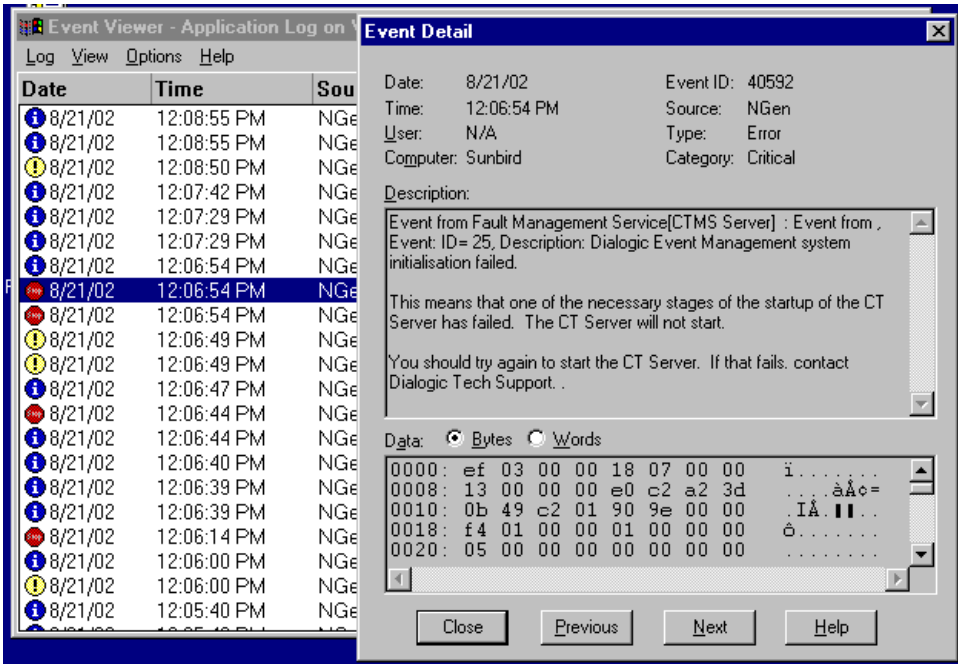
3 Look for error codes flagged with Stop or ! that have occurred since the last startup.

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 56)
- tracert (page 57)
- arp (page 59)
- nbtstat (page 60)
- netstat (page 62)

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.

Chapter 4

Using CallPilot Manager to monitor hardware

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Working with the Channel Monitor 102

Understanding fault management

Introduction

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

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

Event processing

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

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

Alarm notification

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

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

Section A: Tools for isolating and fixing hardware problems

In this section

Overview 68
Alarm Monitor 70
Event Browser 73
Maintenance page 76
Channel and Multimedia Monitors 77

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
Motherboard (IPE server)	All MPCs, and all multimedia and call channels associated with the IPE server.
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:

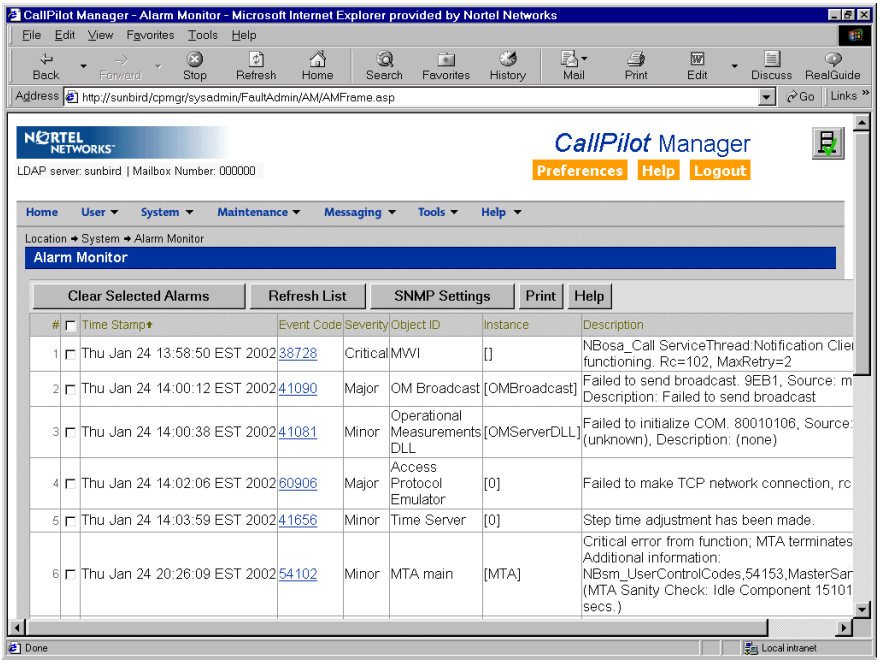
- Alarms appear in the Alarm Monitor only for Minor, Major, and Critical events (not Information events). All events can be reported in the Event Browser (depending on filtering criteria defined in the Event Browser).
- The first time an event occurs, it generates an alarm that appears in the Alarm Monitor. 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 73).

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

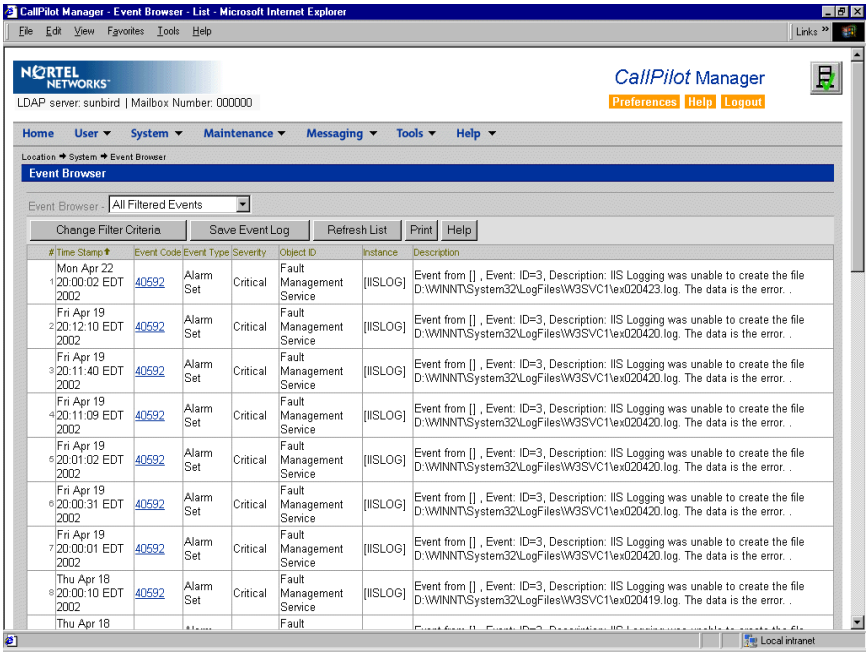
The Event Browser displays events that have been recorded in the server log. Each event identifies the time the event occurred, the object that generated the event, and the cause of the event.

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, 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 79, 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 99.

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 79.

Section B: Working with the Maintenance page

In this section

Introducing the Maintenance page 80
Viewing component states 84
Starting and stopping components 87
Running integrated diagnostics 91
Viewing the last diagnostic results 96

Introducing the Maintenance page

Introduction

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

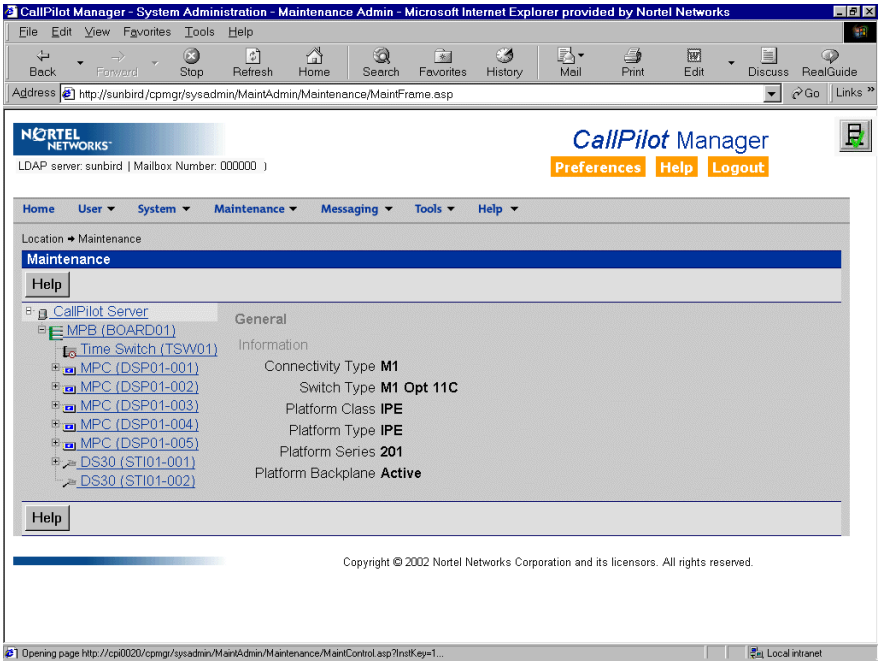
- Obtain general information about components.
- View component states.
- Start and stop components.
- Run integrated diagnostic tests.
- View the results of the last diagnostic test run against a component.

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 201i 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 84 ■ "Starting and stopping components" on page 87
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 91 ■ "Viewing the last diagnostic results" on page 96

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?
Motherboard (IPE server)	Yes	Yes	Yes
Time Switch	No	No	No

Component	Start, stop, or courtesy stop?	Diagnostics available?	Replaceable?
MPCs (embedded on the IPE server 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 down 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 99.

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 99.

Component	Effect of stopping
Motherboard (IPE server)	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 the IPE server or on MPC-8 cards)	Takes the selected MPC out of service.
DSPs	Takes the selected DSP out of service.

Component	Effect of stopping
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.

Button	Description
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 87.

Components that have diagnostic tests available

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

Component	Diagnostics available?	Replaceable?
Motherboard (IPE server)	Yes	Yes
Time Switch	No	No

Component	Diagnostics available?	Replaceable?
MPCs (embedded on the IPE server 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 95).

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 67.)

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 87.

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.

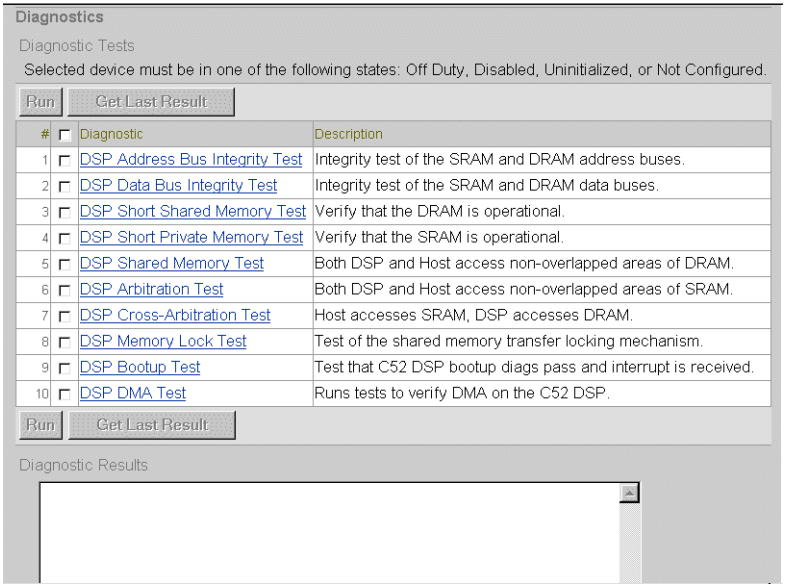
Result: The Maintenance page refreshes to show details about the component.

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 89.

6 Scroll down to the Diagnostics section.

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

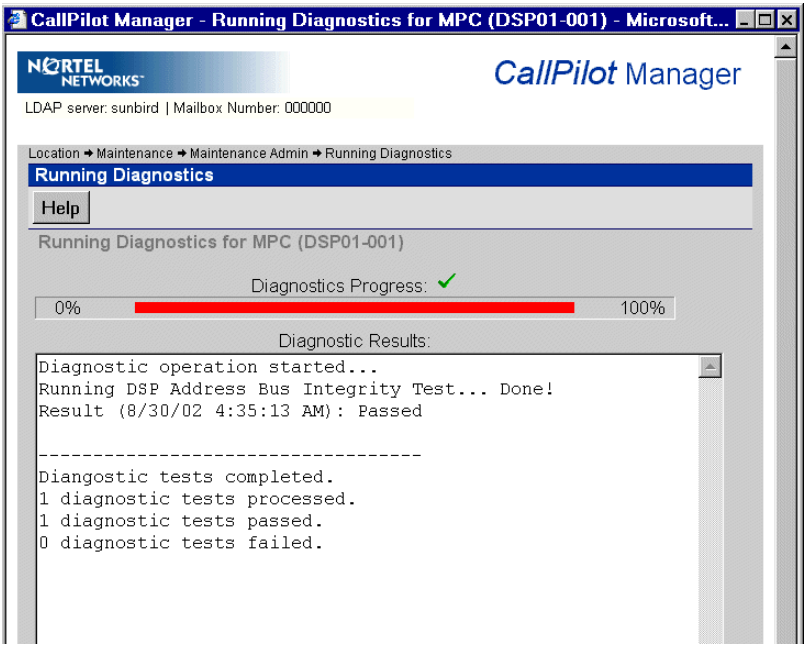


7 Check the check box for each diagnostic that you want to run.

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 87.

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.

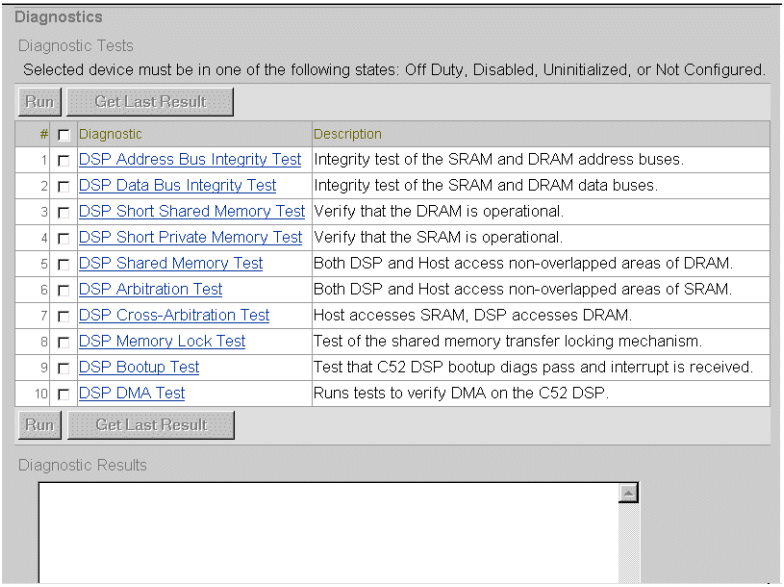
3 Continue clicking the plus sign (+) until the component with which you want to work is visible.

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.

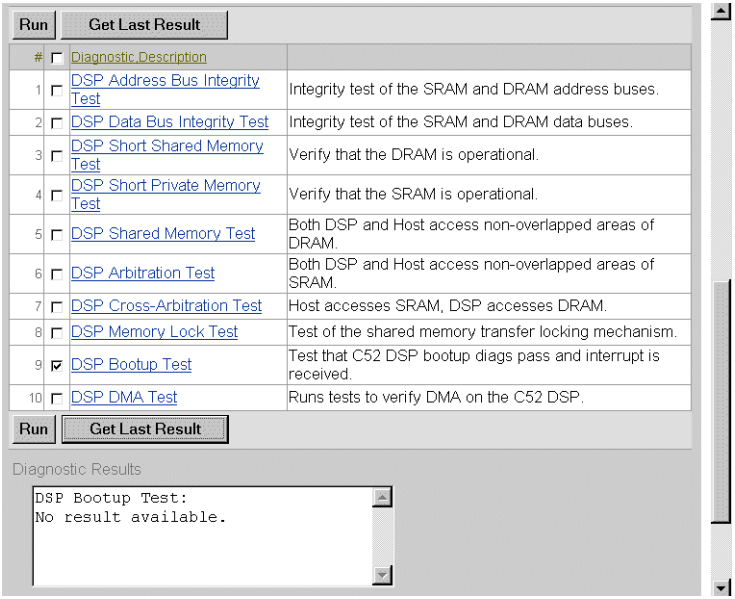
Result: The following is an example of the Diagnostics section for an MPC-8 card (removable MPC):



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 100
Working with the Channel Monitor 102

Working with the Multimedia Monitor

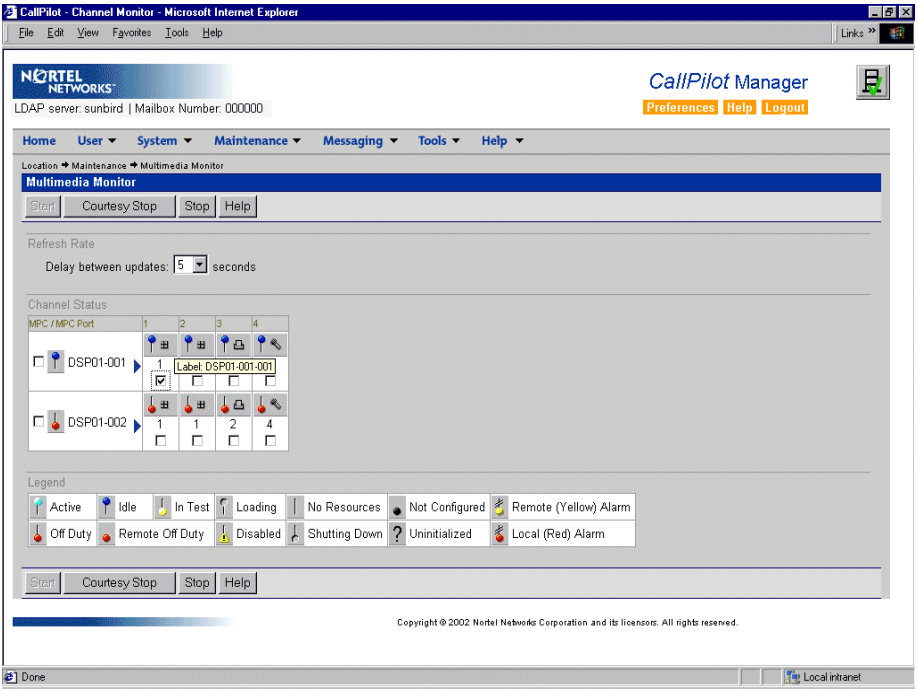
Introduction

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

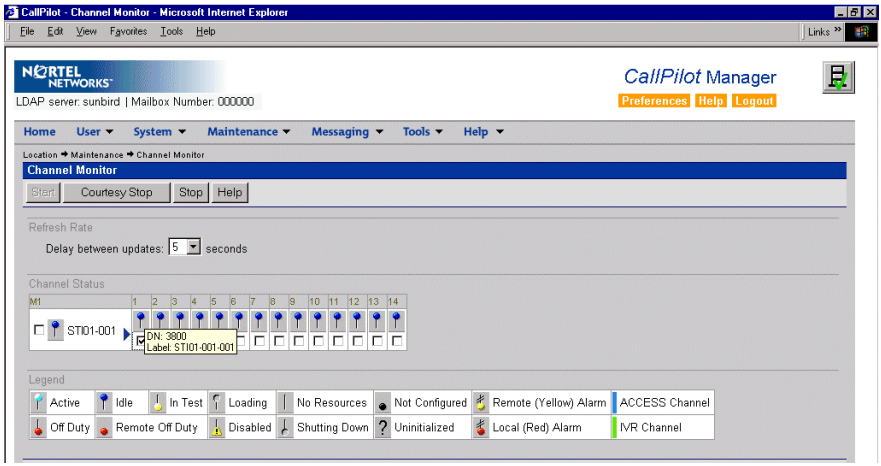
Introduction

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 5

Using CallPilot system utilities

In this chapter

Overview 106

Diagnostics Tool 107

PEP Maintenance utility 110

System Monitor 112

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.

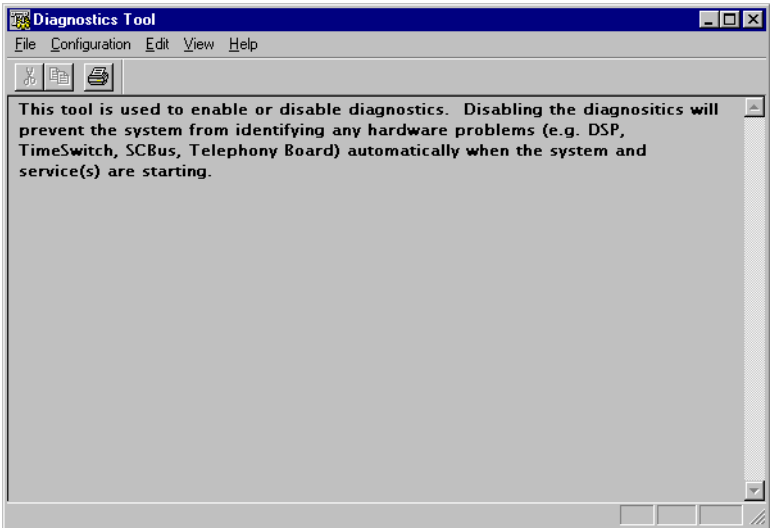
There are three recommended steps:

- 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

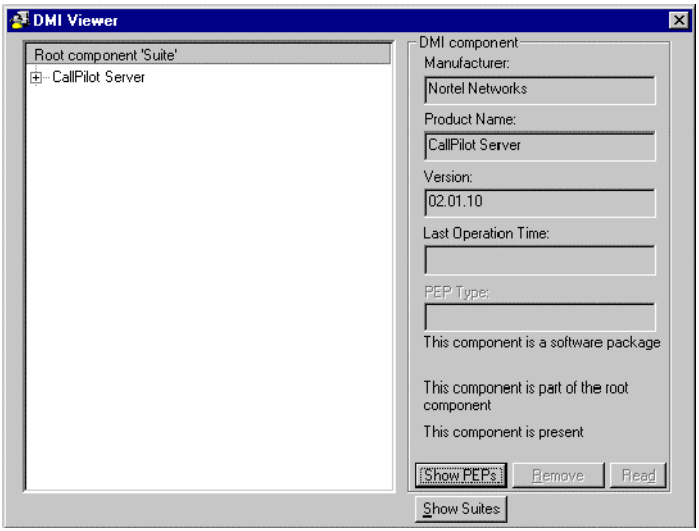
The PEP Maintenance utility displays a list of all installed PEPs on the server and enables you to uninstall PEPS.

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.

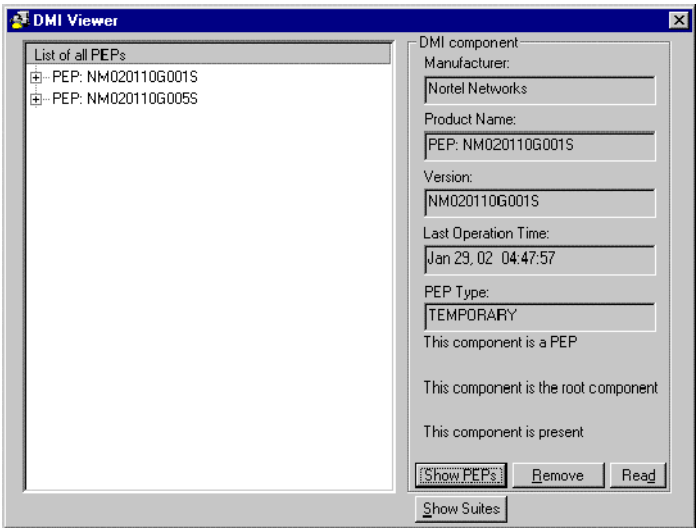


To view a list of all installed PEPs

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.

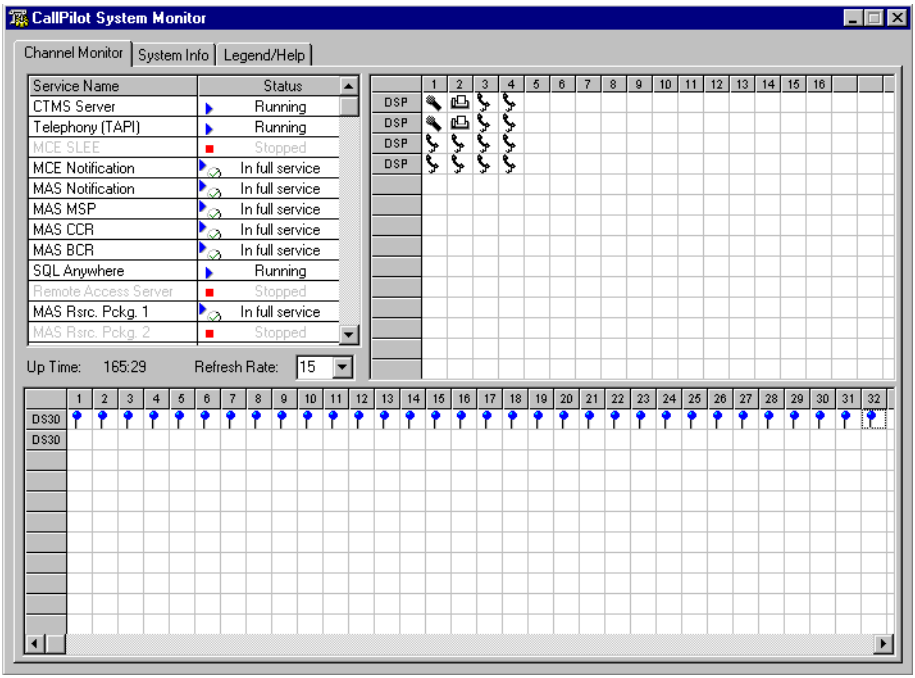
To access the System Monitor

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 201i servers, DSPs reside on the motherboard and on MPC-8 cards. DSPs are distributed as follows:

- The 201i server contains one embedded DSP with up to four MPC-8 cards.
- Each MPC-8 card contains a single DSP.

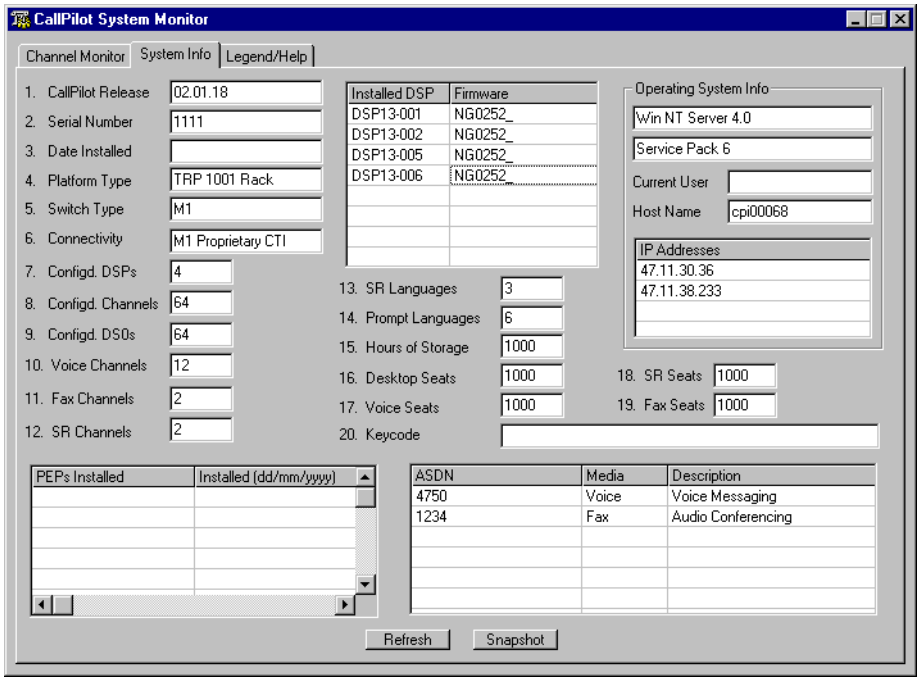
DS30X links

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.

For the 201i server, the DS30X link to the switch is supported by the connection of the server to the switch backplane.

About the System Info tab

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

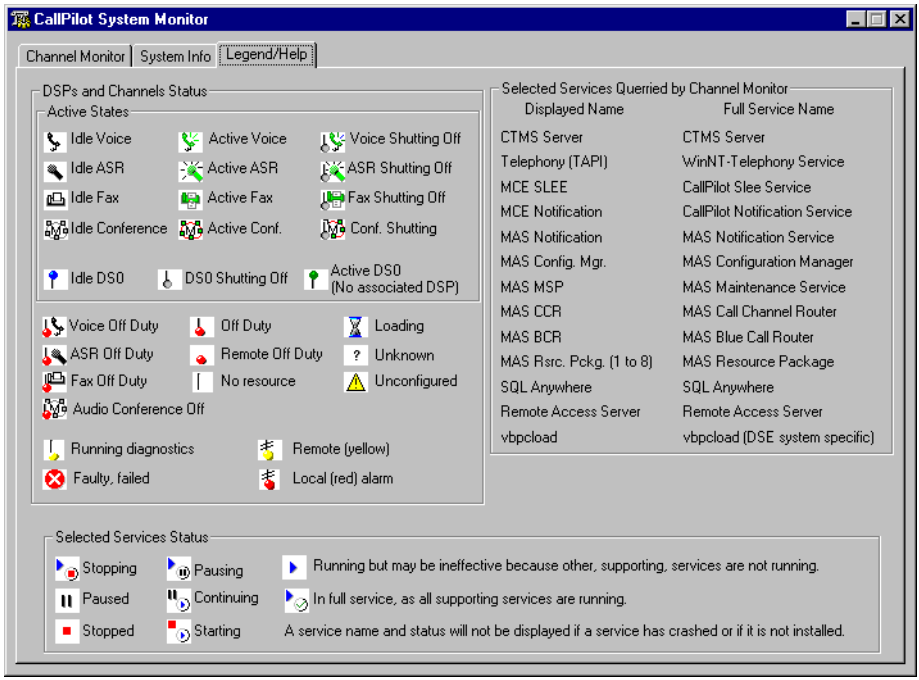


The numbered items provide information about the features purchased. Information about the underlying operating system is provided in the top right corner, including the server IP addresses.

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 6

Performing hardware maintenance and mechanical assembly

In this chapter

Overview 118

Removing the server from the switch 119

Replacing the server 121

Replacing the IDE hard drive 125

Replacing the software feature key 132

Replacing Multimedia Processing Cards 134

Overview

Introduction

Before you can begin component replacement, you must do the following:

- Gather the tools you need.
- Remove the 201i server from the switch.
- Become familiar with component layout on the 201i server.

Equipment required

You need the following tools, based on the component you are replacing:

- antistatic wrist strap or antistatic mat
- Phillips No. 1 and No. 2 screwdrivers
- tweezers

Before you begin

Shut down the server software. Then remove the server from the switch and lay it on a static-resistant surface, with the component side facing up.

If you need to replace the entire 201i server, review “Replacing the server” on page 121. Then review the procedures for installing the server and conducting diagnostic tests.

Removing the server from the switch

Introduction

You must remove the server from the switch before you replace the following components:

- hard drive
- software feature key

Note: You can replace an MPC-8 card without powering down the 201i server.

Equipment required

The following equipment is required for this procedure:

- antistatic mat
- antistatic wrist strap

To remove the server from the switch

1. Power down the server.

   For instructions, refer to Part 1 of the *CallPilot Installation and Configuration* binder.
2. Turn off the monitor.
3. Disconnect the monitor, keyboard, and mouse.
4. Power down the peripheral SCSI devices, and disconnect the SCSI cable.
5. Open the lock latches at the top and bottom of the server.
6. Grip the faceplate, and then pull the server out of the switch.
7. Place the server on a clean, static-resistant surface.

What's next?

Replace and upgrade components, as required.

Replacing the server

Introduction

Replace the server only if you are instructed to do so. For activities that are not supported as field procedures, you must return the server to Nortel Networks for service.

This section summarizes the procedure for replacing the server. References are made to specific component replacement procedures where applicable.

To replace the server

1. If the installed server is functional, perform a complete backup of the hard disk as a precautionary measure.
2. Use the Maintenance page in CallPilot Manager to take the installed MPC-8 cards out of service (see page 87).
3. Remove the MPC-8 cards from the faceplate of the server (see page 134).
4. Shut down the installed server (refer to “Starting up and shutting down the CallPilot server” in Part 1 of the *CallPilot Installation and Configuration* binder).
5. Power down and disconnect all peripherals from the server.
6. Remove the server from the switch (see page 119).
7. Remove the software feature key from the defective server, and then install it in the replacement server (see page 132).
8. Remove the hard drive from the defective server, and then install it in the replacement server (see page 127).
9. Install the replacement server on the switch, and then reconnect the peripherals.
10. Install the MPC-8 cards removed from the defective server (see page 138).

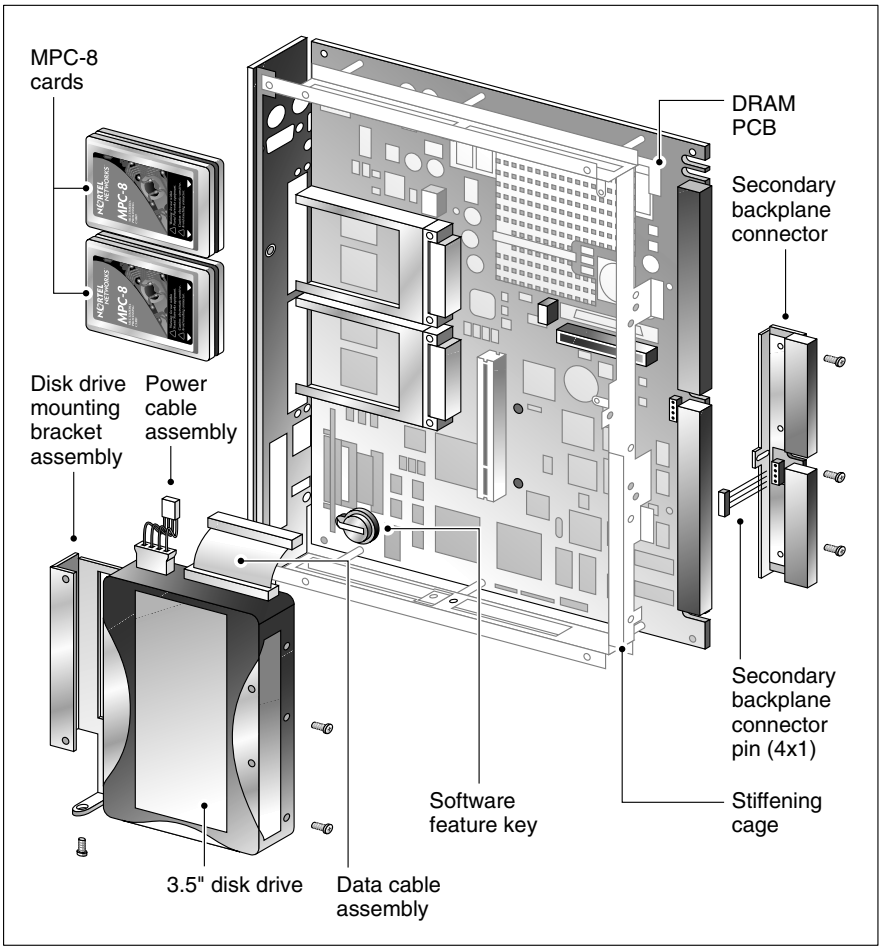
11 Boot the server to Windows NT.

12 Run the Configuration Wizard to configure the new hardware.

For instructions, refer to Part 3 of the *CallPilot Installation and Configuration* binder.

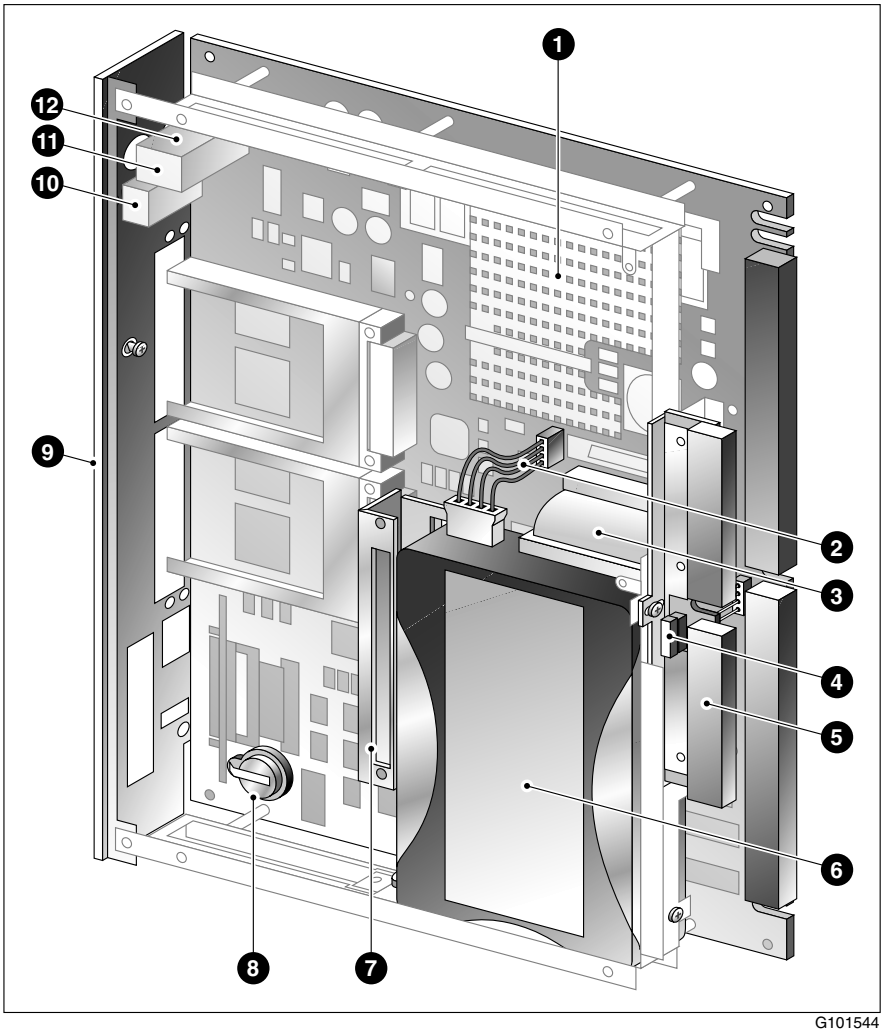
201i server component diagram: exploded view

The following diagram identifies component locations on the 201i server:



201i server component diagram: complete assembly

The following diagram shows the 201i server when it is completely assembled:



Legend

Item	Description
1	Heat sink
2	Hard drive power cable
3	Hard drive data cable
4	Secondary backplane connector pin
5	Secondary backplane connector
6	3.5" IDE hard drive
7	Hard drive mounting bracket
8	Software feature key
9	Faceplate
10	Monitor connector
11	Mouse connector
12	Keyboard connector

Replacing the IDE hard drive

Introduction

The hard drive rests lengthwise along the backplane side of the server. The hard drive is secured in place by five screws—two on the backplane edge, two through the motherboard, and one through the bottom edge of the stiffener.

Equipment required

The following equipment is required for this procedure:

- antistatic wrist strap
- Phillips No. 1 screwdriver

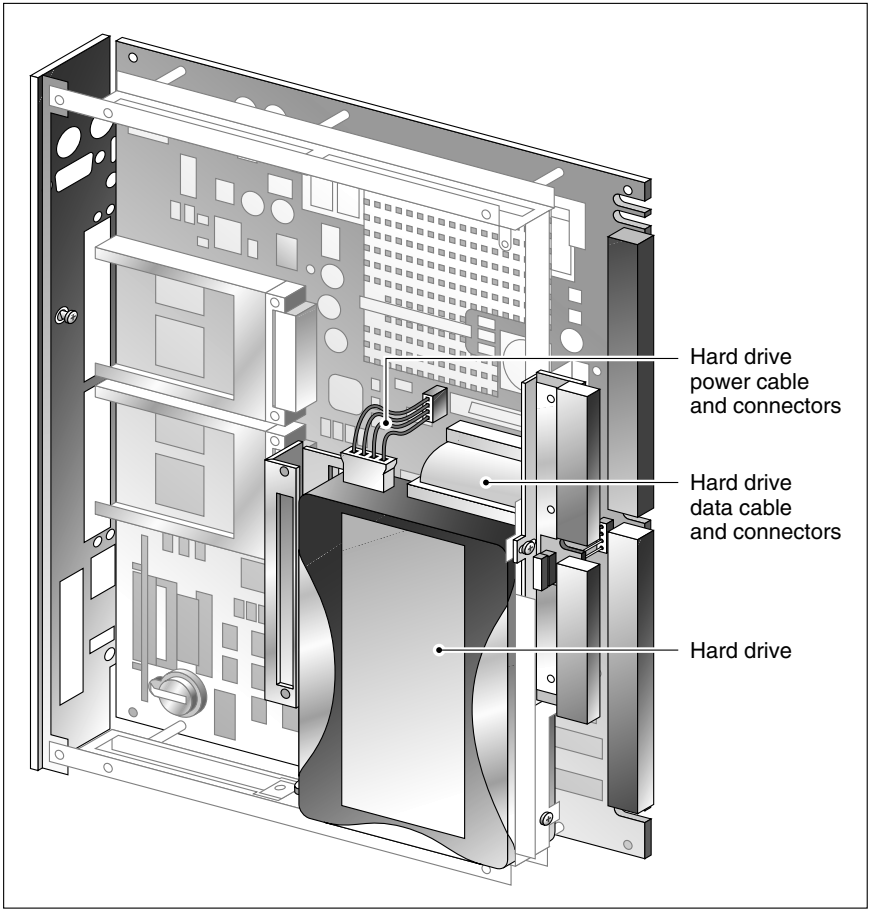
Before you begin

Before you replace the hard drive, review the following:

- "Removing the server from the switch" on page 119
- the "201i server component diagram: exploded view" on page 122

Hard drive assembly diagram

The following diagram shows the hard drive in its assembled state:



To remove the IDE hard drive

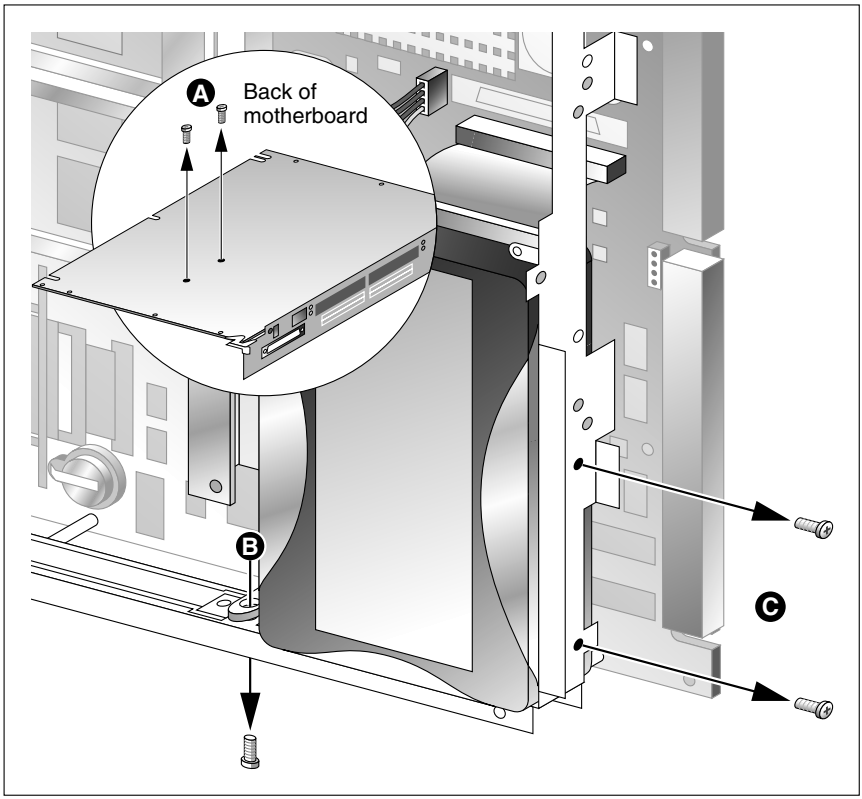
1 Do the following:

a. Remove the two screws on the back of the motherboard.

b. Remove the screw on the stiffening cage.

c. Remove the two screws on the hard drive's stiffener cage (along the backplane edge of the server).

See the following diagram:

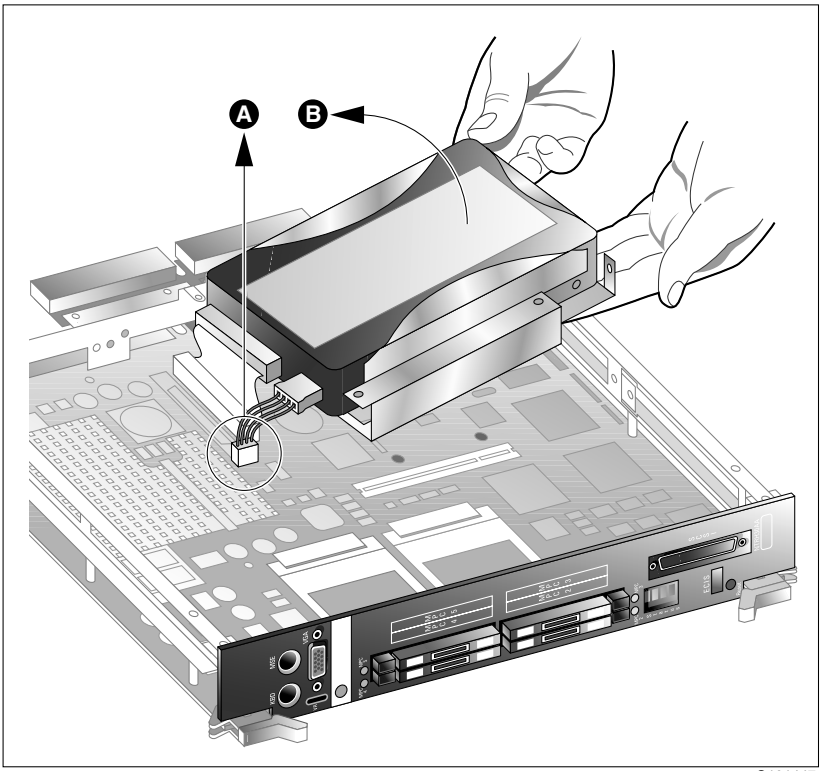


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2 Do the following:

a. Dislodge the power cable from its connector and lift it away from the motherboard.

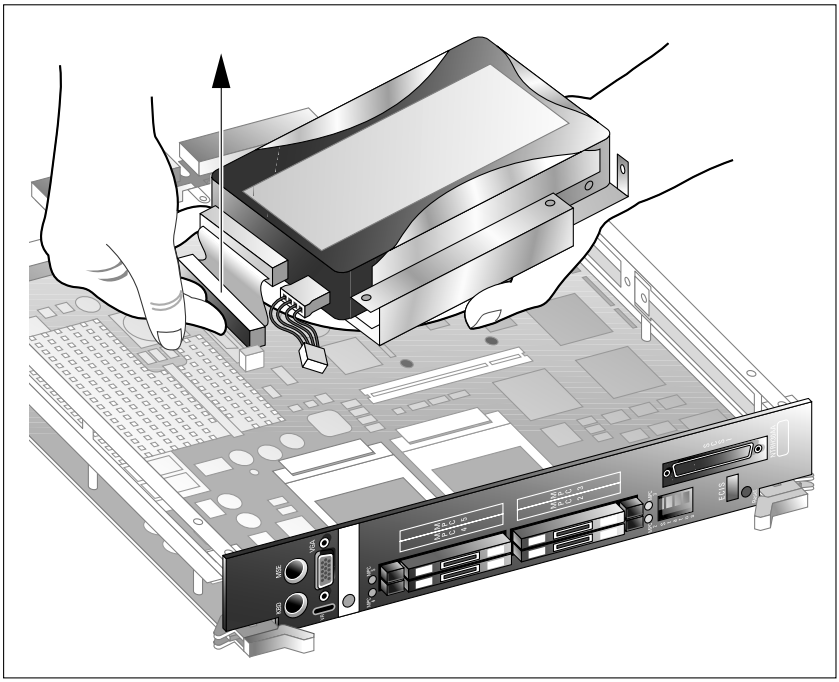
b. Slide one hand as far as you can beneath the hard drive so that it is securely supported and you can touch the data cable connector on the motherboard.



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3 Use the pull tabs to gently remove the data cable connector from the motherboard.

See the following diagram:



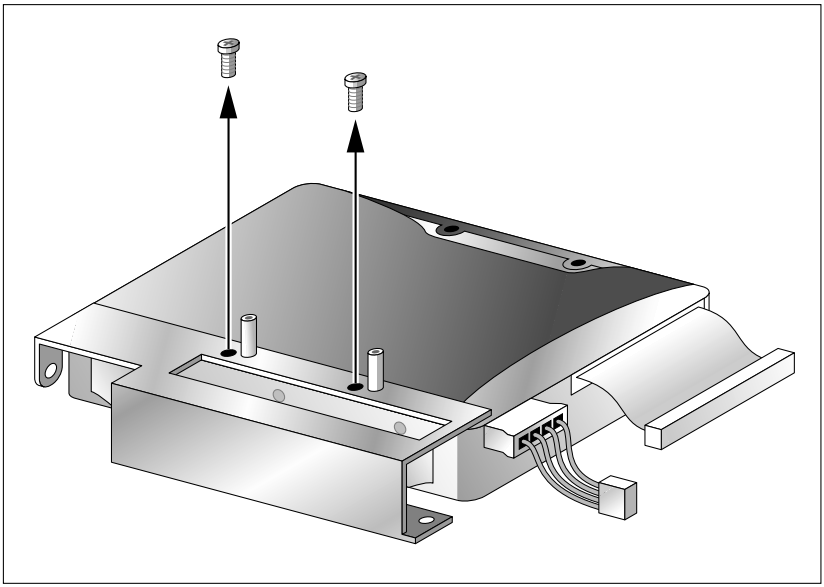
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4 Lift the hard drive assembly away from the motherboard.

5 Do the following:

IF you are	THEN
replacing the hard drive with a new one	continue with step 6.
keeping the hard drive but replacing the 201i server	continue with “To install the hard drive” on page 130.

6 Detach the hard drive bracket by removing the two screws on the bottom of the hard drive assembly.



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7 Remove the power and data cables from the hard drive.

8 Continue with “To install the hard drive” below.

To install the hard drive

1 If you are replacing the hard drive with a new one, do the following:

a. Attach the hard drive bracket to the new hard drive.

b. Attach the power and data cables to the new hard drive.

2 Connect the power and data cables to the 201i server motherboard.

Refer to “Hard drive assembly diagram” on page 126.



CAUTION

Risk of equipment damage

Ensure the pins on the data connector on the motherboard line up correctly with the data cable connector.

When the data cable connector is correctly aligned with the connector on the motherboard, press firmly down until the connector is properly seated.

3 Position the hard drive assembly in the server.

Align the hard drive’s bracket over the PCI connector on the motherboard, and then lower the assembly into position.

Note: The PCI connector on the motherboard is reserved for future use.

4 Align the drive with the screw holes.

5 Replace and tighten the screws.

ATTENTION

The five screws you removed earlier are two different sizes. The three smaller screws belong to the back of the motherboard and the bottom edge of the motherboard’s stiffener cage (see steps 1a and 1b on page 127).

The two larger screws belong to the hard drive’s stiffener cage (along the backplane edge of the server) (see step 1c on page 127).

What’s next?

Review the procedures for installing the server and conducting diagnostic tests.

Replacing the software feature key

Introduction

The software feature key stores the unique serial number of the server. If the 201i server must be replaced, use this procedure to move the software feature key from the faulty server to the replacement server.

Equipment required

The following equipment is required for this procedure:

- flat blade screwdriver
- tweezers

Before you begin

Before you replace the hard drive, review the following:

- "Removing the server from the switch" on page 119
- the "201i server component diagram: exploded view" on page 122

To replace the software feature key

1 Use the flat blade of the screwdriver to lift the clip that secures the software feature key to the motherboard.



CAUTION

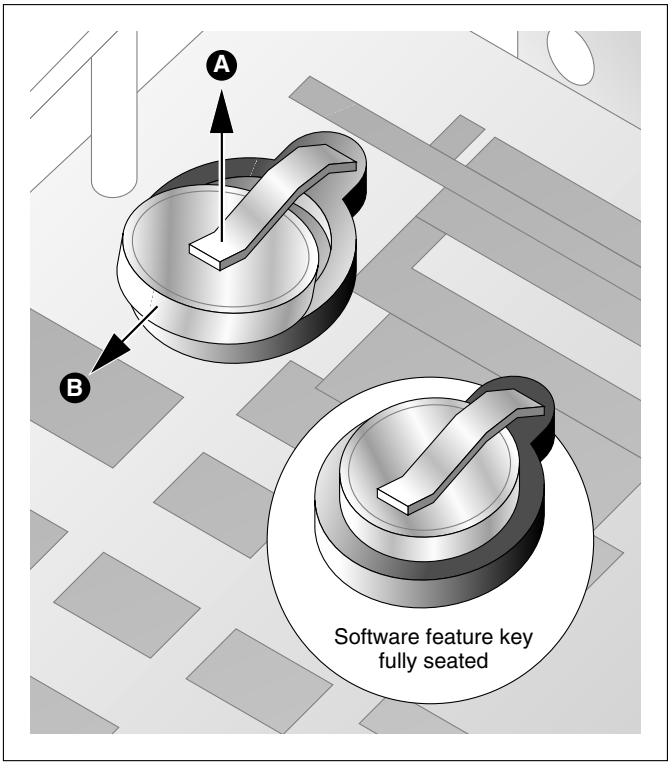
Risk of of equipment damage

Ensure that you do not bend the clip so that it can no longer apply downward pressure.

2 Use the tweezers to pull the software feature key out of the socket.

3 Insert the software feature key into the socket on the replacement server, lip side up.

When the software feature key is correctly installed, it is firmly seated in its socket. See the following diagram:



Replacing Multimedia Processing Cards

Introduction

The Nortel Networks MPC-8 card supports multimedia telephony services on the 201i server.

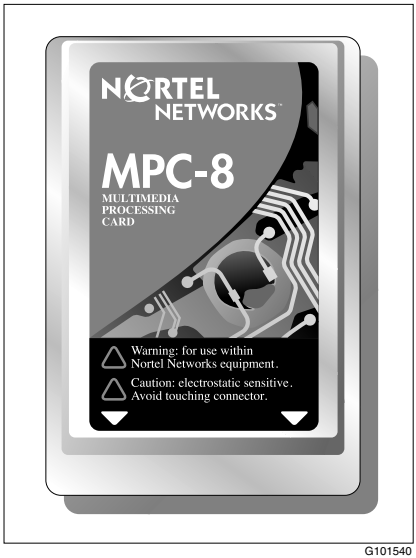
Note: The 201i server motherboard contains one built-in MPC. This MPC is known as MPC 1.

Supported MPC-8 card versions

The 201i server supports MPC-8 cards, Release 14 or later.

What the MPC-8 card looks like

The following is a diagram of the MPC-8 card:



Correct card insertion

Four specially designed card slots for the MPC-8 are located on the 201i server faceplate. The MPC-8 card is keyed so that it fits only one way into the slot on the 201i server faceplate. If the card is inserted incorrectly, the card does not go all the way into the slot.

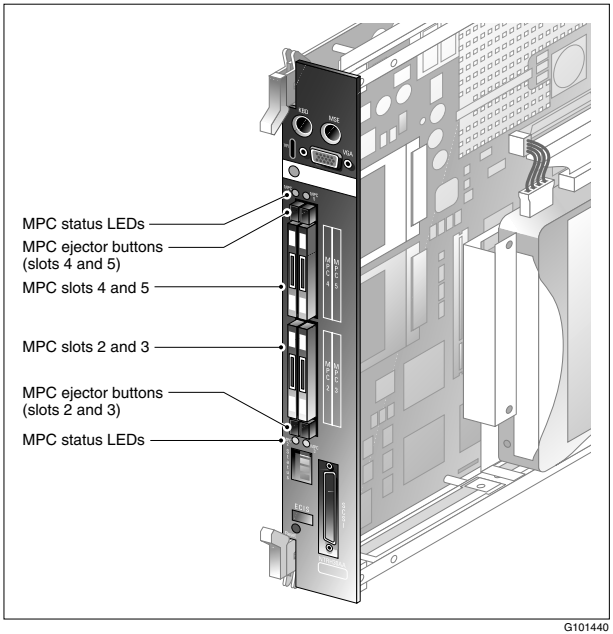
CAUTION

Risk of equipment damage

If you force the card into the slot incorrectly, this can result in damage to the MPC-8 card and the 201i server.

Location of MPC slots

There is an ejector button, slot, and LED for each MPC. The following diagram shows where they are located on the 201i server:



The following table describes each LED status:

Status	Description
Off	The MPC is not receiving power. It is safe to remove the card.
On	The MPC is in use. In this case, it is *not* safe to remove the card.
Off, then on	The MPC has been recognized by the 201i server software and has been powered up.
On, then off	The MPC has been successfully powered down. It is safe to remove the card.

To remove an MPC

ATTENTION

You can replace an MPC-8 card without powering down the 201i server. You must, however, disable the MPC-8 card using the CallPilot Manager software (as described in this procedure) before you remove it from the server.

ATTENTION

This procedure assumes that the 201i server is locked into position on the IPE shelf. If it is not, perform steps 3 and 4 only.

1 In CallPilot Manager, courtesy stop the channels associated with the MPC-8 card.

For instructions, see “Starting and stopping components” on page 87.

2 Ensure that the MPC's LED on the 201i server faceplate is not lit, which indicates that the MPC is no longer receiving power and can be removed safely.



CAUTION

Risk of equipment damage

If you remove an MPC while it is receiving power, this can damage the MPC or the 201i server.

3 Firmly press the MPC's ejector button to dislodge the MPC from its slot.

Refer to "Location of MPC slots" on page 135.



CAUTION

Risk of equipment damage

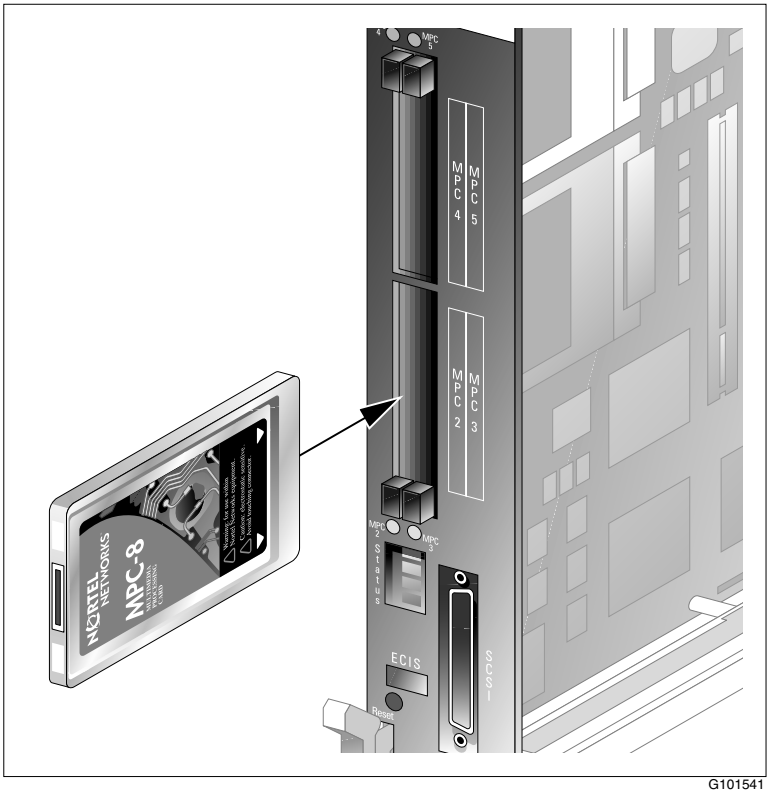
Be ready to grab the MPC card as it ejects so that it does not fall to the floor.

4 Pull the MPC out of its slot.

To install an MPC-8 card

1 Ensure that the MPC-8 card label is facing one of the following ways:

- facing to the right if the 201i server is inserted into the IPE shelf (see the following diagram)



G101541

- facing up if the 201i server is lying horizontally on a flat surface

2 Insert the card into the slot, and gently push it until it is firmly in place and the ejector button pops back out.

3 Ensure that the MPC's LED lights up green.

4 Run the Configuration Wizard to detect and initialize the new hardware.

For instructions on running the Configuration Wizard, refer to Part 3 of the *CallPilot Installation and Configuration* binder.

Note: You do not need to change any data in the Configuration Wizard. However, you must apply the configuration changes as instructed on the last page of the Configuration Wizard.

5 Start the MPC-8 card and its channels.

Result: For instructions, see “Starting and stopping components” on page 87.

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CallPilot

Installation and Configuration
Part 5: 201i Server Maintenance and Diagnostics

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Publication number:	555-7101-119
Product release:	2.0
Document release:	Standard 1.0
Date:	September 2002

Printed in Canada

NORTEL NETWORKS™