



Passport 4400

Release Notes for R3.1.6

800-1953-31, Rev. H

Part Number 210450-A Rev 00

August 2000

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Please note that pages 8-1 through 9-6 are manual updates (change pages to other manuals). They are part of the last section (5). The page numbers match their associated manuals, not this document. There are no missing sections.

Introduction 1

The document provides information on the Passport 4400, Release 3.1 up to Release 3.1.6 (referred to as 3.1.x), available for general customer release. You will find information on the software files, the documentation and the new features. Additionally, there is a section on current known issues with the software and one on manual updates.

Note: Release Notes are updated on an as needed basis. Please check the Web Page (shown below) to find out if this document has been updated.

Occasionally, throughout this document, you will find at the end of a sentence or paragraph an 8-digit number in parenthesis (for example, 60058007 or 10265987). This number is an internal Service Request (SR) number used to track problems and fixes to the software and documentation.

Documentation

The following relevant Passport 4400 documents are available on the following Nortel Networks Web site:

<http://support.baynetworks.com/library/tpubs>

Note: We recommend that you use the Passport 4400 Introduction, 800-1982-31 as a guide through the other documentation. It provides a *roadmap* and *master index* of all the documentation.

- 800-1982-31, Passport 4400 Introduction Manual
- 800-1951-31, Passport 4400 Hardware Installation Manual
- 800-1983-31, Passport 4400 InstallTool Release 2.0 Startup Manual
- 800-1952-31, Passport 4400 Operator's Manual
- 800-1950-31, Passport 4400 CLI Reference Manual
- 800-1943-31, Passport 4400 Analog Voice Modules Manual
- 800-1944-31, Passport 4400 T1/E1 and Digital Voice Module Manual
- 800-1942-31, Passport 4400 ISDN BRI Voice Module Manual
- 800-1961-20, Passport 4400 Low-Speed Data Services Manual
- 800-1988-31, Installation Instructions for 16 MB Flash Memory

These are available on CD-ROM, which can then be installed on a workstation and accessed online.

In addition, the following Passport 4400/6400 Interworking documents are available from the Nortel Networks Performance Online Web site (access to this site requires a Performance Online password). You can obtain the documentation through your Certified Distributor:

- 241-7501-500, Passport 4400 and 6400 Interworking Guide
- 241-7501-505, Passport 4400 and 6400 Quick Start Guide

Upgrading from Previous Releases

Considerations

Passport 4400

- Notes:**
- Upgrading to Release 2.0.3 and later from earlier 2.0.n releases requires a system default reset of the Passport 4400.
 - If the traffic management parameter *Weighted Round Robin* is enabled, you must first disable it prior to upgrading. Re-enable the parameter after the upgrade is complete.
 - When upgrading from Release 2.0.x to 3.1.x, any IP routing RIP compatibility parameters that were configured as Rip1 will be converted automatically to Rip1Compatible. If Rip1Compatible is not the desired RIP compatibility setting, you will need to change this parameter back to Rip1.

Upgrading Release 2.0.3 through 2.0.7 to Release 3.1.x: You must first upgrade to Release 2.0.8 or later before upgrading to Release 3.1.x. This phased approach will preserve your custom configurations. See upgrading from Release 2.0.3 to 2.0.8, which follows.

Exception: Release 2.0.6.0.0.1: You can upgrade directly to Release 3.1.x. This upgrade can be made without a default reset of the Passport 4400.

InstallTool

If you have Install Tool Version...	It supports the following Software Releases...
1.0	Only Release 3.0
2.0	Only Release 3.1
2.0.1	Release 3.1 through 3.1.4
4.0	Release 3.1 and later (It does not support Release 2.0 or 3.0)
4.1	Release 3.1 and later (It does not support Release 2.0 or 3.0)

Upgrading from Release 2.0.3 to 2.0.8

Note: You may want to save the current configuration file to a TFTP server first, and then reload the configuration file after the upgrade.

1. Load the Passport 4400 Release 2.0.8 software onto your TFTP server. The Passport 4400 Release 2.0.8 files can be obtained by (from your Certified Distributor) copying the appropriate files from one of the following sites:
<http://esweb2.us.nortel.com/imds?pg=/prod/passport4000>
<http://www3.nortelnetworks.com/iso/protect/FtpServer>
<http://www3.nortelnetworks.com/iso/protect/passport/index.html>
2. If necessary, start a Telnet session with the Passport 4400 and access the CLI.
3. If necessary, disable weighted round robin traffic management:

```
define tm weightedRoundRobin disabled
```

4. Download the Release 2.0.8 application code on to the Passport 4400 using TFTP. For detailed information on performing this download, refer to "TFTP Software Download" on page 9-5 of the Operator's Manual. A summary of the steps follows:

- a. Commit the application code bank that will be write-protected during the download. Example:

```
set system firmware commitcodebank bank1
```

This will write-protect application code bank 1. The application code will be downloaded into bank 2.

- b. Download the boot code. Example:

```
download base image specific 192.168.15.30 "bt20xxxx.bld"
```

This will download the file bt20xxxx.bld (where the x's are the actual build numbers of Release 2.0 boot code) for the TFTP host with IP address 192.168.15.30.

- c. Download the application code. Example:

```
download base image specific 192.168.15.30 "pr31xxxx.bld"
```

This will download the file pr31xxxx.bld (where the x's are the actual build numbers of Release 2.0 code) from the TFTP host with IP address 192.168.15.30.

5. Commit the new application software to the write-protected bank. Example:

```
set system firmware commitcodebank bank2
```

6. Default reset the Passport 4400.

```
reset system default reset
```

At this point, the Passport 4400 is ready to be upgraded to Release 3.1.x.

Upgrading Release 2.0.8 and above to Release 3.1.6

Note: *When upgrading from 2.0.9 and earlier to 2.0.10 and above or 3.1.x, during the upgrade the fax rate parameter (in voice profile) must be set to 7200. After upgrading, you may change the parameter. Load the Passport 4400 Release 3.1.5 software onto your TFTP server. The Passport 4400 3.1.5 files can be obtained from your certified distributor.*

1. Load the Passport 4400 Release 3.1.6 software onto your TFTP server. The Passport 4400 Release 3.1.6 files can be obtained by (from your Certified Distributor) copying the appropriate files from one of the following sites:
<http://esweb2.us.nortel.com/imds?pg=/prod/passport4000>
<http://www3.nortelnetworks.com/iso/protect/FtpServer>
<http://www3.nortelnetworks.com/iso/protect/passport/index.html>
2. If necessary, start a Telnet session with the Passport 4400 and access the CLI.
3. If necessary, disable weighted round robin traffic management:

```
define tm weightedRoundRobin disabled
```

4. Verify you can PING the TFTP server. If not, add an IP address to the Ethernet port or a route to the unit.
5. Verify your config upload bank

```
CLI> show tftp parameters
```

6. Upload the working 2.0.X config file to the TFTP server.

Note: If for any reason you need to return to 2.0.X. You will need a copy of this original 2.0.X configuration.

```
CLI> upload base config specific {TFTP Server address} {Config filename in quotes}.
```

7. Verify the upload succeeded.

```
CLI> show tftp err
```

8. Download the Release 3.1.6 application code onto the Passport 4400 using TFTP.
 - a. Commit the application code bank that will be write-protected during the download. Example:

```
set system firmware commitcodebank bank1
```

This will write-protect application code bank 1. The application code will be downloaded into bank 2.

- b. Download the boot code. Example:

```
download base image specific 192.168.15.30 "bt31xxxx.bld"
```

This will download the file bt31xxxx.bld from the TFTP host with the IP address 192.168.15.30. (where the x's represent the current version/filename)

c. Download the application code. Example:

```
download base image specific 192.168.15.30 "pr31xxxx.bld"
```

This will download the file pr31xxxx.bld from the TFTP host with IP address 192.168.15.30. (where the x's represent the current version/filename)

9. Verify the downloads succeeded.

a. **show tftp err** download successful

b. **sh sys image** shows the file name and bank

10. Commit the new application software to the write-protected bank. Example:

```
set system firmware commitcodebank bank2
```

11. Restart the Passport 4400.

```
reset system current reset
```

12. Upon boot up you will receive a message indicating the following: "This action requires a <save config update> to keep the changes."

```
CLI> save config up.
```

13. Reboot the system and verify operation.

```
CLI> reset system curr reset.
```

14. Reconnect to the CLI. If necessary, establish another telnet session with the Passport 4400.

15. Re-enable weighted round robin traffic management, if necessary:

```
define tm weightedRoundRobin enabled
```

16. If you used rip1 operation, the upgrade will change the operation to rip1compatible. To return to rip1 operation, enter the following:

```
define ip base ripCompatibility rip1
```

Note: When migrating from Release 2.0.8 to Release 3.1.6, the following parameters need to be checked:

- Nodes using FR tunnel lindex 149. The parameters will return to the default parameter. You will have to reconfigure that parameter. (60092410)
- FR tunnel, after upgrade, defaults to 64 Kb/s, which will give you 5 voice calls. You must configure FRtunnel (**frtunnel**) parameters for additional calls. (60090505)
- In Release 3.1.6. the default is now 126 (7E-flag). (60320918)

Required Hardware Release Levels

- Release 3.1.x is compatible with all Release 2.0 and later hardware. All five versions of the Ethernet Base Module are supported:
 - NTAU01AA
 - NTAU01BA
 - NTAU01CA
 - NTAU01NA
 - NTAU01MA
- If you have a Marathon and wish to use some of the existing voice modules in the Passport 4400, use the following table to select the modules that can be used.

Note: You must upgrade the modules to the Passport 4400 DSP code (part of application software, see page 1-9)

Equivalent Voice Modules

Description	Passport 4400 Module	Marathon Model Number Equivalent
T1 Voice Module (TVM/1), single channel	NTAY99AA	5000TAM/1E, Rev M or later
T1 Voice Module (TVM/2), dual channel	NTAU14AA	5000TAM/2, Rev M or later
E1 Voice Module (EVM/1), single channel	NTAY15AA	5000EAM/1E, Rev K or later
E1 Voice Module (EVM/2), dual channel	NTAY16AA	5000EAM/2, Rev K or later
Digital Voice Expansion Module (DVEM)	NTAY18AA	5000DVEM/12
Digital Voice Module (DVM)	NTAU60AA (also kits NTBQ54AA and NTBQ55AA)	5000DVM, Rev L or later
Analog Voice/Fax Module (AVM), single channel	NTAU61AA	5000CVM/1
Analog Voice/Fax Module (AVM), dual channel	NTAU62AA	5000CVM/2
Universal Analog Voice Module (UAVM)	NTAU50AA	5000UVM/*T (* = 1 or 20)
FXS Interface for UAVM	NTAY12AA	5000V/XSL
FXO Interface for UAVM	NNTLM23AA	5000V/XOL
E&M Interface for UAVM	NTAY09AA	5000V/EM+

Note: Once these modules are installed in a Passport 4400, they should remain as Passport 4400 modules.

- HDM 8-port Module: Your HDM must be Rev. 06, but it is recommended that you use Rev. 08 or later. There is a known problem with Rev.05 and earlier that requires a factory upgrade. For additional information, contact your Certified Distributor or Account Manager.

Software

Install Tool

Install Tool is the recommended tool for initially configuring the basic services of your Passport 4400. It is sufficient to make the unit accessible within a Passport network. The Install Tool software resides on the following Web/ftp site: <http://www3.nortelnetworks.com/iso/protect/FtpServer>. Nortel-approved distributors may download the Install Tool software, at no cost, from the Nortel Networks distributor Web site. In Release 3.1.6, the newly released version of Install Tool V4.1 is available. This tool supports all previous versions of Passport 4400 software Release 3.1 and later. It does not support Release 3.0 and earlier. The Install Tool filenames are as follows:

- it410014.exe (Install Tool software)
- 206906-B Rev 00.pdf (Using Passport 4400 Install Tool Version 4.1, Rev A)

To install the Passport 4400 Install Tool:

1. Access the CD ROM from Windows Explorer (95, 98, NT) and double-click on the file named it40xxxx.exe (where xx is the build number).
2. See “Verifying That Dial-Up Networking Is Installed” in the Using Passport 4400 Install Tool V4.1 manual (206906-B). You may need to install some files on your PC if dial-up networking is not installed.

Passport 4400 Software

Passports 4400 units are shipped from the factory with the current software version and associated boot code installed. The Passport 4400 application software, boot code, and latest MIB files in the formats below are available on the following Web/FTP site (this site is accessible by your Certified Distributor or Account Manager):

<http://www3.nortelnetworks.com/iso/protect/FtpServer>

The installation procedure is described in the Passport 4400 Operator’s Manual (800-1952-31). The following files are on the Web site referenced above. (This site is accessible by your Certified Distributor or Account Manager). Manually copy all the required files from the web server to your TFTP server.

Release Notes

- rs3160xx.pdf (Release Notes in Acrobat format.)
- rs3160xx.ps (Release Notes in postscript format.)

InstallTool

- it410014.exe (InstallTool software)
- 206906-B.00.pdf (InstallTool manual)

4430/4450

- bt316030.bld (Passport 4430/50 boot code)
- bt316030.bin (Passport 4430/50 boot code binary image)
- pr316030.bld (Passport 4430/50 application code)
- pr316030.tar (Passport 4430/50 MIB files in tar format)
- pr316030.zip (Passport 4430/50 MIB files in zip format)

4455

- thb316030.bld (Passport 4455 boot code)
- thb316030.bin (Passport 4455 boot code binary image)
- thb316030.bld (Passport 4455 application code)
- th316030.tar (Passport 4455 MIB files in tar format)
- th316030.zip (Passport 4455 MIB files in zip format)

Version ID String

The following are the version ID strings for the current software.

Passport 4430/50 boot image:

Passport_4430/50_Boot_Rel_3.1.6_Rev 0.3.0 07/31/00 11:50:28

Passport 4430/50 application image:

Passport_4430/50_Appl_Rel_3.1.6_Rev 0.3.0 07/31/00 11:50:51

Passport 4455 boot image:

Passport_4455_Boot_Rel_3.1.6_Rev 0.3.0 07/31/00 12:18:03

Passport 4455 application image:

Passport_4455_Appl_Rel_3.1.6_Rev 0.3.0 07/31/00 12:18:20

A list of the code on the CD you purchased, is shown below. In the event you need to reload software to your unit, you may use the CD (Release 3.1) which can get you up and running immediately until the current software can be loaded. Manually copy all the required files from the CD to your TFTP server.

Install Tool

- it3100019.exe (InstallTool software)
- m198631a.pdf (InstallTool manual 800-1983-31, Rev B)

4430/4450

- bt310000.bld (Passport 4430/50 boot code)
- bt310000.bin (Passport 4430/50 boot code binary image)
- pr310000.bld (Passport 4430/50 application code)
- pr310000.tar (Passport 4430/50 MIB files in tar format)
- pr310000.zip (Passport 4430/50 MIB files in zip format)

4455

- thb310000.bld (Passport 4455 boot code)
- thb310000.bin (Passport 4455 boot code binary image)
- thb310000.bld (Passport 4455 application code)
- th310000.tar (Passport 4455 MIB files in tar format)
- th310000.zip (Passport 4455 MIB files in zip format)

LDM

- ACCGFELX.FIM0200 (LDM code 2.0 for Passport 4400)
- r020.pdf (Release notes for LDM code 2.0 in PDF format)
- r020.ps (Release notes for LDM code 2.0 in postscript format)

The Passport 4400 Application software, is a single file (either thbxxxxxx.bld or prxxxxxx.bld) supplied in a “**bld**” format, consisting of the following six executable images:

- Ethernet Base Module code (Version - Passport_4430/50_Appl_Rel_3.1.6. Rev 0.3.0. or Passport_4455_Appl_Rel_3.1.6. Rev 0.3.0.)
- DSP code for AVM (Version - 2261, XAP)
- DSP code for UAVM (Version - 2263, XAP)
- DSP code for the DVM's installed on the TVM, EVM and DVEM (Version - 2262, XAP)
- Code for the TVM (Version - 909-2291-AX4)
- Code for the EVM (Version - 909-2292-0A)

Note: You can show these versions by issuing the following CLI command: **show system image.** (60318507)

Passport 4400 and 6400 Interworking

For proper interworking between the Passport 4400, Release 3.1.x (and later) and the Passport 6400, the following 6400 release levels are required:

- Passport 6400 Release 4.2, SSUP #23 or later
- Passport 6400 Release 5.0, SSUP #10 or later
- Passport 6400 Release 5.1, SSUP#7 or later

Note: Support for Passport 6400 Release 4.2 and 5.0 is not available after June 30, 2000. For more information, contact your Certified Distributor or Account Manager.

Network Management

- NMS
 - Release 12.3
 - Release 11.2 (plus the NMS 11.2c companion CD)
- OMS Release 4.1, or 4.2

New Features 2

The Passport 4400 series of multiservice access devices provides reduced networking costs through the consolidation of various traffic and network requirements. Unique to the Passport 4400 series is end-to-end Quality of Service (QoS) guarantees for various traffic types, simplified operations through integrated management and switched networking, and superior reliability features.

Release 3.1.x targets multiservice Wide Area Network (WAN) consolidation for small and large organizations. It provides both independent networking using Passport 4400 devices in a small network, as well as integrated services and features with Passport 6400/7400 switches for larger networking applications.

Small and medium enterprises (SMEs)—as few as two sites and up to approximately 50 Sites—can now deploy Passport 4400 series-based networks in their WANs. The Passport 4400 series Release 3.1.x answers the requirements of the small WAN with up to 24/30 voice channels at 8 Kb/s each, plus data combined up to a full T1/E1.

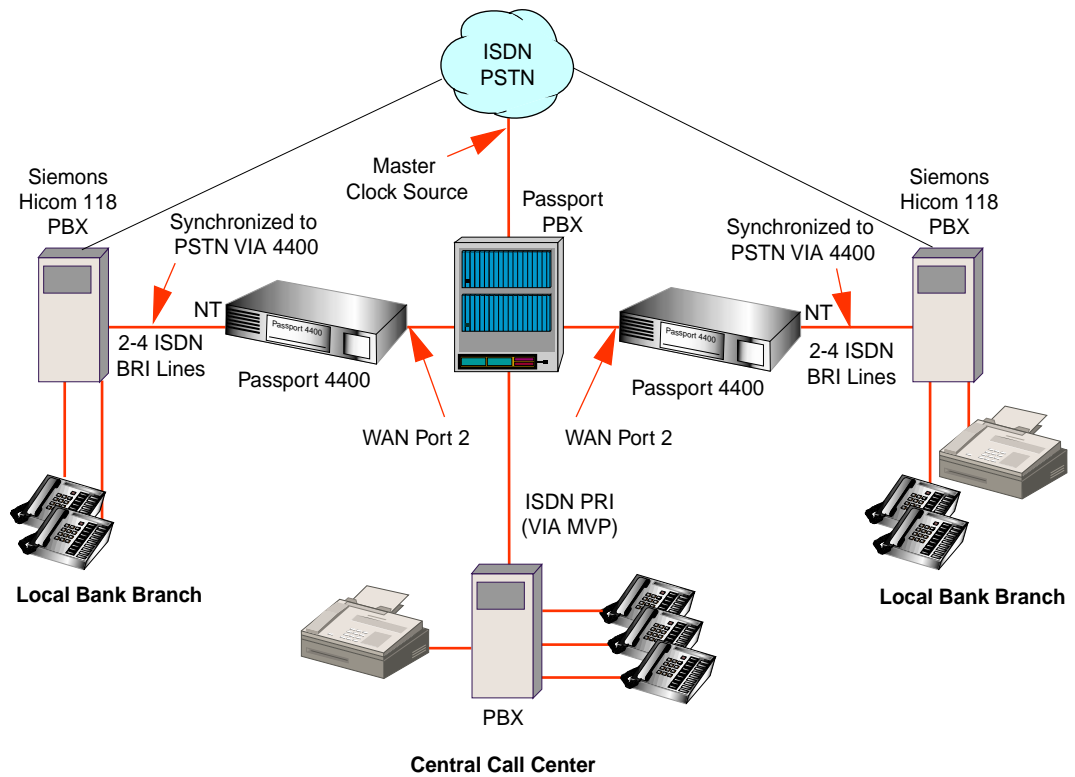
Refer to the Known Features, Section 4, for information on any enhancements.

New Hardware in Release 3.1.x

- **ISDN Module Update/Upgrade** (NTAU76CA) (Release 3.1.5)

Important: This module requires Release 3.1.5 or later software.

- External synchronization is now provided via a clock sync module (daughterboard) installed on the BRI module.
- No configuration required to operate this feature. The module will always look for its clock source from WAN 2 port when configured as NT.
- Requires Ethernet Base Module NTAU01CA or later. This feature is required in applications that may also utilize Siemens HICOM PBXs (which require the NT clock be provided by the Passport 4400).



Note: The connections will depend on the specific site requirements. If you are not sure of the connections required for the Passport 4400 unit, consult your system administrator or Certified Distributor.

Note: Refer to the Manual Update section of these notes for additional information on this module.

- **ISDN BRI Voice Module (NTAU76BA) (Release 3.1)**

The ISDN BRI Voice Module provides:

- Two voice channels on a single ISDN BRI interface from a PBX or Key System
- ETSI common channel signaling protocol and overlap dialing.
- Interworking with the Passport 6400 series MVP using Q.SIG (E1 MVP).
- Basic calling features like call setup and tear-down.
- Pass-through for all QSIG features, and support for the following QSIG IE options:
 - Sending Complete
 - Locking Shift (local significance)
 - Segmented Message (local significance)
 - Bearer Capability
 - Cause
 - Restart Indicator (local significance)
 - Channel Identification (local significance)
 - QSIG GF Facility (Q.931 code 0x1C, UIPE code 0x37)
 - Progress Indicator
 - Calling Party Number
 - Calling Party Subaddress
 - Called Party Number
 - Called Party Subaddress
 - Connected Party Number
 - Connected Party Subaddress
 - Low Layer Compatibility
 - High Layer Compatibility
 - Transit Counter (codeset 5)
 - Party Category (codeset 5)
 - Redirection Number (Q.931 code 0x76, UIPE code 0x21)
 - Notification Indicator
 - User to User Info

Note: The ISDN BRI voice module **is not** supported on the Passport 4455.

- **Passport 4455 (Release 3.1)**

The new Passport 4455 uses the same chassis as the 5-slot 4450 model. There is a new CPU on the base module, which approximately doubles the performance. The Passport 4455 is designed for sites where a high volume of telephony and data traffic must be handled. All Passport 4430/4450 interface modules and WAN modules are identical for the Passport 4455.

- Notes:**
- Passport models 4430 and 4450 are not field-upgradeable to the model 4455.
 - Passport 4455 does not support the ISDN BRI Voice Module.
 - Passport 4455 does not support the DC Power Supply.

- **16 MB Flash memory on base module**

The Passport 4400 series base module now ships with 16 MB Flash memory as standard. This feature is not required for 3.1.x software, but will be required for all subsequent releases. Kits for the upgrade of existing Passport 4400 units to 16 MB Flash memory are available.

- **Stac Data Compression Hardware Option**

Passport 4400 can now be ordered with the Stac compression processor SIMM module included on the EBM (Ethernet Base Module) to enable the use of hardware data compression with Release 4.0 and later. Stac compression can also be ordered as an upgrade to existing Passport 4400 units, but requires an ethernet base module of NTAU01BA or higher, which contains the socket for this SIMM module.

- **E1 DSU WAN Module**

The E1 WAN module inserts into either the primary or secondary WAN port on the base module. It has a built-in DSU that frames the data to conform to ITU-TG.703/G.704. You can save the cost of purchasing or leasing an external DSU that is often quite expensive. There are two versions of the module due to the following two electrical standards:

- G.703: 120 ohm, twisted pair (DB-156 or RJ48C connector) or,
- 75 ohm coaxial (Male BNC connector).

- **Single Port T1 or E1 Module (T1: NTAY99A or E1: NTAY15AA)**

For smaller applications that do not require two ports or the data ports. This module is most cost effective for this application.

Release 3.1.1 Features

- **RIPv2**

IP/IPX routing is enhanced to offer RIPv2 Variable Length Subnet Mask (VLSM) capabilities and Classless Inter-Domain Routing (CIDR). This provides the flexibility to integrate Passport 4400 series products into any type of IP addressing structure, as required in some large, complex networks (which often use OSPF in the backbone). This feature overcomes the limitation of the previously implemented RIPv1 standard.

Note: The Passport 6400 series will offer RIPv2 in 1999; interworking with Release 3.1.x is provided using RIPv1.

- **Constant Bit Rate (CBR)**

CBR is available on the base module (Port 1) and on the High-speed Data Module (HDM). This new bit-transparent service is intended to operate at speeds from 600 b/s to 384 Kb/s to provide clear-channel access and point-to-point service for legacy and video services that are not able to utilize HTDS (HDLC Transparent Data Service). This is particularly useful for running Bisync as well as streaming and surveillance video.

Notes:

- A Passport 4400 device is also required at the destination for termination of these services.
- For video conferencing applications that support HTDS, the HTDS service should be selected.

- **Node and link backup support**

Passport 4400 series supports link backup to a Passport 4400 or 6400/7400 device. As well, node backup provides the ability to designate a second Passport 4400 node as the alternate backup host in case of failure of the primary node.

- **DHCP/BootP relay agent**

Dynamic Host Control Protocol (DHCP) and BootP packets can now be both bridged and routed through the Passport 4400. This permits any third party DHCP server to automatically send IP address assignments/configuration information to your user devices passing traffic through the Passport 4400.

- **IPX filtering**

In addition to the IP filtering capabilities that were in Release 2.0, we now support IPX filtering capabilities allowing the Passport 4400 to accept or ignore specific types of packets based on protocol, source and destination address, and patterns. This can isolate network traffic for security and bandwidth control, thus improving LAN performance.

- **IPX RIP/SAP Request Spoofing**

The RIP/SAP spoofing feature enables the Passport 4400 that is NOT configured for routing to store the most recently used RIP/SAP information locally so that RIP/SAP requests can be intercepted and replied to without the need to send the RIP/SAP packet to the network across the WAN. This feature reduces bandwidth utilization.

Note: For Release 3.1.1 and later, the RIP/SAP spoofing feature is implemented to only intercept RIP/SAP requests from the ethernet side (i.e., not for requests from the WAN side).

- **Transparent CCS voice service**

Transparent CCS (on TVM and EVM digital voice modules) enables support for all PBX CCS protocols in a point-to-point configuration.

This signaling channel only uses WAN bandwidth when it is sending signaling information, compared to competitive solutions that continuously reserve 64 Kb/s of bandwidth. The signaling channel is dropped out of a data port on a digital voice module and connected to a serial port operating HTDS.

Note: Passport 6400/7400 series interworking with transparent CCS is not currently supported.

- **Hoot N Holler (Release 3.1.2 and later)**

Hoot N Holler is a trader voice application providing a permanent end-to-end connection across the network. When a broker wishes to communicate with the trading floor, he/she simply presses a button on the handset and starts talking. There is ZERO delay as no call set-up is required. For *Hoot* applications, the far end does not even ring—it is already *offhook*.

Note: Interworking with the Passport 6400/7400 series Hoot N Holler service is not provided.

- **TVM and EVM Enhancements**

Release 3.1.1 provides support of a second T1/E1 interface port on the TVM/2 and EVM/2. It also adds support for the two data ports on all digital voice card versions, with *Drop and Insert* capability. Some voice channels from the first T1/E1 port can be dropped and inserted at 64 Kb/s (uncompressed) onto a channelized carrier service on the second port for connection to the PSTN. The Drop and Insert feature provides flexible capabilities similar to a small channel bank.

- **Legacy data support**

Interworking with the Passport 6400/7400 series products, the Passport 4400 series uses the LDM (Legacy Data Module) and LEM (Legacy Expansion Module) to provide a rich suite of legacy services including SNA/SDLC, SNA/X.25/QLLC, SNA/Token-Ring, X.25, async X.3/X.28/X.29 and LAN/IP over token ring support. These services require features provided by the Passport 6400/7400 series. These modules are *not supported in a Passport 4400 only network*. New in Release 3.1.1 is that the LDM module is fully manageable using OMS plus Release 3.1.1.

- **InstallTool enhancements**

- A wizard leads you through the minimum steps needed to bring the Passport 4400 into the network
- Auto-discovers the modules installed in the Passport to which it is connected
- Various tests help you to determine the state or possible problem with the WAN ports and voice modules
- Telnet access to CLI for further configuration
- Popup status dialog boxes show more details

Release 3.0 Features

- **RFC 1490 WAN PVC for direct connect to third-party routers, FRADs and the public Internet**

Passport 4400 allows configuration of a single permanent virtual circuit (PVC) using the standard RFC 1490 encapsulation protocol for connection from a Passport 4400 switch to third-party routers or FRADs in the WAN, or to connect to the public Internet. This PVC is in addition to the standards-based PANL (Passport Access Network Link) protocol PVC already available on the Passport 4400.

- **Switching and cascading for Passport 4400-based networks**

This feature allows Passport 4400 products to be used as the network switch in lieu of a Passport 6400 series product, providing connectivity for one, or a group of Passport 4400 devices. This feature also enables the Passport 4400 series to cascade a third tier (or more) of Passport 4400 devices, where an additional layer of switching can be added to the network topology to provide concentration of low-speed devices into a regional Passport 4400 device. Regional nodes can then be fed to a central-site Passport 4400 device. Up to a total of four tiers, or three switching tiers, are supported. This feature provides for a total WAN size of up to 25-50 locations depending on traffic levels.

Note: Additional network scalability can be achieved by adding a Passport 6400/7400 series product, for higher-performance and capacity in the switching sites.

- **TFTP configuration backup and restore**

This unique reliability and serviceability feature allows the network operator to save a Passport 4400 unit's configuration on a TFTP server or management workstation. The configuration can then be downloaded to a new or existing unit. This significantly reduces the amount of on-site time needed to configure a newly installed Passport 4400 unit, or for the deployment of many units with similar configurations.

- **Network management options: NMS and SNMP**

Nortel Networks' NMS provides an integrated network management solution for the Passport 4400 series that offers scalable, carrier-class features. Release 3.1.x uses NMS Release 10.9 software.

The Passport 4400 series is fully manageable using SNMP where an SNMP management application can be configured to perform the management.

- All of the Release 2.0 feature content.
 - Three and five slots models;
 - Ethernet LAN routing and bridging;
 - A variety of expansion modules for serial data and analog and digital voice;
 - Branch access from a Passport 6400/7400 switch or network;
 - Wide area speeds up to T1/E1, with WAN links using public frame relay, leased lines, or ISDN BRI.

This chapter highlights considerations relevant to this release of Passport 4400 software.

System Software

Note: To further ensure proper operation of the Passport 4400 3.1.x software, please refer to the Passport 4400 Engineering Notes and Guidelines document, which can be found on the following Web site:

http://esonline.us.nortel.com/imds?pg=/dept//cse/eng_notes/pp4000/

This document provides guidelines to proper integration of the Passport 4400 into your network, and offers suggested configuration settings based upon specified network scenarios.

Resets

In resetting the unit, it is recommended that you use the **reset system current** option to reset all the devices within the unit (hardware reset). In many cases, selecting **reset system cpu** is not adequate, because only the cpu software will reset. (60096427)

Configuration Guidelines

- When both CBR and HTDS services are running simultaneously, some performance and quality problems have been seen. Therefore, only one of these services should be configured at a time.
- The unit will not boot up if the existing IP address is deleted. To resolve this, enable the commit/rollback feature. If you changed the configuration which isolates the Passport 4400, it will rollback to a configuration that will allow access to the unit, so that these configuration errors can be corrected. *You do not need to factory default the unit to recover from this problem.* (60082840)
- When line efficiency is enabled, the traffic goes to the line speed. (60103899)
- Note that in Bridging mode, the ARP table display is empty; the bridging functionality is not affected. (600902751)

- For the HTDS protocol in Release 3.1.4: When the idle character is set to 255 the port will use mark fill instead of flag fill while the line is idle.
 - When using mark fill, RTS/CTS is raised when data is being sent, and lowered when there is no data to send. When using the NTAU18AA or NTAU19AA RS-232 cables, a modification of the DB-25 end of the cable may be needed if the attached device needs RTS/CTS high all the time.
 - A new to-DTE cable, NT0263AA (shown on page 4-16) has been created that sets CTS high, regardless of the idle character setting. This can be used in place of the NTAU19AA.
 - All other values for the idle character will use flag fill (hex 7E, decimal 126).
 - When using flag fill, RTS/CTS is held high at all times.

Existing applications using HTDS may need to change the idle character from the default of 255 to 126 to keep the same flag fill functionality found in previous revisions.
- When using the drop and insert feature for WAN links, WAN ports 2 and 3 are the only ports on the Base Modules that can accept DS0s from either the TVM or EVM modules. These ports must use the Serial Interface Module for the ports to function properly (not the T1/E1 CSU/DSU module).

Voice Requirements

- **Passport 4400 Network:**
 - You must set up the NAS/NAC services prior to establishing a call across the network.
 - Note that when you set the fax rate (in voice profile) to 9600, voice calls will have 13,000 b/s reserved bandwidth. Because of this, the number of calls permitted across the WAN will be reduced. (10309543)
- **Passport 4400 Interworking with a Passport 6400:**
 - You must provision the VNCS RSA/RSI services prior to establishing a call across the network.
 - Regardless of the configured fax rate, all calls from the Passport 6400 MVPs will have 10,800 b/s reserved bandwidth for the voice session. (10309543)
- **RSI Server DNA:** Do not add any RSI servers with a DNA that duplicates an existing RSI server's DNA.

LAN Services

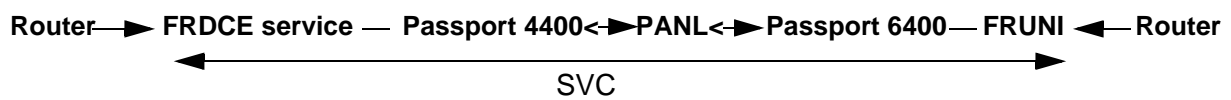
- **Routing:** Do not configure RIP for static routes.
- **Inverse Arp:** For point-to-point links, Inverse Arp (invarp) should only be configured in Basic routing mode (not Easyrouting mode), and only for the unit receiving the call (e.g., if a Regional Site is calling in to a Central Site, only the Central Site unit should be configured for Inverse Arp).
- **Bridging:** When changing the Bridge Priority on the 4400, save the configuration and reset the Passport 4400 to avoid a spanning tree root bridge re-election.

Device/Network Management

- **Install Tool** is the recommended tool for installing, configuring and monitoring the 4400. See "Install Tool" below for special considerations.
- **Passport 4400 only network:** Any third party network management system can be used to monitor the Passport 4400 only network.
- **Passport 6400 interworking networks** can be configured and monitored via the Passport NMS Tool Release 10.8 (10.9 recommended), or OMS Release 3.1.

6400 Interworking

- The following application must be configured properly: (60107059)



When configuring the FR SVC, the Passport 4400 must be configured as the *Master*. The Passport 6400, must be configured as the *Slave*. This configuration will guarantee that the traffic management rate enforcement with CIR will operate correctly in both directions.

- Passport 6400 Software should be at a minimum of Release 4.2 (SSUP #23), 5.0 (SSUP #10), or 5.1 (SSUP #7).

Software Fixes and Known Issues

4

Note: To further ensure proper operation of the Passport 4400 3.1.x software, please refer to the Passport 4400 Engineering Notes and Guidelines document, which can be found on the following Web site:

http://esonline2.us.nortel.com/imds?pg=/dept/cse/eng_notes/pp4000/

This document provides guidelines to proper integration of the Passport 4400 into your network, and offers suggested configuration settings based upon specified network scenarios.

Software Fixes

The following sections describe issues that were problematic in previous Passport 4400 software releases, but have now been resolved. This is not a comprehensive listing of all software fixes—just the major fixes.

Install Tool Release 4.1 Fixes

- Configuration of date and time is supported
- The subscription parameters can now be configured.
- Improve support for statistics and for system level statistics, voice, and WAN and serial links,
- Added the ability to connect to a Passport with a changed Community String, or through a different port than the standard SNMP port.
- Provided the option to reset the Passport without swing configuration changes.
- Several problems with status colors of ports have been corrected.
- Status screens now display correct information.
- Traffic Management CIR; the Install Tool now sets values according to the Passport 4400 Operator's Manual (800-1952-31).
- Can now set up CBR on Port 1.
- Diagnostics now determine the type of configuration on a serial port and diagnose that service.
- ISDN diagnostics now display correct values.
- Problems with the port icons being grayed out have been fixed.

- Additional documentation is now available on setting up modems connected to the Passport 4400.
- Status and tests on ports with more than one PANL link now show all links.
- Configuring a link for RFC1490 is now performed correctly.
- Configuring and displaying IPX network numbers greater than 4 hex digits is now performed correctly.
- A problem preventing you from changing the Default Gateway DNA was fixed.

Release 3.1.6 Software Fixes

- **Issue Resolved:** The lost control frames voice statistic will no longer register when the voice channel is connected to a Passport 6400 MVP voice channel. The Passport 4400 no longer registers a loss of control frames for Passport 6400 connections. (30140328)
- **Issue Resolved:** The fax machine Canon model B100 now works when interfaced to the BRI voice channel interface in the Passport 4400 unit. (60315300)
- **Issue Resolved:** The CLI management port responds to commands when the WAN composite ports are greater than 16. Previously, nodes with more than 16 physical links caused the CLI not to respond to system administration request. (60318680)
- **Issue Resolved:** After power down and power up of the Passport 4400 hardware, some of the WAN composite links on the HDM module would not sync up. This was experienced with many composite links in a central node (Passport 4455) application. This has been corrected. (60320108)
- **Issue Resolved:** When fax calls using 9600 b/s of bandwidth for the transmission was connected between a Passport 4400 and Passport 6400, the fax was getting corrupted when traffic management was enabled. This has been corrected. It should be noted that 9600 fax calls require up to 13 Kb/s to transfer the information correctly and now this bandwidth is reserved for calls from the Passport 6400 MVP channels. (60320217)
- **Issue Resolved:** A node reset, caused by a streams leak after rebooting, occurred on a LAN SVC when the DNA was set only to the prefix of the remote. This is now fixed. (60320320)
- **Issue Resolved:** The ISDN is now sending the calling number for the US switch types: AT&T ESS5, NI1 and DMS100. (60320794)
- **Issue Resolved:** Passport 4400 crashed when receiving a call from HICOM PBX to the 4400 BRI voice interface. Resolution: If a Call Setup Indication is received from the PBX as a BRI-Interface-Type, in the Channel Identification Information Element, the call is rejected with Cause Code 66 (Channel Type Not Implemented). Before the fix was put in, the unit crashed. (60320856)
- **Issue Resolved:** The default value of WAN parameter IdleChar has changed from 255 to 126. (60320918)

- **Issue Resolved:** When configured with a sync char of 255, a CBR link established a connection and started receiving data even though there is no cable in the serial port. CBR was changed so that it will enable and disable the transmitter and receiver based on the link state (DSR signal). (60321024)
- **Issue Resolved:** The CBR clock drift is resolved. Previously, the clock for CBR used to be adjusted as the clock deviation entered certain threshold. In this fix, the clock is corrected as any soon as any deviation occurs. (60322099)
- **Issue Resolved:** The command "sh port parameters table" now displays the "ISDN Signaling Interface" information correctly. (60324695)
- **Issue Resolved:** The access out of the range of an array caused a Bus error crash, this no longer occurs. (60325534)
- **Issue Resolved:** The 4-port HDM power up diagnostics now passes during initialization when a ISDN S/T installed in port 3. (60325545)
- **Issue Resolved:** The primary now recovers correctly when using backup manual switching mode. (60325896)
- **Issue Resolved:** When a call is made from a PP4400 to a Passport 6400 MVP card, the phone now displays the called name or called number. (60106248, 60106250)

Release 3.1.5 Software Fixes

- **Issue Resolved:** ISDN BRI voice channel application: When the called station on a remote PBX is busy, the PP4400 did not pass the busy condition to the calling PBX. (30135937)
- **Issue Resolved:** The BRI voice channel trap *Frame Sync Loss* occurred with idle channels. TRAP message 50042104 was occurring erroneously; this has been corrected. (30139928)
- **Issue Resolved:** The properly working BRI voice module in NT mode during Power-up Diagnostics (for the board) displayed the following message: "Logical Interface Module B: BVM/1 Failed." This indication was incorrect; the situation has been corrected to reflect the proper operating condition of the module. (30140100)
- **Issue Resolved:** The Calling ID is now passed through to the destination for BRI voice calls. (30140441)
- **Issue Resolved:** A mismatch between the GCM traps definition and the actual GCM traps. One variable(mcmGcmUnitIndex) was missing in the GCM traps definition. (30140657)
- **Issue Resolved:** BRI voice calls intermittently did not get a ringing back indication at the origination. This has been corrected. (30140743)
- **Issue Resolved:** BRI voice traps are now being generated properly. (30316112)

- **Issue Resolved:** The ISDN Backup is working now with the multiplug (point-to-multi-point) for ETSI and INS64. It is now possible to connect two Passport 4400 units to a multiplug, so only one BRI is needed for both Passport 4400 units. (50319987)
- **Issue Resolved:** Passport 4450 units with 24 channels of Digital Voice Modules in a Hoot N Holler arrangement: Voice channels went out of service; voice channel statistics displayed "timedOutForceConnected" in the DSPOperStatus. The node need to be reset in order for channels to re-establish connections. This has been corrected. (60318386)
- **Issue Resolved:** The IdleChar field now accepts 1–255 only for the idle fill character. (60089591)
- **Issue Resolved:** Pings sent through the Passport 4400 with long packet size (10k byte or greater) caused the Passport 4400 to reset. This has been corrected. (60098898)
- **Issue Resolved:** Pings sent through the Passport 4400 with long packet size (10k byte or greater) caused the 4400 passport to reset. This has been corrected. (60105247)
- **Issue Resolved:** Modification of the NTAU05AA BRI ISDN-U. Module to disable DC termination circuit. This allows for consistent call completion. (60106056)
- **Issue Resolved:** Ethernet Base Module(NTAU01CA) was intermittently requiring 15 minutes to initialize after a reboot was invoked. This has been corrected. (60106166)
- **Issue Resolved:** PANL links intermittently did not recover from loss of synchronization and required a node reset. This has been fixed and link synchronization now recovers automatically. (60107287)
- **Issue Resolved:** Hoot N Holler voice channels go out of service and display status as "timedOutForceConnected." This required a node reset. This no longer occurs. (60108386)
- **Issue Resolved:** Incorrect CLI restart reason displayed when buffer leak was occurring has been changed to reason watchdog recovery. (60168612)
- **Issue Resolved:** The indicator lights for ISDN backup link now match the physical LAPD operational status. (60108627)
- **Issue Resolved:** The voice channel profile Maximum Forwarding Digits is now 1-36. (60314486)
- **Issue Resolved:** Data transfer on dataport 2 is now operational on the T1/E1 module. (60314716)
- **Issue Resolved:** Calls originated from the external ISDN PSTN network through the Passport 4400 did not properly setup the call successfully to a remote 4400. This has been corrected. Note: Calls to a remote 6400 will require a 6400 modification to operate correctly. A future update of the 6400 will be required. At this time 4/16/2000, a solution for 6400 has not been implemented. (60316031)

- **Issue Resolved:** ISDN BRI backup calls intermittently failed to connect during first and second call initiations. This has been corrected. (60316105)
- **Issue Resolved:** Committing new software caused an erroneous BRI voice trap frame sync loss to occur. This has been corrected and no longer occurs. (60317037)
- **Issue Resolved:** The BRI voice channels were intermittently found to be inoperable (operstatus=down). This has been resolved. (60317529)
- **Issue Resolved:** During migration of software versions from 2.0 to 3.1 (4400 Passport), voice parameters bckGrndNoiseLevel and SilenceHngOvrTime were reported as unknown. This has been corrected. (60317601)
- **Issue Resolved:** PANL now establishes over the ISDN BRI when switching to backup. The answer side was alternating between B1 and B2. Every other call would fail. This has been corrected. (60317697)
- **Issue Resolved:** The report of erroneous status has been corrected. When an ISDN PANL link configured on port 2 is deactivated, the GCMindex "frameRelay2" remains in an "up" status even when the index "isdn2" is not up. This only applies if the GCM mode is set to "central" (60318099)
- **Issue Resolved:** When configuring the ISDN Backup port Up/down via "set port admin isdn" commands were erroneously preventing the backup link recovery when primary link lost connectivity in normal operation. This has now been corrected. (60318789)
- **Issue Resolved:** The ISDN backup link did not come up if primary link often connected/disconnected. This has been corrected. (60318814)
- **Issue Resolved:** If you entered the following CLI command: `add ip add e 2 192.168.010.010 255.255.255.0 255.255.255.255`. The value "010" was translated to its Octal equivalence (namely 8). This was the case for all number input with 0 leading. This has been corrected. (60318828)
- **Issue Resolved:** FXS call did not go through. This has been fixed. (60318870)
- **Issue Resolved:** ISDN Backup intermittently fails to connect if physical the cable is disconnected and re-connected. This has been corrected. (60319277)

Release 3.1.4 Software Fixes

- **Issue Resolved:** Overflow tones (busy tones) are now generated properly when voice calls originate from the Passport 4400 to the Passport 6400 MVP voice channels. Previously this did not occur when the end point destination station was busy. The voice DSP image X9P is required for this fix. (10283465)
- **Issue Resolved:** When doing a ping on the console (using the CLI) with 255 bytes in the address field, an invalid command occurred. This change allows a ping with address 255 in 2nd, 3rd, 4th bytes on the ping address. (30128855)
- **Issue Resolved:** A new informational message is prompted after provisioning the E1 TS16 to the data port connection. This message is prompted at the CLI interface which states "E1 reset required."

- **Issue Resolved:** IPX Circuit Ifindex in the CLI does not support an index above 16. The 4400 does not support more than 16 IPX circuits at this time. If you are Basic Routing IPX, you must make sure that you only create virtual ports lower than Ifindex 16. (60090878)
- **Issue Resolved:** The BRI voice channel calling engaged destination now get a busy indication rather than dead air. (60099901)
- **Issue Resolved:** The software now allows Australian call progress tones to operate correctly without causing a reset to occur to the Digital Voice Channels (DVMs). (60100569)
- **Issue Resolved:** The IPX circuit table accepted a NetNumber =FFFFFFFF. Any “NetNumber: entered between 0x22222220 and 0x77777780, was displayed in Character format rather than actual Hex values. (60101696)
- **Issue Resolved:** When running 30 E1 voice channels over a PANL link and the PANL link synchronization is lost, intermittently the PANL link synchronization does not recover. This has been corrected and no longer occurs. (60102488, 60102558)
- **Issue Resolved:** When the Passport 4400 receives a negative response from VNCS or NAS, or the MPANL link is down, the cause code sent to the PBX is now 41, Temporary Failure. This allows for the PBX to reroute the call. (60102875, 60105886)
- **Issue Resolved:** The BRI voice channel calling engaged destination now gets a busy indication rather than dead air. (60102947)
- **Issue Resolved:** The central node was experiencing buffer leak (memory depletion) when processing heavy LAN and data transfers from the remote nodes. This has been corrected and the central node no longer resets because of this. (60103292)
- **Issue Resolved:** The DHCP reply no longer fails when the reply travels through two DHCP relay agents. Additionally, a check of destination address in Bootp relay agent was added to ensure the message is forwarded correctly. (60103594)
- **Issue Resolved:** BRI voice traps have been added. This includes the standard voice traps such as analog and digital. Additionally Loss of Signal and Loss of Framing traps have been added. (60104004)
- **Issue Resolved:** Outgoing voice calls (Passport 4400 to the PBX) to a busy PBX station did not pass the busy indications back to the origination station. This has been corrected. (60104542)
- **Issue Resolved:** A voice call causing a hex dump to the CLI has been corrected. This hex dump occurred because the voice call setup message was too long. The length of the data was 2 bytes long and the code accounted for only one byte. (60104622)
- **Issue Resolved:** The Passport 4400 no longer rejects Telnet requests and allows Telnet sessions to open properly during heavy LAN traffic transfers. (60105642)
- **Issues Resolved:** The BRI ISDN backup now originates a call when the port is provisioned as “bothoriganswer.” (60104884)

- **Issue Resolved:** The BRI voice channel protocol violation has been corrected. Previously, sending complete information element (IE) was sent in the Setup Indication message from the calling PBX. No Setup Ack was sent to the calling PBX; a Release Complete message should have been sent to the Calling PBX rather than Disconnect message on behalf of the remote busy channel. This is all working properly at this time. (60105468)
- **Issue Resolved:** The CLI command `sh t1 line status table` now shows the correct line status when physical line interface connection is not plugged into the port. The correct line status is now indicated: Red Alarm. (60105687)
- **Issue Resolved:** The Passport 4400 lockup has been resolved. A mixture of traffic (LAN, legacy data, and voice) caused the voice service to suspend and CLI to suspend. Scheduler and Streams processing issue resolved. Passport 4400 lockup is resolved. LAN, legacy data, and voice caused the voice service to suspend and CLI to suspend. Scheduler and Streams processing issue resolved. This issue is believed to exist in Releases 3.1.2 and 3.1.3. (60105698)
- **Issue Resolved:** When the primary link switches to a back up ISDN link, the IPX traffic was not transported across the WAN link. When the primary link was restored, IPX traffic was not transported across the WAN link. This has been corrected. IP and voice service is not affected by the primary and secondary link switching. (60106273)

Release 3.1.3 Software Fixes

- **Issue Resolved:** The define commands `def ipx sys bas sys 1 ""` (space) and `def ipx sys bas sys 1 ""` (null) now process the *space* and *null* entries properly. (10160412)
- **Issue Resolved:** If CBR and FRDCE traffic are both active, the CBR service will not experience increased transmissions delays. (10258020)
- **Issue Resolved:** The voice parameters input gain and output attenuation configuration is maintained when upgrading from release 2.0 to 3.1. (10265279, 10236240, 60092415)
- **Issue Resolved:** If CBR and FRDCE traffic are both active, the CBR will be error free. (10265989)
- **Issue Resolved:** BRI voice calls from the Passport 4400 to Passport 6400 MVP no longer cause the system to reset due to memory virus buffer leaks. (10284496)
- **Issue Resolved:** We now support fax operations on the following Cannon models: L300, B100, GP215, and L380. (30115749, 60096678)
- **Issue Resolved:** The Passport 4400 does accept host routes through RIP. The problems found in RIP input code that 'filtered out' certain host routes have been fixed. In addition, the PP4400 is also modified to look for host routes that might have those addresses. If a destination address is received that has either of the Two List Significant Bits (LSBs) set, it must be a Host Route. Therefore, the Host Mask is returned. (30124176)

- **Issue Resolved:** BRI voice suspended after 4,000 calls. BRI voice application improvements have been added to the call setup and disconnect processes. This no longer occurs. (50125865, 50125868)
- **Issue Resolved:** LMI status messages did not transmit from the Passport 4400 during heavy FRDCE traffic, thus causing the attached equipment to time-out. LMI status messages from 4400 to FRADs are now transmitting properly. (60002209)
- **Issue Resolved:** The backup link is now activated after the primary backup switch delay timer expires. (60002260)
- **Issue Resolved:** Fax training improvements allows more fax calls to fax transmit at 9600 bits per second instead of training down to a lower speed of 7200 and 4800 bits per second. (60089362)
- **Issue Resolved:** The ISDN BRI DSP voice feature does not display a voice level status. This is now fixed in this release. (60086828)
- **Issue Resolved:** Fax training improvements allows more fax calls to fax transmit at 9600 bits per second instead of training down to a lower speed of 7200 and 4800 bits per second. (60089362)
- **Issue Resolved:** The bridge with the lowest MAC address is now the root bridge (as it was designed to be). Improvement to the spanning tree root bridge have resolved the issue where a Passport 4400 (not designated to do so) would become the root bridge. (60090373)
- **Issue Resolved:** Previously, when you did a set T1/E1 dso connect with a range of channels, the system came back with an acknowledgment. This no longer displays. (60090737, 60094818)
- **Issue Resolved:** When upgrading from Release 2.0 to Release 3.1, the committed configuration bank is now preserved. (60090502)
- **Issue Resolved:** The egress function has been corrected to use the proper pointer. The voice call setup and disconnect are more robust. CLI lockup or system reset no longer occurs. (60093846)
- **Issue Resolved:** Faxing at 9600 bits per second with traffic management enabled will claim 13,000 instead of 10,800 to ensure enough bandwidth to transmit properly. This will reduce the number of active voice or fax calls across the WAN links. (60093848)
- **Issue Resolved:** Corrected the loss of system memory buffers. (60094453, 60096928)
- **Issue Resolved:** The static routes range is now 1 to 255 instead of limiting it to 4. (60094891)
- **Issue Resolved:** The syntax for range connection of T1/E1 is improved to permit only 1-30. Using 1_30 is invalid. (60094894)
- **Issue Resolved:** After a save configuration update and a system reset command is requested, you can Enable/Disable the bridge ports via the **set bridge spantree port status** command. (60095142)

- **Issue Resolved:** More than 8 physical links are now allowed with MPANL link provisioning. (60095373)
- **Issue Resolved:** LAPF improvements to the recovery of WAN synchronization. The T200 timer now restarts, which prevents memory virus lockups. (60095613)
- **Issue Resolved:** The Ethernet transmit locked up after a node reset has been corrected and the system throughput has been increased. (60096427)
- **Issue Resolved:** The CBR channels now reconnect properly to restore point-to-point service after a WAN link sync loss and resynchronization occurs.
Note: A new hardware cable is required (NT0263AA shown on page 4-16).
- **Issue Resolved:** Disabling the rate enforcement feature is now possible without default resetting the node. (60098673)
- **Issue Resolved:** Voice degradation was caused by FR line user base rate enforcement automatically enabling. Disabling the rate enforcement is now supported. (60098995)
- **Issue Resolved:** When using the Easy routing mode, multi-cast and uni-cast MAC addresses are now detected correctly preventing the retransmit of these addresses back to the WAN causing 90% transmit utilization. (60099027)
- **Issue Resolved:** You can now download new DSP application code to voice channels in the Hoot N Holler mode. Previously, system reboot occurred. (60099134)
- **Issue Resolved:** Memory leaks no longer occur on HDM modules. (60099144)
- **Issue Resolved:** CBR only supports 384 Kb/s data rate. If you accidentally misconfigure the unit for 1.92 MB, it will no longer reset. (60099340)
- **Issue Resolved:** Misconfiguration of a CBR channel to a rate of 1.92 mega bits per second caused the node to reboot continuously after requesting for a system reset via the CLI. The continuous rebooting has been corrected. (60099518)
- **Issue Resolved:** An HDM module resident in the Passport 4400 and configured to support CBR service no longer experiences time slippage errors and system lockups. (60099519)
- **Issue Resolved:** The CLI command `show fr voice svc circuit table` now displays voice channels connections terminated or switched through a Passport 4400 unit. (60099520)
- **Issue Resolved:** The CLI is now able to set T1 CSU ds0basic rate to either 56K or 64K. (60099523)
- **Issue Resolved:** All E1 Voice channels connected with Hoot N Holler mode will reconnect after a loss and recovery of PANL WAN link. Intermittent loss of some channel connections was occurring after the link synchronization. (60099599)
- **Issue Resolved:** There have been clock drift improvements to CBR 9600 bits per second service. The 100 Hz drift that was detected when primary to backup link was restored no longer occurs. (60099633, 60089709)

- **Issue Resolved:** When the CPU utilization reached 100%, the following problems may have occurred: Loss of CLI, system reboot, loss of PANL links. The WAN receive poll timer has been increased to one second to recover the loss of the interrupts. (60099934)
- **Issue Resolved:** The system processing has been improved to accommodate situations with CPU utilization reached 100%. (60099964)
- **Issue Resolved:** The system no longer loses memory when Passport 4400 requests a ping command. The system degradation caused by lack of memory no longer occurs. (60101352)
- **Issue Resolved:** CLI command `add ipx current "LAN_IPX" type 2 0x44463152` displays show the NetNumber to be "DF1R". This no longer occurs. Invalid NetNumber values such as FFFFFFFF are now validated. (60101696)

Release 3.1.2 Software Fixes

- **Issue Resolved:** In the HDM 8-port expansion module, you could only use a maximum of four ports. These had to be all of the same bank, either ports 1-4 or ports 5-8. This is now fixed. (60094096)
- **Issue Resolved:** Bus errors no longer detected in voice applications with Passport 4400 ISDN BRI voice calls to the Passport 6400 MVP. (10230864)
- **Issue Resolved:** Cosmetic print messages are prevented from displaying during rebooting. This message was intermittent and only cosmetic, no buffer failed to release as indicated by the message. (10251389)
- **Issue Resolved:** When using the BRI voice applications with the overlap dialing functionality, the Passport 4400 prematurely disconnected calls when extra digits were dialed too quickly. This no longer occurs. (30118946)
- **Issue Resolved:** The Ethernet interface no longer locks up due to high volume of broadcast packets. System memory buffer depletions were corrected. (50130963)
- **Issue Resolved:** Improved the system stability. Intermittent node resets resolved when running IP, IPX and voice traffic applications. (60086661)
- **Issue Resolved:** Backup ISDN BRI calls now work Passport 4400 to Passport 4400. Incoming backup calls are now supported (5ESS, NII protocol). (60088269, 60089241)
- **Issue Resolved:** The MPANL link no longer intermittently fails to synchronize after backup activation. (60089100)
- **Issue Resolved:** The display is now the same for the `show sys firm` and `show sys admin` commands. (60089218)
- **Issue Resolved:** Ethernet LAN connections to the Passport 4400 no longer cause the system memory buffers depletion resulting in resets. (60089648)
- **Issue Resolved:** Both an ISDN WAN backup link and a primary T1/E1 CSU link are now supported on the same unit. Any interface module that is configured for DS0 channels will function properly when there is also an ISDN WAN interface module configured on the same unit. (60089915)

- **Issue Resolved:** Bridging lock up when erroneous ARP packets are received no longer occurs. (60090119)
- **Issue Resolved:** Improved system stability and corrected the central node loss of remote node connections. Automatic Reboot Recovery improvement prevents unnecessary reboots. Memory buffer leaks are now prevented; these previously caused the system to lock up and reset intermittently. (60090191)
- **Issue Resolved:** The maximum number of streams that can be successfully open to IP has been increased to 32; previously, the maximum number was 16. This includes IP addresses, UDP, TCP, SNMP NAS...etc. (60090229)
- **Issue Resolved:** It is now possible to configure up to 30 FRDCE DLCIs (of any type) per port. (60090274)
- **Issue Resolved:** With a T1 CSU in Port 2 and a BRI ISDN backup in Port 3, the primary to backup switching functionality now operates correctly with INS64 protocol. (60091361)
- **Issue Resolved:** IP routes are no longer lost from the table. RIP/SAP updates were getting lost in networks with heavy LAN traffic loads. (60091434)
- **Issue Resolved:** Loss of IPX connectivity no longer occurs. (60091972)
- **Issue Resolved:** When the msm traps were enabled and a `show msm link table` command was requested, the CLI did not respond. This no longer occurs. (60092062)
- **Issue Resolved:** There have been improvements to traffic management to cope with instances when the CIR is exceeded. (60092064)
- **Issue Resolved:** IPX has been improved so it does not cause resets. (60092424)
- **Issue Resolved:** Interworking problems faxing from a Passport 6400 MVP.
- **Issue Resolved:** No longer do we have PANL links dropping under high LAN load overdriving traffic management. (60092538)
- **Issue Resolved:** When T1 WAN fluctuations occur from the central office, PANL now recovers (when the line stabilizes). (60092639, 60092235)
- **Issue Resolved:** Misconfiguring the ISDN backup will no longer reset the Passport 4400 unit. (60092673)
- **Issue Resolved:** The central node no longer continuously resets when it is configured for six links and two are ISDN. (60092675)
- **Issue Resolved:** Switching from backup to primary SPVC no longer fails to establish with an E1 CSU interface as primary. (60092931)
- **Issue Resolved:** Improvements for incoming ISDN BRI backup calls have been made. The Central side has ISDN on the primary and backup link (both for incoming calls). Branches trying to access the central node will intermittently not get an ISDN connection. (60093237)
- **Issue Resolved:** Manual backup is now working properly. (60093440, 60092828)

- **Issue Resolved:** Voice call connections caused CLI lock ups and the system crashed. This no longer happens. (60093846)
- **Issue Resolved:** The system stability has been improved when running heavy FRDCE loads. (60094789)
- **Issue Resolved:** Corrected the situation when, in certain circumstances, multicast messages would bounce between two Passport units creating high WAN and CPU utilization. (60095055)
- **Issue Resolved:** The restart timer of MPANL has been reduced from two minutes to 30 seconds. This improves the link recovery time. (60095586)

Release 3.1.1 Software Fixes

- The ISDN BRI WAN card is set for TE mode, but when the CLI command **show isdn physical basicrate operational table** is issued, the table still shows NT for the attribute IfMode. This is now fixed. (30115885)
- The E1 CSU WAN module feature is now functioning on all Passport 4400 platforms (4430/50/55). (1019979, 10212612, 1026484, 60080097, 60080192, 60081761, 60082088, 60082646, 60083161, 60087881)
- The T1 and E1 modules will permit you to configure more than one DS0 connection on either data port 1 or data port 2, and all configured connections will be operational. See the section “Passport 4400 T1/E1 Digital Voice Modules Manual (800-1944-31, Rev. A):” on page 5-11 for configuration procedures. (50113496, 60086812)
- Port 1 now supports CBR service. (60087023)
- ISDN BRI Voice Q.Sig now features full IE support. See “Release 3.1.1 Features” on page 2-5 for a list of all the Q.Sig IE features now supported.
- Voice quality improvements have been made to reduce voice clipping and general degradation.
- IP/Bridging forwarding rate performance is up by 50%.
- CBR service now operates at speeds as low as 600 b/s. Additionally, operation at 2400/4800/9600 baud rate has been improved. (60083597)
- The number of cases of unit lockup, including IPX lockups, have been significantly reduced. In addition, if a unit does lock up, there is now a system recovery mechanism built into the Passport 4400. The unit now auto-resets when a lockup occurs. Activity logs will still show a reset, but the system will have already recovered automatically. (10198278, 10231163, 10234716, 30112326, 60084313, 60086688, 60086978, 60087444, 60090191, 60090257)
- Increased configuration options for the switch from backup link to primary link. You can now configure the Passport 4400 to delay up to 24 hours before it switches from the backup link back to the primary link. (60082643)
- RIP1 packets now send the proper subnet mask. (60083579)
- RIP2 now sends multicast packets to third-party routers. (60084934)

- RFC 1490 link down status now displays.(60083509)
- The show command for 56K CSU now displays correct ifIndex. (60083547)
- The console port can now be configured for 2400 b/s. (1015198)
- T1 alarms display correct DS-1 or DSX-1 interface. (60068735)
- T1/E1 CSU WAN modules can now be configured in data port 2. (60083690)
- The Passport 4455 platform can now function as a branch access device.
- The ISDN BRI Voice module can now operate in TE mode, thus solving problems with fax calls using Brother and Ricoh fax equipment. (30113022)
- ISDN BRI voice improvements have been made. (30112498)
- ISDN BRI voice/fax call completion rate has been improved. (10218258)
- ISDN BRI voice collision occurs less frequently. (60087338)
- ISDN backup has been improved to support North American switch types in a Passport 4400 to a Passport 6400 interworking network. (60089100)
- 56K CSU CLI initialization display has been corrected. (60083665)
- ARP/routing table entries now display correctly. (10197841, 60084702, 60086809)
- Bridging interoperability between Passport 4400 and Passport 6400 is now functioning properly. (10218694)
- The MAC addresses for transparent bridging between the Passport 4400 and Passport 6400 no longer shift a digit.
- Reboots no longer occur when FRDCE traffic is running with Traffic management enabled. (10229655)
- BECN now reduces the CIR when traffic reaches the congestion point. (1022851)
- When rate enforcement and line efficiency are enabled, the Passport 4400 is now setting the DE bit on out bound frames that exceed the CIR. (60083690)
- IP filtering no longer degrades system performance. (60087520)
- IP multihoming is now supported. (50123016)
- IP supernetting now correctly functions. (50123020)
- The CLI can now be accessed even if all IP addresses have been deleted. (60072134)
- GCM, PANL, LMI, Bridging and Frame Relay traps are now all operational. (10211496, 10213016, 10212589, 10222553, 10225434, 60021334)
- Show system hardware command now displays correct information. (60087137)

Known Open Issues

The following known problems exist in Passport 4400 Release 3.1.x. This list in no way illustrates all outstanding known issues. Each outstanding issue is under consideration for a software fix in a future release.

The numbers enclosed in parenthesis (nnnnnnn) are internal tracking numbers.

Install Tool

- **Issue:** Install Tool expects all phone numbers in the network to be the same number of digits. Install Tool fills in the first entry of the Ingress Table with a set of “*” equal to the number of digits in the longest phone number entered, if the table is initially empty. If the Ingress Table already contains a value in table, Install Tool will not alter the table. This means that for network phone numbers shorter than the longest one entered on a particular unit, the Passport 4400’s ten-second time-out will take place before the digits are forwarded. (No SR number associated with this issue.)

Resolution: If this behavior is not desirable, you can use the CLI to manipulate the Ingress Table to the desired state. (Refer to the voice manuals).

System Software

Note that many of these open issues have been resolved in Release 4.0. These will not be fixed in future versions of 3.1.x due to architectural changes in the software.

- **Issue:** CLI presentation is incorrect:
 - set voice egressTable manipulationString
 - set voice egressTable phoneNumber
 - set voice ingressTable ingressNumber
 - set voice ingressTable ManipulationString
 - set voice nac cache egressString

The CLI currently shows 1-40 as the range of options. Actually only 1-36 are options. Do not use 37, 38, 39, or 40. This is fixed in Release 4.0. (60314486)
- **Issue:** Voice profile *maximum number forwarding digits* fail if you configure more than 36 digits (37-40). This is fixed in Release 4.0. (60314486)
- **Issue:** When 4400 BRI voice calls call 6400 MVP, fax background noise may sometimes cause voice circuits to go into fax mode. When the fax mode switches back to the voice mode, voice degradation can occur. (60318245)
- **Issue:** Meridian 1, Release 24 does not work with Passport 4400 BRI voice applications. (10284598)

Resolution: A Meridian patch is necessary to resolve this.
- **Issue:** The CLI command `sh ipx rip cir t` is always 0 for Tx Pkts for all ipx circuits. This is fixed in Release 4.0. (60090878)

- **Issue:** The command `sh sy card` displays an incorrect part number for the single port TVM. This is fixed in Release 4.0.
- **Issue:** The loopback feature for troubleshooting the ISDN BRI U interface is non-functional. This is fixed in Release 4.0. (60091331)
- **Issue:** When the 56K CSU tx Out of Frame service is invoked and the PANL status displays “Down,” the 56K link status displays “Operational” instead of showing an alarm condition. This is fixed in Release 4.0. (60089712)
- **Issue:** If your Passport 4400 unit is operating at 100 percent CPU utilization, you will see some degradation in IPX performance. Please consult the Passport 4400 Engineering Guidelines document (URL: <http://esweb2.us.nortel.com/imds?pg=/prod/passport4000&view=TechnicalTools>) to make sure you have configured your passport 4400(s) to operate properly in your network. This is fixed in Release 4.0. (60089850)
- **Issue:** E1 CSU set commands require the `save configuration update` and `system reset` commands before the parameter configuration takes effect. This is fixed in Release 4.0. (60090108)
- **Issue:** The CLI show presentations are not accurate when you request a show command after provisioning more than the `maxdlcsperline` configuration allows. This is fixed in Release 4.0. (60090355, 60090367)
- **Issue:** When provisioning an ISDN BRI WAN interface as a *leased line* backup from the Passport 4400 to the Passport 6400, the PANL protocol fails to establish a connection. This is fixed in Release 4.0. (60090368)
- **Issue:** The bandwidth utilization is displayed for only one primary port when the `show system statistics` command is used. This is fixed in Release 4.0 (60082859)
Resolution: For port 1 bandwidth utilization, use `sho wan stat`.
- **Issue:** 56K CSU/DSU is not supported in Release 3.x.
- **Issue:** CBR/HTDS Traffic Problems. When both CBR and HTDS services are running simultaneously, some performance and quality problems have been seen. Therefore, only one of these services should be configured at a time. This is fixed in Release 4.0. (60081383)

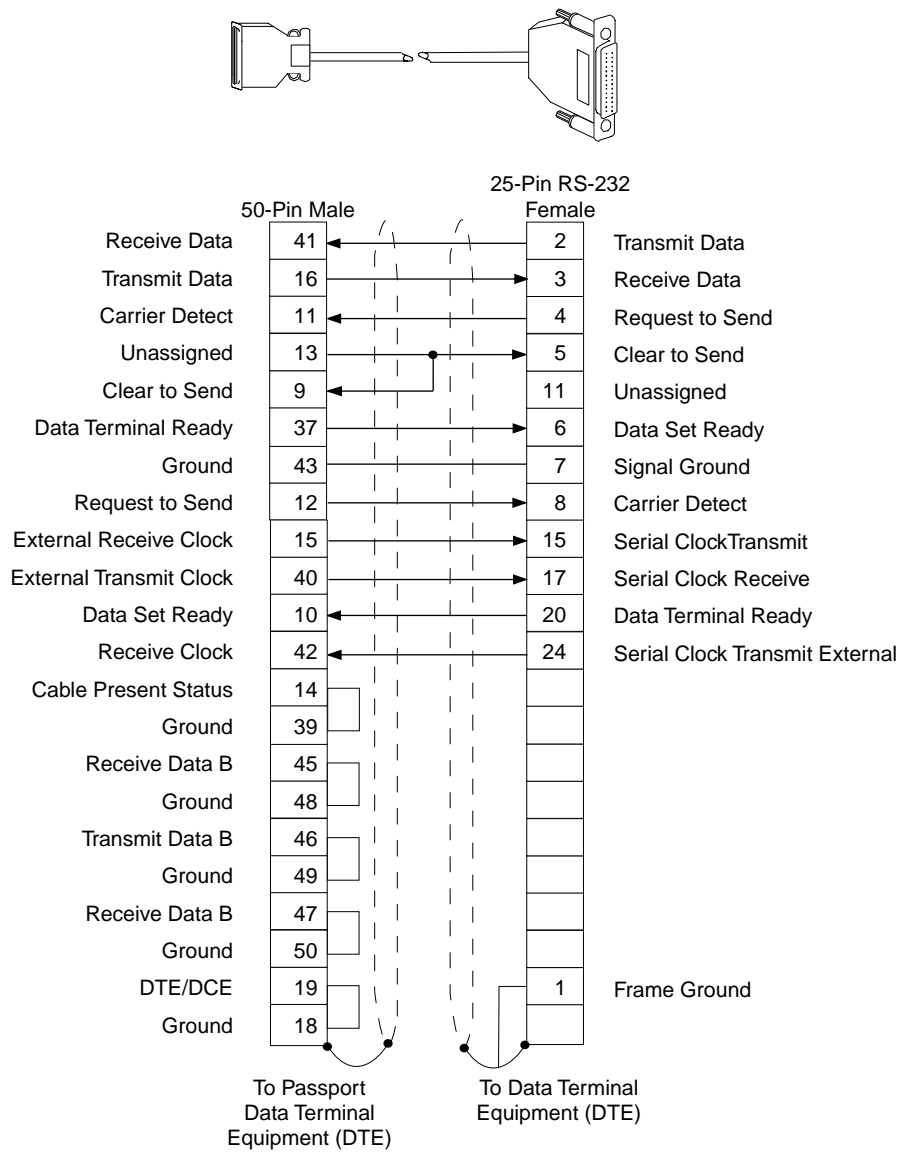


Figure 4-1. Cable NT0263AA - Passport 4400
(Part of SR 60097520)

Manual Updates 5

The following updates have been made to the Passport 4400 user manuals since the manuals went into production. Please make note of these updates in your copy of the specified manual.

LDM Manual (800-1961-20, Rev B)

This manual states that BTDS service is supported on the Passport 4400. In this case, BTDS refers to CBR. In the Passport 4400, BTDS is supported only as CBR. (10341441)

Hardware Installation Manual (800-1951-31, Rev A)

- The ISDN BRI Voice Module has been updated to the following:

Note: The new module requires R3.1.5 or later software.

The ISDN BRI Voice Module (IVM-BRI/ST/2 - NTAU76CA) provides the Passport 4400 unit with an ISDN interface for connection to an ISDN PBX, ISDN phone, or other ISDN protocol and provides external clocking capability.

Note: The NTAU76BA, the previous release of the module, did not provide the BRI clock sync module for external clocking.

Attention:

The ISDN BRI Voice Module will not operate with the Passport 4455. It is used only with the Passport 4430 and Passport 4450.

The NTAU76C requires Ethernet Base Module NTAU01CA or later.

The BRI module connects to the trunk side of an ISDN PBX, serving as one half of an ISDN tie trunk that connects two ISDN PBXs.

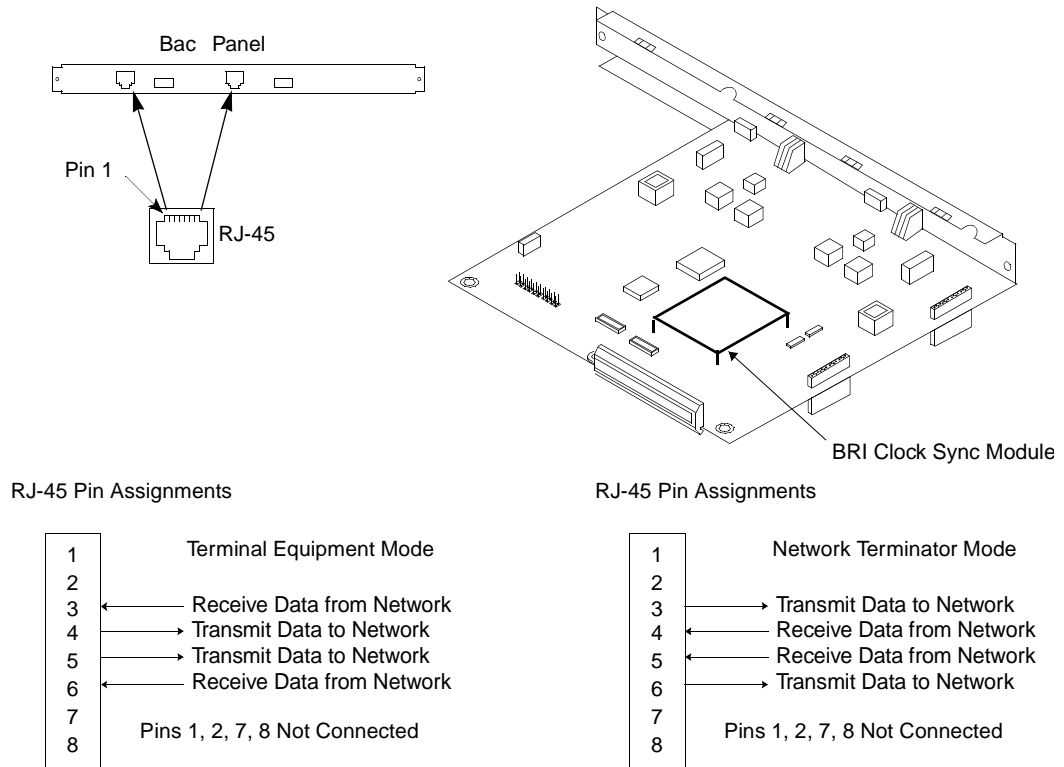


Figure 4-1. ISDN BRI Voice Module (S/T) and Pin Assignments

To ensure that your unit is equipped with the External Synchronization feature, check the part number tag on the face plate of the Ethernet Base Module. All units shipped from the factory after January 2000 to non-North American locations will have this modification. The tag should read NTAU01CA Revision level 05 (or higher). If there is any doubt about the unit you have, contact Nortel Networks Customer Service and refer to ECO E400399. They will let you know if the revision level of your unit includes the necessary features.

Note: If this module is installed in a unit that does not have a wiring change, it will revert to its internal clock and otherwise perform all other functions.

- **Page 5-14:** The Hardware Manual shows the DVEM Power Harness. Please note that this is for 5-slot units only, it is not for the Passport 4430. (60102174)
- **Page 1-15:** The table contained in the second bullet item under “User’s Responsibility” in the **Digital Voice Modules** section, should be replaced with the following table.

Engineering Code	Number used for Agency	Description
NTAY99AA	5000TAM/1E	T1 Voice Module (TVM/1)
NTAY14AA	5000TAM/2	T1 Voice Module (TVM/2)
NTAY15AA	5000EAM/1E	E1 Voice Module (EVM/1)
NTAY16AA	5000EAM/2	E1 Voice Module (EVM/2)
NTAY18AA (requires DVEM Power Cable Harness NTAU32AA)	5000DVEM/12	Digital Voice Expansion Module - 12 Channels (DVEM/12 for TVM/EVM)
NTAU60AA	5000DVM/1	DVM/1 - Single Channel Digital Voice SIMM Module
NTBQ54AA	5000DVM/6	DVM/6 - 6 Single Channel Digital Voice SIMM Modules
NTBQ55AA	5000DVM/12	DVM/12 - 12 Single Channel Digital Voice SIMM Modules

- **Page 1-16:** The table contained in the second bullet item under “User’s Responsibility” in the **Analog Voice Modules (AVM, UAVM)** section, should be replaced with the following table.

Engineering Code	Name for Agency (EU)	Description (see note) (for EU only)
NTAU61AA	5000CVM/1	AVM/1 - Analog Voice Module, single channel
NTAU62AA	5000CVM/2	AVM/2 - Analog Voice Module, dual channel (CVM)
NTAU50AA	5000UVM	UAVM/2 - Universal Analog Voice Module (TUVM)
NTLN23AA	5000V/XOL	VIM/FXO - Voice Interface Module for FXO. Approved for Spain, Sweden, Switzerland, Netherlands, France, U.K. and Germany.
NTAY09AA	5000V/EM+	VIM/E&M - Voice Interface Module for E&M
NTAY12AA	5000V/XSL	VIM/FXS - Voice Interface Module for FXS

- **Page 8-2:** Replace Table 8-1, “Description of Ethernet Base Module Indicators,” with the following.

Protocol	Indicator	Color	Meaning
All	CP	Flashing green	Application is operational
All	CC	Green	Reserved
All	F3	Green	Reserved
All	F4	Green	Reserved
Switching and Standard Frame Relay Only	P1, P2, P3 (representing Ports 1, 2, and 3)	Off	Interface not present
		Amber	Physical connection exists however PVC LMI is not operational
		Green	PVC LMI is operational
		Red	Physical connection is lost, PVC LMI is not operational
HTDS and CBR Only	P1, P2, P3 (representing Ports 1, 2, and 3)	Off	Interface not active
		Amber	No physical connection
		Green	Application operational
		Red	Not used

- **Pages 9-5 and 9-6:** Replace Tables 9-1, 9-2, and 9-3 with the following:

Table 9-1. Configuring the Power Supplies

For Units Containing...	4400 with Standard Power Supply	4400 with Redundant Power Supply	AC Units...	DC Units...
1-3 Modules including the base module	Unplug the AC/DC input connector of the top power supply	Unplug AC/DC input connectors of the top two power supplies	Position jumper J12 according to Table 9-2	Position jumper J12 according to Table 9-3
4-5 Modules including the base module	Plug in all four AC/DC input connectors of the power supplies	Plug in all five AC/DC input connectors of the power supplies		

Table 9-2. Passport 4400 jumper 12 strapping for AC units

Passport 4400 model and configuration	Jumper Positions (J-12)							
	1	2	3	4	5	6	7	8
5-slot standard, AC, 1 to 3 modules		X	X	X	X	X	X	X
5-slot standard, AC, 4 to 5 modules		X	X	X	X	X	X	
5-slot redundant, AC, 1 to 3 modules	X	X	X	X	X	X	X	X
5-slot redundant, AC, 4 to 5 modules	X	X	X	X	X	X		

Table 9-3. Passport 4400 jumper 12 strapping for DC units

Passport 4400 model and configuration	Jumper Positions (J-12)							
	1	2	3	4	5	6	7	8
5-slot standard, DC, 1 to 3 modules		X	X	X		X	X	X
5-slot standard, DC, 4 to 5 modules		X	X	X		X	X	
5-slot redundant, DC, 1 to 3 modules	X	X	X	X		X	X	X
5-slot redundant, DC, 4 to 5 modules	X	X	X	X		X		

- **Page 5-3: should read** “Use an RJ48C Cable (typically a modular STRAIGHT cable) to connect the DSX-1 port to your local equipment: (600096453)
- **Page A-1:** In Table A-1, “Cable Selection for Ethernet Base Module and Data Modules,” there should be a note to indicate that while the V.35 cables listed are 15 ft., if higher speed services (greater than 192 Kb/s), are being run, the cable length should not exceed three (3) meters to conform to ITU V.35 specifications.
- **Page 3-4,** provides the necessary information for building a cable to connect to the management port. It is recommended that you use NTAU17AA, the 6-foot cable provided with your unit. The description on page A-3 shows the pin assignments for NTAU17AA. If you build a cable, remember that RS-232 cables should not ever exceed 50 feet. (60314494)
- **New Cables** NTAU17AA new pin assignments and new Management cable NT0227AA.
- **Replace Chapter 9,** Power Supplies with the new Chapter 9 (following this section). (30120081)

Operator's Manual (800-1952-31, Rev A)

- **Page 7-2:** The note should read as follows:
 - Note:** The choice of transfer modes **does not** apply to CBR. CBR collects data for a period of few milli-seconds and then transfers the collected data.
- DS0 Connects
 - When configuring the DS0 connection parameters for the E1 CSU, take into account the following information: (60106430)

DS0 Connection Parameters for E1 CSU

DS0 Connection Parameter	Actual Frame Time Slots Used by the System...
1-15	1-15
16-30	17-31
Note: Time Slot 16 cannot be used as a B channel to carry data. You must ensure you service provider does not use this channel.	

- The channel numbers must be entered individually, separated by commas. For Example: 1,2,3,4,5,6,7,8,9 is correct while 1-9 is incorrect. (60088902)
- When configuring the unit for CBR, the minimum (lowest) rate supported is 600. The manual states you can configure 300, but it is in error. (60082857)
- Note that the status of the Virtual Port is always **UP** when at least one virtual port is defined. The information in the manual is incorrect. (60077329)
- **Page 2-6:** In the section “Network Limits,” the maximum number of PANL DTEs per Passport 4400 should be 1. (60088713)
- **Page 2-11:** For the msm dtelink options dceReceiverBW and dteReceiverBW, the rate should be set to either the WAN link baud rate, if the WAN link baud rate is set to the default and there is only one frame relay tunnel link configured, *or*, if the WAN baud rate is other than the default or there is more than one frame relay tunnel link configured, these options should be set to the CIR of the frame relay tunnel DLCI. (60087369)
- **Page 5-9:** Step 7 of the IP Routing Configuration procedure should make it clear that Inverse ARP should only be set for the unit receiving calls. Also, Step 8 of the same procedure should say to enable Basic Routing for Inverse ARP, NOT Easyrouting. (60087508)
- **Page 8-2:** The section titled “RFC 1490 Traffic” erroneously states that RFC 1490 traffic is not subject to Passport 4400 traffic management controls. While it is true that RFC 1490 traffic is not fragmented via the PANL protocol, it is queued as LAN traffic (TP 0-2), and subject to Passport 4400 traffic management rules for WAN link transmission.

- **Page 8-4:** The BECN Response section should include the following statement: Traffic management **rate enforcement** must be set to *enable* in order for the Passport 4400 to respond to BECN bits.
- **Page 6-5,** part of step 4 in the table under Option *maxRxFrameSize* add the following information: If you are configuring more than 8 PANL links, you need to change the Framesize to 100 bytes. This reduces the possibility of running out of memory. (60318680)
- When RIP learns a route from another router, it tries to update the IP routing table. If there is already a static route, this takes precedence and the new RIP route is not added to the IP routing table. If this static route is then deleted, there is no mechanism to tell RIP that the static route has been deleted and that it should add the new route to the IP. To add the new route to the IP table you must reset the unit. (50123019)
- The command **def wan p txQueueSize** has a range of 5-255. The manual says the range is 10-255, this is incorrect. (60089533)
- The Operator's manual and CLI Reference manual document the *X25* and *sna-sdlc* options of the **add fr sw map command**. These options are not supported in Release 3.1.x software. They will be supported in a future release. (60089535, 60089537)
- To delete a MacFilter, use the following command: **set bridge macfilter type <ifindex> <filternumber> <macfiltertype>**. You *must* specify the <macfiltertype> as *invalid*. (60096456)
- Chapter 8 Traffic Management of Operators Manual contains incorrect information about RFC 1490 traffic and an incorrect diagram. Please replace pages 8-1 and 8-2 with a new 8-1 and 8-2 which follow this section. (60089601)
- In the Operators Manual and CLI Reference documentation of the **def isdn phy sig prot 2** command, the following protocols are listed but currently are not supported: *dss1*, *vn2*, *vn3*, and *Itr6*. (60089598, 60089814)
- The CLI procedures for modifying GCM switching timer status should now read: (60002260)

The number of minutes of delay, once the primary network has failed, before the backup netlink is activated and the primary netlink deactivated. This setting applies to VoiceSwitch, FastSwitch and BackupManualSwitch. *If using PrimarySwitch Delay, notify your service provider that the layer 1 activation mode of the ISDN network must be set to "always on." This prevents the ISDN network from deactivating layer 1 while the PrimarySwitchDelay timer is running.*

- **Page A-6:** Update the text and table under Voice Traps. The reference to the Analog Users Manual is an error. Please remove this reference.

Name	CLI Variable	Description
mcmVNETNoBVMCodeImage	mcmSysAsciiTimeofDay	Indicates the Passport 4400 built image does not contain BVM code.
mcmVNETBVMLostSignalLevel	mcmSysAsciiTimeofDay mcmVNETChCfgLimID	Indicates a physical connection problem between BVM and PBX. Check the physical connection between BVM and PBX.
mcmVNETBVMLostSignalLevelRestored	mcmSysAsciiTimeofDay mcmVNETChCfgLimID	Indicates recovery from a physical connection problem between BVM and PBX.
mcmVNETBVMLostFramingUpstream	mcmSysAsciiTimeofDay mcmVNETChCfgLimID	Indicates a synchronization problem between BVM and PBX. Check the configuration of the PBX and the physical connection.
mcmVNETBVMLostFramingUpstreamRestored	mcmSysAsciiTimeofDay mcmVNETChCfgLimID	Indicates recovery from a synchronization problem between BVM and PBX.

Key:
VNET = Voice Network
BVM = ISDN BRI Voice Module

Note: In the table, if no specific voice module is referenced, the trap applies to all voice modules (including the ISDN BRI Voice Module).

- **Page 7-8:** The following section should be added for configuration of HTDS or CBR service at speeds higher than 64K:

Configuring HTDS or CBR for Baud Rates Higher Than 64K

To configure the Passport 4400 for HTDS or CBR running at a baud rate higher than 64K, a number of other procedures should be followed in addition to those described in the previous section, “Configuring HTDS or CBR for Baud Rates Higher Than 64K” (of the Operator’s Manual). The following procedures ensure the baud rate and throughput values for the WAN link and SVCs are large enough to support the higher speed HTDS or CBR services.

Note: The following tasks must be performed on each Passport 4400 unit that is to support an attached device.

1. Determine the baud rate on the physical WAN port.

```
show wan parameter port operational entry 153
```

```
IfIndex           : 153
IfType            : v35
Mode              : dte
BaudRate          : 1544000
MaxRxFrameSize   : 4000
NumOfRxBuffers    : 200
RxQueueSize      : 20
TxQueueSize      : 10
ProtocolSupport   : switchingFr
HTDSCutThrough   : no
IdleChar          : 255
SyncChar          : 126
EncodeMethod      : nrz
```

The BaudRate parameter is the maximum limit for all traffic going through the physical link. This parameter must be set to a higher speed than the total throughput of all SVCs running through that physical link.

2. Determine the configured bandwidth on the netlink.

```
show msm dtelink operational entry
```

```
IfIndex           : 149
MaxSubChannelRange : 63
DTEReceiverBW     : 1544000
DCEReceiverBW     : 1544000
DTEMaxFrameSize   : 80
DCEMaxFrameSize   : 80
```

The DTEReceiverBW and DCEReceiverBW parameters are the configured bandwidth on the netlink for both the PANL DTE and PANL DCE side. These should be configured to be greater than the total throughput of all SVCs running through that netlink.

3. Determine the throughput of the SVCs on the netlink.

```
show framerelay switch svc circuit table
```

```
SVCIfIndex      : 149
SVCDLCI        : 17
Type           : switched
DNA            : "[x121]302181147671325"
NegMaxTxSize   : 1600
NegMaxRxSize   : 1600
NegTxThroughput : 1511000
NegRxThroughput : 1511000
NegTxBurstSize : 63872
NegRxBurstSize : 63872
```

The NegTxThroughput and NegRxThroughput parameters should not be configured for less than the baud rate on the HTDS/CBR port. If need be, use the following commands to increase these parameters.

To set the default throughput values for all SVCs on the netlink:

```
define FrameRelay line user basesvclmi maxtxthroughput
define FrameRelay line user basesvclmi maxrxthroughput
```

To set the default throughput values for a specific SVC on the netlink:

```
define framerelay switch svc rxthroughput
define framerelay switch svc txthroughput
```

CLI Reference For the Command Line Interface (800-1950-31, Rev A)

- **Pages 3-19 and 3-20:** Replace the information on these pages for the CLI command `define ip` with the following pages:

Defines IP parameters and objects.

- base
- bootp
- invArp

define ip base parameters

Parameter	Default	Description
bcastAddress	255.255.255.255	The value of the IP address used to send broadcasts on this IP interface.
dataLinkType	ether	Select either frame relay or ethernet.
forwardBcast	off	Specify whether IP address forwarding is on or off.
ipNumbered	numbered	Parameter not supported.
keepAlive	on	This value determines if keep alive's are sent over this interface.
mtu	octets	For interfaces that are used for transmitting datagrams, this is the size of the largest network datagram that can be sent on the interface.
netMask	255.0.0.0	The subnet mask associated with the IP address of this entry. The value of the mask is an IP address with all the network bits set to 1 and all the host bits set to 0.
ripCompatibility	rip1	This value indicates the Routing Internet Protocol (RIP) version. rip1 indicates only RIP version 1 packets are broadcasted. rip1Compatible indicates RIP version 1 packets are broadcast, but both RIP version 1 and RIP version 1 packets are understood. rip2 indicates RIP version 2 packets are multicast.
routeProtocolType	disable	Enter rip, passive rip or disable.

define ip base rip

Define base rip as on or off. Default value is off.

define ip base ripCompatibility

Indicates the version of the routing internet protocol.

Parameter	Description
rip1	Only RIP version 1 packets are broadcast.
rip1Compatible	Indicates RIP version 1 packets are broadcast, but both RIP version 1 and RIP version 2 packets are understood.
rip2	Indicates RIP version 2 packets are multicast

define ip bootp

Parameter	Description
numberOfHops	Indicates the number of hops a Bootp packet is allowed to make.
relayBootpPkts	Determines if the access device will relay Bootp packets.
serverAddress	Indicates the IP address to which Bootp relay agent will relay Bootp requests.

define ip invArp

Parameter	Description
ifIndex	Define the ifIndex associated with this circuit.
protocol	Define as the IP protocol.
status	Sets inverse arp as enabled or disabled. If this is set to enabled, it means a station is allowed to request the IP address corresponding to a given physical address. The default value is disabled.

All Voice Manuals

- When configuring the egress table manipulation string, there is now another symbol you can use. Some PBX units require the hash symbol (#). Use the “h” key to insert the hash character (#). Note that the pound symbol (#) on the keyboard is used for a different function. Do not use that for the hash symbol. (60324287)
- The Passport 4400 Release 3.1 voice module manuals each contain references to configuring modem settings which are in error. The Passport 4400, up through Release 3.1.1, does not currently support modem configuration. The following list specifies which page(s) in each Passport 4400 voice manual contains the erroneous modem configuration information (30113669):
 - **Passport 4400 ISDN BRI Manual (800-1942-31, Rev A):** Pages 4-14, 4-17, 5-2, and 5-4.
 - **Passport 4400 Analog Voice Modules Manual (800-1943-31, Rev A):** Pages 3-23, 3-28, 4-4, and 4-6.
 - **Passport 4400 T1/E1 & Digital Voice Modules Manual (800-1944-31, Rev A):** Pages 5-27, 5-30, 6-2, and 6-4.
- The Passport 4400 DTMF detect/regenerate is only available for fixed length. Both sides (Passport 6000 MVP and Passport 4400) **must** be set the same way (such as DTMF detector enable and in fixed length). (10255133)
- Please note that the maximum number of forwarding digits is 36, not 40 as stated in the voice manuals. (60093752)
- When configuring RSI, the default delay time may be too short for some networks. Under heavy data traffic, FXS to FXS remote calls fail on the ISDN backup line with the minimum value of 5 for resRecTimeOut. Increase the value to a maximum of 30 in these instances. (60095381)

Analog Voice Manual (800-1943-31, Rev. A)

- On **Page 3-37**, under configuration at the Master End, please preface item 2 (Enter ingress index 1 as...) with the following information: (60102653)
 - Each Hoot N Holler channel must be a unique switchingProfile number.
 - Each switchingProfile number must have a VNCS (or NAS) pointer.
- On **Page 3-20** of Disconnect Supervision, the information should now read as follows: (60106156)
 - The *discSupervision* subcommand is used to select the method used to detect when the telephone equipment attached to a voice port goes from an off-hook (active) to an on-hook (idle) state. You have the following two options:
 - *Power Interrupt* – the voice channel monitors Tip and Ring for the absence of the loop current for 600 ms or longer. *Note that the attached PBX must be capable of supporting this setting as described.*
 - *Tone* – if the attached PBX or CO cannot supply a power interrupt signal, the voice channel looks for a call progress tone of 600 Hz or less. *Only FXO to FXS applications are supported with this setting.*
- On **Pages 5-4 and 6-5**, please add the following note: (60101361)
 - Note:** When adding a voice server, verify the proper address server is selected in Voice Switching Profile Options.
- On **page 3-24**, the information should appear as shown below: (60104781)

Format (Regeneration)

The format subcommand is used to allow the voice channel to match the outgoing dialing digits with that of the interfacing PBX. The following options are available:

- Dial Pulse - used for call set up when the interfacing PBX requires that the incoming dialing digits be in a dial pulse format. Once the voice path is established, the DTMF to pulse conversion will not take place. Pulse will be regenerated as pulse, and DTMF will be regenerated as DTMF (if DTMF Tone Detection is turned on at both ends of the call).
- DTMF - used when the interfacing PBX requires that the incoming dialing digits be in a DTMF format.

ISDN BRI Manual (800-1942-31, Rev A)

- To configure Overlap Dialing for BRI Voice applications the following settings should be used (note: you must substitute numbers appropriate for your system):

If the following is true

```
Originate-PBX    --4400  ---FR---4400--PBX--Answer
X1111           x3333      x4444
```

then the following should be configured:

```
Ingress =      Egress Phone = Egress Manipulation = VNCS =3333?
"3333*"        "3333*#"        "D4#"
```

- When configuring an ISDN BRI module, a manipulation string (#) *must* be defined in the egress table in order for the digits to be forwarded from the ISDN BRI voice module to the locally attached PBX. If the manipulation string field is left blank, no dial digits will be forwarded to the PBX connected to the voice channel. (10283752)
- Note that the input level is not supported on BRI voice channels, even though it displays as an option. (60086828)
- On Pages 8-4 and 8-5**, please add the following note: (60101361)
 - Note:** When adding a voice server, verify the proper address server is selected in Voice Switching Profile Options.

- On page 4-15, the information should appear as shown below: (60104781)

Format (Regeneration)

The format subcommand is used to allow the voice/fax channel to match the format of the outgoing dialing digits with that of the interfacing PBX. The following options are available:

- Dial Pulse - used for call set up when the interfacing PBX requires that the incoming dialing digits be in a dial pulse format. Once the voice path is established, the DTMF to pulse conversion will not take place. Pulse will be regenerated as pulse, and DTMF will be regenerated as DTMF (if DTMF Tone Detection is turned on at both ends of the call).
- DTMF - used when the interfacing PBX requires that the incoming dialing digits be in a DTMF format.

Passport 4400 T1/E1 Digital Voice Modules Manual (800-1944-31, Rev. A) Changed Information

- On page A-3, there is mention of the DVEM power harness. Please note that this harness is intended for 5-slot units only. It does not apply to the Passport 4430. (60103174)
- On page 7-4 and 7-5, please add the following note: (60101361)
Note: When adding a voice server, verify the proper address server is selected in Voice Switching Profile Options.
- On page 5-28, the information should appear as shown below: (60104781)

Format (Regeneration)

The format subcommand is used to allow the voice channel to match the outgoing dialing digits with that of the interfacing PBX. The following options are available:

- Dial Pulse - used for call set up when the interfacing PBX requires that the incoming dialing digits be in a dial pulse format. Once the voice path is established, the DTMF to pulse conversion will not take place. Pulse will be regenerated as pulse, and DTMF will be regenerated as DTMF (if DTMF Tone Detection is turned on at both ends of the call).
- DTMF - used when the interfacing PBX requires that the incoming dialing digits be in a DTMF format.

Note: To perform any of the procedures described in this chapter, the T1 or E1 Voice Module, and any Digital Voice Modules (DVMs) or Digital Voice Expansion Modules (DVEMs), must be installed in the Passport 4400 chassis and physically connected. For information about installing T1 or E1 Voice Modules and any of their components, see the Passport 4400 Hardware Installation Manual, 800-1951-31.

- **Page 5-4.** The typical ingress table was in error. It should look as follows: (60106553)

Index	Ingress Number	Manipulation String	Number Transmitted
1	1234567	D3****	4567
2	12345678	D3#	45678
3	25	1234567	251234567
4	1234567	***D2#	12367

- **Page 5-31,** Background Noise Level, add the following explanation: (60101028)

Setting the parameter to -25 dBm allows for voice signals to be sent. The background noise must be above the -25 dBm level to be sent as voice frames speech. Otherwise the background regeneration feature takes over. A problem may occur in some noisy environments where the background regeneration may cut in and out, thus creating voice artifacts which may be interpreted as voice degradation. To avoid this situation, change the level background noise to -45 dBm. The DSP will sense the very weak background noise and send it as voice information, thus eliminating the voice artifacts. Each environment has different noise levels; the voice artifact can be eliminated by selecting a more negative value (towards -45).

- Chapter 3 of the Passport 4400 T1/E1 Digital Voice Modules Manual (800-1944-31, Rev. A) should be replaced with the following, which incorporates multi-DS0 channel configuration.

This chapter describes the procedures used to configure and connect the T1 and E1 Voice Modules. It includes information about the following topics:

- Using the Command Line Interface (CLI) to enter commands.
- Configuring the T1/E1 Voice Modules to meet the requirements of your network.
- Interconnecting the DSX-1/L1 line and DS-1/L2 line with the voice modules and with the Ethernet Base Module (EBM) ports.

Command Line Interface Overview

The Command Line interface is used to configure, provision and monitor Passport 4400 units. With the proper security authorization, you can use the CLI to access any of the units in your network. Once you have accessed a unit, you can examine the modules in each slot, select the T1 or E1 card, and monitor or update its settings.

To access the Command Line Interface, please refer to the instructions in the *Passport 4400 Operator's Manual*, 800-1952.

Using the Command Line Interface

The following points will assist you when using the CLI:

- Use the *ENTER* key to complete each command line entry.
- If you do not know the parameters to complete a command, use the *ENTER* key, and the CLI will respond with the next level of options for that command. If you use the *ENTER* key at the CLI> command line, the Passport 4400 unit will respond with a list of all major commands.
- You can enter abbreviated command names; however, you must enter enough characters to uniquely define the command. For instance, the Passport 4400 will not recognize **s**, because the command could be save, set, or show. When you enter **sh**, the Passport 4400 will recognize the command for show and respond with the next level of options.

Logging into the CLI

After connecting a PC or a terminal to the management port on the Passport 4400 base module, use the procedure listed below to log into the CLI.

Logging into and out of the CLI

Press the *ENTER* key several times until you receive the following prompt:

login:

1. At the login prompt, enter:

cli

The Passport 4400 unit will then prompt you for a password. Once you have entered the appropriate password, the Passport 4400 unit will respond with the following message:

```
Welcome to the Passport 4400Series Command Line Interface
Nortel/MICOM Communications Corporation
CLI>
```

Once you receive the CLI> prompt, you can enter the commands used to configure and connect the T1 or E1 voice modules.

2. To exit the CLI utility, type:

I (for logout)

Configuring the T1 or E1 Line

The T1 or E1 line configuration consists of five parts:

- Profile configuration
- Line parameters configuration
- Profile assignment (to a line)
- Data port configuration
- System clock configuration

Note: All commands involving the DSX-1 or L2 line are applicable, respectively, only to the dual-port T1 or E1 voice modules.

Profile Configuration

To configure the T1/E1 line parameters, you must first create two profiles: one for the local end (DSX-1/L1) and one for the network end (DS-1/L2), if applicable. Each profile includes a set of parameters that uniquely matches either the local T1/E1 line, or the network T1/E1 line. Once the two profiles have been created, you assign them to the applicable T1/E1 line. Assigning a profile to a line involves the *CLI> set t1e1 lineParameters* command.

Note: It is assumed that profile 1 will be used for DSX-1/L1 (local end) and profile 2 for DS-1/L2 (network end).

T1 Line Parameters

The configurable T1 line parameters are:

- T1 BuildOut
- T1 Frame Format
- T1 Line Code
- T1 Loopback Status
- Idle Code

Each command is described below.

Note: Changes made using these commands take effect immediately; a system reset is not required. However, to retain the changes, save the configuration before the system reset.

T1BuildOut

Use the *t1BuildOut* command to configure the T1 DSX-1 interface line length, the cable length attached to a local T1 line. Values include: less than 110 ft., less than 220 ft., less than 330 ft., less than 440 ft., less than 550 ft., less than 660 ft., greater than 665 ft., and external line build out (LBO).

Using the t1BuildOut command

1. Configure the DSX-1 (local end) t1BuildOut by entering the following command:

```
CLI> set t1e1 profile t1BuildOut
```

Parameter	Range of Values	Required Action
<Profile>	INTEGER (1..2)	Select 1 (for DSX-1).
<T1BuildOut>	lessThan110feet lessThan220feet lessThan330feet lessThan440feet externalLBO greaterThan665feet lessThan550feet lessThan660feet	Select the appropriate line length for the DSX-1 (local end) connection. * The DS-1 (network end) line length selection is implemented by a set of DIP switches as detailed in Chapter 1. Default is <i>lessThan110feet</i> .

2. As detailed in Chapter 1, configure the DS-1 line length, using the set of dip switches.

T1FrameFormat

Use the *t1FrameFormat* command to configure the profile for either superframe (D4), or extended superframe (ESF). The superframe format consists of 12 frames, and extended superframe consists of 24 frames.

Using the t1FrameFormat command

1. Configure the DSX-1 (local end) t1FrameFormat by entering the following command:

```
CLI> set t1e1 profile t1FrameFormat
```

Parameter	Range of Values	Required Action
<Profile>	INTEGER (1..2)	Select 1 (for DSX-1).
<T1FrameFormat>	superFrame(D4) extendedSuperFrame (ESF)	Select the frame format appropriate to your interface. Default is <i>superframe (D4)</i> .

2. Repeat step 1 and configure the t1FrameFormat for DS-1 (profile value = 2).

T1 LineCode

Use the *t1LineCode* command to select either of the following line coding format settings:

- B8ZS (Bipolar Eight Zeros Substitution) is a method of zero suppression where a succession of 8 zeros is replaced with a B8ZS code. At the remote end the B8ZS code is recognized and replaced with an all zeros byte. B8ZS format can be enabled only when supported by the connecting equipment or the T1 service provider.
- AMI (Alternate Mark Inversion), which indicates that B8ZS suppression is disabled. When AMI is selected, you must ensure that the Data Terminal Equipment is generating at least one 1 in every four bits.

Using the t1LineCode command

1. Configure the DSX-1 (local end) t1LineCode by entering the following command:

```
CLI> set t1e1 profile t1LineCode
```

Parameter	Range of Values	Required Action
<Profile>	: INTEGER (1..2)	Select 1 (for DSX-1).
<T1LineCode>	: ami b8zs	Enter <i>ami</i> or <i>b8zs</i> . Default is <i>ami</i> .

2. Repeat Step 1 and configure the t1LineCode for DS-1 (profile value =2).

T1LoopbackStatus

Use the *T1LoopbackStatus* command to enable or disable T1 line network-invoked loopback tests. When enabled, the T1 Voice Module recognizes and responds to network-invoked loopback commands. When disabled, the T1 Voice Module will not respond to network-invoked loopback commands.

Using the T1LoopbackStatus command

1. Enable or disable the DSX-1 (local end) T1LoopbackStatus by entering the following command:

```
CLI> set t1e1 profile t1LoopbackStatus
```

Parameter	Range of Values	Required Action
<Profile>	INTEGER (1..2)	Select 1 (for DSX-1).
<T1LoopbackStatus>	disable enable	Select <i>enable</i> or <i>disable</i> , as appropriate for your interface. Default is <i>disable</i> .

- Repeat step 1 and configure the T1LoopbackStatus for DS-1 (profile value = 2).

IdleCode

Use the *idleCode* command to set the idle code for the DS0 channels. It specifies the code to be filled in the line when the line is idle. Values can range from 0 to 255.

Using the idleCode command

- Configure the DSX-1 (local end) idleCode by entering the following command:

```
CLI> set t1e1 profile idleCode
```

Parameter	Range of Values	Required Action
<Profile>	INTEGER (1..2)	Select 1 (for DSX-1).
<IdleCode>	INTEGER (0..255)	Select a value between 0 and 255. The default value is 127 (0X7F). You may enter it in either decimal form (NNN), or hexadecimal form (0XNN).

- Repeat step 1 and configure the idle code for DS-1 (profile value = 2).

E1 Line Parameters

The configurable E1 line parameters are:

- E1 CRC4 Status
- E1 Line Code
- E1 TS16 Connection
- Idle Code

Each command is described below.

Note: Changes made using these commands take effect immediately; a system reset is not required. However, to retain the changes, save the configuration before the system reset.

E1CRC4 Status

Use the *e1CRC4Status* command to enable or disable the CRC-4 Cyclic Redundancy Check feature. When enabled, the E1 Voice Module generates and monitors for the CRC algorithm carried on bit 1 of Time Slot 0 of an E1 frame.

Using the e1CRC4Status command

1. Enable or disable the L1 (local end) e1CRC4Status by entering the following command:

```
CLI> set t1e1 profile e1CRC4Status
```

Parameter	Range of Values	Required Action
<Profile>	INTEGER (1..2)	Select 1 (for L1).
<E1CRC4Status>	disable enable	Select <i>enable</i> or <i>disable</i> , as appropriate for your interface. Default is <i>disable</i> .

2. Repeat step 1 and configure the e1CRC4Status for L2 (profile value = 2).

E1LineCode

Use the *e1LineCode* command to select either of the following line code settings:

- *HDB3* (High Density Bipolar 3), an ITU-TSS-recommended coding method which limits the maximum number of consecutive zeros to three.
- *AMI*, which indicates that HDB3 suppression is disabled. When AMI is selected, you must ensure that the Data Terminal Equipment is generating at least one 1 in every four bits.

Using the e1LineCode command

1. Configure the L1 (local end) e1LineCode by entering the following command:

```
CLI> set t1e1 profile e1LineCode
```

Parameter	Range of Values	Required Action
<Profile>	INTEGER (1..2)	Select 1 (for L1).
<E1LineCode>	ami hDB3	Select either <i>ami</i> or <i>hDB3</i> , as appropriate for your interface. Default is <i>ami</i> .

2. Repeat step 1 and configure the e1LineCode for L2 (profile value = 2).

E1 TS16 Connection

Use the *e1TS16Connection* command to specify the signaling system to be used in time slot 16. The following options are available:

- *toCAS*, which supports G.704 channel associated signaling (CAS). In this method, a multiframe structure of 16 consecutive frames numbered 0 through 15 is used. In each frame, time slot 16 allocates four bits to two channels in the following pattern: Frame 0 = multiframe alignment; Frame 1 = ABCD of Ch 1 and ABCD of Ch 17; Frame 2 = ABCD of Ch 2 and ABCD of Ch 18; etc., up to Frame 15.
- *idle*, places time slot 16 into an idle state.
- *bypass*, bypasses time slot 16 of L1 to time slot 16 of L2.
- *toDataPort1*, connects time slot 16 to DataPort 1.
- *toDataPort2*, connects time slot 16 to DataPort 2.

Using the e1TS16Connection command

1. Configure the L1 (local end) e1TS16Connection by entering the following command:

```
CLI> set t1e1 profile e1TS16Connection
```

Parameter	Range of Values	Required Action
<Profile>	INTEGER (1..2)	Select 1 (for L1).
<T1LoopbackStatus>	toCAS idle bypass toDataPort1 toDataPort2	Select the option applicable to your system, as described above. The default is toCAS.

2. Repeat step 1 and configure the e1TS16Connection appropriate for L2 (profile value = 2).

Idle Code

Use the *idleCode* command to configure the idle code for the DS0 channels. It specifies the code to be filled in the line when the line is idle. Values can range from 0 to 255.

Using the idleCode command

1. Configure the L1 (local end) idleCode by entering the following command:

```
CLI> set t1e1 profile idleCode
```

Parameter	Range of Values	Required Action
<Profile>	INTEGER (1..2)	Select 1 (for L1).
<IdleCode>	INTEGER (0..255)	Select a value between 0 and 255. The default value is 127 (0X7F). You may enter it in either decimal form (NNN), or hexadecimal form (0XNN).

- Repeat step 1 and configure the `idleCode` for L2 (profile value = 2).

Assigning the T1/E1 Profile

The `lineParameters` subcommand is used to assign a previously configured T1/E1 profile to a T1/E1 line.

Command Structure

To access the T1/E1 Line Parameters command, follow this path:

```
CLI> set t1e1 lineParameters
```

Parameter	Range of Values	Required Action
<LineIndex>	localEnd (T1 =DSX-1/E1 =L1) networkEnd (T1=DS-1/E1=L2)	Select <i>localEnd</i> for the DSX-1/L1 line, and <i>networkEnd</i> for the DS1/L2 line.
<Profile>	INTEGER (1..2)	It is recommended that you select 1 for the DSX-1/L1 line, and 2 for the DS-1/L2 line

Configuring the Data Port

The configurable T1/E1 data port (data port 1 and data port 2) parameters are:

- Clock
- DTR Control
- Rate
- RTS Control

Note: Changes made with these commands take effect immediately; a system reset is not required. However, to retain these settings, save the configuration before resetting the Passport 4400.

Configure the data port clock parameter by entering the following command:

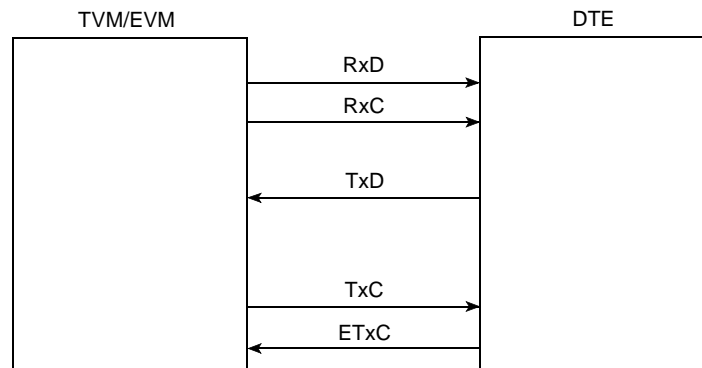
```
CLI> set t1e1 portParameters clock
```

Parameter	Range of Values	Required Action
<PortNumber>	port1 port2	Select the number of the data port you are configuring.
<Clock>	internallySupplied tailCircuit	Enter the required clock source: internallySupplied or tailCircuit. Default is <i>internallySupplied</i> . *Refer to the section on Data Port clocking for additional information.

Data Port Clocking

Each Data Port is implemented as a DCE interface, and supplies the attached DTE equipment with both TxC and RxC clocks.

When *internallySupplied* is selected, the attached DTE equipment samples the RxD signal from the TVM/EVM, based on the clock provided by the TVM/EVM. The attached DTE will clock transmit data (TxD) to the Data Port based on the TVM/EVM-provided transmit clock (TxC). The ETxC input to the Data Port is ignored.



When *tailCircuit* is selected, the attached DTE equipment samples Received Data (RxD) from the TVM/EVM, based on the TVM/EVM-provided Receive Clock (RxC). The attached DTE equipment must use either RxC or TxC to generate the local External Transmit Clock (ETxC). This clock is used by the DTE to clock transmit data (TxD) into the Data Port. ETxC from the attached DTE is provided as an input to the Data Port, and is required to be based on the TVM/EVM-provided clocking, with only short-term jitter and phase differences.

Default = *internallySupplied*.

DTR Control

Use the *dtrControl* command to indicate how the data terminal ready (DTR) signal is supplied. The following options are available:

- *Normal* - in which the DTR must be supplied by the DTE, and the data set ready (DSR) signal follows the DTR.
- *Forced on* - in which the DTR signal from the DTE is ignored, and the DSR is forced on.

Using the *dtrControl* command

Configure the method of the data port DTR control by entering:

```
CLI> set t1e1 portParameters dtrControl
```

Parameter	Range of Values	Required Action
<PortNumber>	port1 port2	Select the number of the data port you are configuring.
<DTRControl>	normal forcedOn	Select <i>normal</i> or <i>forcedOn</i> . Default is <i>normal</i> .

Rate

Use the *rate* command to set the base rate of the data port. The actual rate is determined by the selected base rate multiplied by the number of DS0 channels assigned for the connection to that port. For example, if the rate is set to 56 Kb/s, and the number of connected DS0 channels is 2, the actual rate is 112 Kb/s.

Using the rate command

Configure the data port base rate by entering:

```
CLI> set t1e1 portParameters rate
```

Parameter	Range of Values	Required Action
<PortNumber>	port1 port2	Select the number of the data port you are configuring.
<Rate>	64kbps 56kbps	Select <i>64kbps</i> or <i>56kbps</i> . Default is <i>64kbps</i> .

RTS Control

Use the *rtsControl* command to indicate how the Request To Send (RTS) signal is supplied. The following options are available:

- *Normal* - in which the RTS must be supplied by the DTE, and the Clear To Send (CTS) signal follows the RTS.
- *Forced on* - in which the RTS signal from the DTE is ignored, and the CTS is forced on.

Using the rtsControl command

Configure the method of the data port RTS control by entering:

```
CLI> set t1e1 portParameters rtsControl
```

Parameter	Range of Values	Required Action
<PortNumber>	port1 port2	Select the number of the data port you are configuring.
<RTSControl>	normal forcedOn	Select <i>normal</i> or <i>forcedOn</i> . Default is <i>normal</i> .

Configuring the T1 or E1 System Clock

This command is used to select one of three system clock sources, as follows:

- *networkLineClock* - in which the clock source is taken from the DS-1/L2 interface (dual-port only).
- *localLineClock* - in which the clock source is taken from the DSX-1/L1 interface.
- *internalClock* - in which the clock source is taken from an internal clock source.

Using the t1e1 SystemClock command

Configure the system clock by entering:

```
CLI> set t1e1 systemClock
```

Parameter	Range of Values	Required Action
<TimeResource>	networkLineClock localLineClock internalClock	Select the system clock source which applies. Default is <i>networkLineClock</i> .

Interconnecting the DS0 Channels

The T1/E1 DS0 channels of the DSX-1/L1 line can be connected logically to any of the digital voice modules, to the Primary WAN Link or Backup WAN Link channels of the Passport 4400 Ethernet Base Module, to Data Ports 1 or 2, or be bypassed to equivalent channels of the DS-1/L2 line.

Note: You cannot connect the DS0 channels of a single-port T1 or E1 Voice Module directly to any link of the Ethernet Base Module.

Using the DS0Connect command

The *DS0Connect* command is used to determine how each of the DS0 channels available on the DSX-1/L1 interface will be used. To complete this command, you must define the following parameters:

- LineIndex
- DS0ConnString
- ConnectionState

Each parameter is described below.

LineIndex

The *LineIndex* parameter is used to indicate whether the DS0 channels you are connecting are taken from the DSX-1/L1 or DS-1/L2 line. Enter either *localLine* (T1=DSX-1/E1=L1) or *networkLine* (T1=DS-1/E1=L2), as appropriate.

DS0ConnString

The *DS0ConnString* parameter is used to indicate which DS0 channels are to be connected. Up to 83 characters may be entered, with the following restrictions. The characters must be decimal digits, with commas or hyphens used to define a list of multiple DS0 channels or a range of DS0 channels.

ConnectionState

The *ConnectionState* parameter is used to indicate how the DS0 channels are to be connected. The following options are available:

Idle

The *idle* option is used to place DS0 channels into an idle state. In this state all existing connections to a DS0 channel will be removed, and new assignments can be made. All DS0s (24 maximum for T1, or 30 maximum for E1) may be assigned to the idle state.

When disconnecting a range of DS0s from a data port, the full range of channels (not just individual channels) of the connected DS0s must be set to the *idle* state.

bypassVoice

The *bypassVoice* option is used to allow *voice* traffic to pass from a T1 DSX-1 DS0 channel directly to its equivalent T1 DS-1 DS0 channel, or from an E1 L1 DS0 channel directly to its equivalent E1 L2 DS0 channel. When *bypassVoice* is selected, signaling information is also bypassed. This command is not applicable to single-port models.

For *bypassVoice*, all DS0s (24 maximum for T1, or 30 maximum for E1) may be assigned.

bypassData

The *bypassData* option is used to allow *data* traffic to pass from a T1 DSX-1 DS0 channel directly to its equivalent T1 DS-1 DS0 channel, or from an E1 L1 DS0 channel directly to its equivalent E1 L2 DS0 channel. This command is not applicable to single-port models.

For *bypassData*, all DS0s (24 maximum for T1, or 30 maximum for E1) may be assigned.

toPrimaryLink

The *toPrimaryLink* option is used to connect one or more DS0 channels directly to the primary WAN link on the Passport 4400 ethernet base module. This command is not applicable to single-port models. For WAN ports, you may assign a total of 1, 2, 3, 4, 6, or 8 DS0s — but NOT a total of 5 or 7 DS0s. The total number may not exceed 8 DS0s.

toBackupLink

The *toBackupLink* option is used to connect a one or more DS0 channels directly to the backup WAN link on the Passport 4400 ethernet base module. This command is not applicable to single-port models. For WAN ports, you may assign a total of 1, 2, 3, 4, 6, or 8 DS0s -- but NOT a total of 5 or 7 DS0s. The total number may not exceed 8 DS0s.

toDataPort1

The *toDataPort1* option is used to connect one or more DS0 channels to data port 1 on the TVM or EVM. For data ports, you may assign a total of 1, 2, 3, 4, 6, or 8 DS0s — but NOT a total of 5 or 7 DS0s. The total number may not exceed 8 DS0s.

toDataPort2

The *toDataPort2* option is used to connect one or more DS0 channels to data port 2 on the TVM or EVM. For data ports, you may assign a total of 1, 2, 3, 4, 6, or 8 DS0s — but NOT a total of 5 or 7 DS0s. The total number may not exceed 8 DS0s.

B1-B6, C1-C12, D1-D12 (voice channels)

Enter any of the voice channels B1 through D12 to connect the corresponding Digital Voice Modules to the selected DS0 channels. Voice channels may be assigned only one DS0 channel each.

The location of each voice channel is described below:

- *B1-B6* - refers to the six voice channels (Digital Voice Modules) on the T1 or E1 Voice Modules in logical slot B (limB) of the Passport 4400 unit.
- *C1-C12* - refers to the twelve voice channels of the Digital Voice Expansion Module in logical slot C (limC) of the Passport 4400 unit.
- *D1-D12* - refers to the twelve voice channels of a Digital Voice Expansion Module in logical slot D (limD) of the Passport 4400 unit.

Connecting the DS0 channels

The following procedure lists the steps used to connect a DS0 channel to a voice channel, or to connect multiple DS0 channels to a data port, WAN link port, or to the idle, voice bypass, or data bypass connection states.

Note: To connect a DS0 channel to a voice channel, WAN link channel, or data port, that DS0 channel must first be set to **idle**.

Before a voice channel can be seized by the local PBX to obtain a local dial tone, that voice channel must first be connected to one of the idle DS0 channels (time slots) as described on the next page.

Accessing the DS0Connect Command

To access the *DS0Connect* command, follow this path:

CLI> set t1e1 ds0connect

<LineIndex>	:	localLine (DSX-1 or L1)		networkLine (DS-1 or L2)	
<DS0ConnString>	:	"String" of size (0..83)			
<ConnectionState>	:	idle		bypassVoice	
		bypassData		toPrimaryLink	
		toBackupLink		toDataport 1	
		toDataport 2		b1	
		b2		b3	
		b4		b5	
		b6		c1	
		c2		c3	

c4	c5	
c6	c7	
c8	c9	
c10	c11	
c12	d1	
d2	d3	
d4	d5	
d6	d7	
d8	d9	
d10	d11	
d12		

1. For *LineIndex*, select *localLine* or *networkLine*, as applicable.
2. For *ds0ConnString*, enter the DS0 channel number(s) you want to connect, enclosed within quotation marks. If you want to connect more than one DS0 channel (24 maximum for T1, 30 maximum for E1), enter a “String” of up to 83 characters. This can specify a single DS0, multiple DS0s separated by commas, a range of DS0s, separated by a hyphen, or any combination of these components.

Example:

Single DS0 - “3”

Multiple DS0s - “5,8,12”

Range - “9-20”

Combination - “2,5-10,14,16,20-26”

A range of DS0s can be assigned to one of the following connection states: *idle*, *bypassVoice*, *bypassData*, *toPrimaryLink* (WAN), *toBackupLink* (WAN), *toDataPort1* and *toDataPort2*.

In the case of voice channels, a range of DS0s can also be assigned to multiple connection states (b1-b6, c1-c12, d1-d12). For example, if the user specifies “1-5” for the DS0s, and DVM channel b1 for the connection state, DS0 1 will be assigned to DVM channel b1. The next available DVM channel, such as b2, will be assigned for DS0 2. If, for some reason, a connection state or DS0 is not available, then the next DVM channel will be selected for assignment, if available. When all available DVM channels on one voice module are assigned, the available DVM channels on the next voice module (such as c1-c12) will be assigned.

3. For *connectionState*, select one of the following:
 - **idle**. This is required if the channel is already connected and you wish to make another connection choice.
 - **toPrimaryLink**. (Primary WAN Link on the Ethernet Base Module) Multiple DS0 channels (1, 2, 3, 4, 6, or 8 DS0 channels) may be assigned to the Primary WAN Link.
 - **toBackupLink**. (Backup WAN link on the Ethernet Base Module) Multiple DS0 channels (1, 2, 3, 4, 6, or 8 DS0 channels) may be assigned to the Backup WAN Link.
 - **bypassVoice** (if voice is to be bypassed) Multiple DS0s (up to 24/T1 or 30/E1 may be assigned to the bypassVoice connection state.
 - **bypassData** (if data is to be bypassed) Multiple DS0s (up to 24 maximum for T1 or 30 maximum for E1 may be assigned to the bypassData connection state.
 - **toDataPort1** - Multiple DS0 channels (1, 2, 3, 4, 6, or 8 DS0 channels) may be assigned to the toDataPort1 connection state.
 - **toDataPort2** - Multiple DS0 channels (1, 2, 3, 4, 6, or 8 DS0 channels) may be assigned to the toDataPort2 connection state.
 - One of the voice channels, **B1 through D12**. Only one DS0 channel can be connected to an individual voice channel.

Example 1: To set time slot 3 (DS0 Index) of the DSX-1 T1 interface to idle, enter:

```
CLI> set t1e1 ds0c local "3" idle
```

Example 2: To connect time slot 3 (DS0 Index) of the L1 E1 interface to digital voice channel 2, enter:

```
CLI> set t1e1 ds0c local "3" b2
```

Example 3: To set time slot 29 (DS0 Index) of the L1 E1 interface to idle, enter:

```
CLI> set t1e1 ds0c local "29" idle
```

Example 4: To connect time slot 29 (DS0 Index) of the L2 E1 interface to digital voice channel 14, enter:

```
CLI> set t1e1 ds0c network "29" C8
```

Note: While you are entering the command string, you may reach the end of the screen. In this case, you will receive the following message:
[Q to Quit or Carriage Return to Continue] Press the ENTER key to continue.

What's In This Chapter:

- Overview of Passport 4400 Traffic Management
- Traffic Management Parameters
- Defining Traffic Management Parameters
- Traffic Management Examples
- Monitoring Traffic Management

Passport 4400 Traffic Management

The Passport 4400 traffic management controls the flow of outbound traffic being multiplexed within the unit. Its traffic management is designed to allow small voice frames and large data frames to co-exist in the same outbound link, without compromising the quality of transmission.

Transfer Priority and SVC queues

Each switched virtual circuit (SVC) carries a transfer priority (TP) based on the type of traffic (service) carried. This is the level of importance assigned to frames passed along a particular SVC. Possible TP values range from 0 to 15, with 15 having the highest priority.

Before transmitting outbound traffic, the Passport 4400 examines the TPs of all outbound SVCs. The TP of an SVC determines into which queue the frames will be sent. There are five available SVC queues (numbered 0 to 4), with 4 having the highest priority.


The following priorities are the Passport 4400 default TP values for various traffic types:

- Signaling (LAPF and LMI) traffic: TP 15, queue 4
- Voice traffic: TP 11, queue 3
- FRDCE and HTDS traffic: TP 6, queue 1
- LAN traffic: TP 0, queue 0
- RFC 1490 traffic: queue 0

From the SVC queues, traffic is allocated to fill the outbound (WAN) bandwidth according to its queue number. The WAN link is filled with the higher-priority queues first. For an illustration of how the Passport 4400 fills emission queues and how WAN link bandwidth is allocated, see Figure 8-1.

RFC1490 Traffic

RFC1490 traffic is not subject to all the same traffic management process that affects other traffic over PANL netlinks. RFC1490 frames will not be fragmented. Notice the position of RFC1490 frames in the outbound traffic flow in Figure 8-1.

	<p>Caution: If your Passport 4400 is configured for RFC1490 traffic, set the throughput and frame size to the minimum values required. Large throughput or frame size values will severely impact other traffic, causing delays that can affect voice quality.</p>
---	---

The default maximum frame size (or MTU) for RFC1490 netlinks on the Passport 4400 is 300 bytes; this prevents RFC1490 traffic from creating delays for other outbound frames (such as voice traffic). Make sure that the maximum frame size is set appropriately at the destination node (such as a third-party router).

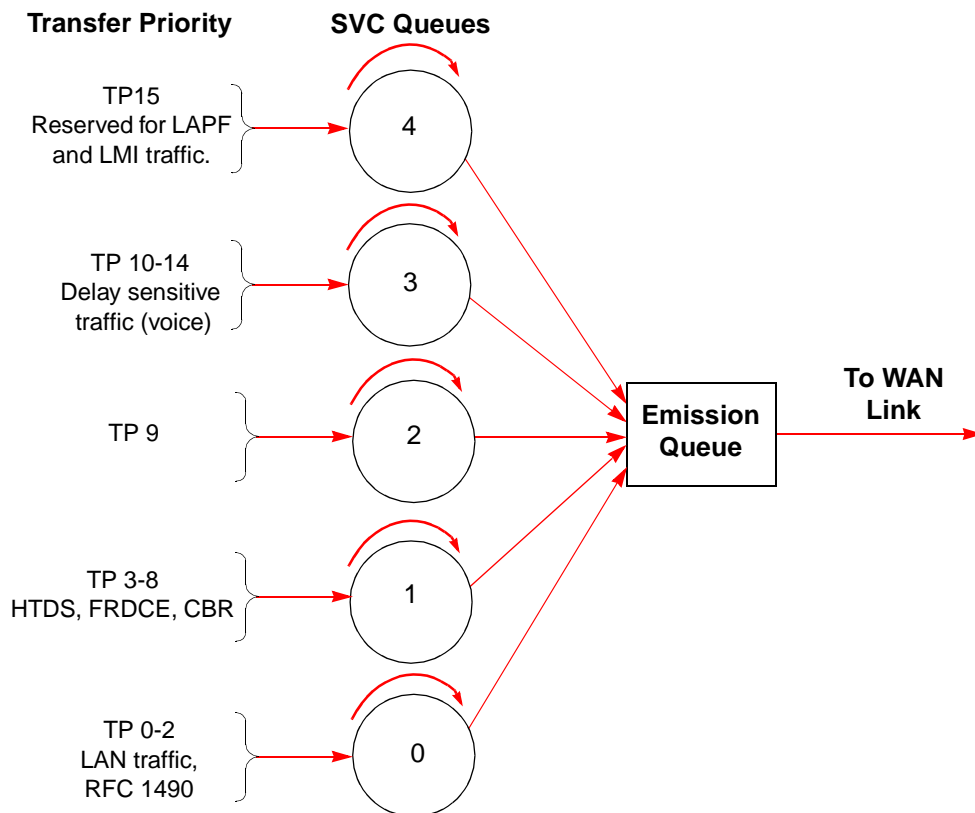


Figure 8-1. Passport 4400 Allocation of Traffic to WAN Link

This chapter discusses the power supplies available for the following Passport units:

- 3-slot Chassis power supply (page 9-1)
- 5-slot Chassis power supply (page 9-2)
- 5-slot Redundant power supply (page 9-3)

3-slot Chassis

The 3-slot Passport 4430 chassis uses a 135W AC power supply to provide power to the Ethernet Base Module and expansion modules.

Note: The three-slot Passport 4430 unit uses AC power only. There is no option for DC power.



Figure 9-1. 3-slot Power Supply

The power cable connects to the Ethernet Base Module. All expansion modules in the unit draw power from the Ethernet Base Module through stacking connectors on the modules.

5-slot Chassis

The five-slot Passport 4450/4455 chassis uses a 160W power supply to provide power to the Ethernet Base Module and expansion modules. Both AC and DC models are available; the figure below shows an AC unit.

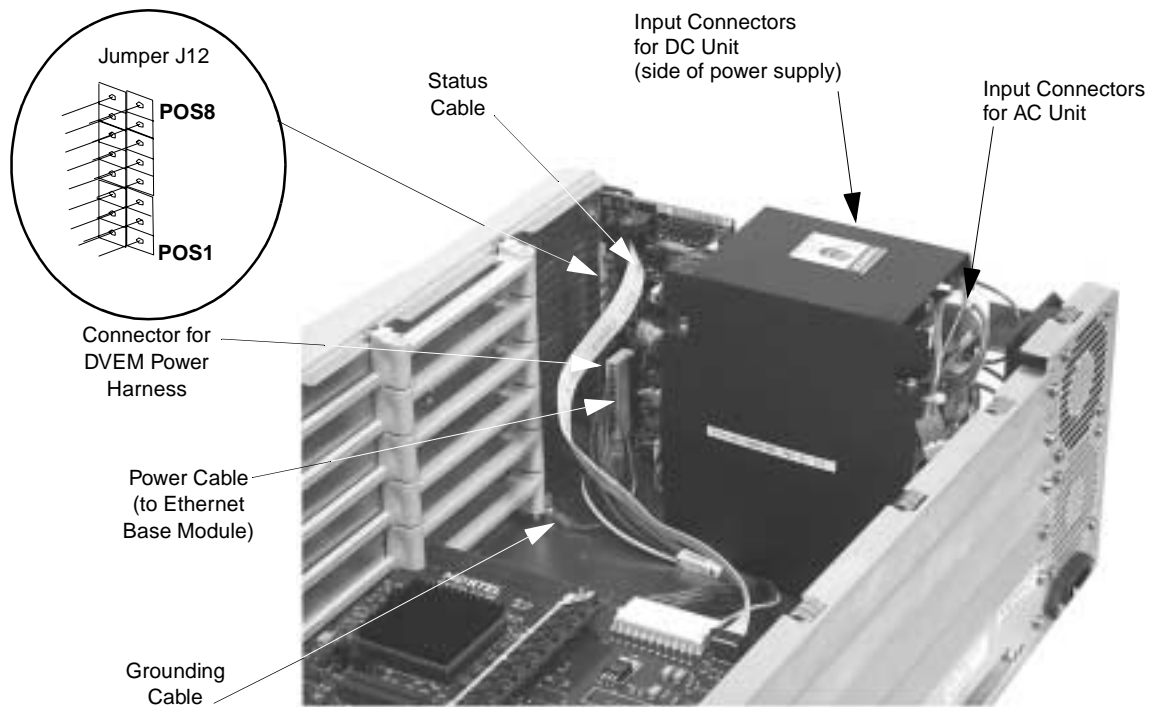


Figure 9-2. 5-slot Passport 4450 Power Supply

Digital Voice Expansion Module Power Harness

The Digital Voice Expansion Module power harness provides redundant power for Passport 4450/4455 units containing one or more Digital Voice Expansion Modules. The power harness connects the modules to the power sharing board (see Figure 9-2 above, and Figure 5-15 on page 5-14 for more information).

5-slot Chassis with Redundant Power Supply

A 5-slot Passport 4450/4455 chassis with the redundant power supply option contains a subassembly that houses an extra power supply in the event that one of the original four fails. This unit is available in either AC and DC power; the figure below shows an AC unit.

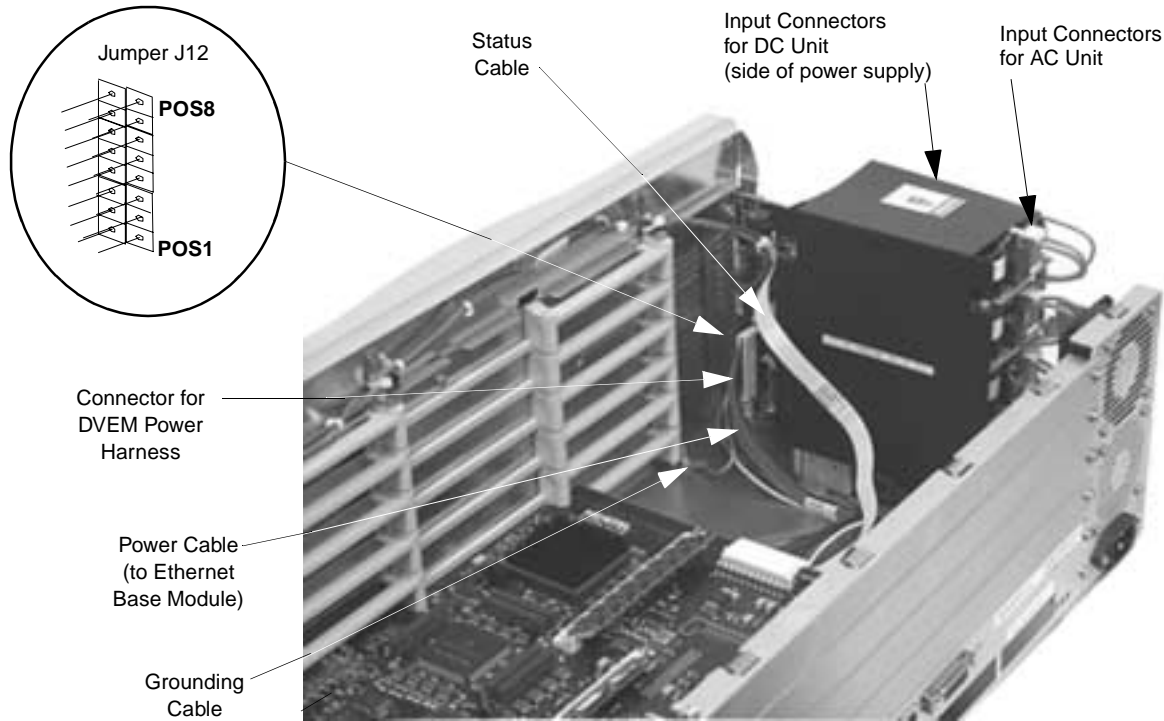


Figure 9-3. 5-slot Passport 4455 with Redundant Power Supply

Two indicator lights that monitor the power supplies are located at the top right side of the front bezel. The triangle-shaped (green) indicator is lit when all power supplies are working properly. The rectangle-shaped (red) indicator lights up when there is a problem with one or more power supplies in the unit, or when too many power supplies are connected (see Table 9-1 on page 9-5).

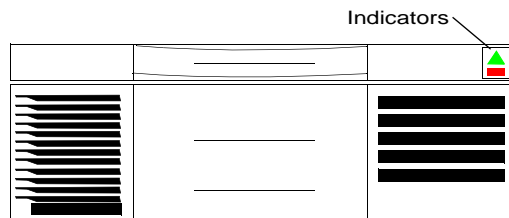


Figure 9-4. Indicators for Passport 4400 Unit with Redundant Power Supply

DC Power Supplies (Passport 4450 only)

The DC power supply system allows the Passport 4400 unit to be installed in a telephone company environment with the necessary DC power input being furnished by the telephone company to the input of the Passport 4400 unit.

Note: The Input Connectors on the DC power supply are located at the side of the power supply closest to the edge (see Figure 9-2 and Figure 9-3).

The -48 volts DC version of the Passport 4400 unit power supply system is identical to the AC version except for the addition of a terminal power adapter that plugs into the line cord Electronic Industry Association (EIA) jack on back of the unit. The five power supplies stack identically to the AC version. The connectors accept the same cables for input and output power.

The DC input voltage must be within the range of -32 volts DC and 72 volts DC. The plus (+) and minus (-) markings on the input power adapter box indicate the polarity of corresponding battery connections. They are electrically floating and can either be connected to house ground or the appropriate DC return. An additional case ground screw is also on the power adapter box. This connection must be grounded to the chassis safety ground for safety and electrical noise suppression. Do not operate the unit without the ground screw connected to the safety ground.

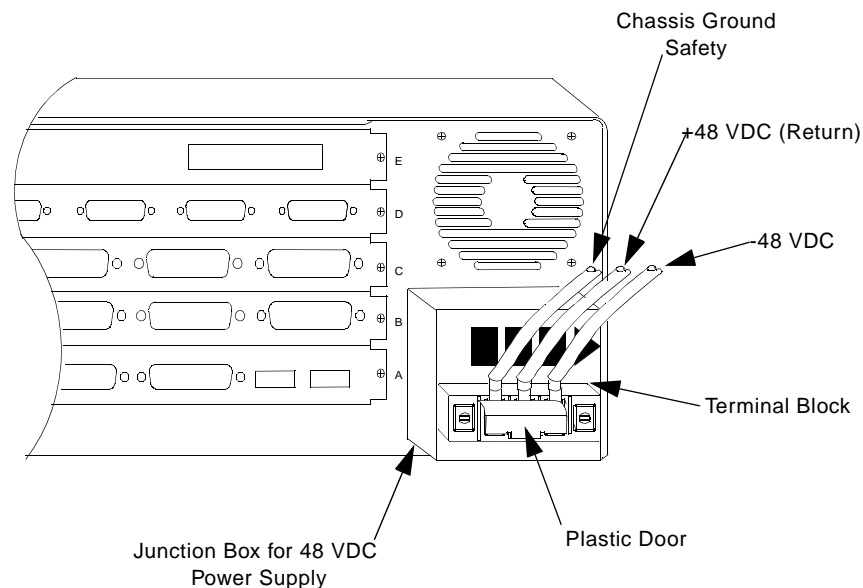


Figure 9-5. DC Power Supply

Configuring the Power Supplies

Note: The following information applies to five-slot Passport 4400 unit only. Three-slot Passport 4430 units do not need to be configured.

The power supply at the bottom of the stack is called the master supply. All other supplies located above the master are called slave supplies. The five-slot models have one master and three slave power supplies.



Caution:

Disconnect all power from the unit before performing these procedures.


The AC input connectors (orange in color) are located at the rear of the unit, behind the fan (see Figure 9-2 on page 9-2).

The DC input connectors (orange in color) are located at the outer side of the power supply (see Figure 9-2 on page 9-2).

If adding new modules to a unit, ensure that the power supplies are properly configured by following these procedures.

Table 9-1. Configuring the Power Supplies

For Units Containing...	Standard Power Supply	Redundant Power Supply	AC Units...	DC Units...
1-3 Modules including the base module	Be sure that the AC/DC input connector of the top power supply is unplugged	Be sure that the AC/DC input connectors of the top two power supplies are unplugged	Strap jumper J12 according to Table 9-2	Strap jumper J12 according to Table 9-3
4-5 Modules including the base module	Plug in all four AC/DC input connectors of the power supplies	Plug in all five AC/DC input connectors of the power supplies		



Caution: Prior to turning on your unit, be sure to check the straps for proper positioning according to the particular unit you have. Incorrect strapping will cause the unit to malfunction.

- Notes:**
- Jumper position one is strapped only when you have a redundant power supply installed. Notice for a 5-slot standard model that position number one is not strapped, regardless if it has 1 to 3, or 4 to 5 modules installed.
 - Jumper position six is strapped for all 5-slot models regardless of the number of modules installed.
 - Jumper position eight is for detecting failed power supplies. Make sure that position eight is NOT strapped for a 5-slot model with 4 to 5 modules installed. If position eight is strapped, then the unit can not detect if the fourth or fifth power supply fails. This strap is installed at the factory and needs to be removed when you add the fourth module.

Table 9-2 Jumper 12 Strapping for the AC Units

Passport 4400 Unit Model and Configuration	Jumper Positions (J-12)							
	1	2	3	4	5	6	7	8
5-slot standard, AC, 1 to 3 modules		X	X	X	X	X	X	X
5-slot standard, AC, 4 to 5 modules		X	X	X	X	X	X	
5-slot redundant, AC, 1 to 3 modules	X	X	X	X	X	X	X	X
5-slot redundant, AC, 4 to 5 modules	X	X	X	X	X	X		

Table 9-3 Jumper 12 Strapping for the DC Units

Passport 4450 Unit only Model and Configuration	Jumper Positions (J-12)							
	1	2	3	4	5	6	7	8
5-slot standard, DC, 1 to 3 modules		X	X	X		X	X	X
5-slot standard, DC, 4 to 5 modules		X	X	X		X	X	
5-slot redundant, DC, 1 to 3 modules	X	X	X	X		X	X	X
5-slot redundant, DC, 4 to 5 modules	X	X	X	X		X		

Passport 4400
Release Notes for R3.1.6

Address comments to:
Manager, Technical Publications
Nortel Networks
4100 Guardian Street
Simi Valley, CA 93063-8233
U.S.A.
1-805-583-8600

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Publication: 210450-A Rev 00
Date: August 2000

