PassageWay™
s o l u t i o n

AT&T

Notice

While reasonable efforts were made to ensure that the information in this document was complete and accurate at the time of printing, AT&T can assume no responsibility for any errors. Changes and corrections to the information contained in this document may be incorporated into future reissues.

Your Responsibility for Your System's Security

You are responsible for the security of your system, AT&T does not warrant that this product is immune from or will prevent unauthorized use of common-carrier telecommunication services or facilities accessed through or connected to it. AT&Twill not be responsible for any charges that result from such unauthorized use. Product administration to prevent unauthorized use is your responsibility and your system administrator should read all documents provided with this product to fully understand the features available that may reduce your risk of incurring charges.

Trademarks

Novell and NetWare are registered trademarks of Novell Inc.
NetWare Telephony Services is a trademark of Novell Inc.
CallVisor is a trademark of AT&T.
DEFINITY is a registered trademark of AT&T. In this document, DEFINITY Communications System Generic 3 is often abbreviated to DEFINITY Generic 3 or Generic 3.

All products and company names are trademarks or registered trademarks of their respective holders.

Acknowledgment

This document was prepared by the AT&T Product Documentation Development department in Denver, CO.

Contents

Contents

Figures

2   **Installation**

4   Maintenance

Figures

Tables

Introduction

<div align="right">

1

</div>

Purpose

This document describes how to install and maintain the AT&T DEFINITY G3 PBX driver (G3PD) on a Novell telephony server. Information in this document is intended to be used by telephony services administrators and the services organization that assists administrators when they experience problems with the G3PD.

Caution should be exercised before executing any tasks that may disrupt existing service.

> ☞ **NOTE:**
> It is safe to view the current status of the G3PD driver and associated switch link(s). Also, viewing the error log, trace files, and running nondestructive tests are acceptable activities while the G3PD is providing telephony services. *All other activities (taking the link off-line, resetting the link, rebooting the G3PD, changing initialization parameters, etc.) should be run out-of-hours after providing a suitable warning to all affected users.*

This document contains the following sections:

- *Introduction* — Summarizes new features supported by the G3PD.

- *Installation* — Describes what equipment and resources are required for the proper installation and operation of the G3PD. Describes how to install, reinstall, and deinstall the G3PD onto a NetWare server.

- *Administration* — Describes how to administer the G3PD driver. Most driver administration is handled during installation.

- *Maintenance* — Describes three tools that can be used to observe and test the G3PD. A Windows utility (wg3oam.exe) can be used from any client workstation to exercise G3PD OA&M tasks. A NetWare NLM (g3oam.nlm) can be loaded on the console to exercise G3PD OA&M from the server's console screen.

- *Troubleshooting* —Describes actions to take when the G3PD driver does not appear to be working properly.

- *Appendix A* — Describes additional publications related to this document.

- *Appendix B* — Lists files that are installed or modified as a result of the G3PD installation.

- *Appendix* C — Describes how to administer the Basic Rate Interface (BRI) line that connects the DEFINITY G3 switch to the PC/ISDN card

Release Notes

This is the first official release of the AT&T DEFINITY Generic 3 PBX Driver (G3PD). With subsequent reissues of the G3PD, this section will include summary descriptions about new G3PD capabilities.

Installation

2

System Requirements

The following equipment and software is required for the proper installation of the G3PD:

- An Intel iAPX386 or iAPX486 class computer with 8 megabytes of main memory and 5 megabytes of disk space available on the sys volume. One free 8-bit slot must be available for the PC/ISDN card.
- Novell NetWare version 3.11 or newer.
- DEFINITY Generic 3 switch[1] with the Adjunct/Switch Applications Interface (ASAI) option installed and enabled.
- PC/ISDN card.

---

[1] Any G3 switch except G3vs or G3s.

Preinstall Checklist

In order to ensure the successful installation and operation of the G3PD, please verify that the following system requirements have been met:

❏ 1. The server has at least 8 megabytes of installed memory.
❏ 2. NetWare 3.11 or 3.12 is installed on the server.
❏ 3. The Telephony Server application has been previously installed.
❏ 4. There is at least 5 megabytes of available disk space on the sys volume.
❏ 5. A DEFINITY G3 switch with the ASAI option installed and an available Basic Rate Interface (BRI) link is available.
❏ 6. The PC/ISDN card requires that interrupt 2 or 3 be available for its use. If you intend to use interupt 3, you may have to disable the COM2 port using your server computer's setup routine (COM2, if present, defaults to interrupt 3 on PC-compatible computers). Most installations are able to use interrupt 2.
If interrupt 2 and 3 are already in use, you must free up interrupt 2 or 3 by locating the adapter card that uses one of these interrupts and selecting another interrupt for that card.

⇒ **NOTE:**
Do not install the G3PD unless all of the above system requirements have been met.

Quick Installation

This section is intended to be used by those familiar with the G3PD and telephony server.

1. Load install on the system console, type p to select Product Options, press enter.

2. Press the insert key, and install the G3PD from the appropriate floppy drive. If an older version of the G3PD is already installed, you will need to delete it first (see the G3PD Removal section).

   The install program will prompt you for each disk in the G3PD install set, When prompted for options, select the recommended defaults.

3. Deactivate the server and install the PC/ISDN card, using the interrupt and memory address selected during install.

4. Start the server (bring up NetWare). If the telephony server has not been started already by an entry in the AUTOEXEC.NCF file, start the Tserver with the command load ts 1000. Next, start the G3PD by entering load g3pd at the system console.

5. Install (and set up) the Windows G3PD OA&M utility (wg30am.exe) onto a client workstation by executing (from within Windows) sys:csta\g3setp\setup.exe[2].

6. Verify the switch link is operational by one of the following methods:

   - Look for the "IPCI: Board 1 Switch Layer 1 and Layer 2 are up." AUDIT message in the Telephony Server error log.
   - Using the Windows G3PD OA&M utility (wg3oam.exe), check the link status and verify that the switch connection is active.

---

[2]Using the File Manager, map the sys volume of the file server to a drive letter and double click on setup. exe under csta\g3setp.

- Using the NetWare G3PD OA&M utility (load g3oam), select the status command to verify that the switch connection is active.

Full Installation

This section describes how to install the NetWare and Windows components of the G3PD and related utilities. In addition to these directions, normal initialization messages are displayed throughout the installation.

NetWare Installation

> ⇒ **NOTE:**
> Do not insert the PC/ISDN card into your PC until you have read and understood the installation instructions below, and have reached the step instructing you to insert the PC/ISDN card. The software shipped with the PC/ISDN card will not be used, and only a portion of the *PC/ISDN Platform Installation and Reference* manual has relevance to the G3 PBX Driver product.

The following steps detail how to properly install the Generic 3 PBX driver (G3PD),

1. The install procedure, executed under NetWare, will inform you what settings to use for the PC/ISDN card. If you know that neither interrupt 2 nor 3 is available on your server, you should reconfigure other cards in your system to free up one of these two interrupts.

2. Verify that the Novell telephony server is already installed. This can be accomplished by confirming that the Tserver NLM is present in the system directory. The Tserver NLM is named TSRV.NLM. If the server is not installed, install the Novell Telephony Server.

3. At the server console, load the install NLM, e.g., load install.

4. Select Product Options and press the enter key.

5. Press insert to install a new product.

6.　　　Select the proper drive letter and press enter. Messages are printed to the screen as files are copied onto the server. A popup message will appear on the screen instructing you to insert the second G3PD install disk.

7.　　　After all files are transferred from floppy disk to the server, the configuration utility g3config is loaded. If this is a reinstall, and the initialization file (g3pd. ini) is still present, you will be asked if you want to use your old setup, or if you want to reenter G3PD initialization data. If you choose to reuse your old setup, skip to step (12).

8.　　　You are prompted for a memory address for the PC/ISDN card. The PC/ISDN requires a 16K block of memory at one of 16 locations. The default location 0xD0000 should work for most servers. The default is selected by pressing the enter key. Note, that if some other adapter card is using the address 0xD0000, the install program will not allow the PC/ISDN card to use this address.

9.　　　You are prompted for an interrupt number. If both interrupts 2 and 3 are available, you are able to select one of the two interrupts. The default is 2. If no interrupts are available, a warning message appears on the screen.

10.　　　You are now prompted for the advertised switch name for the PC/ISDN card. Note that the advertised PBX driver name includes the server name and the switch name. Since the server name is unique on the network, you can safely use the default switch name (G3_SWITCH). Press enter to select the default. If your building switch has a name (e.g., neptune), you would type in that name.

11.　　　You will now be asked to confirm the entries you have just selected. If your choices are correct, type y (yes) and press enter. If you press anything other than y, you are prompted again for the memory address, interrupt, and advertised switch name.

12.　　　This completes the software portion of driver installation. Press enter to clear the configuration screen and return to the install procedure.

13.   You must now shut down your server to install the PC/ISDN card. Exit
        from install, follow any shutdown procedures for running applications, and
        deactivate your server from the console.

14.   With the power shut off, install the PC/ISDN card by completing steps 2
        and 3 of *PC/ISDN Platform Installation and Reference,* Chapter 3
        (complete only steps 2 and 3, do not continue onto step 4 *or any
        subsequent step).*

15.   The PC/ISDN card must be configured to the address you selected in
        step 8 at the top of this page. In step 3 of *PC/ISDN Platform Installation
        and Reference,* you did not have to connect either a headset or a voice
        terminal (phone). You must use a terminating resistor to connect the LINE
        connector to the wall jack going to the DEFINITY Communications System
        BRI line. Leave the cover off the PC so that you can see the LED on the
        PC/ISDN card. The LED will blink if the PC/ISDN card has been properly
        initialized (after the G3PD.NLM has been loaded).

⟹ **NOTE:**
Most ISDN voice terminals require power to operate. This may involve additional equipment depending on your building wiring installation and equipment. Consult your DEFINITY administrator or telecommunications consultant for additional information.

16. If Interrupt 3 was selected, disable the COM2 port if it is installed on your system, Your system should be accompanied by its own set of instructions that describe how to change the configuration settings.

17. Power up the computer. If required, type server to start NetWare. If the Tserver is not running, start the Tserver by typing load tsrv. Next, start the G3PD by typing load g3pd.

18. Observe the LED on the PC/ISDN card. It should begin to flash within 60 seconds. If it does not flash, refer to the troubleshooting section at the end of this document. If you cannot get the PC/ISDN card to work, please refer to the release notes for information concerning who to contact to address this problem.

19. At the console, load g3oam.

20. At the G3oam> prompt, type test and press enter. The expected response for board 1 is "Heartbeat with Switch using ASAI was successful." If the test fails, consult your DEFINITY administrator to check out the BRI line settings. If the DEFINITY switch is properly administered and the wiring checks out, please refer to the release notes for information concerning who to contact to address this problem.

21. Shut down the applications, deactivate the server, and power off the computer. Replace the cover.

22. Power the server back up.

23.   Congratulations, you have successfully installed the DEFINITY G3 PBX
        Driver.

At the end of this section, a table lists typical system messages that may be found
in the telephony server error log after a successful initialization of the G3PD
(providing that the system is configured to log messages to the error file). Such
system messages are informative in nature, and are logged even in the event of a
successful initialization.

The next section describes how to edit your AUTOEXEC.NCF file so that it will
automatically load G3PD.

Automatically Loading G3PD

This section describes how to edit the AUTOEXEC.NCF file so that the G3PD will
be automatically loaded every time you start your server.

From the system console command prompt:

1. Load install.
2. Select System Options.
3. Select Edit AUTOEXEC.NCF File.
4. Use the down cursor arrow key ($\Downarrow$) to go to the end of the file, and add load
   g3pd just after the line containing load tsrv. If the load tsrv line is not present,
   refer to the *NetWare Telephony Services Network Manager's Guide.*

Figure 2-1 shows the relative order of some of the lines in your AUTOEXEC.NCF required to properly run the G3PD.[3]

```
...
load clib
...
load tsrv
load g3pd
```

Figure 2-1. Relative Order of Lines in AUTOEXEC.NCF

[3]Figure 2-1 does not show additional lines that may be required for the proper operation of the telephony server.

Windows Installation

As a result of the G3PD installation, components of the Windows OA&M client application are also placed on the server. The following steps describe how to install this application on a client workstation.

⟹ **NOTE:**
At most, one instance of the G3PD Windows OA&M client (wg3oam.exe) can be connected to a G3PD at a single time. This application is intended to be used by the system administrator. If too many copies are installed throughout the network, it may be difficult to find out who is currently attached (so that you can tell them to log off).

Before you install wg3oam, you must have previously installed the Tserver client libraries on that same workstation. See Telephony Services for NetWare: Network Manager's Guide for instructions on installing the Tserver client libraries.

1. Make sure Windows is running (version 3.1 or Windows for Workgroups™) on the workstation on which you are installing wg3oam.exe.

2. wg3oam uses dynamically linked libraries (DLLs) that are installed as part of the telephony services client install procedure. Make sure that Tserver Windows components have been installed on any workstation on which you attempt to install the G3PD Windows OA&M utility.

3. Connect to the sys volume on the server on which G3PD was installed (as already described). For Windows for Workgroups, select Connect Network Drive in the File Manager.

4. Run your-server/sys:csta\g3setp\setup.exe (where your-server is the name of the server on which G3PD was installed). This can be done by double-clicking setup.exe from the File Manager, or by specifying the above path after selecting File->Run from the Program Manager

5. Follow the instructions displayed by the setup program, If you use the defaults (i.e., select CONTINUE), a program group (Telephony Services) is created and a program item (DEFINITY Driver Admin) is added to the group. The executables are installed under c:\csta (for the default case).

Initialization Messages

Figure 2-2 shows messages that may be found in the Tserver error log that are related to G3PD initialization. The first section lists the driver initialization parameters read from the g3pd.ini file. Next, the ASAI protocol stack is built and initialized. Then the PC/ISDN card is downloaded (pumped). Finally, the core G3PD objects are initialized and service is started.

```
11/22/93 14:25:40 g3Pd/P_STACK 58312 0 AUDIT_TRAIL: Set 'IPCI_INTR' = 2;
11/22/93 14:25:40 G3PD 58313 0 AUDIT_TRAIL: Set 'BOARDl_SMA' = OxDOOOO;
11/22/93 14:25:40 G3PD 58308 0 AUDIT_TRAIL: Set 'LINKl_NAME' = "G3_SWITCH";
11/22/93 14:25:40 G3PD 58312 0 AUDIT_TRAIL: Set 'MAX_ASSOCIATIONS' = 2048;
11/22/93 14:25:40 G3PD 58313 0 AUDIT_TRAIL: set 'BOARD2_SMA' = 0x0;
11/22/93 14:25:40 G3PD 58313 0 AUDIT_TRAIL: Set 'B0ARD3_SMA' = 0x0;
11/22/93 14:25:40 G3PD 58308 0 AUDIT_TRAIL: Set 'LINKS2_NAME' = "";
11/22/93 14:25:40 G3PD 58308 0 AUDIT_TRAIL: Set 'LINK3_NAME' = "";
11/22/93 14:25:40 G3PD 58308 0 AUDIT_TRAIL: Set 'LINK4_NAME' = "";
11/22/93 14:25:40 G3PD 58312 0 AUDIT_TRAIL: Set 'IPCI_UNITS" = 1;
11/22/93 14:25:40 G3PD 58312 0 AUDIT_TRAIL: Set 'NUM_SESSIONS' = 50;
11/22/93 14:25:40 G3PD 58312 0 AUDIT_TRAIL: Set 'NUM_CALL_MONITORS' = 200;
11/22/93 14:25:40 G3PD 58312 0 AUDIT_TRAIL: Set 'NUM_DEVICE_MONITORS' = 200;
11/22/93 14:25:40 G3PD 58312 0 AUDIT_TRAIL: Set 'NUM_ROUTE_DEVICES" = 0;
11/22/93 14:25:40 G3PD 58312 0 AUDIT_TRAIL: Set 'NUM_SESSION_REQUESTS' =
        200;
11/22/93 14:25:40 G3PD 58312 0 AUDIT_TRAIL: Set 'KLOG_RECORDS' = 50000;
11/22/93 14:25:41 G3PD 58256 0 AUDIT_TRAIL: ASAI/IPCI administration daemon
        has started.
11/22/93 14:25:41 G3PD 58011 0 AUDIT_TRAIL: QP bind operation  for the
        /dev/ipcil Stream succeeded.
11/22/93 14:25:41 G3PD 58111 0 AUDIT_TRAIL: ASAI Q.931/932 Provider Version
        02.02.05
11/22/93 14:25:41 G3PD 58014 0 AUDIT_TRAIL: Push of FEL onto /dev/ipcil
        succeeded.
11/22/93 14:25:41 G3PD 58017 0 AUDIT_TRAIL: Link of asai file with
        /dev/ipcil succeeded.
11/22/93 14:25:41 G3PD 58020 0 AUDIT_TRAIL: IPCI stack setup was successful.
```

Figure 2-2. Tserver Error-Log Messages Related to G3PD Installation

(Continued on Next Page)

```
11/22/93 14:25:41 G3PD 56105 0 AUDIT_TRAIL: OnLine: Download to all boards
      has Started.
11/22/93 14:25:41 G3PD 56106 0 AUDIT_TRAIL: OnLine: Download to IPCI 1 has
      started.
11/22/93 14:25:57 G3PD 56118 0 AUDIT_TRAIL: OnLine: Download to IPCI 1 has
      ended Successfully.
11/22/93 14:25:57 G3PD 59014 0 AUDIT_TRAIL: The following info. applies to
      board(s) 1.
11/22/93 14:25:57 G3PD 59016 0 AUDIT_TRAIL: The above listed board(s) has
       (have) been pumped Succeessfully
11/22/93 14:26:00 G3PD 59014 0 AUDIT_TRAIL: The following info. applies to
      board(s) 1.
11/22/93 14:26:00 G3PD 59015 0 AUDIT_TRAIL: IPCI: Board 1 switch Layer 1 and
      Layer 2 are up.
11/22/93 14:26:01 G3PD 58260 0 AUDIT_TRAIL: ASAI/IPCI administration daemon
      done init.
11/22/93 14:26:01 G3PD 10 50 TRACE: [CASmap]: constructor completed
      successfully.
11/22/93 14:26:01 G3PD 20 50 TRACE: [SLOmap]: constructor completed

11/22/93 14:26:01 G3PD 6 68 AUDIT_TRAIL: [main]: PBX G3_SWITCH creation

11/22/93 14:26:01 G3PD 110 61 TRACE: [SLO:l]: Started link thread.
11/22/93 14:26:01 G3PD 500 59 TRACE: [SLO]: Renaming link thread to

11/22/93 14:26:01 G3PD 550 64 TRACE: [LinkThreadOl]: Link is FULLY IN
```

**Figure 2-2 (Continued). Tserver Error-Log Messages Related to G3PD
        Installation**

Figure 2-3 shows the normal messages that correspond to a correct shutdown of the G3PD.

```
11/22/93 14:44:03 G3PD 25002 0 AUDIT_TRAIL: Received signal SIGTERM -
        Unloading G33PD
11/22/93 14:44:03 G3PD 30 50 TRACE: [SLOmap]: destructor completed
        successfully.
11/22/93 14:44:03 G3PD 40 49 TRACE: [SLO:l]: asai_close () completed
        successfully .
11/22/93 14:44:03 G3PD 20 50 TRACE: [CASmap]: destructor completed
        successfully .
11/22/93 14:44:03 G3PD 555 47 WARNING: [LinkThread0l]: Cannot read from
        link.  PBX is exiting.
12/22/93 14:44:03 G3PD 590 60 TRACE: [LinkThread0I]: Link Thread exiting.
11/22/93 14:44:03 G3PD 58261 0 AUDIT_TRAIL: g3pdUnloadProtocolStack called
11/22/93 14:44:03 G3PD 58262 0 AUDIT_TRAIL: g3pdUnloadProtocolStack  complete
11/22/93 14:44:03 G3PD 25001 0 AUDIT_TRAIL: Exiting G3PD
```

Figure 2-3. Normal Messages that Result from a Successful Shutdown of the G3PD

Reinstallation

In order to reinstall the G3PD, you must remove the currently installed driver, Before you remove the G3PD, you may want to save a copy of the G3PD initialization file. To do this, copy sys:\system\tsrv\g3pd\ g3pd.ini to a safe location. The g3pd.ini file is readable and can be printed.

To remove the G3PD:

1. Load install
2. Select 'product options'
3. Use the cursor keys to select the G3PD driver
4. Press the Del (delete) key
5. Answer yes to 'Uninstall G3PD'

If you do not plan on reinstalling the G3PD on this server, remember to remove the load g3pd line from your AUTOEXEC.NCF file.

Administration

3

Tunable Parameters

For the version 1.0 release of the G3PD, administration is accomplished, by manually editing the driver initialization file. Note that the G3PD only reads its initialization file when it is first loaded. The initialization file can be modified from the console, or from a client that has mapped the sys volume for the server on which the G3PD is installed.

⇒ **NOTE:**
Under most circumstances, you should never need to modify the default settings provided in the G3PD initialization file. If you ever decide to modify one or more initialization parameters, it is recommended that you keep a backup copy of the initialization file in case the modifications cause problems.

The table later in this section describes the administrable G3PD parameters. The following procedure describes how to change MAX_ ASSOCIATIONS in the initialization file. This is done from the console, assuming that NetWare was fully installed.

1. Switch to the main console screen.

2. Load the editor, by typing load edit sys:system\tsrv\g3pd\g3pd.ini (g3pd.ini is the G3PD initialization file).

3. Using the down cursor key ($\Downarrow$) move down to the line that contains MAX_ASSOCIATIONS.

4. Using the right arrow cursor key ($\Rightarrow$) move over to the current value for MAX_ASSOCIATIONS. Use the **Del** key to delete the old value, and type in the new value.

5. Press **Esc** to leave the editor. Answer yes to the question asking if you want the modifications saved.

6. In order for the values to be used by the G3PD, you must shut down (unload) and restart the G3PD.

Follow the driver shutdown/restart procedures for PBX drivers described in NetWare Telephony Services Network Manager's Guide.

Table 3-1 describes all the variables in the G3PD initialization file (g3pd.ini):

■ Variables flagged with an asterisk (*) are reserved for future releases (they have no effect in version 1.0).

■ Variables flagged with a dagger (†) are reserved for the AT&T services organization (and should not normally be touched by customers - these parameters could affect overall system performance).

■ Variables flagged with a double dagger (‡) are guidelines, they should be properly sized for optimal performance, but are not subject to strict limitations (e.g., if they are sized too large, memory may be wasted, if they are sized too small performance will decrease slightly).

Table 3-1. Description of Variables in the G3PD Initialization File (g3pd.ini)

VARIABLE	TYPE	DEFAULTS	COMMENTS
IPCI_INTR	DECIMAL	2	Interrupt 2 or 3
BOARD1_SMA	HEX	0xd0O0O	Shared memory address for board 1.
BOARD2_SMA*	HEX	0x0	Shared memory address for board 2.
BOARD3_SMA*	HEX	0x0	Shared memory address for board 3.
BOARD4_SMA*	HEX	0x0	Shared memory address for board 4.
LINK1_NAME	STRING	"G3_SWITCH"	Advertised switch name for link 1. String up to 10 characters in length (will be truncated if it is longer),
LINK2_NAME*	STRING	""	Only one link is supported in R1 .0.
LINK3_NAME*	STRING	""	Only one link is supported in R1.0.
LINK4_NAME*	STRING	""	Only one link is supported in R1 .0.
OAM_NAME	STRING	"G3_OAM"	Advertised OA&M name. String up to 10 characters in length (will be truncated if it is longer).
MAX_ASSOCIATIONS	DECIMAL	2048	Maximum per-link associations (same for all links). Minimum is 64, maximum is 8192. *See text for effects on NLM size.*

(Continued on Next Page)

Table 3-1 (Continued). Description of Variables in the G3PD Initialization File (g3pd.ini)

IPCI_UNITS*	DECIMAL	1	Number of boards configured. *Only one board supported in R1.0*
KLOG_RECORDS†	DECIMAL	2000	Number of in-core trace records. *See description of g3trace.nlm*
NUM_SESSI0NS‡	DECIMAL	50	Guideline for number of simultaneous sessions (active acsOpenStream requests).
NUM_CALL_MONITORS‡	DECIMAL	200	Guideline for number of simultaneous cstaMonitorCall requests.
NUM_DEVICE_MONITORS‡	DECIMAL	200	Guideline for number of simultaneous cstaMonitorDevice requests.
NUM_ROUTE_MONITORS‡*	DECIMAL	0	Route server not supported in R1.O.
NUM_SESSION_REQUESTS‡	DECIMAL	200	Guideline for number of simultaneous (not confirmed) CSTA requests for a single session (open stream).
NUM_SESSION_MONITORS‡	DECIMAL	200	Guideline for number of active device or call monitors for a single session (open stream).
NUM_TRACE_FILES†	DECIMAL	2	The number of files that will be created to contain trace entries. Each file contains 10,000 trace records and is about 250 Kbytes in size. *See description of g3trace.nlm*

(Continued on Next Page)

Table 3-1 (Continued). Description of Variables in the G3PD Initialization File (g3pd.ini)

MAX_TDI_MEMORY	DECIMAL	524288 (0.5 MB)	The number of bytes used for message buffers in the interface between the G3PD and the Telephony Server (per PBX). The minimum is 65536 (64 KB) and the maximum is 2097152 (2 MB).
HWM_TDI_MEM_PERCENT†	DECIMAL	80	The percentage of the MAX_TDI_MEMORY value used as a High Water Mark. When TDI memory usage reaches the High Water Mark amount, TDI memory requests from the Telephony Server (for incoming client messages) will be rejected as a simple means of flow control. TDI memory requests from the G3PD (for reply messages back to clients) will be honored until the memory used for message buffers reaches the MAX_TDI_MEMORY value.

(Continued on Next Page)

Table 3-1 (Continued). Description of Variables in the G3PD Initialization File (g3pd.ini)

MAX_REQS_QUEUED_PER_DEV†	DECIMAL	4	The maximum number of CSTA requests queued on any single device (by all clients). The minimum is 1, and the maximum is 20.
MAX_REQS_QUEUED_PER_PBX†	DECIMAL	10	The maximum number of CSTA requests queued in the TDI for each PBX. This includes messages going from the Tserver to the G3PD and messages going from the G3PD to the Tserver. Once this limit is reached, the Tserver will reject certain CSTA requests from clients (as a simple means of flow control). The minimum is 3, and the maximum is 100.
OAM_INACT_TIMEOUT	DECIMAL	30	The number of minutes of inactivity before the G3PD disconnects WG3OAM. Can be set from 10 to 720 minutes (12 hours).

Memory Use

This section describes how much memory is required for optimal performance by the G3PD. Table 3-2 lists the memory required for a minimally-configured G3PD.

Table 3-2. Memory Required for a Minimally-Configured G3PD.

G3PD.nlm size on disk	1.0 Mbytes
G3PD Static data and text	600 Kbytes
G3PD stacks	55 Kbytes
G3PD Non-load-dependent (static) allocated memory (MAX_ASSOCIATIONS=1024, KLOG_RECORDS=2000, plus additional, non-configurable memory)	297 Kbytes
G3PD Load-dependent (dynamic) allocated memory (Sample 1024-association load: 50 sessions, 200 device monitors, 820 other active CSTA requests (e.g. MakeCalls))	860 Kbytes
G3PD total memory usage (1024 associations)	1,812 Kbytes

For a G3PD that is configured for more than minimal capacity, the multipliers listed in Table 3-3 can be used. The boot-time variables (MAX_ASSOCIATIONS, KLOG_RECORDS) were previously described in Table 3-1. The boot-time variables allocate static memory that is not released back to the system until the driver is unloaded. Further (dynamic) memory is allocated for the lifetime of active associations and CSTA requests (e.g., device monitors or MakeCalls).

Table 3-3. Memory Required for a G3PD that is Configured for more than minimal capacity

PARAMETER	STATIC/DYNAMIC	COST PER UNIT
MAX ASSOCIATIONS (beyond the 1024 above]	STATIC	148 bytes each
KLOG_RECORDS (beyond the 2000 above)	STATIC	22 bytes each
number of active sessions	DYNAMIC	250 bytes avg. each est.
number of active device monitors	DYNAMIC	450 bytes avg. each est.
number of other active CSTA requests (e.g., MakeCalls)	DYNAMIC	950 bytes avg. each est.

As an example, a G3PD configured with MAX_ASSOCIATIONS set to 2048 would use an additional 148 Kbytes of static memory. If the load on the G3PD is 50 active sessions, 200 active device monitors, and 1844 active MakeCalls (i.e. 1024 additional CSTA requests), then an additional 950 Kbytes of dynamic memory would be used. Thus, a total of 1,098 Kbytes of additional memory would be needed to support this configuration and load.

Since G3PD.nlm uses STREAMS.nlm services, the STREAMS.nlm sizes in Table 3-4 must be included if STREAMS.nlm was not previously loaded on the server.

Table 3-4. Additional Memory Required for STREAMS.NLM

STREAMS.nlm size on disk	55 Kbytes
STREAMS Static data and text	47 Kbytes
STREAMS stack and dynamic memory	14 Kbytes
STREAMS total memory usage	61 Kbytes

Maintenance

4

This chapter describes the Windows OA&M utility, the NLM OA&M utility, the NLM trace utility and the DOS/Windows trace utility. The Windows OA&M utility is designed to be the primary tool used by administrators to maintain and control the G3PD.

Windows OA&M Utility

This section describes how to attach to the G3PD OA&M server using the Windows OA&M utility (wg3oam.exe) and how to perform each supported task. If wg3oam.exe has not yet been installed, see the instructions in the Installation section. *Note that you do not have to install wg3oam in order to execute it; you can select wg3oam.exe under sys:csta on your server using the file manager.*

The execution of many of the commands described in this section is recorded in the Telephony Server error log as AUDIT_TRAIL events. Before you can log in to the Windows OA&M utility, you must have OA&M privileges administered on the Tserver. For further information, see *NetWare Telephony Services Network Manager's Guide.*

When specifying the name of the G3PD server you wish to access, the server name must have the following format:

ATTG3#user_selected_name#OAM#server_name

The first and third fields are fixed as above. The default name of the second field is G3_OAM (see Figure 4.1).

Logging into a G3PD OA&M Server

WG3OAM can be started by clicking the DEFINITY Driver icon in the telephony services program group. When you first start wg3oam, the OA&M server-selection screen shown in Figure 4-1 is displayed.
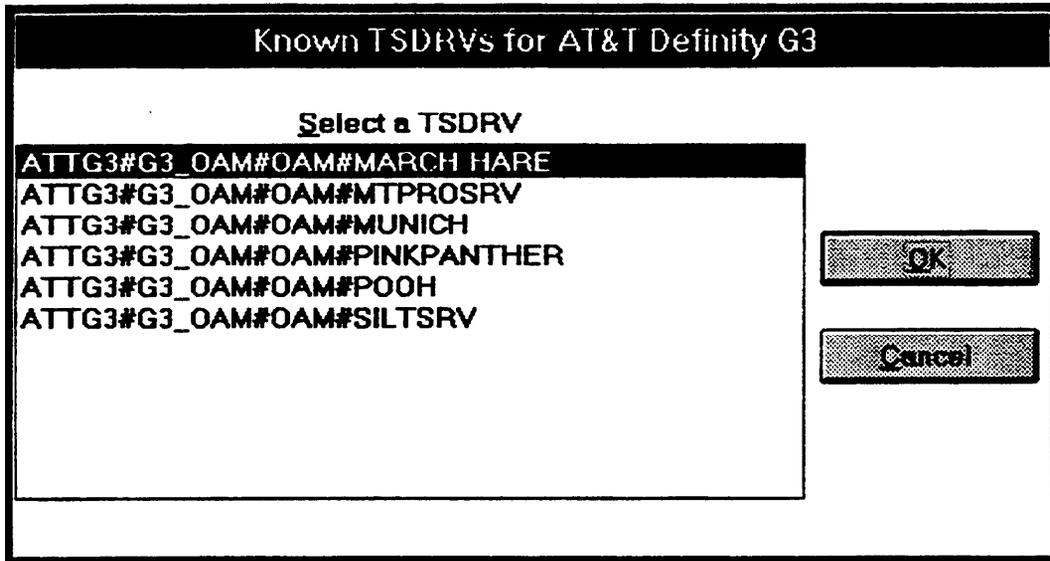

Known TSDRVs for AT&T Definity G3

Select a TSDRV

ATTG3#G3_OAM#OAM#MARCH HARE
ATTG3#G3_OAM#OAM#MTPROSRV
ATTG3#G3_OAM#OAM#MUNICH
ATTG3#G3_OAM#OAM#PINKPANTHER
ATTG3#G3_OAM#OAM#POOH
ATTG3#G3_OAM#OAM#SILTSRV

OK

Cancel

Figure 4-1. Server-Selection Screen

Select the server you want to attach to by highlighting the server name and selecting OK (or double click on the server name, or highlight the server and press the Enter key).

If no servers are displayed, a G3PD may not be running. You can check this by running the g3oam.nlm on the server (see the next section). Once you have selected a server, the login screen shown in Figure 4-2 is displayed.
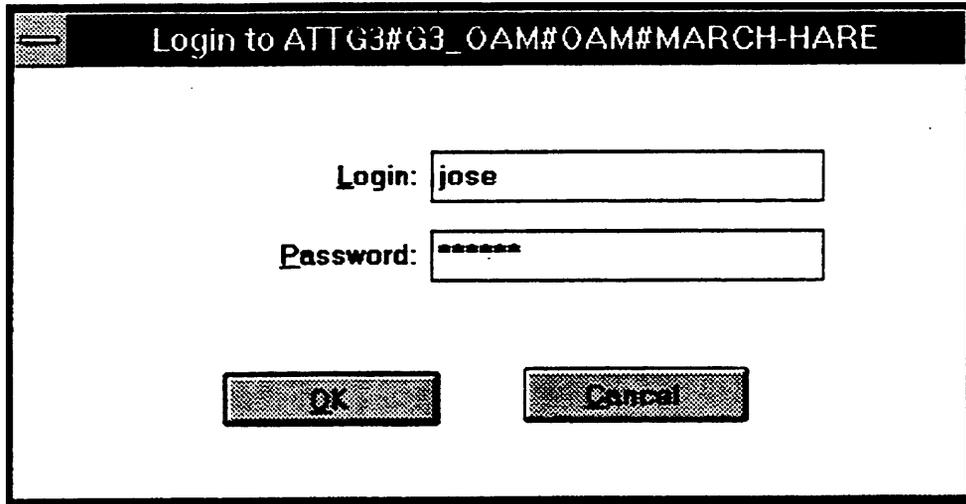
```
┌──────────────────────────────────────────────────────────┐
│ ═  Login to ATTG3#G3_OAM#OAM#MARCH-HARE                   │
│                                                          │
│                                                          │
│              Login: │jose                         │      │
│                                                          │
│           Password: │******                       │      │
│                                                          │
│                                                          │
│           ┌──────────┐      ┌──────────┐                 │
│           │    OK    │      │  Cancel  │                 │
│           └──────────┘      └──────────┘                 │
│                                                          │
└──────────────────────────────────────────────────────────┘
```

Figure 4-2. Login Screen

Complete the login to the G3PD OA&M server by entering a valid user name and password and selecting OK.

Once the login is processed, the WG3OAM main screen is displayed. Figure 4-3 shows the main screen, with the maintenance menu active. Note that the screen has a status line at the bottom.
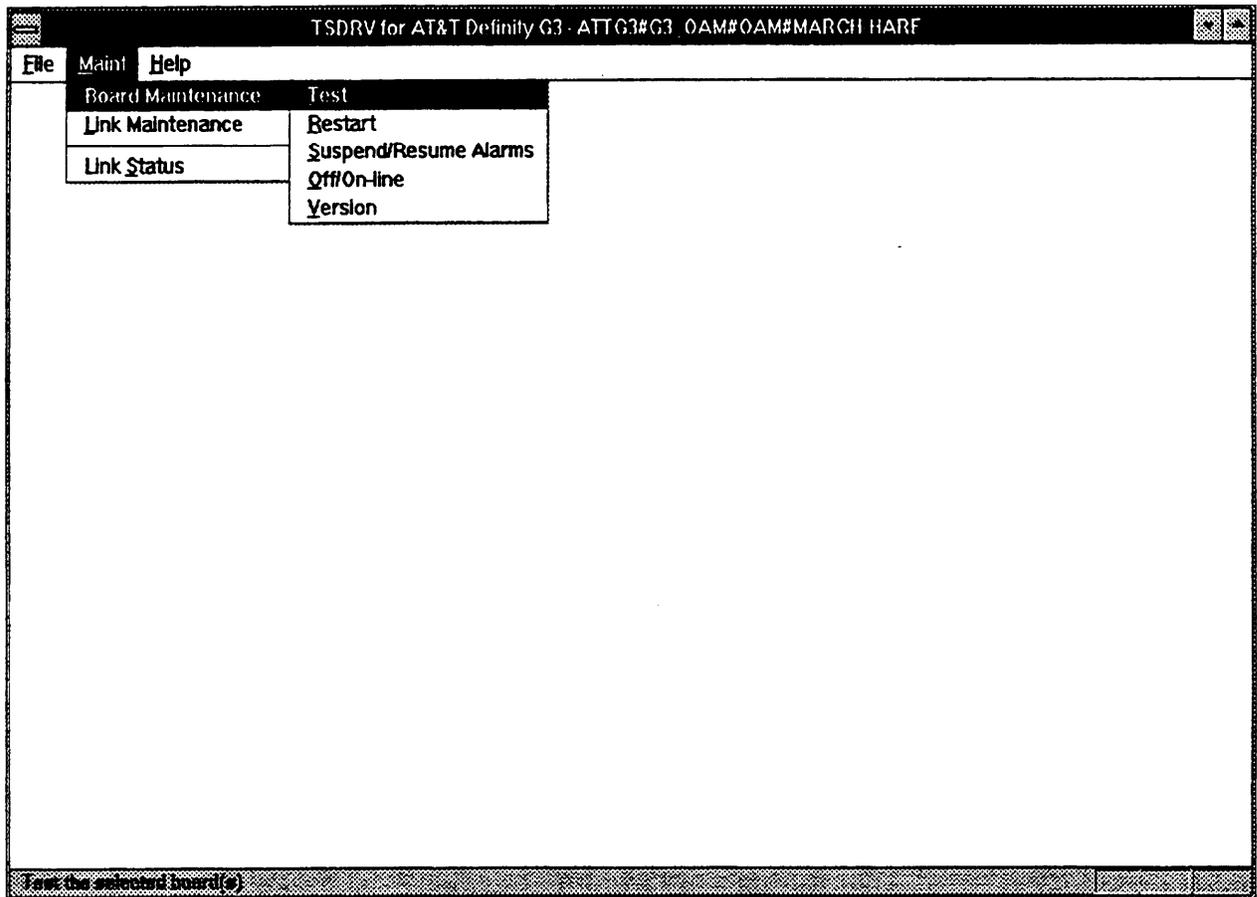

Figure 4-3. Main Screen

Menu Options

Figure 4-4 shows the options that can be selected from the WG3OAM application. Submenus and their relations are shown.
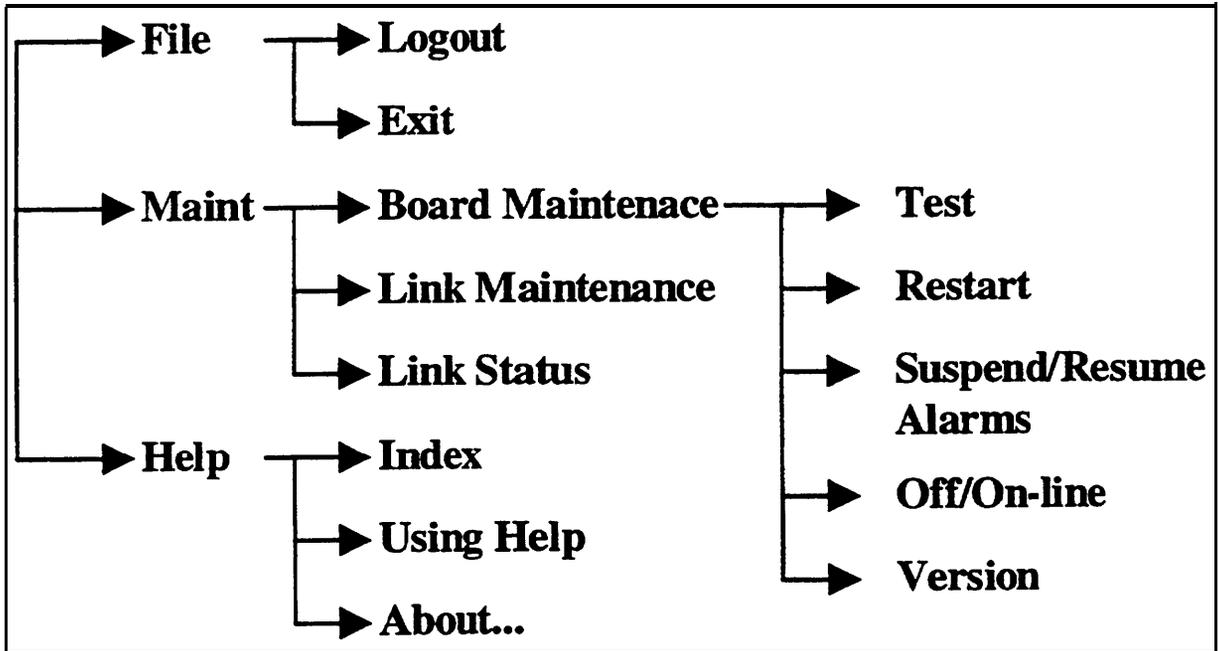
```
┌──► File ────────► Logout
│                 └─► Exit
│
├──► Maint ──► Board Maintenace ──► Test
│            ├─► Link Maintenance ─► Restart
│            └─► Link Status ──────► Suspend/Resume
│                                    Alarms
└──► Help ──► Index               ─► Off/On-line
           ├─► Using Help          └─► Version
           └─► About...
```

Figure 4-4. Application Options

Link Status Command

The link status command displays the current status of each equipped G3PD switch link.

Figure 4-5 shows the Link Status screen. The refresh button updates the screen. The close button exits the screen.
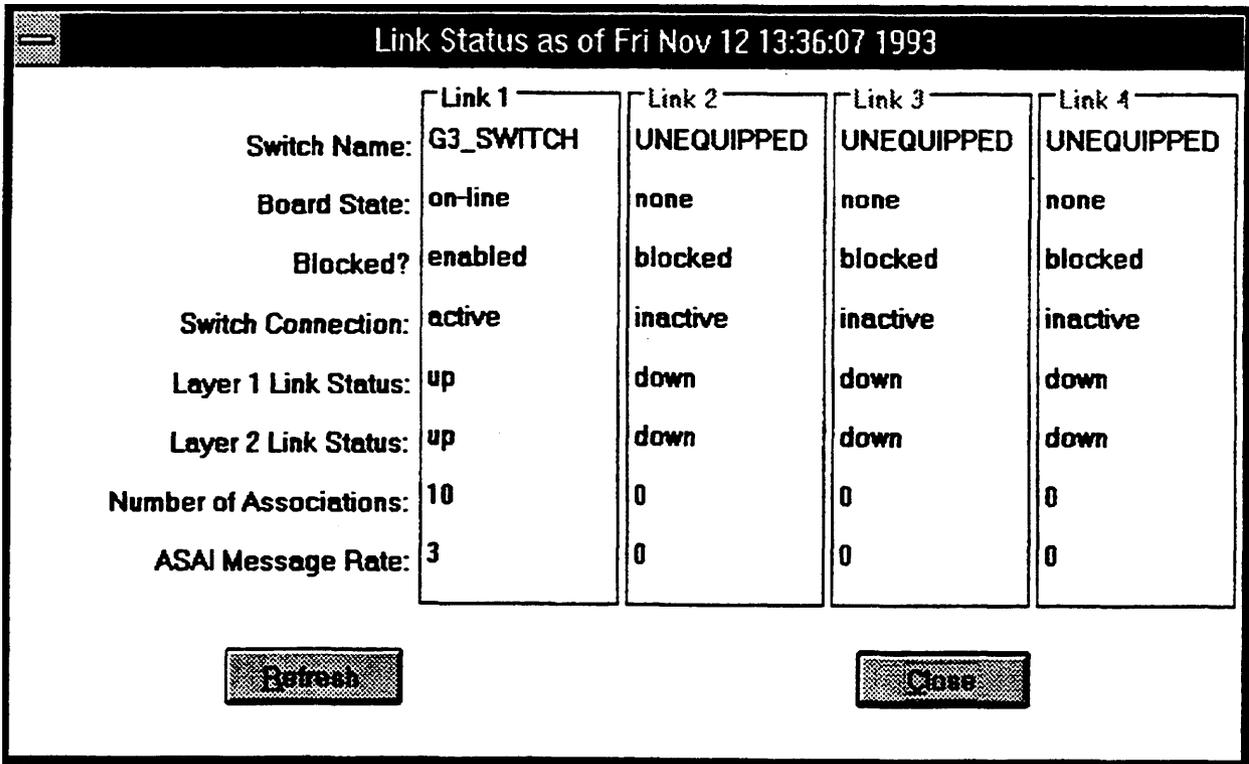
	Link 1	Link 2	Link 3	Link 4
Link Status as of Fri Nov 12 13:36:07 1993				
Switch Name:	G3_SWITCH	UNEQUIPPED	UNEQUIPPED	UNEQUIPPED
Board State:	on-line	none	none	none
Blocked?	enabled	blocked	blocked	blocked
Switch Connection:	active	inactive	inactive	inactive
Layer 1 Link Status:	up	down	down	down
Layer 2 Link Status:	up	down	down	down
Number of Associations:	10	0	0	0
ASAI Message Rate:	3	0	0	0

Refresh Close

Figure 4-5. Link-Status Screen

Table 4-1 describes the Link Status fields.

Table 4-1. Fields Displayed by the Link Status Screen

Switch Name	The advertised switch name (for telephony services).
Board State	The state of the PC/ISDN board. The board state can be None, Off-line, On-line, Pumping, and Hardware Faulty.
Blocked?	Whether new acsOpenStream requests are being accepted. This is controlled by the Link Maintenance command.
Switch Connection	The state of the switch connection, active or inactive.
Layer 1 Link Status	The status of the layer 1 (physical link) connection to the switch.
Layer 2 Link Status	The status of the layer 2 connection to the switch,
Number of Associations	The number of single association objects (SAOs) currently in use. The upper limit of SAOs is controlled by MAX_ASSOCIATIONS (see the Administration section).
ASAI Message Rate	The number of Adjunct-Switch Applications Interface messages sent and received by the switch. Note that the G3PD 'speaks' ASAI to the G3 switch and 'CSTA' to the telephony server. The CSTA message rate can be viewed from the telephony server,

Link Maintenance Command

This command is used to block or enable a given switch link. Blocking a link means that no new acsOpenStream requests will be serviced for that link. However, existing CSTA streams can still be used for telephony services. This command will be useful in future (multilink) releases to allow a link to be gracefully shut down (for maintenance or because of overload).

Figure 4-6 shows the Link-Maintenance screen. To change the state of a link, click the appropriate state with the mouse and select OK.
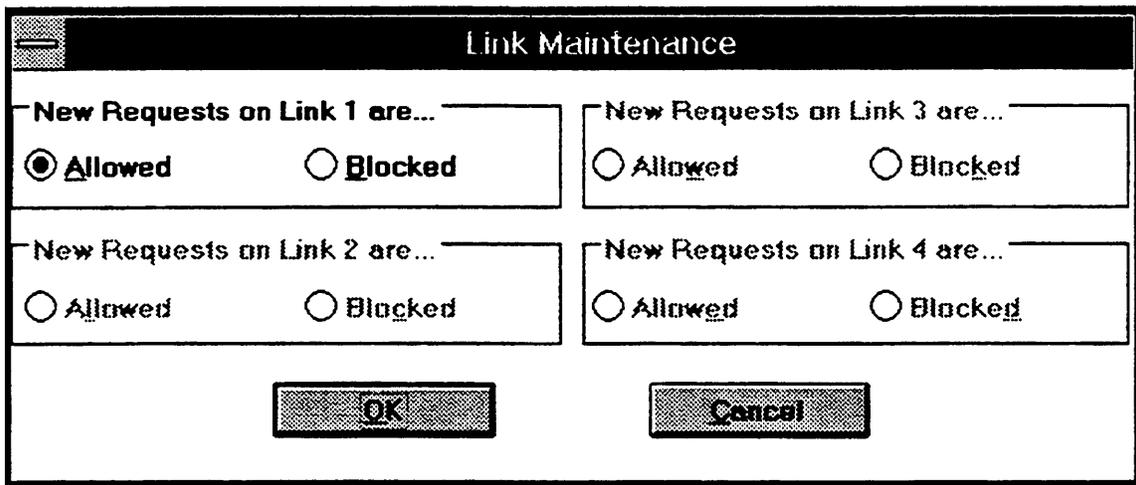
Figure 4-6. Link-Maintenance Screen

After you select OK, the confirmation screen shown in Figure 4-7 is displayed.
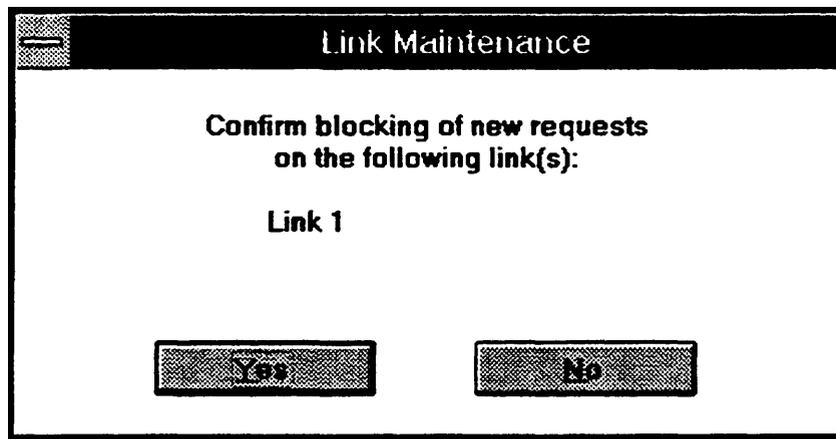Select yes to complete the operation.

Figure 4-7. Link-Maintenance Confirmation Screen

Figure 4-8 displays the close screen that is returned after the Link command has completed. Select close to return to the main menu.
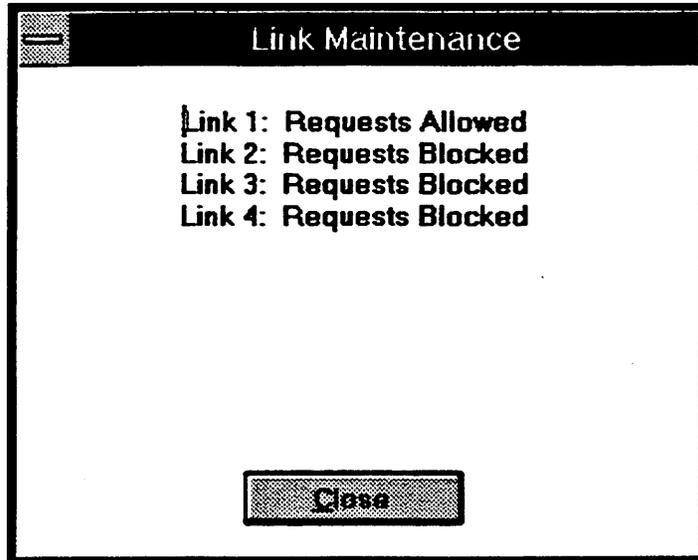
```
┌─────────────────────────────────────────┐
│ ═  │        Link Maintenance             │
├─────────────────────────────────────────┤
│                                          │
│      Link 1:  Requests Allowed           │
│      Link 2:  Requests Blocked           │
│      Link 3:  Requests Blocked           │
│      Link 4:  Requests Blocked           │
│                                          │
│                                          │
│                                          │
│                                          │
│              ┌──────────┐                │
│              │  Close   │                │
│              └──────────┘                │
│                                          │
└─────────────────────────────────────────┘
```

Figure 4-8. Link-Maintenance Exit Screen

Test Command

Figure 4-9 shows the Test screen. To test a board, select the board by clicking
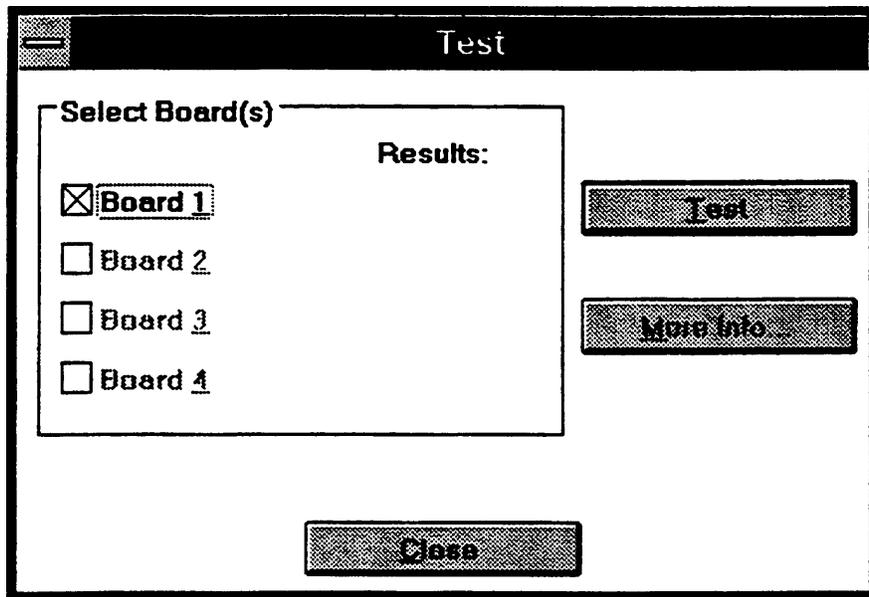the board number and then click the test button.

Figure 4-9. Test Screen

Figure 4-10 shows the screen that is displayed after a successful test. If the switch connection is active, a heartbeat request will be sent to the switch, If the connection is not up, a loopback message will be sent to the PC/ISDN card. If a test fails, other useful information will be written to the telephony server error log.
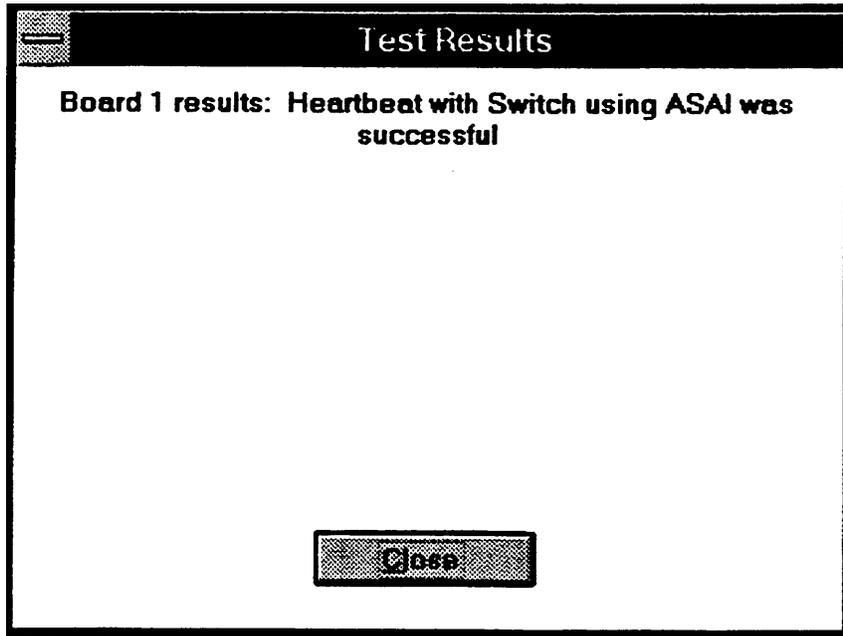

Figure 4-10. Test-Results Screen

Restart Command

The restart command is used to cause a layer 1 or layer 2 restart of a switch link. This command is disruptive, it will cause all existing device and call monitors to fail (see *DEFINITY System Programmer's Guide),* To cause a link restart, select layer 1 or layer 2 and select OK. When the confirmation box shown in Figure 4-11 is displayed, answer yes.
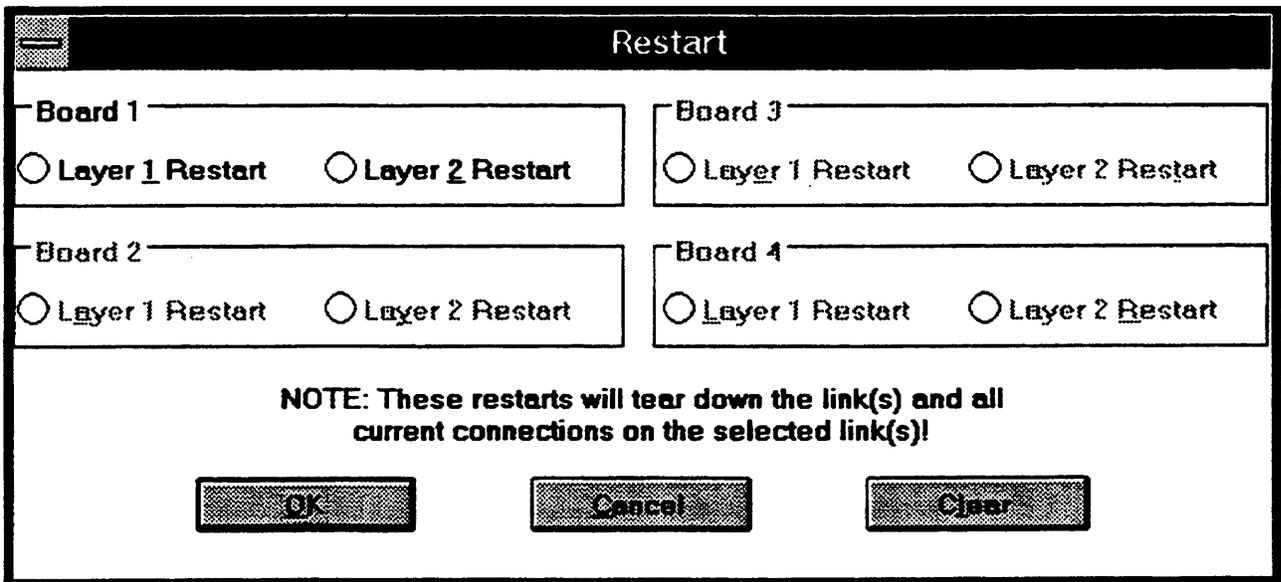
Figure 4-11. Restart Confirmation Screen

Suspend/Resume-Alarms Command

This command is used to suspend or resume switch alarms for a given link. The Suspend/Resume-Alarms screen is displayed in figure 4-12. Suspend the switch alarms if you are working on the switch link (or associated G3PD/server) and do not want an adjunct switch alarm to appear on the switch.
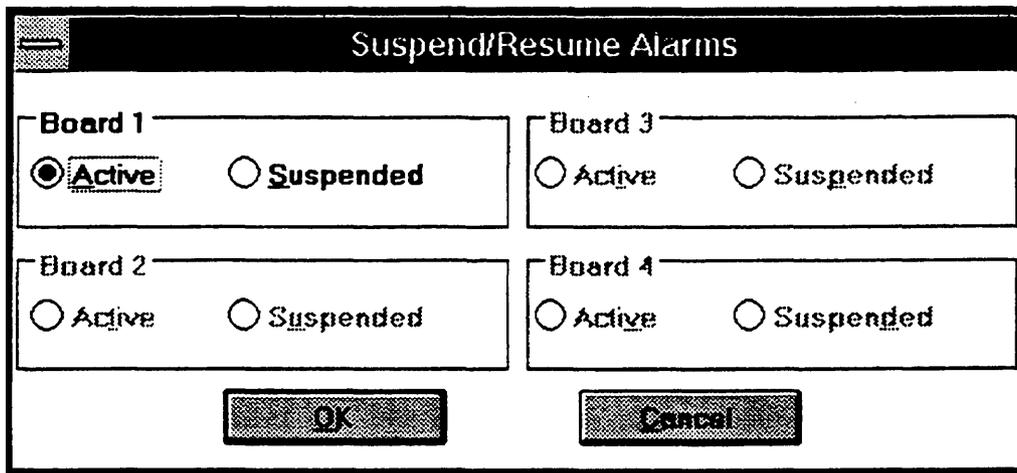

Figure 4-12. Suspend/Resume-Alarms Screen

Off/On-Line Command

This command is used to take a PC/ISDN card off or on line. The Off/On-Line screen is displayed in Figure 4-13. Taking the PC/ISDN card off-line will drop the switch/link connection. While the link is off-line, no CSTA requests for that link can be processed. Furthermore, all existing device and call monitors are dropped (aborted).

A confirmation screen must be acknowledged to complete an off-line request. Bringing a board on-line involves pumping (downloading) the firmware onto the board and establishing a switch connection. This takes approximately 60 seconds.

Switch alarms are suspended automatically before a board is taken off-line, and resumed after the board is placed on-line.
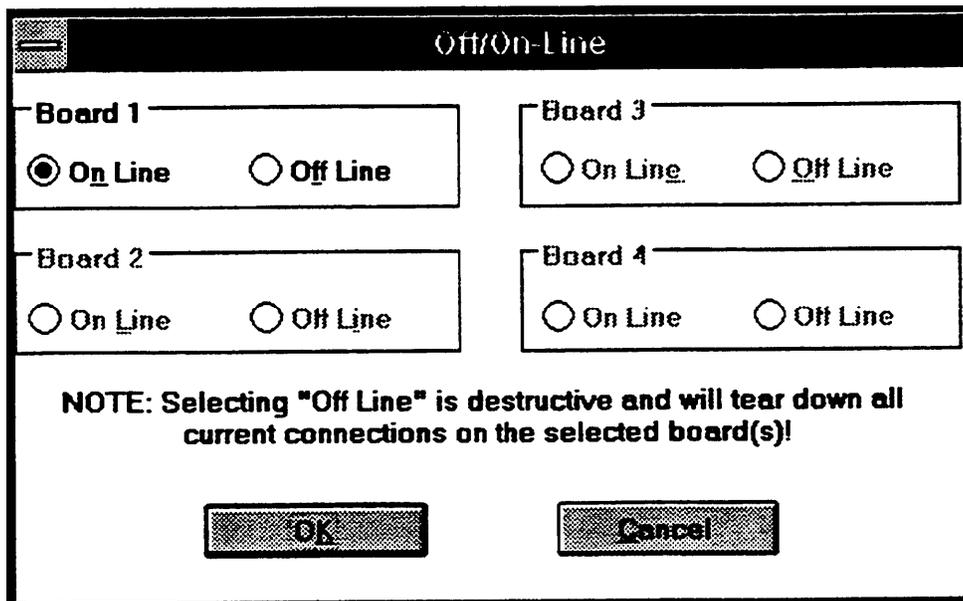

Figure 4-13. Off/On-Line Screen

Version Command

The version command displays the version strings for the G3PD driver, PC/ASAI protocol stack, pumpware running on the PC/ISDN card, and the version of the WG3OAM application you are currently using. Figure 4-14 shows the output from this command.
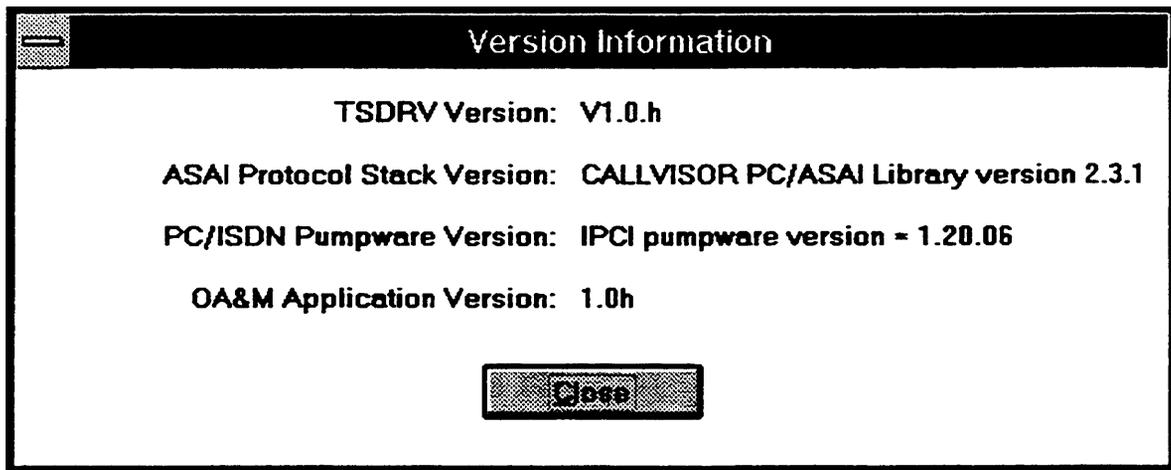
```
╒══════════════════════════════════════════════════════════╕
│                   Version Information                      │
│                                                            │
│            TSDRV Version:  V1.0.h                          │
│                                                            │
│   ASAI Protocol Stack Version:  CALLVISOR PC/ASAI Library version 2.3.1
│                                                            │
│   PC/ISDN Pumpware Version:  IPCI pumpware version = 1.20.06
│                                                            │
│      OA&M Application Version:  1.0h                        │
│                                                            │
│                    [ Close ]                               │
│                                                            │
╘══════════════════════════════════════════════════════════╛
```

Figure 4-14. Output from the "Version" Command

Figure 4-15 shows the output from the "About" command.

```
╒══════════════════════════════════════════════════════════╕
│              About TSDRV for AT&T Definity G3 OA&M         │
│                                                            │
│         TSDRV for AT&T Definity G3 OA&M                    │
│                                                            │
│         Version V0.1e                                      │
│                                               [  OK  ]     │
│         Copyright © 1993                                   │
╘══════════════════════════════════════════════════════════╛
```
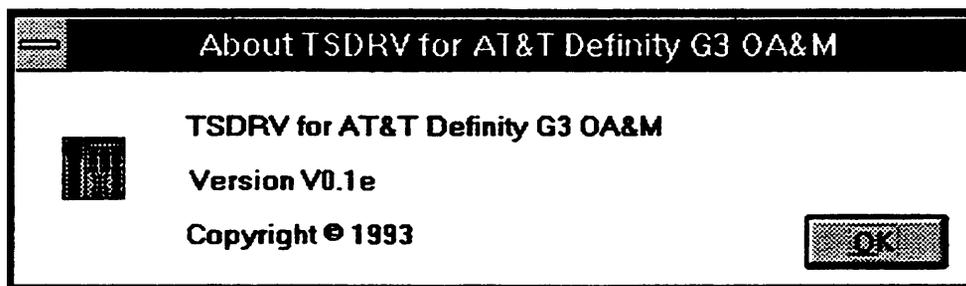
Figure 4-15. Output from the "About" Command

Exiting WG3OAM

By selecting exit, the WG3OAM application will automatically log out from the G3PD OA&M server. If you select logout, you will be logged out and presented with the OA&M server selection screen.

Note, that OA&M sessions are dropped if no activity is detected for a specified interval of time. For more information, see the OAM_INACT_TIMEOUT entry in Table 3-1.

NetWare NLM OA&M Utility

⟹   **NOTE:**
The NetWare NLM OA&M utility (g3oam.nlm) does not ask you to confirm destructive commands. E.g., if you request that a board be taken off-line, this utility will take the board off-line without asking "Are you sure?" The G3PD Windows OA&M client (described in the previous section) is the preferred method of performing OA&M tasks on the G3PD.

This section describes the NetWare OA&M utility that is run from the server console. The NLM OA&M utility has some additional commands not included in the Windows OA&M utility.

This utility is activated by typing load g3oam on the server console screen. The prompt for this screen is `G3oam>.` G30Am commands can be abbreviated, as long as they are unique.

Help Screen

The help screen can be displayed at any time by typing? or help. Figure 4-16
shows the help screen display.

```
                    G3 OA&M Help screen

 help                  prints this screen ('?' also works)

 block        [board] blocks new connections for specified link
 enable       [board] enable new connections for specified link
 get_parms           display current settings for all G3PD boot tunables
 get_names           display current switch link names
 11_reset     [board]  initiate a layer 1 protocol reset
 12_reset     [board] initiate a layer 2 protocol  reset
 layer               returns L1 and L2  stats from board(s)
 offline      [board] place IPCI offline (drops existing connections)
 Online       [bpard] repump IPCI and reestablish ASAI protocol
 resume       [board] resume switch alarms
 set_name     [board] change advertises switch name (reboot to complete)
 status              print status of all equipped links
 suspend      [board] suspend switch alarms
 test         [board] test IPCI (if offline) or switch link (if online)
 version             print version info about ASAI, G3PD and pumpware
 unload              unload (quit from) this NLM


[board] defaults to 1, but is a hex bit mask, where (1 = bd l);
 (2 = bd 2); (4 = bd 3); (8 = bd 4); (3 = bds 1,2); (f = bds l,2,3,4); etc.
```

Figure 4-16. Help Screen Display

Link Status

Figure 4-17 shows the output from the status command. See the status command description for the WG3OAM utility for a description of each field.

```
Board [1] state =      I_ONLINE
New Requests           ENABLED
Switch Alarms          ENABLED
LAPD TEI =             3
Connection State =     ACTIVE
Layer 1 status =       UP
Layer 2 status =       UP
Active Associations = 0
ASAI message rate =    0 msgs/min (for prev. 5 min sample period)

Board [2] not configured.
Board [3] not configured.
Board [4] not configured.
```

Figure 4-17. Output from the "status" Command

Block/Enable New Connections

The block command will disable new acsOpenStream requests for the specified link. Output from the block command are shown in Figure 4-18. The current link block/enable state can be checked by looking at the new Requests field of the status command results.

```
G3oam> block
G3PD returns SUCCESS.
```

Figure 4-18. Output from the "block" Command

The enable command is used to allow (enable) new requests for a link. Output from the block command are shown in Figure 4-19.

```
G3oam> enable
G3PD returns SUCCESS .
```

Figure 4-19. Output from the "enable" Command

Viewing Driver Parameters

The get_parms command is used to view the current in-core driver parameters. Note that it is possible that the on-disk copy (sys:system\tsrv\g3pd\g3pd.ini) of driver parameters may be different from the in-core copy if the driver has not been reloaded since the g3pd.ini file was last updated. Figure 4-20 shows the results of the get_parms command.

```
                IPCI_INTR = "2";
               BOARD1_SMA = "0xd0000";
               BOARD2_SMA = "0x0";
               BOARD3_SMA = "0x0";
               BOARD4_SMA = "0x0";
               LINK1_NAME = "G3_SWITCH";

              LINKS2_NAME = "";
               LINK3_NAME = "";
               LINK4_NAME = "";
                 OAM_NAME = "G3_OAM";
          MAX_ASSOCIATIONS = "2048";
               IPCI_UNITS = "1";
             KLOG_RECORDS = "2000";
             NUM_SESSIONS = "50";
         NUM_CALL_MONITORS = "200";
       NUM_DEVICE_MONITORS = "200";
         NUM_ROUTE_DEVICES = "0";
      NUM_SESSION_REQUESTS = "200";
           NUM_TRACE_FILES = "2";
         OAM_INACT_TIMEOUT = "30";
            MAX_TDI_MEMORY = "524288";
       HWM_TDI_MEM_PERCENT = "80";
  MAX_REQS_REQS_QUEUED_PER_DEV = "4";
     MAX_REQS_QUEUED_PER_PBX = "10";
```

Figure 4-20. Output from the "get_parms" Command

Link Reset

Figure 4-21 shows the results of the layer 1 and layer 2 link-reset commands. Both can be destructive to existing connections, depending on the state of the call. The layer 1 reset takes approximately 60 seconds to complete.

```
G3oam> ll_r
G3PD returns SUCCESS;
Returned link Status is:
Board [1] state = I_ONLINE
  result = the requested operation is complete
Board [21 state = I_NOSTATE (unequipped)
Board [3] state = I_NOSTATE (unequipped)
Board [4] state = I_NOSTATE (unequipped)
G3oam> 12_r
G3PD returns SUCCESS;
Returned link status is:
Board [1] state = I_ONLINE
  result = Level 2 reset complete
Board [2] state = I_NOSTATE (unequipped)
Board [3] state = I_NOSTATE (unequipped)
Board [4] state = I_NOSTATE (unequipped)
```

Figure 4-21. Output from the layer1 and layer2 "link-reset" Commands

Link Layer Statistics

The layer comamnd queries the PC/ISDN card for link layer status and statistics. These statistics are cleared if you execute the l1_reset or offline commands. Numerous reactivations indicate a problem with the link. Figure 4-22 shows the output from the layer command.

```
link # 1:
  Layer 1 is              UP
  Layer 2 is              UP
  L1  activation count = 1
  L2  activation count = 2
```

Figure 4-22. Output from the "layer" Command

Online and Offline Commands

Figure 4-23 shows the off-line and on-line commands. Remember that the off-line command is destructive. An on-line request takes approximately 60 seconds to complete.

```
G3oam> offline
G3PD returns SUCCESS;
Returned link status is:
Board [1] state = I_OFFLINE
  result = the requested operation is complete
Board [2] state = I_NOSTATE (unequipped)
Board [3] state = I_NOSTATE (unequipped)
Board [4] state = I_NOSTATE (unequipped)
G3oam> online
G3PD returns SUCCESS;
Returned link status is:
Board [1] state = I_ONLINE
  result = Board is now on line
Board [2] state = I_NOSTATE (unequipped)
Board [3] state = I_NOSTATE (unequipped)
Board [4] state = I_NOSTATE (unequipped)
```

Figure 4-23. Output from the "offline" and "online" Commands

Suspend and Resume Alarms

The suspend and resume alarms commands send a message to the switch indicating if alarms should be reported on the switch link. Figure 4-24 first shows alarms being suspended, then current status being viewed (showing that alarms are disabled), and finally alarms being resumed (activated).

```
G3oam> suspend
G3PD returned SUCCESS
G3oam> status
Board [1] state =       I_ONLINE
New Requests            ENABLED
Switch Alarms           DISABLED
LAPD TEI =              3
Connection  State   =   ACTIVE
Layer 1 status =        UP
Layer 2 status =        UP
Active Associations = 0
ASAI message rate =    0 msgs/min (for prev. 5 min sample period)

Board [2] not configured.
Board [3] not configured.
Board [4] not configured.
G3oam> resume
G3PD returned SUCCESS
```

Figure 4-24. Output from the "suspend" and "resume" Alarms Commands

Changing the Advertised Switch Name

The advertised switch name can be modified using the set_name command. Another method (described in the *Administration* section) is to directly edit the LINK1_NAME field in the g3pd.ini file. The new name will be used the next time the G3PD is loaded.

The get_name command is used to display the current switch name. The asai_version field will be used (in a future release) to display the version of ASAI running on the associated switch. Figure 4-25 shows the set_name command being used to change the advertised switch name to "elvis".

```
G3oam> set_name
Enter advertised switch name for link 1: elvis
G3PD returns SUCCESS, returned names are:
link [1] . switch_name = elvis;
link [1] . asai_version = ;
G3oam> get_n
G3PD returns SUCCESS, switch names are:
link [1]  .switch_name = elvis;
link [1] .asai_version = Unknown ASAI Version;
link [2]  .switch_name = UNEQUIPPED;
link [2]  .asai_version = ;
link [3] .switch_name = UNEQUIPPED;
link [3]  .asai_version = ;
link [4] .switch_name = UNEQUIPPED;
link [4]  .asai_version = ;
```

Figure 4-25. Using the "set_name" Command to Change a Switch Name

Testing the G3PD

Figure 4-26 shows the results of the test command being run with the switch link attached (first case) and disconnected (second case), The test automatically tests as much of the driver, PC/ISDN card, switch link, and switch as can be tested. For the first case, a heartbeat message is sent to the switch and the response is checked. For the second case, a message is looped around on the PC/ISDN card.

```
G3oam> test
G3PD returns SUCCESS;
Returned link status is:
Board [1] state = I_ONLINE
  result = Heartbeat with Switch using ASAI was successful
Board [2] state = I_NOSTATE (unequipped)
Board [3] state = I_NOSTATE (unequipped)
Board [4] state = I_NOSTATE (unequipped)
G3oam> test
G3PD returns SUCCESS;
Returned link status is:
Board [1] state = I_ONLINE
  result = IPCI is on line and passed loop back test
Board [2] state = I_NOSTATE (unequipped)
Board [3] state = I_NOSTATE (unequipped)
Board [4] state = I_NOSTATE (unequipped)
```

Figure 4-26. Output from the "test" Command

G3PD Version Command

The version command displays the version number of the G3PD driver, the version of the ASAI library linked to the G3PD, and the version of pumpware currently executing on the PC/ISDN card. Figure 4-27 shows output from the version command.

```
G3PD vers = G3PD R1.0 10/31/93;
ASAI info = CALLVISOR PC/ASAI Library version 2.3.1;
IPCI p/w  = IPCI pumpware version = 1.20.06 ;
```

Figure 4-27. Output from the "version" Command

Quitting G3oam

G3OAM can be exited by typing unload at the **G3oam>** prompt or by typing unload g3oam at the server console.

Troubleshooting

5

Problem Descriptions

This section describes several problems that can occur with NetWare, the G3 PBX driver, the switch, and the switch link.

Other problems related to the telepony server, client telephony services, and applications are discussed in the *Troublshooting* chapter of *NetWare Telephony Services Network Manager's Guide.*

Following is a list of possible G3PD problems with their solutions.

1. The G3PD driver won't load.

   This may be due to a PC/ISDN interrupt or memory conflict (see 2. PC/ISDN card won't initialize), or a required module is not present (see warning messages on the console), or there is not enough server memory.

   If the problem is not evident from the console messages, inspect the error log (maintained by the Tserver) for G3PD-tagged errors related to g3pd load problems.

2. The PC/ISDN card won't initialize.

   If the message "G3PD: Hardware conflict between PC/ISDN and NetWare!" appears on the console, you have either an interrupt or shared memory address conflict between the PC/ISDN card and NetWare. If the G3PD used to work, and you recently added adapter cards or drivers to your server, try backing them out to see exactly where the conflict resides. You can always reinstall the G3PD so that it can choose another interrupt and/or shared memory address (that does not conflict with NetWare).

   Verify that the PC you are using does not conflict with the memory range you have selected during PC/ISDN installation.

3. The switch connection is not established.

   Verify that you have a proper BRI connection from the PC/ISDN card to the switch. Verify that a terminating resistor (a small rectangular box with modular connectors at each end) is located on the line near the PC/ISDN card. Verify the switch BRI administration (see *Appendix C).* Check the BRI status from the switch using "stat bri XXX", where XXX is the location of the BRI connection on the BRI circuit pack.

4. Clients cannot see an advertised PBX driver (G3PD).

   Try using the Windows application (wg3oam.exe) to see if you can "see" the OA&M server associated with the server which you are trying to attach. Also, you can use the slist command to list known servers from your workstation. If the problem persists, view the error log on the Tserver to verify that a G3PD is registered and operational.

5. Clients fail to connect (acsOpenStream) to a visible G3PD.

   Errors related to this connection will be visible in the Tserver error log, or obvious from the returned error code (e.g., if the switch link is down, the G3PD will return 'LINK NOT AVAILABLE' when the client attempts an open).

6. How a dropped switch connection affects calls.

    If the switch connection is dropped for any reason, all existing call/device monitors will be aborted (your application will receive monitor-ended confirmation events). If the switch connection is dropped, a message similar to the following will appear in the Tserver error log: "IPCI: Board 1 switch Layer 1 and Layer 2 are down."

7. Questions about switch feature operations.

    The CSTA references indicate what primitives to use to control calls. For actual feature behavior, you will need to reference a switch feature description document.

8. The server runs out of memory.

    This is usually indicated by a "Failed to allocate ..." message. However, server performance will likely degrade before you physically run out of memory. You must reduce the number of NLMs loaded on your server or add more memory. You can also reconfigure server-memory use (increase allocatable memory); use the "set maximum alloc short term memory" command from the server console.

9. The G3PD stops responding.

   Use wg3oam.exe (from Windows) or g3oam.nlm to check on the current state of the G3PD. If the switch link is down, correct the problem. If the G3PD is not responding, you may have to unload and reload the G3PD.

Appendix A

A
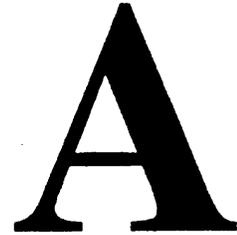
Related Documents

1. *PC/ISDN Platforrn Installation and Reference, CIC # 555-016-102, Issue 2, March 1990.*

    This document is packaged with the PC/ISDN card, Section 3 describes how to set the memory addresses on the PC/ISDN card and how to install the card. Ignore all information related to installing 'Platform Software' in this document. None of the software or drivers that ship with the PC/ISDN card are used for the NetWare platform.

2. *NetWare Telephony Services Network Managers Guide.*

    The installation chapter describes how to install the Telephony Server (which uses the G3PD). The troubleshooting chapter describes the Tserver error log.

4. *NOVELL® NetWare Version 3.11 System Administration, # 183-000296-001.*

   The install section of this manual describes how to use install to load NetWare NLMs (such as the G3PD).

5. DEFINITY® *Communications System Generic 3 Implementation.*

   Describes all G3 switch administration and maintenance procedures. The procedures related to administering the BRI line are taken from this document and included in the DEFINITY Administration appendix.

Appendix B

B

Files Installed or Modified

The following files are used by the G3PD and can be found on the server executing the G3PD in the directory sys:\system\tsrv\g3pd.

g3pd.ini   An ASCII file that specifies the boot parameters for the G3PD. If required, this file can be edited, using EDIT under NetWare, or your favorite editor from a client workstation. The contents of this file are described in the Administration section.

g3pd.old   The previous (backup) copy of the g3pd.ini initialization file.

api.msg   An error number to error string translation file used internally to the G3PD by the PC/ASAI library.

boot. bin	The first stage pumpware image that is loaded into the PC/ISDN card to load the full pumpware image.
pcisdn.bin	The full pumpware image for the PC/ISDN card.

The following NLM's are placed on the server in the sys:system directory:

g3pd.nlm	The PBX Driver (G3PD).
g3oam.nlm	The OA&M NLM described in the Maintenance section.
g3trace.nlm	The trace utility described in the Maintenance section. It is installed into the system directory.
g3config.nlm	The NLM run during installation that validates the PC/ISDN card interrupt and shared memory address settings. It updates the g3pd.ini initialization file.

The following Windows components are installed on the server in the sys:csta directory:

wg3oam.exe	The Windows executable for the client OA&M described in the Maintenance section.
wg3oam.hlp	The help file for the wg3oam utility.
g3ptrace.exe	The DOS utility used to print/format raw trace files.
dos4gw.exe	A 32-bit DOS exetender for g3ptrace.

The directory sys:csta\g3setp contains several files required to run the Windows setup utility for wg3oam.

Appendix C

C

DEFINITY Administration

The Basic Rate Interface (BRI) line that connects the DEFINITY G3 switch to the PC/ISDN card installed in the Telephony file server must be properly administered. Use the **add station** or **change station** to administer the BRI line. Table C-1 summarizes the correct DEFINITY G3 settings for the BRI line:

Table C-1. Correct BRI-Line Settings

Field Name	Required/Optional	Contents
Extension:	Required	Whatever fits your dial plan
Type:	Required	ASAI
Port:	Required	Port that connects ASAI line
Name:	Optional	Whatever you like, room #, etc.
XID:	Required	n
Fixed TEI:	Required	y
TEI:	Required	3
MIM Support:	Required	n
CRV Length:	Required	12

Index

■ **NOVELL.**

This version of PassageWay™ Solution is an AT&T application
that operates on Novell's NetWare* product.
*Novell and NetWare are registered trademarks of Novell.