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Passport 4400

Supplement for R2.0.6.003

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Chapter 1

Introduction

This document provides information for the Passport 4400 software release package for the R2.0.6.003 (PR206003bld) software level, available to all customers.

Please refer to Chapter 2 for details on the current status of various features and enhancements.

Documentation

The following relevant Passport 4400 documents are available on the Nortel Micom World Wide Web at URL <http://199.30.19.9/Engineers/ISO/projects/mpa/a02a/manuals/nav.html> and Passport NTPs are available on the Nortel Magellan World Wide Web at URL <http://47.208.136.61/ntp/> and should be referenced in the order listed:

NTP 241-7001-210, Magellan Passport Access Network Link User Guide
NTP 800-1952-20, Passport 4400 Operators Manual
NTP 241-7001-803, Passport IP Routing User Guide
NTP 241-7001-804, Passport IPX Routing User Guide
NTP 241-7001-802, Passport Frame Relay DTE Access User Guide
NTP 241-7001-300, Passport Frame Relay UNI User Guide
NTP 800-1951-20, Passport 4400 Hardware Installation Manual
NTP 800-1950-20, Passport 4400 CLI Reference
NTP 241-7001-410, Passport Voice Networking User Guide
NTP 241-7001-180, Passport Remote Server Agent User Guide
NTP 241-6001-106, NMS Magellan Access Configuration Server Installation
and Administration Guide
NTP 800-1943-20, Passport 4400 Analog Voice Modules User Guide
NTP 800-1944-20, Passport 4400 T1/E1 and Digital Voice Manual
NTP 241-7001-340, Passport Frame Relay ISDN Switched Access User
Guide

These NTP documents are orderable items, which are available on CD-ROM media also containing Passport 4400 software and MIBS. This documentation can then be installed on a workstation and accessed on-line.

Upgrading from Release R1.X to Release R2.0

From a configuration data standpoint, a R1.X to R2.0 migration path is not supported. Installation of R2.0 boot and application software on a Passport 4400 running R1.X boot and application software requires a 'cold reset' which will restore the configuration data to factory default settings.

Also, a number of R1.X functions and network architecture elements are no longer supported, and the R2.0.6.003 services interworking networking architecture is such that there are a number of deployment pre-requisites and considerations. Please refer to Chapter 3 for deployment recommendations.

Services Interworking Network Architecture

Release 1.X Network Architecture

R1.X Passport 4400 'branch-to-branch' services were considered 'overlay'. The Passport network provided the Frame Relay UNI SVC service, and when used in conjunction with the FRUNI Multi-Media Traffic Classes (MMTC) feature, different classes of service could be signaled across the WAN, for various types of traffic, e.g. Voice, LAN, HTDS, Frame Relay.

In Release 1.X, the Passport 4400 units in the network could be configured to perform dedicated functions such as:

- Network Management Core Router (NMCR) (provides management IP Connectivity between NMS workstations and Passport 4400 branches.)
- User Core Router (UCR) (provides branch LAN routing function.)
- Network Address Server (NAS) (provides voice DN to DNA translation services).

Release 2.0.X Network Architecture

In this release, the Magellan Passport Access Network Link (PANL) uses its own proprietary frame relay based protocol to accommodate the signaling, transport and traffic management requirements for Passport 4400. The Passport Frame Relay UNI MMTC capability remains a requirement. The PANL Switched Permanent Virtual Circuit (SPVC) now provides service interworking capabilities between the Passport network and the Passport 4400 branches, and makes use of the Passport Frame Relay Multiple Egress Emission Priorities. PANL supports multiple link types, including leased line, ISDN (main link or backup), and Frame Relay. For more information please read NTP 241-7001-210, *Magellan Passport Access Network Link User Guide*.

In this release, the R1.X Network Management Core Router, User Core Router, and Network Address Server functions are now provided by the Passport network as follows:

- Passport ILS now provides Network Management and User Core Router functions. SPVC's originating from Passport 4400 branches are terminated on the Passport Frame Relay UNI service, which coexists and must be logically associated with the Passport ILS Frame Relay DTE service. Please refer to NTP 241-7001-803, *Passport IP Routing Guide*, NTP 241-7001-802, *Passport Frame Relay DTE User Guide*, NTP 241-7001-300, *Passport Frame Relay UNI User Guide*.
- The Passport Voice Networking Call Server (VNCS) is a database that supplies routing information required during voice call establishment, and interacts with the Remote Server Agent (RSA), which can reside anywhere in the network, and is an entry point for access to the VNCS. As all DN to DNA translations are dynamic, the manual cache entry capability supported in R1.X is not supported in this release. Although Passport 4400 and Passport Voice interworking is not supported in this release, the above elements are required for Passport 4400 voice 'overlay' as well. Please refer to NTP 241-7001-410, *Passport Voice Networking User Guide*, and NTP 241-7001-180, *Passport Remote Server Agent User Guide*.

Please refer to Chapter 3 for R2.0.6.003 deployment recommendations.

NMS and Passport Software Compatibility

The following table provides the current Passport 4400 product release levels and reflects the minimum NMS and Passport software levels required for compatibility.

Passport 4400	R2.0.6.003 (PR206003.bld) Image code R2.0.6.002 (bt206002.bld) Boot code
NMS	10.7
Passport 6400	P4.2.6 (BD02S6D)

NMS functionality to support this release of Passport 4400 software is available at this time. It includes NMS Surveillance and Configuration capabilities. Please reference the NTP 241-6001-106, *NMS Magellan Access Configuration Server Installation and Administration Guide* for further detailed information. Passport Release P4.2.6 provides support for Passport 4400 Release 2.0.6.003. Please refer to the appropriate Passport release supplement for further information.

Required Hardware Release Levels

All Passport 4400 cards are required to be of the following Card Codes and Revision Levels to use any of the Passport 4400 R2.0.6.003 features.

Table 1 Hardware List

Card Name	Card Code	Release
Passport 4400 Ethernet Base Module	NTAU01AA	10
WAN Serial Interface Module	NTAU03AA	05
Turbo Universal Voice Module, Dual Channel	NTAU50AA	02
Enhanced E&M Voice I/F Module	NTAY09AA	03
Enhanced FXO Voice I/F Module	NTAY11AA	03
Enhanced FXO-European Voice I/F Module	NTLN23AA	01
Enhanced FXS Voice I/F Module	NTAY12AA	01
T1 Module - Dual Port	NTAY14AA	05
E1 Module - Dual Port	NTAY16AA	06
Digital Voice Expansion - 12 Channel	NTAY18AA	02
Digital Voice Module - Single	NTAU60AA	01
Clear Voice Module - Single Channel	NTAU61AA	02
Clear Voice Module (European) - Single Channel	NTLN21AA	--
Clear Voice Module - Dual Channel	NTAU62AA	02
Clear Voice Module (European) - Dual Channel	NTLN22AA	--
T1 CSU/DSU	NTAU04AA	04
56 K CSU/DSU	NTAU02AA	05
ISDN U Interface Module	NTAU05AA	05
ISDN S/T Interface Module	NTAU06AA	05
4-Port Serial Expansion	NTAU83AA	04
8-Port Serial Expansion	NTAU74AA	04

Software Installation Procedure

Passports 4400s 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 CD as an orderable item. Installation is accomplished via 'runtime download' procedure (requires TFTP server) described in NTP 800-1952-20, Passport 4400 Operations Manual, or the 'boot menu' procedure (requires FTP server) described in Chapter 3.

- bt206002.bld (Passport 4400 bootrom code)
- PR206003.bld (Passport 4400 application code)
- PR206003bld.tar (Passport 4400 application code for mibs)
- rs206003.ps and .pdf (Passport 4400 Supplement)

The Passport 4400 Application software, a single file supplied in a "bld" format, consists of six executable images.

Ethernet Base Module code that runs on the 68040 processor
DSP code for CVM modules
DSP code for TUVVM modules
DVM code for the DVM's installed on the TAM, EAM and DVEM cards
TAM code for the 80186 CPU on the TAM card
EAM code for the 80186 CPU on the EAM card

Chapter 2

Features

Software Packages

The following software applications are included in this Release:

Ethernet Base Module Boot Code: bt206002.bld
Application Software: PR206003.bld
Clear Voice Module (CVM) DSP Code: 2261.xjK
Turbo Universal Voice Module (TUVM) Code: 2263.xjK
Digital Voice Module (DVM) Code: 2262.xjK
T1 Digital Voice Module (TAM): 909-2291-AX1
E1 Digital Voice Module (EAM): 909-2292-X1

Passport 4400 Features

This section describes features and interfaces cards introduced by Passport 4400 software release, R2.0.6.003.

Services Interworking with Passport

The Magellan Passport Access Network Link (PANL) service supports interworking of Passport 4400 LAN, Frame Relay, and Voice services with Passport LAN Frame Relay and Voice services. LAN and Frame Relay Interworking is made possible through Switched Permanent Virtual Circuit (SPVC) Support, and A-bit handling. Please refer to Chapter 1 for additional information.

WAN Link Interfaces

- Integrated ISDN Terminal Adapter (U and S/T versions)
- T1/56K Integrated CSU/DSU
- Base Module (Serial Interface) Port 2

Frame Relay and HTDS Access Interfaces

- 4-Port Serial Expansion Card
- 8-Port Serial Expansion Card
- Base Module Port 1

ISDN Main Link and Dial Backup

The Magellan Passport Access Network Link (PANL) can operate over ISDN full time as the primary WAN connection, or as backup, active only upon main link failure.

HTDS Transparent Data Service

The HDLC Transparent Data Service provides end to end connectivity for HDLC based applications. This permits the tunneling of legacy protocols over the WAN. Two operational modes are supported, cut-through and store-and-forward.

Network Management

NMS configuration and surveillance modes of operation are supported with version 10.7. You no longer have to depend on the Command Line Interface (CLI) for all configuration and software download functionality. All future references to NMS in this document refer to the management workstation upon which the NMS applications are installed. Please refer to the NTP 241-6001-106, *NMS Magellan Access Configuration Server Installation and Administration Guide* for further details.

Legacy Data Module

The Legacy Data Module provides end to end connectivity for asynchronous, X.25 LAPB, SNA and Token Ring applications. At the time of this release, LDM services are not supported.

Code and Configuration Rollback

Code and Configuration Rollback allows users to make temporary changes that will be in effect for a 5-minute time period following an activation. Unless committed, the Passport 4400 will automatically revert back to last operating application code and/or configuration.

Frame Relay DCE

The Frame Relay DCE feature enables Frame Relay DTE connectivity between 4400 via the Passport wide area network (WAN). The Frame Relay DCE physical interface is provided via port 1 (residing on the Ethernet Base Module) on the rear panel, or serial expansion interface module. Interfaces types V.11/X.21, V.35, RS-232, and V.36 are available by using the appropriate cable type. Supported link management interfaces (LMI) include DTE CCITT (ITU) Q933 Annex A, ANSI T1.617D (Annex D), Rev 1 and None.

Voice Interfaces

The following voice interfaces are supported:

- Enhanced E&M type I, II, V
- Enhanced FXO
- Enhanced FXS
- T1
- E1

FAX Demodulation

- Group 3

Ethernet LAN and Routing

- IP (RIP v1)
- IPX (RIP v1)
- Transparent Bridging (IEEE 802.1)

Chapter 3

Release Considerations

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

General Considerations

Network Requirements

For first time deployment of Passport 4400 R2.0.6.003 in an existing Passport network, there are a number of prerequisites to installation. Release R1.X to R2.0 network migration is discussed later in this chapter. Please refer to the documentation references provided in Chapter 1 for more information. Below is a high level description of Passport 4400 deployment elements.

Deployment Planning

Considerations include engineering, network addressing, fan-out, link types, link speeds, redundancy, access service.

Passport ILS Network Management Core Router (NMCR)

Deployment considerations include proximity and connectivity to NMS platforms, redundancy, addressing.

Voice Elements Deployment

For voice services, the location and quantity of Passport network elements such as RSA must be determined. As well, VNCS must be configured in the network to support voice call setup. The DNA provided when configuring the Passport 4400 RSI must reside on the RSA on Passport

Passport PM2 Function Processor

All Passport FP's which will provide the PANL service, and terminate Passport 4400 Switched Permanent Virtual Circuits (SPVC's) must be upgraded to PM2.

Passport Network Migration

The Passport network must be migrated to Passport Release level P4.2.6 or greater to support PANL and other elements necessary for Passport 4400 deployment and services interworking.

NMS Platform Deployment

The NMS platform must be installed, and configured to support the TFTP server function for software download, and telnet access to Passport 4400 via TCP/IP. Please refer to the NMS Release Notes for further details.

Installation/Deployment

Passport 4400 WAN link Connection to Passport

Within the Passport network, PANL must be configured on Passport V.35, V.11, DS1, E1, DS1C, E1C Function Processors supporting Passport 4400 WAN links. The minimum Passport Release level required for Passport 4400 connectivity is P4.2.6. In addition to the PANL service, the 'frame relay multi-media traffic class' service must also be configured on FP's to which Passport 4400's are to be connected. Consult NTP 241-7001-210, Magellan Passport Access Network Link User Guide for further information.

If the Passport 4400 is co-located with Passport, either cable NTAU30AA (V.35 50-pin to DB-15 male) or NTAU26AA (V.11 50-Pin to DB-15 male) can be used to connect the PASSPORT 4400 WAN link directly to the Passport fan-out panel. If the PASSPORT 4400 is remote, the Telco must provide a facility with the appropriate V.35 or V.11 interface. In that case, cable NTAU20AA (50-pin to V.35 Male Winchester), or NTAU26AA (50-pin to DB-15 male) could be used. When the Passport 4400 WAN link cable is used in conjunction with a shielded extension cable to facilities or a co-located Passport fan-out panel, the maximum supported combined cable length is 50 feet.

Passport 4400 Remote Site Installation and Initial Configuration

Passport 4400 units shipped from the factory are pre-loaded with R2.0.6.003 or later boot code and application software. The factory default configuration must be modified at the installation site to suit site and network requirements via the local operator console. Elements such as DNA prefix, node ID, customer ID, PANL attributes, SPVC to the FRUNI DNA on the Passport ILS NMCR must be configured on-site using CLI or the PC based NetTool. Once management IP connectivity has been achieved, further remote configuration is then possible.

Once the installed Passport 4400 is remotely accessible, if software is to be upgraded to a later version, a runtime TFTP download can be initiated via the local Command Line Interface (CLI). The software distribution function can be remotely initiated at the NMS workstation using the NMS configuration graphical user interface.

As an alternative to on-site configuration, the Passport 4400 units could be shipped from a customer marshalling site, after being pre-configured with site specific addresses, and installed cards. Consult NTP 800-1952-20, Passport 4400 Operators Manual for further information.

Configuring End-to-End Management IP Connectivity

Prior to installation of the first Passport 4400 in a network, configuration of the Passport ILS NMCR, and the installation of a network management workstation (NMS) platform and TFTP server is a prerequisite. The NMCR function accomplished in previous releases by a dedicated Passport 4400 is no longer supported.

End-to-end management connectivity to branch Passport 4400's is achieved via the combination of a physical connection to the Magellan Passport Access Network Link (PANL) service running on the Passport Function Processor (FP) to which the branch 4400 is connected, the SPVC to the Passport Frame Relay UNI service provided by the Passport ILS NMCR, and the logical associations between these key elements. More information is provided below. Key physical and logical elements of management connectivity can be summarized as follows:

Management Connectivity Physical Components

- Passport 4400 R2.0.6.003 WAN link connection to Passport PM2 function processor supporting the PANL service.
- Passport Release P4.2.6 or greater backbone network (unless public frame relay tunneling option described later in this section is used).
- Passport ILS Network Management Core Router (NMCR) equipped with function processors for FRUNI, FRDTE and Ethernet IP services.
- Sun workstation to provide TFTP server for software download, telnet connectivity for access to branch Passport 4400 Command Line Interface (CLI) and site of Magellan Network Management System (NMS) software installation.

Management Connectivity Logical Components

- Switched Permanent Virtual Circuit (SPVC) from Passport 4400 virtual port 4 to the Passport ILS NMCR FRUNI service.
- Static Route from Passport 4400 virtual port 4 to the management IP LAN subnet connected to a Passport Ethernet port.
- RIP interface associated with the Passport ILS NMCR FRDTE IP Protocol Port.
- Passport ILS NMCR FRUNI DLCI with Direct Call to Passport 4400 remote prefixDNA and DLCI.
- Passport FRUNI to FRDTE virtual (or physical) hairpin connection.
- Static Route definition on the NMS workstation, associating the Passport 4400 branch management IP address assignments with the correct workstation LAN interface.

SPVC's are configured to originate from each branch Passport 4400, and terminate on a Passport Frame Relay DCE (FRUNI) Data Link connection Identifier (DLCI) resident on the Passport ILS NMCR. A physical or virtual Frame Relay hairpin is required on the Passport ILS NMCR to associate the Passport ILS FRDTE interface with the FRUNI service which terminates the SPVC's from the Passport 4400 branches. A distinct IP subnet is required for the FRDTE interface. It is recommended that the Passport ILS FRDTE protocol port be configured for passive rip with silence flag enabled.

An Ethernet interface on the Passport ILS NMCR, or elsewhere in the network, is either connected to the same customer management LAN segment as the NMS workstation(s), or directly to an Ethernet interface on an NMS workstation. The management subnet must reside on a subnet distinct from the FRDTE subnet supporting SPVC's to branch Passport 4400's. It is recommended that RIP with silence flag be enabled on the Passport ILS protocol port supporting connectivity to the management subnet. The NMS workstation must have static route(s) configured to ensure that Passport 4400 destination IP addresses are associated with the correct workstation Ethernet port. This is particularly important in cases where the workstation is equipped with multiple Ethernet interfaces.

Configuring Branch Passport 4400's

After the NMCR is operational, branch Passport 4400's's running factory default software can subsequently be installed and configured for NMS management, an unique name, and a pointer to the SNMP host workstation(s) (to which traps will be directed to). All branch 4400's supported by a Passport ILS NMCR share a common logical subnet on virtual port 4, that is, each branch Passport 4400 must have an IP address within the management subnet configured on virtual port 4 with

an SPVC to the NMCR FRUNI DNA defined. It is strongly recommended that for network management traffic, IP routing with passive RIP be configured on the branch Passport 4400 virtual port 4, with a static route to the management subnet. Static routes are recommended to reduce broadcast traffic in the network. Inverse ARP on interface 4 is also recommended. For additional information, consult NTP 800-1952-20, Passport 4400 Operators Manual.

Configuring the Passport ILS User Core Router (UCR)

The Passport ILS User Core Router (UCR) is used to route and concentrate user LAN traffic (IP and IPX) between branch Passport 4400's. The UCR function accomplished in previous releases by a dedicated Passport 4400 is no longer supported.

Prior to implementing branch LAN services on Passport 4400's in a network, configuration of the Passport ILS UCR is a prerequisite. Branch LAN routing between branch Passport 4400's is achieved via the combination of a physical connection to the PANL service running on the Passport Function Processor (FP) to which the branch 4400 is connected, the SPVC to the Passport Frame Relay UNI service provided by the Passport ILS UCR, and the logical associations between these key elements, which include:

Branch LAN Routing Physical Components

- Passport 4400 R2.0.6.003 WAN link connection to Passport PM2 function processor supporting the PANL service.
- Passport Release P4.2.6 or greater backbone network (unless public frame relay tunneling option described later in this section is used).
- Passport ILS User Core Router (UCR) equipped with function processors for FRUNI, FRDTE

Branch LAN Routing Logical Components

- Switched Permanent Virtual Circuit (SPVC) from Passport 4400 virtual port 2 (or other virtual port if using traffic management capabilities to implement IP prioritization) to the Passport ILS NMCR FRUNI service.
- Passport ILS UCR FRUNI DLCI with Direct Call to Passport 4400 remote prefixDNA and DLCI.
- Passport FRUNI to FRDTE virtual (or physical) hairpin connection.

The configuration of Passport ILS as UCR versus NMCR is very similar, except that the Passport ILS remote groups must be provisioned below the FRDTE component and associated with multiple protocol ports and IP subnets (one per branch Passport 4400). In other words, the number of IP subnets and/or IPX network numbers are equal to the number of Passport 4400's with interconnected LAN's. Also, a Passport ILS Ethernet FP is not a UCR requirement unless the UCR is also the means of corporate LAN or server access. On the branch Passport 4400, virtual port 2 is configured with an IP address with RIP enabled.

Switched Permanent Virtual Circuits (SPVC's) are configured to originate from each branch Passport 4400 virtual port 2, and terminate on a Passport Frame Relay DCE (FRUNI) Data Link Connection Identifier (DLCI) resident on the Passport ILS UCR. A physical or virtual Frame Relay hairpin is required on the Passport ILS NMCR to associate the Passport ILS FRDTE interface with the FRUNI service which terminates the SPVC's from the Passport 4400 branches. A distinct IP subnet is required for the FRDTE interface. It is recommended that the Passport ILS FRDTE protocol port be configured for passive rip with silence flag enabled.

If LAN services are not implemented at branch locations, the Passport ILS UCR is not required. For additional information, Consult NTP 800-1952-20, Passport 4400 Operators Manual.

Configuring Voice Services

The Network Address Server (NAS) function provided in Release 1.X is no longer supported. The Passport Voice Networking Call Server (VNCS) is a database that supplies routing information required during voice call establishment, and interacts with the Passport Remote Server Agent (RSA), which can reside anywhere in the network, and is an entry point for access to the VNCS. The Passport 4400 requires RSI, and an MSM Profile. Although Passport 4400 and Passport Voice interworking is not supported in this release, the above elements are required for Passport 4400 to Passport 4400 voice 'overlay' as well. Please refer to NTP 241-7001-410, Passport Voice Networking User Guide, and NTP 241-7001-180, Passport Remote Server Agent User Guide.

End-to-End Management IP Connectivity Configuration Example

In this example, for the purposes of simplification, Passport PANL and Passport ILS services are provided by a single Passport. No LAN routing protocols are implemented (the Passport with PANL Service providing WAN link connectivity to 4400 and the Passport ILS providing NMCR functions could be separate as well, with RIP, OSPF and export policies implemented). The management subnet 10.10.10.0 has been assigned for both Passport 4400's, and the ILS FRDTE protocol port for WAN management purposes. The subnet 10.10.11.0 has been assigned to the ILS Ethernet protocol port.

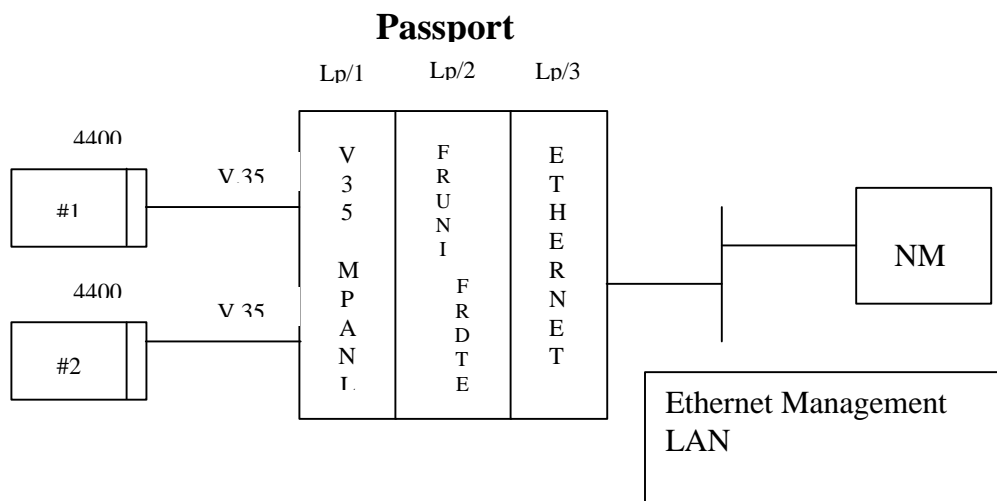


Figure 1 End-to-End Management IP Connectivity Example

Passport Software Configuration Definition:

```
>set sw avl base_BD02S3D, wanDte_BD02S3D, ip_BD02S3D,
  frameRelay_BD02S3D, networking_BD02S3D
```

```
>add sw lpt/CP
```

```
>set sw lpt/CP featureList callServer
```

```
>set lp/0 LogicalProcessorType sw lpt/CP
```

```
>add sw lpt/mpanl
```

```
>set sw lpt/mpanl featureList mpaNetworkLink, frameRelayUniPvcSvc
```

```
>set sh card/1 cardtype v35
```

```
>add lp/1
```

```
>set lp/1 maincard sh card/1
```

```
>set lp/1 LogicalProcessorType sw lpt/mpanl
```

```
>add sw lpt/framerelayhairpin
```

```
>set sw lpt/framerelayhairpin featureList frameRelayDTE, frameRelayUni,
  frsVirtualFramer, ip
```

```
>set shelf card/2 cardType v35
```

```
>add lp/2
```

```
>set lp/2 maincard sh card/2
```

```
>set lp/2 LogicalProcessorType sw lpt/framerelayhairpin
```

```
>add sw lpt/lan
```

```
>set sw lpt/lan featureList ip
>set shelf card/3 cardType 6pEth10BaseT
>add lp/3
>set lp/3 maincard sh card/3
>set lp/3 LogicalProcessorType sw lpt/lan
```

```
>ch prov
>act prov
>conf prov
```

Passport Components Definition:

```
>add CR
>add CR npi/x121
>add CR npi/X121 dna/302102
>set CR npi/X121 dna/302102 moduleId 1789
```

```
>add mpanl/1
>add lp/1 v35/0
>add mpanl/1 framer
>set mpanl/1 framer interfaceName lp/1 v35/0
>add mpanl/2
>add lp/1 v35/1
>add mpanl/2 framer
>set mpanl/2 framer interfaceName lp/1 v35/1
```

```
>add fruni/1
>set fruni/1 dna dna 30210217890200
>del fruni/1 framer
>add fruni/1 vframer
>set fruni/1 vframer lp lp/2
>add fruni/1dpci/100
>add fruni/1dpci/200
>set fruni/1 dpci/100 dc remoteDpci 16
>set fruni/1 dpci/200 dc remoteDpci 16
>set fruni/1 dpci/100 dc type permanentSlave
>set fruni/1 dpci/200 dc type permanentSlave
>set fruni/1 dpci/100 dc remoteDna 30210217895101
>set fruni/1 dpci/200 dc remoteDna 30210217896101
```

```
>add vr/1
>add vr/1 ip
>add vr/1 pp/NMCR
>add vr/1 pp/NMCR ipport
```

```
>add vr/1 pp/NMCR ippport ipLogicalinterface/10.10.10.3
>set vr/1 pp/NMCR ippport ipLogicalinterface/10.10.10.3 broadcast
  10.10.10.255, netmask 255.255.255.0
>add frdte/1
>set frdte/1 acceptundefinedlci disabled
>del frdte/1 framer
>add frdte/1 vframer
>set frdte/1 vframer lp lp/2, vof fruni/1 vframer
>add frdte/1 staticDlci/100
>add frdte/1 staticDlci/200
>set frdte/1 rg/1 linkToFrDteDlci frdte/1 stdlci/100, frdte/1 stdlci/200
>set vr/1 pp/NMCR LinkToMedia frdte/1 rg/1
>add vr/1 pp/NMS
>add vr/1 pp/NMS ippport
>add vr/1 pp/NMS ippport iplogicalinterface/10.10.11.2
>set vr/1 pp/NMS ippport iplogicalinterface/10.10.11.2 broadcast
  10.10.11.255 netmask 255.255.255.0
>add lan/1
>add lp/3 enet/0
>set lan/1 framer interface lp/3 enet/0
>set lan/1 linkToProtocolPort vr/1 pp/NMS

>ch prov
>act prov
>conf prov
>save prov
>commit prov
```

Passport 4400 Configuration:

Define the Passport 4400 #1 prefixDNA and NodeId. The prefixDNA is used during call setup:

```
>def msm profile nodeId 5
  where '5' is the <nodeid> chosen for the two Passport 4400's in this
  example
```

In this example the dna defined adheres to the following addressing convention:

```
<dnic 4 digits>
<rid 2 digits>
<mid 4 digits>
<nodeId 1 digit>
```

```
>def msm pro dn "[x.121]30210217895"
```

Setup the routing information:

```
>add ip add en 4 nn.nn.nn.nn nn.nn.nn.nn nn.nn.nn.nn
>def ip ba pa da 4 fr
>def ip in 4 ip en
>def ip invarp 4 ip en
>add ip route 10.10.10.0 4 2 10.10.11.2 255.255.255.0
```

Setup the SPVC call originating from ifIndex 4:

```
>add fr port spvc 4 100 30210217890200 master createAndGo
>sa con up
>res sys cur res
```

Restart the 4400 and ensure that the PANL link comes up and that the 4400 registers its dna_prefix for that Passport.

```
>d -p npi/x121 dna/*
```

Display the PANL SignalingMpanl component to ensure 4400 has exchanged its profile ID:

```
> d mpanl/x sigm
> d mpanl/x PrefixDna/*
```

Repeat for Passport 4400 #2, using a NodeId value of 6, and a DLCI value of 200.

Release R1.X to Release R2.0.6.003 Network Migration

Passport 4400 Release R1.X configuration data is not forward compatible. As a result, in order to upgrade to R2.0 from previous R1.X releases, once new boot code and application software has been downloaded to the alternate code bank and committed, a 'cold reset' is required. This will restore the Passport 4400 to factory default settings.

Once the unit has been restored to factory default settings, as a minimum, new configuration data to establish management IP connectivity through the Passport ILS Network Management Core Router (NMCR) is required. Once this has been accomplished, user services can optionally be remotely configured.

To minimize the requirement for synchronized cutover of the Passport 4400 and the Passport Function Processor (FP) providing PANL service, the 'PANL over Frame Relay' option can be used in conjunction with a 'Frame Relay Tunneling to PANL hairpin'. This would facilitate 'branch by branch' cutover, and allows for fallback capability as Passport Frame Relay Switched Virtual Circuits (SVC's) on the edge Passport and Permanent Virtual Circuits (PVC's) to the 'FR to PANL hairpin' can coexist on a single Frame Relay UNI Function Processor port. Only the PANL service at the hairpin location would require a PM2 FP. For following is more information specific to the Passport:

PANL Frame Relay Tunneling Physical Components

- Passport 4400 R2.0.6.003 WAN link connection to Passport PM1 or PM2 Function Processor supporting the FRUNI service.
- Passport equipped with Release P4.2.6 or greater, and PM2 Function Processor at the PANL to FRUNI hairpin location.
- Passport ILS Network Management Core Router (NMCR), equipped with function processors for FRUNI, FRDTE

PANL Frame Relay Tunneling Logical Components

- Permanent Virtual Circuit (PVC) from Passport port supporting WAN link connection to branch Passport 4400 to FRUNI service at hairpin location.
- Passport ILS UCR FRUNI DLCI with Direct Call to Passport 4400 remote prefixDNA and DLCI.
- Passport FRUNI to FRDTE virtual (or physical) hairpin connection.

The 'edge Passport' Frame Relay UNI FP does not require an immediate PM2 upgrade. In this scenario, the following R2.0.6.003 deployment sequence in an existing R1.X network is possible:

- 1 Plan Network Cutover (engineering, addressing, fanout, link speeds, redundancy)
- 2 Passport ILS Network Management Core Router (NMCR) deployment
- 3 Voice Elements deployment (RSA, VNCS)
- 4 PANL PM2 FP deployment at FR to PANL hairpin site
- 5 Passport network migration to P4.2.6 or greater

- 6 Passport Frame Relay PVC configuration (from existing edge passport FRUNI SVC service FP to FR to PANL hairpin)
- 7 Download Passport 4400 boot code and application software.
- 8 Commit Passport 4400 R2.0.6.003 application code bank and cold reset the unit.
- 9 On site, enter the Passport 4400 base configuration, (Identity, IP addresses, SPVC to Passport ILS Core Router)
- 10 Migrate the edge Passport FP's to PM2 selected ports to PANL to support branch/edge passport cutover from Frame Relay Tunneling to PANL hairpin to PANL service on edge Passport.

16MB DRAM Installation Instruction

This instruction sheet is intended to guide you through the installation procedure for the 16 Megabyte DRAM SIMM (A0662646) into the Passport 4400 Ethernet Base Module (NTAU01AA).

Table 2 16MB DRAM Installation Instruction

STEP	INSTRUCTION
1	Disable and/or disconnect power source (AC or DC) to unit
2	Remove four (4) each cover screws [two (2) on each side] from unit
3	From the unit backside, slide cover back then lift cover off unit and put aside.
4	Remove screws affixing Expansion Module rear panels and Blank panels to chassis (if no Expansion modules are present, go to Step 6).
5	Remove plastic retainer(s) (see Figure 1) from chassis by lifting up then pulling out (Redundant units will require loosening front panel "L" brackets in order to remove top retainer). Carefully lift Expansion Module up and out (avoid excessive bending). Repeat this step until Base Module is uncovered.
6	Gently push J6 Connector Locking Flanges (see Figure 1 and 2) outward and remove existing (8 Megabyte) DRAM SIMM .
7	Install 16 Megabyte DRAM SIMM into J6 Connector
8	Re-install E21 and E23 (Bank Depth) Jumpers into 4M position (see Figure 2 for location). Both E21 and E23 have two jumpers each.
9	Re-assemble unit in reverse order from Step 5 (i.e. re-install Expansion Modules and plastic retainers, tighten "L" brackets if unit is Redundant, fasten rear and blank panels using screws, re-install unit cover and fasten to chassis sides using screws and reconnect and/or enable power source.

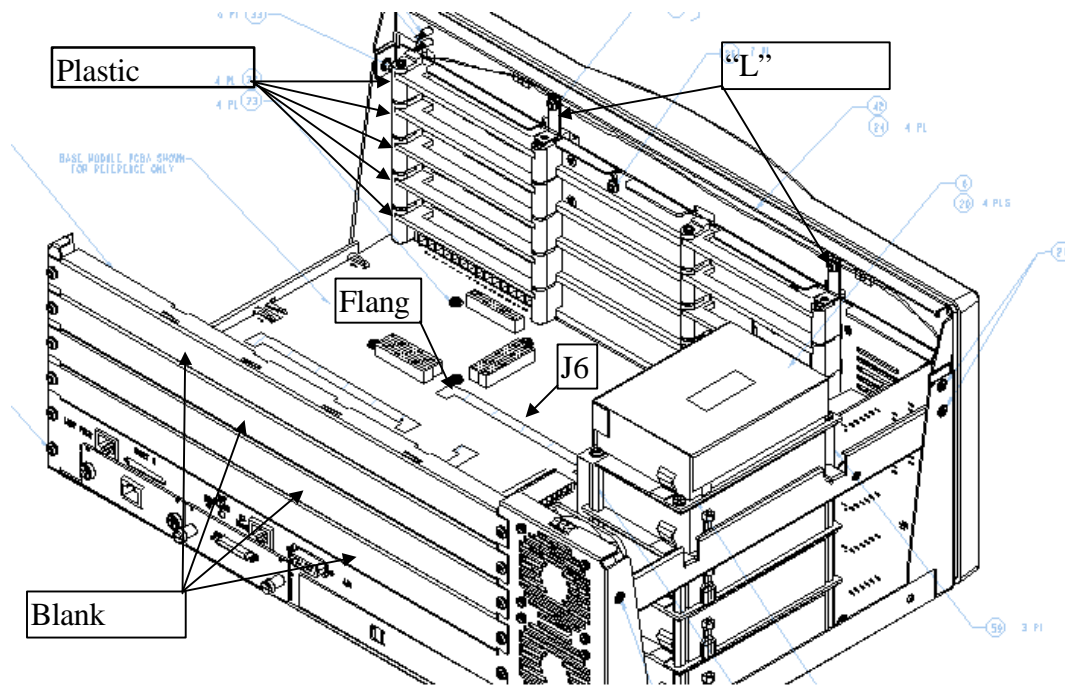


Figure 2 Back View of Passport 4400

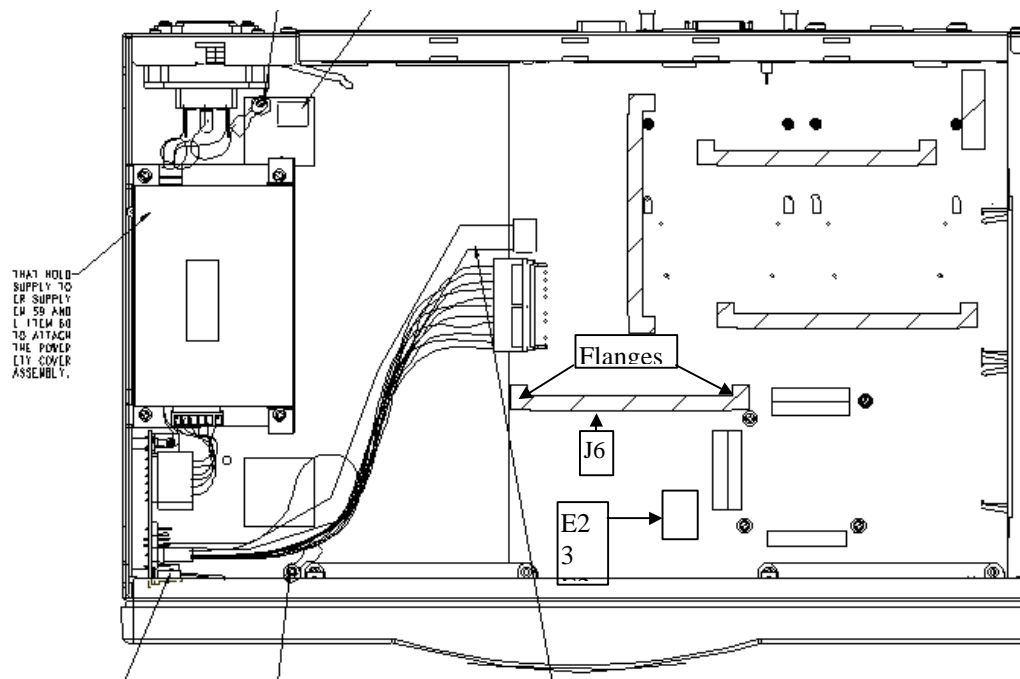


Figure 3 Top View of Passport 4400

Runtime TFTP Software Download

Software Download is part of the future Passport 4400 network management functionality, but can also be initiated from the Passport 4400 Command Line Interface (CLI). Installation is part of the standard Passport 4400 remote site installation and initial configuration process. Runtime TFTP software download requires TFTP configuration on the workstation, and a properly configured Passport ILS Network Management Core Router to provide management IP connectivity to Branch Passport 4400's.

TFTP Download Server Setup

The download server is a TFTP daemon running on an NMS or other workstation. It must be configured to run in secure mode, and be provided with the name of the directory where the software resides. This directory should not contain anything other than the software for download, as everything in it is available to any user on the network who knows how to use TFTP. TFTP does not provide any password protection of the data. (for information on the TFTP server see "man tftp") To set up the TFTP server, do the following:

- 1 Login as root, and edit the /etc/inetd.conf file.
- 2 Find the line that starts with "#tftp dgram" and remove the comment character (#) from the beginning of the line.
- 3 Then change the directory specified at the end of the line from "/tftpboot" to "/opt/MagellanPASSPORT 4400/software".
- 4 Reboot the workstation after saving the changes.

Note: If the line is already uncommented, it means the workstation is already serving as a TFTP server. You will either need to find another workstation, or use the directory already specified. If you choose to use the directory already specified, the files used by the other system must not conflict with the naming conventions for Magellan PASSPORT 4400 Software. We recommend using a different workstation to reduce the chance of conflicts.

Boot Menu Software Installation

The Passport 4400 is equipped with a 'Boot Menu' and is intended for use only by Nortel manufacturing or customer support personnel for debugging purposes. An example of debug FTP software installation via the boot menu is provided below. A TFTP server is not required on the download host, however an FTP daemon or process must be available, since the file transfer uses FTP.

The target Passport 4400 and software distribution site must be connected to the same LAN subnet. Information shown within square brackets represents the boot menu defaults. Entering the information followed by a carriage return makes changes to the information within brackets (shown immediately after brackets). In cases where there is no information shown after the square brackets, then this information is not mandatory for software installation. Note that if a LAN gateway does NOT exist between the software distribution site and the target PASSPORT 4400, a period (.) is required after the 'gateway address' prompt.

Installation

1. View Current Software Status
 2. Install New Software
 3. Install New Bootrom
 4. Enter Debug Menu
 5. Exit (Autoboot)
-

selection -> [1] 2

Install New Software Image

Bank 2 has been selected.

.host name -> [wc]
.host address -> [198.48.9.34] 131.147.140.33
.file name -> [/tmp/oscar/mpa.bld]
/opt/Magellan/software/pr111001/pr111001.bld
.target name -> [mpa]
.target address -> [198.48.9.20:FFFFFF00] 131.147.140.34
.gateway address -> [] .
.user login -> [atlas] myuserid
.user password -> [atlas] mypassword

Network Parameters

boot device : qu
processor number : 0
host name : wc
file name : /opt/MagellanMPA/software/pr111001/pr111001.bld
inet on ethernet (e) : 131.147.140.34:fffffe0
host inet (h) : 131.147.140.33
user (u) : myuserid
ftp password (pw) : mypassword
flags (f) : 0x0
target name (tn) : mpa

Proceed with S/W installation? [yes]

TFTP Configuration Backup

The Passport 4400 configuration file can be uploaded to a host machine running TFTP server code for backup purposes. A backup configuration file can then be downloaded to a Passport 4400 unit for reconfiguration.

For security purposes on the TFTP server, you may want to store backup configuration files in a separate directory from boot and application code images. The directory for backup configuration files must be both read and write accessible.

An alternative security measure is to specify a particular port or socket on the TFTP host machine through which to perform configuration backups.

There are two methods that can be used to accomplish a TFTP configuration backup:

1. **Upload base configuration default**
2. **Upload base configuration specific**

Each of these methods has its own advantages depending on your application environment. Using the default method, the TFTP parameters must be configured for Server IP address and Remote File Name. There's a 3rd command that's optional in the TFTP parameter group called **ConfigUploadBank**. This command may be used to set bank3 or bank4 as the configuration bank to be uploaded to the TFTP Server. If this optional command is not used, the configuration code that will be uploaded is the active code. The syntax for this command is set tftp upload configbank bank3 | bank4.

Note: you can upload configuration files from only one Passport 4400 at a time.

The following tables show procedures used to perform TFTP Configuration Backup. The two methods are **upload base configuration default** and **upload base configuration specific**. Notice that Table 3 shows procedures for upload by default, table 4 shows procedures for download by default, Table 5 shows upload by specific and Table 6 shows download by specific. You can combine tables 3 and 4 and Tables 5 and 6 as they were shown this way for illustration purposes only.

Although the upload and download commands are shown separate, it must be understood that the **upload** command must occur first in order to have a file a configuration file to download.

It is not permitted to have the configuration file name the same as the boot or image code file name in the TFTPboot directory on the server. If this occurs, then the configuration file would overwrite the boot or image code file. You can store the configuration uploaded file in a separate directory on the TFTPboot server.

The **set tftp uploadconfigure bank3 | bank4** command is optional. It is used to identify which bank will be uploaded. If this command is not used, the uploaded configuration bank would be the active configbank.

Table 3 Configuration Upload Default Mode

PROCEDURE	DESCRIPTION
UPLOAD DEFAULT MODE	
SETUP PASSPORT 4400	
bang>> add ip add ent 3 199.30.26.207 255.255.255.0 255.255.255.255	Enter the LAN IP address of the Passport 4400. In this case, the IP address is located in the same subnet.
bang>> save configuration update	Save the configuration.
bang>> reset system current reset	Reset the Passport 4400. Reset causes the system to accept the current configured values
bang>>set tftp serveripaddress 199.30.26.207	Enter the IP address of the UNIX or PC workstation that has TFTP installed and to which you want to upload configuration files for backup.
bang>>set tftp remoteFileName "config1"	Enter the filename you want to give the configuration file on the TFTP server. Do not use the file name of the image or boot code. Remember to enclose the filename within quotation marks. If you need to specify the path in which to locate the file, include the path inside the quotation marks also.
bang>>set tftp uploadconfigbank bank3	Enter the number of the Passport 4400 configuration bank from which you want to upload the configuration file for backup on the TFTP Server. If you choose not to use this command, the upload will occur on the active configuration bank.
MONITOR	
bang>>show tftp parameter	<pre>ServerIPAddress : 199.30.26.207 (operational) : 199.30.26.207 (configured) RemoteFileName : "config1" (operational) : "config1" (configured) Make sure the Remote File Name for configuration is different than the File named used for the image file to be uploaded. If the file names are the same, you will overwrite the image file.</pre>
bang>>show sys firm	<pre>OperationType : accessRouter CommitConfigBank : bank3 ConfigSaveBank : bank4 ActiveConfigBank : bank3 ConfigReadBank : bank3 CodeReadBank : bank1 CommitCodeBank : bank1</pre> <p>Note which config bank that is active.</p>
TFTP HOST SERVER SETUP	
Set up TFTP Server software	Set up TFTP server on same subnet as Passport 4400. If not on same subnet, use appropriate gateways.
Set up PC or UNIX with tftpboot directory shown	Use any tool, such as Windows Explorer, and display tftpboot dir. This directory will be used to observe that the upload of the configuration file actually occurred.

PROCEDURE	DESCRIPTION
EXECUTE	
upload base config default	Enter the command to upload the configuration file using the default option. The Command Successful message will appear and the upload will begin. The Command Successful message does not mean that the upload was successful; it only means that the command syntax was correct.
MONITOR	
show tftp state	To monitor the status in-progress of the upload. State : transfer in progress
show tftp error	To monitor the status and progress of the upload. LastOperStatus : retrieving-file ServerIPAddr : 199.30.26.207 FileName : "config1" TransferBank : fromBank3 PortNumber : 69
After the upload is complete, you should be able to use the appropriate directory display commands on the TFTP host to verify that a backup copy of the configuration file uploaded from the Passport 4400 exists in the specified tftpboot directory on the TFTP Server.	

Table 4 Configuration Download Default Mode

PROCEDURE	DESCRIPTION
DOWNLOAD DEFAULT MODE	
PASSPORT 4400 SETUP	
bang>> add ip add ent 3 199.30.26.207 255.255.255.0 255.255.255	Enter the LAN IP address of the Passport 4400. In this case, the IP address is located in the same subnet.
bang>> save configuration update	Save the configuration.
bang>> reset system current reset	Reset the Passport 4400. Reset causes the system to accept the current configured values
bang>>set tftp serveripaddress 199.30.26.207	Enter the IP address of the UNIX or PC workstation that has TFTP installed and to which you want to upload configuration files for backup.
bang>>set tftp remoteFileName "config1"	Enter the filename you want to give the configuration file on the TFTP server. Do not use the file name of the image or boot code. Remember to enclose the filename within quotation marks. If you need to specify the path in which to locate the file, include the path inside the quotation marks also.
MONITOR	
bang>>show tftp parameter	ServerIPAddress : 199.30.26.207 (operational) : 199.30.26.207 (configured) RemoteFileName : "config1" (operational) : "config1" (configured) Make sure the Remote File Name for configuration is different than the File named used for the image file to be uploaded. If the file names are the same, you will overwrite the image file.
bang>>show sys firm	OperationType : accessRouter

PROCEDURE	DESCRIPTION
	CommitConfigBank : bank3 ConfigSaveBank : bank4 ActiveConfigBank : bank3 ConfigReadBank : bank3 CodeReadBank : bank1 CommitCodeBank : bank1 Note which config bank that is active.
TFTP HOST SERVER SETUP	
Set up TFTP Server software	Set up TFTP server on same subnet as Passport 4400. If not on same subnet, use appropriate gateways.
Set up PC or UNIX with tftpboot directory shown	Use any tool, such as Windows Explorer, and display tftpboot dir. This directory will be used to observe that the upload of the configuration file actually occurred.
The configuration file has been uploaded procedures in Table 3	
EXECUTE	
download base image default	The configuration file named "config1" residing in TFTP Server, TFTPBOOT directory will be downloaded to Passport 4400.
PASSPORT 4400 MONITOR	
show tftp state	To monitor the status and progress of the upload. State : transfer in progress
show tftp error	To monitor the status and progress of the download. LastOperStatus : retrieving-file ServerIPAddr : 199.30.26.207 FileName : "config1" TransferBank : toBank3 PortNumber : 69

Table 5 Configuration Upload Specific Mode

PROCEDURE	DESCRIPTION
UPLOAD SPECIFIC MODE	
SETUP PASSPORT 4400	
bang>> add ip add ent 3 199.30.26.207 255.255.255.0 255.255.255.255	Enter the LAN IP address of the Passport 4400. In this case, the IP address is located in the same subnet.
bang>> save configuration update	Save the configuration.
bang>> reset system current reset	Reset the Passport 4400. Reset causes the system to accept the current configured values
bang>>set tftp uploadconfigbank bank3	Enter the number of the Passport 4400 configuration bank from which you want to upload the configuration file for backup on the TFTP Server. If you choose not to use this command, the upload will occur on the active configuration bank.
MONITOR	
bang>>show tftp parameter	ServerIPAddress : 199.30.26.207 (operational) : 199.30.26.207 (configured)

PROCEDURE	DESCRIPTION
	RemoteFileName : "config1" (operational) : "config1" (configured) Make sure the Remote File Name for configuration is different than the File named used for the image file to be uploaded. If the file names are the same, you will overwrite the image file.
bang>>show sys firm	OperationType : accessRouter CommitConfigBank : bank3 ConfigSaveBank : bank4 ActiveConfigBank : bank3 ConfigReadBank : bank3 CodeReadBank : bank1 CommitCodeBank : bank1 Note which config bank that is active.
TFTP HOST SERVER SETUP	
Set up TFTP Server software	Set up TFTP server on same subnet as Passport 4400. If not on same subnet, use appropriate gateways.
Set up PC or UNIX with tftpboot directory shown	Use any tool, such as Windows Explorer, and display tftpboot dir. This directory will be used to observe that the upload of the configuration file actually occurred.
EXECUTE	
upload base config specific 199.30.26.207 "config1"	Enter the IP address and configuration file name of the UNIX or PC workstation that has TFTP installed and to which you want to upload configuration files for backup.
MONITOR	
show tftp state	To monitor the status in-progress of the upload. State : transfer in progress
show tftp error	To monitor the status and progress of the upload. LastOperStatus : retrieving-file ServerIPAddr : 199.30.26.207 FileName : "config1" TransferBank : fromBank3 PortNumber : 69
After the upload is complete, you should be able to use the appropriate directory display commands on the TFTP host to verify that a backup copy of the configuration file uploaded from the Passport 4400 exists in the specified tftpboot directory on the TFTP Server.	

Table 6 Configuration Download Specific Mode

PROCEDURE	DESCRIPTION
DOWNLOAD SPECIFIC MODE	
PASSPORT 4400 SETUP	
bang>> add ip add ent 3 199.30.26.207 255.255.255.0 255.255.255.255	Enter the LAN IP address of the Passport 4400. In this case, the IP address is located in the same subnet.
bang>> save configuration update	Save the configuration.
bang>> reset system current reset	Reset the Passport 4400. Reset causes the system to accept the current configured values
bang>>set tftp serveripaddress 199.30.26.207	Enter the IP address of the UNIX workstation that has TFTP installed and to which you want to upload configuration files for backup.

PROCEDURE	DESCRIPTION
bang>>set tftp remoteFileName "config1"	Enter the filename you want to give the configuration file on the TFTP server. Do not use the file name of the image or boot code. Remember to enclose the filename within quotation marks. If you need to specify the path in which to locate the file, include the path inside the quotation marks also.
bang>> save configuration update	Save the configuration for TFTP download parameters.
MONITOR	
bang>>show sys firm	<pre> OperationType : accessRouter CommitConfigBank : bank3 ConfigSaveBank : bank4 ActiveConfigBank : bank3 ConfigReadBank : bank3 CodeReadBank : bank1 CommitCodeBank : bank1 Note which config bank that is active. </pre>
TFTP HOST SERVER SETUP	
Set up TFTP Server software	Set up TFTP server on same subnet as Passport 4400. If not on same subnet, use appropriate gateways.
Set up PC or UNIX with tftpboot directory shown	Use any tool, such as Windows Explorer, and display tftpboot dir. This directory will be used to observe that the upload of the configuration file actually occurred.
The configuration file has been uploaded procedures in Table 5	
EXECUTE	
download base image specific 199.30.26.207 "config1"	The configuration file named "config1" residing in TFTP Server, TFTPBOOT directory will be downloaded to Passport 4400.
PASSPORT 4400 MONITOR	
show tftp state	To monitor the status and progress of the upload. State : transfer in progress
show tftp error	To monitor the status and progress of the download. LastOperStatus : retrieving-file ServerIPAddr : 199.30.26.207 FileName : "config1" TransferBank : toBank3 PortNumber : 69

Passport 4400 Link Frame Size Value

The link level frame size is configurable on the Passport 4400. The frame size chosen on the Passport 4400 should take into account the physical link speed, or, if tunneling through a public frame relay network, the Traffic Information Rate (TIR) used on the Passport PANL service should be considered. The default link level frame size on the Passport 4400 is 80 bytes, which is acceptable for a 64kbps link. A simple rule to follow is to increase the link frame size by 80 bytes for each 64kbps increment of bandwidth on the link. For example, use 160 bytes for a 128kbps link speed, 240 bytes for a 192kbps link speed and so on. Failure to set the frame size properly may cause poor throughput

performance (if set too small), or voice quality degradation (if set too large).

PANL Frame Relay Tunneling

When operating in a tunneled configuration the 4400 may experience voice quality degradation if the Passport 4400 link level Traffic Information Rate (TIR) is set to be less than the physical link speed. For example, consider the case where the link speed is 2 Mbps, with one voice call up, and one FR DCE call using a CIR of 64 Kbps. The Passport 4400 link level TIR is set to 64kbps. If the FR DCE port sends a full 64 Kbps to the link, it will be transmitted at the line rate (i.e. at 2Mbps) in one burst lasting approx. 31 ms. This will block the voice samples from being transmitted and cause the samples to be queued until one second has passed, while the TIR mechanism allows more transmissions to occur. In order to prevent degradation of voice quality from occurring, it is recommended that the Passport 4400 link level TIR always be set to the same value as the link physical speed when operating in tunneled mode. When configuring the Passport PANL service for frame relay tunneling mode, this issue does not occur. In other words there is no requirement that the Passport PANL TIR be set to be the same as the WAN link speed.

Voice Call Transfer Priority

Voice calls may have a lower discard priority that is less than data calls. The discard priority that is signaled by the 4400 at call setup time is provisional via VNCS. It is possible to set the Transfer Priority for a voice call to be less than 11. This is not recommended since the voice traffic may encounter unacceptable levels of delay, which may cause severe voice quality degradation.

Passport 4400 Voice over Passport ATM Trunks

As per the Passport frame relay SVC multimedia traffic class feature, transfer priority 11 (TP11) is used for SVC's carrying Passport 4400 voice traffic across the Passport WAN. This Routing Class of Service (RCOS) is NOT maintained if the voice call traverses a Passport ATM trunk. The voice call is established, however at the ATM trunk egress points, the data will become more sensitive to delay and delay variance in the rest of the Passport network..

Passport Trunk Transmit Queue Starvation

As Passport 4400 voice traffic traverses the Passport network backbone, it uses the highest priority interrupting trunk transmit queue (transfer priority 11) a capability provided by the Passport MMTC feature, which is a mandatory prerequisite to Passport 4400 deployment. In situations in which interrupting traffic offered to the network greatly exceeds capacity, it is possible that trunk transmit queue starvation of traffic in lower queues can occur impacting frame relay LMI and routing table control messages. This

situation could cause trunk and LMI failure, resulting in traffic re-routing, potentially further compounding the situation. A number of Passports traffic management robustness enhancements are being introduced in phases, beginning in Passport Release P4.2.

Traffic Prioritization

The transfer priority of the each of the following types of connections is configurable via operator command on the 4400. The discard priority is signaled during call setup is configurable on the 4400 via operator command.

- LAN overlay connection (e.g. from one 4400 to another 4400 for LAN data).
- LAN interworking connection (e.g. from 4400 to Passport ILS for LAN data).
- A frame relay (or HTDS) connection (e.g. for a FR DTE connected to the 4400 FR DCE port that sets up a call to a second 4400 FR DCE port).

The total number of voice calls on a link is controlled by the Voice Call Admission Control (CAC) on the 4400. The CAC works by reserving bandwidth for each voice call, until the maximum amount of bandwidth reserved for voice calls is used up. The maximum amount is set via provisioning.

Command Line Interface (CLI)

The CLI was originally intended for use as an initial Passport 4400 commissioning tool, prior to Network Management connectivity being established.

CLI is an alternative to the NMS configuration and surveillance, the preferred method. As such, alarm indications or extensive semantic checks are not provided. SET commands entered at the CLI will dynamically affect modified attributes. ADD and DEFINE commands typically change the attributes only upon reset.

PC based NetTool

NetTool

Version 1.0 for Passport 4400

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NetTool will provide Nortel and Micom installation personnel a simple and convenient method of provisioning a new or replacement of Passport 4400 at the customer site. NetTool will quickly allow installers to perform the minimal provision and check the results to ensure that the NMS can successfully complete the provisioning from the Network Management Center.

Features:

- Supported platforms: Windows 95 and Windows NT 4.0
- Supported COM ports: 1,2,3,4
- Supported communication parameters: 9600, 8, N, 1
- Support for all four Passport 4400 link types: Serial, ISDN (dial-up, leased lines), T1 CSU, and 56K CSU
- Enhanced faster display
- Terminal Emulator is included for additional viewing and provisioning capabilities
- Automatic primary link hardware detection. Upon login, the user will be presented with the menu for the correct hardware installed for the primary link
- Ability to set the Passport 4400 to factory default configuration
- Ability to save or restore provisioning to/from a file.

Statistics/Accounting

At this time, the Passport 4400 does not gather or spool statistics that can be used for network engineering purposes and problem analysis. Spooled Passport frame relay statistics can be gathered using the Magellan Data Provider (MDP) application available as part of Magellan NMS software when it becomes available.

WAN Link Physical Interface

The WAN interface can only function on physical port 2, which is the first PCMCIA (WAN Serial Interface Module) interface on the Passport 4400 rear panel, the integral CSU/DSU or the ISDN S/T and U interface.

WAN Link Cable Maximum Length

The WAN link cable between Passport 4400 and Passport, when used in conjunction with shielded extension cables, to facilities or Passport function processors must not exceed a combined length of 50 feet.

WAN Link High Speed Clocking

For high speed V.35 WAN link connections to Passport V.35 function processors, it is recommended that the Passport PANL interface port be configured for DTE clock source. This attribute can be observed by issuing the Passport command “d -p Lp/<LP> V35/<Port>”. This is NOT required or applicable to V.11 WAN link connections to Passport V.11 function processors.

Speech Activity Detection

The Speech Activity Detection feature, (SAD) is enabled by default but can be disabled using the Command Line Interface (CLI) in this release. It is strongly recommended that SAD remain enabled for Passport 4400 to Passport 4400 voice services, as engineering impacts include increased link and CPU utilization.

Incorrect Power Failure Trap

In the factory, power supplies are balanced to support the specific module configuration. If voice modules are removed from a chassis, with only the Ethernet Base Module remaining, a jumper setting is required and a power supply harness must be removed to eliminate an erroneous power failure condition, which will be reported to the NMS. For additional information, consult NTP 800-1951-20, *Hardware Installation Guide*.

TAM/EAM Unsupported Ports Configurable

In this release, although the TAM/EAM digital voice cards are equipped with two ports, only the DSX-1 port is supported for connection to a PBX. Network connections are not supported. The unsupported port option is displayed in CLI, under the commands ‘set t1e1 line’, although the port is unsupported.

Network Management Considerations

NMS Connectivity to Passport 4400

NMS workstation physical connectivity for the purpose of managing both Passport 6400 and Passport 4400 can either be distinct and separate or via a single Frame Relay interface. As the primary means of NMS connectivity for Passport 6400, is a Frame Relay connection. It is possible to manage both the Passport 4400 and the Passport 6400 with the existing physical connection to a Passport FRUNI interface with existing PVC's to the IPIFR component on Passports in the network. A new PVC can be configured from this

FRUNI to another FRUNI on a Passport ILS node providing a Passport 4400 Network Management Core Router (NMCR) function via virtual hairpin to the Passport ILS FRDTE service. Since SUN frame relay does not respond to inverse arp requests through the Frame Relay Interface, an arp host entry with PVC association on the Passport ILS NMCR is required. Since Passport 4400 static arp entries can't be mapped to PVCs as they can be with Passport, two subnets are required. IP connectivity to a Passport ILS Network Management Core Router supporting branch Passport 4400's is established via IP, through IP addresses assigned to the NMS workstation and Passport 4400 IfTable Index 4. Typically a WAN subnet is logically separated from end customer IP address space, and is used strictly for NMS connectivity (hence management traffic) purposes. If there is a requirement for the NMS workstation to be connected to a corporate LAN, and also directly to a Passport 4400 NMCR via a separate IP subnet, then multiple Ethernet interfaces are a workstation requirement.

NMS workstation connectivity for the purposes of managing Passports is distinct and separate from Passport 4400, and is typically achieved via IP over X.25 or IP over Frame Relay. This requires X.25 or Frame Relay software to be installed and operational on the NMS workstation.

Engineering Considerations

Following is an overview of Passport 4400 engineering considerations.

A properly engineered Passport network is required for WAN transport of Passport 4400 traffic. Taking into account considerations such as the number of branches, traffic classes, routing, trunk load versus bandwidth available, other traffic types in the network, link speeds, fanout, discard priority, rate enforcement, rate adaptation, services per function processor, and redundancy.

Passport ILS Core Router Fanout

A number of factors determines the number of branches which can be supported by the Passport ILS NMCR, including the service mix on the Passport ILS NMCR FP running the FRUNI service, whether the FP is PM1 or PM2. Please consult Passport Engineering guidelines for further information.

Maximum Voice Channels per Passport 4400

The maximum number of combined simultaneous digital and analog voice channels supported on a single Passport 4400, with SAD enabled, is 30.

Bandwidth and Throughput Required per Voice SPVC

Each SPVC carrying voice traffic requires 10.4 Kbps. The frame consists of 20 bytes of voice payload + 6 bytes overhead = 26 bytes. Each voice channel will require 40 pps throughput.

Chapter 4

Passport 4120 and Passport 4400 LDM

Software release history Passport 4120 and Passport 4400 LDM

The table below documents all releases of Passport Legacy Access software. The software is applicable for both products: Passport 4120 (PP4120) and Passport Legacy Data Module on the Passport 4400 (PP4400 LDM). In addition, the software is also applicable for the existing MAS-6X post G3603. Special mention will be made wherever a software component applies only to a specific product.

Note: Gaps that may appear in the numbering in the table below are due to internal builds for testing purposes only. These levels were never released.

Software Release History

Package	Release Name	Release Type	Notes
R1.0	6001	RSUP	PP4400 LDM Gate 2 release
R1.1	6004	RSUP	PP4120 Gate 2 Release
R1.2	R0120	RSUP	PP4120 and PP4400 LDM Gate 3 Release
R1.3 (Current Release)	R0130	RSUP	MTCE Release for R1.2

Installation procedures

For loading software using NMS, refer to NTP 241-6001-304, *NMS Architect Administrator Guide*.

For installing or commissioning a Passport 4400 LDM, refer to NTP 800-1951-20 *Passport 4400 hardware installation manual*.

For installing or commissioning a Passport 4120, refer to NTP 241-8101-100, *Passport 4120 User Guide*.

Product release table

The PP4120 and PP4400 LDM release R1.3 performs in conjunction with the software levels listed below.

Passport Legacy Access Release R1.3 Compatibility Table

Product	Software Release
Passport 4400:	R2.x
Passport:	R4.2.7 (see exceptions in Chap. 4)
DPN:	G3603 or later
NMS:	R10.7
DPN NCS:	G3603 or later
Ethernet PI F/W:	eth3image_3_7.fimg

List of Relevant NTP References

Volume 1, Getting Started

241-8101-010, *Passport 4120 Services Provisioning Guide*, R1.2.

241-8101-100, *Passport 4120 User Guide*, R1.2.

241-8101-300, *Passport 4120 Commands*.

Volume 2, Hardware Installation & Maintenance

241-1001-161, *T2.1 Router User Guide*, G36.03.

241-1001-162, *T2.1 Router Specification*, G36.03.

Volume 3, Fault Management (part 1 of 2)

241-1001-506, *Alarm Console Indications - Volume 1*, G36.03.

241-1001-506, *Alarm Console Indications - Volume 2*, G36.03.

Volume 4, Fault Management (part 2 of 2) and Configuration Management

241-1001-506, *Alarm Console Indications - Volume 3*, G36.03.

241-2001-102, *Network Control System User Guide*, G36.03.

241-2001-351, *DPN-100 Network Control System Operations and Maintenance*, G36.03.

241-1001-015, *Network Link and Trunk User Guide*, G36.03.

PP4120 / PP4400 LDM R1.3 Release Supplement 1.0

Volume 5, Reference Guides (Part 1 of 7)

241-1001-303, *Operator Commands and Responses - Volume 1*, G36.03.

241-1001-303, *Operator Commands and Responses - Volume 2*, G36.03.

241-1001-303, *Operator Commands and Responses - Volume 3*, G36.03.

Volume 6, Reference Guides (Part 2 of 7)

241-1001-303, *Operator Commands and Responses - Volume 4*, G36.03.

241-1001-303, *Operator Commands and Responses - Volume 5*, G36.03.

241-1001-303, *Operator Commands and Responses - Volume 6*, G36.03.

Volume 7, Reference Guides (Part 3 of 7)

241-2001-340, *Envelope Definitions - Volume 1*, G36.03.

Volume 8, Reference Guides (Part 4 of 7)

241-2001-340, *Envelope Definitions - Volume 2*, G36.03.

Volume 9, Reference Guides (Part 5 of 7)

241-2001-340, *Envelope Definitions - Volume 3*, G36.03.

Volume 10, Reference Guides (Part 6 of 7)

241-2001-340, *Envelope Definitions - Volume 4*, G36.03.

Volume 11, Reference Guides (Part 7 of 7)

241-2001-340, *Envelope Definitions - Volume 5*, G36.03.

Volume 12, Access Service Guides (Part 1 of 2)

241-1001-120, *Frame Relay Service User Guide and Specification*, G36.03.

241-1001-170, *Q.931 and Demand-Established B-Channel User Guide*, G36.03.

PP4120 / PP4400 LDM R1.3 Release Supplement 1.0

241-1001-125, *SNA Multihost and LU Multiplexing User Guide*, G36.03.

241-1001-174, *Token-Ring SNA PAD Specification*, G36.03.

241-1001-018, *Asynchronous Service Provisioning User Guide*, G36.03.

241-1001-317, *X.25 Gateway User Guide*, G36.03.

Volume 13, Access Service Guides (Part 2 of 2)

241-1001-158, *HDLC Transparent Data Service User Guide*, G36.03.

241-1001-160, *SNA Transparent PAD (XPAD) User Guide*, G36.03.

241-1001-163, *Token-Ring SNA PAD Service User Guide*, G36.03.

241-1001-164, *Token-Ring Intelligent Source Routing Bridge Service User Guide*, G36.03.

241-1001-175, *Token-Ring Intelligent Source Routing Bridge Specification*, G36.03.

241-1001-184, *LAPB/X.25 Specification*, G36.03.

Features available in Release R1.3

This chapter presents a summary of the features and enhancements that were delivered with the Passport 4120 and Passport 4400 LDM R1.3 software release.

- BTDS - released for trial (G2)

Release Considerations

General release considerations

Passport 4120 and LDM Release R1.3 is considered an extension to the previous release R1.2. There are no special steps to perform a migration from R1.2 to R1.3.

This release of PP4120 and PP4400 LDM software supports MAS model 6X devices that are in the field today.

Other Release Considerations and Limitations

HTDS

PP4120 Release R1.3 only supports the configuration of WAN connection using UTP. WAN connection using PANL is not supported.

Ethernet Interface

Interoperability with PP4400 for IP applications is achieved through Passport ILS. The current Ethernet release on the PP4120 does not support Inverse ARP and, therefore, static ARP entries are required to support interworking with the PP4120 IP stack.

OA & M Support

Passport centric networks still require a CSRM for record routing to enable PP4120 to support OA&M record spooling.

Discrepancies being tracked

JVC calls not clearing after PP4120 reset/restart

When a PP4120 is restarted the reset occurs so fast that a Passport does not detect the loss of the modem lead. Also it appears that the JVC calls at the PP-PANL are not cleared. The PP4120 comes back up, sets up its internal calls again establishing new JVCs while the old JVCs are still intact. This discrepancy is being tracked under SR # 30005425.

Missing Functionality in PANL

The PP4120 PANL service does not signal to Passport PANL the "dteReceiverBW" or "MaxFrameSize" attributes as described in the PANL protocol design specification. This information forms part of the supplementary association IE. Without this information the PANL setup on the Passport always runs with default values.

This discrepancy is being tracked under SR # 30005458.

Allow download of image while in RDS mode

If a MAS model 6X is running installation service data, a software Download is not possible if the software distribution tool is operating in RDS mode. This discrepancy is being tracked under SR # 10111387.

Alarms 20234038, 20233015 rejected by NMS

Two alarms, 20234038 and 20233015, are rejected by NMS server DMDR because they have an invalid severity code of 1. Valid codes are in the range of 2 to 6. The impact of this is that the customer will not see these alarms in the NMS Alarm Display. This discrepancy is being tracked under SR # 10129234.

Release R1.3 software update items

The following is a list of items, which are resolved in this release.

MPA IEs must be optional in setup message

The X.36 signaling part of the PANL service was expecting that every incoming call setup request would contain at least 1 PANL IE.

This update makes PANL IEs optional in the call setup request.

This item was resolved under SR # 10161230.

ISRB

PP4120 Release R1.3 only supports ISRB connections when the connection into the subnet from each end is using the same protocol, either UTP or PANL. Mixed types, i.e. one end with UTP, the other end with PANL, is not supported. The IFRG service can be used in conjunction with ISRB to allow interworking between a UTP and PANL device. This item was resolved in Passport release 5.0 under SR #10154274 PANL Backup JVC calls fail to be re-established on PANL tunneling through FR network after the primary direct connected PANL link is down.

This item was resolved in Passport release 4.2.8 under SR # 30005418.

PANL Backup

JVC calls fail to be re-established on PANL tunneling through FR network after the primary direct connected PANL link is down.

This item was resolved in Passport release 4.2.8 under SR # 30005418.

Service data activation times out

Activation of changes to X.25 service data times out when MAS model 6X is running frame relay traffic at 19.2K, causing rollback to committed MCF.

This was resolved under SR # 10109260.

Local and Remote loopbacks for PP4120

This update fixes the following missing functionality reported by SR # 10077962.

*V.35 loopback testing was not addressed

*Test result display was incorrect for local and remote tests

*Port 3 loopback issues were not resolved

This item was resolved under SR # 10126945.

ISRB Proxy Frame Timer for Netlogon

The expiry timer for Netlogon frames in ISRB was 2.5 minutes. As Netlogon frames were only sent from customer applications at 5 minute intervals, when the Netlogon Proxy timer expired, the Netlogon proxy frames were removed from the proxy table. This in effect disabled the proxy function for Netlogon frames and caused unnecessary traffic flowing through the network.

This item was resolved under SR # 10169665

The disable port command prevents PI coming up

Disabling the ethernet PI port prevented the PI from ever coming up. The PI now re-initializes after the port has been re-enabled allowing the PI to come up normally.

This item was resolved under SR # 10140543

Port test for Async did not allow 28800,14400,3840

Previous releases of the ACCGFELX software image did not allow for speeds

of 38400, 28800, or 14400 bps with the < pi> < port> async loop back operator command.

This item was resolved under SR # 10110203

CRC error occurred during BTDS DCE data integrity testing

The FR port detected CRC errors when BTDS DCE port was connected to verify data integrity.

This item was resolved under SR # 10176110

Installation Service Data change for PP4120 image

Port 5 on PP41ISD was changed to UTP, 38400 bit/sec, DTE from X25, 19200 bit/sec, DTE.

This item was resolved under SR # 10181643

DBNL would not stage when CNX received from V.25 bis modem

Dial Backup Netlinks (DBNL) would not stage if a CNX (connect) message was received from the modem. This would cause the DPN port to drop Data Terminal Ready (DTR), causing the physical level to fail.

The DBNL port now handles the CNX message allowing the NL to stage.

This item was resolved under SR # 10183051

PP4120 signal line speed 38400, PANL dteReceiverBw set to 16k

PP4120 or LDM PANL was signaling Passport with a certain port speed (ie 38400), however the Passport was setting the dteReceiverBandwidth to 16K regardless of what the PP4120/LDM requested. The bandwidth table has been re-aligned with the PANL internal translation table.

This item was resolved under SR # 10183242

PP4120 Download Aborted Due To Flash Erase Failure

It was not possible to download a new software image to some PP4120 modules. An error message was received from the NMS software distribution tool indicating that the flash bank could not be erased. Not all PP4120 modules exhibited this problem.

This item was resolved under SR # 30005607

List of software images

The delivering media contains the following files:

FILENAME

ACCGFELX.FIMG0140

ETH3IMAGE_3_7.FIMG (See note)

Note: This software image is only used for the Ethernet PI supported on Passport 4120.

Chapter 5

Software Update Items

This chapter highlights fixes that have been introduced in this Release.

Items Resolved in Release R2.0.6.003

The following table provides a list of the Problems fixed in R2.0.6.003.

Item	Title	SR#
1.	ES1 Panic with high utilization.	10211173
2.	Fax problem reported with NTTFAX-412 and Panasonic KX-PW5TA.	10201744
3.	Faxing failed in Release 2.0.	60076259

