Meridian 1
Succession 1000
Succession 1000M
Succession 3.0 Software

IP Line
Description, Installation, and Operation

Document Number: 553-3001-365
Document Release: Standard 1.00
Date: October 2003

Revision history

October 2003

Standard 1.00. This document is a new NTP for Succession 3.0. It was created to support a restructuring of the Documentation Library. This document contains information previously contained in the following legacy document, now retired: *IP Line: Description, Installation and Operation* (553-3001-204).

Content from *IP Line: Description, Installation and Operation* (553-3001-204) also appears in:

- *Data Networking for Voice over IP* (553-3001-160),

- *Small System: Planning and Engineering* (553-3011-120), and

- *Large System: Planning and Engineering* (553-3021-120).

Contents

About this document

This document is a global document. Contact your system supplier or your Nortel Networks representative to verify that the hardware and software described are supported in your area.

Subject

This document

- describes the physical and functional characteristics of IP Line 3.1 application for Meridian 1, Succession 1000, and Succession 1000M systems and its use on the Voice Gateway Media Cards.

- explains how to engineer, install, configure, administer, and maintain an IP Telephony node that contains Voice Gateway Media Cards.

Structure

This document has separate chapters which are applicable only to either Optivity Telephony Manager (OTM) or Element Manager.

The configuration, administration, and maintenance sections are divided into three chapters each. For example, there is a generic configuration chapter dealing with tasks related to installing and configuring IP Line 3.1. This chapter is followed by two other configuration chapters, one for OTM and another for Element Manager. The administration and maintenance chapters have the same format.

Note on legacy products and releases

This NTP contains information about systems, components, and features that are compatible with Succession 3.0 Software. For more information on

legacy products and releases, click the **Technical Documentation** link under **Support** on the Nortel Networks home page:

http://www.nortelnetworks.com/

Applicable systems

This document applies to the following systems:

- Meridian 1 Option 11C Chassis

- Meridian 1 Option 11C Cabinet

- Meridian 1 Option 51C

- Meridian 1 Option 61

- Meridian 1 Option 61C

- Meridian 1 Option 61C CP PII

- Meridian 1 Option 81

- Meridian 1 Option 81C

- Meridian 1 Option 81C CP PII

- Succession 1000

- Succession 1000M Chassis

- Succession 1000M Cabinet

- Succession 1000M Half Group

- Succession 1000M Single Group

- Succession 1000M Multi Group

Note that memory upgrades may be required to run Succession 3.0 Software on CP3 or CP4 systems (Options 51C, 61, 61C, 81, 81C).

System migration

When particular Meridian 1 systems are upgraded to run Succession 3.0 Software and configured to include a Succession Signaling Server, they

become Succession 1000M systems. Table 1 lists each Meridian 1 system that supports an upgrade path to a Succession 1000M system.

Table 1
Meridian 1 systems to Succession 1000M systems

This Meridian 1 system...	Maps to this Succession 1000M system
Meridian 1 Option 11C Chassis	Succession 1000M Chassis
Meridian 1 Option 11C Cabinet	Succession 1000M Cabinet
Meridian 1 Option 51C	Succession 1000M Half Group
Meridian 1 Option 61	Succession 1000M Single Group
Meridian 1 Option 61C	Succession 1000M Single Group
Meridian 1 Option 61C CP PII	Succession 1000M Single Group
Meridian 1 Option 81	Succession 1000M Multi Group
Meridian 1 Option 81C	Succession 1000M Multi Group
Meridian 1 Option 81C CP PII	Succession 1000M Multi Group

Note the following:

• When an Option 11C Mini system is upgraded to run Succession 3.0 Software, that system becomes a Meridian 1 Option 11C Chassis.

• When an Option 11C system is upgraded to run Succession 3.0 Software, that system becomes a Meridian 1 Option 11C Cabinet.

For more information, see one or more of the following NTPs:

• *Small System: Upgrade Procedures* (553-3011-258)

• *Large System: Upgrade Procedures* (553-3021-258)

• *Succession 1000 System: Upgrade Procedures* (553-3031-258)

Conventions

Terminology

In this document, the following systems are referred to generically as "system":

- Meridian 1

- Succession 1000

- Succession 1000M

The following systems are referred to generically as "Small System":

- Succession 1000M Chassis

- Succession 1000M Cabinet

- Meridian 1 Option 11C Chassis

- Meridian 1 Option 11C Cabinet

The following systems are referred to generically as "Large System":

- Meridian 1 Option 51C

- Meridian 1 Option 61

- Meridian 1 Option 61C

- Meridian 1 Option 61C CP PII

- Meridian 1 Option 81

- Meridian 1 Option 81C

- Meridian 1 Option 81C CP PII

- Succession 1000M Half Group

- Succession 1000M Single Group

- Succession 1000M Multi Group

The call processor in Succession 1000 and Succession 1000M systems is referred to as the "Succession Call Server".

Related information

This section lists information sources that relate to this document.

NTPs

The following NTPs are referenced in this document:

- *Data Networking for Voice over IP* (553-3001-160)

- *Signaling Server: Installation and Configuration* (553-3001-212)

- *Branch Office* (553-3001-214)

- *Optivity Telephony Manager: Installation and Configuration* (553-3001-230)

- *Succession 1000 Element Manager: Installation and Configuration* (553-3001-232)

- *Features and Services* (553-3001-306)

- *Emergency Services Access: Description and Administration* (553-3001-313)

- *Optivity Telephony Manager: System Administration* (553-3001-330)

- *Succession 1000 Element Manager: System Administration* (553-3001-332)

- *Internet Terminals: Description* (553-3001-368)

- *Software Input/Output: System Messages* (553-3001-411)

- *Succession 1000 System: Installation and Configuration* (553-3031-210)

- *Succession 1000 System: Upgrade Procedures* (553-3031-258)

- *Succession 1000 System: Maintenance* (553-3031-500)

- *i2002 Internet Telephone User Guide*

- *i2004 Internet Telephone User Guide*

- *i2050 Software Phone User Guide*

Online

To access Nortel Networks documentation online, click the
Technical Documentation link under **Support** on the Nortel Networks
home page:

http://www.nortelnetworks.com/

CD-ROM

To obtain Nortel Networks documentation on CD-ROM, contact your
Nortel Networks customer representative.

Description

Contents

This section contains information on the following topics:

Introduction

Succession 3.0 introduces the IP Line 3.1 application.

The IP Line 3.1 application provides an interface that connects an Internet Telephone to a Meridian 1 PBX, a Succession 1000M Call Server, and a Succession 1000 Call Server.

IP Line 3.1 ports the IP Line 3.0 functionality from Succession 1000 to Meridian 1 and Succession 1000M systems.

Note: IP Line 3.1 does not operate on Meridian 1, Succession 1000M, or Succession 1000 systems running software earlier than Succession 3.0.

IMPORTANT!

IP Line 3.0 (or earlier) is not supported in Succession 3.0.

Features

IP Line 3.1 introduces the following features:

- ringer/buzz volume adjustment

- Russian, Latvian, and Turkish added to the Internet Telephone's Language menu

- registered and configured TNs are displayed in the Set Info menu

- Codec selection for the i2050 Software Phone

- new CLI commands

- enhanced redundancy for IP Line nodes

The following functionalities, once available only for Succession 1000, are now available for the Meridian 1 and Succession 1000M systems:

- support for the Succession Signaling Server platform

- end-user features

  — User-defined Feature Key Labels

  — Corporate Directory

  — Network Wide Virtual Office

  — Private zone classification

  — Codec selection, configuration, and registration enhancements

- additional administration and support features

  — support for Element Manager (Succession 1000M only)

  — call statistic enhancements

  — Dynamic Loss Plan; replaces the Static Loss Plan

  — set-based installation

  — Login Banner enhancement and password guessing protection

Voice Gateway Media Card

If a Succession Media Card 32-port card, a Succession Media Card 8-port card, or an ITG-P 24-port card is running IP Line 3.1 software, it is known as a Voice Gateway Media Card.

DHCP server

A Dynamic Host Configuration Protocol (DHCP) server can be used to provide the required information to enable the Internet Telephone network connection and connect to the Voice Gateway Media Card.

For more information on DHCP, refer to *Data Networking for Voice over IP* (553-3001-160) and *Internet Terminals: Description* (553-3001-368).

Interworking

The Internet Telephone uses the IP network to communicate with the Voice Gateway Media Card and the optional DHCP server. Figure 1 on shows a diagram of the system architecture.

Figure 1
System architecture

Succession 1000M

IP Line

Branch Office

LAN

Succession Signaling Server
(Optionally Redundant)
- Terminal Proxy Server
- H.323 proxy
- **Primary** Gatekeeper
- Element Manager Web Server

IP Trunk 3.0
or higher

Succession Signaling Server

Succession Signaling Server
(Optionally Redundant)
- Terminal Proxy Server
- H.323 proxy
- **Alternate** Gatekeeper
- Element Manager Web Server

WAN

Web Browser for
Element Manager

Succession 1000
Succession   Succession
Call Server   Signaling Server

Succession BCM

Internet
Telephones

LAN

Requires Succession BCM
Release 3.0 or higher

Media streams routed
directly via IP

Succession Media Gateway and
Succession Media Gateway Expansion

553-AAA0400

Applicable systems

The Meridian 1, Succession 1000M, and Succession 1000 systems support the Succession Media Card 32-port line card, Succession Media Card 8-port line card, and ITG-Pentium 24-port line card.

Unsupported products

The following remote service products do not support the Succession Media Card 32-port line card, Succession Media Card 8-port line card, and ITG-Pentium 24-port line card:

- Carrier Remote

- Mini-carrier Remote

- Fiber Remote

- Fiber Remote Multi-IPE

System requirements

Succession 3.0 Software is the minimum system software for IP Line 3.1.

OTM 2.1 and Element Manager

Optivity Telephony Manager (OTM) 2.1 and Element Manager are used throughout this document as the primary interface for Voice Gateway Media Cards and IP Line 3.1.

OTM 2.1 is the minimum required version.

Succession 1000M and Succession 1000

Either OTM 2.1 or Element Manager can be used as the configuration, administration, and maintenance interface for IP Line 3.1 on a Succession 1000M or Succession 1000 system.

If trying to use OTM 2.1 to perform an action available through Element Manager, then OTM 2.1 launches Element Manager automatically.

OTM 2.1 is used for configuration activities not supported by Element Manager, such as terminal administration.

Meridian 1

OTM 2.1 is used as the configuration, administration, and maintenance interface for IP Line 3.1 on a Meridian 1. Element Manager cannot be used as Element Manager is located on a Succession Signaling Server, and there is no Succession Signaling Server in a Meridian 1.

Corporate Directory

OTM 2.1 is necessary for creation of the Corporate Directory database.

SNMP and alarms

Element Manager does not provide a SNMP alarm browser, so the OTM 2.1 Alarm Manager is recommended when SNMP alarm collection is required.

System configurations

Although IP Line 3.1 can be used in different system configurations and its use can vary in those configurations, there are three basic system configurations. See Table 2.

Table 2
Possible system configurations

	System	Succession Signaling Server present
1	Meridian 1	No
2	Succession 1000M	Yes
3	Succession 1000	Yes

IP Line 3.1 can use the Succession Signaling Server if the Succession Signaling Server is deployed in the system configuration.

Meridian 1

A Meridian 1 system does not have a Succession Signaling Server in its configuration. Each Voice Gateway Media Card functions as both a Terminal Proxy Server (TPS) and voice gateway.

In this system configuration, one line card is configured as the Leader. Internet Telephones register with individual Voice Gateway Media Cards.

Note: If a Succession Media Card 32-port card, a Succession Media Card 8-port card, or an ITG-P 24-port card is running IP Line 3.1 software, it is known as a Voice Gateway Media Card.

Succession 1000 and Succession 1000M

A Succession 1000 and Succession 1000M system have a Succession Signaling Server in their network configuration. The Succession Signaling Server is a server that provides signaling interfaces to the IP network. The Succession Signaling Server's central processor drives the signaling for Internet telephones and IP Peer networking.

In IP Line 3.1, the TPS executes on the Succession Signaling Server and the voice gateway executes on the Voice Gateway Media Cards. All Internet Telephones register with the Succession Signaling Server. The Voice Gateway Media Cards only provide access to the voice gateway.

The Succession Signaling Server is the node leader and, by default, acts as a Master for the node.

Succession Signaling Server redundancy

There are several methods of redundancy for a Succession Signaling Server.

Stage	Description
	With a backup Succession Signaling Server
1	A backup Succession Signaling Server can be configured in a normal configuration.

Stage	Description
2	If the primary Succession Signaling Server fails, the backup Succession Signaling Server takes over and all Internet Telephones register with the backup Succession Signaling Server.
3	If the backup Succession Signaling Server fails, one of the Voice Gateway Media Cards is elected to be the node Master.
4	The Internet Telephones then register to the Voice Gateway Media Cards.
	Without a backup Succession Signaling Server
1	If there is no backup Succession Signaling Server, and the primary Succession Signaling Server fails, one of the Voice Gateway Media Cards is elected to be the node Master.
2	The Internet Telephones then register to the Voice Gateway Media Cards.

Software delivery

IP Line 3.1 supports software delivery through the following formats:

1   CompactFlash

2   Succession Signaling Server CD-ROM

3   Download from the Nortel Networks web site

Note: Stand-alone IP Line 3.1 software is not available through CD-ROM.

The IP Line 3.1 software and related documentation (such as *Readme First* documents) can be downloaded from the Nortel Networks web site. See Appendix E on for details.

Required packages

The Internet Telephones require the software packages listed in Table 3.

Table 3
Required packages

Package	Package number
Digital Set Package (DSET)	88
Aries Terminal Package (ARIES)	170

Note: To configure IP Line 3.1 in groups 5-7 on Option 81C CP PII or Succession 1000M Multi Group, the Fiber Network (FIBN) software package 365 is required.

IP Line package components lists

Meridian 1, Succession 1000, and Succession 1000M package components

Table 4 lists the IP Line 3.1 package components for Meridian 1, Succession 1000, and Succession 1000M systems.

Table 4
IP Line 3.1 Succession Media Card 32-port line card package components (Part 1 of 2)

Component	Code
Succession Media Card 32-port - IP Line 3.1 Voice Gateway Systems Package includes the following: • Succession Media Card 32-port assembly • Succession IP Line 3.1 Voice Gateway CompactFlash • ITG EMC Shielding Kit (NTVQ83AA) • Readme First Document • Shielded 50-pin to Serial/ELAN/TLAN adaptor (A0852632) • PC Maintenance cable (NTAG81CA) • IP Line 3.1 NTP (CD-ROM) • ITG-specific Meridian 1 Backplane 50-pin I/O Panel Filter Connector (NTCW84JA) (see Note)	NTDU41DB

Table 4
IP Line 3.1 Succession Media Card 32-port line card package components (Part 2 of 2)

Component	Code
IP Line 3.1 Voice Gateway NTP (CD-ROM), includes: • *IP Line: Description, Installation, and Operation* (553-3001-365) • *Internet Terminals: Description* (553-3001-368) • *i2002 Internet Telephone User Guide* • i2002 Quick Reference Card • *i2004 Internet Telephone User Guide* • i2004 Quick Reference Card • *i2050 Software Phone User Guide*	NTDW81ED
Note: The I/O panel filter connector is not required for Meridian 1 Option 11C Cabinet, Meridian 1 Option 11C Chassis, Succession 1000M Cabinet, Succession 1000M Chassis, or Succession 1000 systems.	

IP Line 3.1 Succession Media Card 8-port card package components

Table 5 lists the IP Line 3.1 Succession Media Card 8-port card package components. The Succession Media Card 8-port card is usually intended for Succession Branch Office. The card is applicable to the Meridian 1, Succession 1000, and Succession 1000M systems.

Table 5
IP Line 3.1 Succession Media Card 8-Port card package components

Component	Code
Succession Media Card 8-port - IP Line 3.1 Voice Gateway Systems Package includes: • Succession Media Card 8-port Assembly • Succession IP Line 3.1 CompactFlash • ITG EMC Shielding Kit (NTVQ83AA) • Readme First Document • Shielded 50-pin to Serial/ELAN/TLAN adaptor (A0852632) • PC Maintenance Cable • IP Line 3.1 NTP (CD-ROM) • ITG-specific Meridian 1 Backplane 50-pin I/O Panel Filter Connector (NTCW84JA) (see Note)	NTDU41AB
Note: The I/O panel filter connector is not required for Meridian 1 Option 11C Cabinet, Meridian 1 Option 11C Chassis, Succession 1000M Cabinet, Succession 1000M Chassis, or Succession 1000 systems.	

Documentation

The following documents are available on the IP Line 3.1 CD-ROM and on the Nortel Networks web site:

- *IP Line: Description, Installation, and Operation* (553-3001-365)

- *Internet Terminals: Description* (553-3001-368)

- *i2002 Internet Telephone User Guide*

- i2002 Quick Reference Card

- *i2004 Internet Telephone User Guide*

- i2004 Quick Reference Card

- *i2050 Software Phone User Guide*

The documents are also available on the SMERL (Succession Meridian Electronic Reference Library) CD-ROM.

Voice Gateway Media Cards

Voice Gateway Media Card is a term used to encompass the Succession Media Card 32-port line card, Succession Media Card 8-port line card, and ITG-P 24-port line card. These cards plug into an Intelligent Peripheral Equipment (IPE) shelf in the Meridian 1 and Succession 1000M systems, and into a Media Gateway and Media Gateway Expansion in the Succession 1000 system.

The ITG-P 24-port line card occupies two slots while the Succession Media Card line card occupies only one slot. The Succession Media Card comes in two versions: 8-port and 32-port.

The Succession Media Card has the following features:

- the 32-port card's packet processing power is greater than that of the ITG-P 24-port line card

- increases the channel density from 24 to 32 ports (for 32-port version)

- reduces the slot count from a dual IPE slot to a single IPE slot

- supports up to 128 Internet Telephones for the 32-port version, while 32 Internet Telephones are supported on the 8-port version (if a Succession Signaling Server is not present in the network configuration).

The 8-port version is typically intended for the Branch Office configuration.

Table 6 provides a comparison of the ITG-P 24-port line card and Succession Media Card 32-port and 8-port line cards.

Table 6
Comparison of ITG-P 24-port and Succession Media Card 32-port and 8-port line cards (Part 1 of 2)

Item	ITG-P 24-port line card	Succession Media Card 32-port line card	Succession Media Card 8-port line card
Total DSP Channels	24	32	8
Number of slots the card occupies	2	1	1
Operating System	VxWorks 5.3	VxWorks 5.4	VxWorks 5.4
Processor	Pentium	IXP1200	IXP1200
DSP	8 x TI5409	4 x TI5421	1 x TI5421
Telogy version	7.01	8.1 High Density version (8 ports for each DSP)	8.1 High Density version (8 ports for each DSP)
Number of Internet Telephones that can register on each Voice Gateway Media Card	96 (in a Meridian 1 – see note)	128 (in a Meridian 1 – see note)	32 (in a Meridian 1 – see note)
Image file name prefixes shown by swVersionShow command	IPL P	IPL SA	IPL SA

Table 6
**Comparison of ITG-P 24-port and Succession Media Card 32-port and 8-port
line cards (Part 2 of 2)**

Item	ITG-P 24-port line card	Succession Media Card 32-port line card	Succession Media Card 8-port line card
/C: drive	On board Flash 2 x 4Mb	Plug-in CompactFlash 16Mb	Plug-in CompactFlash 16Mb
Upgrade	Two images files	One image file (no backup)	One image file (no backup)
Note: If a Voice Gateway Media Card is used in a Succession 1000 or Succession 1000M system, then the Internet Telephones register to the Succession Signaling Server instead of the Voice Gateway Media Card, and are not subject to these restrictions. A Succession Signaling Server can register a maximum of 5000 telephones.			

Voice Gateway Media Cards have an ELAN Ethernet port (10BaseT) and a
TLAN Ethernet port (10/100BaseT) on the I/O panel.

Note: The ELAN (Embedded LAN) isolates critical telephony signaling
between the Call Server and the other components. The ELAN is also
known as the Management LAN.
The TLAN (Telephony LAN) carries telephony / voice / signaling traffic.
The TLAN, also known as the Voice LAN, connects to the customer
network and the PSTN.

There is an RS-232 Maintenance Port connection on the faceplates of both the
ITG-P 24-port line card and the Succession Media Card line card. The ITG-P
24-port line card has an alternative connection to the same serial port on the
I/O backplane.

CAUTION
Do not connect maintenance terminals to both the
faceplate and the I/O panel serial maintenance port
connections at the same time.

Capacity

The VTN feature allows each Voice Gateway Media Card to support more Internet Telephones than there are physical bearer channels. There are 24 bearer channels on each ITG-P card and 8 or 32 channels on each Succession Media Card.

Both cards support a 4:1 concentration of registered Internet Telephones to gateway channels; the ITG-P supports 96 while the Succession Media Card supports 32 (when the card has 8 channels) or 128 (when the card has 32 channels) registered i2002, i2004 and i2050 Internet Telephones. The Internet Telephones only require the services of the bearer channels when they are busy on a call which requires a TDM circuit such as an Internet Telephone-to-digital telephone/ trunk/ voice mail / conference. When an Internet Telephones is idle or there is an IP-to-IP call, no gateway channel is required.

When the total number of Internet Telephones that are registered or are attempting to register reaches the limit (96 on the ITG-P, 32 or 128 on the Succession Media Card), the Voice Gateway Media Card recognizes this and no more Internet Telephones are assigned to the card. Each Voice Gateway Media Card is restricted to a total of 1200 call attempts per hour distributed across all the Internet Telephones associated with the card.

Succession Media Card line card controls, indicators, and connectors

Figure 2 shows the Succession Media Card 32-port and 8-port line card faceplate.

Figure 2
Succession Media Card IP assembly
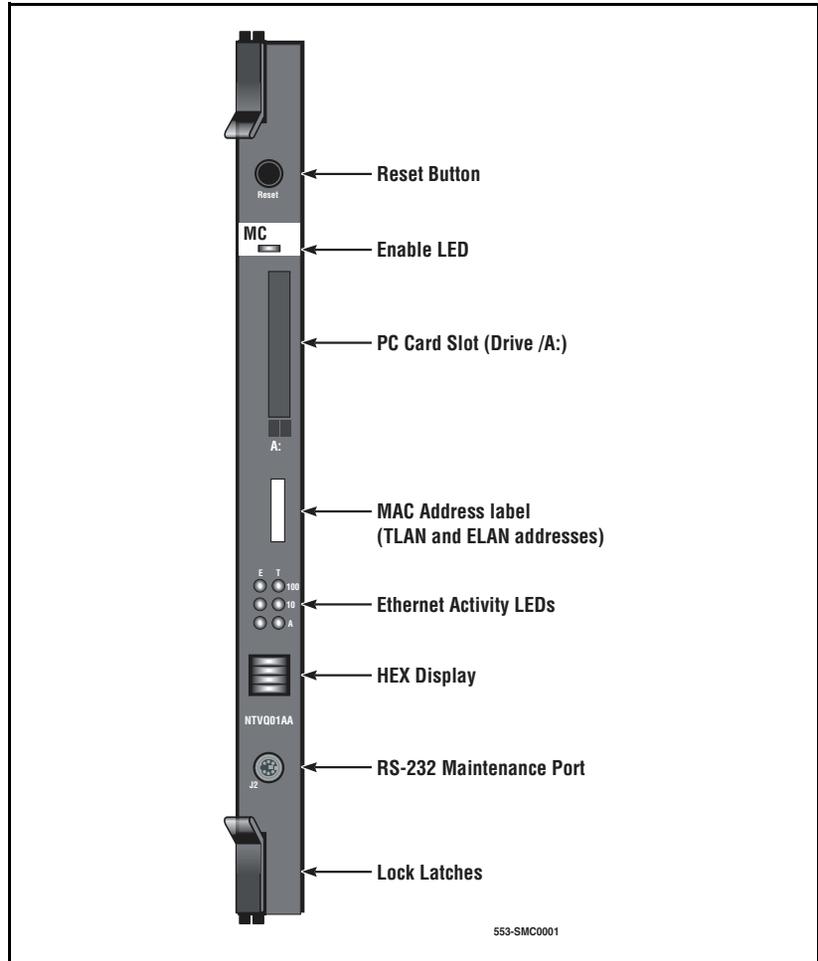
Faceplate components

The components on the faceplate of the Succession Media Card 32-port and 8-port line card are described in the following sections.

Reset button

Use the Reset button on the faceplate to manually reset the Succession Media Card. This enables the card to be reset without cycling power to it. The Reset button is used to reboot the card after a software upgrade or to clear a fault condition.

Enable LED

The faceplate red LED indicates the following:

- the enabled/disabled status of the card

- the self-testing result during power up or card insertion into an operational system

PC Card slot

This slot accepts the Type I or Type II standard PC Flash Cards, including ATA Flash cards (3 Mb to 170 Mb). The slot is labeled /A:.

Nortel Networks supplies PC Card adaptors that enable CompactFlash cards to be used in the slot.

MAC Address label

The MAC Address label on the card's faceplate is labeled ETHERNET ADDRESS. It shows the TLAN and ELAN addresses. The ELAN address corresponds to the cards Management MAC address. The Management MAC/ELAN address for each card is assigned during manufacturing and is unchangeable. The MAC Address label on the Succession Media Card is similar to the following example:

> **ETHERNET ADDRESS**
> **TLAN**
> **00:60:38:BD:C9:9C**
> **ELAN**
> **00:60:38:BD:C9:9D**

Ethernet activity LEDs

The faceplate contains six Ethernet activity LEDs, three for the ELAN and three for the TLAN. The LEDs indicate the following links on the ELAN and TLAN (in order from the top):

1 100 (100BaseT)

2 10 (10BaseT)

3 A (Activity)

Maintenance hex display

This is a four-digit LED-based hexadecimal display that provides the role of the card. It also provides an indication of fault conditions and the progress of PC Card-based software upgrades or backups.

RS-232 Maintenance Port

The Succession Media Card faceplate provides a female 8-pin mini-DIN serial maintenance port connection. The faceplate on the card is labeled J2.

ITG-P 24-port line card controls, indicators, and connectors

Figure 3 shows the ITG-P 24-port line card faceplate components.

Figure 3
ITG-P 24-port line card assembly

553-9150
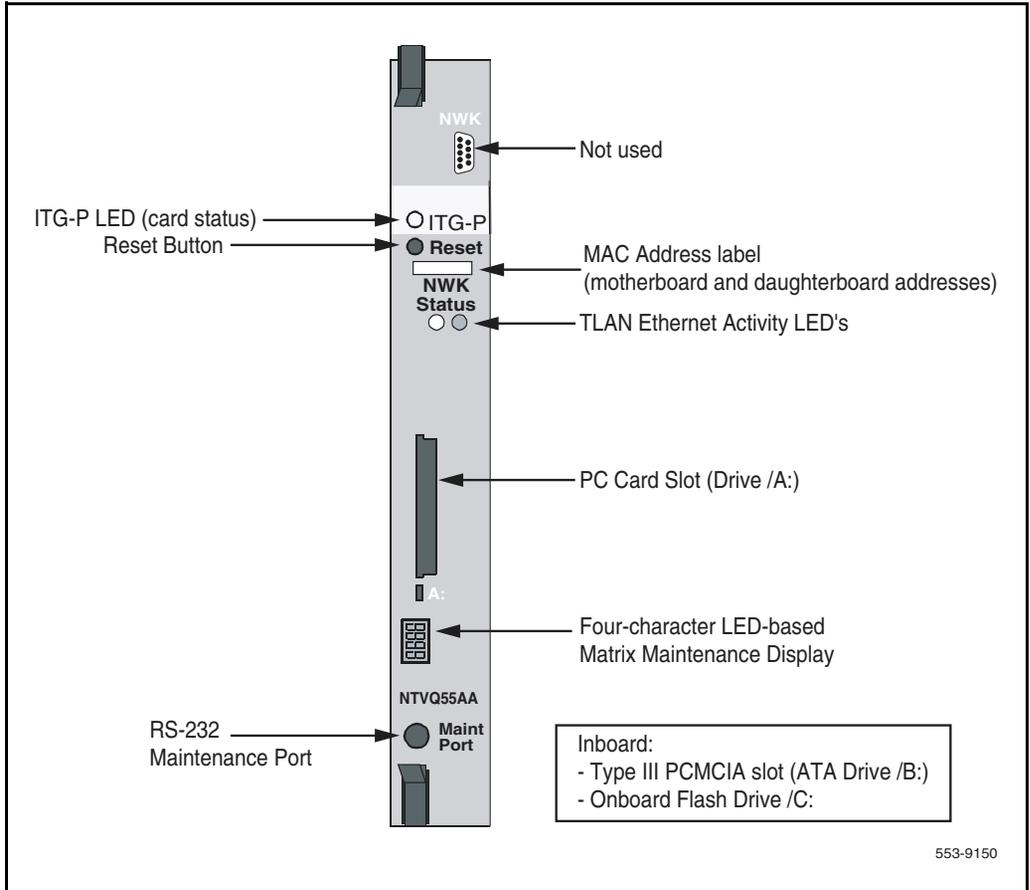
Faceplate components

The components on the faceplate of the ITG-P 24-port line card are described in the following sections.

NWK

The faceplate connector labeled NWK is a 9-pin, sub-miniature D-type connector. The connector is not used for the IP Line application.

> ⚠️ **WARNING**
> The NWK connector looks like a 9-pin serial connector. DO NOT connect a serial cable or any other cable to it. If a cable is connected to the NWK connector, the TLAN is disabled.

ITG-P LED (card status)

The red status faceplate LED indicates the enabled/disabled status of the 24 card ports. The LED is on (red) during the power-up or reset sequence. The LED remains lit until the card is enabled by the system. If the LED remains on, the self-test failed, the card is disabled, or the card rebooted.

Reset button

Press the Reset switch to reset the card without having to cycle power to the card. This switch is normally used after a software upgrade to the card or to clear a fault condition.

MAC Address label

The MAC Address label on the card's faceplate shows the motherboard and daughterboard addresses. The ELAN address corresponds to the Management MAC address. The Management MAC address for each card is assigned during manufacturing and is unchangeable. The ELAN/Management MAC address is the MOTHERBOARD Ethernet address found on the label. The MAC Address label on the ITG-P 24-port line card is similar to the following example:

> **ETHERNET ADDRESS**
> **MOTHERBOARD**
> **00:60:38:8c:03:d5**
> **DAUGHTERBOARD**
> **00:60:38:01:b3:cb**

TLAN Ethernet activity LEDs (labeled NWK Status LEDs)

The two NWK Status LEDs display TLAN Ethernet activity.

- Green – the LED is on if the carrier (link pulse) is received from the TLAN Ethernet switch.

- Yellow – the LED flashes when there is TLAN data activity. During heavy traffic, the yellow LED can stay continuously lit.

   Note: There are no Ethernet status LEDs for the ELAN interface.

PC Card slots

The ITG-P 24-port line card has one faceplate PC Card slot (designated Drive /A:). It is used for optional maintenance. The ITG-P 24-port line card also has one unused inboard slot (designated Drive /B:). The PC Card slots support high-capacity PC flash memory cards.

Matrix maintenance display

A four-character, LED-based dot matrix display shows the maintenance status fault codes and other card state information. For a list of the fault codes, see Table 53: "ITG-P 24-port line card faceplate maintenance display codes" on page 481 and Table 54: "Succession Media Card faceplate maintenance display codes" on page 482.

RS-232 maintenance port

The ITG-P 24-port line card faceplate provides a female 8-pin mini-DIN serial maintenance port connection, labeled **Maint Port**. An alternative connection to the faceplate serial maintenance port exists on the NTMF94EA I/O panel breakout cable.

> ⚠️ **CAUTION**
> Do not connect maintenance terminals or modems to the faceplate and I/O panel DB-9 male serial maintenance port at the same time.

Backplane interfaces

The backplane provides the following connectors:

- ELAN connectors
- TLAN connectors
- alternate connection to the DS-30X serial maintenance port
- Card LAN interface connectors

DS-30X voice/signaling

The DS-30X serial maintenance port carries Pulse Code Modulation (PCM) voice and proprietary signaling on the IPE backplane between the ITG-P 24-port line card and the Intelligent Peripheral Equipment Controller (XPEC).

Card LAN

Card LAN carries card polling and initialization messages on the IPE backplane between the ITG-P 24-port line card and the Intelligent Peripheral Equipment Controller (XPEC).

Assembly description

The ITG-P 24-port line card assembly is a two-slot motherboard and daughterboard combination. A PCI interconnect board connects the motherboard and the DSP daughterboard. See Figure 4 on .

Figure 4
ITG-P 24-port line card physical assembly
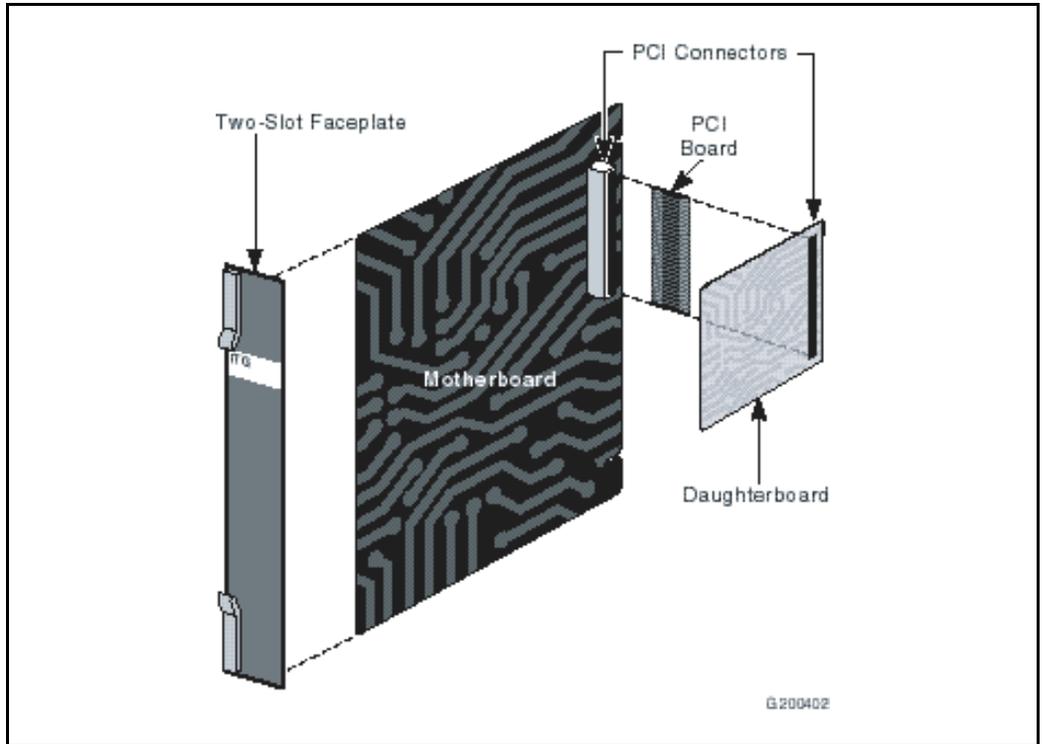
Functional description of the Voice Gateway Media Cards

The Succession Media Card line cards and the ITG-P 24-port line card can perform two separate functions depending on the system in which the card is located:

1   The card acts as a gateway between the circuit-switched voice network and the IP network.

2   The card acts as a Terminal Proxy Server (TPS) or "virtual line card" for the Internet Telephones, based on whether a Succession Signaling Server is used in the configuration or not.

Gateway functional description

The Gateway performs the following functions:

- registers with the PBX using the TN Registration messages

- accepts commands from the PBX to connect/disconnect audio channel

- uses Realtime Transport Protocol/Realtime Conferencing Protocol (RTP/RTCP) protocol to transport audio between the gateway and the Internet Telephone

- encodes/decodes audio from PCM to and from the Internet Telephone's format

- provides echo cancellation for the speaker on Internet Telephones (not applicable to the i2050 Software Phone)

Gateway functionality on the Meridian 1

Since there is no Succession Signaling Server, each Voice Gateway Media Card functions as both the TPS and Voice Gateway.

The Gateway portion of the card connects to the Meridian 1 through the DS30X backplane. The Gateway portion also receives call speech-path setup and Codec selection commands through the ELAN port. The Internet Telephone connects to both the Gateway and the TPS functions through the TLAN port.

Gateway functionality on the Succession 1000 and Succession 1000M

A Succession Signaling Server is always present in the Succession 1000 and Succession 1000M systems. The LTPS executes on the Succession Signaling Server and the voice gateway executes on the Voice Gateway Media Cards. The Voice Gateway Media Cards only provide the voice gateway access.

Active Master

The Terminal Proxy Server (TPS) maintains a count of the number of telephones registered to the card. Each IP Telephony node has one active Master. The active Master broadcasts to all Voice Gateway Media Cards and requests a response if it has room for another telephone.

The Election function uses a selection process to determine the node's Master. The Census function determines the Voice Gateway Media Cards within an IP Telephony node.

Internet Telephone registration

Internet Telephone registration on a Meridian 1 system

Table 4 describes the maximum number of Internet Telephones that can be registered to each type of line card in a Meridian 1 system.

Table 7
Maximum number of Internet Telephones that can register to a Voice Gateway Media Card in a Meridian 1

Card type	Maximum number
Succession Media Card 32-port	128
Succession Media Card 8-port	32
ITG-P 24-port	96

For more information, refer to "System capacities" in *Large System: Planning and Engineering* (553-3021-120), *Small System: Planning and Engineering* (553-3011-120), and *Succession 1000 System: Planning and Engineering* (553-3031-120).

Internet Telephone registration on a Succession 1000 and Succession 1000M

On a Succession 1000 and 1000M system, the Internet Telephones register with the TPS on the Succession Signaling Server. If a secondary Succession Signaling Server exists, the Internet Telephone registrations are split between the primary and secondary Succession Signaling Servers to aid in load balancing. In that case, the Internet Telephone registrations alternate between the primary and secondary Succession Signaling Servers.

If the primary Succession Signaling Server fails, the secondary Succession Signaling Server takes over (if it exists) and the Internet Telephones that were registered with the failed Succession Signaling Server re-register with the TPS on the secondary Succession Signaling Server. If there is no secondary Succession Signaling Server or the secondary Succession Signaling Server fails, the Internet Telephones register with the TPS on the Voice Gateway Media Cards.

IMPORTANT!

Each Succession Signaling Server supports the registration of up to 5000 Internet Telephones.

For more information on Succession Signaling Server failure and redundancy, see *Succession 1000 System: Planning and Engineering* (553-3031-120) and *Signaling Server: Installation and Configuration* (553-3001-212).

Virtual Terminal Manager

The Virtual Terminal Manager (VTM) performs the following functions:

- arbitrates application access to the Internet Telephones

- manages all the telephones between the applications and the Unistim messaging to the telephone

- maintains context-sensitive states of the telephone (for example, display or lamp state)

- isolates telephone-specific information from the applications (for example, the number of display lines, number of characters for each display line, tone frequency, and cadence parameters)

Interactions with Internet Telephones

The following information describes the process by which an Internet Telephone registers and unregisters with a Meridian 1, Succession 1000, or Succession 1000M system.

Registration

Step	Description
1	The Internet Telephone receives the IP address of the Connect Server (co-located with the TPS) through either DHCP or manual configuration.
2	The Internet Telephone contacts the Connect Server.
3	The Connect Server instructs the Internet Telephone to display a message on its display screen requesting the customer's IP Telephony node number and TN.
4	The node number and TN are entered. The Connect Server redirects the Internet Telephone to the Node Master.
5	The Internet Telephone contacts the Node Master. The Node Master redirects the Internet Telephone to the TPS.
6	The Internet Telephone contacts the TPS.
7	If the Internet Telephone is valid, the TPS registers it with the system.

Unregistration

Step	Description
1	If the TPS detects a loss of connection with one of its registered Internet Telephones, it logs the event.
2	The TPS then sends an unregister message to the system for that Internet Telephone.

Signaling and messaging

The IP Line 3.1 application sends Scan and Signaling Distribution (SSD) messages through the system ELAN. When tone service is provided, the service is signaled to the TPS using new SSD messages sent through the ELAN.

Signaling protocols

The signaling protocol between the Internet Telephone and the IP Telephony node is the Unified Networks IP Stimulus Protocol (UNIStim). The Reliable User Datagram Protocol (RUDP) is the transport protocol.

RUDP

RUDP is used for:

- ELAN communications between the Succession Call Server and the Voice Gateway Media Cards
- TLAN communications between the IP Telephony node and the Internet Telephones

Description

Signaling messages between the Voice Gateway Media Card and Internet Telephones use RUDP. Each RUDP connection is distinguished by its IP address and port number. RUDP is another layer on top of UDP. RUDP is proprietary to Nortel Networks.

The features of RUDP are as follows:

- provides reliable communication system over a network

- packages are resent if an acknowledgement message (ACK) is not received following a time-out

- messages arrive in the correct sequence

- duplicate messages are ignored

- loss of contact detection

When a data sequence is packetized and sent from source **A** to receiver **B**, RUDP adds a number to each packet header to indicate its order in the sequence.

- If the packet is successfully transmitted to **B**, **B** sends back an ACK to **A**, acknowledging that the packet has been received.

- If **A** receives no message within a configured time, it retransmits the packet.

- If **B** receives a packet without having first received its predecessor, it discards the packet and all subsequent packets, and a NAK (no acknowledge) message which includes the number of the missed packet is sent to **A**. **A** retransmits the missed packet and continues.

UNIStim

The Unified Network IP Stimulus protocol (UNIStim) is the single point of contact between the various server components and the Internet Telephone.

UNIStim is the stimulus-based protocol used for communication between an Internet Telephone and a TPS on the Voice Gateway Media Card or Succession Signaling Server.

ELAN TCP transport

Although TCP is used for the signaling protocol between the Succession Call Server and the Voice Gateway Media Card, RUDP remains for the Keep Alive mechanism for the link. This means RUDP messages are exchanged to maintain the link status between the Succession Call Server and the Voice Gateway Media Card.

There is no change on the TLAN signaling mechanism. Internet Telephones continue to use the RUDP transport protocol to communicate with the Voice Gateway Media Card.

The TCP protocol enables messages to be bundled. Unlike the RUDP transport that creates a separate message for every signaling message (such as display updates or key messages), the TCP transport bundles a number of messages and sends them as one packet.

Handshaking is added to the Succession Call Server and IP Line software so that the TCP functionality is automatically enabled. A software version check is performed by the IP Line application each time before it attempts to establish a TCP link with the Meridian 1, Succession 1000M, and Succession 1000 CPUs. TCP transports messages, while RUDP establishes and maintains the link.

If the version does not satisfy the minimum supported version (Succession 3.0), a RUDP link is used instead to maintain the link and all signaling.

Virtual superloops, virtual TNs, and physical TNs

Virtual TNs (VTNs) enable configuration of service data for an Internet Telephone, such as key layout and class of service, without requiring the Internet Telephone to be dedicated (hard-wired) to a given TN on the Voice Gateway Media Card.

Calls are made between an Internet Telephone and circuit-switched telephone/trunks using the full Meridian 1, Succession 1000M, and Succession 1000 feature set. Digital Signal Processor (DSP) channels are allocated dynamically for this type of call to perform the encoding/decoding required to connect the Internet Telephone to the circuit-switched network.

To create an Internet Telephone using VTNs, create a virtual superloop in LD 97.

• Up to 1024 VTNs can be configured on a single virtual superloop for Large Systems.

- Up to 128 VTNs can be configured on a single virtual superloop for Meridian 1 Option 11C Cabinet and Meridian 1 Option 11C Chassis systems, leading to support for a maximum of 640 VTNs for each of these systems.

- Up to 1024 VTNs can be configured on a single virtual superloop for Succession 1000M Cabinet and Succession 1000M Chassis systems.

- Up to 1024 VTNs can be configured on a single virtual superloop for Succession 1000 systems. Table 8 describes the virtual superloop and virtual card mapping on a Succession 1000 system. Each superloop has two ranges of cards.

Table 8
Virtual superloop/virtual card mapping for Succession 1000

SUPL	Card	
96	61-64	81-84
100	65-68	85-88
104	69-72	89-92
108	73-76	93-96
112	77-80	97-99

Each ITG-P 24-port line card provides 24 physical TNs and each Succession Media Card 32-port line card provides 32 physical TNs. The physical TNs are the gateway channels (DSP ports).

Configure the physical TNs (IPTN) in LD 14. They appear as TIE trunks without a Route Data Block (RDB).

Virtual TNs

Virtual TNs enable service data to be configured for a telephone, such as key layout and class of service, without requiring a physical telephone to be directly connected to the Succession Call Server.

The concentration of Internet Telephones is made possible by dynamically allocating a port (also referred to as a physical TN) of the Voice Gateway Media Card for a circuit-switched- to-Internet Telephone call. All system speech path management is done with physical TNs instead of virtual TNs.

The channels (ports) on the Voice Gateway Media Cards are pooled resources.

The Internet Telephones (virtual TNs) are defined on virtual superloops.

A virtual superloop is a hybrid of real and phantom superloops. Like phantom superloops, no hardware (for example, XPEC or line card) is used to define and enable units on a virtual superloop. As with real superloops, virtual superloops use the time slot map to handle Internet Telephone (virtual TNs)-to-Internet Telephone calls.

ISM parameters

Customers must purchase one Internet Telephone Incremental Software Management (ISM) parameter for each Internet Telephone installed on Meridian 1, Succession 1000M, and Succession 1000 systems. A new ISM parameter uses the existing Meridian 1, Succession 1000M, and Succession 1000 keycode to enable the Internet Telephone in the system software. The default is zero.

To expand the ISM limits for the Internet Telephones, order and install a new Meridian 1, Succession 1000M, or Succession 1000 keycode. Refer to the Incremental Software Management feature module in the *Features and Services* (553-3001-306) NTP.

> *Note:* Individual ISMs are not supported on Functional Pricing. With Functional Pricing, ISMs are provisioned in blocks of eight.

Zones

Definition

To optimize IP Line traffic bandwidth use between different locations, the IP Line network is divided into "zones", representing different topographical areas of the network. All Internet Telephones and IP Line ports are assigned a zone number indicating the zone to which they belong.

When a call is made, the Codecs that are used vary, depending on which zone(s) the caller and receiver are in.

By default, when a zone is created in LD 117:

- Codecs are selected to optimize voice quality (BQ - Best Quality) for connections between units in the *same* zone.

- Codecs are selected to optimize voice quality (BQ - Best Quality) for connections between units in *different* zones.

Each zone can be configured to:

- optimize either voice quality (BQ) or bandwidth usage (BB - Best Bandwidth) for calls between users in that zone

- optimize either voice quality or bandwidth usage within a zone and all traffic going out of a zone

For more information about zones, refer to the following:

- Shared and Private zones (see "Private Zone configuration" on)

- Zones and Virtual Trunks (see *IP Trunk: Description, Installation, and Operation* (553-3001-363))

- Zones and Branch Office (see *Branch Office* (553-3001-214))

Administration

The Voice Gateway Media Card is administered using multiple management interfaces including the following:

- the IP 3.1 Line application GUI provided by OTM 2.1

- a Command Line Interface (CLI)

- administration and maintenance overlays of Call Servers

- a web browser interface provided by Element Manager. Element Manager is used for administering Voice Gateway Media Cards in the systems that use a Succession Signaling Server

IP Line 3.1 application in OTM 2.1

For Meridian 1 systems, OTM 2.1 is required for IP Line 3.1. OTM 2.1 is used for tasks such as the following:

- creating a node

- adding Voice Gateway Media Cards to the node

- transmitting loadware to the Voice Gateway Media Cards

- upgrading loadware

- defining SNMP alarms

- selecting Codecs

Element Manager

The Element Manager web server is required for Succession 1000 and Succession 1000M systems. Element Manager's web interface enables IP Line 3.1 to be configured and managed from a web browser.

The Element Manager web interface is divided into two categories:

1   Element Manager – used to manage the Call Server and IP Telephony nodes (IP Line).

2   Gatekeeper Element Manager – used to administer network numbering plan for the Network Connect Server that is used by Network-Wide Virtual Office and Branch Office.

Command Line Interface

Definition

The CLI provides a text-based interface to perform specific Succession Signaling Server and Voice Gateway Media Card installation, configuration, administration, and maintenance functions.

Access

Establish a CLI session by connecting a TTY or PC to the card serial port or Telnet through the ELAN or TLAN IP address.

IMPORTANT!

In the case of an IP Telephony node with no Succession Signaling Server, the CLI must be used to configure the Leader card of the IP Telephony node. This enables OTM 2.1 and Element Manager to communicate with the Leader card and the node.

For more information about the CLI commands, see "IP Line CLI commands" on .

Overlays

The following sections describe the changes that have been made to the Overlays with the availability of IP Line 3.1 for the Meridian 1 and Succession 1000M.

LD 11

A subtype for the Internet Telephones is available in LD 11.

The CLS for the Virtual Office feature has been added.
The CLS prompt includes the VOLA/VOLD (Virtual Office Login Allowed/Denied) and VOUA/VOUD (Virtual Office User Allowed/Denied) for Virtual Office. LD 11 accepts CRPA/CRPD class of service input for the Corporate Directory feature on the Internet Telephones.

See Table 43: "LD 11 – Configure an Internet Telephone" on .

LD 14

There are two minor changes to the administration of the Voice Gateway Media Cards in LD 14.

See "Configure physical TNs (LD 14)" on for information on XTRK and VGW.

Configure physical TNs (LD 14)

Use LD 14 to define the physical TNs for the Voice Gateway Media Card.

Use LD 14 to disable the cards. The OTM IP Telephony Gateway - IP Line application requires Voice Gateway Media Cards to be in a disabled state before transmitting card properties.

See Table 9 for a list of the prompts and responses in LD 14.

Table 9
Configure physical TNs in LD 14 (Part 1 of 2)

Prompt	Response	Description
REQ:	NEW CHG OUT	Create the voice media gateway channels on a line card. Change configuration data for a gateway channel. Delete the voice media gateway channels on a line card.
TYPE:	VGW	Voice Gateway
TN		TN of the first ITG Physical TN
	l s c u c u	Large System TN format Small System TN format
DES	aa.......a	Description for gateway channel. Identify the channel using the card's TLAN IP address or MAC address.

Table 9
Configure physical TNs in LD 14 (Part 2 of 2)

Prompt	Response	Description
XTRK	aaa	ITG8 – ITG 486 8-port card
		ITGP – ITG-P 24-port card
		MC8 – Succession Media Card 8-port card
		MC32 – Succession Media Card 32-port card
ZONE	0 – 255	Zone number to which this ITG Physical TN belongs. Verify that the zone exists in LD 117.
CUST	0 – 99	Customer number

3 See Table 39: "Configure physical TNs in LD 14" on for prompts and responses.

LD 20

For the TYPE prompt, the Internet Telephone type (for example, i2002) response is available as a customer response.

LD 81

Two changes have been made to LD 81.

1 The FEAT prompt prints for the Internet Telephone type (for example, i2002).

2 The FEAT prompt accepts VOLA, VOLD, VOUA, and VOUD for the Virtual Office feature.

LD 82

No new prompts have been added to LD 83; however, the Internet Telephone type (for example, i2002) is printed.

LD 117

Two new prompts have been added to LD 117 to translate an Internet Telephone's DN to its IP address and its IP address to its DN.

1   PRT DNIP <DN> [<CustomerNO>]

2   PRT IPDN <IPAddress>

Search criteria

If a customer number is entered, only that customer is searched for the designated DN. If no customer number is entered, the database for all customers on the system is searched.

The **PRT DNIP** command accepts a partially defined DN; that is, a DN entered with only partial leading digits. For example, entering a DN of 34 with no customer number results in output for any DN in the system starting with 34.

PRT DNIP output

The PRT DNIP command generally produces the following output:

- an initial line displaying the DN and customer number. If there is output for multiple customers, this line is repeated before each customer's output.

- information for each occurrence of the DN on any internet telephone for that customer.

    — TN

    — set type

    — key number of DN appearance and type of DN

    — current IP address of the Internet Telephone

    — configured zone for the Internet Telephone

    — state of the Internet Telephone's registration

Sample output

```
=> PRT DNIP 4000 0 (only search customer 0 for DN)
CUST 00 DN 4000
TN Type Key IP Address Zone Status
------------------------------------------------------------------
061-01 i2002 03 SCR 47.11.215.41 000 REG
061-00 i2004 00 SCR 47.11.215.39 000 REG
=> prt dnip 4000 (same DN in different customers)
CUST 00 DN 4000
TN Type Key IP Address Zone Status
------------------------------------------------------------------
061-01 i2002 03 SCR 47.11.215.41 000 REG
061-00 i2004 00 SCR 47.11.215.39 000 REG
CUST 01 DN 4000
TN Type Key IP Address Zone Status
------------------------------------------------------------------
061-10 i2004 05 MCR 47.11.215.38 001 REG
```

PRT IPDN

The PRT IPDN command produces the following output:

- an initial line displaying the IP address for the search

- a second line displaying the customer number, TN, set type, zone and registration status of the Internet Telephone using the specified IP address

- information for all DNs configured on that Internet Telephone

  — key number of DN appearance and type of DN

  — DN

  — configured CPDN for the DN

Sample output

```
=> PRT IPDN 47.11.215.38
IP 47.11.215.38
CUST 01 TN 061-10 TYPE i2004 ZONE 001 REG
Key DN CPND Name
------------------------------------------
00 SCR 4010 I2004_1 VLN61-10
05 MCR 4000 i2004_cust1 vln61_10
```

Partial IP addresses

Partial IP addressed can be entered. Partial IP addresses can be entered with only the leading digits of the IP address (for example, 142.10), or as the IP address with zeroes at the end (for example, 142.10.0.0

The following examples for "PRT IPDN <IP_ADDR>" shows a partial IP address of 47.0.0. The zeroes in the <IP_ADDR> are handled as if they are trimmed off.This means that the output of **PRT IPDN 47** is the same as that of **PRT IPDN 47.0.0**.

A sample of Internet Telephones has been configured in the following manner:

IP Address	TN	DN
47.11.216.138	063-20	4120
47.11.216.140	061-02	4002
47.11.215.39	061-00	4000
47.11.215.38	063-00	4100
47.11.215.41	063-01	4101

Example 1

To print the information on the Internet Telephones whose IP address starts with 47.11.215, enter the following:

=> prt ipdn 47.11.215

The following output is printed:

```
IP 47.11.215.38
CUST 01  TN 063-00  TYPE i2004  ZONE 001  REG
Key      DN      CPND Name
---------------------------------------------
00 SCR   4100     I2004_Cust_1 VLN63_00


IP 47.11.215.39
CUST 00  TN 061-00  TYPE i2004  ZONE 000  REG
Key      DN      CPND Name
---------------------------------------------
00 SCR   4000     I2004_Cust_0 VLN61_00


IP 47.11.215.41
CUST 01  TN 063-01  TYPE i2001  ZONE 001  REG
Key      DN      CPND Name
---------------------------------------------
00 SCR   4101     I2001_Cust_1 VLN63_01
```

Example 2

Alternatively, to print the information on the Internet Telephones whose IP address starts with 47.11.215, enter the following:

=> prt ipdn 47.11.215.0

The following output is printed:

```
IP 47.11.215.38

CUST 01   TN 063-00   TYPE i2004   ZONE 001   REG

Key       DN       CPND Name

-------------------------------------------

00 SCR    4100     I2004_Cust_1 VLN63_00


IP 47.11.215.39

CUST 00   TN 061-00   TYPE i2004   ZONE 000   REG

Key       DN       CPND Name

-------------------------------------------

00 SCR    4000     I2004_Cust_0 VLN61_00


IP 47.11.215.41

CUST 01   TN 063-01   TYPE i2001   ZONE 001   REG

Key       DN       CPND Name

-------------------------------------------

00 SCR    4101     I2001_Cust_1 VLN63_01
```

Example 3

To print the information on the Internet Telephones whose IP address starts with 47.11.216, enter the following:

=> prt ipdn 47.11.216

The following output is printed:

```
IP 47.11.216.138

CUST 01  TN 063-20  TYPE i2002  ZONE 001  REG

Key      DN       CPND Name

---------------------------------------------

00 SCR   4120      I2002_Cust_1 VLN63_20


IP 47.11.216.140

CUST 00  TN 061-02  TYPE i2002  ZONE 000  REG

Key      DN       CPND Name

---------------------------------------------

00 SCR   4002      I2002_Cust_0 VLN61_02
```

Example 4

Alternatively, to print the information on the Internet Telephones whose IP address starts with 47.11.216, enter the following:

=> prt ipdn 47.11.216.0

The following output is printed:

```
IP 47.11.216.138

CUST 01  TN 063-20  TYPE i2002  ZONE 001  REG

Key      DN       CPND Name

-------------------------------------------

00 SCR   4120     I2002_Cust_1 VLN63_20


IP 47.11.216.140

CUST 00  TN 061-02  TYPE i2002  ZONE 000  REG

Key      DN       CPND Name

-------------------------------------------

00 SCR   4002     I2002_Cust_0 VLN61_02
```

More information

> *Note:* For a complete listing of the changes to the software input/output prompts, refer to *What's New for Succession 3.0* (553-3001-015).

Features

Contents

This section contains information on the following topics:

Introduction

Table 10 outlines the features available for Meridian 1, Succession 1000, and Succession 1000M systems with Succession 3.0 Software.

Table 10
IP Line 3.1 feature support (Part 1 of 2)

Feature	Meridian 1	Succession 1000M	Succession 1000
Support for Succession Media Card	Yes	Yes	Yes
Support for Element Manager	No	Yes	Yes
Support for Succession Signaling Server	Yes	Yes	Yes
Support of the following Internet Telephones: • i2002 • i2004 Support of the following software clients: • i2050 Software Phone	Yes	Yes	Yes
Dynamic Loss Plan	Yes	Yes	Yes
NAT enhancement	Yes	Yes	Yes
Network-wide Virtual Office	Yes	Yes	Yes
Patching	Partial	Partial	Yes
802.1Q	Yes	Yes	Yes
Corporate Directory	Yes	Yes	Yes
Data Path Capture tool	Yes	Yes	Yes
Call statistics enhancements	Yes	Yes	Yes
a. Node level patching is not provided by OTM 2.1. The patching CLI command of the Succession Media Card 32-port line card, Succession Media Card 8-port line card, and ITG-Pentium 24-port line card can be used. ***** = introduced in IP Line 3.1			

Table 10
IP Line 3.1 feature support (Part 2 of 2)

Feature	Meridian 1	Succession 1000M	Succession 1000
User-defined Feature Key Labels	Yes	Yes	Yes
Private Zone	Yes	Yes	Yes
Graceful TPS Disable	Yes	Yes	Yes
Run-time download	Yes	Yes	Yes
Codec selection, configuration, and registration enhancements	Yes	Yes	Yes
Watchdog Timer	Yes	Yes	Yes
Improved Login Banner and Password Guessing Protection	Yes	Yes	Yes
Ringer and buzzer volume adjustment*	Yes	Yes	Yes
Set-based install (Small Systems only)	Yes	Yes	Yes
Maintenance Audit enhancement	Yes	Yes	Yes
Three new languages: Russian, Latvian, Turkish*	Yes	Yes	Yes
Enhanced Redundancy for IP Line nodes*			
i2050 Soft Phone user-selectable Codec*	Yes	yes	Yes
a. Node level patching is not provided by OTM 2.1. The patching CLI command of the Succession Media Card 32-port line card, Succession Media Card 8-port line card, and ITG-Pentium 24-port line card can be used. ***** = introduced in IP Line 3.1			

Internet Telephone support

The IP Line 3.1 application supports the following Internet Telephones:

- i2002 Internet Telephone

- i2004 Internet Telephone

- i2050 Software Phone

For detailed information about Internet Telephones, see the following guides:

- *i2002 Internet Telephone User Guide*

- *i2004 Internet Telephone User Guide*

- *i2050 Software Phone User Guide*

- *Internet Terminals: Description* (553-3001-368)

Table 11 shows a comparison of the i2002, and i2004 Internet Telephones.

Table 11
Comparison of the i2002 and i2004 Internet Telephones (Part 1 of 2)

Feature	i2002 Internet Telephone	i2004 Internet Telephone
Display		
Display size and format	1 line display 24 characters	3 line display 24 characters on each line
Information Line	1 * 24 characters	3 * 24 characters
Dedicated Data/Time field	No	Yes
Context Label field	No	Yes
Keys		
Soft Keys	4 soft keys, soft-labeling 6 characters long	4 soft keys, soft-labeling 7 characters long
Feature Keys	4 soft keys, soft-labeling 10 characters long	6 soft keys, soft-labeling 10 characters long
Other features		

Table 11
Comparison of the i2002 and i2004 Internet Telephones (Part 2 of 2)

Feature	i2002 Internet Telephone	i2004 Internet Telephone
DHCP support	Yes	Yes
Transducers	Headset (HS) / Handset (HD) / Handsfree (HF)	Headset (HS) / Handset (HD) / Handsfree (HF)
Mute key	Yes	Yes
Navigation keys	Up, down, left, and right	Up, down, left, and right
Voice Codec support	G.711, G729A, G729AB, G.723.1	G.711, G729A, G729AB, G.723.1
Firmware download	Automatic firmware version checking and download	Automatic firmware version checking and download
3-port unmanaged Layer 2 switch for data and voice	Built-in	Built-in ***Note:*** Earlier models have an external switch.

Corporate Directory

The Corporate Directory feature is based on the M3900 telephone Corporate Directory feature.

The Corporate Directory database is created using OTM 2.1 and is generated from one of the following:

• the configured DN information from the Call Server

• the data from a corporate LDAP server

The database is downloaded and stored on the Call Server. It is then accessible to the Internet Telephones. The Succession Signaling Server can support Corporate Directory access for the same number of Internet Telephones that are registered.

The Directory key on the telephone is used to access the directory, select a listing, and then dial a number from the Corporate Directory. The Navigation keys are used to refine the search within the Corporate Directory.

Corporate Directory is configured in LD 11. LD 11 accepts CRPA/CRPD class of service for the Internet Telephones (see "Corporate Directory: LD 11 configuration" on).

For more information about the operation of the Corporate Directory feature, refer to the following:

- *Optivity Telephony Manager: Installation and Configuration* (553-3001-230)

- *Internet Terminals: Description* (553-3001-368).

Element Manager support

Element Manager enables configuration of IP Line 3.1 using a web browser on Succession 1000 and Succession 1000M systems.

Each Succession Signaling Server hosts a web server, Element Manager, that allows configuration, administration, and maintenance to be performed on the system components. Element Manager is a graphical Web interface that provides a graphical alternative to the traditional CLI and overlays. The interface is available to users running a web browser on a PC. No special client software is required.

The Element Manager web server runs on each Succession Signaling Server and the Succession Signaling Server acts as a file server.

When a web browser is opened and the IP address of the Succession Signaling Server is entered, the Element Manager interface is displayed. Element Manager is then used to perform tasks such as configuring an IP Telephony node, checking and uploading loadware and firmware files, and retrieving the CONFIG.INI and BOOTP.TAB configuration files from the Succession Call Server. The Voice Gateway Media Cards are notified to FTP the files from the Call Server.

OTM 2.1's Navigators incorporate links to each Element Manager web server in a network.

For more information, refer to *Succession 1000 Element Manager: Installation and Configuration* (553-3001-232) and *Succession 1000 Element Manager: System Administration* (553-3001-332).

Call Statistics enhancements

IP Line 3.1 enables statistics on the Quality of Service (QoS) of calls connected by the Succession Call Server to be collected.

These commands print the number of Internet Telephones registered on a card, zone, node, or Succession Signaling Server. Traffic printouts are available per zone at user-configurable intervals for the following:

- blocked calls

- bandwidth used

- call attempts and completions

Counting Internet Telephones

The commands to count registered Internet Telephones are available in LD 32. The commands are:

- ECNT CARDS L S C <customer>

- ECNT ZONE zoneNum <customer>

- ECNT NODE nodeNum

- ECNT SS hostName

Table 12 describes these commands.

Table 12
LD 32 commands to count registered Internet Telephones (Part 1 of 2)

Command	Description
ECNT CARD L S C <customer>	Counts and prints the number of Internet Telephones registered for the specified card.
	• If the <customer> parameter is specified, the count is specific to that customer. A card must be specified to enter a customer; otherwise, the count is across all customers.
	• If no parameters are entered, the count is printed for all zones. A partial TN can be entered for the card (L or L S) which then prints the count per that parameter. A customer cannot be specified in this case.
	Example:
	ECNT CARD 81 << Card 81 >> Number of Registered Ethersets: 5 Number of Unregistered Ethersets: 27
ECNT ZONE zoneNum <customer>	Counts and prints the number of Internet Telephones registered for the specified zone.
	• If <customer> parameter is specified, the count is specific to that customer. A zone must be specified to enter a customer; otherwise, the count is across all customers.
	• If no parameters are entered, the count is printed for all zones.
	Example:
	ECNT ZONE 0 0 << Zone 0 Customer 0 >> Number of Registered Ethersets: 4 Number of Unregistered Ethersets: 17

Table 12
LD 32 commands to count registered Internet Telephones (Part 2 of 2)

Command	Description
ECNT NODE nodeNum	Counts and prints the number of Internet Telephones registered for the specified node. • If the nodeNum parameter is not entered, the count is printed for all nodes. Example: ECNT NODE 8765 << Zone 8765 >> Number of Registered Ethersets: 3
ECNT SS <hostName>	Counts and prints the number of Internet Telephones registered for the specified Succession Signaling Server. • If hostName parameter is not entered, the count is printed for all Succession Signaling Servers. Example: ECNT SS << Signaling Server: BVWAlphaFox IP 10.10.10.242>> Number of Register Ethersets: 1000 ***Note:*** If the hostName variable contains an underscore (_), then an NPR001 error message is returned, as an underscore is considered to be an invalid character.

Error messages for the ECNT commands

Error messages are printed when invalid data is entered for these commands. The messages include valuable information such as the correct ranges for the command parameters. See the following tables for the error messages:

*   Table 13: "ECNT Card command error messages" on .

*   Table 14: "ECNT Zone command error messages" on .

Table 13
ECNT Card command error messages

Error	Error Message
Slot out of range error	Slot out of range. Range: [61-99]
Slot non-virtual loop error	Slot does not correspond to a virtual loop.
Slot not configured loop error	Slot corresponds to a virtual loop but it is not configured.
Customer out of range error	Customer out of range. Range: [0-31]
Customer not configured error	Customer does not exist.
Combination of invalid slot and invalid customer	Slot does not correspond to a virtual loop. Customer out of range. Range: [0-31]

Table 14
ECNT Zone command error messages

Error	Error Message
Zone out of range error	Zone out of range. Range: [0-255]
Zone not configured error	Zone not configured.
Customer out of range error	Customer out of range. Range: [0-31]
Customer not configured error	Customer does not exist.
Combination of invalid zone and invalid customer error	Zone not configured. Customer out of range. Range: [0-31]

Table 15
ECNT Node command error messages

Error	Error Message
Node out of range error	Node out of range. Range: [0-9999]
Node not configured error	Node not registered.

Table 16
ECNT SS command error message

Error	Error Message
SS not found in system error	Signaling Server <name> does not exist.

Internet Telephone Zone Traffic Report 16

A system traffic report, Internet Telephone Zone Traffic Report 16 in LD 2 is created on the system to print Internet Telephone data at the zone level. The data is printed for the following categories at the end of each collection period on a per zone basis:

• Total inter/intra calls made

• Total inter/intra calls blocked

• Percent average inter/intra zone bandwidth used

• Percent maximum inter/intra zone bandwidth used

• Total inter/intra zone bandwidth threshold exceeded count

The counters are reset after the data is printed.

The "Total inter/intra zone bandwidth threshold exceeded count" prints the number of times a user-configured bandwidth threshold was exceeded for the zone during the collection period. Existing LD 2 commands that are related to setting the system threshold are used with a new value defined for the bandwidth threshold.

Table 17
System threshold commands

Command	Description
TTHS TH tv	Prints the current system thresholds.
STHS TH tv -- TV	Sets the system thresholds.
Note 1: The system thresholds TH values 1 – 4 already exist. A new TH value of 5 is used for the zone bandwidth threshold.	
Note 2: The system thresholds TV value is the percentage of the zone's maximum bandwidth. The range values are 000 – 999, where 000 corresponds to 00.0% and 999 corresponds to 99.9%. The default is 90.0%.	

The following examples first set the system bandwidth to 75% and then print the actual value.

```
.STHS 5 750
.TTHS 5
```

The Internet Telephone Zone Traffic Report 16 outputs data in the following format:

   zone cmi cmo cbi cbo pi po ai ao vi vo pkl lat jit

Table 18 describes the output data.

Table 18
Internet Telephone Zone Traffic Report 16 data output

Data	Description
zone	number of the zone
cmi	intrazone calls made
cmo	interzone calls made
cbi	intrazone calls blocked
cbo	interzone calls blocked
pi	intrazone peak bandwidth (%)
po	interzone peak bandwidth (%)
ai	intrazone average bandwidth usage (%)
ao	interzone average bandwidth usage (%)
vi	intrazone threshold violations
vo	interzone threshold violations
pkl	packet loss violations
lat	latency violations
jit	jitter violations

The printout is similar to the following example:

```
.invs 16
0000 TFS016

000 00005 00003 00000 00000 07 03 02 01 000 000
001 00003 00003 00000 00000 03 2 01 01 000 000
```

All other commands (SOPS, COPS, TOPS) function in the normal manner. Table 19 shows the SOPS, COPS, and TOPS commands:

Table 19
SOPS, COPS, TOPS commands

.tops 1 2 3 4 5 14	display the current system report list
.sops 1 2 3 4 5 14 -- 16	add report 16 to be printed
.tops 1 2 3 4 5 14 16	display system report list with report 16 added
.cops 1 2 3 4 5 14 16 -- 16	delete report 16
.tops 1 2 3 4 5 14	display system report list with report 16 deleted

User-defined Feature Key Labels

Definition

IP Line 3.1 gives the Internet Telephone user the ability to program the label on the feature key. This label change is saved and then displayed on the feature key.

Availability

Model	Number of feature keys	Number of feature keys using Shift key	Maximum label character length
i2002	4	N/A	10
12004	6	12	10
i2050	6	12	10

The Feature Key labels for each Internet Telephone are stored in the Call Server's database. When the Call Server performs an EDD, the Feature Key labels are saved to the database. The Feature Key label information is retrieved from the file into memory during the sysload of the Call Server. When the system performs an INI or sysload, Feature Key label changes performed by users between the last EDD and the INI or sysload are lost.

When the Internet Telephone registers with the Call Server, the Call Server looks up the Feature Key label in the memory, based on the TN of the Internet Telephone. If the labels are found, they are sent to the telephone when the key map download occurs. If the labels are not found, the Call Server sends out the key number strings or key functions.

For more information about programmable line (DN)/feature keys (self-labeled), refer to *Internet Terminals: Description* (553-3001-368).

Private Zone configuration

Private Zones are available for the Meridian 1, Succession 1000, and Succession 1000M.

Lack of DSP resources

DSP resources for each customer are placed in one common pool. A DSP channel is allocated to an IP-to-circuit-switched call based on a round-robin searching algorithm within the pool.

If an available resource cannot be found, the overflow tone is given. For most installations, this approach works because all Internet Telephone users share the IP Line DSP resources. The DSPs can be provisioned using a DSP-to-Internet Telephone ratio similar to trunk resources, since the DSPs are used only for circuit-switched access or conference calls.

When IP-to-PSTN calls are used, such as with ACD agents or other users who consistently are using trunk resources when making calls, it becomes difficult to provision the system in a way that guarantees an available DSP channel when these users need it. If the other users suddenly make a lot of conference calls or trunk calls, the DSP resources can deplete and as a result, calls cannot be made. This occurs because all DSP channels are in one pool.

DSP resources and Private Zones

To address this situation, IP Line 3.1 adds the Private Zone Configuration feature for DSP configuration and allocation to the zone configuration. This feature enables the configuration of one or more gateway channels as a private resource. This guarantees DSP availability for critical or ACD agent Internet Telephones.

A zone can be configured as shared or private.

Shared Zone

The current default zone type is a shared zone. Internet Telephones configured in shared zones use DSP resources configured in shared zones. If all the shared zones' gateway channels are used, the caller receives an overflow tone and the call is blocked.

Select gateway channels in the following order:

• Select a channel from the same zone as the Internet Telephone is configured.

• Select any available channel from the shared zones' channels.

Private Zone

The Private Zone enables DSP channels configured in a private zone to be used only by the Internet Telephones that have also been configured for that private zone. If more DSP resources are required by these Internet Telephones than what are available in the zone, DSPs from other shared zones are used.

Internet Telephones configured in shared zones cannot use the private zones' channels.

Select the gateway channels in the following order:

• Select a channel from the same private zone as the Internet Telephone is configured.

• Select any available channel from the pool of shared zones' channels.

LD 117

VGW channels and Internet Telephones are set as shared or private based on zone configuration. In LD 117, zone configuration can be set to either shared or private using the parameter <zoneResourceType>.

A zone is configured in LD 117 as follows:

NEW ZONE <zoneNumber> [<intraZoneBandwidth> <intraZoneStrategy> <interZoneBandwidth> <interZoneStrategy> <zoneResourceType>]

CHG ZONE <zoneNumber> [<intraZoneBandwidth> <intraZoneStrategy> <interZoneBandwidth> <interZoneStrategy> <zoneResourceType>]

By default, a zone is configured as shared (zoneResourceType=shared).

Example

The command to add a new zone, zone 10, is as follows:

```
new zone 4 BQ 10000 BQ 10000 private

Zone 4 added. Total number of Zones = n
(where n is the total number of zones)
```

Site details

Use the **PRT ZONE** or **PRT ZONE ALL** command to see details for all configured zones. Table 20 gives a sample output of the **PRT ZONE** or **PRT ZONE ALL** command.

Table 20
Sample output from PRT ZONE or PRT ZONE ALL command

Zone	State	Type	Intrazone				Interzone				HO/BRCH
			Bandwidth (Kbps)	Strategy	Usage (%)	Peak (Kbps)	Bandwidth (Kbps)	Strategy	Usage (%)	Peak (Kbps)	
0	ENL	SHARED	100000	BQ	0	0	100000	BQ	0	0	HO
1	ENL	SHARED	10000	BQ	0	0	10000	BQ	0	0	HO
4	ENL	PRIVATE	10000	BQ	0	0	10000	BQ	0	0	HO
10	ENL	SHARED	10000	BQ	0	0	10000	BQ	0	0	HO

Resource-sharing for shared and private zones

If a resource-critical Internet Telephone is configured for a private zone, and there are not enough resources found within that zone, the search continues into the shared zones within the same customer for an available DSP channel.

However, if a phone is configured in a shared zone, the PBX/Call Server limits its search to the pool of shared DSP channels. The search does not extend into the private zones' channels.

When configuring the allocation of shared versus private resources, consideration must be given to the number of private resources that are needed. Enough DSP resources should be configured to prevent the Internet Telephones configured in shared zones from running out of channels.

> **WARNING**
>
> The Call Server does not search for voice gateway channels in Private Zones when the Internet Telephone is configured in a Shared Zone. Only Internet Telephones configured in the same Private Zone can use the Private Zone voice gateway channels.
>
> Since the voice gateway channels in the Private Zone are not accessible to Internet Telephones in the Shared Zone, ensure that only enough private channels are configured to cover the Internet Telephones in the Private Zone. Do not configure more channels than are required in the Private Zone as the Shared Zone Internet Telephones cannot access these channels.

Interworking with NAT

Network Address Translation (NAT) provides the following benefits:

- the ability to network multiple sites with overlapping private address ranges

- added security for servers on a private network

- conservation of public IP address allocation

A NAT device exists between a private network and a public network. The NAT device maps private addresses to public addresses.

IP Line 3.1 and NAT

IP Line 3.1 does not support all the benefits of NAT listed previously. IP Line 3.1 implements only a periodic message feature to keep NAT sessions alive when a call is on mute. This periodic messaging prevents an RTP packet stream NAT session from timing out. This could occur when the Internet Telephone is muted and packet transmission is stopped.

To support multiple Internet Telephones behind one NAT device, it is necessary for NAT to map between public and private IP addresses, and ports for each Internet Telephone behind it. The mapping should include both a signaling port and media (voice) port. In a situation where there are multiple NATs between the Internet Telephone and the Voice Gateway Media Card, all NATs on the path must follow the rules described in the following sections for signaling and media streams.

Mapping is configured and implemented using the NAT device. The IP Line application does not implement any of the mappings.

NAT and signaling

NAT hides the true identity of the Internet Telephone from the TPS. The TPS knows only the IP address and port number of the Internet Telephone.

Signaling messages between the Voice Gateway Media Card and Internet Telephones are carried by RUDP. Each RUDP connection is distinguished by its IP address and port number. The NAT performs one-to-one mapping on the signaling port for each Internet Telephone behind it to support multiple Internet Telephones. The TPS uses fixed port numbers for signaling. NAT must perform a one-to-one mapping for these port numbers. Table 21 lists the UDP port number used.

Table 21
Signaling UDP Ports (Part 1 of 2)

UDP Port	Device	Use
5000	Internet Telephone	incoming signaling messages to the Internet Telephone
5100	TPS	incoming call processing messages to the TPS

Table 21
Signaling UDP Ports (Part 2 of 2)

UDP Port	Device	Use
4100	TPS	incoming registration message to Connect Server
7300	TPS	incoming registration messages to node Master

Port numbers on the Voice Gateway Media Card use a fixed numbering scheme where the starting number for the port range is configurable. The first port on the card uses the configured starting port number; the rest of the port numbers follow in sequence. Each port has two sequential numbers: one for RTP and one for RTCP.

Note: The NAT has to provide one fixed public port number (5200) for to and from the Internet Telephones behind it.

Do not change this port at any time. Map this port to port 5200 on the Internet Telephones.

Table 22
IP Line UDP Ports (Part 1 of 2)

UDP Port	Device	Use
5200-5262	Succession Media Card	RTP packets (configurable starting port number – Internet Telephone's port matches it)
5201-5263	Succession Media Card	RTCP packets into Succession Media Card (port number is RTP port number + 1)
5200-5246	ITG-P 24-port line card	RTP packets (configurable starting port number - Internet Telephone's port matches it)

Table 22
IP Line UDP Ports (Part 2 of 2)

UDP Port	Device	Use
5201-5247	ITG-P 24-port line card	RTCP packets into Succession Media Card (port number is RTP port number + 1)
5200	Internet Telephone	RTP packets into internet phone (port matches first RTP port of the Voice Gateway Media Card)
5201	Internet Telephone	RTCP packets into Internet Telephone (port matches first RTCP port of the Voice Gateway Media Card)

Mute and Hold considerations

IP Line 3.1 has to handle two special cases when interworking with NAT: Mute and Hold.

Mute

Table 23
Mute process (Part 1 of 2)

	Description
Problem	
1	When a user enables Mute, the TPS sends a Mute Transmit (Tx) command to the Internet Telephone. This forces the telephone to generate silence in the transmit direction.
2	If the telephone is using an evocator that implements silence suppression, for example G.729AB, the telephone sends one silence frame to the far end, and then stops sending any further frames until Mute is cancelled.
3	Data sent from the Internet Telephone stops.
4	The NAT device sees that the Internet Telephones's UDP connection is not active in the transmit direction and starts aging the translation.

Table 23
Mute process (Part 2 of 2)

	Description
5	Depending on the length of time the call is muted and the duration of the NAT's translation aging timeout value, the NAT device might timeout the translation and drop the connection.
6	All packets coming from the far end are dropped by the NAT device.
7	When mute is cancelled, the Internet Telephone starts transmitting again.
8	NAT considers this to be a new connection and creates a new translation. NAT sends data to the far end using this new translation, resulting in half-duplex voice connection between the Internet Telephone and the far-end device.
9	Data sent to the far end device gets there but the data coming back is lost.
Solution	
1	The Internet Telephone periodically sends an extra non-RTP packet to the far end to keep the NAT translation alive, ensuring that the NAT's session timeout does not expire.
2	The non-RTP packet is constructed to fail any RTP validation tests so it is not played out by the far-end device (Internet Telephone or gateway channel.

Hold

The Hold function differs from the Mute function as Hold does not cause problems with the audio stream.

Table 24
Hold process

	Description
1	When an Internet Telephone user places a call on Hold, it closes the audio stream in both the Transmit (Tx) and Receive (Rx) directions.
2	The NAT device begins aging the translation.
3	When the call is retrieved from Hold, a new set of open audio stream messages are issued by the TPS and new connections are established.

Table 25 shows supported operations for Internet Telephones behind a NAT device in IP Line 3.1.

Table 25
IP Line NAT Support Strategy (Part 1 of 2)

Requirement	Comment
An Internet Telephone behind a NAT device can be registered.	Yes
An Internet Telephone behind NAT can make a call through the Voice Gateway Media Card channels and to other Internet Telephones that are not behind the NAT device.	Yes
A call can be established between two Internet Telephones on the same private network (behind the same NAT device).	No

Table 25
IP Line NAT Support Strategy (Part 2 of 2)

Requirement	Comment
If there are multiple DNs configured on an Internet Telephone, all DNs are able to make and receive calls.	Yes
The user must be able to hold, mute, and retrieve calls.	Yes

Note: While not directly associated with NAT support, the i2002/2004 Internet Telephone firmware continues to be downloaded using Trivial File Transfer Protocol (TFTP). UFTP is not supported. TFTP prevents placing Internet Telephones behind firewalls that have the TFTP port blocked for security reasons. An alternative is to upgrade the Internet Telephones firmware to the latest version prior to placing it behind the firewall.

NAT Configuration

Element Manager and OTM 2.1 have two prompts to configure the timer function. A checkbox is used to enable or disable the NAT message. When enabled, a configuration box sets the time (in seconds) between messages sent. The default value is 90 seconds. The configured values apply to all Internet Telephones on the node.

Run-time configuration changes

IP Line 3.1 enables most changes to be made without disabling or rebooting the Voice Gateway Media Cards. After adding configuration information for a new Voice Gateway Media Card and downloading the BOOTP file to the Leader, a new Voice Gateway Media Card can be added to an existing node without rebooting the other cards.

The following exceptions require a reboot:

• a role change; that is, changing a Leader to Follower or changing Follower to Leader.

- changing the node IP subnet masks or gateway IP addresses requires a reboot of all cards in the node.

- changing the IP address of a particular card so it can retrieve its new IP address information.

Supported run-time changes

Therefore, IP Line 3.1 supports only run-time changes for the following:

- changes to the CONFIG.INI file

- add card or delete card changes to the BOOTP.TAB file

Configuration changes have an effect only on new calls. Existing calls are not interrupted. However, there are exceptions:

- If the active Call Server ELAN link's configuration data is changed (for example, a changed IP address), then active calls are released.

  Note: If the non-active Call Server is changed (for example, survivable side IP address), then the calls are not affected.

  When the ELAN connections are taken down to implement the configuration change, the Internet Telephones and gateway channels registrations are unregistered on the Call Server. The Call Server releases the calls. When the link is re-established, the TPS synchronizes the call states and releases the active calls. Service is interrupted during this re-establishment period and the following are affected:

  — New Internet Telephones cannot register.

  — Registered Internet Telephones cannot establish new calls.

  — The Voice Gateway Media Card's faceplate displays S009.

  Once the ELAN link comes back up, the Line Terminal Proxy Server (LTPS) re-registers the telephones with the Call Server and all service is resumed.

- If the Codec list is changed, the Voice Gateway Media Card's DSPs might need to be reloaded. For instance, one DSP image contains G.711, FAX, and G.729A/G.729AB. The other DSP image contains G.711, FAX, and G.723.1. If the user has a node configured with the G.729AB Codec and the user performs an administrative change to use G.723.1 (or vice versa), the DSPs must be reloaded.

    After the CONFIG.INI file containing the administrative change is downloaded to a Voice Gateway Media Card, the card's DSPs are reloaded as they become idle. For instance, if all DSPs are idle on the card, the new image is loaded to all of them at once. If one or more DSPs have active calls, the DSP is not reloaded until the active calls have been released. This can cause some DSPs to be reloaded later than others.

This functionality is supported by both Element Manager and OTM 2.1.

Network wide Virtual Office

Network Wide Virtual Office is supported for the Succession 1000 and 1000M systems.

IP Line 3.1 provides the Network Wide Virtual Office feature. This feature enables a user to use any Internet Telephone within the network.

The Virtual Office feature provides a call service to "travelling" users who want to use a different physical Internet Telephone (other than the telephone they normally use). Users can log into another Internet Telephone using their DN and pre-configured Station Control Password (SCPW).

Once logged in, users have access to their DNs, autodial numbers, key layout, feature keys, and voice mail indication/access that are configured on their own home/office Internet Telephones. For example, if users go to another office or to a different location within the same office, they can log into any available Internet Telephone and have all the features of their home/office Internet Telephone. When the user logs off the Internet Telephone, the features that were "transferred" to that telephone are removed.

Network Wide Virtual Office and the Gatekeeper

Network Wide Virtual Office is limited to a single Gatekeeper zone. As long as Virtual Offices share the same Gatekeeper, a Virtual Office login can redirect an Internet Telephone to any of the systems.

Requirements

A Succession Signaling Server or standalone gatekeeper is required in the network.

Supported Internet Telephones

Virtual Office is supported for the i2002 and i2004 Internet Telephones, and the i2050 Software Phone. An i2004 or i2050 user can log in from an i2002 Internet Telephone under certain conditions. See "Set type checking and blocking" on .

Table 26 shows which user can log in to particular telephones.

Table 26
Virtual Office login from various telephones

Internet Telephone User	Virtual Office login
An i2002 Internet Telephone user...	...can Virtual Office login from i2002, i2004, and i2050.
An i2004 Internet Telephone user...	...can Virtual Office login from i2004 and i2050. ...can log in under certain conditions when the user attempts a Virtual Office login from an i2002 Internet Telephone. See "Set type checking and blocking" on page 108.
An i2050 Software Phone user...	...can virtually login from i2004 and i2050. ...can log in under certain conditions when the user attempts a Virtual Office login from an i2002 Internet Telephone. See "Set type checking and blocking" on page 108.

Virtual Office User Allowed (VOUA) and Virtual Office Login Allowed (VOLA) must be configured on the Internet Telephones as follows:

- The Internet Telephone where the user wants to virtually login (destination) must have Virtual Office User Allowed (VOUA) configured.

- The Internet Telephone where the user wants to log in from (source) must have Virtual Office Login Allowed (VOLA) configured.

Failed password attempt

Three failed password attempts to log in using the Virtual Office feature locks the user out from Virtual Office login at the Call Server for one hour. The Call Server lock can be removed by an administrator using an LD 32 command to disable and re-enable that TN. Refer to *Succession 1000 System: Maintenance* (553-3031-500) or *Software Input/Output: Maintenance* (553-3001-511) for more information.

Passwords and Internet Telephone Registration

An Internet Telephone registers using the TN (in its EEPROM). A valid user ID and password are used to determine the Home TPS for the Internet Telephone during the Virtual Office connection. A Gatekeeper is required if the Home TPS is not the TPS where the Internet Telephone is registered when the Virtual Office login is initiated.

Virtual Office capabilities

Virtual Offices provides the following capabilities:

1 A network-wide connection server (Gatekeeper) is equipped to provide addressing information of call servers, based on a user's DN.

2 A key sequence is entered at an Internet Telephone to initiate the login sequence. Then the current network DN and a user-level password is entered. The password is the Station Control Password configured in LD 11. If a SCPW is not configured, the Virtual Office feature is blocked.

3 A user logs out when leaving the location.

For more detailed information about Virtual Office, see *Internet Terminals: Description* (553-3001-368).

Branch Office

Branch Office provides a means of extending Succession 3.0 features to one or more remotely-located Branch Offices.

Definition

Branch Office is a feature set of the equipment and software that a secondary location needs to centralize the call processing of its IP-based communications network. The Call Server at the Main Office provides the call processing for the Internet Telephones in both the Main Office and Branch Offices. The H.323 WAN Gateway in the Branch Office provides access to the local PSTN.

Connections

Branch Office is connected to the Main Office over a virtual trunk on a WAN. Internet Telephone calls and IP network connections are controlled by, and come from, the Main Office. If the Main Office fails to function, or if there is a network outage, the Succession System Controller (SSC) at the Branch Office provides service to the Internet Telephones located in the Branch. The Internet Telephones then survive an outage between the Branch Office and the Main Office.

Components

The basic hardware of a Branch Office includes the H.323 WAN Gateway and the Succession Signaling Server. The H.323 WAN Gateway provides access to the local PSTN for users in the Branch. It also provides support for analog devices such as fax machines or telephones in the Branch Office.

For detailed information about Branch Office, refer to *Branch Office* (553-3001-214).

802.1Q support

The i2002, and i2004 Internet Telephones support 802.1Q. 802.1Q This support enables the definition of virtual LANs (VLANs) within a single LAN. This improves bandwidth management, limits the impact of broadcast and multicast messages, and simplifies VLAN configuration and packet prioritization.

Configuration of the Internet Telephone's 802.1Q

The 802.1Q support for the Internet Telephones is configured and controlled using the telephone's user interface or DHCP. The DHCP approach eliminates the need to manually set the VLAN ID during the installation.

To configure 802.1Q, set the following:

- "p" bits
- VLAN ID

Set the "p" bits

By default, the 3-bit field "p" bits are set to 110b (6), which is the value recommended by Nortel Networks. The "p" bit value can be changed using either OTM or Element Manager. There are two fields in OTM 2.1 and Element Manager used to set the "p" bits:

1   A **checkbox** that, when checked, means the priority bits should be set to the value specified by the 802.1Q priority bit value field. If the checkbox is unchecked, the i2002/i2004 Internet Telephone sends out the default priority of 6.

2   A **802.1Q priority bit value field**. This field sets the value that the i2002/i2004 Internet Telephones sends out. The range is 0 – 7.

Set the VLAN ID

The contents of the VLAN ID field can be specified on a "per interface" basis and is a global setting. This means that all packets transmitted by the Internet Telephone have the same VLAN ID.

The VLAN ID is specified as follows:

- the default VLAN ID is 000 (hex)
- the VLAN ID can be set during a manual configuration of the Internet Telephone using the telephone keypad, or automatically retrieved using DHCP (automatic VLAN discovery)

Note: For more information about manual or automatic Internet Telephone configuration, refer to *Internet Terminals: Description* (553-3001-368).

DHCP requirements

Some implementation requirements of the Automatic VLAN Discovery using DHCP are:

1   A DHCP server IP address pool must exist for each subnet (also VLANs). This is standard DHCP operation. The requirement is the same for PCs or Internet Telephones.

2   A DHCP server should not exist in more than one VLAN at one time (one subnet for each VLAN), unless the link to the DHCP server is tagged and the DHCP server can recognize this. With an untagged link to the DHCP server, traffic could originate on one VLAN and end up on the other VLAN. In this case, the VLAN using DHCP feature does not work.

3   Voice and data subnets must be separate if the three-port switch with VLANs is being used.

4   A layer three switch (or router) with a Relay agent must be used because traffic from the voice VLAN to the data VLAN must be routed. Presumably, the DHCP server is on the data VLAN. Without a Relay agent, a DHCP server must exist on each subnet.

5   At least two IP address pools are used on the DHCP server – one for the Voice VLAN/subnet and another for the Data VLAN/subnet. Additional pools can be added as required as long as one IP address pool per subnet and VLAN is used. A relay agent is required if it is a PC-only network.

Control of the Internet Telephone's 802.1Q

The 802.1Q header in the outgoing packets from the i2002 and i2004 Internet Telephones is enabled by one of the following:

•   If the Internet Telephone's VLAN GUI response is set to 1, then the 802.1Q functionality is enabled. All packets from the Internet Telephone have the 802.1Q header as part of the Ethernet frame.

- If the Internet Telephone's VLAN GUI response is set to 2, then the 802.1Q functionality is enabled after the DHCP response is received with the VLAN ID.

- If the OTM 2.1 or Element Manager configuration enables the use of the "p" bits, once downloaded to the Internet Telephone, the 802.1Q functionality is enabled.

802.1Q and the Voice Gateway Media Cards

The ITG-P 24-port and Succession Media Card line cards cannot send the 802.1Q header because the cards' operating system does not support it. The switch ports connected to the Voice Gateway Media Card's TLAN should be configured for untagged operation so if a 802.1Q header is present, it is stripped before a packet is passed to the card.

The configuration in OTM 2.1 and Element Manager is for the control of the priority bits in the 802.1Q header sent by the Internet Telephones only.

Data Path Capture tool

IP Line 3.1 contains the Data Path Capture tool, a built-in utility used to capture audio information. This tool helps debug audio-related gateway problems and allows after-the-fact analysis of what the user heard.

The Data Path Capture process is controlled by a set of CLI commands.

Internet Telephone firmware

Minimum firmware version

Version 1.5x of the i2004 and i2002 Internet Telephone firmware (F/W) is the minimum version supported by IP Line 3.1.

Firmware download

The firmware files for the Internet Telephones are downloaded from OTM 2.1 or Element Manager to the node Master. They are compressed as they are stored on the node Master card's /C: drive. File compression reduces the firmware file to less than 900 K. However, the /C: drive Flash disk space is limited on the ITG-P 24-port line card.

The Internet Telephone normally does not have to be pre-loaded with the firmware file because, during normal operation, the Internet Telephone's firmware is automatically upgraded as part of the registration to the TPS. If the firmware cannot be upgraded, perhaps due to firewall restrictions, then the Internet Telephone must be upgraded with the current firmware version before distributing the telephone.

Firmware filenames

The Internet Telephone firmware files are released on CD-ROM. The files are also available from the Nortel Networks Web site (see Appendix E: "Download IP Line 3.1 files from Nortel Networks web site" on).

The Internet Telephone firmware files are labelled as follows:

- 0602Bnn.BIN is the filename for the i2004 Internet Telephone firmware where Bnn = F/W version 1.nn.

- 0603Bnn.BIN is the filename for the i2002 Internet Telephone firmware where Bnn = F/W version 1.nn.

If the external file server option is used (in OTM 2.1 or Element Manager) for firmware distribution with a node, the files must be renamed before being placed on the server:

- 0602Bnn.BIN must be renamed to i2004.fw

- 0603Bnn.BIN must be renamed to i2002.fw

For the external file server options:

- see Procedure 18 on for OTM 2.1

- see Procedure 35 on for Element Manager

Meridian 1

Default location of firmware files

The firmware files for the Internet Telephones are stored in the C:/FW directory. The firmware files are downloaded and saved to this directory when the user checks the firmware download checkbox in the OTM Synchronize/Transmit dialog and presses the Transmit button. The IP Line application saves the firmware file for the i2004 Internet Telephone as i2004.fw and saves the firmware file for the i2002 Internet Telephone as i2002.fw. Then at card bootup time, if the firmware file is not retrieved from the external server or the /A: drive, the /C:/FW directory is accessed and the firmware files present in the directory are loaded into memory and uncompressed.

Firmware file management with IP Line 3.1

The firmware file is stored and retrieved from the local /C:/FW directory.

The IP Line 3.1 application searches for the firmware first at the file server, then in the /A:/FW directory, and finally in the /C:/FW directory.

- Normally the file server is not configured in OTM 2.1.
  OTM 2.1 places IP address 0.0.0.0 in the CONFIG.INI file for the file server address. If an address of "0.0.0.0" (the default) is read from the file, the IP Line 3.1 application ignores the file server settings. As a result, the normal search ends with the firmware file being retrieved from the /C:/FW directory.

- If a file server address is configured, the file is downloaded into the /ums directory in memory. In order for all the Voice Gateway Media Cards to get the same firmware files, it is necessary to ensure that the configured file server is up and running before any of the cards boot up.

The "/A:" drive (faceplate PC Card slot) of the Voice Gateway Media Card can also be used with a PC Card containing the firmware files. The card is specified as the server and the file directory specifies the "/A:/FW" drive.

Download Protocol

The TFTP download mechanism is used in IP Line 3.1. The Master card notifies the Followers about changes to the status of the firmware file using a broadcast on the TLAN interface.

   Note: UFTP is not supported.

Bootup Scenarios

If the Master is unable to retrieve a firmware file, the upgrade policy is set as "Never". When the upgrade policy is set to "Never", the Internet Telephone's firmware version is not checked and the telephone registers with the firmware version that is currently on the telephone.

If the Master card reboots, the Election process selects another Voice Gateway Media Card as the Master. That Voice Gateway Media Card has all firmware files in its memory. When the original Master card finishes rebooting, it becomes the Master and does the normal Master startup procedure for retrieving the firmware files.

In a power-on situation, where all cards reboot together, the first card that is elected Master retrieves the firmware files from the server.

Succession 1000M and Succession 1000

Default location of firmware files

For Succession 1000M and Succession 1000 configurations, the default
storage location for the firmware files is on the Succession Signaling Server
in the /u/fw directory. The firmware file is downloaded to this directory, the
file is selected in Element Manager, and the Transmit button is clicked.

Firmware file management with IP Line 3.1

Due to the limited flash drive space on the Voice Gateway Media Cards,
IP Line 3.1 manages the firmware file in the following manner:

1 There is one firmware file for each telephone type. These files are saved
and retrieved in one of the following two locations:

    a to/from a file server
(The file server can be a dedicated external server, the Call Server,
or a Voice Gateway Media Card.)

    b to/from a Master card's RAM device

2 The server's information is configured in Element Manager and the
information is saved in the CONFIG.INI file. The server's IP address,
routing table, file path, user name, and password are specified during
configuration time.

3 When the Master card boots, it searches for the firmware files on the
specified server.

    a If found, they are retrieved and stored on the RAM drive in the /ums
directory.

    b Otherwise,

        i. for a Voice Gateway Media Card, the Master card continues to
search for the firmware files in the local A:/fw directory and
then the C:/fw directory until the files are found.

        ii. for a Succession Signaling Server, the Master card attempts to
search for the firmware files in the /u/fw directory, and then the
/A:/fw directory.

4   When a Follower card boots, it looks for the firmware files on the Master card's RAM drive in the /ums directory.

     If the Master has not yet retrieved the files, the Follower waits until the Master sends notification that the firmware files are retrieved. Using FTP, the Follower transfers the files from the Master and stores them in the /ums directory on its RAM drive.

5   Once a firmware file is found and stored in the card's RAM drive, the upgrade manager parses the file and updates its policy based on the firmware version it received from file.

6   The i2002 and i2004 Internet Telephones are checked against the upgrade policy at the time they register. If a firmware update is required, the firmware is downloaded from the Succession Signaling Server or the Voice Gateway Media Card's TFTP server to the Internet Telephone.

The firmware file for the i2004 Internet Telephone is saved as i2004.fw and is saved as i2002.fw for the i2002 Internet Telephone. These filenames are required for the upgrade manager to find certain files in either the standalone file server or the Master card's RAM drive.

In order for all Voice Gateway Media Cards to obtain the same firmware files, ensure that the configured file server is running before any of the Voice Gateway Media Cards boot up.

In Succession 1000 and 1000M, the Succession Signaling Server acts as the file server and the Master function is on the Succession Signaling Server. As a result, no time to download the firmware files from the file server is needed.

The /A: drive (the PC Card slot on the card's faceplate) of the Voice Gateway Media Card can also be used with a PC Card containing the firmware files; the Voice Gateway Media Card is specified as the server and the file directory specifies the /A: drive.

Graceful Disable

The DISI command in LD 32 can be used to disable the Voice Gateway Media Card's gateway channels when they become idle. This command removes gateway call traffic from a Voice Gateway Media Card; however, it does not remove the Internet Telephones registered to the Voice Gateway Media Card. Even after the gateway channels are disabled, all telephones registered to the card are impacted when the card is unplugged or reset. Also, if a Voice Gateway Media Card or Succession Signaling Server is the node Master when it is removed, the Internet Telephone registration service is interrupted until the next election occurs.

To over come these problems, the Graceful TPS enhancement provides a card-level CLI command that disables the TPS service on the Voice Gateway Media Card or Succession Signaling Server.

The Graceful TPS command:

- prevents new Internet Telephones from registering
- soft-resets any idle, registered Internet Telephones

Since the TPS does not accept new registrations, the Internet Telephones register with another card's TPS after the reset. Eventually, all Internet Telephones are registered with other TPSs and the card can be removed without impact to any users.

Operation of the TPS DISI

The Graceful TPS Disable is controlled from the CLI of the card. When the disiTPS command is executed on the card's TPS, the following occurs:

- The card does not accept any new registration requests.
- The card soft-resets all registered Internet Telephones that are in the idle state and redirects the Internet Telephones to the node Master.

- The card soft resets the remaining busy registered Internet Telephones after they release their active call.

- If the card is node Master, an election is held to transfer the mastership. This occurs only on the Voice Gateway Media Card. The Succession Signaling Server's node mastership is not transferred.

IMPORTANT!

When only the **disiTPS** command is entered on a Succession Signaling Server and the mastership remains with that Succession Signaling Server, then Internet Telephones can re-register to both Voice Gateway Media Cards and another Succession Signaling Server in the node.

To ensure that the Internet Telephones re-register only to the secondary Succession Signaling Server, Nortel Networks recommends that the command **disableServices** be used on the Succession Signaling Server instead of **disiTPS**. Using the **disiTPS** command alone on the on the Succession Signaling Server is not recommended.

Alternatively, the **vtrkShutdown** command followed by the disiTPS can be entered.

Feature operation of the Voice Gateway DISI

The Voice Gateway can also be disabled from the CLI of a Voice Gateway Media Card. When the disiVGW command is executed, the following happens on that card's Voice Gateway:

- Idle gateway channels are unregistered.

- A busy gateway channel is unregistered when it becomes idle.

Note: Care should be taken with this command to avoid a potential problem when calls are placed on hold. When a telephone has a call on hold, the voice gateway channel on the card is idle; however, it is still reserved in the Call Server. If the Voice Gateway is still disabled when the call is taken off hold, the call does not have a speech path.

Recommendation

Nortel Networks recommends that the LD 32 DISI command be used for disabling the gateway channels.

Hardware watchdog timer

A hardware watchdog timer is enabled on the ITG-P 24-port and Succession Media Card line cards. This functionality adds further robustness to the existing exception handler and maintenance task audits.

The hardware watchdog timer handles scenarios such as the following:

- the CPU failing

- the code running and not triggering an exception

- resetting the card and bringing it back to normal operation

The timer runs on the ITG-P 24-port and Succession Media Card line card processors. The card's main processor is polled every 20 seconds. If three pollings are missed, then the card is reset. This gives the main processor 60 seconds to respond, covering most normal operating conditions.

A reset reason is saved when a card resets. The reset reason is displayed as a message during the startup sequence and appears in the SYSLOG file.

The following are examples of reset reasons:

- JAN 04 12:17:45 tXA: Info Last Reset Reason: Reboot command issued Output after card reset using the CLI command cardReboot.

- JAN 04 12:17:45 tXA: Info Last Reset Reason: Watchdog Timer Expired Output after card reset due to watchdog timer expiration.

- JAN 04 12:17:45 tXA: Info Last Reset Reason: Manual reset
  Output after card reset due to either the faceplate reset button press or a
  power cycle to the card.

- JAN 04 12:17:45 tXA: Info Last Reset Reason: Unknown
  Output after card reset due either the card F/W not supporting the reset
  reason or a corruption of the reset reason code.

The last reset reason can also be displayed at any time by entering the
lastResetReason CLI command.

Watchdog timer and Voice Gateway Media Card firmware

The application starts the Watchdog Timer as part of the application startup
process. The timer is started only if the application's check of the firmware
version indicates the card's firmware supports the Watchdog Timer function.

Required Voice Gateway Media Card firmware version

A firmware upgrade can be required on the Voice Gateway Media Cards to
invoke the Watchdog Time functionality:

- ITG-P 24-port line card – Version 5.3 of the firmware file is the required
  minimum to enable the Watchdog Timer functionality on the ITG-P
  24-port line card. To upgrade the firmware version of the ITG-P 24-port
  line card to support the Watchdog functionality, see Procedure 87 on
  page 538.

- Succession Media Card – Version 6.0 of the firmware file is the required
  minimum to enable the Watchdog Timer functionality on the Succession
  Media Card line cards. To upgrade the firmware version of the
  Succession Media Card line cards to support the Watchdog functionality,
  see Procedure 88 on page 541.

Codecs

Codec refers to the voice coding and compression algorithm used by the
DSPs on the Voice Gateway Media Card. Different Codecs provide different
levels of voice quality and compression properties. The specific Codecs and
the order in which they are used are configured on the TPS and Meridian 1,
Succession 1000M, and Succession 1000.

Table 27 on page 108 shows which Codecs are supported on the systems:

Table 27
Supported Codecs

Codec	Payload size
G.711 a-law, G.711 mu-law, NOVAD	10, 20, and 30 ms
G.729A	10, 20, 30, 40, and 50 ms
G.729AB	10, 20, 30, 40, and 50 ms
G.723.1 [1]	30 ms
T.38 [2]	supported for fax calls on gateway channels
G.711 Clear Channel [2]	supported for fax calls on gateway channels
Note 1: The G.723.1 Codec has bit rates of 5.3 Kbps and 6.3 Kbps. In IP Line 3.1, The G.723.1 Codec can only be configured with a 5.3 Kbps bit rate; however, the system accepts both G.723.1 5.3Kbps and 6.4Kbps from the far end.	
Note 2: T.38 is the preferred Codec type for fax calls over virtual trunks. However, the G.711 Clear Channel Codec is used if the far end does not support the T.38 Codec.	

For detailed information about Codecs, refer to "Codecs" on .

Set type checking and blocking

If the registration is a regular request (not a Virtual Office login), the Succession Call Server checks the configured TN type against the actual set type. If they don't match, the registration is blocked.

However, if the registration request is a virtual login, this check is not performed. All sets are allowed to be registered onto any IP TN type when the login is through Virtual Office.

Special checking on the DN/ Feature keys is performed when an i2004 or i2050 user logs in from an i2002 internet telephone.

Special checking is required to prevent a user from logging in from an Internet Telephone that cannot display an incoming call because the Internet Telephone used to log in does not have the DN/Feature key(s) to display the incoming call. If the login were allowed to occur, it could result in the phone ringing without providing the user a way to answer the call. The configuration of the logging-in user is examined for DN/Feature key types that receive incoming calls. If these appear on any keys not present on the type of internet phone being used for the login, the login is blocked.

> *Note:* The login from i2002 Internet Telephones is blocked for users configured for ACD.

Because the i2002 Internet Telephone supports only 4 feature keys, a restricted VO login is applied to i2004 and i2050 TNs when they log in using an i2002 Internet Telephone. When the i2004 or i2050 user logs in from an i2002 Internet Telephone, it is blocked if the user's configuration has one of the following:

- key 0 defined as ACD

- any key from key 4 to key 15 defined as AAK, CWT, DIG, DPU, GPU, ICF, MCN, MCR, MSB, PVN, PVR, SCR or SCN.

Enhanced Redundancy for IP Line nodes

The Enhanced Redundancy for IP Line nodes feature relaxes the checking performed by a node on the Node ID that is presented by a registering Internet Telephone. Under the circumstances described in this section, an Internet Telephone with a 3-digit Node ID can register to a node that is configured with a 4-digit Node ID. To enable the registration to be successful, the 3-digit Node ID must match the first 3 digits of the node's 4-digit Node ID.

This feature enhances the Internet telephone's survivability in the case of network outages or equipment failure, as it allows an Internet Telephone to register to more than one node on a system. By configuring the Internet telephone's S1 and S2 Connect Server IP addresses to the node addressees of two different nodes, and properly configuring the Node IDs, the Internet Telephone is able to register to another secondary node if it cannot register to the primary node.

The rules are as follows:

- if the Node ID on the system has 3 digits or less, the Node ID from the Internet Telephone must match exactly

- if the Node ID on the system has 4 digits and:

  — the Node ID from the Internet Telephone has fewer than 3 digits, reject the registration

  — the Node ID from the Internet Telephone has 4 digits, the Node ID must match exactly

  — if the Node ID from the Internet Telephone has 3 digits and they match the first 3 digits of the node's 4 digit Node ID (left to right), then allow the Internet Telephone to register. If the first three digits do not match, reject the registration.

Up to 10 nodes can be configured on a system (3-digit Node ID base + 0-9 for the fourth digit). The Internet Telephones are distributed among the nodes by programming different S1 and S2 IP addresses into the Internet Telephones. The Internet Telephones register to the primary Connect Server (the S1 IP address) if possible. If a network outage or equipment failure prevents the registration to the primary Connect Server, the Internet Telephone can register to a secondary Connect Server (the S2 IP address). This feature enables a node's registered Internet Telephones to spread across the spare Internet Telephone registration capacity of the other nodes in the system in the event of a network outage or equipment failure.

Example

For example, the installer configures two nodes on a system with Node IDs 3431 and 3432. An Internet Telephone configured with Node ID 343 can register with either node.

If the Internet Telephone presented one of the following Node IDs, it would be rejected for registration

- 3

- 34

- 3433

The TN must still match before the phone is allowed to register.

If the customer does not want to use the Enhanced Redundancy for IP Line Nodes feature, programming 2- or 4-digit Node IDs retains the "exact match" requirement.

Codecs

Contents

This section contains information on the following topics:

Introduction

The Internet Telephones and Voice Gateway Media Cards support different Codecs and Codec parameters with different compression rates and audio quality. The Meridian 1, Succession 1000M, and Succession 1000 systems select the appropriate Codecs based on user-configurable parameters.

For instance, an Internet Telephone-to-Internet Telephone call in the same zone within a LAN can be set up using G.711 at 64 Kbps. For an Internet Telephone-to-Internet Telephone call over a WAN, the call can be set up using G.729A or G.729AB at 8 Kbps. These data rates and the Voice Gateway Channel Server on the Voice Gateway Media Card are for the voice stream only. Packet overhead is not included.

Pre-defined Codec table

The Terminal Proxy Server (TPS) and the Voice Gateway Channel Server on the Voice Gateway Media Card have a pre-defined table of Codec option sets that can be supported.

The first entry in the table has the highest quality audio (BQ = Best Quality) and requires the largest amount of bandwidth. The last entry requires the least amount of bandwidth (BB = Best Bandwidth) with lower voice quality.

When the Call Server sets up a Call Server connection between an Internet Telephone-to-Internet Telephone or Internet Telephone-to-Voice Gateway Channel Server, the pre-defined table determines which Codec it selects for that connection. This information is provided to the system as part of the Internet Telephone registration sequence.

For more information about the registration sequence, refer to "Configuring the DHCP Server" in *Data Networking for Voice over IP* (553-3001-160).

Codec selection

The systems use this information to set up a speech path and select a Codec that both endpoints support. As part of zone management, the system further selects the Codec based on whether it is trying to optimize quality (BQ) or bandwidth usage (BB).

> **CAUTION**
> When voice compression Codecs are used, voice quality is impaired if end-to-end calls include multiple compressions.

The term "Codec" refers to the voice coding and compression algorithm used by the DSPs on the Voice Gateway Media Card. Different Codecs provide different levels of voice quality and compression properties. The specific Codecs and the order in which they are used are configured in the TPS, and on the system.

Table 28 shows which Codecs are supported on the Meridian 1, Succession 1000M, and Succession 1000 systems.

Table 28
Supported Codecs

Codec	Payload size
G.711 a-law, G.711 mu-law, NOVAD	10, 20, and 30 ms
G.729A	10, 20, 30, 40, and 50 ms
G.729AB	10, 20, 30, 40, and 50 ms
G.723.1 [1]	30 ms
T.38 [2]	supported for fax calls on gateway channels
G.711 Clear Channel [2]	supported for fax calls on gateway channels
Note 1: The G.723.1 Codec has bit rates of 5.3 Kbps and 6.3 Kbps. In IP Line 3.1, The G.723.1 Codec can only be configured with a 5.3 Kbps bit rate; however, the system accepts both G.723.1 5.3Kbps and 6.4Kbps from the far end.	
Note 2: T.38 is the preferred Codec type for fax calls over virtual trunks. However, the G.711 Clear Channel Codec is used if the far end does not support the T.38 Codec.	

Note: If there are multiple nodes on a system and the same Codec is selected on more than one node, ensure that each node has the same voice payload size configured for the Codec.

Codec configuration

Configure the Codec in the DSP Profile sections of OTM 2.1 and Element Manager.

Codec selection in OTM 2.1

Figure 5 on page 117 shows the list of Codecs available on the DSP Profile tab within OTM's IP Line 3.1 application. The Codec Options sub-tab presents a table of different sets of Codec options identified by a Codec setting index number. There is a list of up to 32 Codec settings for G.711, G.729A, and G.729AB. The lesser Codec setting index corresponds to BQ (Best Quality) in LD 117 zone configuration. The greater Codec setting index corresponds to BB (Best Bandwidth). For more information, see *Data Networking for Voice over IP* (553-3001-160).

Figure 5
Codec list on OTM 2.1
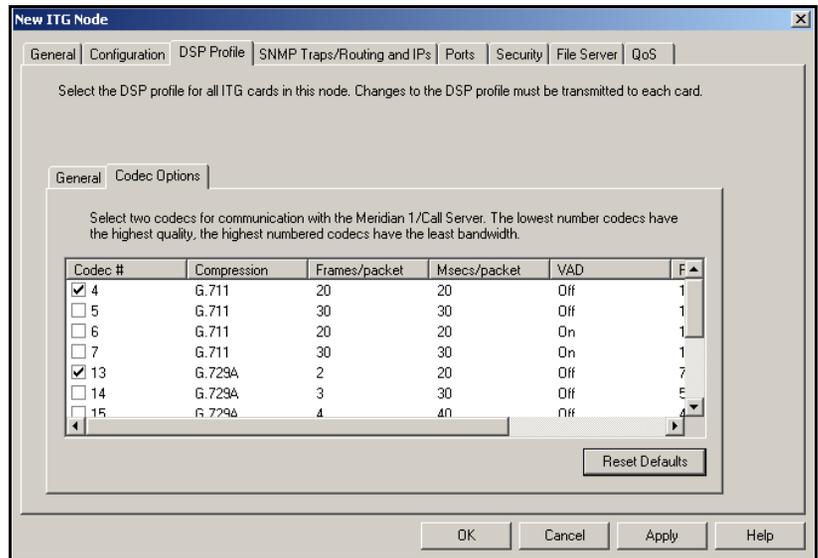
For more information, see "Configure DSP profile data" on page 197.

Codec selection in Element Manager

Figure 6 on page 118 shows the list of Codec types that are displayed in Element Manager.

Figure 6
Codec list in Element Manager

The G.711, G.711 Clear Channel, and T.38 Fax Codecs are automatically
selected and cannot be un-selected. Even though these Codecs cannot be
un-selected, the payload size, and the jitter buffer for G.711 can be changed.
For G.711 Clear Channel, only the jitter buffer can be changed.

Select all three, any two, any one, or none of the G.729A, G.729AB, and
G.723.1 Codecs. If the G.729A or G.729AB Codec is selected, the payload
size and the jitter buffer settings can be changed. If the G.723.1 Codec is
selected, only the jitter buffer can be changed, as the only supported payload
size is 30 msec.

For Codec configuration in Element Manager, see "Configure Voice
Gateway Profile data" on .

Codec registration

After the configuration of Codecs is complete, the Internet Telephones and
DSPs have to register the configured Codecs with the Call Server.

Codec registration for Internet Telephones

The Internet Telephones always register both the G.711 a-law and mu-law
Codecs, as well as all Codec(s) configured by the user. The Codecs that can
be configured by the user are G.729A, G.729AB, and G.723.1.

The minimum number of Codecs registered for an Internet Telephone is two: G.711 a-law and G.711 mu-law (G.711 is always configured).

The maximum number of Codecs registered for an Internet Telephone is five: G.711 a-law, G.711 mu-law, G729A, G729AB, and G.723.1.

Note: Internet Telephones do not register the fax Codecs (T.38 and G.711 Clear Channel).

Example 1

A user configures a G.711 mu-law Codec (with a 30 msec payload) and a G.723.1 Codec (with a 30 msec payload).

The following three Codecs are actually registered:

1   G.711 mu-law (30 msec)

2   G.711 a-law (30 msec)

3   G.723.1 (30 msec)

Example 2

A user configures four Codecs:

1   G.711 a-law Codec with a 10 msec payload

2   G.729A Codec with 50 msec payload

3   G.729AB Codec with 30 msec payload

4   G.723.1 Codec with a 30 msec payload

The following five Codecs are actually registered:

1   G.711 a-law (10 msec)

2   G.711 mu-law (10 msec)

3   G.729A (50 msec)

4   G.729AB (30 msec)

5   G.723.1 (30 msec)

Codec registration for DSPs

DSPs register the following Codecs:

- both G.711 a-law and G.711 mu-law Codecs are always registered

- both fax Codecs (T.38 and G.711 Clear Channel) are always registered

- one best bandwidth (BB) Codec, if at least one of G.729A, G.729AB, or G.723.1 Codecs was configured. The BB Codec is based on the Codec type. The order of preference for choosing the BB Codec is G.729AB, G.729A, and then G.723.1.

IMPORTANT!

When G.723.1 Codec is configured on the Succession Media Card 32-port line card, the number of channels is reduced to 24. This is a limitation of the DSP software. The unused channels are not registered, therefore the Call Server software does not access them

---

Minimum Codecs

The minimum number of Codecs registered for DSPs is four:

- G.711 a-law

- G.711 mu-law

- T.38

- G.711 Clear Channel

Maximum Codecs

The maximum number of Codecs registered for DSPs is five:

- G.711 a-law

- G.711 mu-law

- T.38

- G.711 Clear Channel

- one of G.729AB, G.729A, or G.723.1

Example 1

A user configures four Codecs:

1 G.711 a-law Codec with a 10 msec payload

2 G.729A Codec with 50 msec payload

3 G.729AB Codec with 30 msec payload

4 G.723.1 Codec with a 30 msec payload

The following five Codecs are actually registered:

1 G.711 a-law (10 msec)

2 G.711 mu-law (10 msec)

3 G.729AB (30 msec)

4 T.38

5 G.711 Clear Channel

The G.729AB Codec is selected, as it is the first in the order of preference of the BB Codecs. The G.729A and G.723.1 Codecs do not get registered.

Example 2

A user configures three Codecs:

1 G.711 mu-law Codec with a 20 msec payload

2 G.729A Codec with 30 msec payload

3 G.723.1 Codec with a 30 msec payload

The following five Codecs are actually registered:

1 G.711 mu-law (20 msec)

2 G.711 a-law (20 msec)

3 G.729A (30 msec)

4 T.38

5 G.711 Clear Channel

The G.729A Codec is selected, as it precedes the G.723.1 Codec in the order of preference of the "best bandwidth" Codecs.

Voice Gateway Codec registration

The Voice Gateway registers Codecs for the gateway channels as follows:

- G.711 a-law and G.711 mu-law are always registered.

- T.38 and G.711 Clear Channel fax Codecs are always registered. G.711 Clear Channel is used for IP Trunk connections to BCM, which does not support T.38 fax.

- A minimum of two Codecs are registered if only G.711 was configured.

- A maximum of three Codecs can be registered - the G.711 a-law and mu-law for BQ Codec, and one BB Codec as configured by the user.

- The order of preference first to last) for the BB Codec is as follows:

  — G.729AB

  — G.729A

  — G.723.1

Example 1
G.711 a-law, G.729A, G.729AB, and G.723.1 are configured.
The Voice Gateway registers G.711 a-law, G.711 mu-law, and G.729AB.

Example 2
G.711 mu-law, G.729A, and G.723.1 are configured.
The Voice Gateway registers G.711 a-law, G.711 mu-law, and G.729A.

Example 3

G.711 mu-law and G.723.1 are configured.
The Voice Gateway registers G.711 a-law, G.711 mu-law, and G.723.1.

Codec negotiation

For every virtual trunk call, a common Codec must be selected for the call. This is known as Codec negotiation. Codec negotiation for virtual trunk calls is performed through the H.323 FastStart and Terminal Capability Set (TCS) messages.

For a call setup with the FastStart procedure, the originating node sends its Codec list in the FastStart element in the SETUP message to the terminating node. For a call setup using the SlowStart procedure or for a call modification (media redirection), each node sends its Codec list in the TCS message to the other node.

Codec sorting

Before sending a Codec list in FastStart and TCS messages, the Codec list must be sorted according to the BB or BQ policy. This is determined by the following:

• the zone configuration of the Internet Telephone / DSP involved in the call

• the zone configuration of the virtual trunk used for the call

Codec sorting methods

There are two methods for sorting the Codec list:

1 BQ sorting – the Codec list is sorted so that the first Codec in the list is the best BQ Codec, the second Codec is the second best BQ Codec in the list, and so on.

2 BB sorting – the Codec list is sorted so that the first Codec in the list is the best BB Codec, the second Codec is the second best BB Codec in the list, and so on.

Table 29 shows the Codec list sorting order for the BQ and BB Codecs. To know if a Codec is BQ (as compared to another Codec), refer to the lists in columns 1 and 2. To determine if a Codec is BB (as compared to another Codec), refer to the lists in columns 3 and 4. The BQ or BB Codec is listed at the top of the column.

Table 29
BQ and BB Codec sorting lists

Best Quality (BQ) sorting		Best Bandwidth (BB) sorting	
For mu-law systems	**For a-law systems**	**For mu-law systems**	**For a-law systems**
G.71_mu_law_10msec	G.711_a_law_10msec	G.729AB_50msec	G.729AB_50msec
G.711_mu_law_20msec	G.711_a_law_20msec	G.729AB_40msec	G.729AB_40msec
G.711_mu_law_30msec	G.711_a_law_30msec	G.729AB_30msec	G.729AB_30msec
G.711_a_law_10msec	G.711_mu_law_10msec	G.729AB_20msec	G.729AB_20msec
G.711_a_law_20msec	G.711_mu_law_20msec	G.729AB_10msec	G.729AB_10msec
G.711_a_law_30msec	G.711_mu_law_30msec	G.729A_50msec	G.729A_50msec
G.729A_10msec	G.729A_10msec	G.729A_40msec	G.729A_40msec
G.729A_20msec	G.729A_20msec	G.729A_30msec	G.729A_30msec
G.729A_30msec	G.729A_30msec	G.729A_20msec	G.729A_20msec
G.729A_40msec	G.729A_40msec	G.729A_10msec	G.729A_10msec
G.729A_50msec	G.729A_50msec	G.723.1_5.3kbps_30ms	G.723.1_5.3kbps_30ms
G.729AB_10msec	G.729AB_10msec	G.723.1_6.4kbps_30ms	G.723.1_6.4kbps_30ms
G.729AB_20msec	G.729AB_20msec	G.711_mu_law_30msec	G.711_a_law_30msec
G.729AB_30msec	G.729AB_30msec	G.711_mu_law_20msec	G.711_a_law_20msec
G.729AB_40msec	G.729AB_40msec	G.711_mu_law_10msec	G.711_a_law_10msec
G.729AB_50msec	G.729AB_50msec	G.711_a_law_30msec	G.711_mu_law_30msec
G.723.1_5.3kbps_30ms	G.723.1_5.3kbps_30ms	G.711_a_law_20msec	G.711_mu_law_20msec
G.723.1_6.4kbps_30ms	G.723.1_6.4kbps_30ms	G.711_a_law_10msec	G.711_mu_law_10msec
T.38	T.38	T.38	T.38
G.711CC	G.711CC	G.711CC	G.711CC

Codec selection

For every virtual trunk call, a Codec must be selected before the media path is opened.

When a call setup with the FastStart procedure is used, the terminating node selects a common Codec and sends the selected Codec to the originating node. For a call modification (media redirection) or for a call setup using the SlowStart procedure, the Codec selection occurs on both nodes. Each node has two Codec lists: its own list and the far-end's list. To select the same Codec on both nodes, it is essential to use the same Codec selection algorithm on both nodes.

For the Codec selection, both the near- and far-end Codec lists are retrieved:

• The far-end list is not modified because it is already sorted when it is received (in FastStart or TCS message).

• The near-end list is sorted and then expanded to include lower payloads, the same way it is done before sending the Codec list in FastStart message.

The following conditions are met before Codec selection occurs:

• There are two Codec lists:

— The near-end list is the Codec list of the local unit.

— The far-end list is the Codec list received from the far end.

• Each Codec list can contain more than one payload size for a given Codec type. The Codec list depends on the Codec configuration.

• Each Codec list is sorted by order of preference. The first Codec in the near-end list is the near-end's most preferred Codec and the first Codec in far-end list is the far end's most preferred Codec, and so on.

Once the above conditions are met, a Codec selection algorithm is used to select the Codec to be used for a call. There are two different Codec selection algorithms:

1   H.323's Master/Slave algorithm

2   Best Bandwidth Codec Selection algorithm

H.323's Master/Slave algorithm

The Codec selection algorithm proposed by the H.323 standard involves a Master/Slave negotiation, initiated each time two nodes exchange their capabilities (TCS message). The Master/Slave information decides that one node is Master and the other node is Slave. The outcome of the Master/Slave negotiation is not known in advance, it is a random result: one node could be Master then Slave (or vice versa) during the same call.

• The Master node uses its own Codec list as the preferred one. From the far-end list, it finds the common Codec.

   The Master gets the first Codec in its own list (Codec1). The Master then checks the far-end list to see if Codec1 is a common Codec (that is, is Codec1 also listed in the far-end list). If Codec1 is common to both lists, Codec1 becomes the selected Codec. Otherwise, the Master obtains the second Codec from its own list and repeats the search in the far-end list, and so on.

• The node which is Slave uses the far-end list as the preferred list. The Slave selects a Codec from the far-end list and then searches in its own list to find the common Codec.

The issues caused by the Master/Slave algorithm are due to the random nature of the Master/Slave information. The Codec that is selected and used during a virtual trunk call cannot be pre-determined. This can make bandwidth usage calculations and bandwidth management difficult.

Known issues include:

- After an on-hold and off-hold scenario (that triggers Master/Slave negotiation), the Codec used for the restored call can be different than the Codec used before the call was placed on hold. The Master/Slave information could have been changed when the call was on hold.

- Since the terminating end of a call is always the Master, a call from telephone1 (node1) to telephone2 (node2) can use a different Codec than a call from telephone2 (node2) to telephone1 (node1).

- For tandem calls, the Master/Slave information is not relevant. That is, the Master/Slave information is designed to be used only between two nodes, not among three or more nodes. The Master/Slave algorithm makes the Codec selection for tandem calls more complex and inefficient.

To solve the issues, another Codec selection algorithm was needed. This new algorithm is called the Best Bandwidth Codec Selection algorithm and is not based on the unpredictable Master/Slave information.

The Best Bandwidth Codec Selection algorithm is used for virtual trunk calls between Nortel Networks equipment, since any change to the Master/Slave algorithm implies a change to the H.323 standard. The H.323's Master/Slave algorithm is used when there is a virtual trunk call between Nortel Networks equipment and third-party equipment.

Best Bandwidth Codec Selection algorithm

The Best Bandwidth Codec Selection algorithm was implemented to solve the issues caused by the H.323 Master/Slave algorithm. The Best Bandwidth Codec Selection algorithm selects one common Codec based on two Codec lists. With this algorithm, every time the selection is done using the same two lists, the selected Codec is always the same.

The "Best Bandwidth" Codec selection is based on the Codec type only; it does not take into account the fact that some Codecs, while generally using

less bandwidth, consume more bandwidth than others at certain payload sizes.

- The Best Bandwidth Codec Selection algorithm finds the first Codec in the near-end list that is also in far-end list (Codec is the same type and has the same payload size). Call the selected Codec C1.

- Find the first Codec in the far-end list that is also in the near-end list (same type, same payload size). Call this Codec C2.

- The C1 and C2 Codec that is selected is considered to be the BB Codec type. To determine which Codec type is Best Bandwidth, the following rules are used:

  — a G.729AB Codec is considered BB compared to G.729A, G.723.1, G.711_mu-Law, and G.711_a-Law Codecs

  — a G.729A Codec is considered BB compared to G.723.1,G.711_muLaw, and G.711_aLaw Codecs

  — a G.723.1 Codec is considered BB compared to a G.711_mu-Law and G.711_a-Law Codec

  — a G.711_mu-Law Codec is considered BB compared to a G.711_a-Law Codec

Table 30 shows the Codec that would be selected between any two Codecs. For example, if the two Codecs are the G.729A and G.723.1, the selected Codec is the G.729A.

Table 30
Best Bandwidth Codec Selection between any two Codecs types

Codec type	G.711_a-Law	G.711_mu-Law	G.729A	G.729AB	G.723.1
G.711_a-Law	G.711_a-Law	G.711_muLaw	G.729A	G.729AB	G.723.1
G.711_mu-Law	G.711_mu-Law	G.711_mu-Law	G.729A	G.729AB	G.723.1
G.729A	G.729A	G.729A	G.729A	G.729AB	G.729A
G.729AB	G.729AB	G.729AB	G.729AB	G.729AB	G.729AB
G.723.1	G.723.1	G.723.1	G.729A	G.729AB	G.723.1

Installation and configuration summary

Contents

This section contains information on the following topics:

Introduction

This chapter provides a summary of the procedures required to install a new IP Telephony node, add cards to the node, install the cards, transmit data to the cards, and install the Internet Telephones. It also includes information on what is required before beginning the installation procedures.

Read the "Codecs" on before installing an IP Telephony node.

Before you begin

Ensure that the system meets the following minimum requirements:

- A Meridian 1, Succession 1000M, or Succession 1000 system running Succession 3.0 software

Installation summary

The following summary of steps can be used as a reference guide to install and configure an IP Telephony node and Voice Gateway Media Cards on a system. This summary is intended to serve as a pointer to the more detailed procedures contained in other chapters and to provide a sequential flow to the steps involved in the overall installation procedure.

Note: Complete all installation and configuration steps before transmitting data to the Voice Gateway Media Cards.

1   Complete the Voice Gateway Media Card installation summary sheet. See Table 31 on page 133.

2   Complete the Internet Telephone configuration data summary sheet. See Table 32 on page 135.

3   Install the hardware components:

   a.   Install the Voice Gateway Media Card(s). See Procedure 1 on page 144 for installing the ITG-P 24-port line cards and Procedure 3 on page 150 for installing the Succession Media Card 8-port and 32-port line cards.

   b.   Cable the Voice Gateway Media Cards:

      i.   Install the ELAN, TLAN, serial interface cable for the ITG-P 24-port line card. See Procedure 5 on page 157.

      ii. Install the Shielded 50-pin to Serial/ELAN/TLAN Adapter for the Succession Media Card 8-port and 32-port line card. See Procedure 6 on page 161.

4   Configure IP Line data on the system:

   a.   Configure the IP address for the ELAN Ethernet interface. See Procedure 7 on page 162.

   b.   Configure VoIP bandwidth management zones. See page 163.

   c.   Configure IP Line physical TNs. See page 167.

   d.   Configure virtual superloops. See page 172.

   e.   Configure Small System (if applicable) mapping of virtual superloops. See page 173.

   f.   Configure Internet Telephone features. See page 175.

5   Configure IP Line data using Element Manager:

    a.   Manually add an IP Telephony node. See page 262.

    b.   Configure SNMP traps and community names access for security. See page 268.

    c.   Configure DSP Profile data. See page 271.

    d.   Configure DiffServ CodePoint (DSCP) data, 802.1Q support, and NAT support. See page 276.

    e.   Configure Call Server ELAN IP (Active ELNK) address, TLAN Voice port, and the routing tables on the Voice Gateway Media Card. See page 278.

    f.   Configure file server access. See page 283.

    g.   Configure the loss plan. See page 285.

    h.   Configure Voice Gateway Media Care properties. See page 286.

6   Submit and transfer the node information to the Call Server. See page 289.

7   Transmit Voice Gateway Media Card configuration data to the Voice Gateway Media Cards:

    a.   Set Leader IP Address. See Procedure 39 on page 294.

    b.   Transmit node and card properties to the Leader. See Procedure 40 on page 297.

8   Upgrade the card software and Internet Telephone firmware:

    a.   Verify card software version. See page 306.

    b.   Verify card firmware release. See page 309.

    c.   Download software and firmware files from the Nortel Networks web site. See page 312.

    d.   Upload the software and firmware files to the file server. See page 313.

    e.   Upgrade the software on the Voice Gateway Media Card. See page 315.

    f.   Reboot the card. See page 319.

    g.   Upgrade the firmware on the card. See page 319.

9   Configure OTM alarm notification feature to receive IP Line SNMP traps. See Procedure 27 on .

10   Assemble and install an Internet Telephone. Refer to *Internet Terminals: Description* (553-3001-368).

11   Change the default IP Line Command Line Interface (IPL>) Shell password. See Procedure 51 on .

12   Configure the Internet Telephone Installer Passwords (see).

   a.   Enable and set the administrative Internet Telephone Installer Password. See Procedure 51 on .

   b.   If needed, enable and set a temporary Internet Telephone Installer Password. See Procedure 52 on .

Voice Gateway Media Card installation summary sheet

Nortel Networks recommends that a Voice Gateway Media Card installation summary sheet (Table 31 on) be filled out as the line cards are unpacked, inventoried, and provisioned. IP address information is usually supplied by the IP Network Administrator.

To complete the installation summary sheet, the following information is required:

- The MAC address. This is the motherboard Ethernet address on the Voice Gateway Media Card faceplate sticker (for example 00:60:38:01:12:77).

- The ELAN Management IP address of the motherboard Ethernet interface used to perform management through OTM and to communicate with the system

- The TLAN Node IP address for the IP Telephony node

- The TLAN card IP address of the voice interface on each card

- The IP address of the active ELNK Ethernet interface on the system core

Nortel Networks recommends that an Internet Telephone configuration data summary sheet (Table 32 on) be filled out as the Internet Telephones are installed and configured.

Table 31
Voice Gateway Media Card installation summary sheet (Part 1 of 2)

Site_____ Meridian 1/Succession system _____

Meridian 1, Succession 1000M, and Succession 1000
customer_____

Node ID (Number)_____

TLAN Node IP address_____

Meridian 1, Succession 1000M, and Succession 1000 active ELNK IP
address_____

SNMP Manager List IP addresses_____

TLAN gateway (router) IP address_____

TLAN subnet mask_____

ELAN gateway (router) IP address_____

ELAN subnet mask_____

TN	ELAN Management MAC address	ELAN Management IP address	TLAN (Voice) Card IP address	Card role
				Leader
				Follower (OTM: Leader1)
				Follower
				Follower
				Follower
				Follower
				Follower
				Follower
				Follower
				Follower

Table 31
Voice Gateway Media Card installation summary sheet (Part 2 of 2)

Site_____ Meridian 1/Succession system _____
Meridian 1, Succession 1000M, and Succession 1000
customer_____
Node ID (Number)_____
TLAN Node IP address_____
Meridian 1, Succession 1000M, and Succession 1000 active ELNK IP
address_____
SNMP Manager List IP addresses_____
TLAN gateway (router) IP address_____
TLAN subnet mask_____
ELAN gateway (router) IP address_____
ELAN subnet mask_____

TN	ELAN Management MAC address	ELAN Management IP address	TLAN (Voice) Card IP address	Card role
				Follower
				Follower

Internet Telephone configuration data summary sheet

Table 32
Internet Telephone configuration data summary sheet

No DHCP								
			Partial DHCP					
						Full DHCP		
IP address	**Subnet mask**	**Gateway IP address**	**Connect Server IP address***	**Node#**	**VTN**	**DN**	**User Name**	**User Location**
*Connect server IP address is the Node IP address of the IP Telephony node.								

Installation and initial configuration of an IP telephony node

Contents

This section contains information on the following topics:

Introduction

This chapter explains how to install and perform the initial configuration of new IP Telephony nodes, Voice Gateway Media Cards (ITG-P 24-port and Succession Media Card line cards), and associated cables.

Meridian 1

If configuring IP Line 3.1 on a Meridian 1, the remainder of the configuration of IP Line data is completed using Optivity Telephony Manager (OTM) 2.1.

Succession 1000 and Succession 1000M

If configuring IP Line 3.1 on a Succession 1000M or Succession 1000 system, the remainder of the configuration of IP Line data is completed using Element Manager.

Before installing an IP Telephony node, refer to *Data Networking for Voice over IP* (553-3001-160) for information on IP network engineering guidelines.

The following is a list of procedures in this chapter:

*   "Installing the ITG-P 24-port line card" on page 144

*   "Installing the CompactFlash on the Succession Media Card" on page 146

*   "Installing the Succession Media Card" on page 150

*   "Replacing the existing I/O Panel Filter Connector" on page 152

*   "Installing the NTMF94EA ELAN, TLAN, serial interface cable" on page 157 for the ITG-P Line Card

- "Installing the Shielded 50-pin to Serial/ELAN/TLAN Adapter onto the Succession Media Card" on for the Succession Media Card

- "Configuring the ELAN IP address for the active ELNK Ethernet interface" on

Equipment considerations

This section lists the required and optional equipment that can be used to install, configure, and maintain the Voice Gateway Media Cards and Internet Telephone products.

Required equipment

The required equipment includes the following:

- a PC to manage IP Line 3.1, with the following installed:

  — OTM 2.1 must be installed for a Meridian 1 system

  — Internet Explorer 6.0.2600 (or later) to run Element Manager for Succession 1000M and Succession 1000 systems

- local TTY or terminal in a switch room. This is required for Leader configuration.

- two shielded CAT 5 Ethernet cables to connect the Voice Gateway Media Card to an external switch (recommended) or hub equipment

- 10/100BaseT Ethernet port (optional auto-sensing) to support TLAN and 10BaseT ELAN network connections

- 10/100BaseT Ethernet port (optional auto-sensing) in each location where an Internet Telephone resides

- serial cables

Optional equipment

The optional equipment includes the following:

- a server configured with Dynamic Host Configuration Protocol (DHCP); for example, a Nortel Networks NetID server

- an external modem router to enable remote dial-up connection to the ELAN for technical support (Nortel Networks RM356 modem router is recommended)

Install the hardware components

There are three cards that use the IP Line 3.1 software; the Succession Media Card 8-port and 32-port line cards and the ITG-P 24-port line card.

- See page 143 for installation instructions for the ITG-P 24-port line card.

- See page 145 for installation instructions for the Succession Media Card 8-port and 32-port line card.

Voice Gateway Media Card

If a Succession Media Card 32-port card, a Succession Media Card 8-port card, or an ITG-P 24-port card is running IP Line 3.1 software, it is known as a Voice Gateway Media Card.

Summary of installation steps

The following table summarizes the steps for installing each Voice Gateway Media Card.

Table 33
Installation summary (Part 1 of 2)

Step	ITG-P 24-port line card	Succession Media Card line card
Determine card slot.	See "Identify the IPE card slots on a Meridian 1 or Succession 1000M" on page 142	See "Identify the IPE card slots on a Meridian 1 or Succession 1000M" on page 142
Unpack the card.	Remove all contents from the packaging box.	Remove all contents from the packaging box.
Install the CompactFlash Card.	Not applicable	Procedure 2 on page 146
Install the Voice Gateway Media Cards.	Procedure 1 on page 144	Procedure 3 on page 150
Install NTCW84JA ITG-specific I/O Panel Filter Connector for Option 51C/61C/81/81C.	Procedure on page 151	Procedure on page 151
Install the NTMF94EA ELAN, TLAN, RS-232 Serial Maintenance I/O interface cable.	Procedure 5 on page 157	Not applicable
Install the A0852632 Shielded 50-pin to Serial/ELAN/TLAN Adapter.	Not applicable	Procedure 6 on page 161

Table 33
Installation summary (Part 2 of 2)

Step	ITG-P 24-port line card	Succession Media Card line card
Configure card as a Leader or Follower.	In OTM 2.1: Procedure 20 on page 217 In Element Manager: Procedure 39 on page 294 (Leader) Procedure 41 on page 300 (Follower)	In OTM 2.1: Procedure 20 on page 217 In Element Manager: Procedure 39 on page 294 (Leader) Procedure 41 on page 300 (Follower)
Configure the card properties	In OTM 2.1: Procedure 13 on page 195 In Element Manager: Procedure 37 on page 286	In OTM 2.1: Procedure 13 on page 195 In Element Manager: Procedure 37 on page 286
Transmit/Transfer properties	In OTM 2.1: Procedure 21 on page 219 Procedure 22 on page 221 In Element Manager: Procedure 40 on page 297	In OTM 2.1: Procedure 21 on page 219 Procedure 22 on page 221 In Element Manager: Procedure 40 on page 297

Identify the IPE card slots on a Meridian 1 or Succession 1000M

Depending on the module that is used, the ITG-P 24-port line card must be installed in a specific slot. Use Table 34 to identify the IPE card slots selected for the Voice Gateway Media Card.

Table 34
Voice Gateway Media Card installation by module type

Meridian 1 modules	ITG-P 24-port line card slots
NT8D37BA/EC IPE modules	All available IPE card slots
NT8D37AA/DC IPE modules	0, 4, 8, and 12

Note: EMC restriction must be considered when installing the Voice Gateway Media Cards. For more information see "Electro-magnetic Containment" on .

Installing and cabling the ITG-P 24-port line card

Each ITG-P 24-port line card requires two slots in the Meridian 1, Succession 1000M, and Succession 1000. Only the left slot of the card connects to the IPE backplane and I/O panel.

A maximum of eight ITG-P 24-port line cards can be installed in an IPE shelf in a Large System. The ITG-P 24-port line card can occupy any two adjacent slots in an IPE shelf, with the left slot of the card plugging into slots 0 to 6 and 8 to 15. The left slot of an ITG-P 24-port line card cannot be plugged into slot 7, because the XPEC card is situated between slots 7 and 8.

To enable a module to hold the maximum number of ITG-P 24-port line cards, install each card with the left slot of the card inserted into an even-numbered slot.

> **CAUTION WITH ESDS DEVICES**
> Wear an ElectroStatic Discharge Strap (ESDS) when handling ITG-P 24-port and Succession Media Card line cards. As an additional safety measure, handle all cards by the edges, and when possible, with the loosened packaging material still around the component.

> **WARNING**
> The TLAN cable between the ITG-P 24-port line card and the Layer 2 switch must have a length of 50 meters or less for proper operation of the TLAN interface.

To install an ITG-P 24-port line card, follow the steps in Procedure 1 on .

Procedure 1
Installing the ITG-P 24-port line card

1 For each ITG-P 24-port line card in the node, identify the IPE card slot selected for the ITG-P 24-port line card. Use the information from the "Voice Gateway Media Card installation summary sheet" on page 132, and Table 31 on page 133.

Table 35
ITG-P 24-port line card installation by module type

Meridian 1 Modules	ITG-P 24-port line card
NT8D37BA/EC IPE modules	All available IPE card slots
NT8D37AA/DC IPE modules	0, 4, 8, and 12

Note: Even though the ITG-P 24-port line card is a two-slot card, only the left slot is counted for the card slot number. For example, for an ITG-P 24-port line card installed in slots 2 and 3, the slot number is 2.

2 Remove any existing I/O panel cabling associated with any card previously installed in the selected card slot.

3 Insert the ITG-P 24-port line card into the card guides and gently push it until it makes contact with the backplane connector. Hook the locking devices.

Note 1: The red LED on the card faceplate remains lit until the card is configured and enabled in the software, at which point the LED turns off.

Note 2: The faceplate display window displays startup self-test results (T:xx) and status messages. A display "F:XX" indicates a failure of the self-test. It is normal for the ITG-P 24-port line card to display "F:10" during the start-up self-test. F:10 indicates that the self-test did not find a Security Device. The ITG-P 24-port line card does not have a security device.
Some failures indicate that the card must be replaced. See Table 53 on page 481 for a list of the ITG-P 24-port line card display codes.

———————— **End of Procedure** ————————

Installing and cabling the Succession Media Card 8-port and 32-port line cards

The Succession Media Card 32-port line card is the successor of the ITG-P 24-port line card. It increases the packet processing power of the ITG-P 24-port line card, increases the channel density from 24 to 32 ports, and reduces the slot usage from a dual slot to a single IPE slot.

Both the Succession Media Card 32-port and 8-port line card require only one slot in the IPE shelf.

⚠️	**CAUTION WITH ESDS DEVICES** Wear an ElectroStatic Discharge strap when handling Succession Media Card line cards. As an additional safety measure, handle all cards by the edges, and when possible, with the loosened packaging material still around the component.

CompactFlash installation

The Succession Media Card package contains the following items:

- Succession Media Card
- CompactFlash card
- retaining pin

The CompactFlash must be installed on the Succession Media Card prior to installing the card in the system. Follow the steps in Procedure 2 on to install the CompactFlash.

Note: If it is necessary to remove the CompactFlash card, follow the steps outlined in Procedure 89 on .

Procedure 2
Installing the CompactFlash on the Succession Media Card

1 Remove the Succession Media Card, CompactFlash, and retaining pin from the packaging.

CAUTION WITH ESDS DEVICES
Observe the necessary precautions for handling ESD-sensitive devices. Wear a properly connected anti-static wrist strap while removing the cards from the packaging and work on a static dissipative surface.

The CompactFlash card and retaining pin are shown in Figure 7 on page 146.

Figure 7
CompactFlash card and retaining pin

CompactFlash card

retaining pin
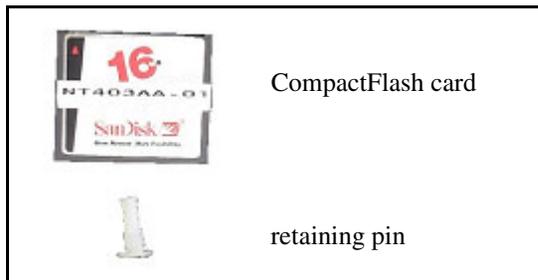
2 Locate the CompactFlash socket in the lower left-hand corner of the Succession Media Card (see Figure 8 on page 147).

Figure 8
CompactFlash socket on Succession Media Card

3   Position the CompactFlash card with the label facing up and contact pins toward the socket as shown in Figure 9.

Figure 9
Position the CompactFlash in socket
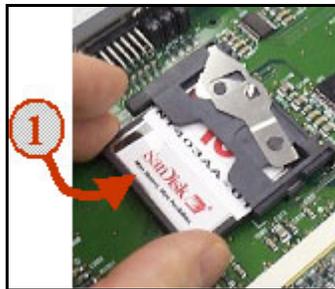
4   Insert the CompactFlash card in the socket. Press firmly until it is fully seated and the Eject button extends (see Figure 10 on page 148).

Figure 10
Insert CompactFlash to extend Eject button
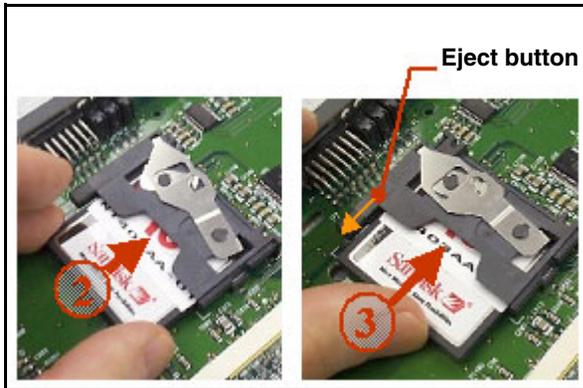
5   Turn the Succession Media Card over to view the back of the card.
     Identify the hole for the retaining pin. The hole (labeled *a* in Figure 11) is
     located approximately 1 inch (2.5 cm) above the lower lock latch and
     1 inch (2.5 cm) from the card's faceplate.

Figure 11
Retaining pin hole
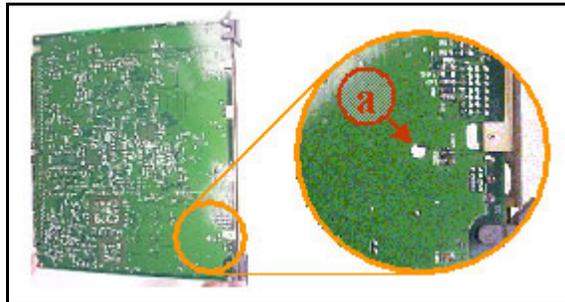
6   Insert the retaining pin (labeled **1** in Figure 12) in this hole. Press the retaining pin into the hole (labeled **2** in Figure 12) until the pin clicks as it locks into position. The underside of the head of the retaining pin should be flat against the card.

Figure 12
Inserting the retaining pin
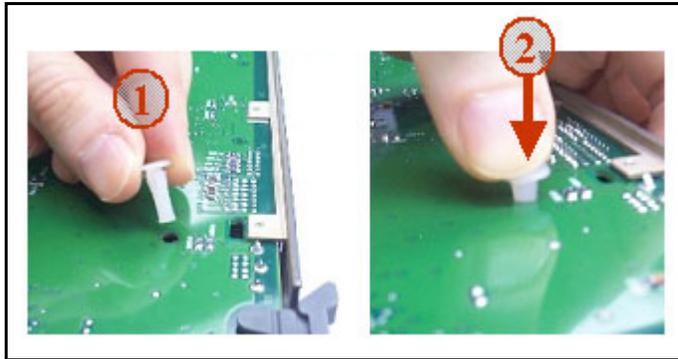
7   Turn the card over to view the front of the card. Ensure the retaining pin is in place as shown in Figure 13.

Figure 13
Retaining pin fully inserted

—————— **End of Procedure** ——————

Install the Succession Media Card

To install an Succession Media Card, follow the steps in Procedure 3 on

Procedure 3
Installing the Succession Media Card

1   For each Succession Media Card in the node, identify the IPE card slot selected for the Succession Media Card. Use the information from the "Voice Gateway Media Card installation summary sheet" on page 132, and Table 31 on page 133.

Table 36
Succession Media Card installation by module type

Meridian 1 Modules	Succession Media Card
NT8D37BA/EC IPE modules	All available IPE card slots
NT8D37AA/DC IPE modules	0, 4, 8, and 12

2   Remove any existing I/O panel cabling associated with any card previously installed in the selected card slot.

3   Insert the Succession Media Card into the card guides and gently push it until it makes contact with the backplane connector. Hook the locking devices.

Note 1: The red LED on the faceplate remains lit until the card is configured and enabled in the software, at which point the LED turns off.

Note 2: The card faceplate display window displays startup self-test results (T:xx) and status messages. A display "F:xx" indicates a failure of the self-test. Some failures indicate that the card must be replaced.

Note 3: Refer to "Transfer node configuration from Element Manager to the Voice Gateway Media Cards" on page 293.

Note 4: Refer to Table 54 on page 482 for a listing of the Succession Media Card display codes.

———————— **End of Procedure** ————————

Installing the NTCW84JA ITG-specific I/O Panel filter connector for a Large System

For Large Systems, the standard IPE module I/O filtering is provided by the 50-Pin filter connectors mounted in the I/O Panel on the back of the IPE shelf. The filter connector attaches externally to the MDF cables and internally to the NT8D81AA Backplane to the I/O Panel ribbon cable assembly.

For 100BaseTX TLAN operation, the standard I/O filter connector must be replaced with the NTCW84JA ITG Line-specific I/O filter connector for the following:

- the leftmost of the two card slots occupied by the ITG-P 24-port line card

- the slot occupied by the Succession Media Card

For Small Systems, and Succession 1000 systems, the standard I/O filter connector already supports 100BaseTX TLAN operation.

To replace an existing I/O Panel Filter Connector, follow the steps in Procedure 4 on .

Note: This NTCW84JA ITG-specific Filter Connector is not required on Small Systems or Succession 1000 systems.

CAUTION

For Large systems manufactured between 1998-1999 and shipped in North America, the IPE modules have the NT8D81BA Backplane to I/O Panel ribbon cable assembly with a non-removable filter connector. The NT8D81BA is compatible with a 10BaseT TLAN, but if a 100BaseT TLAN is required, order the NT8D81AA Backplane to I/O Panel ribbon cable assembly to replace it. Do not install the NTCW84JA ITG-specific filter connector onto the existing non-removable filter connector.

Replace existing I/O panel filter connector

The standard I/O filter connector is shielded metal with a black plastic insert connector. The NTCW84JA connector uses yellow warning labels to indicate EMC filtering modifications and which MDF connection points can support 100BaseT connections.

Procedure 4
Replacing the existing I/O Panel Filter Connector

1   Before any of the following steps, remove the ITG pack, or any other IPE pack, from the IPE shelf card slot corresponding to the I/O Panel connector to be removed.

    Note: Make sure to use the I/O Panel Filter Connector which corresponds to the left slot number of the DCHIP card.

2   Remove the NT8D81AA Backplane to I/O Panel ribbon cable assembly, that is connected to the Backplane side of the existing block, by releasing the latching pins on the filter block and pulling the NT8D81AA cable away.

3   Unscrew the existing filter connector from the I/O panel. There is one screw on the lower front of the connector and one screw on the upper back of the connector. Remove the connector.

4   Re-position the new NTCW84JA filter connector in the now vacant I/O panel opening. See Figure 14 on .

Figure 14
NTCW84JA 50 pin ITG-specific I/O Panel filter connector for Large Systems
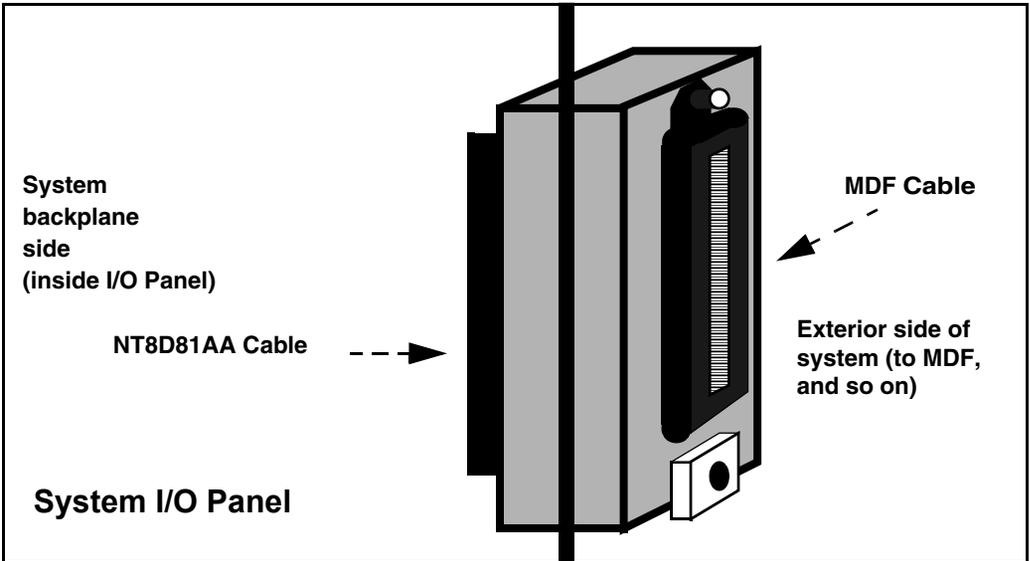
5   Attach the new NTCW84JA ITG-specific filter connector to the I/O panel
by securely fastening the top back screw and the bottom front screw.

6   Reconnect the NT8D81AA cable and secure it in place by snapping shut
the locking latches provided on the NTCW84JA connector.

——————————————— **End of Procedure** ———————————————

Incorrect configuration problems

TLAN operation problems can arise from the standard I/O filter connector in IPE modules on Large Systems. Some problem scenarios and their respective solutions are outlined in Table 37.

Table 37
I/O filter connector

Scenario	Solution
The installer forgets to replace the standard IPE module I/O filter connector with the provided Voice Gateway Media Card/ITG-specific filter connector that removes filtering from pairs 23 and 24.	Correctly install the Voice Gateway Media Card/ITG-specific filter connector by replacing the standard IPE Module I/O filter connector.
The installer installs the Voice Gateway Media Card/ITG-specific filter connector on top of the standard IPE module I/O filter connector.	Correctly install the Voice Gateway Media Card/ITG-specific filter connector by replacing the standard IPE Module I/O filter connector.
The installer encounters an IPE module that is equipped with standard filter connectors molded onto the backplane I/O ribbon cable assemblies. The installer does not replace the IPE module backplane I/O ribbon cable assemblies with the ones that have interchangeable I/O filter connectors.	Order new IPE Module Backplane I/O ribbon cable assemblies that have interchangeable I/O filter connectors if it becomes necessary to use one of the IPE Modules with molded-on I/O filter connectors.
The TLAN UTP cabling does not meet the UTP CAT 5 termination and impedance uniformity standards.	Always ensure that TLAN UTP cabling as installed is CAT 5 compliant.

Voice Gateway Media Card ELAN and TLAN interfaces

Meridian 1 and Succession 1000M systems

The ELAN and TLAN interfaces are provided by one of the following:

*   NTMF94EA ELAN, TLAN, RS-232 Serial Maintenance I/O interface cable (see Figure 15 on)

*   A0852632 Shielded 50-pin to Serial/ELAN/TLAN Adapter (see Figure 16 on)

The ITG-P 24-port line card uses the NTMF94EA ELAN, TLAN, RS-232 Serial Maintenance I/O interface cable.

The Succession Media Card uses the A0852632 Shielded 50-pin to Serial/ELAN/TLAN Adapter.

The ELAN supports 10BaseT operation and the TLAN supports 10/100BaseT operation. To support the 100BaseT operation on Large Systems, the TLAN interface requires specialized I/O panel mounting connectors. These replace the standard connectors provided on the system.

Cables and connectors for the ELAN and TLAN interface functions include the following:

*   the NTCW84JA I/O panel filter block

*   NTMF94EA ELAN, TLAN, RS-232 Serial Maintenance I/O interface cable

*   A0852632 Shielded 50-pin to Serial/ELAN/TLAN Adapter. Standard shielded, CAT 5 LAN cables (<100 meters) are recommended to attach the LAN ports to the local network.

Succession 1000 systems

For information Voice Gateway Media Card ELAN and TLAN interfaces on a Succession 1000 system, refer to *Succession 1000 System: Installation and Configuration* (553-3031-210).

Install the NTMF94EA ELAN, TLAN, RS-232 Serial Maintenance I/O interface cable

The NTMF94EA cable provides the ELAN, TLAN and serial interface for the ITG-P 24-port line card. See Appendix A: "I/O, maintenance, and extender cable description" on page 603 for pinouts and technical specifications on the NTMF94EA cable.

Figure 15
NTMF94EA ELAN, TLAN, and RS-232 Serial Maintenance I/O cable
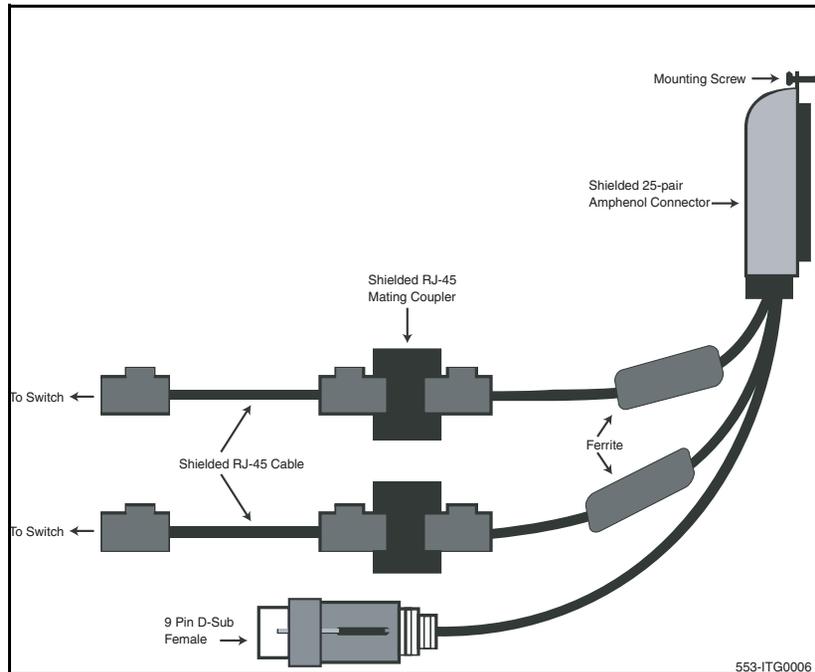
To install the NTMF94EA ELAN, TLAN, serial interface cable, complete the steps in Procedure 5.

Procedure 5
Installing the NTMF94EA ELAN, TLAN, serial interface cable

> ⚠️ **WARNING**
> Plug all Voice Gateway Media Cards ELAN interfaces belonging to the same node into the same ELAN hub or Layer 2 switch port group.

1 On Large Systems, connect the NTMF94EA ELAN, TLAN, and RS-232 Serial Maintenance I/O cable to the I/O panel connector for the left hand card slot.

For Small Systems, connect the cable to the I/O connector in the cabinet that corresponds to the IP Line card slot (see Figure 171 on).

2 Connect a shielded CAT 5 cable from the customer's TLAN switch equipment to the port labeled "TLAN".

3 Connect a shielded CAT 5 cable from the customer's ELAN hub or switch equipment to the port labeled "ELAN".

4 Install the NTAG81CA serial cable into the faceplate Maintenance port. This connection is used to configure the IP address for Leader 0. If required, use the NTAG81BA maintenance extender cable.

Note: Alternatively, for a permanent connection to the maintenance port, use the DB9 female connector on the NTMF94BA breakout cable to connect a modem (using a null modem) or directly to a local TTY terminal.

> ⚠️ **WARNING**
> The serial maintenance ports presented at the faceplate and at the backplane are identical. Do not connect a terminal to both access points simultaneously. This results in incorrect and unpredictable operation of the Voice Gateway Media Card.

Note 1: The switch LEDs and the faceplate link LEDs light when the card is connected to the WAN/LAN through the TLAN port.

Note 2: Refer to *Data Networking for Voice over IP* (553-3001-160) for more information about engineering and connecting the LAN/WAN.

——————————— **End of Procedure** ———————————

Install the Shielded 50-pin to Serial/ELAN/TLAN Adapter

The Succession Media Card can support a single connector solution for access to the TLAN and ELAN Ethernet Ports. This connector (see Figure 16 on page 159) is called the A0852632 Shielded 50-pin to Serial/ELAN/TLAN Adapter. It replaces the single NTMF94EA ELAN, TLAN, RS-232 Serial Maintenance I/O interface cable ('octopus' cable).

The adapter breaks out the signals from the I/O connector to the following:

- ELAN (management) port
- TLAN (telephony) port
- one RS-232 (local console) port

Figure 16
Shielded 50-pin to Serial/ELAN/TLAN Adapter
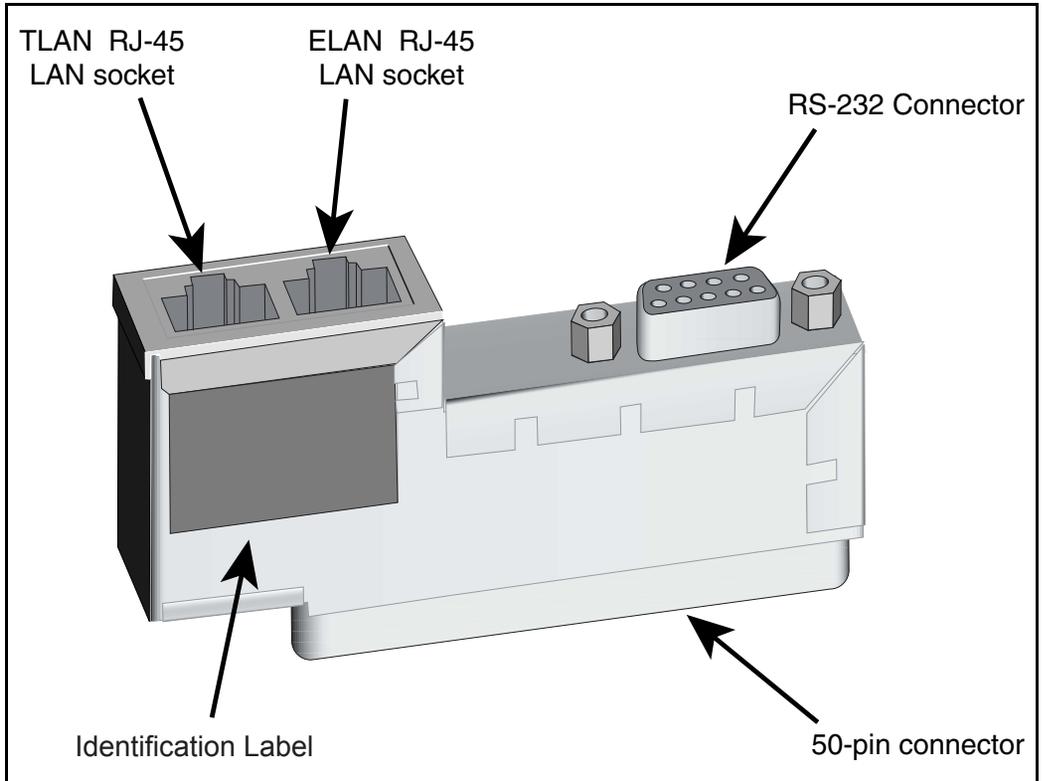
On Large Systems, the NT8D81AA cable is used to bring all 24 Tip and Ring pairs to the I/O panel. The NTCW84JA I/O panel mounting block must be installed on Large Systems before the A0852632 Shielded 50-pin to Serial/ELAN/TLAN Adapter is installed. Refer to Figure 16 on page 159.

To ensure proper connection, install the adapter securely; otherwise, connectivity could be lost.

EMC Shielding Kit

An ITG EMC shielding kit (NTVQ83AA) must be installed on the ELAN and TLAN interface cables to meet regulatory requirements at the installation site. As shown in Figure 17 on page 160, a ferrite must be placed on both the ELAN and TLAN Ethernet cables during installation. Cable ties are then placed to retain the ferrites in the correct position. This applies to Small Systems and Large Systems.

Figure 17
ITG EMC Shielding Kit Deployment
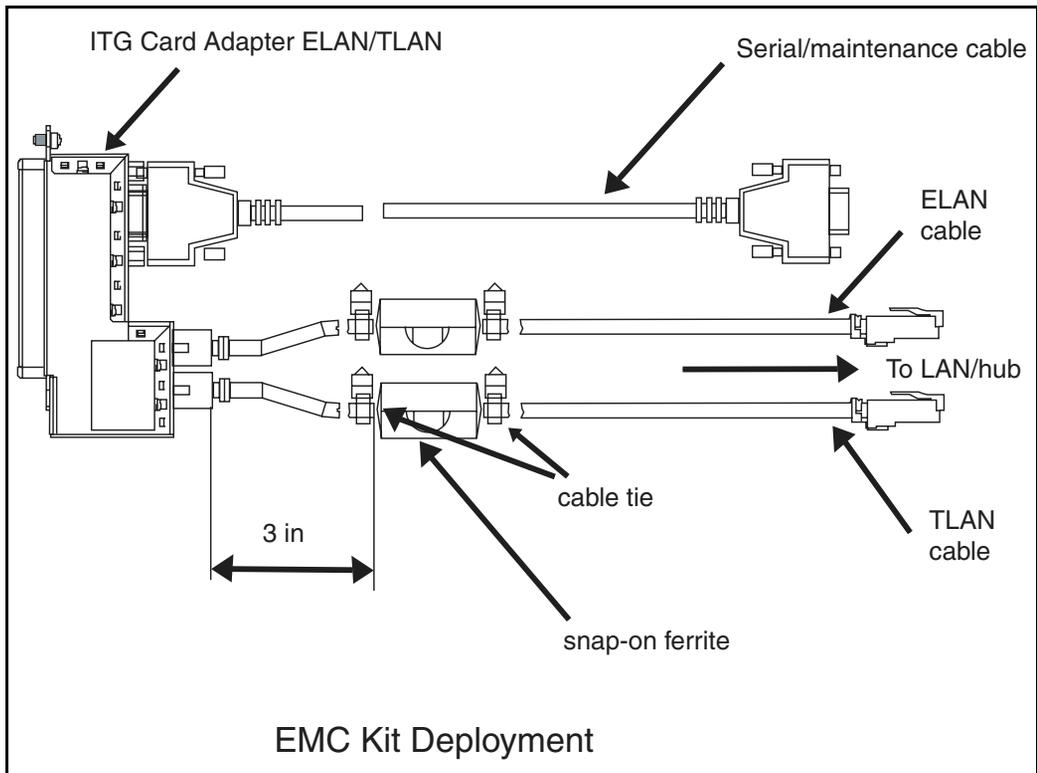
Procedure 6
**Installing the Shielded 50-pin to Serial/ELAN/TLAN Adapter onto the
Succession Media Card**

1   Install the Shielded 50-pin to Serial/ELAN/TLAN Adapter into the card
     connector (1, 2, 3, or 4) where the Succession Media Card is located.

2   Connect a shielded Cat 5 cable from the customer's TLAN switch
     equipment to the port labeled "TLAN".

3   Connect a shielded Category 5 cable from the customer's ELAN hub or
     switch equipment to the port labeled "ELAN".

4   Install the NTAG81CA serial cable into the faceplate Maintenance port.

———————————————   **End of Procedure**   ———————————————

Initial configuration of IP Line data

Before beginning the configuration:

•   Ensure the system is running Succession 3.0 software.

•   Verify the ISM system limit in LD 22. The ISM system limit must have
     sufficient unused units to support the number of Internet Telephones to
     be installed. For more information, refer to *Software Input/Output:
     Maintenance* (553-3001-511).

•   Expand the ISM system limit, if necessary, by ordering additional ISM
     Parameters. See "ISM parameters" on page 52 for more information.

Summary of procedures

1   Configure IP address for the system active
     ELNK Ethernet interface (LD 117). See page 162.

2   Configure VoIP bandwidth management zones (LD 117). See page 163.

3   Configure physical TNs (LD 14). See page 167.

4   Configure virtual superloops for Internet Telephones (LD 97). See
     page 172.

5   Configure Internet Telephone features (LD 11). See page 175.

Configure IP address for the system active ELNK Ethernet interface (LD 117)

To configure the ELAN IP address for the system active ELNK Ethernet interface, follow the steps in Procedure 7.

Procedure 7
Configuring the ELAN IP address for the active ELNK Ethernet interface

1 Go to LD 117.

2 Create host entries with the IP address on the ELAN subnet by entering one of the following commands:

NEW HOST PRIMARY_IP xx.xx.xx.xx

NEW HOST SECONDARY_IP xx.xx.xx.xx (for Large Systems only)

3 Assign the host entry IP address to active and inactive ELNK interfaces on ELAN by entering one of the following commands:

CHG ELNK ACTIVE PRIMARY_IP

CHG ELNK INACTIVE SECONDARY_IP (for Dual CPU only)

4 Verify the IP address for the Ethernet by entering the following command: **PRT ELNK**.

5 Enter the following command: **Update DBS**.

6 Go to LD 137. Check the status of the Ethernet interface by entering the command: **STAT ENLK**. If the ELNK is disabled, enable it by entering: **ENL ELNK**.

───────────── **End of Procedure** ─────────────

Configure VoIP bandwidth management zones (LD 117)

Up to 256 zones can be defined in LD 117. The Call Server uses the zones for VoIP bandwidth management. For more information, see *Data Networking for Voice over IP* (553-3001-160).

The term Intrazone means within the same zone. Interzone means between two different zones.

Table 38 on lists the four zone parameters as follows:

- p1 – total bandwidth (Kbps) available for Intrazone calls

- p2 – defines the Codec for Intrazone calls (that is, preserve voice quality or preserve bandwidth). BQ provides the best voice quality but uses the most bandwidth. BB uses the least amount of bandwidth but reduces voice quality.

- p3 – total bandwidth available for Interzone calls

- p4 – preferred strategy for the choice of the Codec for Interzone calls

- p5 – zone resource type. The type is either shared or private.

LD 117 also includes the DIS and ENL commands to disable or enable a zone. When a zone is created, its default state is enabled.

> **CAUTION**
> Zone 0 must be configured in LD 117 first before other zones are configured or all calls associated with zone 0 are blocked.

Table 38
LD 117 bandwidth management zone configuration

Command	Description
NEW ZONE xxx p1 p2 p3 p4 p5	Create a new zone, where: xxx = zone number = (0) – 255. p1 = Intrazone available bandwidth = 0 – (10000) – 100000 (Kbps) p2 = Intrazone preferred strategy = (BQ – Best Quality) or BB – Best Bandwidth p3 = Interzone available bandwidth = 0 – (10000) – 100000 (Kbps) p4 = Interzone preferred strategy = BQ for Best Quality or BB for Best Bandwidth p5 = Zone resource type = (shared) or private
New ZONE xxx	Create a new zone with default values for the parameters: p1 = 10000 (Kbps) p2 = BQ p3 = 10000 (Kbps) p4 = BQ p5 = shared
CHG ZONE xxx p1 p2 p3 p4 p5	Change parameters of a zone. All parameters must be re-entered, even those that are unchanged.
OUT ZONE xxx	Remove a zone.
DIS ZONE xxx	Disable a zone. When a zone is disabled, no new calls are established inside, from, or toward this zone.
ENL ZONE xxx	Enable a zone.
PRT ZONE xxx PRT ZONE ALL	Print zone and bandwidth information, where xxx specifies a zone. If no zone is specified, information for all zones is printed. PRT ZONE ALL also prints information for all zones.

Element Manager for Zone Configuration

Optionally, zones can be configured using Element Manager instead of LD 117.

To view Element Manager for zone configuration, perform the steps in Procedure 9 on :

Procedure 8
Viewing Element Manager for Zone Configuration

1   Launch and log into Element Manager. See Procedure 29 on .

2   In the Navigation Tree, click **Configuration** and then click **Zone**. The **Zone List** appears.

Figure 18
Zone List
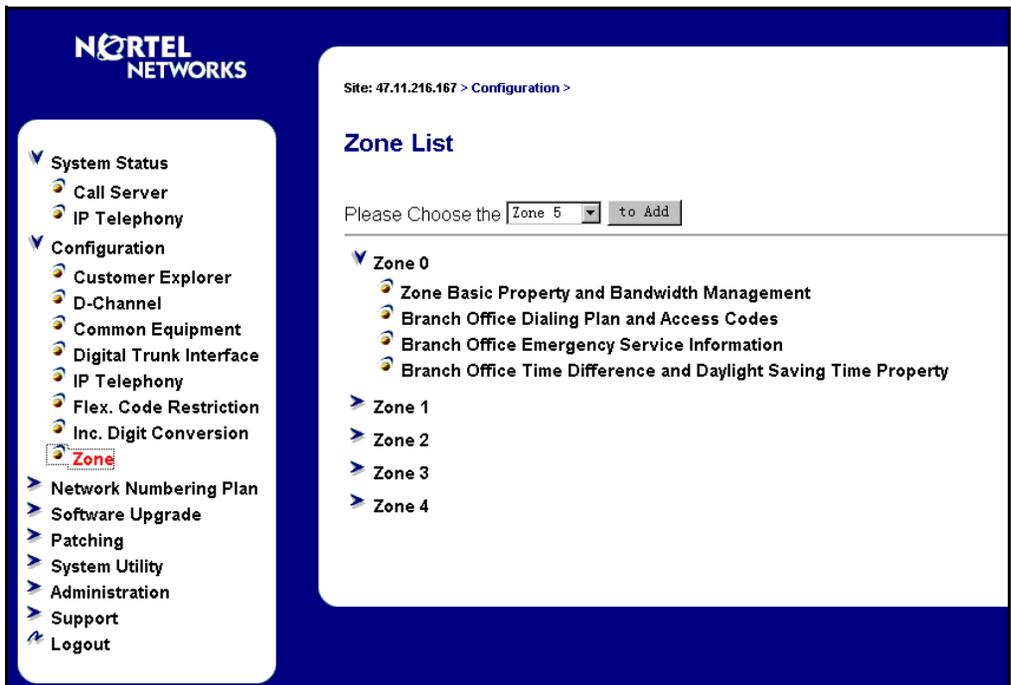
3   Click the **to Add** button to add a new zone. The **Zone Basic Property and Bandwidth Management** window opens.

Figure 19
Zone Basic Property and Bandwidth Management window

—————— **End of Procedure** ——————

Configure physical TNs (LD 14)

Use LD 14 to define the physical TNs for the Voice Gateway Media Card.

Also use LD 14 to disable the cards. The OTM IP Telephony Gateway - IP Line application requires Voice Gateway Media Cards to be in a disabled state before transmitting card properties.

See Table 39 for a list of the prompts and responses in LD 14.

Table 39
Configure physical TNs in LD 14

Prompt	Response	Description
REQ:	NEW CHG OUT	Create the voice media gateway channels on a line card. Change configuration data for a gateway channel. Delete the voice media gateway channels on a line card.
TYPE:	VGW	Voice Gateway
TN		TN of the first ITG Physical TN
	l s c u c u	Large System TN format Small System TN format
DES	aa.......a	Description for gateway channel.
		Identify the channel using the card's TLAN IP address or MAC address.
XTRK	aaa	ITG8 – ITG 486 8-port card
		ITGP – ITG-P 24-port card
		MC8 – Succession Media Card 8-port card
		MC32 – Succession Media Card 32-port card
ZONE	0 – 255	Zone number to which this ITG Physical TN belongs. Verify that the zone exists in LD 117.
CUST	0 – 99	Customer number

Element Manager for Gateway Channels

Alternatively, if the system is a Succession 1000M or Succession 1000, configure the Gateway Channels using Element Manager instead of using LD 14.

To view Element Manager for Gateway Channels, perform the steps in Procedure 9 on .

Procedure 9
Viewing Element Manager for Gateway Channels

1   Launch and log into Element Manager. See Procedure 29 on page 258 for details.

2   In the Navigation Tree, click **Configuration** and then click **IP Telephony**. The Node Summary window opens. See Figure 20.

Figure 20
Node Summary window
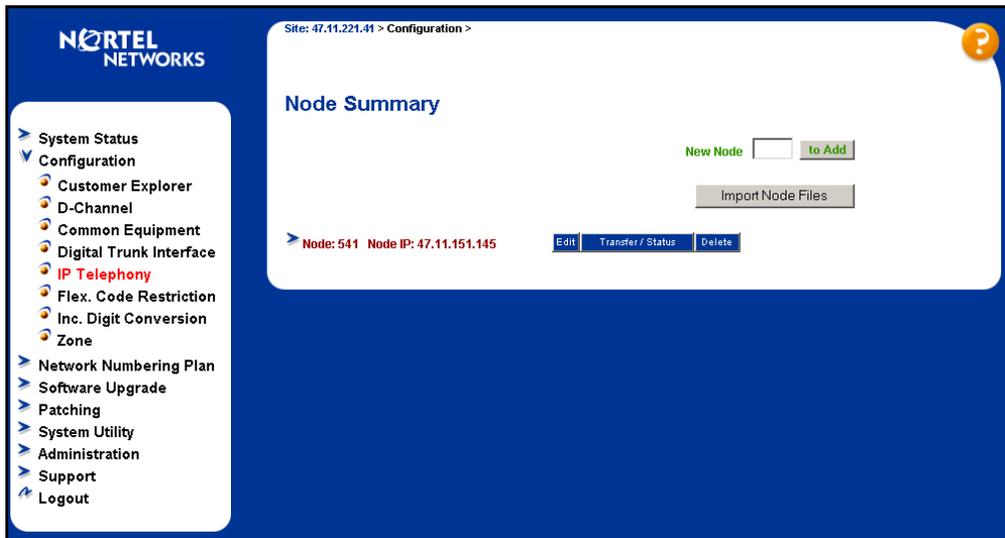
3 Expand a node by clicking the arrow to the left of the node. Click the **DSP Channels** button. The Gateway Channel summary window opens. See Figure 21.

Figure 21
Voice gateway Channel summary window

4 To add new gateway channels, click the **Add** button at the top in the Gateway Channel summary window.

Figure 22 on page 170 shows the equivalent to LD 14's NEW command.

Figure 22
Add voice gateway channel

5   To edit a particular gateway channel, click the Edit button to the right of
the channel on the Gateway Channel summary page.

Figure 23 on page 171 shows the gateway channel's Edit page. This
window is equivalent to LD 14's CHG command that enables the
changing of the DES and ZONE parameters of the channel.

Figure 23
Edit voice gateway channel

6 To delete a gateway channel, click the **Delete** button in the Gateway Channel summary page. See Figure 21 on .

The Delete page for the gateway channel opens. See Figure 24 on . Select a gateway channel from the drop-down list box and click **Delete**.

Figure 24, the Delete window, is the equivalent of LD 14's OUT command.

Figure 24
Delete voice gateway channel

End of Procedure

Configure virtual superloops for Internet Telephones (LD 97)

One or more virtual superloops must be configured to support Internet Telephone Virtual TNs (VTNs).

Large Systems

In Large Systems, virtual superloops contend for the same range of loops with phantom, standard and remote superloops, digital trunk loops and all service loops. Virtual superloops can reside in physically-equipped network groups or in virtual network groups.

Group maximums

Without FIBN, Package 365, there is a maximum of five network groups available, 0 – 4. With Package 365, there are a maximum of eight network groups, 0 – 7. For normal traffic engineering, provision up to 1024 VTNs on a single virtual superloop for a Large System. For non-blocking, do not exceed 120 VTNs on a single virtual superloop for a Large System.

Nortel Networks recommends that virtual superloops are configured starting in the highest non-physically equipped group available. Table 39 lists the prompts and responses required to configure virtual superloops in LD 97.

Table 40
LD 97 – Virtual superloop configuration for Large Systems

Prompt	Response	Description
REQ:	CHG	Change
TYPE:	SUPL	Superloop
SUPL	Vxxx	V stands for a virtual superloop and xxx is the number of the virtual superloop
		xxx = 0 – 156 and multiple of four for a Large System without FIBN package 365
		xxx = 0 – 252 and multiple of four for a Large System with FIBN package 365

Small Systems

In Small Systems, virtual superloops contend for the same range of superloops, 96 – 112, with phantom superloops.

Up to 128 VTNs can be configured on a single virtual superloop for a Meridian 1 Option 11C Cabinet and Option 11C Chassis, for a maximum of 640 VTNs in each system.

A maximum of 1000 VTNs can be configured on a Succession 1000M Cabinet and Succession 1000M Chassis.

In a Small System, mapping virtual superloops to virtual cards is the same as mapping phantom superloops to phantom cards. See Table 41 on .

Table 41
Virtual superloop/virtual card mapping for Small Systems

SUPL	Card
96	61-64
100	65-68
104	69-72
108	73-76
112	77-80

Succession 1000 systems

Table 42 on lists the virtual superloop and virtual card mapping for the Succession 1000 system.

Table 42
Virtual superloop/virtual card mapping for Succession 1000 systems

SUPL	Card	
96	61-64	81-84
100	65-68	85-88
104	69-72	89-92
108	73-76	93-96
112	77-80	97-99

LD 97 PRT TYPE SUPL prints the implicit virtual, phantom, or DECT cards for a virtual, phantom, or DECT superloop.

LD 21 LUU allows the user to list unused units of a specified type (iset, vtrk, phantom, DECT) in a specified range of (virtual, and so on) TNs. Similarly, LUC of a specified type (virtual, phantom, or DECT) prints a list of unused cards on configured superloops.

Configure Internet Telephone features (LD 11)

The existing ISM header that is printed at the start of LD 11 includes the new ISM limit for the Internet Telephone. Refer to Table 32 on page 135 to configure the i2002 Internet Telephone, i2004 Internet Telephone, or the i2050 Software Phone in LD 11.

Table 43
LD 11 – Configure an Internet Telephone (Part 1 of 2)

Prompt	Response	Description
REQ:		Action request
	NEW	New
	CHG	Change
	PRT	Print
	OUT	Out
	CPY	Copy
	MOV	Move
TYPE:	i2002 i2004 i2050	For model i2002 and i2004 Internet Telephones, or i2050 Software Phone. The system accepts this response if it is equipped with packages 88 and 170. The i2002 and i2050 are also restricted by the Internet Telephone ISM setting.
TN	l s c u	Enter loop (virtual loop), shelf, card, and unit (terminal number), where unit = 0 – 31
	c u	Slot (virtual slot) and unit for Small Systems and Succession 1000. ***Note:*** See Table 41 on page 174 for virtual superloop to virtual card slot mapping for Small Systems.

Table 43
LD 11 – Configure an Internet Telephone (Part 2 of 2)

Prompt	Response	Description
DES	a...z	ODAS telephone designator
CUST	0 – 99	Customer number
ZONE	0 – 255	Zone number to which this Internet Telephone belongs. The zone prompt is applied only when TYPE = i2002, i2004, or i2050.
		Note: Verify that the zone number exists in LD 117.
CLS	aaaa	ADD - Automatic Digit Display, default for Internet Telephone.
		For a complete list of responses, refer to *Software Input/Output: Administration* (553-3001-311).
KEY	xx aaa yy zz...zz	Telephone function key assignments where:
		xx = Keys 0 – 5 (and 6 – 11 using Shift key) for i2004 and xx = Keys 0 – 3 for the i2002. These are self-labeled physical keys that can be programmed with any feature. aaa = key name or function yyy, zzz = additional information required for the key.
		Note: Keys 16 – 26 are reserved for dedicated Internet Telephone soft keys.
		Table 44 lists the dedicated Internet Telephone key name values (aaa). Other key name values can be found in *Software Input/Output: Administration* (553-3001-311).

Internet Telephone dedicated soft keys

Table 44 on describes the features that can be assigned to dedicated soft keys 16-26 on the i2002 and i2004 Internet Telephones, or i2050 Software Phone. Remove unused feature keys by configuring the dedicated soft keys to NUL. Some features depend on the given Class of Service.

If an attempt is made to configure anything other than the permitted response, the system generates an error code. For related error messages, see SCH messages in *Software Input/Output: System Messages* (553-3001-411).

Table 44
LD 11 – Internet Telephone dedicated soft key assignment (Part 1 of 2)

Internet telephone key number	Response(s) Allowed
Key 16	MWK, NUL MWK – Message Waiting key
Key 17	TRN, NUL TRN– - Call Transfer key
Key 18	A03, A06, NUL AO3 – 3-party conference key AO6 – 6-party conference key
Key 19	CFW, NUL CFW – Call Forward key
Key 20	RGA, NUL RGA – Ring Again key
Key 21	PRK, NUL PRK – Call Park key
Key 22	RNP, NUL RNP – Ringing Number pickup key

Table 44
LD 11 – Internet Telephone dedicated soft key assignment (Part 2 of 2)

Internet telephone key number	Response(s) Allowed
Key 23	SCU, SSU, SCC, SSC, NUL SCU – Speed Call User SSU – System Speed Call User SCC – Speed Call Controller SSC – System Speed Call Controller
Key 24	PRS, NUL PRS – Privacy Release key
Key 25	CHG, NUL CHG – Charge Account key
Key 26	CPN, NUL CPN – Calling Party Number key

Node election rules

The rules for the node election process are as follows:

1 A Succession Signaling Server wins over any Voice Gateway Media Cards.

2 A Leader card always wins over a Follower card.

3 A Succession Media Card wins over an ITG-P card.

4 Within each class (Leader/Follower), the card with the longest up-time wins.

5 In the event of a tie in up-time length, the card with the lowest IP address wins.

The precedence of the rules is from 1 (highest) to 5 (lowest). This means, for example, that since Rule 2 is applied before Rule 3, a Succession Media Card Follower card cannot win over an ITG-P Leader card.

Configuration of IP telephony nodes using OTM 2.1

Contents

This section contains information on the following topics:

Introduction

This chapter explains how to configure IP Telephony nodes and Voice
Gateway Media Cards using Optivity Telephony Manager (OTM) 2.1.

This chapter also provides instruction for transmitting data to Voice Gateway
Media Cards, upgrading card software, and upgrading Internet Telephone
firmware using OTM.

Read about IP network engineering guidelines in *Data Networking for Voice
over IP* (553-3001-160) before installing an IP Telephony node.

Configure IP Line data using OTM

Optivity Telephony Manager (OTM) can be used to manually add and
configure IP Telephony nodes. OTM 2.1 includes an IP Line 3.1 application
that is used to configure nodes on Meridian 1, Succession 1000M, or
Succession 1000 systems. Multiple IP Telephony nodes for Internet
Telephones are configured and managed from the same OTM 2.1 PC.

Node definition

A node is defined as a collection of Succession Signaling Servers and Voice Gateway Media Cards (ITG-P 24-port line cards and Succession Media Card 8-port and 32-port line cards). Each node in the network has a unique Node ID. This Node ID is an integer value. A node has only one primary or Leader Voice Gateway Media Card. All the other Voice Gateway Media Cards are defined as Followers.

Note 1: All IP addresses and subnet mask data must be in dotted decimal format. Convert subnet mask data from Classless Inter-Domain (CIDR) format.

Note 2: Refer to Table 31 on page 133 for IP addresses and information required in this procedure.

WARNING

OTM 2.1 does not support configuration of nodes which reside on a Succession 1000 system. However, since OTM 2.1 is required for retrieval of Operational Measurement (OM) reports from nodes on these systems, OTM is capable of being configured with basic network connection information of the node. The necessary configuration to retrieve the OM reports is covered in Procedure 10 on page 182 through Procedure 14 on page 198. In these procedures, pay special attention to any comments specific to nodes which reside on a Succession 1000 system.


Launch OTM and the IP Line 3.1 application

To launch OTM and start the IP Line 3.1 application, follow the steps in Procedure 10 on .

Procedure 10
Launching OTM

1   Select **Start | Programs | Optivity Telephony Manager | OTM Navigator**.

2   The **OTM Login** screen appears. See Figure 25 on . Enter the **Login Name** and **Password**. Click **OK**.

Figure 25
OTM Login screen
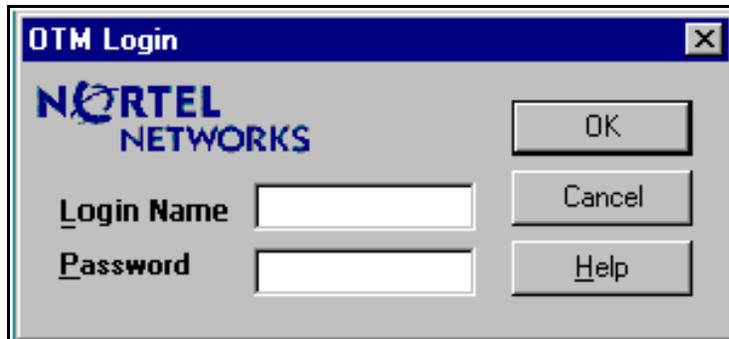
3   The OTM Navigator window opens. OTM Navigator has two tabs: Sites and Gatekeeper Zones. The IP Line 3.1 application, called IP Telephony, that is available with OTM is located on the Sites tab. Click the **Sites** tab. See Figure 26.

Figure 26
OTM Navigator
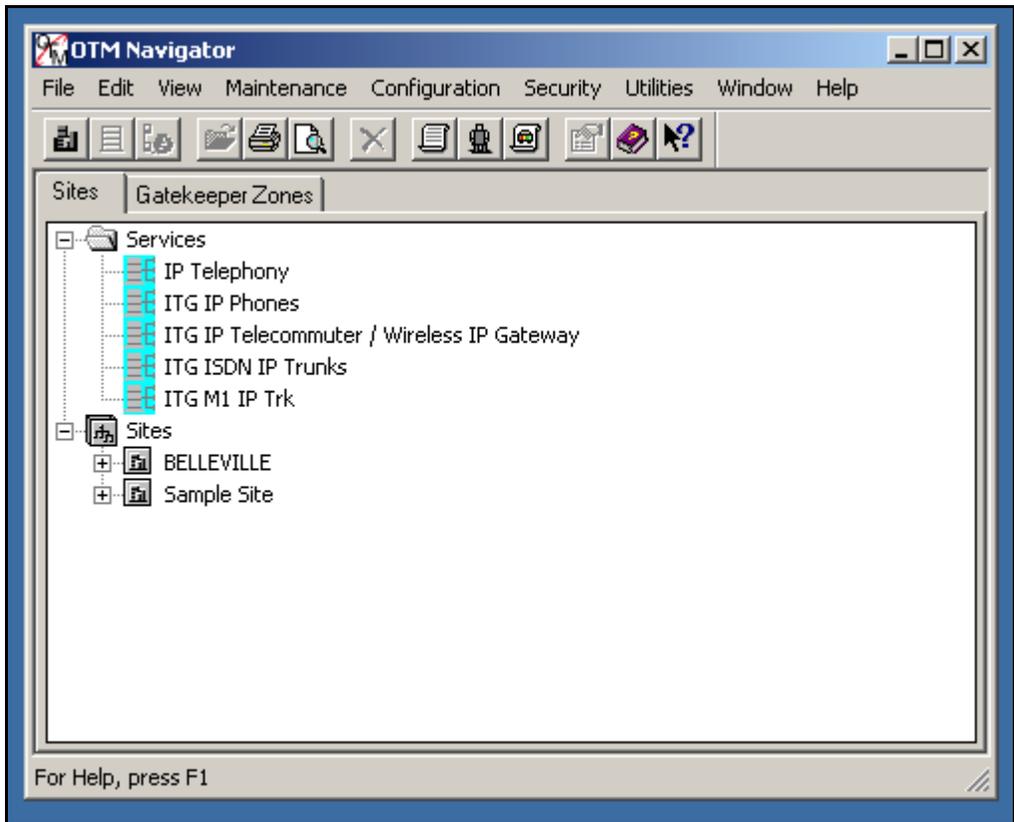
4   Expand the Services folder. Double-click the **IP Telephony** icon to launch the IP Line 3.1 application. See Figure 26 on page 183. The **IP Telephony** window opens. This application is used to configure and administer the IP Telephony nodes and the Voice Gateway Media Cards.

──────────── **End of Procedure** ────────────

Add a site, system, and customer

A site, system, and customer must be added before nodes and Voice Gateway Media Cards can be configured. Follow the steps in Procedure 11 to add a site, system, and customer using OTM Navigator.

Procedure 11
Adding a site, system, and customer

1   In the **OTM Navigator** window, click **Configuration | Add Site.** See Figure 27.

Figure 27
OTM Navigator – Configuration | Add Site
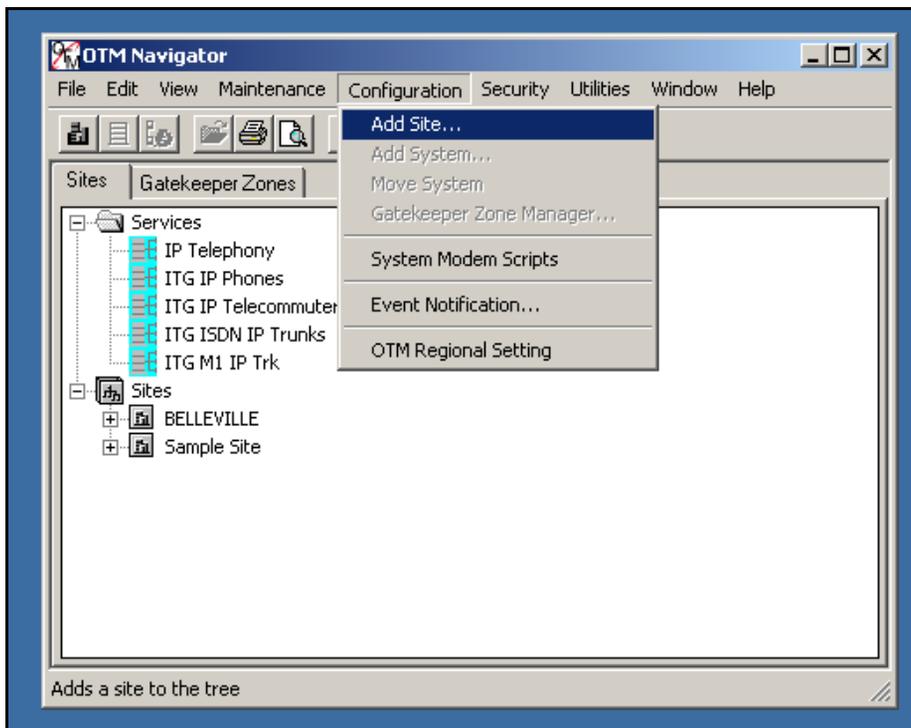
2   The **New Site Properties** window opens. See Figure 28 on .

Figure 28
New Site Properties window

3   In the **New Site Properties** window, set the following:

    a.   **Site Name:** Enter the name of the site.

    b.   **Short Name:** Enter a short name for the site.

       Under **Site Location**, add the **Address**, **City**, **State/Province**, **Country**, and **Zip/Postal Code** of the site.

       Under **Contact Information**, add the **Name**, **Phone Number**, **Job Title**, and any **Comments** for the site contact person(s).

4   Click **Apply**. The **Add System** button (located in the upper right corner of the New Site Properties window) is enabled.

5   Click the **Add System** button. The **Add System** dialog window appears. See Figure 29.

Figure 29
Add System
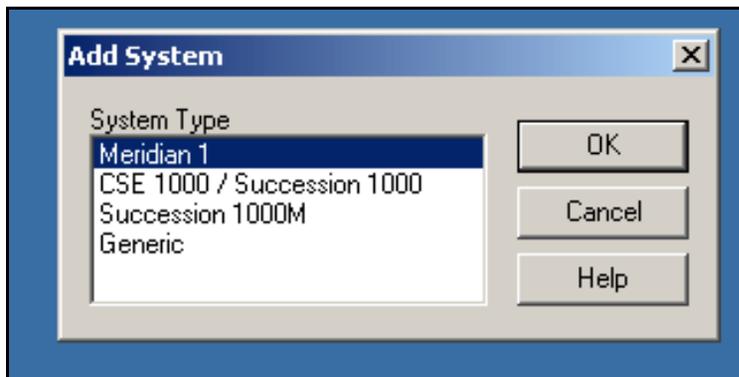
6   In the Add System window, select the system and click **OK**.

7 The **New System Properties** window opens. See Figure 30 on
page 187.

Figure 30
New System Properties window

8 In the **New System Properties** window, set the following:

a. System Name: Enter the name of the system.

b. Short Name: Enter a short name for the system.

9 Click **Apply**. The **System Properties** window opens.

10 Click the **Customers** tab and then click the **Add** button. The **Add Customer** dialog window appears (see Figure 31 on).

Figure 31
System Properties window – Add Customer
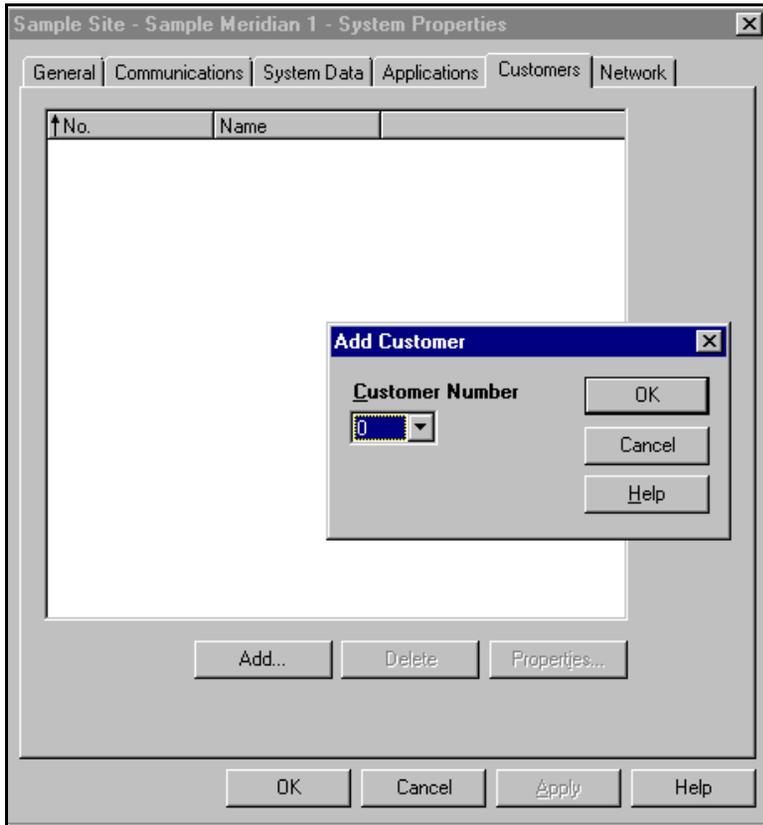
11 Select the **Customer Number.** Click **OK**.

This adds a customer to the system and opens the **New - (Customer n) Properties** window. Click **OK**. The System Properties window opens. Click **OK** to save and close the System Properties.

Note: Only the Customer Number is required to add a system. There is no need to enter any other customer data. The other data in the Customer tab and other System Properties tabs is not required for the IP Line 3.1 application. This data is used by other OTM applications.

——————————— **End of Procedure** ———————————

The following is a summary of steps required to configure a Voice Gateway Media Card using OTM 2.1:

1   "Manually add an IP Telephony node" on .

2   "Configure the card properties of the Voice Gateway Media Card" on .

3   "Configure DSP profile data" on .

4   "Configure SNMP traps and ELAN gateway routing table" on .

5   "Configure the Call Server ELAN IP address and the TLAN voice port" on .

6   "Configure security for SNMP access" on .

7   "Configure file server access" on .

8   "Configure QoS" on .

# Manually add an IP Telephony node

Procedure 12
Adding an IP Telephony node manually

1   In the OTM Navigator window, click on the **Services** folder.

2   Double-click the **IP Telephony** icon. See Figure 26 on page 183. The **IP Telephony** window opens.

3   Click **Configuration | Node | Add.** See Figure 32 on page 190. The **Add Node** dialog box opens.

Figure 32
IP Telephony main window
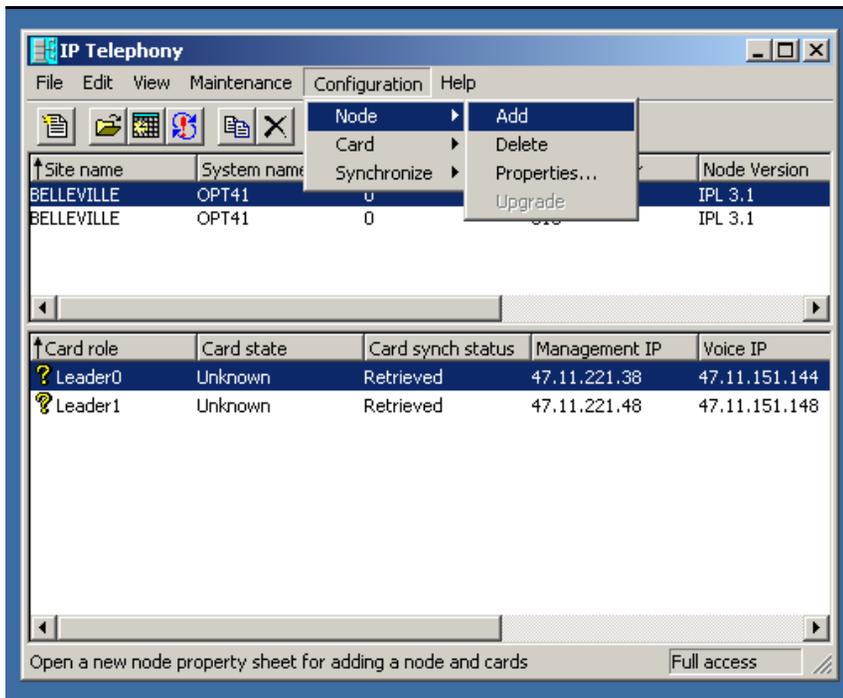
4   The **Add Node** window opens. See Figure 33. Ensure the "Define node
configuration manually" radio button is selected. Select the IP Line
software release being installed. Click **OK**.

Figure 33
Add Node
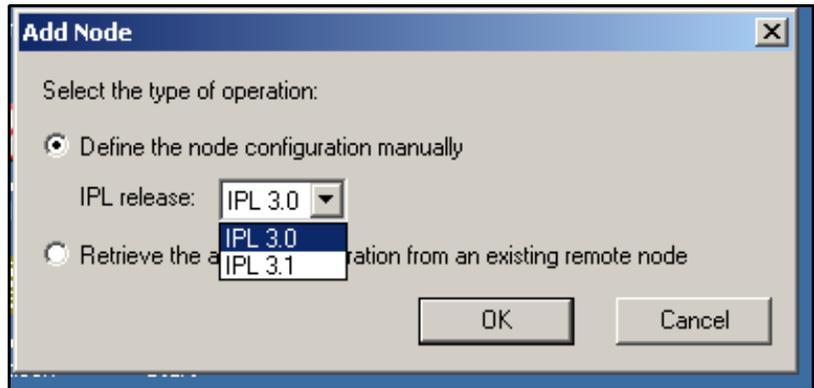
The **New Node** window opens. See Figure 34 on .

Figure 34
New Node – General tab

5 On the **General** tab, under **Node Location**:

  a. Select an **OTM site**, **OTM system**, and **Customer** number.

b.   Type in a **Node number** (one to four digits). The Node Number field in the tab corresponds to the Node ID field in the Internet Telephone configuration. When defining the node number, determine if the Enhanced Redundancy for IP Line Nodes functionality is required (see "Enhanced Redundancy for IP Line nodes" on). If it is required, factor the requirement into the node number assignment process.

> **CAUTION**
> The Voice Gateway Media Cards identify themselves with a node using the node number. If there are multiple IP Telephony nodes sharing the same TLAN, each node must have a unique ID. Each system on the TLAN must have a unique node ID assigned to the Voice Gateway Media Cards on the system.

c.   Write down the node number, which is used in the Internet Telephone configuration.

6   Under **Network Connections**:

a.   **Voice LAN Node IP:** Enter the Voice LAN (TLAN) Node IP address in dotted decimal format. Press the space bar to move between each decimal point. The Voice LAN Node IP is on the TLAN. The Node IP address is the IP address used by the Internet Telephones to communicate with the Voice Gateway Media Cards on the TLAN. If a Voice Gateway Media Card becomes the primary (Leader) during an election, it assigns itself the Node IP address.

b.   **Management LAN gateway IP:** Enter the Management LAN (ELAN) gateway IP address in dotted decimal format. This is the IP address of the gateway of the subnet to which the Voice Gateway Media Card belongs. This is the IP address of the router interface on the ELAN, if present. If there is no management LAN gateway, enter 0.0.0.0.

c.   **Management LAN subnet mask:** Enter the Management LAN (ELAN) subnet mask address in dotted decimal format. This is the subnet mask that is used, along with the ELAN IP address, to identify the subnet to which the Voice Gateway Media Card belongs.

d.   **Voice LAN subnet mask:** Enter the Voice LAN (TLAN) subnet mask address in dotted decimal format. This is the subnet mask used along with the TLAN IP address, to identify the subnet to which the Voice Gateway Media Card belongs.

7   Click the **Configuration** tab and continue with Procedure 13 on

———————————— **End of Procedure** ————————————

Configure the card properties of the Voice Gateway Media Card

If the IP Network Administrator provides IP addresses and subnet masks in CIDR format, for example, "10.1.1.10/24", convert the subnet mask to dotted decimal format. See Appendix D on

Note 1: On the Configuration tab, cards can be added, changed, or deleted in the node one at a time.

Note 2: The Leader 0 card cannot be deleted in the Configuration tab. It is necessary to delete the node to delete Leader 0.

Follow the steps in Procedure 13 to configure card properties for the Voice Gateway Media Card.

Procedure 13
Configuring card properties for the Voice Gateway Media Card

1   Click the **Configuration** tab in the New Node window. See Figure 35.

Figure 35
New Node – Configuration tab
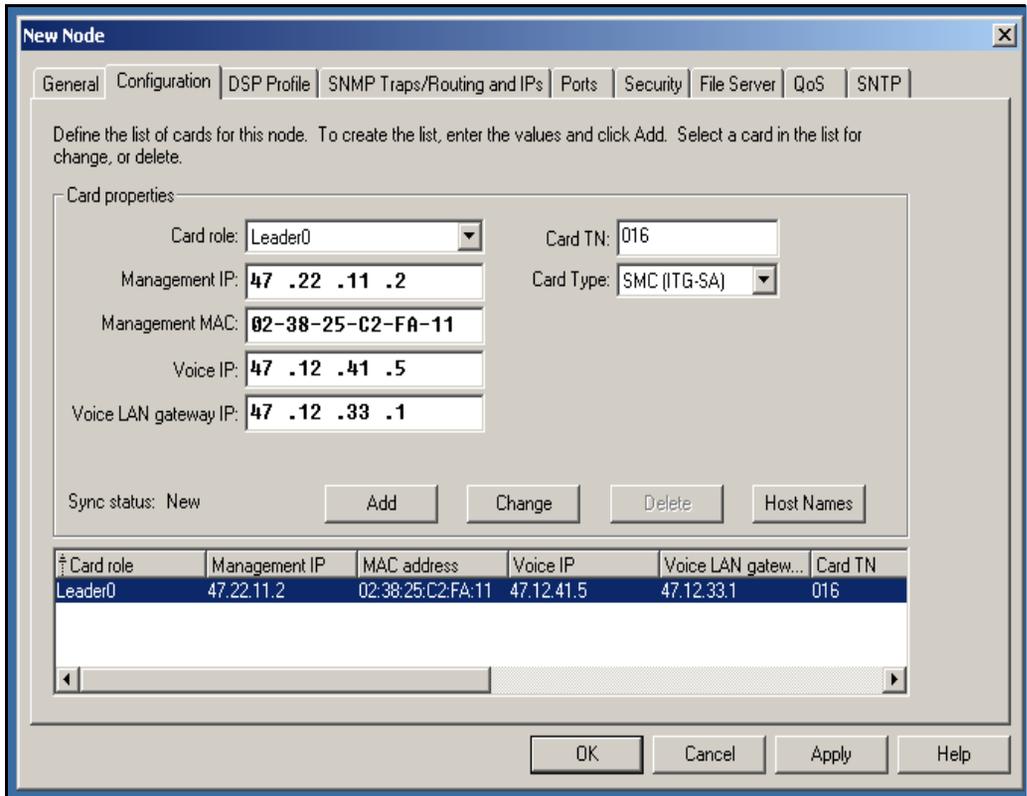
2   Enter the **Card Properties** data for the Leader 0 and Follower cards as follows:

a.   **Card role:** Assign the Card role of Leader 0, to the first card configured. For the second card configured, assign the role of Leader 1. For all remaining cards, assign the role of Follower.

Note: When adding cards for a node that resides on a Succession 1000 system for the purpose of retrieving OM reports, always assign the Succession Signaling Server to be the Leader 0 card. A backup Succession Signaling Server, if present, is assigned to be the Leader 1 card and all the Voice Gateway Media Cards in the node are assigned to be Follower cards. If no Backup Succession Signaling Server is present, assign one of the Voice Gateway Media Cards in the node to be the Leader 1 card.

b.   **Management IP:** This is the ELAN IP address for the card. OTM 2.1 and Meridian 1/Succession 1000M use this address to communicate with the card.

c.   **Management MAC:** This is the motherboard Ethernet address from the "Voice Gateway Media Card installation summary sheet" on page 133.

d.   **Voice IP:** This is the TLAN IP address for the card.

e.   **Voice LAN gateway IP:** This is the IP address of the router interface on the TLAN.

f.   **Card TN:** For Large Systems, enter Card TN (l s c) information. For Small Systems and Succession 1000 systems, enter two zeros followed by the card slot number (1-50); for example, **0 0 49**. The card TN format is determined by the system type that is configured in the OTM Navigator. Ensure the correct system type is entered in the OTM Navigator before adding the node.

g.   **Card Type:** Choose either Pentium or StrongArm. Select Pentium if using the ITG-P 24-port line card (dual-slot card). Select StrongArm if using the Succession Media Card (single-slot card).

h.   Click **Add**. The card role and address information appears in a working list at the bottom of the New Node window.

i.   Repeat the above steps for each card that is being added to the node.

3   Click **Apply** to add the card(s) to the Node.

Note: When Apply is clicked, the title of the window changes from New Node to Node Properties.

———————————   **End of Procedure**   ———————————

Configure DSP profile data

In OTM 2.1, the DSP Profile tab and its two sub-tabs (**DSP Options** and **Codec Options**) are used to configure DSP profile data.

Follow the steps in Procedure 14 on to configure DSP profile data.

Procedure 14
Configuring DSP profile data using OTM

1   Click the **DSP Profile** tab. The DSP Options sub-tab opens. See Figure 36.

Figure 36
New Node – DSP Profile tab
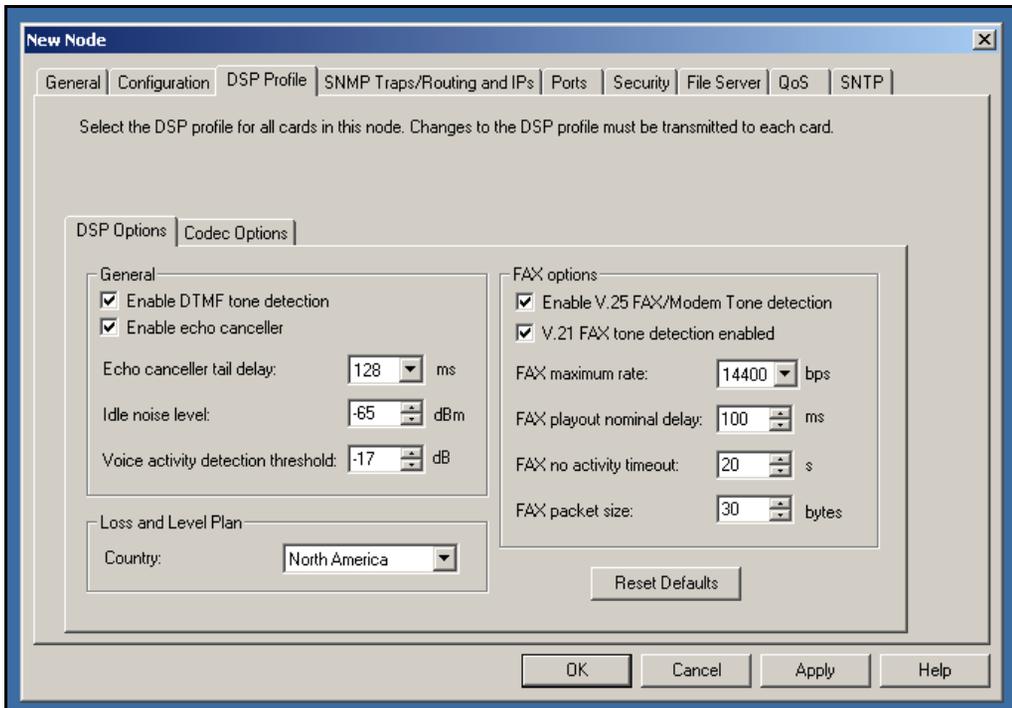
Table 45 lists the configurable DSP parameters, the range of the values, and the default values.

Table 45
DSP parameters

Parameter	Range	Default value
Enable DTMF tone detection	checked or unchecked	checked
Enable echo canceller	checked or unchecked	checked
Echo canceller tail delay	64 or 128 ms	128 ms
Idle noise level	−327 to +327 dB	−65
Voice activity detection threshold	−20 to +10 dB	−17 dB
Enable V.25 FAX/Modem tone detection	checked or unchecked	checked
Enable V.21 FAX tone detection	checked or unchecked	checked
FAX maximum rate	2400, 4800, 7200, 9600, 12000, 14400 bps	14400 bps
FAX playout nominal delay	0 – 300 ms	100 ms
FAX no activity timeout	10 – 32000 seconds	20 seconds
FAX packet size	20 – 48 bytes	30 bytes

2   Click the **Codec Options** sub-tab. See Figure 37 on .

Up to four Codecs can be selected.

Note: The T.38 Fax and G.711 Clear Channel Fax Codecs are not counted in this limit.

The G.711 Codec type is mandatory and is automatically selected.

> ### Recommendation
>
> Nortel Networks recommends that the system be configured with both G.711 and G.729A if there is a possibility that i2050 Software Phones could be configured with the "I use a modem to connect to the network" checkbox checked. If the node does not have G.729A and/or G.723 configured, i2050 Software Phone users with that checkbox checked will have calls blocked.
>
> For more information, refer to *Internet Terminals: Description* (553-3001-368) in the "Select Sound Devices tab" section.

3   Under **Codec Options**, the following parameters are user-configurable on a per-Codec basis:

Leave the values at their default settings unless directed to change them as follows or by Nortel Networks Field Support.

a.   **Law type:** The law type is applicable to G.711 only. The default is mu-law.

b.   **Voice Activity Detection:** The default is VAD disabled.

The VAD value is stored in the Config.ini file under the entry *VadEnabled=*

VAD is not supported for G.711.

c.   **Voice payload size**: The default is the maximum supported. This parameter is not configurable for the following:

- G.723.1
- T.38 Fax
- G.711 Clear Channel Fax

The payload size is stored in the Config.ini file under the entry *VxPayload=*

d.   **Voice playout nominal delay (nominal jitter buffer)**
      Voice playout maximum delay (maximum jitter buffer)

The default values and the range of allowed values are displayed in the pull-down lists.

4 Click **OK**.

Figure 37
New Node – DSP Profile tab - Codec Options sub-tab with G.729 AB Codec selected
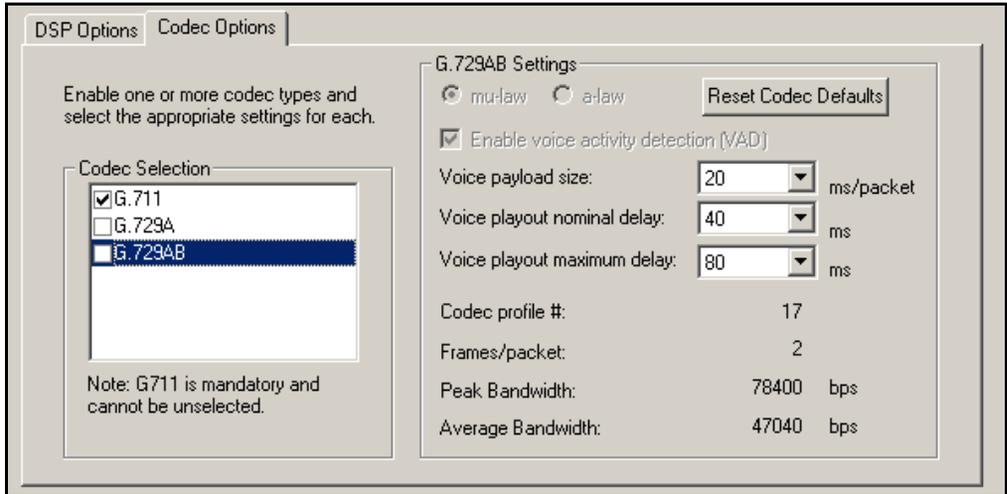
Note: If there are multiple nodes on a system and the same Codec is selected on more than one node, ensure that each node has the same voice payload size configured for the Codec.

———— **End of Procedure** ————

Configure SNMP traps and ELAN gateway routing table

Follow the steps in Procedure 15 on to configure SNMP traps and the ELAN gateway routing table.

Procedure 15
Configuring SNMP traps and ELAN GW Routing table

1   Click the **SNMP Traps/Routing and IPs** tab in the New Node window.
     See Figure 38 on .

     IP addresses that are added in this tab create special card routing tables
     that direct packets out the ELAN and ELAN gateway. Exercise caution
     when adding entries since the entry could result in one-way voice
     transmission if a change results in voice packets being streamed out the
     ELAN instead of the TLAN interface.

Figure 38
New Node – SNMP Traps/Routing and IPs tab
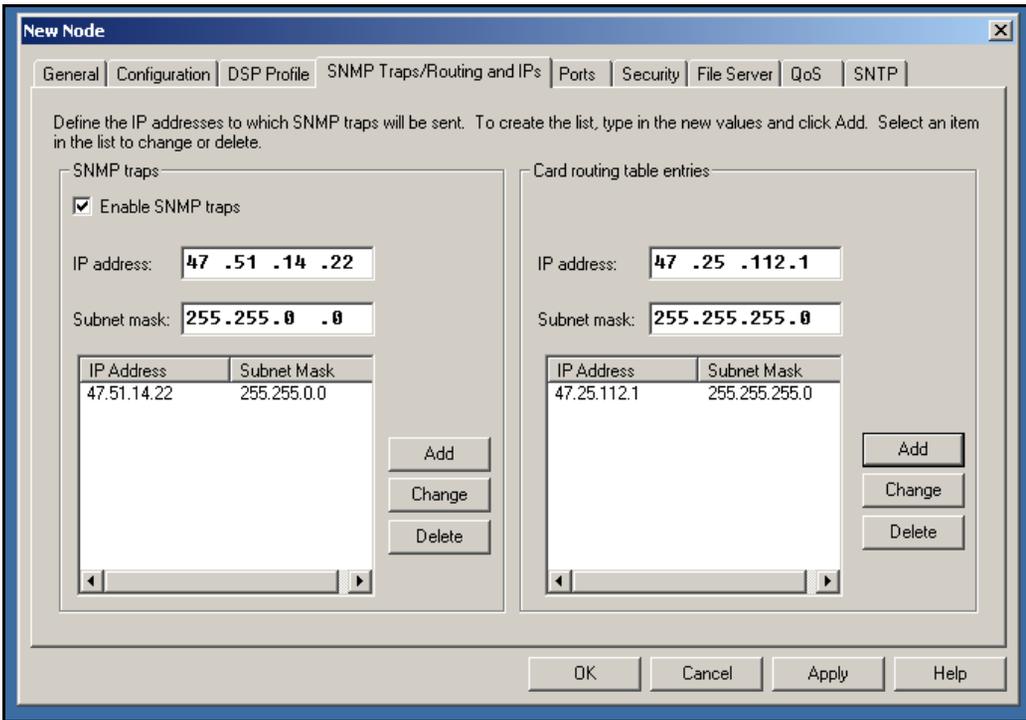
2   On the left side of the window, under **SNMP traps**:

a.   **Enable SNMP traps:** Check the Enable SNMP traps checkbox, if configuring one or more SNMP management IP addresses to receive SNMP traps from cards in the IP Telephony node.

b.   **IP address:** If SNMP traps are enabled, the SNMP traps are sent to the IP address entered here.

c.   **Subnet mask:** If SNMP traps are enabled, this is the subnet mask where SNMP traps are sent.

To add an SNMP Manager IP address, type the IP address in the SNMP traps entry fields, and click **Add**. Add SNMP Manager IP addresses for the following:

— the local or remote OTM server

— PPP IP address configured in the Netgear RM356 Modem Router, or equivalent, on the ELAN for the remote support OTM PC

— the SNMP manager for remote alarm monitoring

Note 1: Up to eight SNMP trap servers can be defined.

Note 2: A net route or host route through the ELAN gateway is added to the Voice Gateway Media Cards IP Routing Table for each SNMP management address that is added to the SNMP traps list.

3   On the right side of the window, under **Card routing table entries**, enter the **IP address** and **Subnet mask** for any host that is not on the ELAN subnet but requires access to the Voice Gateway Media Card across the ELAN. A Telnet session for maintenance from a remote PC is an example of when this would be needed. The address of the remote PC would be added in the Route list.

The default route on the card causes packets for unknown subnets to be sent out the TLAN interface. Packets from an external host arrive on the ELAN interface and responses are sent on the TLAN interface. This can cause one-way communication if the TLAN is not routed to the ELAN. It is necessary to add an entry in the Route list, to correct the routing so that response packets are sent on the ELAN. Each entry creates a route entry in the card's route table that directs packets out the ELAN interface. See Figure 39 on .

> **CAUTION**
>
> Use caution when assigning card routing table entries. Do not include the IP address of an Internet Telephone. Otherwise, voice traffic to this Internet Telephone is incorrectly routed through the ELAN and ELAN gateway. To avoid including the wrong IP address, Nortel Networks recommends that Host IDs be defined for the card routing table entries.

To add a net route or host route, type the IP address and subnet mask in the entry field of the card routing table, and click **Add**.

4   Click **Apply**.

Figure 39
Specifying additional ELAN routes

Meridian 1,
Succession 1000M,
or Succession 1000

In this diagram, an additional ELAN route is required to reach the management workstation, which is accessible through the ELAN interface but is not on the ELAN subnet.

553-CSE0141
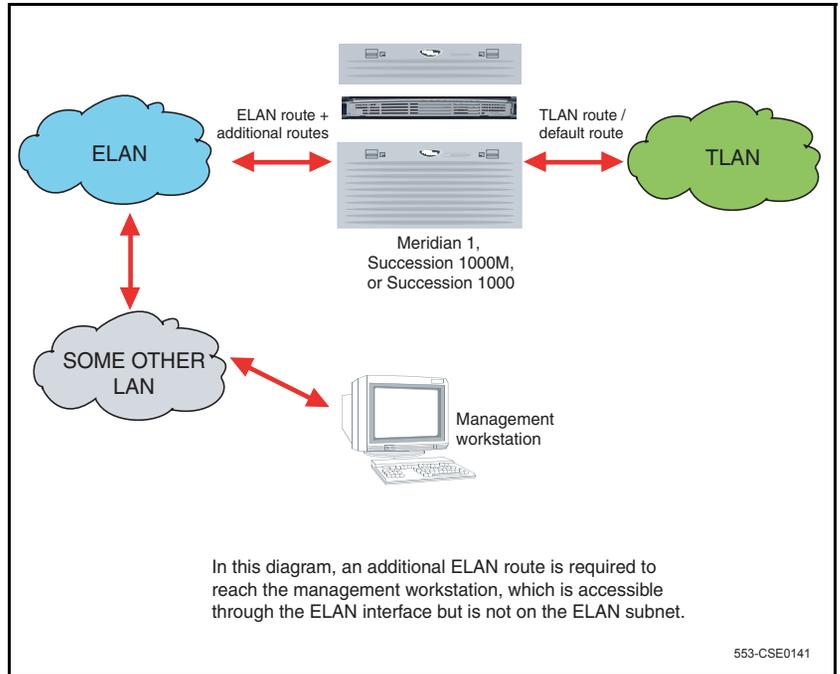
End of Procedure

Configure the Call Server ELAN IP address and the TLAN voice port

Follow the steps in Procedure 16 on to configure the Call Server IP address (Active ELNK) and the TLAN voice port.

Procedure 16
Configuring the Call Server ELAN IP address (Active ELNK) and the TLAN voice port

1   Click the **Ports** tab. See Figure 40.

Figure 40
New Node – Ports tab

2   Enter the following **ELAN** settings:

a. **Call Processor IP:** Enter the Call Processor ELAN IP Address (Active ELNK).

Note: The Call Processor ELAN IP address must correspond to the Active ELNK IP address configured in LD 117. It must be in the same subnet as the ELAN for the IP Telephony node.

b. **Survival Cabinet IP:** If applicable, enter the Survivable Cabinet ELAN IP address (Active ELNK). This is the IP address that is configured for survivability. The survivable Cabinet IP is enabled only for Small Systems and Succession 1000 systems.

Note: For Small Systems or Succession 1000, this field is disabled unless at least one cabinet has been defined as a survival cabinet of the main system in OTM Navigator. There is only one survival cabinet IP address for each node. The survival cabinet is equipped with sufficient trunk cards and Voice Gateway Media Cards. In case of Call Server equipment failure, it provides a large degree of survivability for Internet Telephone users.

c. **Signaling port:** The default value is 15000. This field is read-only.

d. **Broadcast port:** The default value is 15001. This field is read-only.

3 Enter the following **TLAN** settings:

a. **Signaling port:**

b. **Voice port**: Change the Voice port only as instructed by the IP network administrator to improve QoS for the Internet Telephones. For example, if RTP Header compression is used to reduce voice bandwidth on narrow-band WAN links, then TLAN voice port range must be set to 16384 or higher. The exact range will be provided by the system administrator.

Note 1: The TLAN Voice port range is 1024 to 65535. The default Voice ports are 5200-5295.

Note 2: The TLAN Signaling occurs on UDP ports 7300, 4100, 5100, and 5000.

CAUTION

Do not set the Voice port to a value that is already used for signaling (4100, 5000, 5100, 7300).

The Voice port defines the first port in a range spanning the gateway channels on the card; this means a Voice port value of 5200 reserves the following:

- ports 5200-5263 on the Succession Media Card 32-port line card

- 5200-5215 on the Succession Media Card 8-port line card

- 5200-5247 on the ITG-P 24-port line card.

If this value is changed from the default, confirm the selected Voice port value does not range into one of the reserved signaling port values.

---

4 Click **Apply**.

———— **End of Procedure** ————

Configure security for SNMP access

For security purposes, control administrative access to the IP Telephony node. Changing the SNMP community names provides better security for the IP Telephony node. OTM uses the community name password to refresh the Voice Gateway Media Card status, and to control the transmitting and retrieving of configuration data files for database synchronization.

Follow the steps in Procedure 17 to change the SNMP community names.

Note: If the community names are forgotten, connect a TTY to the Voice Gateway Media Card maintenance port. Restart the card. The card displays the community name on the TTY during startup.

Procedure 17
Configuring security for OTM SNMP access

1   Click the **Security** tab. See Figure 41.

Figure 41
New Node – Security tab

2   Change the default **Read only** and **Read/write** community names.

OTM uses the **Previous Read/write** community name to transmit the card properties. The first time data is transmitted after changing the password, the Previous Read/write password is used. For all following data transmissions, the changed password is used.

3   Click **Apply**.

──────────   **End of Procedure**   ──────────

Configure file server access

With the addition of new Internet Telephones, there are also additional firmware files for the Internet Telephones. The Voice Gateway Media Card has limited space to store the files for all the Internet Telephones on the card. Instead, a file server can be used to store the Internet Telephone firmware files.

The i2002 Internet Telephone firmware filename is 0603Bnn.BIN where Bnn = firmware version 1.nn. The i2004 Internet Telephone firmware filename is 0602Bnn.BIN where Bnn = F/W version 1.nn.

External file server option

If the external file server option is used in OTM 2.1 for firmware distribution with a node, the 0603Bnn.BIN file must be renamed to i2002.fw before being placed on the server. If the external file server option is used in OTM 2.1 for firmware distribution with a node, the 0602Bnn.BIN file must be renamed to i2004.fw before being placed on the server.

To configure the file server, follow the steps in Procedure 18 on .

Procedure 18
Configuring access to the File Server

1   Click the **File Server** tab. See Figure 42.

Figure 42
New Node – File Server tab

2   Under **File Server Parameters**, specify the parameters needed to connect to the file server:

   a.   **File Server IP:** Enter the IP address of the file server.

   b.   **Subnet Mask:** Enter the subnet mask of the file server.

   c.   **User ID:** Enter the user ID that is required to access the file server.

   d.   **Password:** Enter the password that is required to access the file server.

   e.   **Location of the firmware files:** Enter the path for the location of the firmware files. See page 100 for the default location of firmware files for the system.

3   Click **Apply**.

—————————— **End of Procedure** ——————————

Configure QoS

Configure QoS by enabling 802.1Q and NAT support, configuring DiffServ CodePoint (DSCP) settings, and configuring OM QoS thresholds.

Procedure 19
Enabling 802.1Q and NAT support, configuring DSCP settings, and configuring OM QoS thresholds

1   Click the **QoS** tab. See Figure 43.

Figure 43
New Node – QoS tab

2   802.1Q enables virtual LANs (VLANs) to be defined within a single LAN. This improves bandwidth management and limits the impact of broadcast and multicast messages.

Configure the 802.1Q settings as follows:

a.   **Enable 802.1Q support:** Check the check box to enable 802.1Q support. By default, 802.1Q support is disabled.

b.   **Priority Bits value (802.1p):** The priority field is a 3-bit value, with a default value of 6. The range is 0 – 7. A value of 6 is recommended by Nortel Networks. The p bits within the 802.1Q standard enables packet prioritization at Layer 2, improving network throughput for IP Telephony data.

Note: These values are applied to all Voice Gateway Media Cards in the node.

3   Network Address Translation (NAT) enables a LAN to use one set of IP addresses for internal traffic (private) and another set of IP addresses for external traffic (public). NAT tables provide mapping of public to private addressing. Support for networks containing NAT devices has been enhanced with the addition of a periodic message that is sent to prevent the RTP packet stream's NAT session from timing out. This could occur when the Internet Telephone is muted and packet transmission is stopped.

Configure the NAT settings as follows:

a.   **Enable NAT support:** Click this check box to enable the periodic sending of the session Keep Alive message. By default, this is disabled and the message is not sent.

b.   **Keepalive message interval:** The field defines the delay between transmissions of the dummy message. The default value is 90 seconds. The range is 30 – 120 seconds. Set this to a value that is shorter than the NAT device's session timeout value.

4   Under **DiffServ Codepoint**, modify the DSCP Control and Voice values only as directed by the IP network administrator.

The recommended configuration values are:

a.   **Control packets:** A value of 40 – Class Selector 5 (CS5). This sets the priority of the signaling messaging.

b.   **Voice packets:** A value of 46 Control DSCP – Expedited Forwarding (EF).

The DSCP determines the priorities of the management and voice packets in the IP Line network. The range for both management and voice packet DSCP is 0 – 63 inclusive.

The DSCP value can be configured, if required, to obtain better QoS over the IP data network (LAN/WAN).

The value entered depends on the policy in the customer's data network.

Note: Do not change DSCP from the default values unless instructed.

5   OM QoS Threshold monitoring provides data on the key factors impacting QoS as follows:

- packet loss

- latency

- jitter

This data is collected by the Succession Signaling Server and Voice Gateway Media Cards. The Polling Period can be configured (in seconds).
QoS threshold monitoring can be optionally configured to report QoS threshold violations to the Succession Call Server.

The OM QoS Thresholds can be configured as follows:

a.   **Packet Loss**: The range is 0 – 1000 (in units of 0.1%). The default value is 10.

b.   **Latency**: The range is 0 – 1000 milliseconds. The default is 250.

c.   **Jitter**: The range is 0 – 100 milliseconds. The default value is 30.

d.   **Polling Period**: The range is 0 – 600 seconds. The default is 5 seconds.

e.   **Call Serve Reporting**: This checkbox is optional. The default is the box is checked.

6   Click **Apply** and then click **OK**.

─────────────── **End of Procedure** ───────────────

Configure SNTP

Simple Network Time Protocol (SNTP) can be configured for an SNTP Server and SNTP Client. See Figure 44.

Figure 44
SNTP configuration tab

SNTP Server parameters

The following are the parameters for the SNTP Server:

- **Mode:** Can be configured as active or passive. The default is active.

- **Intervals (seconds)**: The range is 0 –2147483646. The default is 256.

- **Port**: The range is 0 – 99999. The default is 20000 + the Node number.

Note: The Node number is the same value as the value stored in the Node number field in the main IP Telephony application window.

SNTP Client parameters

The following are the parameters for the SNTP Client:

- **Mode:** Can be configured as active or passive. The default is passive.

- **Intervals (seconds)**: The range is 0 –2147483646. The default is 256.

- **Port**: The range is 0 – 99999. The default is 20000 + the Node number.

- SNTP Server IP address. The default is 0.0.0.0.

Note: The Node number is the same value as the value stored in the Node number field in the main IP Telephony application window.

Transmit node configuration from OTM 2.1 to the Voice Gateway Media Cards

Before transmitting the node configuration to the Voice Gateway Media Cards, ensure the following:

- Voice Gateway Media Cards and cables have been installed.

- ELAN and TLAN interfaces of all cards are connected with access to the IP network.

- IP Line 3.1 data has been configured in OTM 2.1.

- OTM 2.1 server is connected to the local ELAN subnet or to a remote subnet with IP router access to the ELAN and TLAN.

The IP Telephony node and card properties are configured using OTM 2.1's IP Line 3.1 application. The configuration data is converted to text files by OTM 2.1 and is then transmitted to the Voice Gateway Media Cards.

The process consists of the following steps:

1   Set the Leader 0 IP address from a TTY connected to the local RS-232 maintenance port. See Procedure 20 on .

2   Reboot Leader 0.

3 Transmit the node and card properties from the OTM IP Line 3.1 application to Leader 0. See Procedure 21 on

4 Reboot Leader 0.

5 Transmit card properties to all cards in the node. See Procedure 22 on

Set the Leader 0 IP address

Follow the steps in Procedure 20 to set the IP address of a factory-new Leader 0 Voice Gateway Media Card.

If the card is being re-used from an existing installation, enter the commands **NVRClear**, followed by **clearLeader, at the card's CLI.**

Procedure 20
Setting the Leader 0 IP address

1 Access the IPL> CLI by connecting the COM port of an OTM 2.1 PC to the RS-232 serial maintenance port on the faceplate of the Leader 0 Voice Gateway Media Card. Use an NTAG81CA PC Maintenance cable. If required, use an NTAG81BA Maintenance Extender cable between the PC Maintenance cable and the OTM PC.

Alternatively, connect the NTAG81BA Maintenance Extender cable to the female DB-9 connector of the NTMF94EA ELAN, TLAN RS-232 Ports cable for a more permanent connection to the Voice Gateway Media Card serial maintenance port.

Note: Never connect two terminals to the faceplate and I/O panel breakout cable serial maintenance port connectors at the same time.

2 Use the following communication parameters for the TTY terminal emulation on the OTM PC:

- 9600 baud

- 8 bits

- no parity

- one stop bit

3 Observe the Leader 0 card faceplate maintenance display window.

When the display reads "T:20", it begins to send BootP requests on the ELAN. A series of dots is printed on the TTY.

If the card does not display "T20", or has stopped printing the series of dots on the TTY, reboot the card and wait for "T20" to be displayed.

4   Type **+++** to escape from the BootP request.

5   At the Login prompt, enter the default user ID and password of **itgadmin** and **itgadmin** to access the IPL> CLI:

itg Login: itgadmin

Password: itgadmin

6   When the maintenance window displays "T:21", at the IPL> prompt, enter: **setLeader "xx.xx.xx.xx","yy.yy.yy.yy","zz.zz.zz.zz"**

The three parameters must each be enclosed in double quotation marks. Ensure that there is a space after the command and before the first parameter. Put commas and no spaces between the following parameters:

"xx.xx.xx.xx"=IP address.
Enter the same IP address that was entered in the **Management LAN IP** field for **Leader 0** in the **Configuration** tab of the **Node Properties** window.

"yy.yy.yy.yy"=Gateway IP address.
Enter the same address that was entered in the **Management LAN gateway IP** field in the **General** tab of the **Node Properties** window. If there is none, enter the following: "**0.0.0.0**"

"zz.zz.zz.zz"=Management LAN subnet mask.
Enter the same address that was entered in the **Management LAN subnet mask** field in the **General** tab of the **Node Properties** window.

Note: This step assumes that the new IP Telephony node has already been configured in OTM 2.1.

7   Reboot the Leader 0 Voice Gateway Media Card. At the IPL> prompt, enter: **cardReset**, or press the Reset button on the faceplate of the Leader 0 Voice Gateway Media Card.

8   Check the maintenance display for T:22 to confirm a successful reboot.

9   From the OTM IP Telephony Gateway - IP Line 3.0 application, select
View | Refresh to show the card status. Otherwise, verify LAN
connections and IP configuration.

——————————— **End of Procedure** ———————————

Transmit node and card properties to Leader 0

To transmit the node and card properties to Leader 0, follow the steps in
Procedure 21.

> **CAUTION**
>
> OTM 2.1 does not support transmitting node and/or card
> properties to a node (or any of the card within the node)
> which resides on a Succession 1000 system.

Procedure 21
Transmitting node and card properties to Leader 0

1   Log into LD 32 on the system. Disable the card in order to transmit the
card properties.

2   Open OTM. From the **OTM Navigator** window, click on the **Services**
folder to expand the menu. Double-click on **IP Line 3.1**. The **IP
Telephony Gateway - IP Line 3.1** window opens.

3   From the list of IP Telephony nodes in the upper part of the window, select
the node to which configuration data is to be transmitted.

4   Select the **Configuration** | **Synchronize** | **Transmit**. The **Transmit
Options** window appears. See Figure 45 on .

Figure 45
Transmit Options dialog box
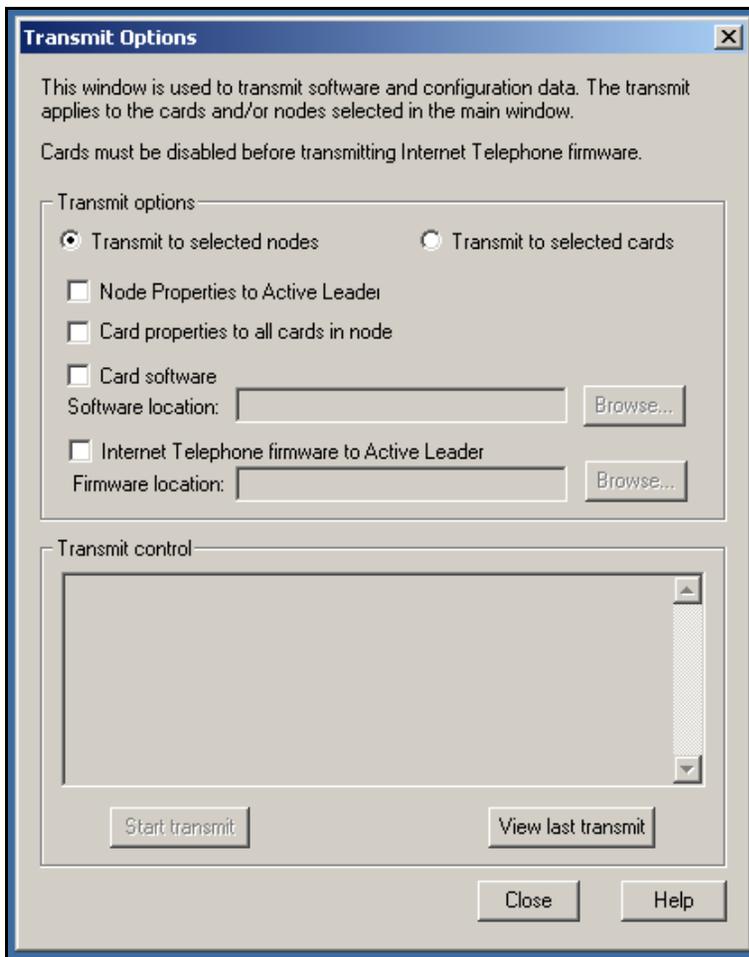
5 Use the default setting of **Transmit to selected nodes**. Check both the **Node Properties to Active Leader** and the **Card properties to all cards in the node** check boxes.?

6 Click the **Start transmit** button. Monitor progress in the **Transmit control** area. Confirm that the node and card properties are transmitted successfully to Leader 0.

Note: At this point, it is normal that the card properties fail to transmit to the other cards in the node, because they have not yet received the IP address from Leader 0 BootP server.

7 When the transmission is complete, click **Close**.

8 Reboot the Leader 0 Voice Gateway Media Card. At the IPL> prompt, enter: **cardReset.** Alternatively, push the Reset button on the faceplate of the Voice Gateway Media Card.

———————— **End of Procedure** ————————

Transmit card properties to all cards in the node

To transmit the card properties to all the Voice Gateway Media Cards in the node, follow the steps in Procedure 22.

> ⚠ **CAUTION**
>
> OTM 2.1 does not support transmitting node and/or card properties to a node (or to any of the cards within the node) which resides on a Succession 1000 system.

Procedure 22
Transmitting card properties to all cards in the node

1 To verify installation and configuration of the node properties, observe the displays on the card faceplate.

- After successfully rebooting, the Leader 0 card is now fully configured with the Node Properties of the node and enters a state of "active Leader". The card faceplate display shows **Lxxx**, where xxx = the number of Internet Telephones registered with the TPS on the Leader card. L000 means that no Internet Telephones are registered.

- The Leader 1 card and any Follower cards receive their configuration from the Leader 0 card. The faceplate display shows **Fxxx**, where xxx = the number of Internet Telephones registered with the TPS on

the Leader card. F000 means that no Internet Telephones are registered.

2 In the IP Telephony window, select the new IP Telephony node from the list in the upper part of the window. All Voice Gateway Media Cards in the node are displayed in the lower part of the window. See Figure 46.

Figure 46
IP Telephony window
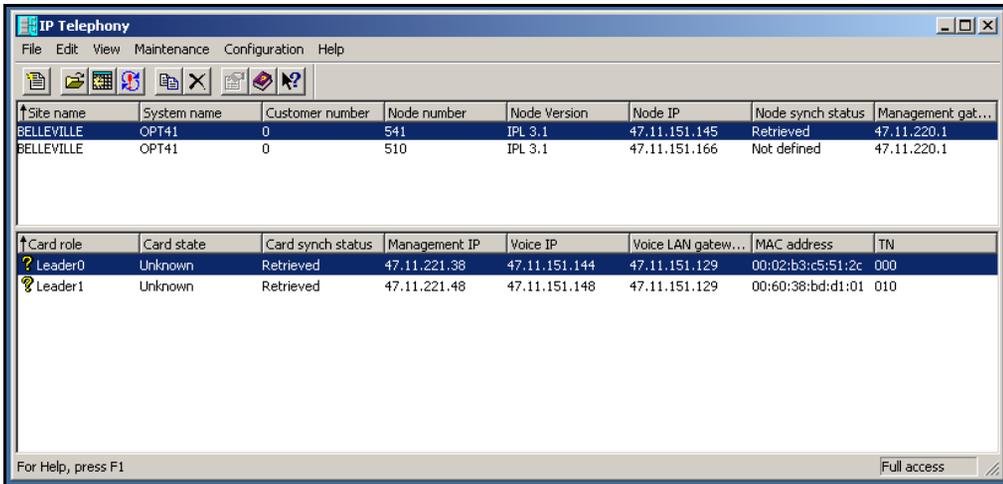
3 Press function key **F5** to refresh the card status of all cards in the selected node.
Alternatively, from the upper menu, select **View** | **Refresh** | **Selection.**
The card status changes from "Unknown" or "Not responding" to "Disabled", "Enabled", and "Unequipped".

Note: If it is not possible to communicate with the Leader 1 and Follower cards in the node after transmitting the node and card properties and rebooting the Leader 0 card, this means that the Voice Gateway Media Cards are unable to communicate back to the remote OTM PC through the voice gateway or TLAN router.

To establish communication with the Leader 1 or Follower cards in the IP Telephony node, perform the following actions:

a. Verify the TLAN physical and logical connections on all the non-responsive cards. Ensure the following:

    i. cables are plugged securely into the correct TLAN connection

    ii. switch is connected to correct TLAN router

    iii. remote OTM can communicate with TLAN router

b. If remote OTM 2.1 cannot communicate using the TLAN router, connect to the Voice Gateway Media Card maintenance port with a TTY and use the IPL> CLI **routeAdd** command on each Voice Gateway Media Card to add a new IP route through the management gateway that points to the remote OTM PC subnet.

c. Repeat step b if the card is reset before OTM successfully transmits the card properties (containing the SNMP Manager IP addresses and the card routing IP addresses).

4 When Leader 1 and all Follower cards show a status of disabled, click **Configure | Synchronize | Transmit**. When the Transmit window opens, click the **Transmit to selected nodes** radio button. Check the **Card properties to all disabled cards** check box.

5 Click **Start transmit**. Carefully monitor the progression in the Transmit Control window. Confirm that the card properties are successfully transmitted to every Voice Gateway Media Card in the selected node identified by its TN

6 Verify that all Voice Gateway Media Cards in the node have established a signaling link to the Call Server.

——————— **End of Procedure** ———————

Upgrade the Voice Gateway Media Card software and Internet Telephone firmware

> **WARNING**
>
> Before beginning the upgrade, ensure that a PWD1 user name and password has been configured on the Call Server. If there is no PWD1 user name and password, configure them in LD 17. This is necessary to enable login to the Voice Gateway Media Cards and Succession Signaling Server.

Before upgrading the software and firmware, determine the version of card software and Internet Telephone firmware that is currently installed. Compare the versions to the latest available versions by accessing the Nortel Networks web site. Refer to Procedure 23 on page 227 for complete instructions.

When a software or firmware upgrade is required, go to the Nortel Networks web site to download the appropriate upgrade files. When Internet access is unavailable from the OTM PC, use a PC with Internet access and transfer the files to the OTM PC for the following procedures.

Internet Telephone firmware installation and upgrade

The firmware files for the Internet telephones are downloaded from OTM 2.1 or Element Manager to the node Master and saved in a directory on the Master card's Flash disk. The node master then notifies the other cards in the node to retrieve the new files. When those firmware files are downloaded from OTM or Element Manager, they are compressed and stored on the /C: drive. File compression reduces the firmware file to less than 900 Kbytes.

There is no requirement on operations to pre-load the Internet Telephones with the correct version of firmware. Except in the case where the TFTP download to the set would be blocked (such as when the Internet Telephone is behind a firewall), the Internet Telephone's firmware is automatically upgraded as part of the registration to the TPS. If the firmware cannot be upgraded due to firewall restrictions, then upgrade the Internet Telephone with the current firmware version before distributing the telephone.

There is one firmware file each for the i2002 and i2004 terminals.

There is limited space on the Voice Gateway Media Card running IP Line 3.1 to store the firmware files. Therefore, the firmware is stored on a file server or on the Master card's RAM device.

Note: A firmware download does not occur with Internet Telephones performing a Virtual Office login or Branch Office login to a remote system. No firmware upgrade takes place during a Virtual Office Login or a Branch User registration with the TPS. The registration is allowed since the Internet Telephone firmware version must be 1.33 or later to do a Virtual Office login or a Branch Office User registration.

The **umsUpgradeAll** command has no impact on Virtual Office Login Internet Telephones. These Internet Telephones are not reset. If the Virtual Office Login is on the same Call Server, then the Internet Telephone firmware is upgraded after the user logs out. If the Virtual office Login is between different Call Servers, then the Internet Telephone just registers back to its home TPS and follows the normal firmware rules for regular registration.

When the **umsUpgradeAll** command is executed, Branch User Internet Telephones that on an active call are flagged. After the Internet Telephone becomes idle, the Internet Telephones are switched by the Call Server back to the Branch Office for the firmware upgrade .

Requirements

If a file server is used to store the firmware file, the following items are required to access the firmware:

- IP address of the file server

- routing table

- file path to the file server

- user name and password required to access the file server

This information is configured in the OTM 2.1 IP Line 3.1 application. If using OTM 2.1, this information is configured in the File Server tab of the Node properties. See Figure 42 on .

IMPORTANT!

All Internet Telephones in a system must use the same version of firmware as the Voice Gateway Media Card.

The Internet Telephones use Trivial File Transfer Protocol (TFTP) to transfer the firmware; therefore, the customer's network must support TFTP. For example, the customer's network cannot be blocked by a firewall.

CAUTION
The OTM PC should not be used as the file server for the firmware download.

Internet Telephone firmware upgrade from a new Voice Gateway Media Card

Meridian 1

When the Voice Gateway Media Card is received from the factory, the IP Line 3.1 software is located on the CompactFlash card. It is necessary to go to the Nortel Networks web site and download the firmware for the Internet Telephones to the Leader card.

As each Internet Telephone comes online, its firmware version is automatically compared to the version that is stored on the Voice Gateway Media Card. If they are different, the new firmware is downloaded from the Voice Gateway Media Card to the Internet Telephones. After the new firmware has been downloaded, the Internet Telephone reboots and registers again with the Voice Gateway Media Card.

Succession 1000M and Succession 1000

For Succession 1000M and Succession 1000 systems, it is not necessary to download software and firmware files to the card. All required software and firmware files are on the Succession Signaling Server Installation CD and are copied over at installation. The Succession Signaling Server is the Leader, so all Voice Gateway Media Cards in the node go to the Succession Signaling Server to obtain the Internet Telephone firmware files.

Note: The Internet Telephone does not necessarily register with the same card as before the upgrade.

Verify card software and Internet Telephone firmware

Before beginning, ensure that the following software is installed on the PC:

- Software to extract zipped files (WinZip or equivalent)

- A web browser such as Microsoft Internet Explorer 6.0.2600 (or later)

To verify the Voice Gateway Media Card software and the firmware on the Internet Telephone, follow the steps in Procedure 23.

Procedure 23
Verifying card loadware and Internet Telephone firmware using OTM 2.1

1 In the **OTM Navigator**, select the **Services** folder. Double-click on the **IP Line Telephony** icon. The **IP Telephony** window opens. Select an IP Telephony node in the upper part of the window. A list of all line cards for that node appears in the lower part of the window.

2 Starting with the Leader 0 Voice Gateway Media Card, double-click each Voice Gateway Media Card in the list to open the **Card Properties** window. There are two tabs in the Card Properties window: Maintenance and Configuration. See Figure 47 on and Figure 48 on .

Figure 47
Card Properties – Maintenance tab
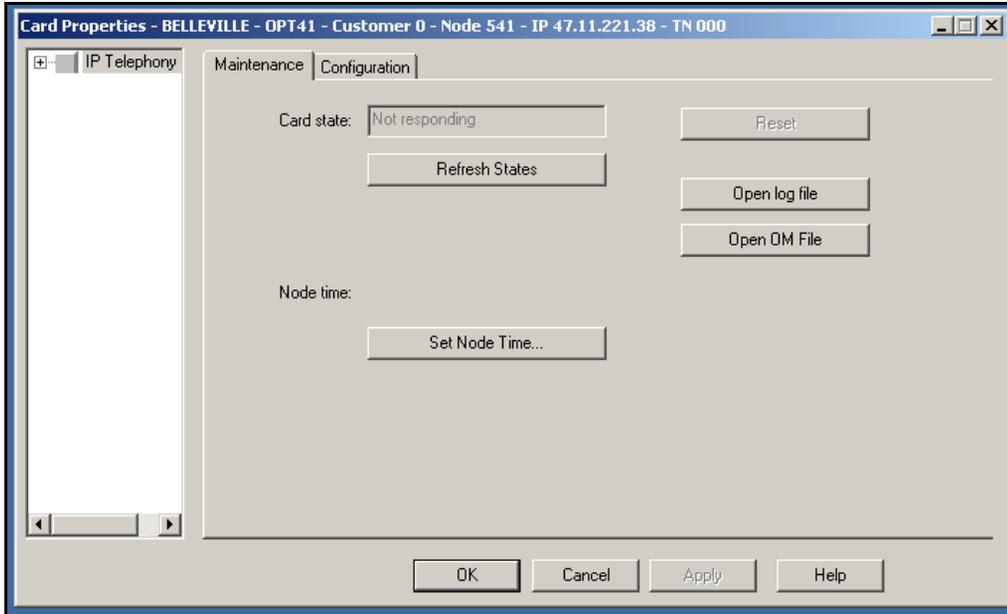
3 Keep the default settings shown in the Maintenance tab. Click the **Configuration** tab. See Figure 48 on .

Figure 48
Card Properties – Configuration tab
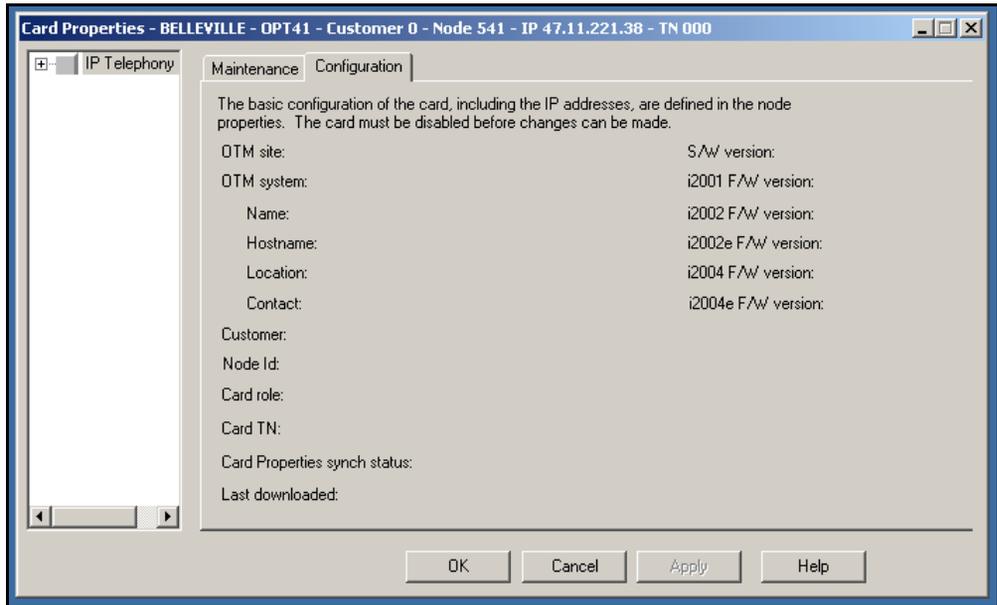
The current Voice Gateway Media Card software and Internet Telephone firmware versions are displayed on the Configuration tab. The Voice Gateway Media Card software is labelled **S/W version** and The Internet Telephone firmware is labeled **i2002** or **i2004 F/W version**.

4 Write down the loadware and firmware version for each Voice Gateway Media Card. Compare the loadware and firmware version with the latest recommended software release on the Nortel Networks web site.

5   Check the Nortel Networks web site for the latest IP Line 3.1 software and Internet Telephone firmware releases. Download the files. Follow the steps in Procedure 108 on page 649 to download files from the Nortel Networks web site.

Note: The IP Line 3.1 software files and Internet Telephone firmware files are contained in the **IP Line 3.10xx. SA** file in the **Internet Telephony Gateway** product list on the Nortel Networks web site. The zip file contains the following:

- The **IPL310xx.p2** and **IPL310xx.sa** loadware files. The IPL310xx.p2 file is the IP Line 3.1 application for the ITG-P 24-port line card. The IPL310xx.sa is the IP Line 3.1 application for the Succession Media Card.

- The **0602Bxx.BIN** (i2004) and **0603Bxx.BIN** (i2002) firmware file.

   For example, a firmware version can be labelled 0602B38. This means Internet Telephone firmware version 1.38.

   — The 02 represents the i2004 Internet Telephone.

   — The letter B represents the Version number 1.

   — 38 represents the Release number .38.

- A **readme.txt** file.
   The readme.txt file explains important considerations when installing the new software and firmware versions. The readme file also includes identifying information for the software and firmware files such as the date and time, size and checksum.

6   Locate the saved file and double-click the *.zip file. The zipped file opens in a compression utility program and the uncompressed files are listed.

7   If the card's software and firmware are not up-to-date, transfer the downloaded files (*.p2, *.sa, and firmware file(s)) from an Internet-enabled PC to the OTM PC.

8   If the card's software and firmware are not up-to-date, upgrade the Voice Gateway Media Card with the software and firmware files.

Refer to Procedure 24, "Upgrading Voice Gateway Media Card software from the OTM 2.1 PC" on , and Procedure 26, "Upgrading the Internet Telephone firmware" on for detailed instructions on how to perform the upgrades.

Note: All cards must be running the same version of the software.

———————————   **End of Procedure**   ———————————

Once the Voice Gateway Media Card software and Internet Telephone firmware has been verified, there are three upgrade options:

1 Upgrade the Voice Gateway Media Card software.
– In this case, perform Procedure 24 on only.

This is the most frequently-used option is used; however, verify if an Internet Telephone firmware upgrade is also required.

2 Upgrade both the Voice Gateway Media Card software and Internet Telephone firmware.
– In this case, perform a combination of Procedure 24 on and Procedure 26 on .

Note: Do not restart the Voice Gateway Media Cards until the end of Procedure 26, as restarting the cards restarts all the Internet Telephones.

3 Upgrade the Internet Telephone firmware.
– In this case, perform Procedure 26 on only.

Note: In this case, restart all Internet Telephones instead of all Voice Gateway Media Cards. To do this, select a single test Internet Telephone and reset the firmware only on that test telephone before completing the procedure on all Internet Telephones. If the upgrade works properly, use the **umsUpgradeAll** command to complete the upgrade on all the Internet Telephones.

Upgrade Voice Gateway Media Card software

To upgrade the software on the Voice Gateway Media Card, follow the steps in Procedure 24 on .

If Procedure 23 has just been completed, the correct software should have been verified and obtained for the Voice Gateway Media Card, and the files transferred to the OTM PC.

Note: A node can contain a mix of Succession Media Cards 32-port and 8-port line cards and ITG-P 24-port line cards. Each card type has a different software version. If a node contains a mix of cards, the software upgrade must be performed separately for each card type. That is, upgrade the ITG-P 24-port line card' software and then the Succession Media Card line card's software.

Procedure 24
Upgrading Voice Gateway Media Card software from the OTM 2.1 PC

1   Open the **OTM Navigator**, and click on the **Services** folder. Double-click the **IP Telephony** icon. The **IP Telephony** window opens.

2   Select the Voice Gateway Media Cards that are to be upgraded from the main card list view. Upgrade all the cards in the node together, unless a spare card that has older software is being installed.

3   Disable all Voice Gateway Media Cards to be upgraded. Use the LD 32 **DISI** command from OTM Maintenance Windows, the OTM System Passthru terminal, or a system management terminal directly connected to a TTY port on the system.

   Note: Nortel Networks recommends that a Voice Gateway Media Card be disabled prior to upgrading the software. However, it is possible to perform the transfer of the software to the card while the card is enabled. A Voice Gateway Media Card does not have to be disabled to transfer the software, however, the card must be disabled before it is rebooted.

4   In the **IP Telephony Gateway - IP Line 3.1** main window, select **View | Refresh** and verify that the card status is showing "Disabled."

5   Select **Configuration | Synchronize | Transmit**. The **Transmit Options** dialog box is displayed. See Table 49 on .

6   Under **Transmit options**, select the **Transmit to selected cards** radio button.

Figure 49
Transmit Options window
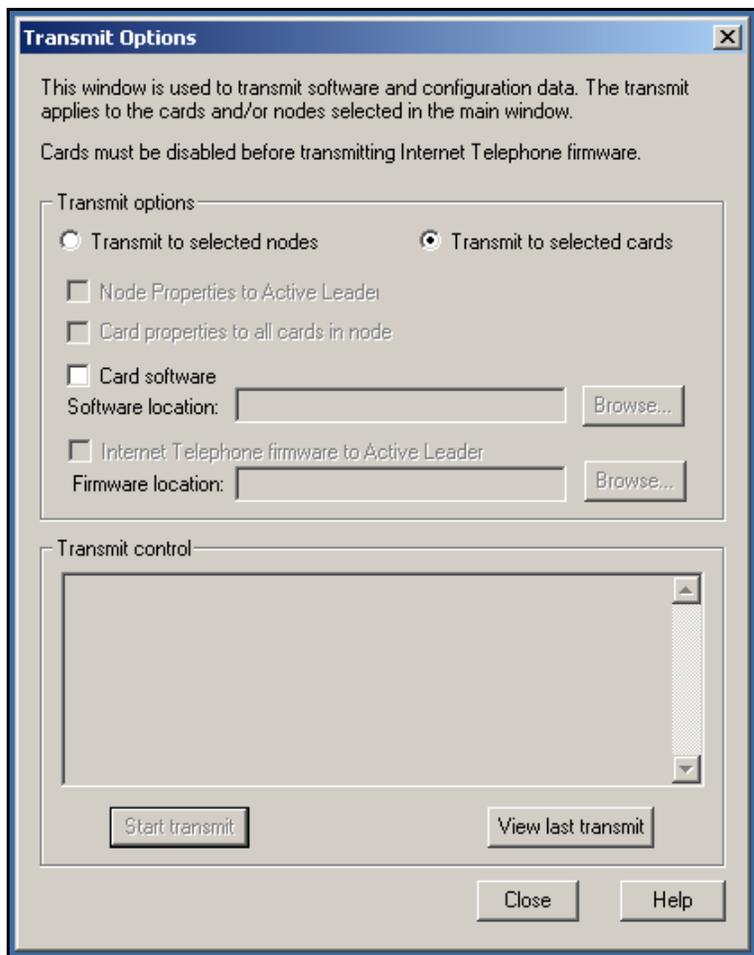
7   Check the **Card software** check box.

8   Click on the **Browse** button to the right of the **Software location** text box.

9   Select the appropriate file filter (that is, ***.sa, *.p2, *.mms, *.***) from the **Files of type:** drop-down list box.

10   Locate the Voice Gateway Media Card software that was verified to be the correct version in Procedure 23 on .

Select the file and click **Open** to save the selection. The path and file name of the Voice Gateway Media Card loadware appears in the **Software location** text box.

11   Click **Start transmit** to begin the Voice Gateway Media Card software upgrade process.

The software is transmitted to each card in turn, and burned into the flash ROM on the Voice Gateway Media Card.

12   Monitor progress in the **Transmit control** window. Confirm that the card software is transmitted successfully to all cards. Note any error messages, investigate and correct any problems, and repeat card software transmission until it is completed successfully for each Voice Gateway Media Card. The cards continue to run the old software until they are rebooted.

13   Reboot each Voice Gateway Media Card that received the transmitted software. This enables the new loadware to take effect. Reboot Leader 0 first, followed by the other cards.

14   These cards must remain in the "Disabled" state after the upgrade, so that a "**Reset**" command can be issued from the Maintenance menu.

Alternatively, click the Reset button on the Maintenance tab in the Card Properties window of each card to reboot the cards. Also, the cards can be reset by using a pointed object to press the "Reset" button on the card faceplate.

WARNING

Do not use a pencil to reset the Voice Gateway Media Card. The graphite carbon can create an electrical short circuit on the board.

---

15   After all the Voice Gateway Media Cards have been reset, have successfully rebooted, and are responding again to the OTM 2.1 IP Line 3.1 application, do a **Status refresh** (disabled: active; disabled: backup; disabled).

16   Double-click each upgraded card and verify the card software version in the S/W version field of the **Configuration** tab in the Card Properties window.

17 Use the LD 32 **ENLC** command to re-enable the Voice Gateway Media Cards.

Use LD 32 in the TTY or OTM Overlay passthru to enable the Voice Gateway Media Card with one of the following commands:

- ENLC l s c (for Meridian 1 and Succession 1000M Large Systems)

- ENLC c (for Meridian 1 and Succession 1000M Small Systems, and Succession 1000)

18 Repeat the previous two steps for each Voice Gateway Media Card.

———— **End of Procedure** ————

Upgrade the Voice Gateway Media Card software

The minimum versions of IP Line 3.1 software for the Voice Gateway Media Cards are:

- Version 6.7 for the Succession Media Card

- Version 5.7 for the ITG-P 24-port card

    Note: Refer to the ReadMe First document or the General Release Bulletin to ensure that the latest firmware is identified.

To upgrade the IP Line software for the Voice Gateway Media Card, follow the steps in Procedure 25 on page 236.

Procedure 25
Upgrading the Voice Gateway Media Card software

1   Check the Nortel Networks web site for the most current versions of the
    IP Line software for the ITG-P 24-port line card and Succession Media
    Card line cards. To download firmware files from Nortel Networks, follow
    the steps in Procedure 108 on page 649.

2   Once the most current version of the software has been downloaded,
    follow the steps in:

    •   Procedure 87 on page 538 to upgrade the software on the ITG-P
        24-port line card

    •   Procedure 88 on page 541 to upgrade the software on the
        Succession Media Card line cards

———————————————————— **End of Procedure** ————————————————————

Upgrade the Internet Telephone firmware

When the IP Line 3.1 software has been upgraded on the Voice Gateway
Media Card, verify if an Internet Telephone firmware upgrade is also
required. Check the *Readme First* document for the OTM IP Line 3.1
application to determine which Internet Telephone firmware version is
required to be compatible. The firmware upgrade does not apply to the i2050
Soft Phone.

•   In Procedure 23 on page 227, the correct software for the Voice Gateway
    Media Card should have been obtained and verified. The files should
    have been transferred to the OTM PC.

•   If using Procedure 24 on page 232 and Procedure 26 on page 237
    together, do not restart the Voice Gateway Media Card until
    Procedure 26 is completed. All the cards must be restarted because the
    software has not been upgraded. The new software will not run until the
    cards are rebooted, because the new firmware is incompatible with the
    old software.

•   If using Procedure 26 on page 237 alone (a firmware upgrade only), it is
    only necessary to reboot the node.

To upgrade the firmware on the Internet Telephone, follow the steps in Procedure 26. This procedure has two major steps:

- placing the Internet Telephone firmware onto each card in the node

- propagating the firmware from the card to each Internet Telephone registered on that card

Procedure 26
Upgrading the Internet Telephone firmware

1 Open OTM Navigator, and click the **Services** folder. Double-click the **IP Telephony** icon. The **IP Telephony** window opens.

2 In the main card list view, disable all Voice Gateway Media Cards that are to be upgraded with the new firmware. All cards must have the same Internet Telephone firmware version.

3 Verify that all Voice Gateway Media Cards that require a firmware upgrade have established a signaling link with the Call Server.

   Note: The Voice Gateway Media Cards must first be disabled in order to update the firmware. Use the LD 32 **DISI** command from OTM Maintenance Windows, the OTM system Passthru terminal, or a system management terminal directly connected to a TTY port.

   To verify that the link is available between the Call Server and Voice Gateway Media Card, Telnet to each card and log in. From the command line, type **pbxLinkShow**. The status of the Call Server link appears. If the link is active, the screen displays the following:

   ```
   RUDPLinkState = Up
   ```

4 Select **Configuration | Synchronize | Transmit**. The **Transmit Options** dialog box is displayed. See Figure 50 on page 238.

Figure 50
Transmit Options window
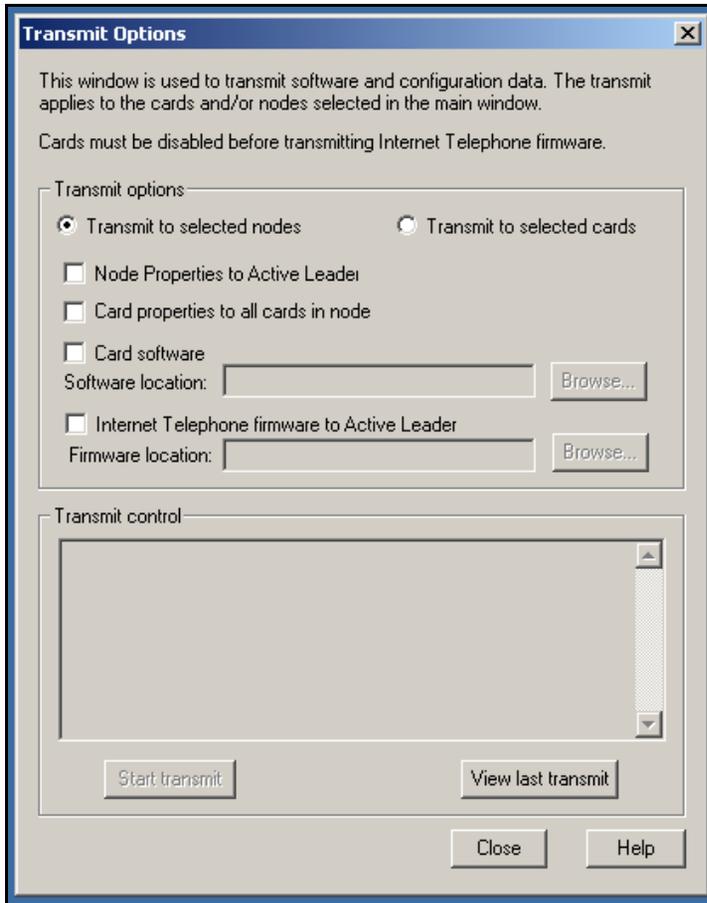
5   Under **Transmit options**, click the **Transmit to selected nodes** radio
    button.

6   Check the **Internet Telephone firmware to Active Leader** check box.

7   Click on the **Browse** button to the right of the **Firmware location** text box, to locate the Internet Telephone firmware that was previously verified as required for the Voice Gateway Media Card software version. Select the firmware file, and click **Open**. The path and file name of the Internet Telephone firmware appears in the **Firmware location** text box.

The IP Line 3.1 software determines the target Internet Telephone type (i2002 or i2004) based on the firmware filename. A filename of the format **xx02xxx.bin** (where "x" can be any alpha-numeric character) represents a firmware file for the i2004 Internet Telephone. Similarly a filename of the format **xx03xxx.bin** represents a firmware file for the i2002 Internet Telephone.

> **CAUTION**
> Downloading an incorrect version of the Internet Telephone firmware can result in extended service interruptions and require special recovery procedures.

8   Click the **Start transmit** button to begin upgrading the Internet Telephone firmware on the Voice Gateway Media Cards.

9   Monitor progress in the **Transmit control** window. Confirm the card firmware is transmitted successfully to all cards. Note any error messages, investigate, correct any problems, and repeat card firmware transmission until it is completed successfully on each Voice Gateway Media Card.

10   The Internet Telephones continue to run the old firmware until each telephone re-registers with a Voice Gateway Media Card that contains the new Internet Telephone firmware.

Note: Commands are available from the IPL> command line to upgrade a single Internet Telephone immediately, all Internet Telephones immediately, or schedule all Internet Telephones to be upgraded at a later time. Before doing this, verify that each card has the correct firmware version and also check the date and time on the node.

11   Select an Internet Telephone for test purposes. Telnet to the Voice Gateway Media Card. Log into the IPL> command line, and enter the following:

```
iSetReset "xxx.xxx.xxx.xxx"
```

where xxx.xxx.xxx.xxx is the IP Address of the selected Internet Telephone.

12   Monitor the display on the test telephone. As it upgrades the firmware, note the IP Address of the Voice Gateway Media Card from where the test telephone is receiving its upgrade.

13   Press the **Services** key (key with globe with arrow pointing East and West) on the Internet Telephone. The Services key provides access the **Telephone Options** list.

    i.   Press **Select** to select Telephone Options.

    ii.   Use the **Navigation** keys to scroll to **Set Info**.

    iii.   Press the **Select** softkey, then press the **Navigation** keys until it displays **FW Version:**. For the Voice Gateway Media Card, select the appropriate firmware.

Note: For example, a firmware version can be labelled 0602B38, which means Internet Telephone firmware version 1.38.

- 02 represents the i2004 Internet Telephone.

- B represents the Version number 1.

- 38 represents the Release number .38

14   Lift the handset and make a call to verify the Internet Telephone works.

When the Internet Telephone is working, verify the date and time on the node. Ensure each Voice Gateway Media Card has the correct loadware and firmware before using the **umsUpgradeAll** command to upgrade all the Internet Telephones.

15   To verify the date and time on the node from OTM 2.1, select the node in the top of the **IP Telephony Gateway - IP Line 3.1** window.

Double-click on Leader 0 in the bottom of the window. The **Card Properties** window appears.

Note: Cards receive their time from the Leader 0 card. If the time for Leader 0 is correct, all cards on the node should be the same. If Leader 0 displays the incorrect time, reset the time. The time propagates to the other cards.

16   Click the **Maintenance** tab. This displays the **Node time**. If the time is incorrect, click on the **Set Node Time** button. The Set Node Time window opens. Under **Time and date**, set the **Time**, where the time is displayed in the HH:MM:SS AM/PM format. Click **OK** to close the window.

17   Click the **Configuration** tab. Note the card's software version (**S/W version**) and the Internet Telephone firmware version (**i2002** or **i2204 F/W version**).

Double-click on each card to verify the loadware and firmware version. Do this for every card.

18   Before proceeding, ensure the time on the card is set correctly. Telnet to each Voice Gateway Media Card and log in. At the IPL> command line, enter the following:

    umsUpgradeAll "hh:mma/p"

hh:mma/p specifies the time when the upgrade will occur, **a** represents A.M., and **p** represents P.M. The time is in Standard format.

Example:
umsUpgradeAll "11:30a" or umsUpgradeAll "2:45p".

At the time specified, all the Internet Telephones on the Voice Gateway Media Card go out of service. This can take several minutes.

Upon completion of the firmware upgrade, the Internet Telephones are brought back online in groups of ten.

WARNING

The **umsUpgradeAll** command (without the time parameter) causes the Internet Telephones registered on all cards that are logged into to be immediately taken out of service, unless the time parameter is specified.

After the test telephone is working, the **umsUpgradeAll** does not need the time parameter. However, without the time parameter, the command immediately resets all the Internet Telephones currently registered on that line card.

If the technician does not want to immediately reset all the phones, and wants to schedule the reset time of the Internet Telephones, check the time on all the cards. If necessary, reset the time to ensure all cards have the same time. Then issue the umsUpgradeAll "**hh:mma/p**" command, where "hh:mma/p" represents the time when the upgrade will occur.

19   At the IPL> prompt, verify that the Internet Telephones are upgraded for each Voice Gateway Media Card by entering the following:

    isetShow

Inspect the list to ensure all Internet Telephones have the correct firmware version.

20 For any Internet Telephones that did not upgrade successfully, try one of the following (in order):

- use the **isetReset "IP Address"** command

- enter the following combination of keystrokes at the telephone console: **release**, **mute**, **up**, **down**, **up**, **down**, **up**, **mute**, **9**, **release**

- power the telephone off and then on again

If the upgrade was unsuccessful on any of the Internet Telephones, this is most likely due to one of the following reasons:

- one of the Voice Gateway Media Cards did not upgrade the software successfully

- an Internet Telephone is loaded with a firmware version that was unable to be upgraded by the Voice Gateway Media Card in the normal way

- the **umsUpgradeAll** command was not issued

- one of the cards has not been reset

If the upgrade was unsuccessful, re-do the appropriate procedure. If the upgrade is still unsuccessful, contact the technical support representative for further assistance.

——————————— **End of Procedure** ———————————

For additional information on configuring the Internet Telephones and the i2050 Software Phone, see *Internet Terminals: Description* (553-3001-368).

Configure OTM Alarm Management to receive IP Line SNMP traps

To configure the alarm notification feature in OTM 2.1 to receive SNMP traps, follow the steps in Procedure 27.

For more information about OTM Alarm Management, refer to *Optivity Telephony Manager: System Administration* (553-3001-330).

Procedure 27
Configuring SNMP Traps

1   In the **OTM Navigator** window, select the **Utilities** menu option and then
click on **Alarm Notification.** See Figure 51.

Figure 51
OTM Navigator – Utilities | Alarm Notification
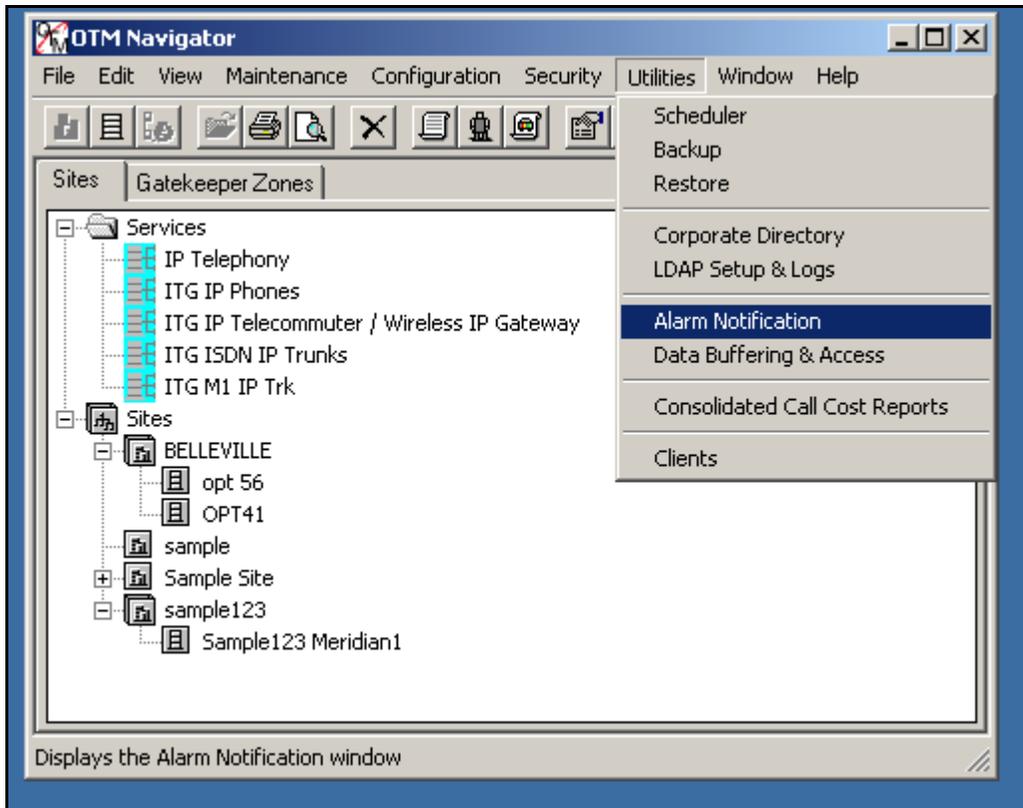
2   The **OTM Alarm Notification** window opens. Select **Configuration |
Run Options**.

3 The **Alarm Notification Run Options** dialog box opens. Click the **Control Files** tab. See Figure 52.

Figure 52
Alarm Notification Run Options – Control Files tab
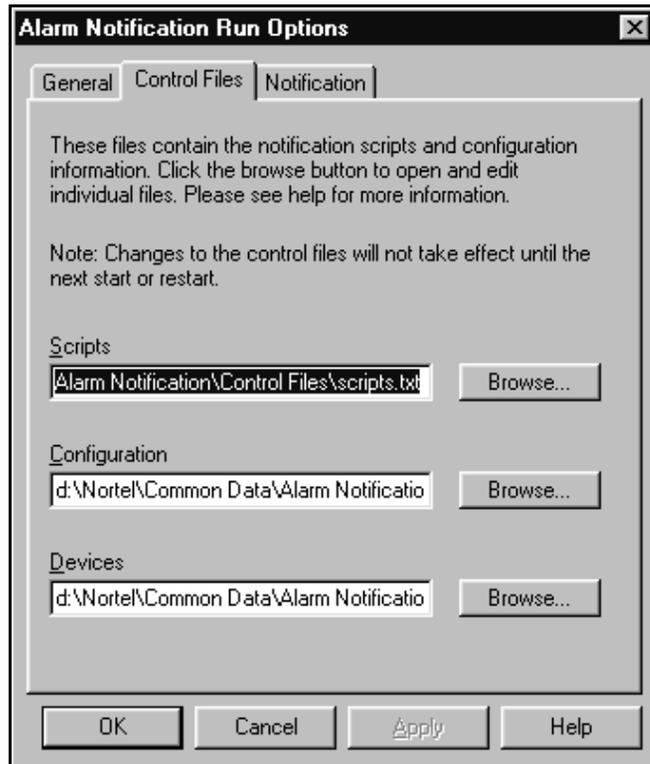
4 Click the **Browse** button located to the right of the **Devices** text box. The **Open** dialog box opens.

5 Select the **Devices** file from the Control Files folder and click **Open.** See Figure 53 on .

Figure 53
Open dialog box
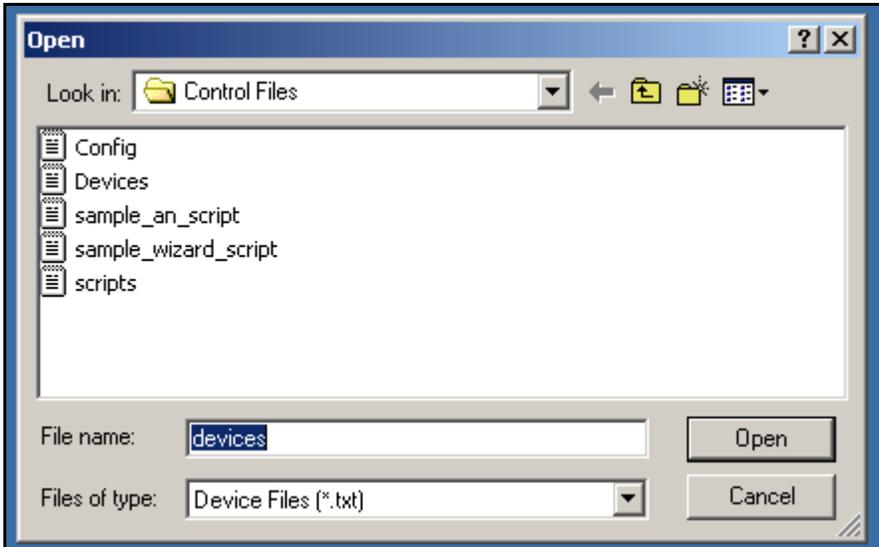
      6   The Devices.txt file opens. See Figure 54 on page 247.

Figure 54
Devices.txt file

7   For each Voice Gateway Media Card in each monitored IP Telephony node, add a line consisting of three fields separated by spaces, as shown in Table 46 on page 248. Enter the first line under the last line that begins with a "**#**".

8   Click **File | Save As**. Save the template to a new file, for example, **ITGDevices1.txt**, to avoid overwriting the template file.

9   In the **Alarm Notification Run Options** window, verify that the devices field name is correct (ITGDevices1.txt). Click **Apply**, and then **OK**.

Note: OTM Alarm Notification must be restarted whenever Control Files are changed.

10 If OTM Alarm Notification is running (the red traffic light is showing on the toolbar), click on the red traffic light to stop alarm notification. The traffic light changes to green. Click the green traffic light to restart alarm notification. The traffic light should turn to red to indicate it is running.

If OTM Alarm Notification is not running, as indicated by the green traffic light, click on the green traffic light to change it to red. This starts Alarm Notification.

11 Telnet to each Line card and log in. At the IPL> command line, enter the **itgAlarmTest** command.
A series of SNMP traps is emitted by the Voice Gateway Media Card and appears in the OTM Alarm Notification browser window. Verify that the device name identifies the correct Voice Gateway Media Card.

Table 46
Format of Devices.txt file

Device Type	IP Address	Device Name
ITG_IP_PHONE	xxx.xxx.xxx.xxx	Site_Leader_0
ITG_IP_PHONE	xxx.xxx.xxx.xxx	Site_Leader_1
ITG_IP_PHONE	xxx.xxx.xxx.xxx	Site_Follower_2

For every Voice Gateway Media Card in every node, there is a line in the table. For example, a line in the table can look like this:

ITG_IP_PHONE 192.9.200.1 MySite_MySystem_Leader_1

The following is a description of each field in the table:

Device Type – is a dedicated receive string or name used as an index for the IP Line application. The Device Type must be ITG_IP_PHONE.

IP Address – the source IP address on the Voice Gateway Media Card from which the traps are coming (either the card Voice IP address (TLAN) or card Management IP address (ELAN)). By default, the SMNP traps are issued from the card Voice IP address (TLAN). If a card routing table entry on the IP Telephony node was previously configured pointing to the IP address of the OTM, then the SMNP trap issues from the Management IP address (ELAN) of the card.

Device Name – the device name can be any string. Nortel Networks recommends that abbreviations for the site and system, the card functions, and the Terminal Numbers (TNs) are used, such as Site_System_Leader/Follower_TN. Note: Spaces should not be used in the Device Name. Use an underscore (_) as a separator.

The Leader card has two IP addresses: the card voice IP address (TLAN) and the node IP address. The Follower cards have only a single IP address, the card voice IP address.

————————— **End of Procedure** —————————

Assemble and install an Internet Telephone

To assemble and install an Internet Telephone, refer to *Internet Terminals: Description* (553-3001-368).

Change the default IPL> CLI Shell password

The IPL> Command Line Interface (CLI) is password protected for Telnet access and access to the local maintenance port. The same user name and password also protects FTP access to the Voice Gateway Media Card. The IPL> CLI has a default user name of **itgadmin** and a default password of **itgadmin**.

Refer to "IPL> CLI Shell user name and password" on and "Node password synchronization" on for more detailed information on the passwords.

Configure the Internet Telephone Installer Passwords

The Internet Telephone Installer Password protection, for changing the TN on the telephone, controls registration with a virtual line TN on the Call Server. See for more information about the Internet Telephone Install Passwords.

To enable and set the administrative Internet Telephone Installer Password, see Procedure 51 on . If needed, enable and set a temporary Internet Telephone Installer Password. See Procedure 52 on .

Configuration of IP Telephony nodes using Element Manager

Contents

This section contains information on the following topics:

Introduction

This chapter explains how to configure IP Telephony nodes and Voice
Gateway Media Cards using Element Manager. Element Manager is accessed
using a PC with Internet Explorer 6.0.2600 (or later). The PC must be
connected to a LAN that has access to the Succession Signaling Server's
Node IP address, either directly or routed through the network.

> *Note:* The ELAN IP address might be required, instead of the Node IP
> address, to access the Element Manager login page in secure
> environments.

This chapter also provides instruction for transmitting files to Voice Gateway
Media Cards, upgrading card software, and upgrading Internet Telephone
firmware.

Read the information on IP network engineering guidelines in *Data Networking for Voice over IP* (553-3001-160) before installing an IP Telephony node.

Upgrade the ITG-P 24-port line cards to IP Line 3.1

Element Manager cannot be used with the Meridian 1 system, as a Succession Signaling Server is required in the system configuration.

Meridian 1, Succession 1000M, and Succession 1000 require the ITG-P 24-port line cards to be running IP Line 3.1.

WARNING

In Succession 1000 systems, the ITG-P 24-port line card using an earlier release of the IP Line application must be upgraded to IP Line 3.1, or communication with Element Manager fails. In Succession 1000M systems, the ITG-P 24-port line card must be upgraded to IP Line 3.1 to communicate with Element Manager.

OTM 2.1 is required to upgrade an ITG-P 24-port line card to IP Line 3.1. Once the card's software has been upgraded to IP Line 3.1 using OTM 2.1, configuration, administration, and maintenance tasks can be performed using Element Manager.

Refer to "ITG-P 24-port card upgrades" in *Succession 1000 System: Upgrade Procedures* (553-3031-258) for the procedure to upgrade an ITG-P 24-port line card to IP Line 3.1 software.

Configure IP Line 3.1 data using Element Manager

Element Manager can be used to manually add and configure an IP Telephony node on Succession 1000 and Succession 1000M systems. Multiple nodes can be configured and managed from Element Manager.

Node definition

A node is defined as a collection of Succession Signaling Servers and Voice Gateway Media Cards. Each node in the network has a unique Node ID. This Node ID is an integer value. A node has only one Primary Succession Signaling Server or Leader Voice Gateway Media Card. All the other Voice Gateway Media Cards are defined as Followers.

Note 1: All IP addresses and subnet mask data must be in dotted decimal format. Convert subnet mask data from Classless Inter-Domain (CIDR) format. for more information, see "Subnet Mask Conversion from CIDR to Dotted Decimal Format" on .

Note 2: See Table 31 on for IP addresses and information required in this procedure.

Note 3: The following sections discuss how to configure IP Line 3.1 using Element Manager. The following three sections (of the IP Telephony section) in Element Manager are not covered in this NTP:

- SNTP (see *IP Peer Networking* (553-3001-213)

- Gatekeeper (see *IP Peer Networking* (553-3001-213)

- Succession Signaling Server (see *Signaling Server: Installation and Configuration* (553-3001-212)

Internet Explorer browser configuration

Element Manager requires Microsoft Internet Explorer 6.0.2600 (or later).
Element Manager is not supported on the Netscape Navigator browser. The
PC should be a PIII with a 500 MHz processor (at minimum).

IMPORTANT!

Internet Explorer caching interferes with the Element Manager
application, in that users cannot see real-time changes as they occur.
For this reason, Internet Explorer caching **must** be turned off.

Follow the steps outlined in Procedure 28 on to prevent caching of
web pages by Internet Explorer.

Procedure 28
Turning off browser caching in Internet Explorer

1 Launch Internet Explorer.

2 Click **Tools | Internet Options**. The Internet Options window opens. See Figure 55 on .

Figure 55
Internet Explorer – Internet Options
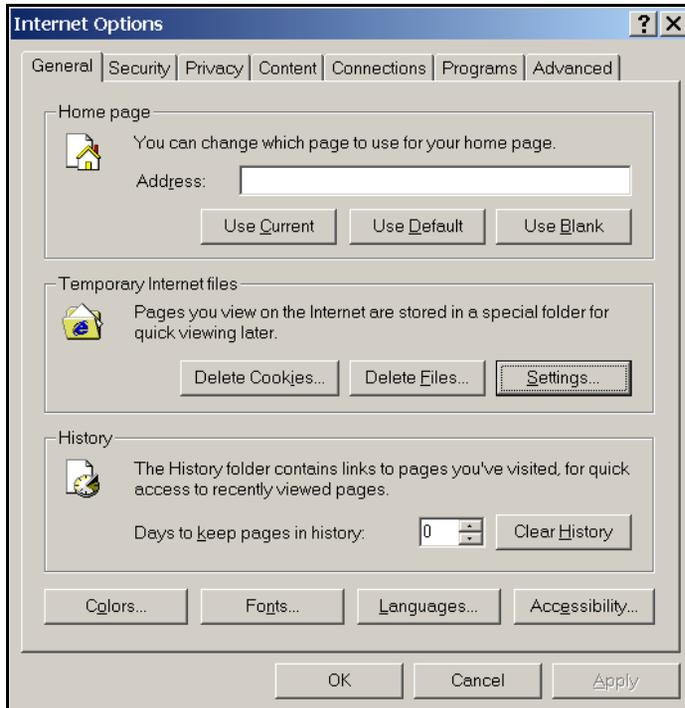
3   On the **General** tab, under the **Temporary Internet files** section, click the **Settings** button. The Settings window opens. See Figure 56 on .

Figure 56
Temporary Internet files Settings window
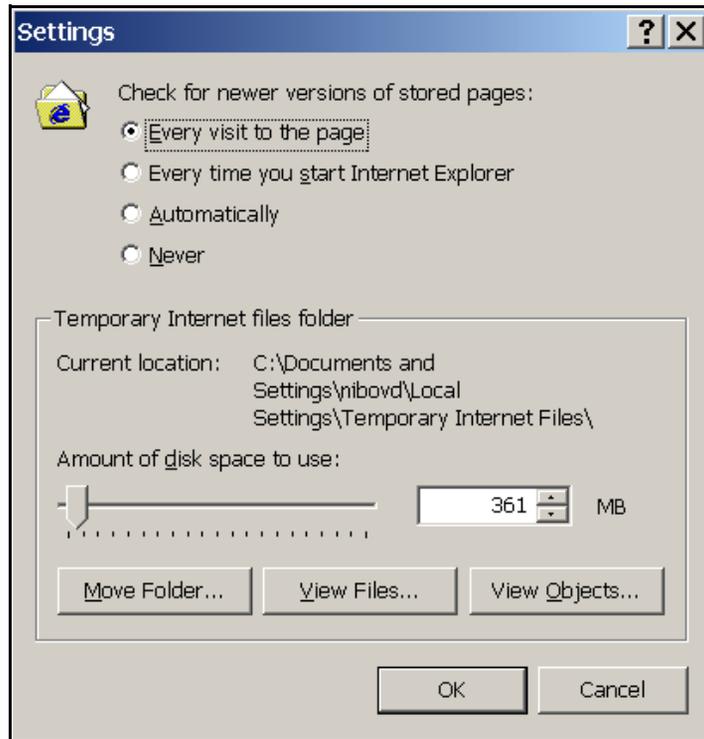
4   Click the **Every visit to the page** radio button. This checks for new versions of stored pages on every visit to the web page.

5   Click **OK** in the Settings window.

6   Click **OK** in the Internet Options window.

──────────────   **End of Procedure**   ──────────────

Launch Element Manager

Follow the steps in Procedure 29 to launch Element Manager.

Procedure 29
**Launching Element Manager**

1   Open Internet Explorer.

2   Enter the **Signaling Server Node IP address** in the Address Bar (url line) of the browser window. Click **Go** or press **Enter** on the keyboard.

   Note: The ELAN IP address might be required, instead of the Node IP address, to access the Element Manager login page in secure environments.

3   Element Manager opens and the **Login** window appears. See Figure 57 on .

   a.   Enter the **User ID** and **Password** of the Call Server.

   b.   Enter the IP Address of the Call Server in the **CS IP Address** field.

   c.   Click the **Login** button.

Figure 57
Element Manager – Login window
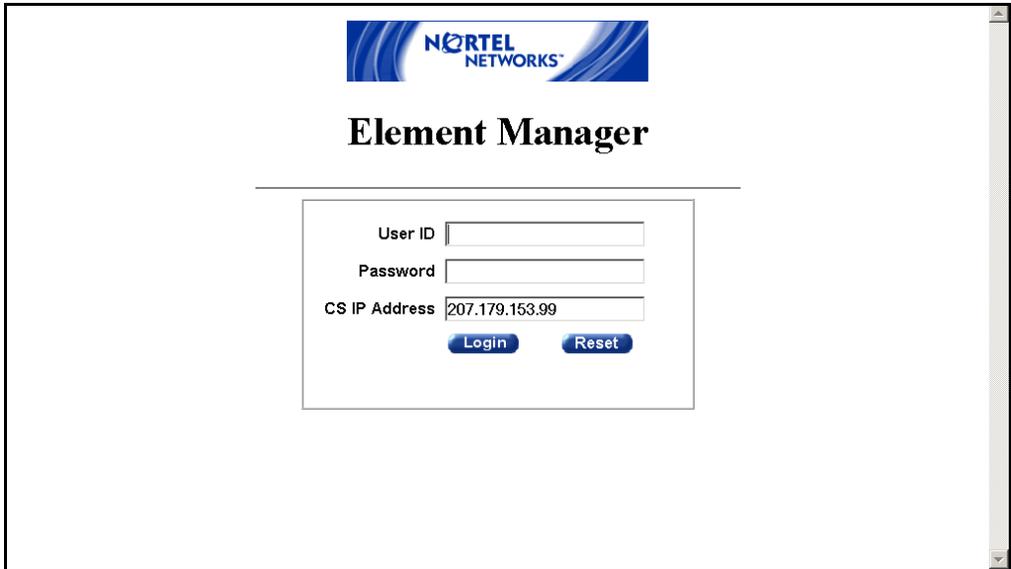
4   The **System Information** page appears. See Figure 58 on .

The **Navigation Tree** is located on the left side of the browser window. The **System Status** menu is expanded in the Navigation Tree.

Figure 58
**Element Manager – System Information**
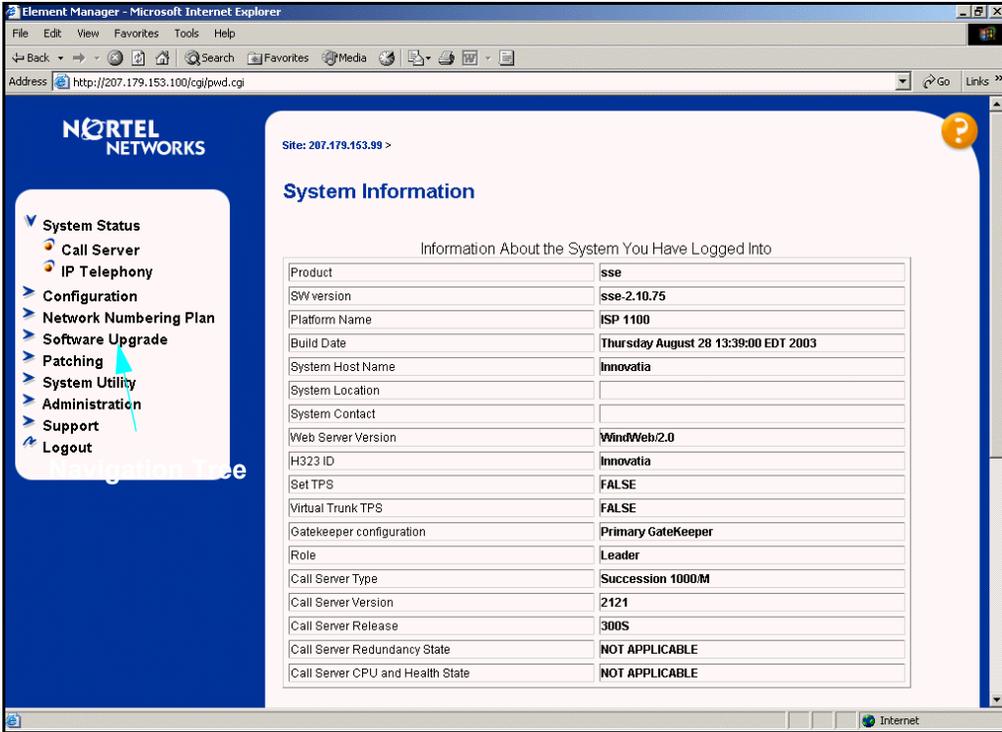
Note: To log out of Element Manager, click **Logout** at the bottom of the Navigation Tree.

Timing out

When a user is on the Configuration -> IP Telephony -> Node ->Edit page seen in Figure 62 on , Element Manager times out after a period of inactivity. Users are prompted with a warning five minutes before Element Manager times out. If the user clicks OK within the warning time out period, the timer is reset. If the user does not respond, the session is cancelled and the user is forced to login again. Any data that was modified, but not submitted, is lost.

Figure 59
Timeout message

—————— **End of Procedure** ——————

Summary of procedures

The following is the summary of the steps required to configure a node and a Voice Gateway Media Card using Element Manager:

1   "Manually add an IP Telephony node" on

2   "Configure SNMP traps and community name access for security" on

3   "Configure Voice Gateway Profile data" on

4   "Configure Quality of Service" on

5   "Configure ELAN IP address (Active ELNK), TLAN voice port, and routes (Small Systems and Succession 1000 only)" on

6   "Configure file server access" on

7   "Configure loss and level plan" on

8   "Configure the card properties of the Voice Gateway Media Card" on

9   "Submit and transfer the node information" on

Manually add an IP Telephony node

Follow the steps in Procedure 30 to add an IP Telephony node using Element Manager.

Procedure 30
Adding an IP Telephony node manually

1   To manually add a new IP Telephony node, click **Configuration** in the Navigation Tree.

2   In the Configuration menu, click **IP Telephony**. The **Node Summary** page appears. See Figure 60.

Figure 60
**Element Manager – Node Summary- Adding a new node**
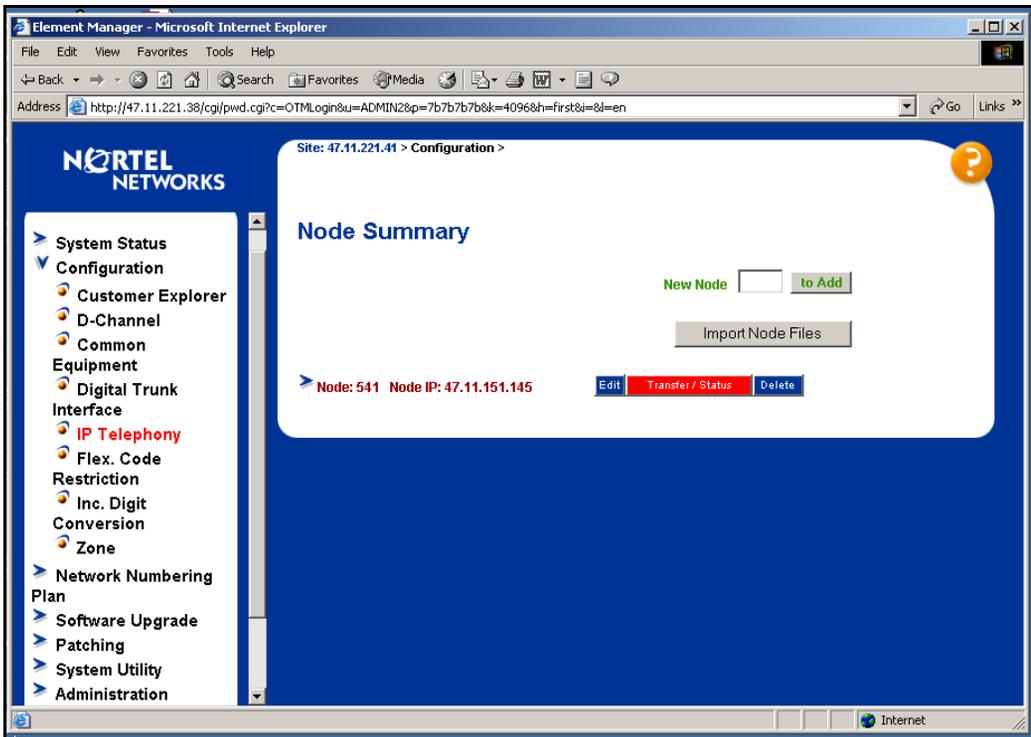
If this is the first node to be added, the "**No nodes are configured**" message is displayed. There are two options: "**Add a New Node**" or "**Import Node Files**".

The Node Summary page shows a list of all the configured nodes. To expand a node and view its elements, click the arrow (**>**) to the left of the Node information. Figure 61 on shows one expanded node.

There are five buttons on the Node Summary page:

- **to Add** – This button is used to add a new IP Telephony node. Enter an unused Node ID and then click to Add.

- **Import Node Files** – This button imports the configuration files from an existing node.

- **Transfer/Status** – This button is used to transfer/obtain the status on the requested changes to the node. The node then obtains its information (CONFIG.INI and BOOT.P files) from the Call Server.

- **Edit** – This button retrieves the node information from the Call Server and returns the information to the Edit page. The node information can then be changed.

- **Delete** – This button is used to delete the selected node and its information from the Call Server.

Figure 61
Node Summary – expand a node
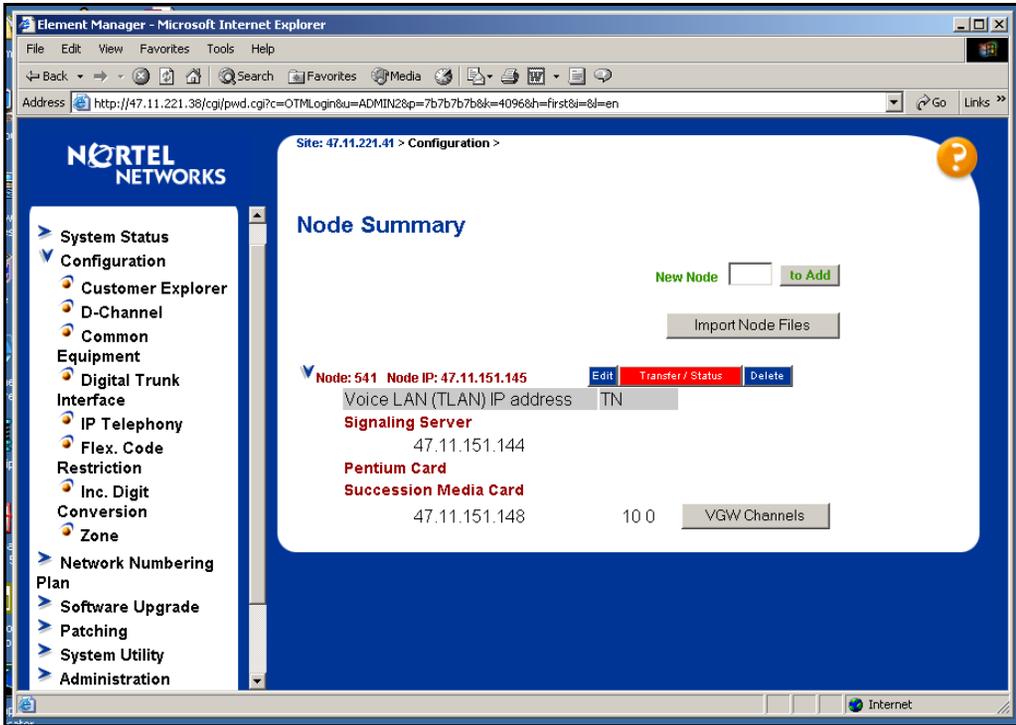
3   Enter the new Node ID in the **New Node** text box. The Node ID can be
one to four digits in length. When defining the node number, determine if
the Enhanced Redundancy for IP Line Nodes functionality is required
(see "Enhanced Redundancy for IP Line nodes" on page 109). If it is
required, factor the requirement into the node number assignment
process.

> **CAUTION**
>
> The Voice Gateway Media Cards identify themselves
> with a node using the node number or node ID. If there
> are multiple IP Telephony nodes sharing the same
> TLAN, each node must have a unique ID. Each system
> on the TLAN must have a unique node ID assigned to
> the Voice Gateway Media Cards on the system.

Note: The Node ID field corresponds to the Node ID field in the Internet
Telephone configuration. Write down the node number, which is used
during the Internet Telephone configuration.

4   Click the **to Add** button. The **Edit** page opens. See Figure 62 on
page 266.

Figure 62
Element Manager – Edit
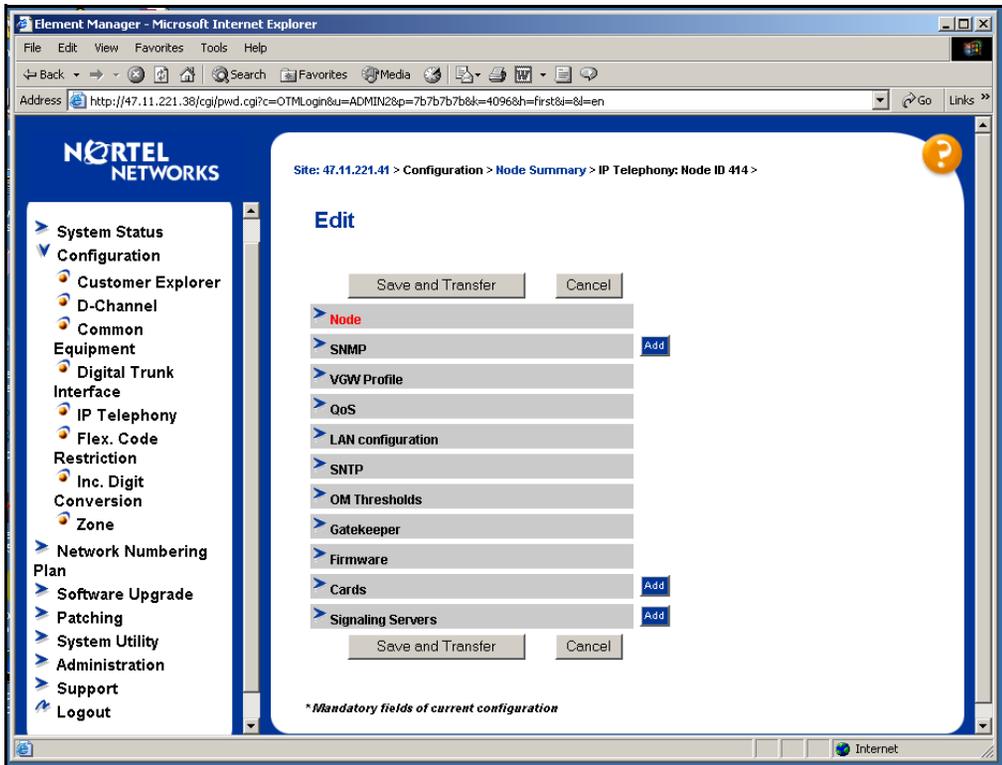
There are three different buttons on the Edit page:

- **Save and Transfer** – This button saves and transfers changes to the Call Server and returns the users to the Node Summary page.

- **Cancel** – This button discards changes made to the IP Telephony node and returns the users to the Node Summary page.

- **Add** - The Add buttons are associated with specific sections of the IP Telephony node properties. The user can add new SNMP traps, cards, and Succession Signaling Servers.

5 Click **Node** to edit the Node information, if it is not already expanded by default. See Figure 63 on .

Figure 63
Configuration > Node Summary > Edit > Node

a. **Node ID:** The node ID entered on the previous page appears.

b. **Voice LAN (TLAN) Node IP address:** Enter **the** Voice LAN (TLAN) Node IP address in dotted decimal format. The Voice LAN Node IP address is on the TLAN. The Node IP address is the IP address used by the Internet Telephones to communicate with the Voice Gateway Media Cards on the TLAN. If a Voice Gateway Media Card becomes the primary (Leader) during an election, it assigns itself the Node IP address.

Note: A green asterisk (*) indicates that a field is a required / mandatory field.

c. **Management LAN (ELAN) gateway IP address:** Enter the Management LAN (ELAN) gateway IP address in dotted decimal format. This is the IP address of the gateway of the subnet to which the Voice Gateway Media Card belongs. Also, this is the IP address of the router interface on the ELAN, if present. If there is no Management LAN gateway, enter 0.0.0.0.

d. **Management LAN (ELAN) subnet mask:** Enter the Management LAN subnet mask address in dotted decimal format. This is the subnet mask that is used along with the ELAN IP address to identify to which subnet the Voice Gateway Media Card belongs.

e.   **Voice LAN (TLAN) subnet mask:** Enter **the** Voice LAN subnet mask address in dotted decimal format. This is the subnet mask that is used along with the TLAN IP address, to identify the subnet to which the Voice Gateway Media Card belongs.

Note: Do not click Submit until all the node information has been entered. If the Submit button is clicked prematurely, the Node Summary page reappears. To continue the configuration, click the Edit button to return to the Node Edit page.

─────────────── **End of Procedure** ───────────────

Configure SNMP traps and community name access for security

Procedure 31 on explains how to change the SNMP community names and to set SNMP traps.

The SNMP community names provide better security for the IP Telephony node. Element Manager uses the community name password to refresh the Voice Gateway Media Card status, and to control the transmitting and retrieving of configuration data files for database synchronization.

Note: If the community names are forgotten, connect a TTY to the Voice Gateway Media Card maintenance port. Restart the card. The card displays the community name on the TTY during startup.

To configure the SNMP traps and community names, follow the steps in Procedure 31 on .

Procedure 31
Configuring SNMP traps

1 On the Edit page, click **SNMP.** See Figure 64 on .

Figure 64
Configuration > Node Summary > Edit > SNMP

2 Make the following selections.

a. **Read only community name:** Leave the default selection.

b. **Read/write community name:** Leave the default selection.

c. **Enable SNMP traps:** Check the Enable SNMP traps checkbox, if configuring one or more SNMP management IP addresses to receive SNMP traps from cards in the IP Telephony node.

d. **IP address:** If SNMP traps are enabled, the SNMP traps are sent to the IP address entered here.

e. **Subnet mask:** If SNMP traps are enabled, this is the subnet mask of the location where SNMP traps are sent.

IP addresses that are added here create special card routing tables that direct packets out of the ELAN and ELAN gateway. Exercise caution when adding entries since the entry could result in one-way voice transmission if a change results in voice packets being streamed out the ELAN instead of the TLAN interface.

To add an SNMP Manager IP address, click the **Add** button, and then type the IP address in the SNMP traps entry fields. Add SNMP Manager IP addresses for:

- the local or remote OTM server

- PPP IP address configured in the Netgear RM356 Modem Router, or equivalent, on the ELAN for the remote support OTM PC

- the SNMP manager for remote alarm monitoring

Note 1: Up to eight SNMP trap servers can be defined.

Note 2: A net route or host route through the Management (ELAN) gateway is added to the Voice Gateway Media Cards IP Routing Table for each SNMP management address that is added to the SNMP traps list.

Note 3: Element Manager does not provide an SNMP alarm browser. If SNMP alarm collection is required, the OTM Alarm Manager is recommended.

Note 4: To remove an SNMP trap server, click the corresponding **Remove** button.

―――――――――――――――― **End of Procedure** ――――――――――――――

Configure Voice Gateway Profile data

Procedure 32
Configuring DSP Profile data

1   On the Edit page, click **VGW Profile**. The VGW Profile page opens.
See Figure 65. The VGW Profile area includes VGW Profile information
and a list of Codecs.

Figure 65
Configuration > Node Summary > Edit > VGW Profile

2   Under **VGW Profile** leave the values at their default settings unless directed to change them by Nortel Networks Field Support.

a.   **Enable Echo canceller:** The echo canceller is enabled by default. Do not uncheck this box. Never disable echo canceller unless directed by Nortel Networks Field Support.

b.   **Echo canceller tail delay:** Select the maximum value available. The default value is 128ms. Never reduce the echo canceller value unless directed by Nortel Networks Field Support.

c.   **Voice activity detection threshold:** The default value is –17db. The range is –20db to +10db.

d.   **Idle noise level:** The default value is –65db. The range is –327db to +327db.

e.   **DTMF Tone detection:** Ensure this is checked to enable DTMF tone detection. This is enabled by default.

f.   **Enable V.21 FAX tone detection:** Ensure this is checked to enable V.21 FAX tone detection. This is enabled by default.

g.   **FAX maximum rate:** The FAX maximum rate is one of the following values: 2400, 4800, 7200, 9600, 12000, or 14400. The default value is 14400 bps.

h.   **FAX playout nominal delay:** The default value is 100 ms. The range is 0ms to 300ms.

i.   **FAX no activity timeout:** The default value is 20 secs. The range is 10secs to 32000 secs.

j.   **FAX packet size:** Select the packet size. The default value is 30 bytes. The range is 20 to 48 bytes.

To select a Codec, scroll through the list, and click the corresponding **Select** check box. See Figure 66 for Codecs samples. A maximum of four Codecs can be selected.

Recommendation

Nortel Networks recommends that the system be configured with both G.711 and G.729A if there is a possibility that i2050 Software Phones could be configured with the "I use a modem to connect to the network" checkbox checked. If the node does not have G.729A and/or G.723 configured, i2050 Software Phone users with that checkbox checked will have calls blocked.

For more information, refer to *Internet Terminals: Description* (553-3001-368) in the "Select Sound Devices tab" section.

Figure 66
Codec list

Note: The Codec list contains six Codec settings for G.711, G.729A, G.729AB, C.723.1, G711 Clear Channel, and T.38 FAX for the Voice Gateway Media Card.

3 The G.711, G711 Clear Channel, and T.38 FAX Codecs are selected by default and these selections cannot be cleared. However, the following changes can be made:

- The payload size, jitter buffer setting, and companding law for the G.711 Codec can be changed. The default is G.711 mu-law.

- Only the jitter buffer can be changed for the G.711 Clear Channel Codec.

   Up to three additional Codecs can be optionally selected. The user can select the G.729A, G.729AB, and/or G.723.1 Codecs.

- If the G.729A or G.729AB Codec are selected, the payload and jitter buffer can be changed. The payload defaults are the maximum supported payload.

- If the G.723.1 Codec is selected, only the jitter buffer can be changed. The payload size of 30 msec is the only supported payload.

   Note: The supported G.723.1 Codec has bit rates of 5.3 Kbps and 6.3 Kbps.

4 Expand the selected **Codec.** See Figure 67 on .

Figure 67
Selected Codec

Element Manager performs some jitter buffer adjustments on the browser side. The following are the jitter buffer adjustment that are made in Element Manager:

- A change of payload resets the Nominal Voice Playout (NVP) and Maximum Voice Playout (MVP) values to the default recommended values:

NVP = 2 * payload
MVP = NVP + 2 * payload

- A change of NVP value changes the MVP value to the default (MVP = NVP + 2 * payload) and changes the values listed in the MVP pull down list so the minimum value listed does not violate the requirement of NVP + 2 * payload.

- The MVP value can be changed by the user. The pulldown values range from the minimum recommended value (see above) up to the maximum allowed value for the selected Codec type.

5   Set the following values for the Codec:

a.   **Codec Name:** The Codec name is based on the selected Codec.

b.   **Voice payload size (msecs/frame):** The payload size is determined by the selected Codec.

For each Codec type, the payload is defaulted to the maximum supported: 30 msec for G.711 (a-law and mu-law), 50 msec for G.729A, 50 msec for G.729AB, and 30 msec for the G.723.1.

Note: If there are multiple nodes on a system and the same Codec is selected on more than one node, ensure that each node has the same voice payload size configured for the Codec.

c.   **Voice playout (jitter buffer) nominal delay:** Set the nominal value to the highest setting that the device allows. The range is 20–200 ms and is dependent on the Codec. Changing this value can cause the automatic adjustment of the other settings for this Codec. For more information, see *Data Networking for Voice over IP* (553-3001-160)."

d.   **Voice playout (jitter buffer) maximum delay:** The maximum delay has a range of 60–500 ms and is dependent on the Codec. Changing this value, can cause the automatic adjustment of the other settings for this Codec.

e.   **VAD:** Check the VAD check box to enable Voice Activity Detection.

6   Repeat the last step for each of the selected Codecs.

———————————————— **End of Procedure** ————————————————

Configure Quality of Service

The Quality of Service (QoS) section includes the settings for the following:

- DiffServ CodePoint (DSCP)

- 802.1Q support

- NAT support

Follow the steps in Procedure 33 to configure QoS.

Procedure 33
Configuring QoS

1   Click **QoS.** See Figure 68.

Figure 68
Configuration > Node Summary > Edit > Qos

2   The Differentiated Service (DiffServ) CodePoint (DSCP) determines the priorities of the management and voice packets in the IP Line network. The range for both management and voice packet DiffServ is 0 – 63 inclusive.

The DiffServ value can be configured, if required, to obtain better QoS over the IP data network (LAN/WAN).

The value entered depends on the policy in the customer's data network.

Note: Do not change DiffServ from the default values unless instructed by the IP network administrator.

Under **QoS**, only modify the Control priority and Voice priority values as and when directed by the IP network administrator.

The recommended configuration values are as follows:

a. **Diffserv CodePoint (DSCP) Control packets:** A value of 40 - Class Selector 5 (CS5). The range is 0 – 63. This sets the priority of the signaling messaging.

b. **Diffserv CodePoint (DSCP) Voice packets:** A value of 46 Control DSCP - Expedited Forwarding (EF). The range is 0 – 63.

3 802.1Q enables Virtual LANs (VLANs) to be defined within a single LAN. This improves bandwidth management and limits the impact of broadcast storms and multicast messages.

a. **Enable 802.1Q support:** 802.1Q support is disabled by default.

b. **802.1Q Bits value (802.1p):** The priority field is a 3-bit value, with a default value of 6. The range is 0 – 7. A value of 6 is recommended by Nortel Networks. The p bits within the 802.1Q standard enables packet prioritization at Layer 2 improving network throughput for IP Telephony data.

4 NAT provides mapping of public to private addressing. Support for networks containing NAT devices has been enhanced with the addition of a periodic message that is sent to prevent the RTP packet stream's NAT session from timing out. This can occur when the Internet Telephone is muted or on hold, and packet transmission is stopped.

a. **Enable NAT support:** Click this check box to enable the periodic sending of the session Keep Alive message. By default, this is disabled and the message is not sent.

b. **Keepalive message interval:** The field defines the delay between transmissions of the dummy message. The default value is 90 seconds. The range is 10 – 3600 seconds. Set this value to a value that is shorter than the NAT device's session timeout value.

———————— **End of Procedure** ————————

Configure ELAN IP address (Active ELNK), TLAN voice port, and routes (Small Systems and Succession 1000 only)

The LAN configuration section is used for configuring the Call Server ELAN IP address (Active ELNK), TLAN voice port, and routes.

This information is applicable only to Small Systems.

Procedure 34
Configuring the Call Server ELAN IP address (Active ELNK), TLAN voice port, and routes on a Small System

1   Click **LAN Configuration.** See Figure 69.

Figure 69
Configuration > Node Summary > Edit > LAN configuration

2 Enter the following **Management LAN (ELAN) configuration** settings:

a. Call Server IP address: This is the IP address of the Call Server on the ELAN. Enter the Call Server ELAN IP Address (Active ELNK).

Note: The Call Server ELAN IP address must correspond to the Active ELNK IP address configured in LD 117. It must be in the same subnet as the ELAN for the IP Line node.

b. Survivable Succession Media Gateway IP address: This address is configured for survivability. It is the IP address of the Survivable Succession 1000 Media Gateway on the ELAN.

Note 1: The Survivable Succession 1000 Media Gateway IP address must correspond to the Active ELNK IP address. If configured, all Voice Gateway Media Cards in the same node should be in the same Survivable Cabinet.

Note 2: The Survivable Media Gateway associated with the Primary Succession Signaling Server IP Telephony node is called the Alternate Call Server. It is normally located in the same equipment rack with the Call Server and Succession Signaling Server, therefore it is normally connected to the same ELAN subnet as the Call Server and the Primary Succession Signaling Server IP Telephony node. The Alternate Call Server Media Gateway should be equipped with sufficient trunk cards, Voice Gateway Media Cards, and centralized Call Pilot, so that it provides a large degree of survivability in case of Call Server equipment failure for Internet Telephone users who normally register through the Succession Signaling Server.

Refer to *Succession 1000 System: Planning and Engineering* (553-3031-120) and *Succession 1000 System: Installation and Configuration* (553-3031-210) for more information about survivability.

c. Signaling port: The default value is 15000. The range is 1024 to 65535.

d. Broadcast port: The default value is 15001. The range is 1024 to 65535.

3   Under **Voice LAN (TLAN) configuration**:

   a.   **Signaling port:** The default value is 5000. The range is 1024 to 65535. The TLAN Signaling occurs on UDP ports 7300, 4100, 5100, and 5000.

   b.   **Voice port:** Change the Voice port only as instructed by the IP network administrator to improve QoS for the Internet Telephones. For example, if RTP Header compression is used to reduce voice bandwidth on narrow band WAN links, then the TLAN voice port range needs to be set to 16384 or higher. The exact range is provided by the system administrator. The TLAN Voice port range is 1024 to 65535. The default Voice ports are 5200 – 5295.

CAUTION

Do not set the Voice port to a value that is already used for signaling (4100, 5000, 5100, 7300).

The Voice port defines the first port in a range spanning the gateway channels on the card; this means a Voice port value of 5200 reserves the following:

- ports 5200 – 5263 on the Succession Media Card 32-port line card

- ports 5200 – 5215 on the Succession Media Card 8-port line card

- and 5200 – 5247 on the ITG-P 24-port line card.

If this value is changed from the default, verify that the selected Voice port value does not intrude into one of the reserved signaling port values.

---

4   Click the **Add** button to the right of **Routes** if entries must be made to the card routing table. See Figure 70 on . The Routes fields expand.

Figure 70
Routes

Under **Routes**, enter the **IP address** and **Subnet mask** for any host that is not on the ELAN subnet but requires access to the Voice Gateway Media Card across the ELAN. A Telnet session for maintenance from a remote PC is an example of when this would be needed. The address of the remote PC would be added in the Route list.

The default route on the card causes packets destined for unknown subnets to be sent out the TLAN interface. Packets from an external host arrive on the ELAN interface and responses are sent on the TLAN interface. This can cause one-way communication if the TLAN is not routed to the ELAN. It is necessary to add an entry in the Route list to correct the routing so that response packets are sent on the ELAN. Each entry creates a route entry in the card's route table that directs packets out the ELAN interface. See Figure 71 on .

CAUTION

Use caution when assigning card routing table entries. Do not include the IP address of an Internet Telephone. Otherwise, voice traffic to these Internet Telephones is incorrectly routed through the ELAN and ELAN gateway. To avoid including the wrong IP address, Nortel Networks recommends that Host IDs are defined for the card routing table entries.

5   To add additional routes, click the **Add** button again and enter the route
information. Repeat this step for each route to be added.

Figure 71
Specifying additional ELAN routes

ELAN route +
additional routes

TLAN route /
default route

ELAN

TLAN

Meridian 1,
Succession 1000M,
or Succession 1000

SOME OTHER
LAN

Management
workstation

In this diagram, an additional ELAN route is required to
reach the management workstation, which is accessible
through the ELAN interface but is not on the ELAN subnet.

553-CSE0141
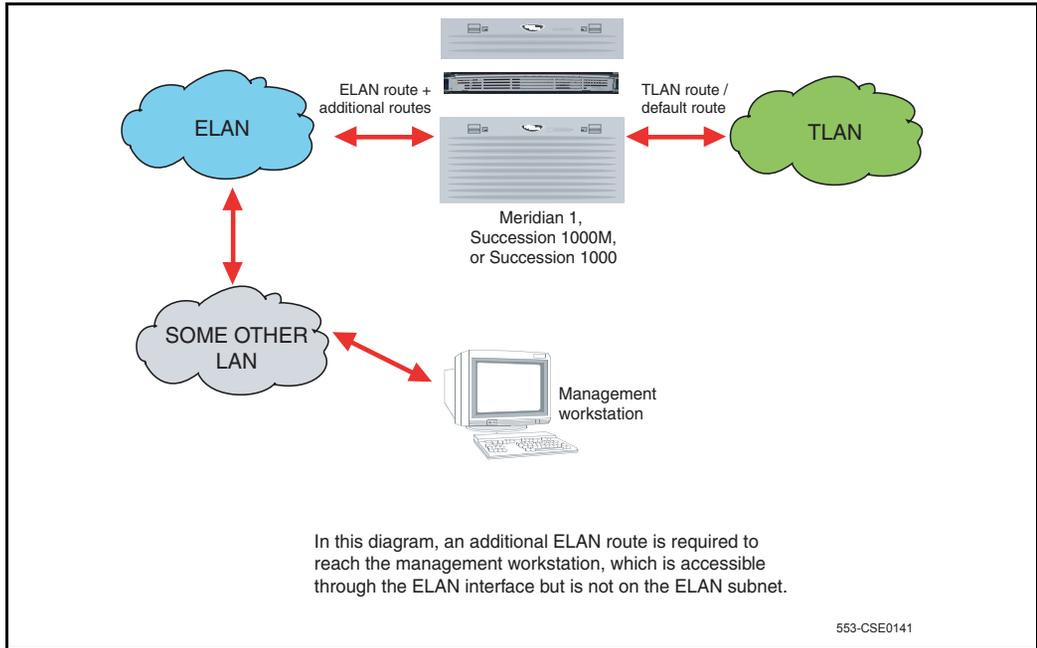
—— **End of Procedure** ——

Configure file server access

With the addition of more Internet Telephones, there are also additional firmware files for the Internet Telephones. The Voice Gateway Media Card has limited space to store the files on the card for all the telephones. As a result, a file server is used to store the telephone firmware files. For more information, see "Internet Telephone firmware" on

The Internet Telephone firmware files are labeled as follows:

- 0602Bnn.BIN is the filename for the i2004 Internet Telephone firmware where Bnn = F/W version 1.nn.

- 0603Bnn.BIN is the filename for the i2002 Internet Telephone firmware where Bnn = F/W version 1.nn.

If the external file server option is used in Element Manager for firmware distribution with a node, the files must be renamed before being placed on the server:

- 0602Bnn.BIN must be renamed to i2004.fw

- 0603Bnn.BIN must be renamed to i2002.fw

To configure the file server, follow the steps in Procedure 35 on .

Procedure 35
Configuring access to the file server

1   Click **Firmware.** See Figure 72.

Figure 72
Configuration > Node Summary > Edit > Firmware

2   Specify the parameters needed to connect to the file server:

    a.   **Firmware download server IP address:** Enter the IP address of the file server to where the firmware is to be downloaded.

    b.   **Firmware file path:** Enter the path for the location of the firmware files. See page 102 for the default location of firmware files for the Succession 1000M and Succession 1000 system.

    c.   **User ID:** Enter the User ID that is required to access the file server.

    d.   **Password:** Enter the Password that is required to access the file server.

—————————— **End of Procedure** ——————————

Configure loss and level plan

The loss and level plan determines parameters, such as transmission gain, that vary from country to country.

Dynamic Loss Plan

A Dynamic Loss Plan has been implemented to define the gateway loss value per endpoint connection type. The loss plan adjusts the Voice Gateway Media Card gateway channel's loss for each call by sending pad values to the card. Loss plan values are now configured through LD 73.

Default values

The default values in the system are for the North American loss plan.

Non-North American countries

Installation of IP Line 3.1 in any other country requires setting the pad values in Table 15 to that country's loss plan. If the system is installed in other countries, the GPRI package (International 1.5/2.0 Mb/s Gateway package 167) must be used, and the NTP-specified values must be entered in LD 73. At the PDCA prompt, enter Table 15.

See the section on Transmission Parameters in *Succession 1000 System: Planning and Engineering* (553-3031-120) for details.

United Kingdom

In addition, when a system is installed in the UK, the CLI command **UKLossPlanSet** is entered at the CLI of one card in each node. This adjusts the loss plan of the Internet Telephones to the higher transmit levels required in the UK. Follow the steps in x to set the loss plan for the UK.

Procedure 36
Setting the loss plan for the UK

1   Telnet to the card, connect to the maintenance port, or use OTM 2.1 or Element Manager to access the Voice Gateway Media Card.

2   Log into the IPL> shell.

3   At the IPL > CLI, enter the command **UKLossPlanSet**. Press <cr>.

4   Exit from the login session.

——————————— **End of Procedure** ———————————

After the UKLossPlanSet command is entered, the loss plan adjustment is transmitted by that card to all other cards in the node. The loss plan is then adjusted on any registered Internet Telephones, and on other Internet Telephones as they register.

To clear the loss plan adjustment, use the command **UKLossPlanClr.**

Refer to "Internet Telephone Loss Plan (UK)" on for more information on these and other loss plan commands.

Configure the card properties of the Voice Gateway Media Card

If the Network Administrator provides IP addresses and subnet masks in CIDR format, for example, "10.1.1.10/24", convert the subnet mask to dotted decimal format. See Appendix D on .

Note: In the Cards section, cards can be added, changed, or removed in the node one at a time.

> **WARNING**
> Every node must has a Leader. Exercise caution when removing the Leader card. If the Leader card is deleted, a new Leader must be configured immediately.

Procedure 37
Configuring Voice Gateway Media Card properties

1   Click **Cards** and then click the **Add** button. See Figure 73 on .

Figure 73
Configuration > Node Summary > Edit > Cards

2   Enter the **Card Properties** data for Leader 0 and Follower cards. The fields with green asterisks are required fields:

a.   **Role:** The role is assigned based on the information that Element Manager reads from the card configuration. This is a read-only field.

b.   **Management LAN (ELAN) IP address:** This is the ELAN IP address for the card. Element Manager and the system use this address to communicate with the card.

c.   **Management LAN (ELAN) MAC address:** This is the motherboard Ethernet address from the "Voice Gateway Media Card installation summary sheet" on .

      d. **Voice LAN (TLAN) IP address:** This is the TLAN IP address for the card.

      e. **Voice LAN (TLAN) gateway IP address:** This is the IP address of the router interface on the TLAN.

      f. **Card TN:** Enter the card slot number between 1 – 50.

      g. **Card processor type:** Choose either Pentium or Succession Media Card. Select Pentium if using the ITG-P 24-port line card (dual-slot card). Select Succession Media Card if using the Succession Media Card 32-port or 8-port line card (single-slot card).

      h. **H323 ID:** The H323 ID within IP Line 3.1 is for the Virtual Office/Branch Office feature. Keep the H323 ID the same for all the elements within one node.

      i. **System name:** Enter the name of the system.

      j. **System location:** Enter the location where the system resides.

      k. **System contact:** Enter a contact name and telephone number.

3   To add additional cards to the node, click the **Add** button again and enter the new card information. Repeat this step for each card that is being added to the node.

4   New cards appear under the Cards menu as they are added. See Figure 74 on .

Figure 74
Cards added to the system

———————————————————— **End of Procedure** ————————————————————

Submit and transfer the node information

To submit node changes and transfer the changes to the Call Server, follow the steps in Procedure 38 on .

Procedure 38
Submitting and transferring the node information

1 Click the **Save and Transfer** button when all the node information has been configured in the Edit page. Clicking the **Save and Transfer** button saves and transfers the data to the Call Server.

The Edit page closes, and the Node Summary page opens with the new node added. See Figure 75 on .

Note 1: The Save and Transfer button can be clicked after each section is configured in the Edit page. However, each time the Save and Transfer button is clicked, the Edit page closes and the Node Summary page is displayed. To continue the node configuration, click the Edit button to return to the Edit page.

Note 2: If the Cancel button is clicked, all information that has been configured is discarded. The Edit page closes and the Node Summary page opens.

Figure 75
Node added to Node Summary page
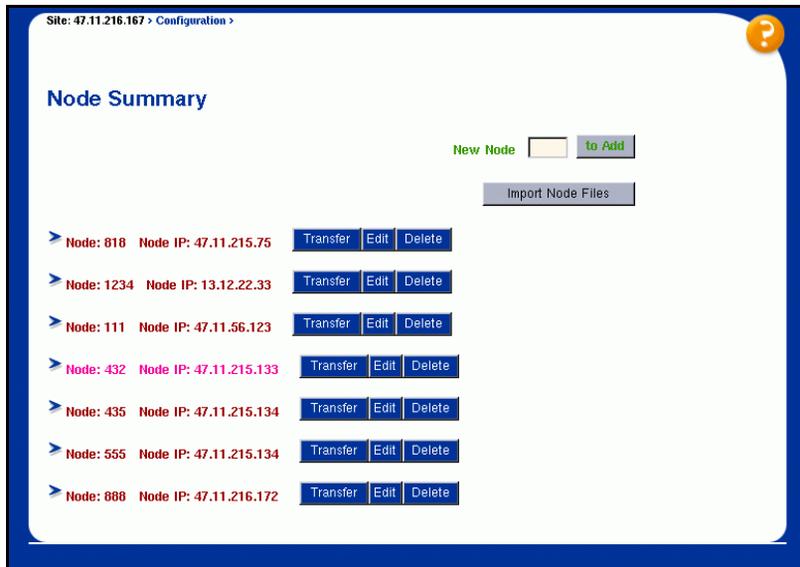
2   Click the **Transfer** button for the node.

3   Click **OK** to confirm the transfer. See Figure 76 on .

Figure 76
Transfer confirmation dialog box

4   After a few seconds, the **Transfer Progress** page opens and displays each of the Voice Gateway Media Cards in the node. See Figure 77 on .

The Voice Gateway Media Cards retrieve the CONFIG.INI and BOOTP.TAB files from the Call Server. A check mark is added to each field as the card receives its CONFIG.INI and BOOTP.TAB files. When the transfer is complete, click **OK** in the Progress Check Complete dialog box.

- If the transfer is successful for a card, the Status column displays "Complete".

- If the transfer is unsuccessful, the Status column displays "Fail".

Figure 77
Transfer Progress page
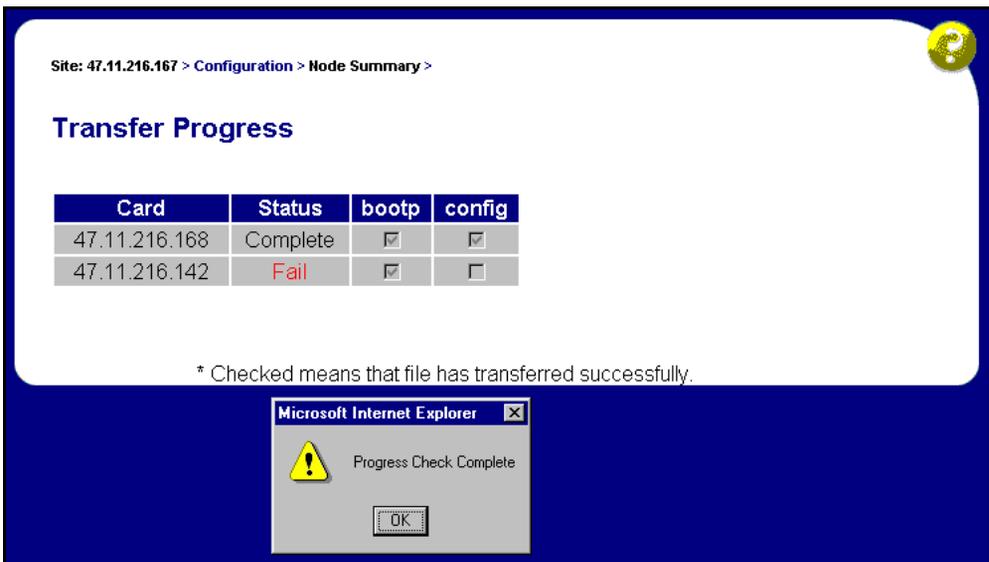
Figure 78
Transfer Successful message box

—————————————— **End of Procedure** ——————————————

Transfer node configuration from Element Manager to the Voice Gateway Media Cards

Before beginning, ensure the following:

- The Voice Gateway Media Cards and cables have been installed.

- The ELAN and TLAN interfaces of all cards have access to the IP network.

- To enable access to Element Manager through a web browser, a network PC must be able to access the node's Succession Signaling Server, either directly or remotely.

The IP Telephony node and card properties are configured using Element Manager. The configuration data is saved to the Call Server and then transferred to the Voice Gateway Media Cards.

Saving the configuration

The configuration data is saved when the **Submit** button on the Edit page is clicked. Submitting saves the files to the Call Server. After the data has been saved, the configuration must be transferred to the Voice Gateway Media Card. When the Transfer button on the Node Summary page is clicked, Element Manager instructs each card from where to retrieve the files using FTP. The Voice Gateway Media Card then retrieves the CONFIG.INI and BOOTP.TAB files.

Transferring the configuration - main node

For a Succession Signaling Server node, the process to transfer the node configuration to the cards consists of the following steps:

1 Transmit the node properties. See Procedure 40 on page 297.

2 Configure the Follower card. See Procedure 41 on page 300.

Note: The following sequence of steps are applicable only to nodes that do not use the Succession Signaling Server as the Leader card; that is, a second (or subsequent) node is being configured on the system – not the main node. The Succession Signaling Server must be properly configured to use Element Manager, so that the steps of setting and rebooting the Leader are not needed. The Succession Signaling Server

requires a reboot only if the Succession Signaling Server IP address information has been changed, such as the node IP address or Succession Signaling Server TLAN IP address. The Voice Gateway Media Cards require a reboot only if the card IP address information has been changed.

Transferring the configuration - second node

For a second (or subsequent) node, the process to transfer the node configuration to the cards consists of the following steps:

1   Set the Leader IP address. See Procedure 39 on .

2   Transmit the node properties. Procedure 40 on .

3   Configure the Follower card. See Procedure 41 on .

Setting the Leader IP address

Follow the steps in Procedure 39 to set the IP address of the Leader Voice Gateway Media Card.

Procedure 39
Setting the Leader IP address for a second or subsequent node

1   Access the IPL> CLI by connecting the COM port of a PC to the RS-232 serial maintenance port on the faceplate of the Leader Voice Gateway Media Card with an NTAG81CA PC Maintenance cable.
If required, use an NTAG81BA Maintenance Extender cable between the PC Maintenance cable and the PC.

Alternatively, connect the NTAG81BA Maintenance Extender cable to the female DB-9 connector of the NTMF94EA ELAN, TLAN RS-232 Ports cable for a more permanent connection to the Voice Gateway Media Card serial maintenance port.

Note: Never connect two terminals to the faceplate and I/O panel breakout cable serial maintenance port connectors at the same time.

2   Use the following communication parameters for the TTY terminal
emulation on the PC:

- 9600 baud

- 8 bits

- no parity

- one stop bit

3   Observe the Leader card faceplate maintenance display window.

When the display reads "T:20", the card begins to send BootP requests
on the ELAN. A series of dots is printed on the TTY.

4   Type **+++** to escape from the BootP request.

5   At the Login prompt, enter the user ID and password to access the
IPL> CLI:

- If the card is a new card (out of the box), then the user ID is **itgadmin**
and the password is **itgadmin**.

- If the card has been previously connected to the Call Server, then the
user ID and password are the PWD1 of the Call Server.

- If the user ID and password are forgotten, see Procedure 53 on
page 360 to reset the IPL> CLI Shell username and password.

6   When the maintenance window displays "T:21", login to the IPL> CLI.
At the IPL> prompt, enter the setLeader command to set the Leader
Management LAN IP address, Management LAN gateway IP address
and the Management LAN subnet mask:

setLeader "xx.xx.xx.xx","yy.yy.yy.yy","zz.zz.zz.zz"

Note 1: The three parameters must each be enclosed in double quotation marks. There must be a space after the command and before the first parameter. Put commas and no spaces between the following parameters:

"xx.xx.xx.xx" = IP address.
Enter the same IP address that was entered in the **Management LAN IP address** field for **Leader** in the **Cards** menu of the **Edit** page.

"yy.yy.yy.yy" = Gateway IP address.
Enter the same IP address that was entered in the **Management LAN gateway IP address** field in the **Node** menu of the **Edit** page. If there is none, enter the following: "**0.0.0.0**"

"zz.zz.zz.zz" = Management LAN subnet mask.
Enter the same address that was entered in the **Management LAN subnet mask** field **Node** menu of the **Edit** page.

Note 2: This step assumes that the new IP Telephony node has already been configured in Element Manager.

7   Reboot the Leader Voice Gateway Media Card. At the IPL> prompt, enter: **cardReset**, or press the Reset button on the faceplate of the Leader Voice Gateway Media Card.

⚠	**WARNING** Do not use a pencil to reset the Voice Gateway Media Card. The graphite carbon can create an electrical short circuit on the board.

---

8   Check the maintenance display for T:22 to confirm a successful reboot.

9   In Element Manager, click **System Status > IP Telephony**. The **IP Telephony Information** pages opens. Expand the node. Click the Leader card's **Status** button to check the status of the card. Otherwise, verify LAN connections and IP configuration.

————————— **End of Procedure** —————————

Transmit node properties

To transmit the node properties to the Leader, follow the steps in
Procedure 40.

Procedure 40
**Transmitting node properties to Leader**

1   If changes are made to the node or card configuration data, ensure the
     data is saved to the Call Server by clicking the **Submit** button. A
     confirmation dialog box appears. See Figure 79.

Figure 79
Confirm Submit
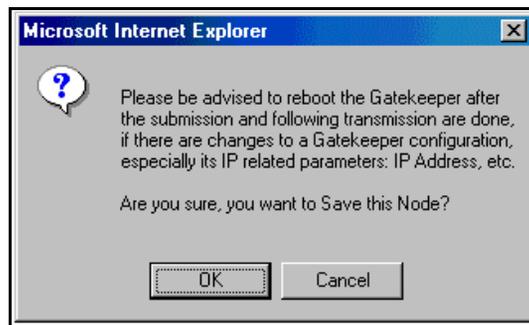
2   Click **OK** to confirm the save of the node data.

3   The Edit page closes, and the Node Summary page opens. In the Node
     Summary page, click the **Transfer** button associated with the node. See
     Figure 80 on .

Figure 80
Transfer Node
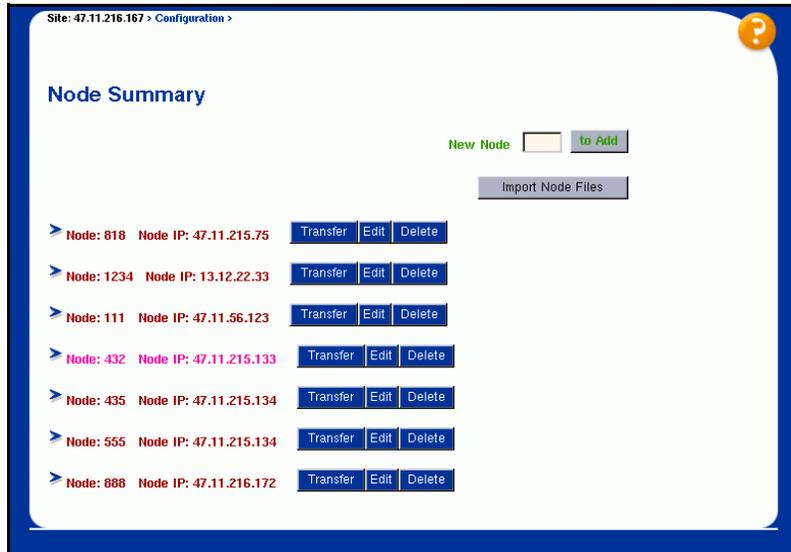
4   Click **OK** to confirm the transfer. See Figure 81.

Figure 81
Transfer confirmation dialog box
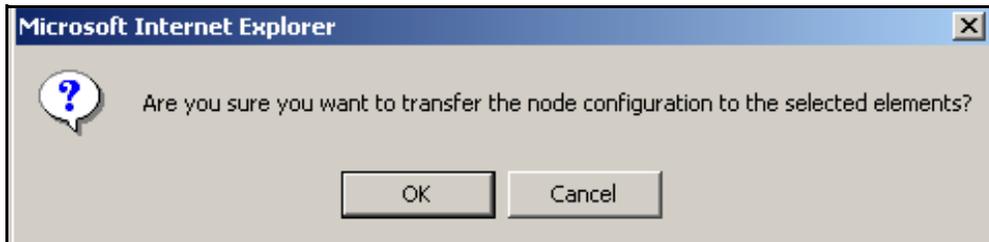
5   Element Manager notifies the Leader and the Voice Gateway Media
     Cards which then retrieve the CONFIG.INI and BOOTP.TAB files from the
     Call Server.

     The **Transfer Progress** page opens and displays each of the Voice
     Gateway Media Cards in the node. The Voice Gateway Media Cards
     retrieve the CONFIG.INI and BOOTP.TAB files from the Call Server.
     When the transfer is complete, click **OK** (see Figure 77 on page 291) in
     the Progress Check Complete dialog box. If the transfer is successful for
     a card, the Status column displays "Complete." If the transfer is
     unsuccessful, the Status column displays "Fail."

6   The Leader card must be reset in the following situations:

     •   if the Leader card is a new card (out of the box)

     •   if the Leader card is a card that is being configured for the first time
          as a Leader card

     •   if the Leader card's IP address has changed

     In the Navigation Tree, click **System Status > IP Telephony**. The IP
     Telephony Information pages opens. Click the **Reset** button associated
     with the Leader card.

     Note 1: If any of the Succession Signaling Server IP address information
     is changed, the Succession Signaling Server must be rebooted.

     Note 2: Alternatively, restart the card by entering the **cardReset**
     command at the IPL> prompt or by pushing the Reset button on the card's
     faceplate.

WARNING
Do not use a pencil to reset the Voice Gateway Media
Card. The graphite carbon can create an electrical short
circuit on the board.

End of Procedure

Configure the Follower cards

To configure a Follower card, follow the steps in Procedure 41.

Procedure 41
Configuring the Follower cards

1   Check the displays on the card faceplate.

• After successfully rebooting, the Leader card is now fully configured with the Node Properties of the node. The card enters a state of "active Leader". The card faceplate display shows **Lxxx**, where xxx = the number of Internet Telephones registered with the TPS on the Leader card.
L000 shows that no Internet Telephones are registered.

• The Follower cards receive their BOOTP configuration information from the Leader card. The Follower card faceplate display shows **Fxxx**, where xxx = the number of Internet Telephones registered with the Follower card's TPS.
F000 shows that no Internet Telephones are registered.

2   Reboot the Follower card if the card's faceplate does not display FXXX or F000.

3   Once all the Follower cards have the correct display on their faceplates, go to Element Manager.

4   In the Node Summary page, click the **Transfer** button associated with the node. See Figure 80 on .

Figure 82
Transfer node information to the card
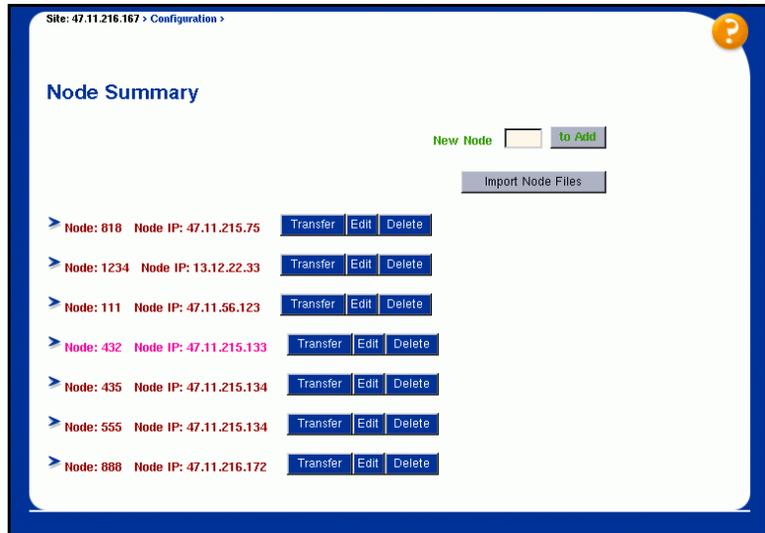
5   Click the **Transfer** button. Click **OK** to confirm the transfer. See Figure 81 on .

Figure 83
Transfer confirmation dialog box

6   The **Transfer Progress** page opens and displays each of the Voice Gateway Media Cards in the node. The Voice Gateway Media Cards retrieve the CONFIG.INI and BOOTP.TAB files from the Call Server. When the transfer is complete, click **OK** in the Progress Check Complete dialog box. See Figure 77 on . If the transfer is successful for a card, the Status column displays "Complete." If the transfer is unsuccessful, the Status column displays "Fail."

7   If the Follower card is a new card (never used before), then reboot the card.

──────────────── **End of Procedure** ────────────────

Upgrade the Voice Gateway Media Card software and Internet Telephone firmware

> **WARNING**
>
> Before beginning the upgrade, ensure that a PWD1 user name and password has been configured on the Call Server. If there is no PWD1 user name and password, configure them in LD 17. This is necessary to enable login to the Voice Gateway Media Cards and Succession Signaling Server.

Before beginning, ensure that the following software is installed on the PC:

- Software to extract zipped files (WinZip or equivalent)

- Microsoft Internet Explorer version 6.02 (or later). NetScape Navigator is not supported.

Upgrade procedure steps

The following steps are required to upgrade the Voice Gateway Media Card loadware and Internet Telephone firmware:

1   Determine the version of the software currently installed on the Voice Gateway Media Card. See Procedure 42 on page 306.

2   Determine the version of the Internet Telephone firmware that is currently running on the Voice Gateway Media Card. See Procedure 43 on page 309.

3   Download the most up-to-date version of the software and firmware files from the Nortel Networks web site. See Procedure 108 on page 649.

4   Upload the software and firmware files using the File Upload system utility in Element Manager. See Procedure 45 on page 314.

5   Upgrade the Voice Gateway Media Card software. See Procedure 46 on page 315.

6   Restart the Voice Gateway Media Card. See Procedure 47 on page 319.

7   Upgrade and distribute the Internet Telephones firmware on the Voice Gateway Media Card. See Procedure 48 on page 320.

Note: To upgrade the Voice Gateway Media Card firmware, see Procedure 49 on page 326.

Upgrade options

Once the Voice Gateway Media Card loadware and Internet Telephone firmware has been verified, there are three upgrade options:

1   Upgrade the Voice Gateway Media Card software only. It may only be necessary to upgrade the Voice Gateway Media Card software. This option is used most frequently; however, verify if an Internet Telephone firmware upgrade is also required.

2   Upgrade both the Voice Gateway Media Card software and the Internet Telephone firmware.

Note: Defer restarting the cards until the end of the firmware upgrade. If the Internet Telephones are registered to the Succession Signaling Server, rebooting the Voice Gateway Media Card does not affect the telephones as long as they are not using a gateway channel on the

rebooted card. However, if the Internet Telephones are registered to the Voice Gateway Media Card, resetting the card causes the Internet Telephone to reboot and reregister.

3   Upgrade only the Internet Telephone firmware.

Note: In this case, restart all the telephones instead of the Voice Gateway Media Cards. To do this, select a single test telephone and reset the firmware only on that test telephone before completing the procedure on all telephones. If the upgrade works properly, use the **umsUpgradeAll** command to complete the upgrade on all the Internet Telephones.

i2002 and i2004 Internet Telephone firmware requirements

The i2002 and i2004 Internet Telephone firmware can be upgraded in the field.

The file server can be a dedicated external file server, the Succession Signaling Server, or a Voice Gateway Media Card. If a file server is used to store the firmware file, the following items are required to access the firmware:

- IP address of the file server

- routing table

- file path to the file server

- user name and password required to access the file server

This information is configured in Element Manager under Firmware on the Edit page. See Figure 72 on page 284.

- For a node using the Succession Signaling Server as the Leader, no Firmware Server configuration is necessary since the files are stored on the Succession Signaling Server and by default, the files are retrieved from the Succession Signaling Server.

- For nodes that are not using the Succession Signaling Server as the Leader, configure the FTP access information for the Succession Signaling Server or some other server as the Firmware server.

TFTP

Internet Telephones use Trivial File Transfer Protocol (TFTP) to transfer the firmware; therefore, the customer's network must support TFTP. For example, the customer's network cannot have telephones on the other side of a firewall that blocks the TFTP port number.

Default location of firmware files

The default location of the firmware files is different depending on the system configuration, due to limitations of the various platforms:

- Succession Signaling Server:

    — The firmware file is stored on the Succession Signaling Server in the "/u/fw" directory.

- node using a Voice Gateway Media Card as the Leader card (the files can be located in any of the following locations):

    — The firmware files can be retrieved from the system's Succession Signaling Server.

    — If the Voice Gateway Media card is a Succession Media Card, the files are placed in the /C:/fw directory on the card.

    — If the Voice Gateway Media card is an ITG-P 24-port line card, the files attempt to store in the /C:/fw directory on the card. If there is not enough storage space, the files can be stored on a PC Card plugged into the card faceplate (/A: drive).

    — The files can be placed on an alternate file server.

Internet Telephone Firmware upgrade from a new Voice Gateway Media Card

Use Element Manager to upgrade the Internet Telephone firmware files to the new Voice Gateway Media Card. See Procedure 48 on .

Determine Voice Gateway Media Card software version

To determine the version of software on the Voice Gateway Media Card, follow the steps in Procedure 42 on page 306.

Procedure 42
Determining card software version

1   Click **Software Upgrade** from the Navigation Tree.

2   Click **IP Telephony(LW)** from the expanded Software Version menu. The **IP Telephony (LW) Upgrade** page appears. See Figure 84 on page 307.

Figure 84
IP Telephony (LW) Upgrade

IP Telephony (LW) Upgrade

Select Card(s)

| | Open all nodes | Close All nodes | Clear all | |

▼ Node ID: 541	Node IP: 47.11.151.145	Total elements: 2			
Index	**ELAN IP**	**TN**	**Type**	**Role**	
☐ ● 1	47.11.221.38	NO TN	Signaling Server	Leader	[LW Version]
☐ ● 2	47.11.221.48	10 0	Succession Media Card	Follower	[LW Version]

```
Click a button to invoke a command.
```

Select File

	File Name	Type	Create Time
○	IPL31010.P2	ITG Pentium	FRI JAN 17 01:19:40 2003
○	IPL31048.P2	ITG Pentium	THU APR 17 12:01:44 2003
○	IPL31055.P2	ITG Pentium	THU MAY 29 17:26:04 2003
○	IPL31059.P2	ITG Pentium	TUE JUN 03 09:25:48 2003
○	IPL31063.P2	ITG Pentium	TUE JUL 15 17:27:08 2003
○	IPL31070.P2	ITG Pentium	FRI AUG 08 14:13:34 2003
○	IPL31075.P2	ITG Pentium	TUE SEP 02 09:21:08 2003
○	IPL31010.SA	Succession Media Card	FRI JAN 17 01:19:46 2003
○	IPL31048.SA	Succession Media Card	THU APR 17 12:01:50 2003
○	IPL31055.SA	Succession Media Card	THU MAY 29 17:26:12 2003
○	IPL31059.SA	Succession Media Card	TUE JUN 03 09:25:54 2003
○	IPL31063.SA	Succession Media Card	TUE JUL 15 17:27:14 2003
○	IPL31070.SA	Succession Media Card	FRI AUG 08 14:13:40 2003
○	IPL31075.SA	Succession Media Card	TUE SEP 02 09:21:14 2003

Start   Loadware Upgrade

3   Expand a node and select a card in the node. See Figure 85 on .

Figure 85
LW Version window

4 Click the **LW Version** button located to the right of the card information.

The software version running on the card is displayed in the pane in the center of the IP Telephony (LW) page. See Figure 85 on . Note the software version for the card.

——————— **End of Procedure** ———————

Determine the Internet Telephone firmware version

To determine the version of firmware on the Voice Gateway Media Card, follow the steps in Procedure 43 on .

Procedure 43
Determining the Internet Telephone firmware version

1 Click **Software Upgrade** from the Navigation Tree.

2 Click **IP Telephony(FW)** from the expanded Software Version menu. The **IP Telephony (FW) Upgrade** page appears. See Figure 86 on .

At the top of the screen, there are two radio buttons:

   i. **Distribute to Nodes** – disables all elements that are not Leaders. Distribute to Nodes is the default since IP Line is responsible for distributing from the Leader to all Followers in a node.

   ii. **Distribute to Elements** – enables all the elements in case it is necessary to distribute the firmware to some elements which have failed.

Figure 86
IP Telephony (FW) Upgrade window

IP Telephony (FW) Upgrade

Distribute to Nodes ⊙	Distribute to Elements ○

Open all nodes	Close All nodes	Clear all

Select Card(s)

➤ Node ID: 541	Node IP: 47.11.151.145	Total elements: 2			

```
Click a button to invoke a command.
```

Select File

	File Name	Release	Version	Type	Create Time
○	0602B39.BIN	1	39	i2004	THU APR 17 12:01:42 2003
○	0602B44.BIN	1	44	i2004	THU MAY 29 17:25:58 2003
○	0602B50.BIN	1	50	i2004	TUE JUL 15 17:27:06 2003
○	0602B56.BIN	1	56	i2004	TUE SEP 02 09:21:06 2003
○	0603B39.BIN	1	39	i2002	THU APR 17 12:01:40 2003
○	0603B44.BIN	1	44	i2002	TUE JUL 15 17:27:04 2003
○	0603B56.BIN	1	56	i2002	TUE SEP 02 09:21:04 2003
No i200x Phase2 fw file					

Start	Firmware Distribute	

3   Expand a node and select a card. See Figure 87 on .

Figure 87
FWVersionShow button

4   Click the **fmVersionShow** button located to the right of the card information.

The firmware version running on the card is displayed in the pane in the center of the IP Telephony (FW) page.

5   Note the firmware version for the card.

———————————————— **End of Procedure** ————————————————

Download the current software and Internet Telephone firmware

To check for the latest software and Internet Telephone firmware releases on the Nortel Networks Customer Support web site, follow the steps in Procedure 44.

Procedure 44
Downloading loadware and firmware from the Nortel Networks web site

1   Check the Nortel Networks Customer Support web site for the latest IP Line 3.1 software and Internet Telephone firmware releases.

Note: The IP Line 3.1 software and Internet Telephone firmware files are contained in the **2.10.xx Signaling Server CD Image** file in the "**Succession 1000**" product list on the Nortel Networks web site. The file contains:

- The **IPL310xx.p2** and **IPL310xx.sa** software files. The IPL310xx.p2 file is the IP Line application for the ITG-P 24-port card and the IPL310xx.sa is the IP Line application for the Succession Media Card.

- The **0602Bxx.BIN** (i2004) and **0603Bxx.BIN** (i2002) firmware files.

  For example, a firmware version can be labelled 0602B38 or 0603B38. This means Internet Telephone firmware version 1.38.

  — The 02 represents the i2004 Internet Telephone and 03 is the i2002 Internet Telephone.

  — The letter B represents the Version number 1.

  — 38 represents the Release number .38.

- A **readme.txt** file. The readme.txt file explains important considerations for installing the new loadware and firmware versions. The readme file also includes identifying information for the loadware and firmware files such as the date and time, size and checksum.

2   Compare the latest software and firmware versions available to the loadware and firmware versions currently installed on the Voice Gateway Media Card and the Internet Telephones.

3   If more recent files are available, download the **2.10.xx Signaling Server CD Image** file. See Procedure 108 on for the steps for downloading files from the Nortel Networks web site.

———————————— **End of Procedure** ————————————

Upload the software and firmware files to the file server

The next step is to upload the files from the Element Manager PC to the file server. The "Centralized file upload" page enables software and firmware to be uploaded and stored on the Succession Signaling Server. These files can then be downloaded to the Internet Telephones and the Voice Gateway Media Cards using the firmware and software upgrade functions available from the Software Upgrade menu. The Succession Signaling Server can be used as a central distribution point to load and activate software, firmware and patches. To upload the files, follow the step in Procedure 45 on .

Note: For patches, Element Manager does not need to upload to Succession Signaling Server first. The Succession Signaling Server gets the patch file from the Element Manager PC directly.

Procedure 45
Uploading software and firmware files

1   Click **Software Upgrade** in the Navigation Tree.

2   Click **File Upload**. The **Centralized file upload** page opens. See Figure 88.

Figure 88
System Utility > File Upload > Centralized file upload

3   Click the **Browse** button. In the **Choose File** dialog box, select the path and file to upload. Alternatively, enter the path and filename for the file to be uploaded.

Note: Only one software or firmware file can be uploaded at a time.

4   Once selected, the path and file name appear in the text box to the left of the Browse button. See Figure 89 on .

Figure 89
Firmware file text box

D:\xiaoyi\fw\I2004.fw   Browse...

5   Click the **File Upload** button.

6   The firmware file appears in the list at the top of the page when they are uploaded.

Note: To delete older versions of the firmware and software files, click the check box associated with the older file and then click the **Delete** button located at the top of the column of check boxes.

———————————   **End of Procedure**   ———————————

Upgrade the Voice Gateway Media Card software

Once the files are uploaded to the file server, the cards must be upgraded to the newest software version. To upgrade the card software, follow the steps in Procedure 46.

Procedure 46
Upgrading the card software

1   Click **Software Upgrade** from the Navigation Tree.

2   Click **IP Telephony(LW)** from the expanded Software Version menu. The IP Telephony (LW) Upgrade page appears. See Figure 90 on .

Figure 90
IP Telephony(LW) Upgrade page

3   Expand a node.

4 Select the card(s) to upgrade by clicking the check box to the left of the card information.

Note: Element Manager supports upgrading the software on up to four cards at the same time.

5 In the lower part of the page, click the radio button of the most current version of the software.

Note: If the card receiving the upgrade is an ITG-P 24-port line card, select the radio button next to the most current version of the ITG-P 24-port line card software (IPL310xx.P2). If the card receiving the upgrade is a Succession Media Card, select the radio button next to the must current version of the Succession Media Card software (IPL310xx.SA).

6 Click the **Loadware Upgrade** button at the bottom of the page.

A confirmation dialog box appears similar to Figure 91 on . Click **OK** to confirm the card upgrade. The upgrade begins.

Figure 91
Loadware Upgrade confirmation dialog box
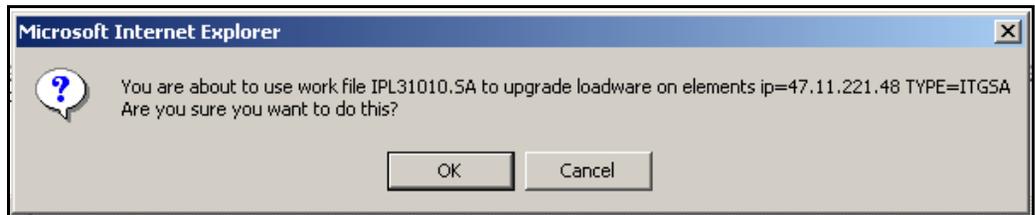
7 The **Loadware Upgrade Progress** pages appears. See Figure 92 on page 318. The status of the upgrade is shown for each of the cards selected to receive the software upgrade. This status of the upgrade can be Work in progress, Upgrading, Fail, or Finished. See Figure 92 on page 318 and Figure 93 on page 318.

Figure 92
Loadware Upgrade Progress – upgrade status
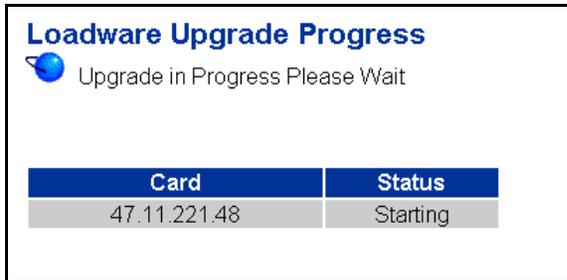
Figure 93
Loadware Upgrade Progress – completion status

8   Click **OK.**

9   Repeat steps 4-8 for the other card(s) that have to be upgraded.

———————————— **End of Procedure** ————————————

Reboot the Voice Gateway Media Card

Follow the steps in Procedure 47 to reboot a Voice Gateway Media Card.

Procedure 47
Rebooting the Voice Gateway Media Card

1   Disable the Voice Gateway Media Card.

2   Click **System Status** and then **IP Telephony**. The IP Telephony Information page opens. Expand the node containing the card to be rebooted.

3   Click the **Reset** button to reboot the card.

Note 1: The cards remain in the "Disabled" state after the upgrade, so a "Reset" command can be used. The cards can also be reset by using a pointed object to press the Reset button on the card's faceplate.

Note 2: Reboot the Leader card only if the node is using the Voice Gateway Media Card as the Leader; that is, the Succession Signaling Server is not the Leader.

4   Click the card's **Status** button in the IP Telephony Information page to verify the status of the Voice Gateway Media Card.

5   Use the LD 32 **ENLC** command to re-enable the Voice Gateway Media Cards.

6   Repeat these steps for each Voice Gateway Media Card that received the software upgrade.

———————— **End of Procedure** ————————

Upgrade the Internet Telephone firmware

When the IP Line 3.1 software has been upgraded on the Voice Gateway Media Cards, determine if an Internet Telephone firmware upgrade is also required. If an upgrade is required, the Voice Gateway Media Cards must be upgraded to the newest Internet Telephone firmware version. To upgrade the

firmware required for the Internet Telephones, follow the steps in Procedure 48 on page 320. This procedure has two major components:

- placing the Internet Telephone firmware onto each Voice Gateway Media Card in the node

- propagating the firmware from the Voice Gateway Media Card to each telephone registered on that card

   Note: A firmware download does not occur with Internet Telephones performing a Virtual Office login or Branch Office login to a remote system. No firmware upgrade takes place during a Virtual Office Login or a Branch User registration with the TPS. The registration is allowed since the Internet Telephone firmware version must be 1.33 or later to do a Virtual Office login or a Branch Office User registration.

   The **umsUpgradeAll** command has no impact on Virtual Office Login Internet Telephones. These Internet Telephones are not reset. If the Virtual Office Login is on the same Call Server, then the Internet Telephone firmware is upgraded after the user logs out. If the Virtual office Login is between different Call Servers, then the Internet Telephone just registers back to its home TPS and follows the normal firmware rules for regular registration.

   When the **umsUpgradeAll** command is executed, Branch User Internet Telephones that are on an active call are flagged. After the Internet Telephone becomes idle, the Internet Telephones are switched by the Call Server back to the Branch Office for the firmware upgrade .

Procedure 48
Upgrading the Internet Telephone firmware

1   Disable the Voice Gateway Media Cards before updating the firmware. Use the LD 32 DISI command to disable the card.

2   Verify that all Voice Gateway Media Cards that require a firmware upgrade have established a signaling link with the Call Server.

To verify the link is available between the Call Server and the card, Telnet to each card and log into the card. From the command line, type **pbxLinkShow**. The status of the Call Server link appears. If the link is active the page displays the following:

```
RUDPLinkState = Up
```

3   Click **Software Upgrade** on the Navigation Tree.

4   Click **IP Telephony(FW)** from the expanded Software Version menu. The IP Telephony (FW) Upgrade page opens. See Figure 94 on .

Figure 94
IP Telephony (FW) Upgrade page

5   Expand the node containing the cards that are to receive the Internet Telephone firmware upgrade.

6   Select the card(s) to upgrade by clicking the check box to the left of the card information.

Note: Element Manager can upgrade the firmware on a maximum of four cards at the same time.

7   In the lower part of the page, click the radio button next to the most current version of the firmware. Click the **Firmware Distribute** button. Complete this step for each version of the firmware that must be distributed.

> **CAUTION**
> Downloading an incorrect version of the Internet Telephone firmware can result in extended service interruptions and can require special recovery procedures.

8   A confirmation dialog box appears similar to Figure 95 on page 322.

Click **OK** to confirm the firmware upgrade to the card. The upgrade begins.

Figure 95
Firmware Upgrade confirmation dialog box
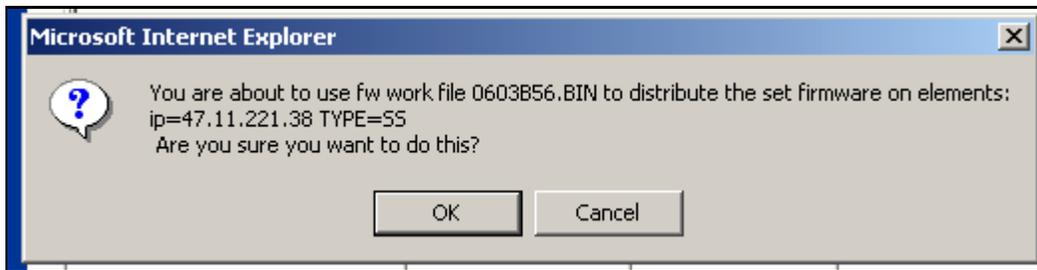
9   The **Firmware Upgrade Progress** page opens. See Figure 96 on page 323. The status of the upgrade is shown for each of the cards selected to receive the firmware upgrade.

Figure 96
Firmware Upgrade Progress

Site: 47.11.216.167 > Software Upgrade > IP Telephony (FW) Upgrade >

Firmware Upgrade Progress

Card	Status
47.11.216.135	Finished
47.11.216.168	Work in progress
47.11.216.142	Work in progress
47.11.216.194	Work in progress

10 Repeat the preceding steps for all the card(s) that have to be upgraded.

The Internet Telephones continue to run the old firmware until each telephone re-registers with a Voice Gateway Media Card that contains the new Internet Telephone firmware.

Note: Commands are available from the IPL> command line to upgrade a single Internet Telephone immediately, all Internet Telephones immediately, or schedule all Internet Telephones to be upgraded at a later time. Before doing this, verify that each Voice Gateway Media Card has the correct Internet Telephone firmware version.

11 Select an Internet Telephone for test purposes.

12 Telnet to the Voice Gateway Media Card and then log into the IPL> command line, and enter the following:

isetReset "xxx.xxx.xxx.xxx"

where xxx.xxx.xxx.xxx is the IP Address of the selected telephone.

13 Monitor the display on the test telephone. As the Internet Telephone upgrades the firmware, note the IP Address of the Voice Gateway Media Card from which the telephone is receiving its upgrade.

14 Press the **Services** key (key with globe with arrow pointing East and West on the i2002/i2004 Internet Telephone). The Services key enables access to the **Telephone Options** list.

a. Press **Select** to select Telephone Options.

b. Use the **Navigation** keys to scroll to **Set Info**.

c. Press the **Select** softkey, then press the **Navigation** keys until it displays **FW Version:**. Select the appropriate firmware on the Voice Gateway Media Card

Note: For example, a firmware version can be labelled 0602B38 or 0603B38, which means Internet Telephone firmware version 1.38.

- 02 represents the i2004 Internet Telephone and 03 represents the i2002 Internet Telephone.

- B represents the Version number 1.

- 38 represents the Release number .38.

15 Lift the handset of the Internet Telephone and make a call to verify the telephone works.

16 Before proceeding, ensure the time on the card is set correctly. Telnet to each Voice Gateway Media Card and log in. At the IPL> command line, enter the following:

    umsUpgradeAll "hh:mma/p"

hh:mma/p specifies the time when the upgrade will occur, **a** represents A.M., and **p** represents P.M. The time is in Standard format.

For example, umsUpgradeAll "11:30a" or umsUpgradeAll "2:45p".

At the time specified, all the Internet Telephones registered to the Voice Gateway Media Card go out of service. This can take several minutes.

Upon completion of the firmware upgrade, the Internet Telephones are brought back online in groups of ten.

CAUTION

If the **umsUpgradeAll** command is used without the time parameter, all i2002/i2004 Internet Telephones registered on cards that are logged into, are immediately taken out of service. Use the time parameter with the command to prevent this from happening.

After the test telephone is working, the **umsUpgradeAll** command does not require the time parameter. However, if the time parameter is not used, the command immediately resets all the Internet Telephones currently registered on that line card.

To schedule a specific reset time for the Internet Telephones, instead of resetting them immediately, check the time on all the cards. Reset the time, if necessary, to ensure all cards have the same time, and then issue the **umsUpgradeAll** "hh:mma/p", where "hh:mma/p" represents the time the upgrade is scheduled to occur.

17 At the IPL> prompt, verify the Internet Telephones for each Voice Gateway Media Card are upgraded by entering the following:

> **isetShow**

Inspect the list to ensure all Internet Telephones have the correct firmware version.

18 For any Internet Telephones that did not upgrade successfully, try one of the following (in order):

- Use the **isetReset "IP Address"** command.

- Enter the following combination of key strokes at the telephone console: **release**, **mute**, **up**, **down**, **up**, **down**, **up**, **mute**, **9**, **release**.

- Power the telephone off and then on again.

If the upgrade was unsuccessful on any of the Internet Telephones, the cause is probably due to one of the following:

- One of the Voice Gateway Media Cards did not upgrade its software successfully.

- An Internet Telephone's firmware version was unable to be upgraded by the Voice Gateway Media Card in the normal manner.

- The **umsUpgradeAll** command has not been issued.

- One of the cards might not have been reset.

  If the upgrade was unsuccessful, re-do the appropriate procedure. If the upgrade is still unsuccessful, contact a technical support representative for further assistance.

────────────── **End of Procedure** ──────────────

For additional information on configuring the i2002 and i2004 Internet Telephones and the i2050 Software Phone, see *Internet Terminals: Description* (553-3001-368).

Upgrade the Voice Gateway Media Card firmware

The minimum versions of the card firmware for the Voice Gateway Media Card are:

- Version 6.4 for the Succession Media Cards

- Version 5.7 for the ITG-P 24-port line card

To upgrade the card firmware, follow the steps in Procedure 49.

Procedure 49
Upgrading the Voice Gateway Media Card firmware

1   Check the Nortel Networks web site for the most current versions of the firmware for the ITG-P 24-port line card and Succession Media Cards. To download firmware files from Nortel Networks, follow the steps in Procedure 108 on .

2   Once the most current version of the firmware has been downloaded, follow the steps in:

- Procedure 87 on to upgrade the firmware on the ITG-P 24-port line card

- Procedure 88 on to upgrade the firmware on the Succession Media Cards

———————————— **End of Procedure** ————————————

Configure Alarm Management to receive IP Line SNMP traps

Alarm Management cannot be configured using Element Manager. OTM 2.1 must be used to configure the Alarm Management feature to receive IP Line SNMP traps. See Procedure 27 on page 244.

Assemble and install an Internet Telephone

To assemble and install an Internet Telephone, refer to *Internet Terminals: Description* (553-3001-368).

Change the default IPL> CLI Shell password

The IPL> Command Line Interface (CLI) is password-protected to control Telnet access and access to the local maintenance port. The same user name and password also controls FTP access to the Voice Gateway Media Card. The IPL> CLI has a default user name of **itgadmin** and a default password of **itgadmin**.

The default user name and password must be changed as a preventative security measure. See "IPL> CLI Shell user name and password" on page 341 and Procedure 51 on page 356.

Configure the Internet Telephone Installer Passwords

The Internet Telephone Installer Password, used when changing the TN on the telephone, controls registration with a virtual line TN on the Call Server. Refer to page 345 for more information about the Internet Telephone Installer Passwords.

To enable and set the administrative Internet Telephone Installer Password, see Procedure 51 on page 356.

If required, enable and set a temporary Internet Telephone Installer Password. See Procedure 52 on page 359.

Element Manager can also be used to configure the Internet Telephone Installer Passwords. See "Setting the Internet Telephone Installer Password" on .

Import node configuration from an existing node

It is possible to import a node and its configuration data from an existing node into Element Manager.

For example, if Node 151 exists, but does not exist on the Call Server, then Node 151 can be imported into Element Manager. Once imported, the node configuration data can be updated and edited.

Procedure 50
Importing node files

1   In the Navigation Tree, click **Configuration** and then **IP Telephony**.

2   The Node Summary page appears. Click the **Import Node Files** button. The Import Node Files page appears. See "Import node files" on .

Figure 97
Import node files

3   Enter the Management LAN (ELAN) IP Address of the Leader in the text
box. This address is used to retrieve the node files.

4   Click the **Import** button.

If the node already exists on the Call Server, a message appears
indicating that the node already exists on the Call Server. See Figure 98
on .

Figure 98
Duplicate node information

If the node does not exist, Element Manager tries to write the configuration to the Call Server. If it succeeds, a message indicating the import was successful appears. See Figure 99 on . If Element Manager cannot write the configuration to the Call Server, a fail reason appears in the text area of the Import Node Files page.

5   If the import is successful, information appears in the text area of the Node Import Files screen. See Figure 99 on .

A message box also appears. In the message box, click the **OK** button to proceed to the **Node Summary** page. The node information can then be viewed and, if necessary, edited.

If the node import is not successful, an error message appears in the text box area.

Figure 99
Import Node Files – successfully imported node
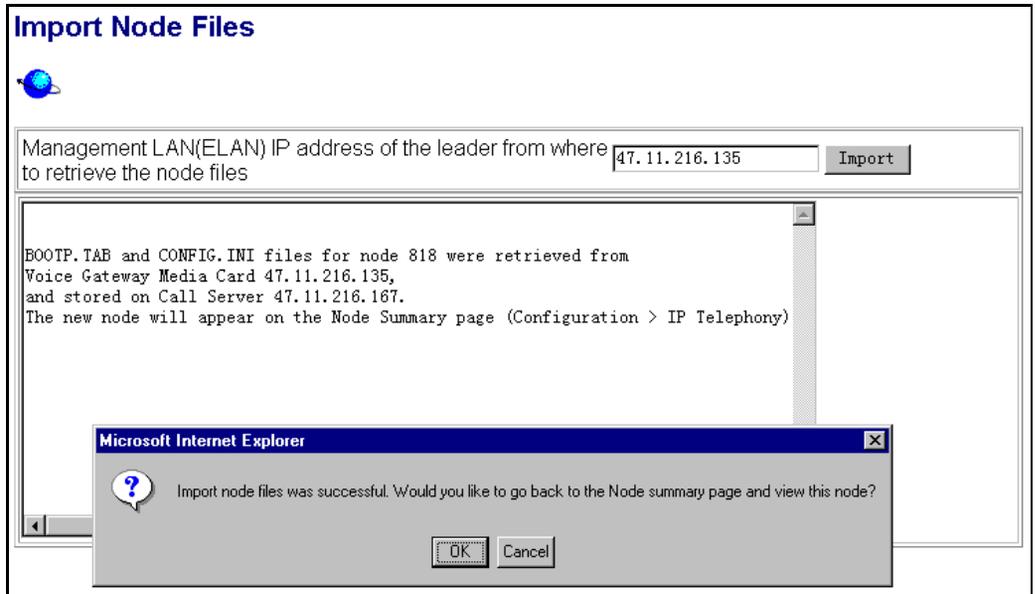
- - - - - - - - - - **End of Procedure** - - - - - - - - - -

IP Line 3.1 administration

Contents

This section contains information on the following topics:

Introduction

This chapter explains how to administer IP Line 3.1 and the Voice Gateway Media Cards on the Meridian 1, Succession 1000M and Succession 1000 systems.

Administration procedures include activities such as monitoring the system status, operational reports, performing upgrades, changing configuration, and adding, changing, and removing cards. Administration does not include engineering, provisioning, initial installation and configuration, maintenance, or troubleshooting.

The Voice Gateway Media Card provides four administration interfaces:

• Optivity Telephony Manager (OTM) 2.1

    OTM's IP Line 3.1 application provides a GUI to the Voice Gateway Media Card. OTM 2.1 is used to Telnet to the card, install and upgrade software and firmware, configure alarm event reporting, view and update a card's property and configuration data, add new cards to a node, schedule reports and other related tasks.

• Element Manager

    Element Manager is a web server that provides a GUI using the Internet Explorer 6.0.2600 (or later) web browser. Element Manager is used to Telnet to the card, install and upgrade software and firmware, configure alarm event reporting, view and update card property and configuration data, add new cards to a node, schedule reports, and other related tasks.

• IPL> Command Line Interface (CLI)

    Use the CLI to display card and node status, change passwords, check software versions, view channel states, and other card information. The CLI is also used for expert level support and debug. The prompt for the CLI on the Voice Gateway Media Card is IPL>. Access the CLI through a direct serial connection to the I/O panel serial port, the Maint Port on

the faceplate, or through a Telnet session. Use a VT-100 terminal emulation program set to 9600 baud, 8 bits, no parity, one stop bit.

• Overlays

Use the same LDs, commands, and messages for the Voice Gateway Media Card as for any other line card.

IP Line feature administration

Corporate Directory

LD 11 accepts Class of Service (CLS) CRPA/CRPD for Internet Telephones.

Table 47
Corporate Directory: LD 11 configuration

Prompt	Response	Description
REQ:	NEW CHG	Enter main command.
TYPE:	i2002 i2004 i2050	Enter terminal type.
TN	l s	Enter set TN.
...		
CLS	CRPA CRPD	Enable/Disable the Corporate Directory feature for this TN.

The Call Server service change does not affect Corporate Directory immediately. If a telephone is in Corporate Directory mode, and there is a service change to set CLS as CPRD, then the current display and key handling should not be affected. The changed CLS occurs only when the user quits the Corporate Directory application and enters again. For more information about the operation of the Corporate Directory feature, refer to *Optivity Telephony Manager: Installation and Configuration* (553-3001-230).

NAT

Element Manager and OTM 2.1 have two prompts to configure the timer function:

- Enable NAT support: – A checkbox is used to enable or disable the NAT message.

- Keepalive message interval: – When NAT is enabled, a configuration box sets the time (in seconds) between messages sent. The default value is 90 seconds. The configured values apply to all Internet Telephones on the node.

Private Zone configuration

DSP channels and Internet Telephones are set as shared or private based on zone configuration. This is accomplished through the parameter, zoneResourceType, in the zone configuration commands in LD 117.

The <zoneResourceType> parameter specifies the zone to be either shared or private.

A zone is configured in LD 117 as follows:

> **NEW ZONE <zoneNumber> [<intraZoneBandwidth>**
> **<intraZoneStrategy> <interZoneBandwidth> <interZoneStrategy>**
> **<zoneResourceType>]**

> **CHG ZONE <zoneNumber> [<intraZoneBandwidth>**
> **<intraZoneStrategy> <interZoneBandwidth> <interZoneStrategy>**
> **<zoneResourceType>]**

By default, a zone is configured as shared (zoneResourceType=shared).

Virtual Office

The Internet Telephone Virtual Office feature uses the Station Control Password (SCPW) feature. The SCPW password can be maintained either through LD 11 administration or by the user if Flexible Feature Code (FFC) code access is configured. If the SCPW is not configured for a TN registering by means of the Virtual Office feature, the login is rejected. An appropriate error message is displayed to alert the user that a password must be configured.

Enable the SCPW in the Customer Data Block (CDB) by setting the length of the SCPW (scpl). The SCPW must be at least four digits.

To login using Virtual Office, the TN associated with the current Internet Telephone registration must be configured with the CLS VOLA (Virtual Office Login Allowed). The TN associated with the user ID for the login must be configured with the CLS VOUA (Virtual Office User Allowed).

Two CLSs restrict Virtual Office usage. The two classes of services are:

- VOLA/VOLD – defines whether this TN (physical Internet Telephone) allows/disallows a Virtual Office login option.

- VOUA/VOUD – defines if a specific remote user can log onto this TN (allows/disallows a particular user to login using Virtual Office).

Table 48 shows the new CLS for LD 11.

Table 48
LD 11 – Virtual Office Login for Internet Telephones

Prompt	Responses	Description
REQ	NEW CHG	
TYPE	i2002 i2004 i2050	Internet Telephone model
CUST	<number>	Customer number
BUID	<user id>	Dialable DN, Main Office user ID Enter X to delete.
MOTN	l s c u	Main Office TN for Large System Main Office. Accept default for Succession 1000 or Small System Main Office
...		
CLS	(VOLA VOLD	Virtual Office login operation is allowed/denied on this TN
CLS	(VOLA) VOUD	Allow/Disallow Virtual Office user on this TN using other Internet Telephone

e911

If 911 is dialed while logged into Virtual Office, the TPS re-directs the 911 call to the local area 911 service (PSAP), not the remote Call Server 911 service. Table 49 describes the process.

Table 49
e911 process

Step	Description
1	The TPS aborts the call on the remote Call Server.
2	The TPS displays **Emergency Call** on the Internet Telephone.
3	The TPS logs the Internet Telephone out of Virtual Office.
4	The TPS reconnects to the local Call Server.
5	The TPS restarts the 911 call, thus reaching the correct PSAP. *Note:* The extra processing adds 5 seconds to the call setup time.
6	After the emergency call ends, the Internet Telephone remains registered to the Home TPS as a normal telephone, in case the PSAP makes a call back to the originator of the emergency call. After the Internet Telephone is redirected to its Home Site, it is not allowed to initiate a new operation for five minutes. This prevents the user from accidentally dialing the emergency DN and hanging up. In this case, the emergency response personnel might call back to confirm the accidental call (and thus confirm that there is no emergency). If the Internet Telephone were allowed to immediately resume a Virtual Office login to another site, it could not receive the call back. If the local TN has another Internet Telephone Virtual Office logged into it when it comes back, the non-emergency Internet Telephone is pre-empted. *Note:* If this occurs, ESAxxx messages are generated on the system TTY.

Configuration

The Emergency Services Access (ESA) feature must be configured on all nodes participating in Virtual Office logins. No other special configuration is required.

For more information, refer to *Emergency Services Access: Description and Administration* (553-3001-313).

802.1Q

The 802.1Q support for Internet Telephones is configured and controlled using the telephone's user interface or DHCP. The DHCP approach eliminates the requirement to manually set the VLAN ID as part of the installation. The configuration is composed of two items: setting the "p" bits and setting the VLAN ID.

OTM 2.1 and Element Manager have two fields for setting 802.1Q support:

• Enable 802.1Q support: A checkbox that, when checked, sets the priority bits to the value specified by the next item. If the checkbox is unchecked, the i2001/i2002/i2004 Internet Telephone sends out the default priority of 6.

• 802.1Q Bits value (802.1p): A 802.1Q priority bit value field that sets the value the i2001/i2002/i2004 Internet Telephones sent out in the priority field. The range is 0 – 7.

Password security

There are password security features that must be configured and administered in IP Line 3.1. The password security features are as follows:

1 SNMP Community Name password

2 IPL> CLI Shell password

3 Call Server's Level 1 Password (PWD1)

4 Internet Telephone Installer Password

The SNMP Community Name password, IPL> CLI Shell password, and Call Server's Level 1 Password (PWD1) operate at the card level. The Internet Telephone Installer Password works at the node level.

• The SNMP Community Name password is contained in the card properties that were transmitted to each card.

• The IPL> CLI Shell password is set on each individual card.

- The Level 1 Password (PWD1) is set at the Call Server and is sent to all cards in the node.

- The Internet Telephone Installer Password is first applied to one card in the node, and then is applied to all the cards in the node.

SNMP Community Names password

SNMP Community Names passwords are required to access the Voice Gateway Media Card. There are two community names, Current and Previous.

OTM 2.1 stores both community names for Meridian 1 systems. See Figure 41 on page 209. The Previous community name is used to access the Voice Gateway Media Card when changing the community name. Procedure 17 on page 209 explains how to change the SNMP community names to provide greater security for the IP Telephony node.

Element Manager stores the community names (see Figure 64 on page 269) for Succession 1000 and 1000M systems. Procedure 31 on page 269 is used to change the SNMP community name to provide increased security.

IPL> CLI Shell user name and password

The IPL> Command Line Interface (CLI) is password-protected to control Telnet access and access to the local maintenance port. The same user name and password also controls FTP access to the Voice Gateway Media Cards.

Login banner

The IP Line 3.1 login banner information includes the IP 3.1 line card software version, ELAN IP address, card type, firmware version, current time and date, system name, system location, and system contact.

The following information is an example of the login banner displayed on the Succession Media Card:

> **Login:**
> **Password**
>
> **Welcome to the IP Line command line.**
> **Software Version: IPL-3.10.20**
> **Management IP: 47.11.216.216**
> **Host Type: Succession Media Card**
> **Firmware Version: ITG Firmware Rls 5.7**
>
> **SysName: ITG Line**
> **SysLocation: TN 10 0**
> **SysContact: designer**
>
> **OS Time: Date (04/03/2002) Time (09:07:43)**
> **Use "logout" to logout.**
> **Idle session timeout = 20 minutes.**
> **IPL>**

Password Guessing Protection

IP Line 3.1 provides protection against password guessing. This protection blocks a hacker from attempting to log into the Voice Gateway Media Card's shell by making repeated attempts to guess the shell user ID and password.

The password guessing protection is applicable to either a tip session (direct maintenance port-connected TTY session) or a Telnet session.

The password guessing protection feature is described as follows:

- There is a login failure threshold of 3 and a lockout period of 10 minutes. This is not user configurable.

- Password guessing protection is enabled by default when the card starts the first time. The protection can be disabled and re-enabled at the VxWorks shell. Entering the **shellLoginProtectSet 0** command disables the protection and **shellLoginProtectSet 1** enables it.

- When the login failure threshold is exceeded (by 3 consecutive failed login attempts), the system raises an "ITG1038" critical alarm. This alarm is sent to indicate the card's login has been locked due to too many incorrect password entries.

    Alarm value = ITG alarm 38
    perceivedSeverity = Critical
    probableCause = Unauthorized maximum access attempts
    Alarm text = IPL login protection (login locked)

When the 10 minute timer expires for the lockout period, the system raises an "ITG5038" cleared alarm. The clear message is sent after the lockout period expires.

    perceivedSeverity = Cleared
    probableCause = Unauthorized maximum access attempts
    Alarm text = IPL login protection (login available)

- There is no online indication or warning during the failed login attempt lockout state. Everything appears the same to the user trying to login. The user is not informed that login blocking has been activated. The login is ignored for 10 minutes.

    Note: Both the "critical" and "cleared" alarms send an SNMP trap to the system administrator. For security reasons, these two alarms do not call the syslog function as the other itgAlarms do, so no syslog message is displayed on the console or written in the syslog file.

- On the Voice Gateway Media Card, the faceplate displays GO38 (ITG1038) when the ITG1038 alarm is received, since it is a critical alarm. The ITG5038 clears GO38 from the faceplate when the 10 minute timer expires.

Node password synchronization

The BOOTP.TAB, CONFIG.INI, and Internet Telephone firmware files must be the same on all cards in the system. The cards that can be in the system are the ITG-P 24-port line card, the Succession Media Card 8-port and 32-port line card, and the Succession Signaling Server. To maintain a consistent configuration within the system, files are transferred from Leader 0 to the Follower cards using FTP.

In order for the FTP process to work correctly, all the cards in a node must be synchronized with the same user ID and password. Once the Voice Gateway Media Cards are synchronized with the Call Server, the user login is synchronized with the Call Server's PWD1. The cards can then only be accessed by using the Call Server's Level 1 Password (PWD1) user ID and password.

A card uses its user ID and password when it tries to access another card to FTP files. The FTP fails unless all the cards have the same user ID and password, due to failed user authentication. Therefore, a unique user ID and password should be used within one system. Since most applications (except the Gatekeeper) communicate directly with the Call Server, the Call Server's Level 1 PWD1 user ID and password is the unique password among all platforms.

Level 1 Password (PWD1)

The minimum password length on the Call Server is four characters. The minimum password on the Voice Gateway Media Card and the Succession Signaling Server is eight characters. To make the passwords match, the PWD1 is padded at the end with spaces if the password is less than eight characters.

For example, if the Call Server's PWD1 is "0000", it is padded to the right with the four space characters to become "0000   ". This is done automatically by the software. It is not necessary to manually add the spaces.

Password Updates

The Call Server's PWD1 user ID and password is sent to all cards at the following times:

- when the cards initially establish a connection with the Call Server across the ELAN

- when an EDD operation is performed on the Call Server

Once the PWD1 information is downloaded from the Call Server, it is saved in the card's NVRAM. If a card has not yet established a link with the ELAN, the user ID and password that is currently stored in the card's NVRAM is used to log in. The user ID and password might not match the PWD1 on the Call Server because the Call Server has not yet downloaded the current PWD1 to the card. Once the ELAN connection is established, the user ID and password are synchronized on all cards, and the new user ID and password are saved in the card's NVRAM.

Since all cards automatically receive the user ID and password from the Call Server, the password can be changed in a single location, the Call Server's CLI. This eliminates the need to change the password on every card in the node (just change the password once on the Call Server). When the password is changed at the Call Server, the password is automatically sent to all the Voice Gateway Media Cards.

A user can change the user ID and password login on any card using the shellPasswordSet CLI command. However, updates from the Call Server overwrite the cards' user ID and password in the NVRAM.

If the PWD1 is changed and an EDD operation is not performed, the cards can contain a mixture of old and new passwords. This could happen if a new card is plugged in, an existing card reboots or loses and reestablishes its ELAN connection. Nortel Networks recommends that an EED be performed when the PWD1 password is changed on the Call Server. This ensures that all cards have the new PWD1 user ID and password.

For more information on the PWD1 Level 1 password, see the "LD 17 Gate Opener PWD (Password)" section in *Software Input/Output: Administration* (553-3001-311).

Internet Telephone Installer Password

An Internet Telephone displays the node ID and Terminal Number (TN) of the telephone for five seconds as the telephone boots up. IP Line 3.1's password protection controls who can change the TN on the Internet Telephone. This feature is available on the i2002 and i2004 Internet Telephones and i2050 Software Phone. The Internet Telephone Installer Password protection, for changing the TN on the telephone, controls registration with a virtual line TN on the Call Server.

Note: The Internet Telephone Installer Password can also set using the CLI commands in Element Manager. See "Setting the Internet Telephone Installer Password" on page 473.

Administrator Internet Telephone Installer Password

This feature adds basic Internet Telephone Installer Password protection on the Internet Telephones to control registration with a virtual line TN on the Call Server. This feature does not provide a user password or a Station Control Password for Internet Telephones.

i2004 Internet Telephone

When the password is configured, the i2004 Internet Telephone screen shows:

1   The four digit Node ID and a Password prompt (see Page 1 of Figure 102 on page 351), instead of the Node ID and TN fields (see Figure 100 on page 348).

2   When the user enters the password, an asterisk (*) is displayed for each digit entered. The password is not shown.

3   Once the Node ID and Password are entered, the user presses OK. If the password passes the Connect Server's authentication, a screen is displayed with the TN field (see Figure 102 on page 351).

i2002 Internet Telephone

When the password is configured, the i2002 Internet Telephone screen shows:

1   The four digit Node ID screen is displayed first (see Figure 103 on page 352).

2   The user is then prompted with the Password screen (see Figure 103 on page 352) instead of the TN field screen (see Figure 101 on page 349).

3   When the user enters the password, an asterisk (*) is displayed for each digit entered. The password is not shown.

4   Once the Password is entered, the user presses OK. If the password passes the Connect Server's authentication, a screen is displayed with the TN field (see Figure 103 on page 352).

If the Node ID and Password are not entered, the registration continues after five seconds and the TN is not displayed. If an invalid Node ID password is entered, the Node ID and Password screen is displayed again. This screen is re-displayed a maximum of two times, giving the technician a total of three chances to enter the password. After three failed attempts, the registration continues as if there were no password entries. The technician can reboot the telephone and try again if more tries are needed.

If the technician has entered a zero length (null) password, then the Node ID, TN, and Password screens are not displayed on the Internet Telephone during the registration process. This provides the most security as it prevents any entry of passwords or TNs from the Internet Telephone.

Temporary Internet Telephone Installer Password

A Temporary Internet Telephone Installer Password can be configured, which provides temporary user access to the TN for configuration. A temporary password removes the need to distribute the Node password and then change the password afterwards. The temporary password is automatically deleted after it has been used the defined number of times or when the duration expires, whichever comes first.

The following are examples of situations where the Temporary Internet Telephone Installer Password can be used:

- A department is installing i2050 Software Phones. The technician creates a temporary password, sets an appropriate number of uses (such as allowing two logins for each telephone in case there is a problem the first time) and sets the duration to expire by the end of the weekend. The password access automatically ends before Monday morning (or sooner if the number of uses expires).

- A telecommuter needs to install an Internet Telephone. The technician provides the temporary password that expires the next day or after two uses. When the Internet Telephone Installer Password protection is enabled, the Set TN is not displayed as part of the Set Info sub-menu of the Telephone Option menu. The telephone's TN can be retrieved on the core CPU through the LD 20 PRT DNB and LD 32 IDU, or LD 80 TRAC, or PDT> rlmShow. It can also be found on the Voice Gateway Media Card through IPL> isetShowByIP.

Registration screens with TN password feature

The following screens shows the existing TN entry screen that appears when the Internet Telephone registers:

- Figure 100 on displays the screen on the i2004 Internet Telephone if password protection is disabled or not configured.

- Figure 101 on displays the screen on the i2002 Internet Telephone if password protection is disabled or not configured.

Figure 100
i2004 registration with no password checking

Figure 101
i2002 registration with no password checking

```
Page 1:

  Node:__ __ __ __
  _____

     OK        BKSpace      Clear      Cancel


Page 2:

  TN: __ __ __ __ __ __ __ __ __ __ __ __ __ __
  _____

     OK        BKSpace      Clear      Cancel
```

When the TN password protection feature is configured with a non-zero length password and is enabled:

- Figure 102 on page 351 shows the i2004 TN entry screens.

  — Figure 102 on page 351 displays the Node ID and Password. Note the Password entry input field is blank (underscores are not displayed). Therefore, the maximum length of the password is not disclosed.

  — If the correct password is entered, the TN is displayed.

- Figure 103 on page 352 shows the i2002 TN entry screens.

  — Figure 103 displays the Node ID. The Node ID is entered and the user presses OK.

  — Figure 103 displays Password entry page. Note the Password entry input field is blank (underscores are not displayed). Therefore, the maximum length of the password is not disclosed.

  — If the correct password is entered, the TN is displayed.

Figure 102
i2004 registration with password checking

```
Page 1:

  Node:__  __  __  __
  Password:


     OK        BKSpace      Clear       Cancel



Page 2:

  TN:__  __  __.__  __.__  __.__  __


     OK        BKSpace      Clear       Cancel
```

Figure 103
i2002 registration with password checking

```
Page 1:

  Node:__  __  __  __


     OK        BKSpace      Clear        Cancel


Page 2:

  Password:


     OK        BKSpace      Clear        Cancel


Page 3:

  TN: __ __ __ __ __ __ __ __ __ __ __ __ __ __


     OK        BKSpace      Clear        Cancel
```

IP Line CLI commands for password control

The Internet Telephone Installer Passwords are configured on any Voice Gateway Media Card in the node. The Internet Telephone Installer Password is configured and administered using a set of six IPL> CLI commands:

- nodePwdSet "password"

- nodePwdShow

- nodePwdTempPwdSet "temppwd", uses, <time>

- nodeTempPwdClear

- nodePwdEnable

- nodePwdDisable

The commands begin with "node" as they work at the node level. For detailed information about these commands, see Table 67: "Internet Telephone Installer Password commands" on .

When an IP Telephony node is first installed, the Internet Telephone Installer Password is not defined or enabled by default. To prevent users from inadvertently re-configuring the Node ID and TN on their Internet Telephones, enable the Internet Telephone Installer Password after the Internet Telephone is initially installed and the system is in service.

Password security controls access to an Internet Telephone's TN for the purpose of registering to a different virtual line TN on the Call Server after the Internet Telephones have been installed. A password is not encrypted by the telephone or the Voice Gateway Media Card.

By default, when a node is initially installed, the administrative password and the temporary password are not defined, and the password feature is disabled.

The **nodePwdSet "password"** command sets and enables the password. When the password is enabled and configured, the screen on the Internet Telephone displays the four digit Node ID and a Password prompt, instead of the Node ID and TN fields.

> **WARNING**
>
> The **nodePwdSet** command with no "password" parameter enables the administrator password and sets a null (zero-length) password.
>
> Enabling the administrator password and setting a null password makes it impossible to install the Internet Telephones because the Node ID and TN prompts are not displayed on the telephone screen.
>
> Always specify the "password" parameter when issuing the nodePwdSet command. This password parameter is 6-14 digits. The valid characters are 0-9 * #.

If the **nodePwdEnable** command is entered before the password is set using the nodePwdSet command, the password is also enabled with a null (zero-length) password and as a result, the password and TN prompts are also never displayed on the Internet Telephones.

The administrator normally uses the Administrative Internet Telephone Installer Password if it is necessary to install a new telephone or change the configuration (node ID and TN) of an existing telephone.

Note: If an Internet Telephone cannot be installed because a prompt for a node ID and TN does not appear, log into a Voice Gateway Media Card and check the status of the password using the **nodePwdShow** command.

IMPORTANT!

The administrator can create a temporary Internet Telephone Installer Password for experienced users who are delegated to install Internet Telephones. If a null administrator password is set and a temporary password is created, the temporary password overrides the null administrator password.

If the administrator wishes to suppress all password prompting to reconfigure the Node ID and TN, then clear the temporary password using the **nodeTempPwdClear** command. Also, set the administrative password to a null password using the **nodePwdSet** command with no "password" parameter specified.

Set the Internet Telephone Installer Passwords

The Internet Telephone Installer Passwords are configured on one Voice Gateway Media Card or on the Succession Signaling Server in the node. The passwords are then applied to all cards in the node.

Administrative Internet Telephone Installer Password

The Administrative Internet Telephone Installer Password is used by the administrator to install a new Internet Telephone or change the configuration (node ID and TN) of an existing Internet Telephone.

To set the Administrative Internet Telephone Installer Password, see .

Procedure 51
Configuring the administrative Internet Telephone Installer Password

1   Connect to any Voice Gateway Media Card in the node.

2   Login to the IPL> CLI and type the **nodePwdShow** command. This
command displays the settings of the Internet Telephone Installer (node)
password.

If in the default state, the Internet Telephone Installer Password has never
been set. The nodePwdShow command should display the following:

```
NodeID    PwdEna    Pwd         TmpPwd      Uses      Timeout
======    =======   ========    ========    =======   ===========
123       No                                          0d 0h 0m 0s
```

where:

NodeID – the Internet Telephone Installer Password configuration applies
to all Voice Gateway Media Cards on the same TLAN that belong to this
Node ID.

PwdEna – by default the cards should be in disabled state (PwdEna=No).
The PwdEna setting specifies the enabled (Yes) or disabled (No) state of
the Internet Telephone Installer Password.

Pwd – this is the Administrator Internet Telephone Installer Password. In
the default state, the Administrator password is null (zero-length).

TmpPwd – this is the temporary Internet Telephone Installer Password.
In the default state, the temporary password is null.

Uses – the Uses parameter applies to the temporary Internet Telephone
Installer Password. In the default state, this setting is null. If the card is not
in the default state, the Uses parameter is a numeric value from 0 –1000.
This number specifies the remaining number of uses for the temporary
password. If zero is entered for the Uses parameter when setting the
temporary password, the Time parameter is mandatory. When the Time
parameter is in effect, the password expiration is based on time instead of
the number of uses.

Timeout – the Timeout heading corresponds to the Time parameter of the temporary Internet Telephone Installer Password. In the default state, the Time is null. If the card is not in the default state, this setting specifies the duration in hours in which the temporary password is valid. The range is 0 – 240 hours (which is a maximum of 10 days). The number specified under Timeout indicates the remaining time to expire of the temporary password. The Time parameter is optional if the Uses parameter is non-zero. The Time parameter is mandatory if the Uses parameter is set to zero.

Note: If both the Uses and Time parameters are entered, the password expires based on whichever happens first; that is, the number of Uses is reduced to zero or the Time has expired. If both the Uses and Time parameters are entered and are set to zero, it is the same as not setting the temporary password.

3   Set the Administrator Internet Telephone Installer Password. The **nodePwdSet "password"** commands enables and sets the administrator password. The "password" parameter can be null, or 6 to 14 digits in length. The valid characters are 0-9 * #. This command can be entered at any time. The new password entered simply overwrites the previous password.

Set the administrator password, first with a null password and then with a password specified.

4 Type **nodePwdSet** at the IPL> prompt. Note that no password parameter is specified.

Type **nodePwdShow** to see the following:

NodeID	PwdEna	Pwd	TmpPwd	Uses	Timeout
========	========	========	========	========	=============
123	Yes				0d 0h 0m 0s

PwdEna – the administrator password is now enabled (PwdEna=Yes).

Pwd – if no "password" parameter specified, the administrator password is null. Internet Telephones cannot be installed when the password is null. A null password causes the node ID and Password screen to be skipped during restart.

> **WARNING**
> The **nodePwdSet** command, with no parameter, by default enables the administrator password and sets a null (zero-length) password.
>
> Internet Telephones cannot be installed if the administrator password is enabled and set to null.
>
> Always specify the password parameter to install Internet Telephones.

5 Type **nodePwdSet "password"** at the IPL> prompt, where the password parameter is 6 to 14 digits in length. The valid character are 0-9 * #. For this example, use "1234567" as the password.

6 Type **nodePwdShow** to see the following:

NodeID	PwdEna	Pwd	TmpPwd	Uses	Timeout
========	========	========	========	========	=============
123	Yes	1234567			0d 0h 0m 0s

PwdEna – the administrator password is enabled (PwdEna=Yes).

Pwd – the administrator password, 1234567, is displayed.

Note: Always specify the "password" parameter when entering the **nodePwdSet** command.

7   The **nodePwdEnable** and **nodePwdDisable** commands enable and
disable the administrative Internet Telephone Installer Password,
respectively.

———————————   **End of Procedure**   ———————————

Temporary Internet Telephone Installer Password

A temporary Internet Telephone Installer Password can be set. This enables
temporary user access to the TN for configuration. A temporary password
removes the need to distribute the administrative (node) password and then
the need to change it afterwards. If there is a null administrator password set
and you create a temporary password, the temporary password overrides the
null administrative password.

The syntax for temporary Internet Telephone Installer Password specifies the
password, the number of times that the password can be entered, and the time
that the password is valid.

To set a temporary Internet Telephone Installer Password, follow the steps in
Procedure 52.

Procedure 52
Configuring the temporary Internet Telephone Installer Password

1   Type **nodeTempPwdSet "password", uses, <time>** at the IPL> prompt,
where "password" is the temporary password string 6 to 14 digits in
length, uses is the value from 0 to 1000, and time is between 0 and 240
hours.

For example, nodeTempPwdSet "987654", 15, 3

2   Type **nodePwdShow** to see the following:

NodeID	PwdEna	Pwd	TmpPwd	Uses	Timeout
123	Yes	1234567	987654	15	0d 3h 0m 0s

3   The temporary password is automatically deleted after it has been used
the defined number of times (Uses) or when the duration expires
(Timeout), whichever comes first. However, to delete the temporary
password before the number of uses or time has expired, type the
nodeTempPwdClear command at the IPL> prompt.

4 Type **nodePwdShow** to verify that the temporary password has been deleted.:

NodeID	PwdEna	Pwd	TmpPwd	Uses	Timeout
========	========	========	========	========	===========
123	Yes	1234567			0d 0h 0m 0s

---------- **End of Procedure** ----------

Default user name and password

The IPL> CLI has a default user name of **itgadmin** and a default password of **itgadmin**. The default user name and password must be changed as a preventative security measure. The shellPasswordSet command changes the IP Line username and password.

Reset the IPL> CLI Shell user name and password

If the authorized system management personnel do not have the current IPL> CLI Shell user name and password, reset the user name and password to the default (itgadmin and itgadmin).

To reset the IPL> CLI shell user name and password, follow the steps in Procedure 53. This procedure requires a connection to the local maintenance port on the Voice Gateway Media Card and also requires rebooting the card which will interrupt services.

Procedure 53
Resetting the user name and password to default

1 Connect a terminal to the Maintenance port (labeled Maint) either directly or through a dial-up modem. The terminal communication parameters must be as follows:

- 9600bp

- 8 data bits

- no parity

- 1 stop bit

2 Press the **Enter** key on the keyboard. The **IPL>** prompt is displayed.

3   Reboot the card by pressing the **RESET** button on the faceplate of the
card with a pointed object, such as a ball-point pen.

> **WARNING**
> Do not use a pencil to reset the Voice Gateway Media
> Card. The graphite carbon can create an electrical short
> circuit on the board.

4   Start up messages are displayed on the terminal. Type **jkl** on the terminal
keyboard when the prompt is displayed.

Note: **jkl** runs from BIOS or boot ROM which is printed early in the
bootup process. There is only a six second window at the prompt to enter
jkl. If the prompt is missed, restart the card and repeat the above step.

5   Once the card has booted from BIOS or boot ROM, a CLI prompt such as
the BIOS> appears. Enter the following command:

shellPasswordNvramClear at the prompt.

6   Type **reboot** at the prompt to reboot the card.

7   Wait for the card to completely reboot into the IP Line 3.1 application.
The password synchronization feature changes the password on the card
automatically.

——————— **End of Procedure** ———————

IP configuration commands

Table 50 describes the IP configuration commands.

Table 50
IP configuration commands

IP configuration command	Function
setLeader	Performs all the necessary actions to make a Leader. Sets IP address, gateway, subnet mask, boot method to static, and Leader bit in NVRAM.
clearLeader	Clears the Leader info in NVRAM and sets the boot method to use BOOTP, thus, making the card a Follower.
NVRIPShow	Prints the values of the IP parameters that reside in NVRAM.

TLAN configuration commands

Auto-negotiate mode can be disabled if the ports on some data network switches and routers are manually configured. For example, configuring a port for 100BaseT Full-duplex can disable auto-negotiation on the signaling link.

The Voice Gateway Media Card and the Internet Telephone default to Half-duplex mode when no auto-negotiation signaling occurs. The result is that the Voice Gateway Media Card and the Internet Telephone operate in Half-duplex mode, while the switch is in Full-duplex mode. Communication continues, but random packet loss can occur which affects the correct operation and voice quality.

IMPORTANT!

Set ports for auto-negotiation, auto-sense.

Configure the speed and duplex setting of the TLAN connection using the following commands:

- **tLanSpeedSet speed** – this command sets the speed of the TLAN interface. By default, the interface auto-negotiates to the highest speed supported by the switch. If the switch is 10/100BaseT, the interface negotiates to 100BaseT. Use this command to debug Ethernet speed-related problems by forcing the interface to 10BaseT operation immediately. The duplex mode setting is saved in NVRAM and read at startup. The parameter speed is set to the following:

     10 – disables auto-negotiation and sets speed to 10 Mbps
     10100 – enables auto-negotiation

- **tLanDuplexSet duplexMode** – this command immediately sets the duplex mode of the TLAN interface while operating when auto-negotiate is disabled and speed has been fixed to 10 Mbps (or 10BaseT mode). The duplex mode is saved in NVRAM and read at startup. The parameter duplexMode is set to the following:

     0 – enables Full-duplex mode
     1 – enables Half-duplex mode

If the auto-negotiation is disabled, and the speed and duplex mode are forced using the CLI commands, Nortel Networks recommends that Half-duplex mode be used to inter-operate with the far end when the far end is set to auto-negotiate.

If the duplex mode is set to Full-duplex, the far end must be set to Full-duplex and auto-negotiate turned off.

Half-duplex mode works with either Half-duplex or auto-negotiate at the far end. However, Full-duplex at the near end only operates with Full-duplex at the far end.

For the IP Line 3.1 application, Half-duplex has ample bandwidth for a Voice Gateway Media Card even with 24 busy channels, VAD disabled, and G.711 Codec with 10 Mbps voice payload size.

Display the number of DSPs

The **DSPNumShow** command displays the number of DSPs on the Voice Gateway Media Card.

At the IPL> prompt, type: **DSPNumShow**.

Display IP Telephony node properties

The **IPInfoShow** command displays information about an IP Telephony node.

 At the IPL> prompt, type: **IPInfoShow**

The following IP Telephony node information is displayed on the TTY:

- IP addresses for the management and voice subnets

- default router for the management and voice subnets

- subnet mask for the management and voice subnets

- SNMP manager

- IP routing table

- IP configuration of the card (which is related to the IP configuration of the node)

The IPInfoShow command displays information similar to the following:

```
Maintenance Interface = lnIsa0
Maintenance IP address = 47.103.220.199
Maintenance subnet mask = 255.255.255.224
Voice Interface = lnPci1
Voice IP address = 47.103.247.221
Voice subnet mask = 255.255.255.0
```

ROUTE NET TABLE

destination	gateway	flags	Refcnt	Use	Interface
0.0.0.0	47.103.247.1	3	7	5800883	lnPci1
47.103.220.192	47.103.220.199	101	0	0	lnIsa0
47.103.247.0	47.103.247.221	101	0	0	lnPci1
47.103.247.0	47.103.247.221	101	0	0	lnPci1

ROUTE HOST TABLE

destination	gateway	flags	Refcnt	Use	Interface
127.0.0.1	127.0.0.1	5	0	0	lo0

value = 77 = 0x4d = 'M'

Display Voice Gateway Media Card parameters

The following commands provide information about a Voice Gateway Media Card:

- itgCardShow

- ifShow

- serialNumShow

- firmwareVersionShow

- swVersionShow

- electShow

- tpfShow

itgCardShow

The **itgCardShow** command displays information about a Voice Gateway Media Card.

At the IPL> prompt, type: **itgCardShow**

The itgCardShow command displays information similar to the following:

```
Index : 1
Type : EXUT
Role : Leader
Node : 123
Leader IP : 47.103.247.220
Card IP : 47.103.247.221
Card TN : 44 0 10
Card State : ENBL
Uptime : 1 days, 19 hours, 43 mins, 11 secs (157391
secs)
Codecs : G711Ulaw(default), G711Alaw, G729AB
lnPci stat : 100 Mbps (Carrier OK)
value = 1 = 0x1
```

electShow

The electShow command shows information to help a technician quickly become familiar with the current state of the node. The command displays a list of cards in the node and information about each card. This includes showing all registered followers to a leader.

The output has two sections:

- cards currently registered
- cards that are in the BOOTP.TAB configuration but not yet registered

Registered cards

The following information is displayed for each card currently registered:

- platform
- TN
- ELAN MAC
- TLAN IP Address
- ELAN IP Address
- how long it has been registered
- how many internet telephones are registered to the card
- number of Time Outs

Unregistered cards

The following information is displayed for each card currently not yet registered based on BOOTP.TAB:

- platform
- TN
- ELAN MAC
- TLAN IP Address
- ELAN IP Address

Example

The following is an example of the output on a Succession Signaling Server:

```
oam> electShow

Node ID : 678
Node Master : Yes
Up Time : 1 days, 3 hours, 1 mins, 58 secs
TN : 00 00
Host Type : ISP 1100
IP TLAN : 47.11.215.55
IP ELAN : 47.11.216.139
Election Duration : 15
Wait for Result time : 35
Master Broadcast period : 30

===== master tps =====

Host Type TN TLAN IP Addr
ISP 1100 00 00 47.11.215.55
Next timeout : 3 sec
AutoAnnounce : 1
Timer duration : 60 (Next timeout in 17 sec)

====== all tps ======

Num TN Host Type ELAN MAC TLAN IP Addr ELAN IP Addr
Up Time NumOfSets TimeOut

001 00 00 ISP 1100 00:02:B3:C5:50:C2 47.11.215.55
47.11.216.139 001 03:01:58 5 0

002 03 00 ITG-P 00:60:38:8E:71:5C 47.11.215.37
47.11.217.157 006 05:30:13 0 0

====== Cards in node configuration that are not
registered ======

Num TN Host Type ELAN MAC TLAN IP Addr ELAN IP Addr

001 7 0 SMC 00:60:38:BD:C1:C1 47.11.215.54
47.11.216.49

value = 27886252 = 0x1a982ac
```

When all cards configured in a node are registered, the last part of the output displays the following:

```
====== All cards in node configuration are
registered ======
```

tpsShow

The following is an example of the output from the tpsShow command for an ITG-P 24-port line card.

```
IPL> tpsShow
Node ID : 0
Is master : 1
Up time : 4 days, 2 hours, 40 mins, 53 secs (355253
secs)
TN : 03-00
Platform : ITG Pentium
TPS Service : Yes
IP TLAN : 192.168.1.140
IP ELAN : 192.168.1.14
ELAN Link : Up
Sets Connected: 4
Sets Reserved : 0
value = 18 = 0x12
```

Packet loss monitor

Monitor audio packet loss using the following commands:

- **vgwPLLog 0|1|2** – enables the packet loss monitor. Packet loss is measured in the receive direction and the two halves of a call are monitored and logged independently.

  — A value of zero (0) disables packet loss logging.

  — A value of one (1 – default) logs a message if packet loss during the course of the call exceeds the threshold set with the **itgPLThreshold** command.

— A value of two (2) indicates that log messages are printed as packet loss is detected during the call. A message is printed each time packet loss is detected indicating how many packets where lost at that moment.

- **itgPLThreshold xxx** – this command sets the packet loss logging and alarm threshold, where xxx is a number between 1 and 1000, and represents the threshold in 0.1% increments. Packet loss which exceeds the threshold generates an SNMP trap and writes a message to the log file if logging is enabled. The default value is 10 (1%).

Transfer files using the Command Line Interface

There are a number of special file transfer commands available to Put/Get files from the IPL> CLI. These commands are normally used as part of an expert support procedure if OTM or Element Manager are not available.

These commands, listed in Table 51 on , are from the perspective of the Voice Gateway Media Card. If "Get" is part of the command, the file is transferred from the OTM PC to the Voice Gateway Media Card. If "Put" is part of the command, the file is transferred from the Voice Gateway Media Card to the OTM PC.

To transfer a file, enter one of the commands in listed in Table 51 at the IPL> CLI, depending on what type of file transfer is to occur.

Table 51 lists the commands can be entered at the IPL> CLI:

Table 51
IPL> CLI Commands – file transfer (Part 1 of 2)

Command	Parameters
swDownload	\<hostname\> \<username\> \<password\> \<directory path\> \<filename\>
configFileGet	\<hostname\> \<username\> \<password\> \<directory path\> \<filename\>
bootPFileGet	\<hostname\> \<username\> \<password\> \<directory path\> \<filename\>
hostFileGet	\<hostname\> \<username\> \<password\> \<directory path\> \<filename\> \<ITGFileName\> \<listener\>

Table 51
IPL> CLI Commands – file transfer (Part 2 of 2)

bootPFilePut	<hostname> <username> <password> <directory path> <filename>
currOMFilePut	<hostname> <username> <password> <directory path> <filename>
prevOMFilePut	<hostname> <username> <password> <directory path> <filename>
logFilePut	<hostname> <username> <password> <directory path> <filename>
configFilePut	<hostname> <username> <password> <directory path> <filename>
hostFilePut	<hostname> <username> <password> <directory path> <filename> <ITGFileName>

Note 1: These commands are case-sensitive. The parameters following the command must each be enclosed in quotations marks, and there must be a comma and no spaces between the parameters.

Note 2: For a complete description of these commands, see Table 61: "File Transfer commands" on .

Note 3: Hostname refers to any of the following:

- the IP address of the FTP host

- the Voice Gateway Media Card itself (use loopback address 127.0.0.1)

- another Voice Gateway Media Card

Download the IP Line 3.1 error log

The IP Line 3.1 error log contains error conditions, as well as normal events. Some error conditions can be severe enough to raise an alarm through SNMP traps.

Use the **LogFilePut** command to download an IP Line 3.1 error log.

Reset the Operational Measurements file

Reset the Operational Measurements (OM) file if incorrect statistics might have been collected.

At the IPL> prompt, type: **resetOM**.

The resetOM command resets all operational measurement parameters that have been collected since the last log dump. The statistics start from zero.

IP Line administration using OTM 2.1

Contents

This section contains information on the following topics:

Introduction

This chapter explains how to administer IP Line 3.1 and the Voice Gateway Media Card on the systems using OTM 2.1.

Optivity Telephony Manager (OTM) provides a graphical user interface to the Voice Gateway Media Card. OTM can be used to Telnet to the card, install and upgrade software, configure alarm event reporting, view and update card property and configuration data, add new cards to a node, schedule reports and other related tasks.

> **WARNING**
>
> The only support provided for nodes which reside on a Succession 1000 system is the retrieval of OM reports. This is covered in Procedure 54 on page 376 through Procedure 58 on page 385.

OTM administration procedures

This section describes the OTM administration procedures using the OTM IP Line 3.1 application. All references to OTM in the following procedures assume the latest OTM version.

IP Line Operational Measurement report scheduling and generation

Operational Measurement (OM) reports provide important statistical and traffic information and feedback to the system administrator to better engineer the system. The information stored in the OM file applies only to the calls routed over the IP network by way of IP Line 3.1. OM reports give a quantitative view of system performance, such as jitter.

OTM is used to support Operational Measurements on the systems.

The OM reports are a collection of data from all the Voice Gateway Media Cards in the network. OM data is written to a file every hour. At midnight, the OM file is copied to a backup file, and the new day starts with a new file.

OTM uses the following naming convention for the IP Line 3.1 OM file names:

ipline31_MM_YYYY_file1.csv

Note: The MM (month) portion of the filename is only one character for the months of January to September (1-9). The remaining three months appear as two digit numbers (10, 11, and 12).

An example is **ipline31_10_2002_file1.csv**. This comma-delimited file opens in a program that interprets the .csv file, such as Microsoft Excel or any other comma-delimited file reader.

OM reports are generated on demand or on a pre-selected schedule. When a report is generated, the application retrieves the latest OM data from each Voice Gateway Media Card defined in OTM.

Under certain conditions, the OM report is not available, as follows:

• the first hour after a Voice Gateway Media Card reboot

• the first hour after installing a new Voice Gateway Media Card

The following error messages are generated when requesting the OM report during the first hour:

• on OTM: "fails to transfer the OM file"

• on the Voice Gateway Media Card console: "tfxl: Error File C:/OM/omreport.xxx not found"

Note: Nortel Networks recommends that report generation be scheduled once a day.

To schedule a generated OM Report, follow the steps in Procedure 54 on

Procedure 54
Scheduling Reports

1   Select the node in the **IP Telephony** window. Click **File | Report |**
    Generate. The **Generate OM Report** window opens. See Figure 104.

Figure 104
Generate OM Report – Schedule an OM report
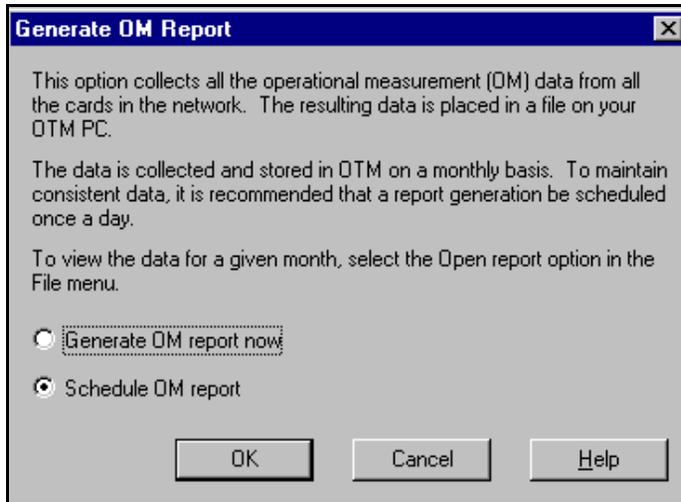
2   In the Generate OM Report window there are two choices, Generate OM
    report now and Schedule OM report.

3   Select the **Schedule OM report** radio button. Click **OK**.

    The **Scheduling** window opens. See Figure 105 on .

Figure 105
Scheduling an OM Report

4 Under **Job**, enter the **Name** and a **Description** for the scheduled OM Report.

5 Under **Run**, select the radio button that indicates the frequency of report generation.

6 Under **Start at**, enter the date and time of the start of the report period using the **Month**, **Day**, **Year**, **Hour**, and **Minute** list boxes and the **am** or **pm** radio buttons.

7 Under **Start at**, click the **Late execution** check box if the report is to run at a later time if the system is busy at the scheduled time.

8 Click **OK**.

———————————— **End of Procedure** ————————————

The generated OM report includes information for all cards in all the nodes in the system. The report file accumulates data for the month. The data is stored in the generated file called ipline_MM_YYYY_file#.csv.

OTM has a report feature called "Generate OM Report now". This feature enables an OM Report to be generated immediately.

WARNING

Running the "Generate OM Report now" feature while the Scheduled OM Reports feature is also running causes duplicate data to be displayed at the end of the OM Report. The data for the current day is appended to the end of the OM file by the "Generate OM Report Now" option.

Be careful to take into account any duplicate data when viewing system performance.

To generate an OM Report immediately, follow the steps in Procedure 55 on .

Procedure 55
Generating reports

1   In the **IP Telephony** window, click the node. Click **File | Report**. The
     Generate OM Report window opens. See Figure 106.

Figure 106
Generate OM Report – Generate OM report now
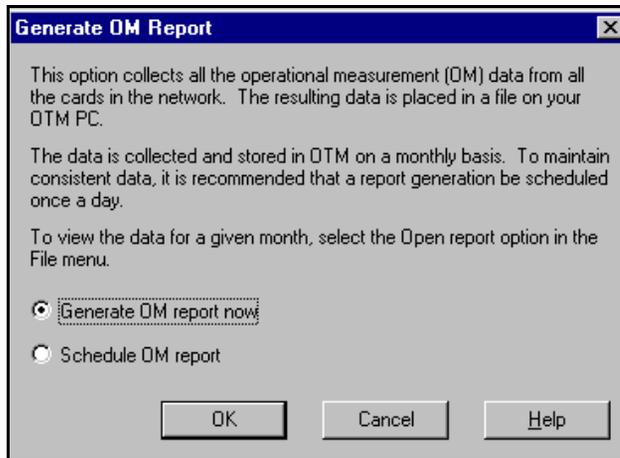
2   Click **Generate OM report now** and then click **OK**.

     OTM creates and displays a report named **Operational Measurement
     Report**. This report is saved as a comma-delimited file (csv):
     ipline31_MM_YYYY_file#.csv. The default file that is generated opens in
     Microsoft Excel or any other application that can open .csv files.

———————————— **End of Procedure** ————————————

To open and view the OM Report file, follow the steps in Procedure 56.

Procedure 56
Opening an Operational Measurement (OM) report

1   In the **IP Telephony** window, select the node in the top of the window.

2   Click **File | Report | Open**. The **Open OM Report** dialog window opens.
     See Figure 107 on .

Figure 107
Open OM Report
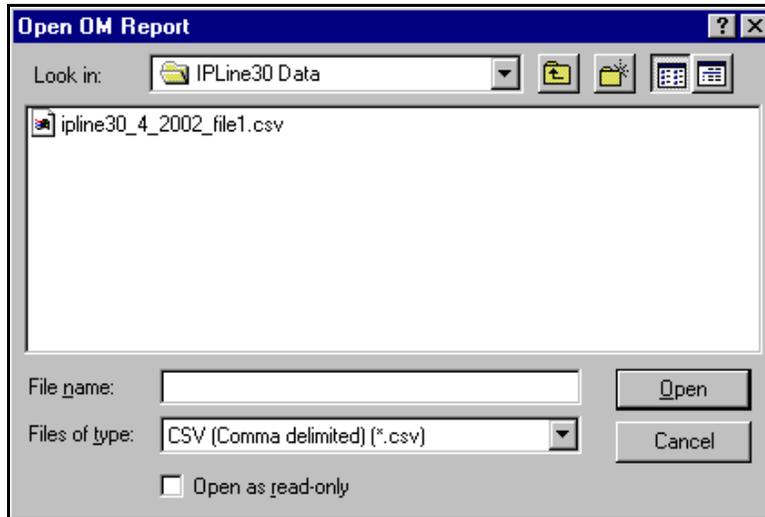
3   Select a report file and click **Open**. The file opens in a program that interprets .csv (comma-delimited) files such as Microsoft Excel. If Microsoft Excel is not installed on the PC, then OTM notifies the user that the file will be opened in Wordpad.

──────────── **End of Procedure** ────────────

Operational Measurements (OM) information for a Voice Gateway Media Card in the node can be viewed using OTM. This OM file is a view of the TPS and Voice Gateway channel activity for each model of Internet Telephone on that card. (The OTM OM Report Generation feature is an overview of all the cards in all sites and systems.)

The Voice Gateway Media Card OM file contains the following information for each model of Internet Telephone:

•   the number of incoming and outgoing calls

•   the number of call attempts

• the number of calls completed

• the total holding time for voice calls

To view a Voice Gateway Media Card's OM file from OTM, follow the steps in Procedure 57.

Procedure 57
Retrieving the current OM file from the Voice Gateway Media Card using OTM

1   In the OTM Navigator window, click the **Services** folder. Double-click the **IP Telephony** icon. The **IP Telephony** window opens.

2   Select the node in the upper portion of the window. Select the Voice Gateway Media Card from the lower portion of the window.

3   Right-click the card and then select **Properties** from the pop-up menu. The **Card Properties** window opens to the **Maintenance** tab. See Figure 108 on .

Figure 108
Card Properties – Maintenance tab
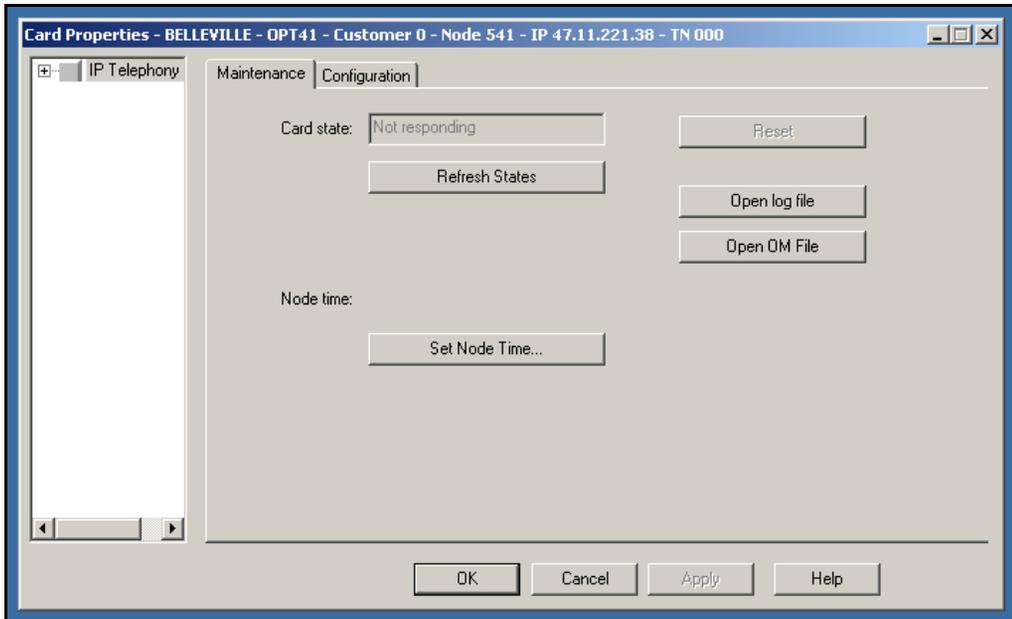
4   Click the **Open OM File** button. A file called **om.txt** opens in the WordPad application. The file contains collection period information for each hour of the day that the card was running, broken down for each model of Internet Telephone.

The collection periods start with the hour from midnight to 1:00 am. OTM adds to the file each hour, so there is a total of 24 collection periods each day. A collection period looks like the following:

```
i2004Reg_Att: 0
i2004Reg_Fail: 0
i2004Unreg_Att: 0
i2004Aud_Setup: 3
i2004Jitter_Avg: 0.3
i2004Jitter_Max: 2
i2004Pkt_Lost: 0.00
```

i2004Voice_Time: 4 mins 32 secs

i2002Reg_Att: 0

i2002Reg_Fail: 0

i2002Unreg_Att: 0

i2002Aud_Setup: 4

i2002Jitter_Avg: 0.3

i2002Jitter_Max: 2

i2002Pkt_Lost: 0.00

i2002Voice_Time: 3 mins 31 secs

i2050Reg_Att: 0

i2050Reg_Fail: 0

i2050Unreg_Att: 0

i2050Aud_Setup: 0

i2050Jitter_Avg: 0.0

i2050Jitter_Max: 0

i2050Pkt_Lost: 0.00

i2050Voice_Time: 0 mins 0 secs

3Pi2004Reg_Att: 0

3Pi2004Reg_Fail: 0

3Pi2004Unreg_Att: 0

3Pi2004Aud_Setup: 0

3Pi2004Jitter_Avg: 0.0

3Pi2004Jitter_Max: 0

3Pi2004Pkt_Lost: 0.00

3Pi2004Voice_Time: 0 mins 0 secs

3Pi2002Reg_Att: 0

3Pi2002Reg_Fail: 0

3Pi2002Unreg_Att: 0

3Pi2002Aud_Setup: 0

3Pi2002Jitter_Avg: 0.0

3Pi2002Jitter_Max: 0

3Pi2002Pkt_Lost: 0.00

3Pi2002Voice_Time: 0 mins 0 secs

3Pi2050Reg_Att: 0

```
3Pi2050Reg_Fail: 0
3Pi2050Unreg_Att: 0
3Pi2050Aud_Setup: 0
3Pi2050Jitter_Avg: 0.0
3Pi2050Jitter_Max: 0
3Pi2050Pkt_Lost: 0.00
3Pi2050Voice_Time: 0 mins 0 secs
ChanAud_Setup: 3
ChanJitter_Avg: 1.0
ChanJitter_Max: 23
ChanPkt_Lost: 0.00
ChanVoice_Time: 1 mins 29 secs
```

Each collection period provides the following:

- the date and time for the collection period hour.

- TPS information for Internet Telephones that are registered to the TPS on the Voice Gateway Media Card during that hour. The TPS information is prefixed by the model number (i2002, i2004, i2050).

- Voice Gateway channel information accumulated during the hour. The Voice Gateway data is prefixed by *Chan.*

- Notes indicating whether the machine has been rebooted during the hour.

The om.txt file relates to the omreport.xxx file on the Voice Gateway Media Card, where xxx indicates the numbers of days since December 31.

In general, there is no relationship between the Internet Telephones registered on a card and the Voice Gateway channels on the card (if there are two or more cards) in the node. If there is only one card (with multiple Internet Telephones), there can be a partial correlation between the Internet Telephones and the card information. However, even with only one card there still is not a 100% correlation, since an Internet Telephone can still call another Internet Telephone without involving the Voice Gateway channels.

──────────────── **End of Procedure** ────────────────

Viewing the IP Line log files

OTM uses FTP to transfer the log file from the Voice Gateway Media Card
to the PC. The file is opened in WordPad. The IP Line Error log file (syslog)
displays error information, including error date/time, the originating module
(IP Telephony node), and specific error data.

To view IP Line error conditions that are abnormal events, but not severe
enough to raise an alarm, follow the steps in Procedure 58.

Procedure 58
Viewing IP Line info and error log

1   In the OTM Navigator window, click the **Services** folder. Double-click the
IP Telephony icon. The **IP Telephony** window opens.

2   Right-click the card and then select **Properties** from the pop-up menu.
The **Card Properties** window opens to the **Maintenance** tab. See
Figure 108 on .

3   Click the **Open log file** button and review the file contents.

———————— **End of Procedure** ————————

Back up and restore OTM data

The OTM Backup Wizard is used to backup and restore any or all OTM
PC-based data, including IP Line OTM data. All IP Line data is stored in an
Access database file on the OTM PC or Server. This file is backed up only
when the user selects the "Full OTM Backup" option. This option backs up
all OTM data contained in the PC directory where OTM is installed and can
only be used to restore all data.

For more information on using the OTM Backup Wizard, see the *Common
Services* section in *Optivity Telephony Manager: System Administration*
(553-3001-330).

Update IP Telephony node properties using OTM

To update the node properties of a Voice Gateway Media Card, follow the steps in Procedure 59.

<table>
<tr>
<td>⚠️</td>
<td>

CAUTION — Service Interruption

This procedure is not supported for a node which resides on a Succession 1000 system.

</td>
</tr>
</table>

Procedure 59
Updating the IP Telephony node properties

1   In the OTM Navigator window, click the **Services** folder. Double-click the **IP Telephony** icon. The **IP Telephony** window opens.

2   Double-click on the node in the upper part of the window. The **Node Properties** window appears.

   Perform all required updates to the **General** tab and **Configuration** tab parameters. The General and Configuration tabs are used to set the node properties. The other tabs affect the CONFIG.INI file and are also known as the card-affecting properties tabs. If any node or card property is changed, the configuration data must be transmitted to the node or the card.

3   If Voice Gateway Media Cards are added, deleted or replaced in the node or if a Voice Gateway Media Card is replaced, then use one of the following procedures:

   • "Add a Voice Gateway Media Card to the node" on page 387

   • "Delete a Voice Gateway Media Card from the node" on page 393

   • "Delete the Leader Voice Gateway Media Card from the node" on page 395

   • "Change the IP addresses of an IP Telephony node in OTM" on page 396

   • "Replacing a Leader Voice Gateway Media Card" on page 549

End of Procedure

Add a Voice Gateway Media Card to the node

To add a Voice Gateway Media Card to the node, follow the steps in
Procedure 60.

> ⚠ **CAUTION — Service Interruption**
>
> This procedure is not supported for a node which resides
> on a Succession 1000 system.

Procedure 60
Adding a Voice Gateway Media Card to the node

1   Choose a card slot for the new card. Note the TN.

2   Configure IPTN on the system in LD 14 at the Call Server.

3   Install the I/O cables for connection to the ELAN and TLAN on the
selected card slot.

4   In the OTM Navigator window, click the **Services** folder. Double-click the
IP Telephony icon. The **IP Telephony** window opens.

5   Double-click the node in the upper portion of the window. The Node
Properties window opens. Click on the **Configuration** tab. See
Figure 109 on .

Figure 109
Node Properties – Configuration tab

6   Enter the Card Properties data for Leader 1 and the Follower cards:

a. **Card role:** Assign the Card role Leader 0 to the first card configured. Assign the second card configured as Leader 1. All remaining cards are assigned as Followers.

b. **Management IP:** This is the ELAN IP address for the card. OTM and and the system use this address to communicate with the card.

c. **Management MAC:** This is the motherboard Ethernet address from the "Voice Gateway Media Card installation summary sheet" on page 132.

d. **Voice IP:** This is the TLAN IP address for the card.

e. **Voice LAN gateway IP:** This is the IP address of the router interface on the TLAN.

f. **Card TN:** For Large Systems, enter Card TN (l s c) information. For Small Systems, enter only the card number between 0 – 50. The card TN format is determined by the system type that is configured in the OTM Navigator. Enter the correct system type in the OTM Navigator before adding the node.

g. **Card Type:** Select Pentium for the ITG-P 24-port line card or Strong Arm for the Succession Media Cards.

h. Click **Add**. The card role and address information appears in a working list at the bottom of the New Node window.

7 Click **Apply** to add the Card Properties to the Node.

8 If more cards are to be added, add them by repeating the steps above. Click **OK** when all the cards are added.

Prematurely clicking OK at this point, closes the window and saves any changes. Double-click the new node in the upper part of the main **IP Telephony** window to re-open Node Properties and complete the configuration procedures.

9 In the OTM Navigator window, click the **Services** folder. Double-click the **IP Telephony** icon. The **IP Telephony** window opens.

10 From this list of IP Telephony nodes in the upper part of the window, select the IP Telephony node to which configuration data will be transmitted.

11 Click the **Configuration | Synchronize | Transmit**. The **Transmit Options** window appears. Keep the default setting of **Transmit to selected nodes** radio button. Check only the **Node Properties to Active Leader** check box. See Figure 110 on .

12 Click the **Start transmit** button. Monitor progress under the **Transmit Control** window. Confirm that the node properties are transmitted successfully to Leader 0.

13 When the transmission is complete, click the **Close** button.

14 Choose a card slot for the new card. Note the TN. Configure IPTN in Meridian 1. See Table 39 on .

15 Install the I/O cables for the connection to the ELAN and TLAN on the selected card slot. Ensure that the I/O cable are connected to the ELAN and TLAN network.

16 In the OTM Navigator window, click the **Services** folder. Double-click the **ITG Line 3.1** icon. The **IP Telephony Gateway - IP Line 3.1** window opens.

17 From this list of IP Telephony nodes in the upper part of the window, select the IP Telephony node to which the configuration data will be transmitted.

18 Click the **Configuration | Synchronize | Transmit**. The **Transmit Options** window opens.

19 Keep the default setting of **Transmit to selected nodes** radio button. Check only the **Node Properties to Active Leader** check box. See Figure 110 on .

Figure 110
Transmit Options
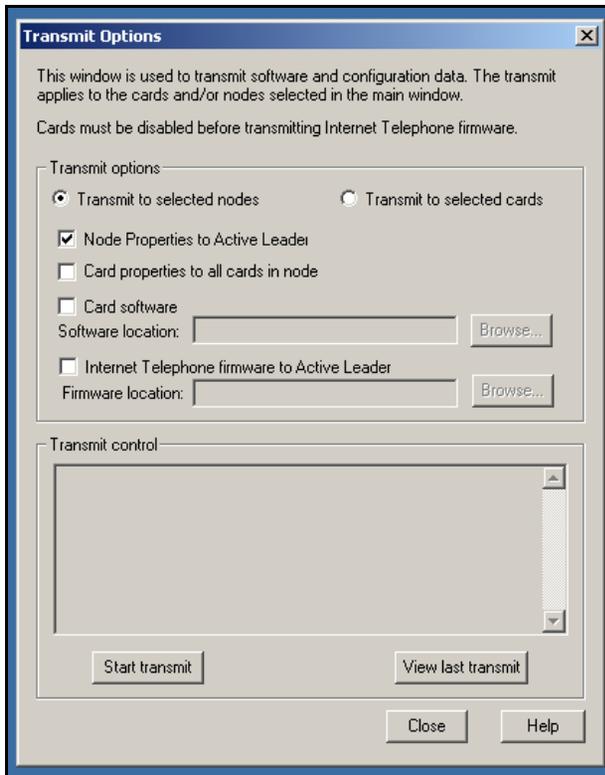
20 Click the **Start transmit** button. Monitor the progress in the **Transmit Control** window. Confirm that the node properties are transmitted successfully to Leader 0.

21 When the transmission is complete, click the **Close** button.

22 Insert the new card. The card starts and obtains its IP configuration from the node master. This takes several minutes.

   The Maintenance faceplate display shows an alarm of T:21 or S009.

   •   T:21 is displayed if the card is new and there is no CONFIG.INI file.

   •   S009 is displayed if the card has been used before and has a CONFIG.INI file that contains an IP address for the Call Server that is no longer correct.

23 In the OTM IP Line 3.1 application, refresh the view of the card status in the node. Verify the card is responding to OTM by selecting the IP Telephony node from the list in the upper part of the main window. All Voice Gateway Media Cards in the node are displayed in the lower part of the window. While the node is selected, from the node list, press function key **F5** or **View | Refresh | Selection** to refresh the card status of all cards in the selected node.

   The card status should display as "Enabled" or "Disabled". If the status is "Not responding", verify the network connection and the proper configuration of the network equipment.

24 In the OTM Navigator window, click the **Services** folder. Double-click the **IP Telephony** icon. The **IP Telephony** window opens.

25 Select the IP Telephony node in the upper part of the window.

26 Select the new card(s) in the lower part of the window. Hold down the **Ctrl** key to select multiple cards.

27 Click the **Configuration** menu option and then select **Synchronize | Transmit**. The **Transmit Options** window appears.

28 Click the **Transmit to selected cards** radio button. See Figure 111 on .

Figure 111
Transmit Options – Transmit to selected cards
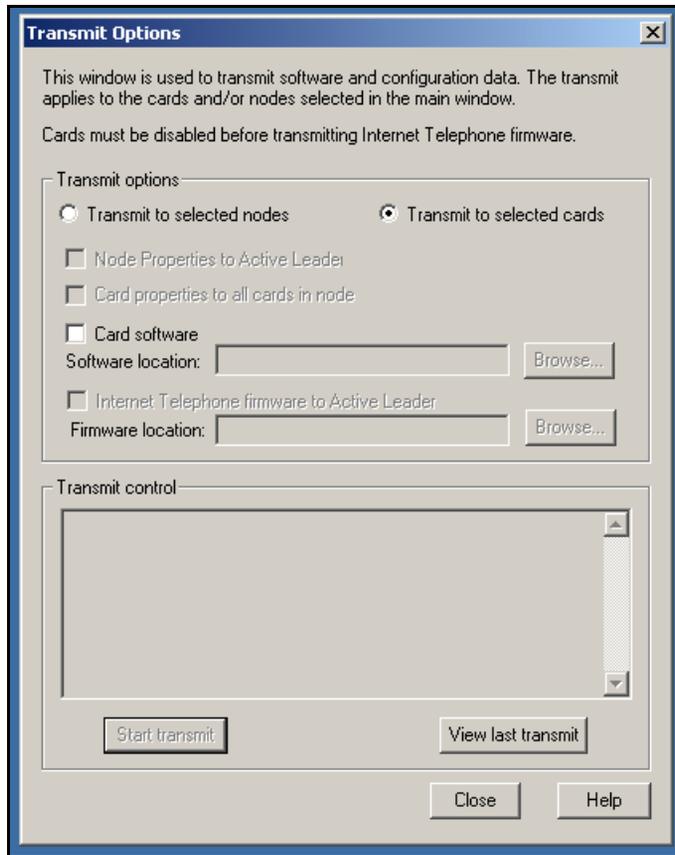
29 Click the **Start transmit** button. Monitor the progress in the **Transmit Control** window.

30 When the transmission is complete, click the **Close** button.

31 Verify that all the new Voice Gateway Media Cards in the node have a signaling link to the Call Server.

32 Telnet to each Voice Gateway Media Card and log in. At the IPL> command line, enter the **pbxLinkShow** command. Alternatively, observe the display on the card and ensure it is displaying F000.

33 At this point verify the card software and firmware version. Upgrade the software and the firmware, if necessary, using Procedure 23 on page 227, Procedure 24 on page 232, and Procedure 26 on page 237. However, apply these procedures only to this card.

———————— **End of Procedure** ————————

Delete a Voice Gateway Media Card from the node

To delete a Voice Gateway Media Card from the node, follow the steps in Procedure 61.

To delete the Leader 0 Voice Gateway Media Card from the node, follow the steps in Procedure 62 on page 395.

> **CAUTION — Service Interruption**
>
> These procedures are not supported for a node which resides on a Succession 1000 system.

Procedure 61
Deleting a Voice Gateway Media Card from the node

1 In the OTM Navigator window, click the **Services** folder. Double-click the **IP Telephony** icon. The **IP Telephony** window opens.

2 Select the node in the upper portion of the window.

3 In the **IP Telephony** window, select **Node | Properties** from the popup menu. The Node Properties window is displayed.

4 Click the **Configuration** tab.

5 Select the Voice Gateway Media Card to be deleted from the working list at the bottom of the window.

6 Click the **Delete** button.

7 Click **OK**.

8 Next, transmit the node properties. In the **IP Telephony** window, click the **Configuration | Synchronize | Transmit**. The **Transmit Options** window opens.

9   Select the **Transmit to selected nodes** radio button. Check the **Node Properties to Active Leader** check box.

10 Click the **Start transmit** button. Monitor progress in the **Transmit Control** window. Confirm that the node properties are transmitted successfully to Leader 0.

11 When the transmission is complete, click the **Close** button.

12 Remove the Voice Gateway Media Card.

⚠️ **CAUTION WITH ESDS DEVICES**
Follow the anti-static procedures and place the Voice Gateway Media Card in an appropriate anti-static package.

---

13 Remove the Voice Gateway Media Card configuration data from the Call Server.

    a.   Identify the TN of the Voice Gateway Media Card.

    b.   In LD 20, enter the **LTN** (List Terminal Number) command where **TYPE = VGW** to list the TNs on the Voice Gateway Media Card TN. This returns a list of units equipped on the card. Verify the number of units that are equipped on the card. Take note of the first unit equipped on the card.

    c.   In LD 14, use the **Out n** command, where **n** equals the number of units that are equipped on the card.

14 At the TN prompt, enter the TN for the first unit that was equipped on the card, as determined in Step 15 in Procedure 60 on . As the units are deleted, verify that the intended units are "outed".

End of Procedure

Delete the Leader Voice Gateway Media Card from the node

A node's Leader 0 card cannot be deleted from OTM. It is necessary to Telnet to the Leader 0 Voice Gateway Media Card and enter a command to remove the Leader 0 card. Follow the steps in Procedure 62 to delete the Leader 0 card.

CAUTION — Service Interruption

This procedure is not supported for a node which resides on a Succession 1000 system.

Procedure 62
Deleting the Leader 0 Voice Gateway Media Card from the node

1 In the OTM Navigator window, click the **Services** folder. Double-click the **IP Telephony** icon. The **IP Telephony** window opens.

1 Select the node in the upper portion of the window.

2 In the lower portion of the window, right-click on the Leader 0 card to be deleted. Select **Telnet** from the pop-up window.

3 Log into the card.

4 Enter the **clearLeader** command from the IPL> CLI. This command removes the IP address information from NVRAM and clears the Leader flag.

———————————— **End of Procedure** ————————————

Change the IP addresses of an IP Telephony node in OTM

Prior to changing any IP address, understand "Codecs" on page 113, and consult with the IP network administrator. IP address configuration changes are completed on four tabs in the Node Properties window as follows:

- General tab – Configure network connections in this tab.
  See Figure 112 on page 397.

- Configuration tab – Card properties are set in this tab.
  See Figure 113 on page 399.

- SNMP Traps/Routing and IPs tab – SMNP traps and card routing table entries are configured in this tab.
  See Figure 115 on page 402.

- Ports tab – ELAN settings are set in this tab.
  See Figure 116 on page 403.

To change the IP address of an IP Telephony node, follow the steps in Procedure 63 on page 396.

> **CAUTION — Service Interruption**
>
> This procedure is not supported for a node which resides on a Succession 1000 system.

Procedure 63
Changing the IP addresses of an IP Telephony node in OTM

1 In the OTM Navigator window, click the **Services** folder. Double-click the **IP Telephony** icon. The **IP Telephony** window opens.

2 Select the node in the upper portion of the window. Select the card in the lower portion of the window.

3 Click **Configuration | Node | Properties** to update the Voice Gateway Media Card IP addresses as required. The **Node Properties** window opens.

Figure 112
Node Properties – General tab

4 Select the **General** tab. See Figure 112 on page 397.

Under **Network Connections**

a. **Voice LAN Node IP:** This is also known as the TLAN IP address.

- If the node IP is changed, this affects the configuration of the Connect Server IP address in the DHCP Server for the Internet Telephones.

- If the Internet Telephones are using partial DHCP mode, manually reconfigure the IP address in each Internet Telephone.

b. **Management LAN gateway IP:** This IP address is used to route to the ELAN. If OTM is not connected to the local ELAN, then it communicates with this node through the Management LAN gateway. If changes are made to the gateway IP address and these changes are not coordinated properly, OTM loses communication with the node:

- When a Management LAN gateway is added to the ELAN, the gateway must restrict access so that only authorized traffic is permitted on the ELAN.

- The router must disable the BootP relay agent for ELAN interface.

- The router must block all broadcast and multicast traffic from the ELAN and enable only proper access; that is, only authorized traffic and users can come through the Management LAN gateway. OTM is one of these users.

c. **Management LAN subnet mask:** When changing these subnet masks, consider the possibility of conflict between the ELAN and TLAN IP addresses. Consult with the IP administrator before making any changes to subnets. See "Codecs" on page 113.

When changing the Management LAN (ELAN) subnet, this must be coordinated with the IP address on the Call Server (Active ELNK) subnet. Changes must also be co-ordinated with the following:

- Management LAN gateway, and other IP devices on the ELAN (for example, OTM if it is local)

- any other devices on the ELAN and the customer's enterprise network (CLAN) that could need to communicate with IP Line

- devices that are looking to receive SNMP traps

d. **Voice LAN subnet mask:** Coordinate with Voice LAN gateway (router). When changing the Voice LAN (TLAN) subnet mask, the change must be coordinated with changing the subnet mask of the Voice LAN (TLAN) gateway (router) interface.

5 Click **Apply**.

6 Select the **Configuration** tab. See Figure 113 on page 399.

Figure 113
Node Properties – Configuration tab

7   Select the card to be changed from the list at the bottom of the tab.

8   Click the **Host Names** button. The Hostname Config window opens. See
    Figure 114 on .

    The Hostname Config is part of the management information base. It
    enables the card to be identified by System Name, System Location, and
    System Contact to an SNMP management server. If any of this
    information is changed, it must be changed on each individual card. Click
    OK when done to return to the Configuration tab.

Figure 114
Hostname Config
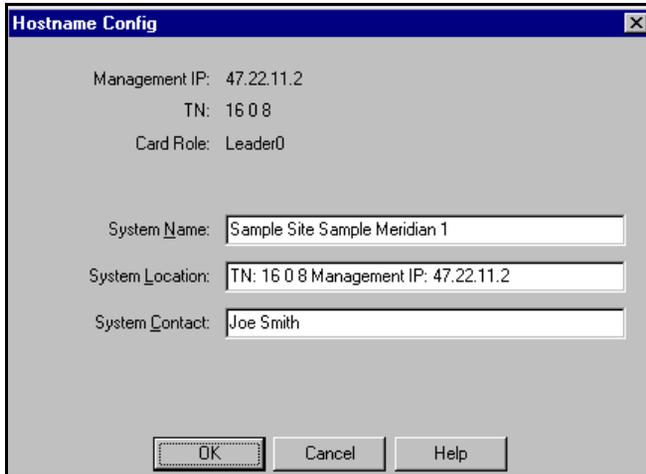
9   Under **Card Properties**:

   a.   Card Role: The first card in the node must be Leader 0.

      The can be only one Leader 0 in each IP Telephony node. All other cards function as Followers. OTM, however, requires that the first Follower be configured as Leader 1 even though it has no Leader functions. The remaining cards are configured as Followers.

   b.   Management IP: If changing the Management IP address of Leader 0, it is necessary Telnet to the card and use the **setLeader** command to make the same change (new Management IP address) in the NVRAM of the Leader 0 card.

      Leader 0 must be reset for OTM to resume communication with the node.

   Note: Prior to resetting Leader 0, unplug all the other cards to prevent any other card from becoming the Master. When Leader 0 restarts, plug the cards back in. These other cards receive their new configuration from Leader 0.

c. **Management MAC:** All other IP configuration depends on the accurate configuration of the Management MAC address. The MAC address is located on the faceplate of the Voice Gateway Media Card and is labelled as MOTHERBOARD Ethernet address. The Management MAC address corresponds to the ELAN address.

d. **Voice IP:** This is the card Voice IP address. This address is also known as the card TLAN IP address. In an IP Telephony node, all cards must be assigned an address on the same TLAN subnet. The card Voice IP address must be distinct from the node IP address.

e. **Voice LAN gateway IP:** All cards in the IP Telephony node must be on the TLAN; therefore they all share the same Voice LAN (TLAN) gateway IP address.

f. **Card TN:** It is mandatory that the Card TN format match both the machine type and the card slot where the card resides. Otherwise, the voice gateway channels do not function.

If trying to change the card TN format, first record the node configuration data. Delete the node. Change the card TN format to the correct machine, and rebuild the node.

For Large Systems systems, enter Card TN (l s c) information. For Small Systems and Succession 1000 systems, enter only the card slot number between 1 – 50. The card TN format is determined by the Meridian 1, Succession 1000M, and Succession 1000 system type which is configured in the OTM navigator. The correct system type must be entered in the OTM Navigator before adding the node.

g. **Card Type:** Select Pentium for the ITG-P 24-port line card or Strong Arm for the Succession Media Cards.

10 For each card:

a. Click the **Change** button. The changes are reflected in the working list at the bottom of the tab.

b. Then click **Apply** to save the changes to the card in the database.

Select the next card to be changed from the working list at the bottom of the tab. Make the appropriate changes, and then repeat the previous steps.

11 Select the **SNMP Traps/Routing and IPs** tab. See Figure 115 on .

Figure 115
Node Properties – SNMP Traps/Routing and IPs tab
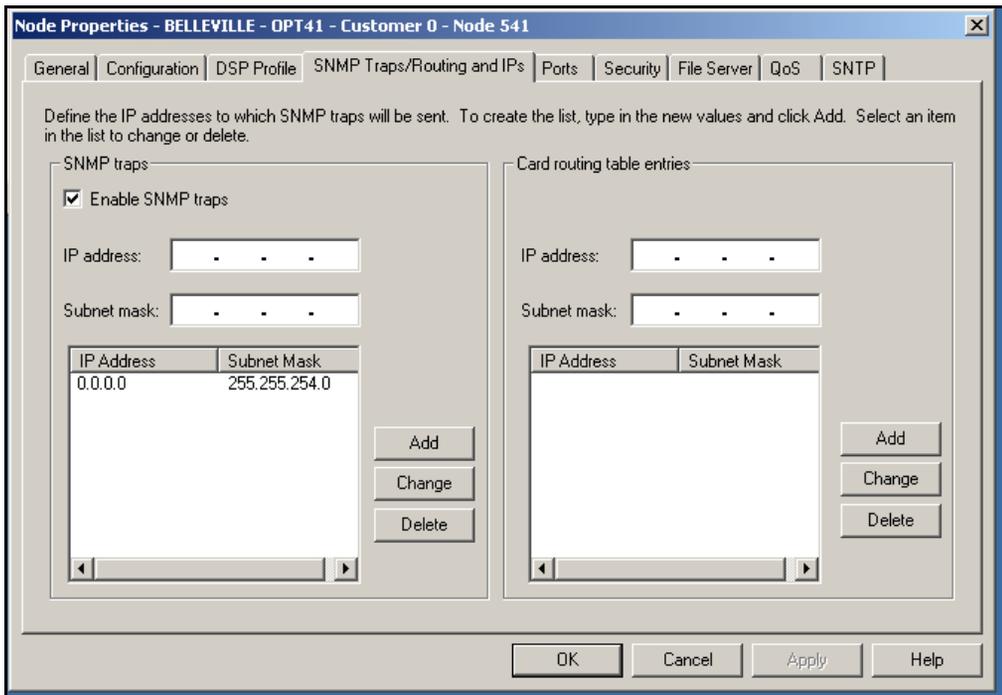
Changes can be made to the SNMP Traps and Card routing table entries without affecting other IP addresses. Change the SNMP traps and Card routing table entries as required, based on the destination host to be reached.

IP addresses that are added in this tab create special card routing tables that direct packets out the ELAN and ELAN gateway. Exercise caution when adding entries since the entry could result in one-way voice transmission, if a change results in voice packets being streamed out the ELAN instead of the TLAN interface.

Under **SNMP Traps**, up to eight SNMP trap servers can be defined.

Under **Card routing table entries**, use caution when assigning card routing table entries. Do not include the IP address of an Internet Telephone. Otherwise, voice traffic to these Internet Telephones is incorrectly routed through the ELAN and ELAN gateway. To avoid including the wrong IP address, Nortel Networks recommends that Host IDs be defined for the card routing table entries.

12   Click **Apply** if any changes are made on the SNMP Traps/Routing and IPs tab.

13   Select the **Ports** tab. See Figure 116 on .

Figure 116
Node Properties – Ports tab

Under **ELAN**:

a.   **Call Processor ID:** A change to this IP address must be co-ordinated with the Call Server (Active ELNK) subnet.

b.   **Survival Cabinet IP:** If applicable, enter the Survivable Cabinet ELAN IP address (Active ELNK). The survivable Cabinet IP is enabled only for Small Systems and Succession 1000 systems.

Note: For Small Systems or Succession 1000 systems, this field is disabled unless at least one cabinet has been defined in OTM Navigator as a survival cabinet of the main system. There is only one survival cabinet IP address for each node. The survivable cabinet is equipped with sufficient trunk cards and Voice Gateway Media Cards. In case of Call Server equipment failure, the survival cabinet provides a large degree of survivability for Internet Telephone users.

c.   **Signaling port:** This field is read-only.

d.   **Broadcast port:** This field is read-only.

Under **TLAN**:

a.   **Signaling port:** This field is read-only.

b.   **Voice port:** This field displays the range for RTP packets sent to the Internet Telephones. In general, use the default value of 5200. If, however, there are numerous telephones working over low bandwidth WAN links using CISCO RTP header compression, then change the voice port to a number in the range of 16384 to 32767. Coordinate this value change with the IP network administrator.

14   Click **Apply**.

15   When all updates to the IP addresses have been made, click **OK** in the Node Properties window.

16   Unplug all the Voice Gateway Media Cards, except Leader 0. Leader 0 receives its configuration from the BOOTP.TAB file. Plug in all the cards. Leader 0 forces its configuration to all the other cards.

17 Transmit the node or card properties to the Leader 0 card.

Select the Leader 0 Voice Gateway Media Card in the IP Telephony window.

If changes are made to the _____ tab...	... then transmit _____ properties.
General tab *Note:* If changes are made to the System Name, System Location, or System Contact in the Hostname Config window (Host Names button), the card properties must be transmitted.	node properties
Configuration tab	node properties
SNMP Traps/Routing and IPs tab	card properties
Ports tab	card properties

18 Click the **Configuration | Synchronize | Transmit**.

To transmit to the node, select the **Transmit to selected nodes** radio button. Check the **Node Properties to Active Leader** check box.

Click the **Start transmit** button.

The results of the transmit appear in the box under **Transmit control**. Verify that the properties are transmitted successfully. If the transmit is unsuccessful, click the **Start transmit** button again.

19 Log into LD 32 and disable the cards using the DISI command.

Click the **Configuration | Synchronize | Transmit**.

Select the **Transmit to select cards** radio button.

Click the **Start transmit** button.

The results of the transmit appear in the box under **Transmit control**. Verify that the properties transmitted successfully. If the transmit is unsuccessful, click the **Start transmit** button again.

20 Click **Close** when the properties are successfully transmitted.

―――――――――― **End of Procedure** ――――――――――

If the IP addresses of a single card have changed, the card must be restarted for the changes to take effect. See "Restart a Voice Gateway Media Card" on However, if IP addresses that affect the entire node have been changed, then all cards in the node must be restarted. See "Restart all Voice Gateway Media Cards" on

Restart a Voice Gateway Media Card

If the IP address of a Voice Gateway Media Card has changed, restart that card only. Follow the steps in Procedure 64.

Procedure 64
Restarting a Voice Gateway Media Card

1 To prevent interruption to the speech path, log into LD 32. Type the **DISI** command. This command disables the voice gateway channels when they become idle. DISI removes the call traffic but does not remove the Internet Telephones that are registered on that Voice Gateway Media Card. The Graceful TPS Disable command **disiTPS** does that.

2 Type **disiTPS** at the card's IPL> prompt to disable the TPS service on the Voice Gateway Media Card. This Graceful TPS Disable command prevents new Internet Telephones from registering on the card. All Internet Telephones registered on the card are re-directed to another Voice Gateway Media Card when the telephone becomes idle.

   After the command is entered, an idle Internet Telephone is supposed to be updated with the Watchdog reset message. However, the TPS sends a soft reset message to the Internet Telephone, redirecting it to the Connect Server. The disabled TPS does not accept new registrations, so the Internet Telephones must register with another TPS in the node. Eventually, as all of the TPS's Internet Telephones become idle, they are registered with other TPSs. The Voice Gateway Media Card can then be restarted with no impact to any users.

———————————— **End of Procedure** ————————————

Restart all Voice Gateway Media Cards

All Voice Gateway Media Cards cards have to be restarted if there has been a change to one of the following:

- node IP address – these changes affect the whole node and, as a result, all cards must be restarted

- subnet of either the TLAN or ELAN (by changing the subnet mask or the subnet fields of the IP address) – if the Management (ELAN) IP address of Leader 0 has changed, all cards have to be restarted. Even though this is a change to a single card, this change affects all cards, as OTM uses this address to transmit properties to the node

Follow the steps in Procedure 65 to restart all the Voice Gateway Media Cards.

Procedure 65
Restarting all the Voice Gateway Media Cards

1   Telnet to the card from OTM.

2   Use the **setLeader** command to set the new IP address. Leader 0 uses this new IP address when it reboots.

3   Reboot the Leader 0 using the **cardReset** command.

4   The Leader 0 card reads the new IP address from NVRAM.

5   Restart all the other cards.

———————————————————— **End of Procedure** ————————————————————

Update Voice Gateway Media Card card properties

Some basic Voice Gateway Media Card configuration must be performed from the Node Properties window. To update the card properties in the DSP Profile, follow the steps in Procedure 66.

<table>
<tr>
<td>⚠️</td>
<td>

CAUTION — Service Interruption

This procedure is not supported for a node which resides on a Succession 1000 system.

</td>
</tr>
</table>

Procedure 66
Updating card properties – DSP Profile tab

1   In the OTM Navigator window, click the **Services** folder. Double-click the **IP Telephony** icon. The **IP Telephony** window opens.

2   Click **Configuration | Node | Properties**.

3   Click the **DSP Profile** tab. The **DSP Options** sub-tab appears. See Figure 117 on .

Figure 117
Node Properties – DSP Profile tab - DSP Options sub-tab
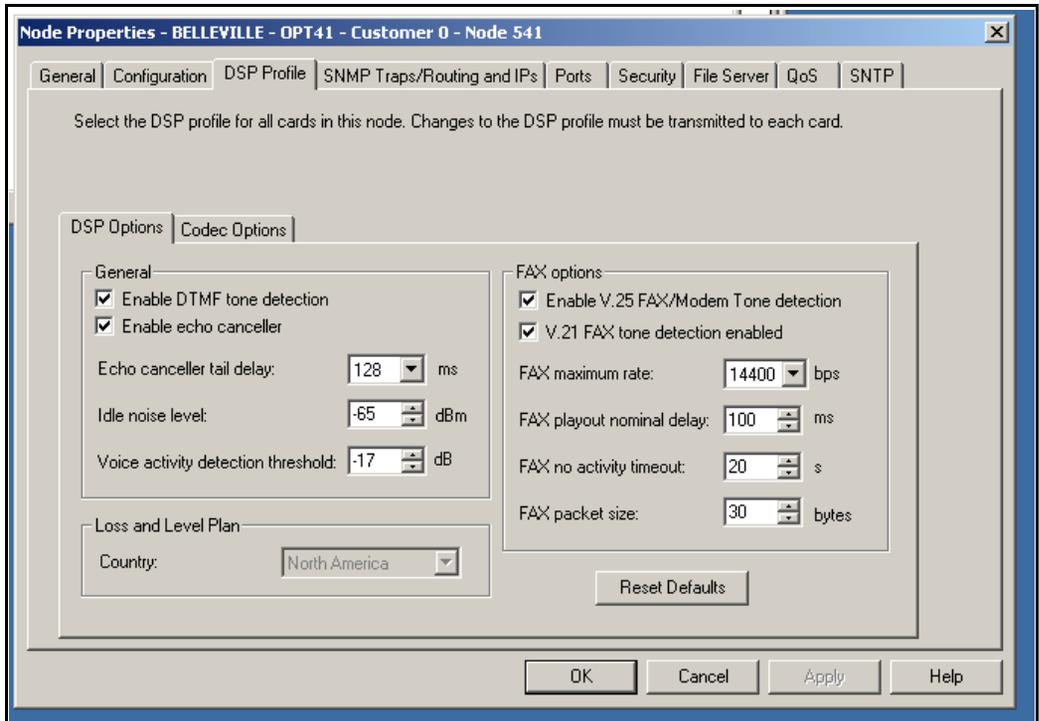
Table 52 lists the configurable DSP parameters, the range of the values, and the default values.

Table 52
DSP parameters (Part 1 of 2)

Parameter	Range	Default value
Enable DTMF tone detection	checked or unchecked	checked
Enable echo canceller	checked or unchecked	checked
Echo canceller tail delay	64 or 128 ms	128 ms
Idle noise level	–327 to +327 dB	–65

Table 52
DSP parameters (Part 2 of 2)

Parameter	Range	Default value
Voice activity detection threshold	–20 to +10 dB	–17 dB
Enable V.25 FAX/Modem tone detection	checked or unchecked	checked
Enable V.21 FAX tone detection	checked or unchecked	checked
FAX maximum rate	2400, 4800, 7200, 9600, 12000, 14400 bps	14400 bps
FAX playout nominal delay	0 – 300 ms	100 ms
FAX no activity timeout	10 – 32000 seconds	20 seconds
FAX packet size	20 – 48 bytes	30 bytes

4   Click the **Codec Options** sub-tab. See Figure 118 on .

Up to four Codecs can be selected.

Note: The T.38 Fax and G.711 Clear Channel Fax Codecs are not counted in this limit.

The G.711 Codec type is mandatory and is automatically selected.

5   Under **Codec Options**, the following parameters are user-configurable on a per-Codec basis:

Leave the values at their default settings unless directed to change them as follows or by Nortel Networks Field Support.

a.   **Law type:** The law type is applicable to G.711 only. The default is mu-law.

b.   **Voice Activity Detection:** The default is VAD disabled.

The VAD value is stored in the Config.ini file under the entry *VadEnabled=*

VAD is not supported for G.711.

    c.   **Voice payload size**: The default is the maximum supported. This parameter is not configurable for the following:

- G.723.1

- T.38 Fax

- G.711 Clear Channel Fax

The payload size is stored in the Config.ini file under the entry *VxPayload=*

    d.   **Voice playout nominal delay (nominal jitter buffer)**
        Voice playout maximum delay (maximum jitter buffer)

The default values and the range of allowed values are displayed in the pull-down lists.

6   Click **OK**.

Figure 118
ITG Node Properties – DSP Profile tab - Codec Options sub-tab with G.729 AB Codec selected
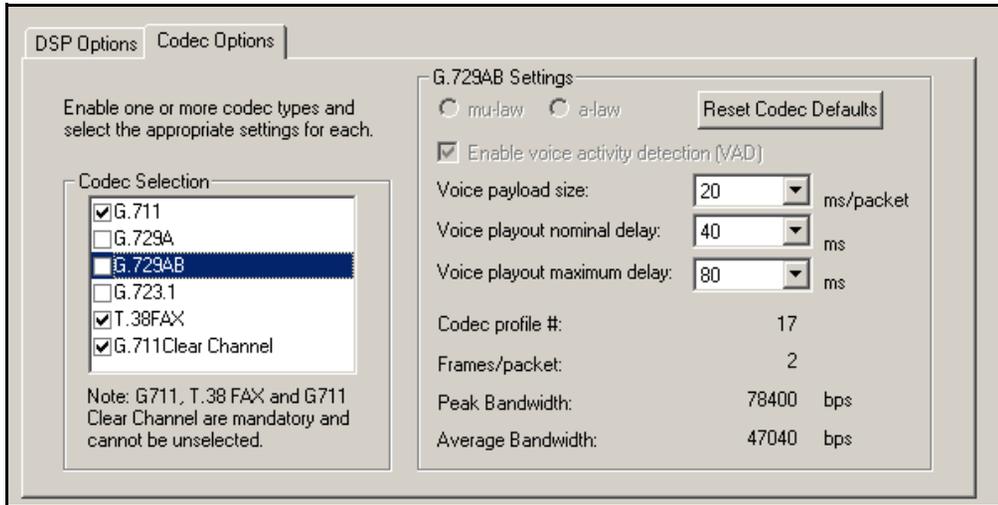
Note: If there are multiple nodes on a system and the same Codec is selected on more than one node, ensure that each node has the same voice payload size configured for the Codec.

──────── **End of Procedure** ────────

As a result of the Run-time Configuration Change feature, the card does not have to be restarted if there are changes to the settings on the DSP Profile tab. For changes to the Codec Options, disable the card, download the card properties, and then re-enable the card.

If the settings have changed on the DSP Profile tab, follow the steps in Procedure 67 to disable and then enable the Voice Gateway Media Card.

> **CAUTION — Service Interruption**
>
> This procedure is not supported for a node which resides on a Succession 1000 system.

Changes to the DSP Profile tab settings are applied immediately when the card properties are transmitted.

Procedure 67
Disabling and re-enabling the Voice Gateway Media Card

1   Log into LD 32 on the Call Server and use the **DISI** command to disable the Voice Gateway Media Card.

2   In the OTM Navigator window, click the **Services** folder. Double-click the **IP Telephony** icon. The **IP Telephony** window opens.

3   Select the IP Telephony node from the list in the upper part of the main window. All Voice Gateway Media Cards in the node are displayed in the lower part of the window. Select the node from the node list and press function key **F5** or **View | Refresh | Selected** to refresh the card status of all cards in the selected node.

4   In the **IP Telephony** window, click the **Configuration** menu option and then select **Synchronize | Transmit**. The **Transmit Options** window appears.

5   Select the **Transmit to selected cards** radio button.

6   Click the **Start transmit** button. Verify that the transmit is successful under **Transmit Control** and then click **Close**.

7   Login to the Call Server and go to LD 32. Type the **ENCL** command to enable the Voice Gateway Media Card.

——————————   **End of Procedure**   ——————————

The Retrieve command

The Retrieve command sends information from the Voice Gateway Media Cards to the OTM IP Telephony node. The Retrieve command is used for the following:

•   downloading a node or card configuration by a remote OTM user

    Note: This can also be performed by using the "Add Node" command and selecting the "Retrieve the active configuration from an existing node" option.

- copying node information from one node to another

- restoring accidentally-changed OTM information, and downloading information to a fictitious "dummy" node that has been created for this purpose, in order to view the configuration of the Voice Gateway Media Card and the IP Telephony node.

CAUTION — Service Interruption

This procedure is not supported for a node which resides on a Succession 1000 system.

Procedure 68
Using the Retrieve command

1   In the OTM Navigator window, click the **Services** folder. Double-click the **IP Telephony** icon. The **IP Telephony** window opens.

2   Select the card(s) from which to retrieve information.

3   Click **Configuration | Synchronize | Retrieve**. The **Retrieve Options** window opens. See Figure 119 on page 415.

Figure 119
Retrieve Options window
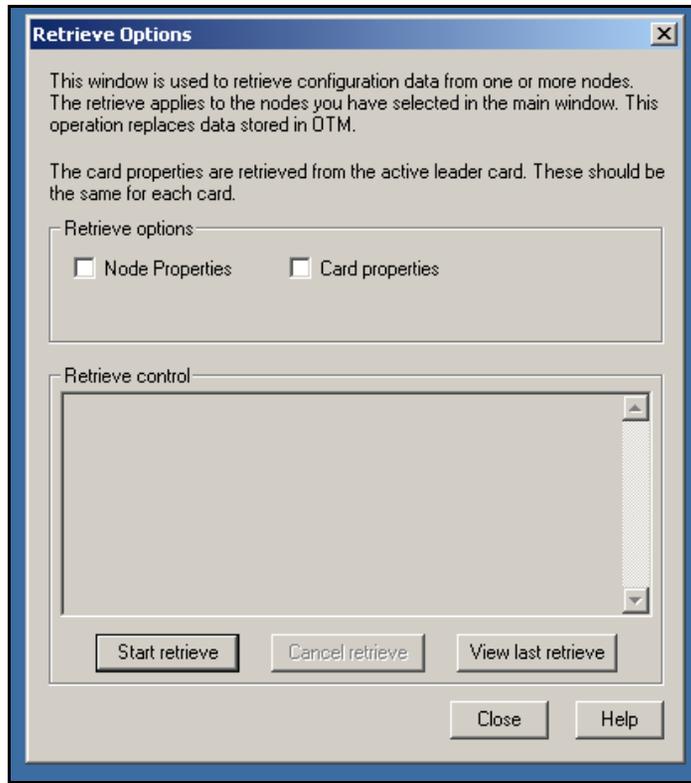
4   Under **Retrieve Options**, configure whether to retrieve **Node properties**
    or **Card properties** by clicking one or more of the check boxes.

5   Click **Start Retrieve**. The results of the Retrieve command are displayed
    under **Retrieve control**.

    Note 1: If the Retrieve command is successful, the current configuration
    of the node or card properties in OTM is overwritten by the configuration
    data that was retrieved from the node. The new configuration data can be
    viewed in the Node Properties window.

Note 2: To view the configuration of a node without overwriting the current node configuration in OTM, retrieve the information to a dummy node.

—————— **End of Procedure** ——————

Add an IP Telephony node in OTM by retrieving an existing node

Use this optional procedure in the following cases:

- to add existing nodes to a particular OTM PC to manage the IP Telephony network from a single point of view

- to restore the IP Telephony configuration database to an OTM PC whose hard drive has crashed, as an alternative to restoring the OTM IP Telephony nodes from the OTM Disaster Recovery Backup

When the IP Telephony node is installed and configured manually, that node can then be added to another OTM PC by retrieving the configuration data from the existing IP Telephony node.

Configure the site name, system name, and customer number in the OTM Navigator before adding a new IP Telephony node. Only one IP Telephony node can be added in the OTM IP Line application for each system customer.

If multiple OTM PCs are used to manage the same IP Telephony network, care must be taken to synchronize the different copies of the IP Telephony database. The OTM **Configuration | Synchronize | Retrieve** function can be used to synchronize the OTM IP Telephony database with the database on the IP Telephony node.

> **CAUTION — Service Interruption**
>
> This procedure is not supported for a node which resides on a Succession 1000 system.

Follow the steps in Procedure 69 to add an IP Telephony node by retrieving an existing node.

Procedure 69
Adding a node by retrieving an existing node

1   In the OTM Navigator window, click the **Services** folder. Double-click the **IP Telephony** icon. The **IP Telephony** window opens.

2   Click the **Configuration | Node | Add**. The **Add Node** dialog box opens. See Figure 120 on .

Figure 120
Add Node – Retrieve configuration from existing node
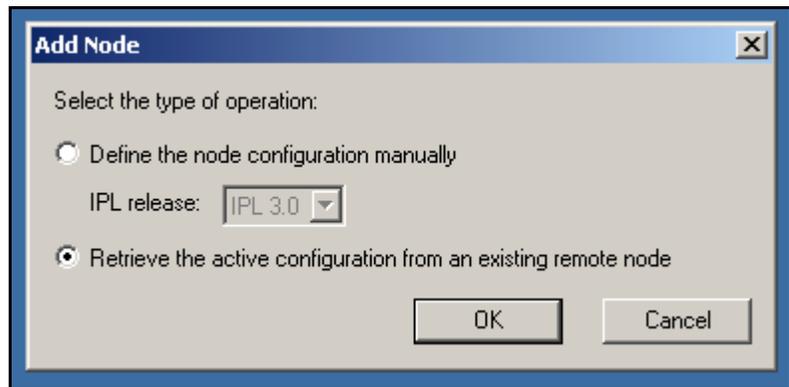
3   Click the **Retrieve the active configuration from an existing remote node** radio button, and then click **OK**. The **Retrieve node** window opens. See Figure 121 on .

Figure 121
Retrieve node
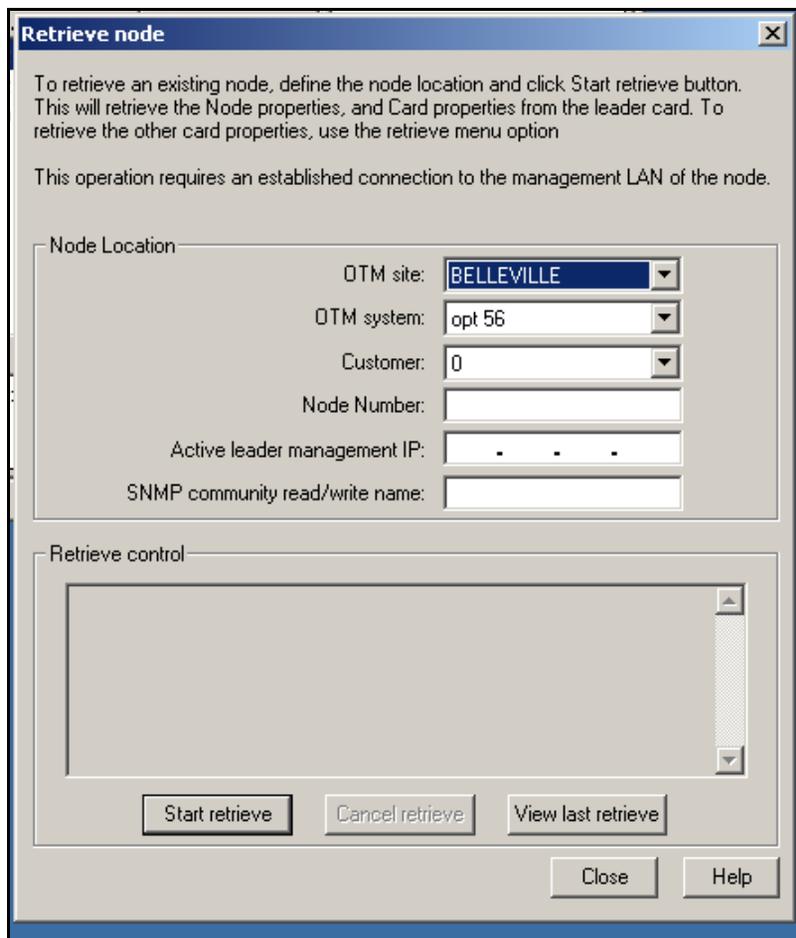
4 The OTM site name, OTM system name, and customer number must exist in the OTM Navigator before a new IP Telephony node can be added.

Note: Ensure the system type is defined correctly.

Under **Node Location** in the **Retrieve node** window:

a. **OTM site:** Select the OTM Site.

b. **OTM system:** Select the system.

c. **Customer:** Select the Customer number.

d. **Node Number:** Ensure the node number is unique under the customer number. Also, ensure that all IP Telephony nodes connected to the same TLAN subnet have a unique node number regardless of the OTM site, Meridian 1 system, and customer number.

e. **Active leader management (ELAN) IP:** Enter the active Leader management IP address field for the existing node.

f. **SNMP community read/write name:** Enter the SNMP read/write community name.

5 Click **Start retrieve**.

The results of the retrieval are shown under **Retrieve control**. The node properties are retrieved from the active Leader. The card properties are retrieved from Leader 0.

6 Click **Close** when the download is complete.

7 In the **IP Telephony** window, select the newly added node in the top part of the window.

8 Refresh the card status (**View | Refresh**) and verify that the cards in the newly added node are responding.

9 A new node has been created by retrieving data from another node Double-click on the new node in the **IP Telephony** window. The **Node Properties** window opens for the newly added node.

10 Inspect each tab in the node properties and verify the data is correct and consistent with the node from which the data was retrieved. Click the **Configuration** tab and ensure the Host names information, IP addresses, and TN are consistent.

──────── **End of Procedure** ────────

IP Line CLI access using Telnet or local RS-232 maintenance port

There are two ways to access the IPL> Command Line Interface (CLI):

1   Use the NTAG81CA cable to connect the DIN8 pin connector on the faceplate, or the NTAG81BA cable to connect the DB9 I/O breakout cable to the COM port of a local PC. Use a null modem adapter to connect a modem for remote dial-up access.

2   Telnet to the card from the OTM **IP Telephony** window. This automatically Telnets to the IP address of the Management interface (ELAN) of the card. Alternatively, use the Telnet application on a PC and manually enter the Management IP address (ELAN), Voice IP address (TLAN), or the node IP address if trying to connect to the active Leader.

CAUTION

Do not connect two maintenance terminals to both the faceplate and I/O panel serial maintenance port connections at the same time.

Telnet to a Voice Gateway Media Card

To access the CLI on a Voice Gateway Media Card from the OTM PC, follow the steps in Procedure 70.

Procedure 70
Accessing a Voice Gateway Media Card using Telnet

1   In the OTM Navigator window, click the **Services** folder. Double-click the **IP Telephony** icon. The **IP Telephony** window opens.

2   Right-click on the Voice Gateway Media Card to be accessed. Select **Telnet to ITG card** from the popup menu. The OTM PC opens a Telnet window and automatically connects to the Voice Gateway Media Card by using the Management IP address (ELAN).

3 Enter a user name and password to access the IPL> CLI. The default user name and password are both **itgadmin**. However, for security purposes, the user name and password should have been changed during installation.

4 The IPL> prompt appears if the login is successful. Type **?** at the prompt to display a list of available IPL> CLI commands. See "IP Line CLI commands" on for a detailed list of commands.

——————————— **End of Procedure** ———————————

IP Line administration using Element Manager

Contents

This section contains information on the following topics:

Introduction

This chapter explains how to administer IP Line 3.1 and the Voice Gateway Media Card on Succession 1000 and Succession 1000M systems using Element Manager.

Element Manager administration procedures

This section describes the administration procedures that can be performed using Element Manager.

Turn off browser caching

Internet Explorer caching interferes with the Element Manager application, in that users cannot see real-time changes as they occur. For this reason, Nortel Networks recommends that Internet Explorer's caching be turned off prior to using Element Manager.

Follow the steps outlined in Procedure 28 on to prevent caching of web pages by the Internet Explorer browser.

IP Line Operational Measurement report scheduling and generation

Operational Measurement (OM) reports provide important statistical and traffic information and feedback to the system administrator to better engineer the system. The information stored in the OM file applies only to the calls routed over the IP network by way of IP Line. OM reports give a quantitative view of system performance, such as jitter.

A single Voice Gateway Media Card's Operational Measurements file can be viewed directly from Element Manager. This OM report is a view of the TPS and Voice Gateway channel activity on that specific card. Use this procedure to view the individual card 's information for each Voice Gateway Media Card in the node.

The Voice Gateway Media Card OM file contains the following information:

• the number of incoming and outgoing calls

• the number of call attempts

• the number of calls completed

• the total holding time for voice calls

To view a single Voice Gateway Media Card's OM file directly from Element Manager, follow the steps in Procedure 71 on .

Procedure 71
Retrieving the current OM file from the Voice Gateway Media Card using Element Manager

1 Click **System Status** in the Navigation Tree.

2 Click **IP Telephony**. The **IP Telephony Information** page opens.

3 Expand the node containing the Voice Gateway Media Card. See Figure 122.

Figure 122
System Status > IP Telephony > IP Telephony Information
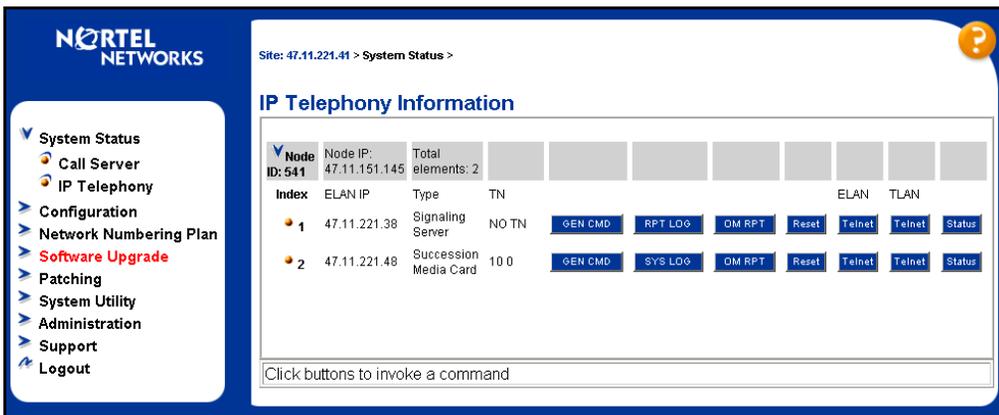
4   Click the **OM RPT** button associated with the Voice Gateway Media Card. The **View OM File** page opens. See Figure 123 on .

Figure 123
System Status > IP Telephony > IP Telephony Information > View OM File
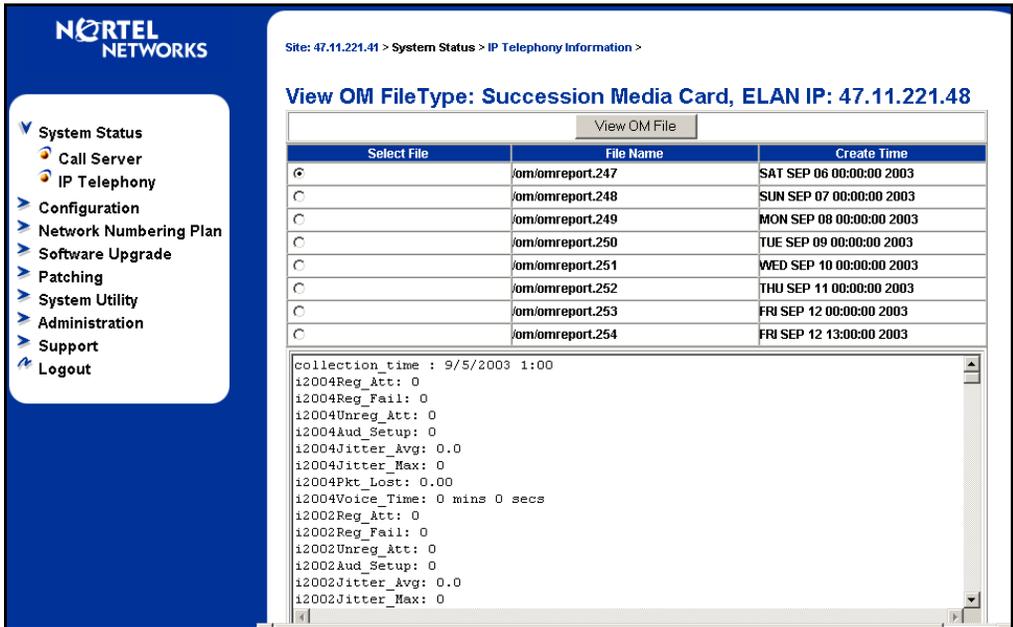
5   The eight most recent OM Report files are displayed in chronological order for that Voice Gateway Media Card.

6   To view a OM file, click the radio button for the file to be viewed and then click the **View OM File** button. The OM report data appears at the bottom of the page.

—————————   **End of Procedure**   —————————

Collection period

The file contains collection period information for each hour of the day that the card was running.

The collection periods start with the hour from midnight to 1:00am. As each hour passes, a collection period is added to the OM file; therefore, there is a maximum of 24 collection periods each day.

Output

The OM report output tracks the statistics per Internet Telephone set type.

Data is first output for the Nortel Networks versions of the i2004, i2002, and i2050.

That output is followed by data for the 3rd party internet telephones, labelled:

- 3Pi2004

- 3Pi2002

- 3Pi2050

Finally, the data for the gateway channels is output.

Output example

An example of a single hour's OM report is as follows:

```
-> ommShow

collection_time : 9/5/2003 1:00

i2004Reg_Att: 0

i2004Reg_Fail: 0

i2004Unreg_Att: 0

i2004Aud_Setup: 0

i2004Jitter_Avg: 0.0

i2004Jitter_Max: 0

i2004Pkt_Lost: 0.00

i2004Voice_Time: 0 mins 0 secs

i2002Reg_Att: 0

i2002Reg_Fail: 0

i2002Unreg_Att: 0

i2002Aud_Setup: 0

i2002Jitter_Avg: 0.0

i2002Jitter_Max: 0

i2002Pkt_Lost: 0.00

i2002Voice_Time: 0 mins 0 secs

i2001Reg_Att: 0

i2001Reg_Fail: 0

i2001Unreg_Att: 0

i2001Aud_Setup: 0

i2001Jitter_Avg: 0.0

i2001Jitter_Max: 0

i2001Pkt_Lost: 0.00

i2001Voice_Time: 0 mins 0 secs
```

```
i2050Reg_Att: 0

i2050Reg_Fail: 0

i2050Unreg_Att: 0

i2050Aud_Setup: 0

i2050Jitter_Avg: 0.0

i2050Jitter_Max: 0

i2050Pkt_Lost: 0.00

i2050Voice_Time: 0 mins 0 secs

3Pi2004Reg_Att: 0

3Pi2004Reg_Fail: 0

3Pi2004Unreg_Att: 0

3Pi2004Aud_Setup: 0

3Pi2004Jitter_Avg: 0.0

3Pi2004Jitter_Max: 0

3Pi2004Pkt_Lost: 0.00

3Pi2004Voice_Time: 0 mins 0 secs

3Pi2002Reg_Att: 0

3Pi2002Reg_Fail: 0

3Pi2002Unreg_Att: 0

3Pi2002Aud_Setup: 0

3Pi2002Jitter_Avg: 0.0

3Pi2002Jitter_Max: 0

3Pi2002Pkt_Lost: 0.00

3Pi2002Voice_Time: 0 mins 0 secs

3Pi2050Reg_Att: 0

3Pi2050Reg_Fail: 0

3Pi2050Unreg_Att: 0

3Pi2050Aud_Setup: 0
```

```
3Pi2050Jitter_Avg: 0.0

3Pi2050Jitter_Max: 0

3Pi2050Pkt_Lost: 0.00

3Pi2050Voice_Time: 0 mins 0 secs

ChanAud_Setup: 0

ChanJitter_Avg: 0.0

ChanJitter_Max: 0

ChanPkt_Lost: 0.00

ChanVoice_Time: 0 mins 0 secs
```

Each collection period provides the following information:

- The date and time for the collection period hour.

- TPS information for Internet Telephones that are registered to the TPS on the Voice Gateway Media Card during that hour. During normal operation, the TPS values for the Voice Gateway Media Card can be zeros as the Internet Telephone normally register to the TPS on the Succession Signaling Server.

- Voice Gateway channel information accumulated during the hour. The Voice Gateway data is prefixed by *Chan.*

- Notes indicating whether the machine has been rebooted during the hour.

- Virtual Trunk statistics display only for a Succession Signaling Server that has been running the VTRK H.323 Succession Signaling Server in the last hour.

The OM file relates to the omreport.xxx file on the Voice Gateway Media Card, where xxx indicates the numbers of days since December 31.

In general, there is no relationship between the Internet Telephones registered on a card and the Voice Gateway channels on the card (if there are two or more cards) in the node. If there is only one card (with multiple Internet Telephones), there might be a partial correlation between the Internet Telephones and the card information. However, even with only one card there still is not a 100% correlation, since an Internet Telephone can still call another Internet Telephone without involving the Voice Gateway channels.

──────────── **End of Procedure** ────────────

Note: Element Manager supports the ability to view OM files only. OTM can optionally be used to support other Operational Measurements tasks such as scheduling reports, generating reports, opening reports, and viewing reports.

See "IP Line Operational Measurement report scheduling and generation" on for more information.

View IP Line log files

Element Manager uses RPC to transfer the sysfile from the Voice Gateway Media Card to the PC. The error log file displays error information, including error date/time, the originating module (IP Telephony node), and specific error data.

To view error conditions that are abnormal events, but not severe enough to raise an alarm, follow the steps in Procedure 72.

Procedure 72
Viewing IP Line log files

1 Click **System Status** in the Navigation Tree.

2 Click **IP Telephony**. The **IP Telephony Information** page appears.

3 Expand the node containing the Voice Gateway Media Card. See Figure 122 on .

4 Click the **SYS LOG** button associated with the Voice Gateway Media Card. The **Syslog** page appears. See Figure 124 on .

5 The Syslog page has five buttons to view the log files:

- The LATEST button displays the most recent syslog information for the Voice Gateway Media Card.

- There are four SYSLOG.# buttons; one for each of the four syslog files on the Voice Gateway Media Card.

Figure 124
System Status > IP Telephony > Syslog
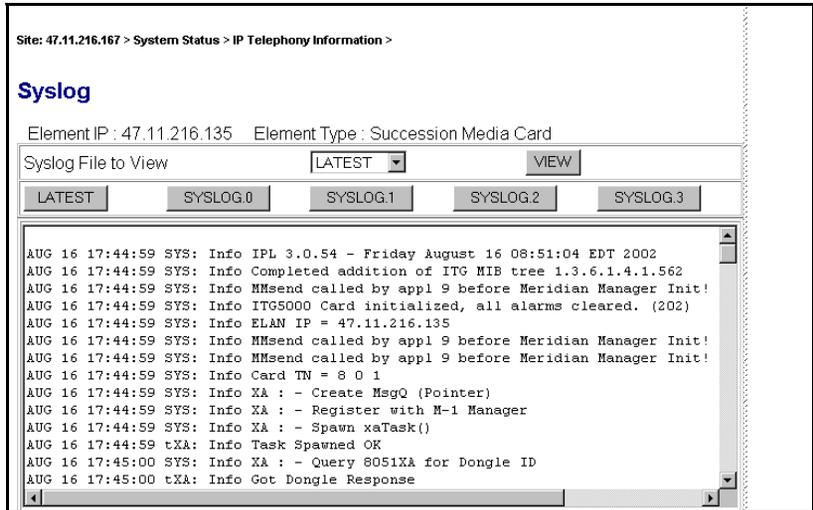
6 Click the LATEST button to view the most current syslog information that was written to the Voice Gateway Media card, or click the SYSLOG.0-3 buttons to view any of the syslog files.

The syslog file data is displayed in the window below the buttons. The data can be error messages or information messages. For each message, the date, timestamp, and the task that is printing the message is displayed.

———————— **End of Procedure** ————————

Backup and restore data

All data is stored on the Call Server. Element Manager accesses the data for the elements being maintained. Element Manager does not store data.

There is no Element Manager-specific data that needs to be backed up. All data is retrieved from the Call Server and elements.

The c:/u/db/node directory is populated on the Call Server when the node configuration is saved. The BOOTP.TAB and CONFIG.INI files are saved in this directory as c:/u/db/node/nodexxxx.btp and c:/u/db/node/nodexxxx.cfg where xxxx is the node ID:

- nodexxxx.btp is the BOOTP.TAB file

- nodexxxx.cfg is the CONFIG.INI.

If a node is removed, the associated files are also removed. For every node that is created, a nodeyyyy.btp and nodeyyyy.cfg file are created in the C:/u/db/node directory.

	WARNING Do not manually edit or delete the node files. Manually editing or deleting these files can cause corruption of Element Manager.

Backup

The Backup command invokes the Equipment Data Dump (EDD) operation on the Call Server to back up all Call Server data. Within Element Manager, the **Call Server Backup** function invokes a data dump and writes the Call Server data to the primary and internal backup drives.

The backup includes all Call Server data as well as the BOOTP.TAB and CONFIG.INI files for each node configured in the system. These files are stored on the Call Server for the IP Telephony nodes configured in the system.

This Backup function can also be performed on the Call Server by entering the **EDD** CLI command using LD 43.

During the Backup function, the BOOTP.TAB and CONFIG.INI files of all registered nodes are copied so that they can be restored in case of system failure.

Follow the steps in Procedure 73 on to back up the Call Server.

Procedure 73
Backing up the Call Server data

1   Click **System Utility** in the Navigation Tree.

2   Click **Backup**. The **Call Server Backup** page opens. See Figure 125 on .

Figure 125
System Utility > Backup
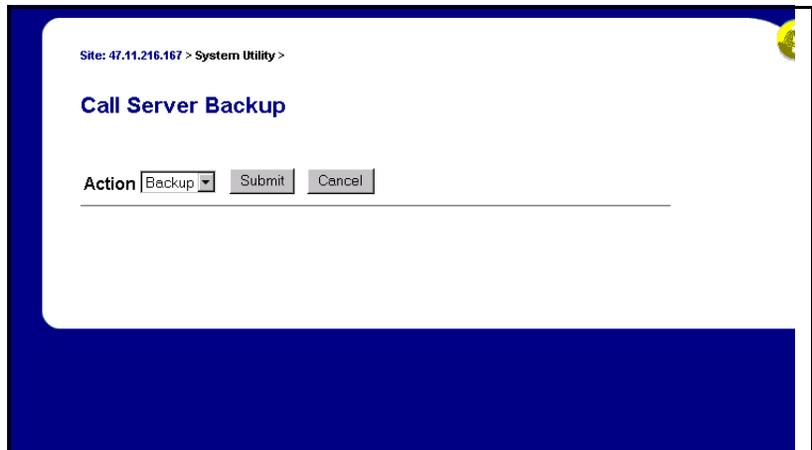
3   Select **Backup** from the Action drop-down list box.

4   Click the **Submit** button. The page displays messages indicating "Backup in progress. Please wait..."

5   Click OK in the EDD complete dialog box. See Figure 126 on .

Figure 126
EDD complete

The Backup function then displays information in a tabular form indicating the actions that were performed.

———————— **End of Procedure** ————————

Restore the backed up files

The **Call Server Restore** function restores the backed up files from the internal backup device to the primary device. The Restore function performs the same task as the **RIB** CLI command in LD 43.

To restore the Call Server data, follow the steps in Procedure 74.

Procedure 74
Restoring the Call Server data

1   Click **System Utility** in the Navigation Tree.

2   Click **Restore**. The **Call Server Restore** page opens. See Figure 127 on page 438.

Figure 127
System Utility > Restore
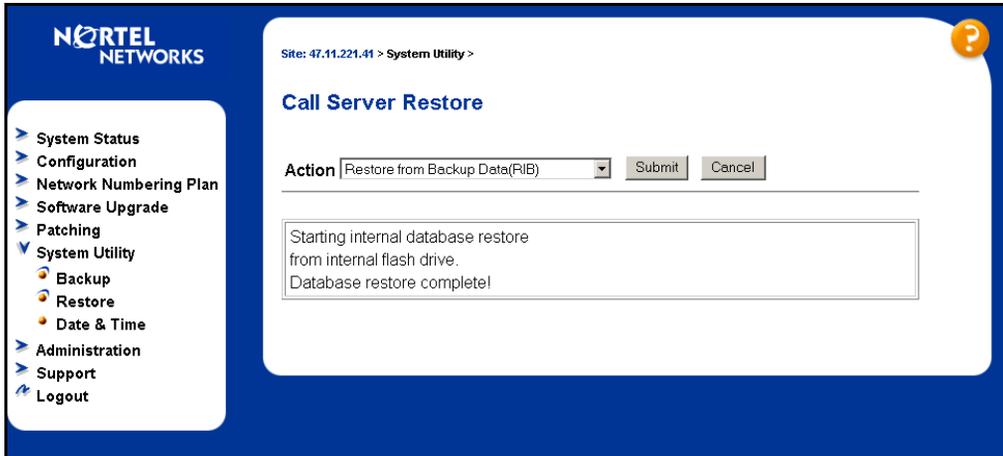
3   Select **Restore from Backup Data** from the **Action** drop-down list box.

4   Click the **Submit** button.

    If the Restore is successful, the message "Restore was done successfully" is displayed.

——————————— **End of Procedure** ———————————

Update IP Telephony node properties

To update the node properties of a Voice Gateway Media Card, follow the steps in Procedure 75.

Procedure 75
Updating the IP Telephony node properties

1   Click **Configuration** in the Navigation Tree.

2   In the Configuration menu, click **IP Telephony**. The **Node Summary** page opens.

3   Click the **Edit** button associated with the node to be updated. See Figure 128 on .

Figure 128
Element Manager – Node Summary
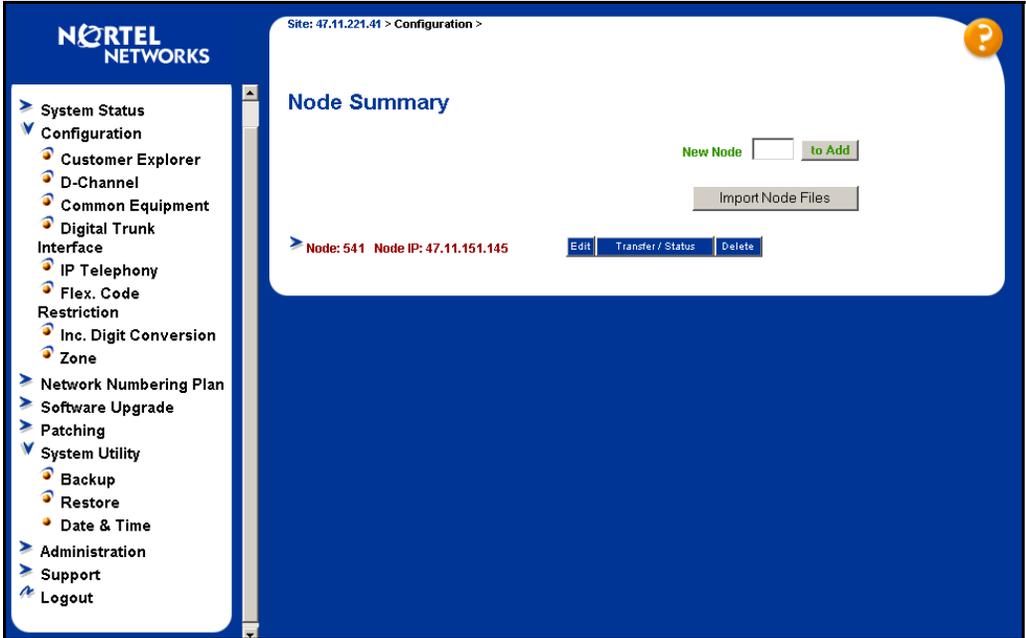
4   The **Edit** page opens. See Figure 129 on .

Figure 129
Element Manager – Edit
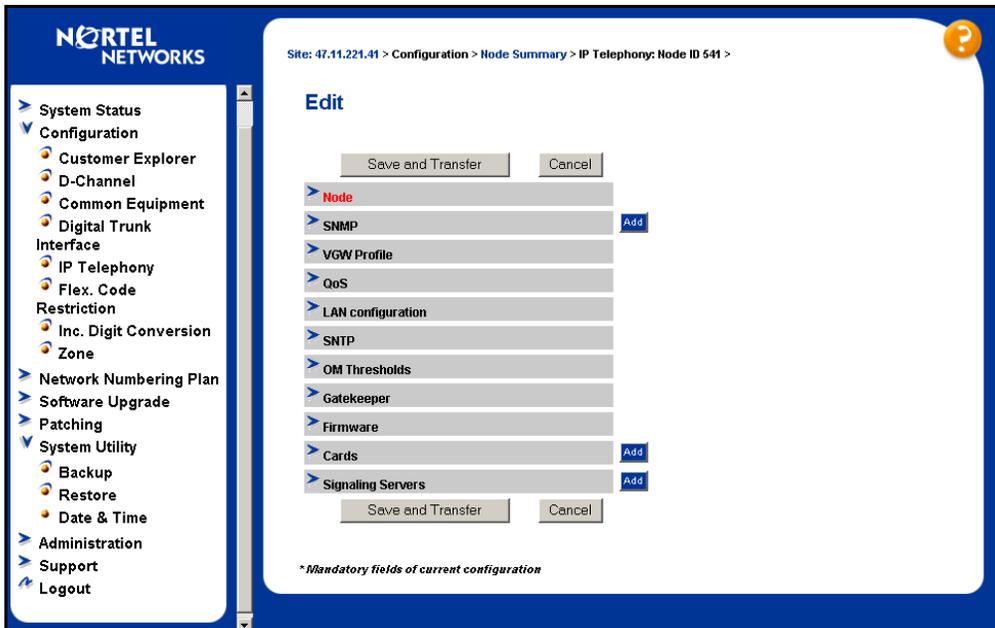
5   Perform all required updates to the parameters in the appropriate sections.

6   If Voice Gateway Media Cards are added to, deleted from, or replaced in the node or a Voice Gateway Media Card is changed, then use one of the following procedures:

   •   "Add a Voice Gateway Media Card to the node" on

   •   "Delete a Follower Voice Gateway Media Card from the node" on

- "Change the IP addresses of an IP Telephony node in Element Manager" on

- "Replacing a Follower Voice Gateway Media Card" on

- refer to the Maintenance section for the procedure to replace a Voice Gateway Media Card – "Replace a Voice Gateway Media Card" on

——— **End of Procedure** ———

Add a Voice Gateway Media Card to the node

To add a Voice Gateway Media Card to the node, follow the steps in Procedure 76.

Procedure 76
Adding a Voice Gateway Media Card to the node

1 Choose a card slot for the new card. Note the TN.

2 Configure IPTN in LD 14 at the Call Server.

3 Install the I/O cables for connection to the ELAN and TLAN on the selected card slot.

4 Click **Configuration** in the Navigation Tree.

5 In the Configuration menu, click **IP Telephony**. The **Node Summary** page opens.

6 Click the **Edit** button for the node that is receiving the new Voice Gateway Media Card. The **Edit** page opens.

7 Click the **Add** button to the right of the Cards section. See Figure 130 on .

Figure 130
Cards – Add button

8 Observe that the Cards section expands. See Figure 131 on .

Figure 131
Configuration > Node Summary > Edit > Add Card

9   Enter the **Card Properties** data:

   a.   **Role:** Element Manager reads the role from the card configuration.

   b.   **Management LAN (ELAN) IP address:** This is the ELAN IP address for the card. Element Manager and the system use this address to communicate with the card.

   c.   **Management LAN (ELAN) MAC address:** This is the motherboard Ethernet address from the "Voice Gateway Media Card installation summary sheet" on page 133.

   d.   **Voice LAN IP (TLAN) address:** This is the TLAN IP address for the card.

   e.   **Voice LAN gateway (TLAN) IP address:** This is the IP address of the router interface on the TLAN.

   f.   **Card TN:** Enter the card slot number between 1 – 50.

g. **Card processor type:** Choose either Pentium or Succession Media Card. Select Pentium if using the ITG-P 24-port line card (dual-slot card), or select Succession Media Card if using the Succession Media Card single-slot card.

h. **H323 ID:** The H323 ID in IP Line 3.1 is for the Virtual Office/Branch Office feature. Keep the H323 ID the same for all the elements within one node.

i. **System name:** Enter the name of the system.

j. **System location:** Enter the location where the system resides.

k. **System contact:** Enter the system contact name and phone number.

10 To add additional cards to the node, click the **Add** button again and enter the new card information. Repeat this step for each card to be added to the node.

11 Observe that new cards appear under the Cards section as they are added. See Figure 132 on .

Figure 132
Added cards

12 Click the **Submit** button after the card(s) has been added and configured. Clicking the **Submit** button saves the data to the Call Server. Click **OK** to confirm.

Note 1: The Submit button can be clicked after each card is configured in the Edit page. However, each time the Submit button is clicked, the Edit page closes and the Node Summary page is displayed. To continue the node configuration, click the Edit button to return to the Edit page.

Note 2: If the Cancel button is clicked, all information that has been configured is discarded. The Edit page closes and the Node Summary page opens.

13 The Edit page closes, and the Node Summary page opens. See Figure 133 on .

Figure 133
Node added to the Node Summary page
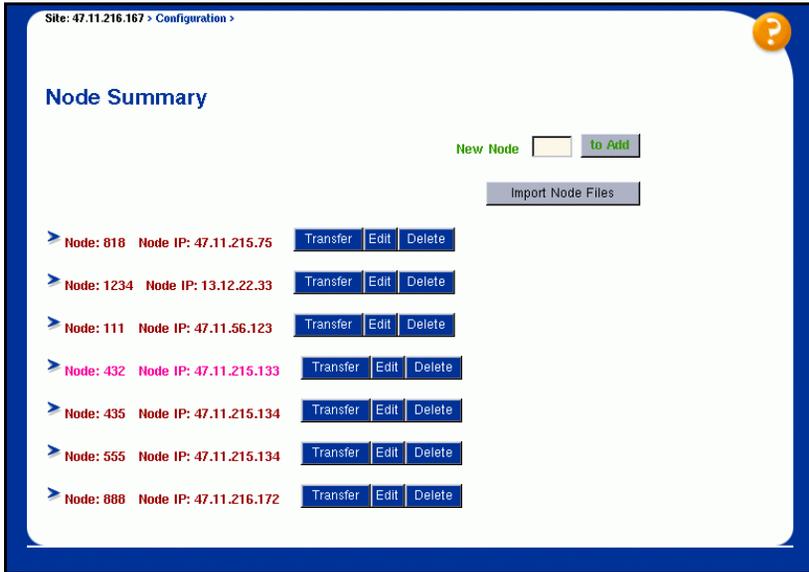
14 Click the **Transfer** button associated with the node where the new card(s) was added.

15 Click **OK** to confirm the transfer. See Figure 134 on .

Figure 134
Transfer confirmation dialog box

16 The **Transfer Progress** page opens and displays each of the Voice Gateway Media Card in the node. See Figure 135 on .

The Voice Gateway Media Card's retrieve the CONFIG.INI and BOOTP.TAB files from the Call Server. A check mark is added to each field as the card receives its CONFIG.INI and BOOTP.TAB files. When the transfer is complete, click **OK** in the Progress Check Complete dialog box.

- If the transfer is successful for a card, the Status column displays "Complete".

- If the transfer is unsuccessful, the Status column displays "Fail".

Figure 135
Transfer Progress page
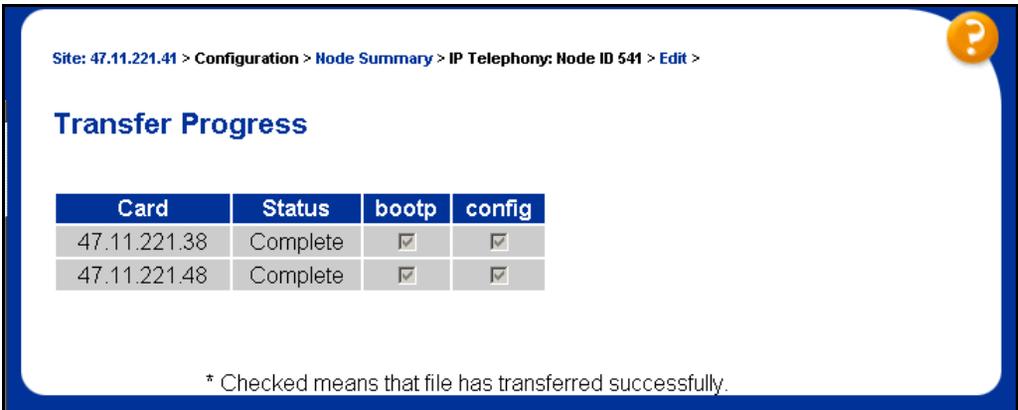
17 Insert the new card. The card starts and obtains its IP configuration from the node master. This takes several minutes.

The Maintenance faceplate display shows an alarm of T:21 or S009.

- T:21 is displayed if the card is new and there is no CONFIG.INI file.

- S009 is displayed if the card has been used before and has a CONFIG.INI file that contains an IP address for the Call Server that is no longer correct.

18 Select **System Status | IP Telephony** from the Navigation Tree. The IP Telephony Information pages appears. Expand the node containing the Voice Gateway Media Card.

19 Click the **GEN CMD** button associated with the Voice Gateway Media Card. The **General Commands** page opens. Click the **cardRoleShow** command from the drop-down list box.

If the card role is not a Follower as expected, Telnet to the card's IPL> CLI and enter the **clearLeader** command to remove the clearLeader flag.

20 In the **Node Summary** page, click the **Transfer** button. This downloads the node information to the card.

21 Click **System Status** in the Navigation Tree. Click **IP Telephony**. The IP Telephony Information page appears.

22 Expand the node containing the new card(s) that were added.

23 Click the **Status** button for each Voice Gateway Media Card that was added.

The card status should display as "Enabled" or "Disabled". If the status message of "WEB3003: Destination IP address cannot be reached; initial RPC failure" is displayed, then verify the network connection and the proper configuration of the network equipment.

24 Verify that all the new Voice Gateway Media Cards in the node have a signaling link to the Call Server.

25 Click **System Status | IP Telephony Information**. Go to the **General Command** page. Click the **pbxLinkShow** command from the drop-down list box. See Figure 136 on .

Alternatively, Telnet to each Voice Gateway Media Card and log in. Enter the **pbxLinkShow** command at the IPL> prompt.

Figure 136
General Commands > pbxLinkShow
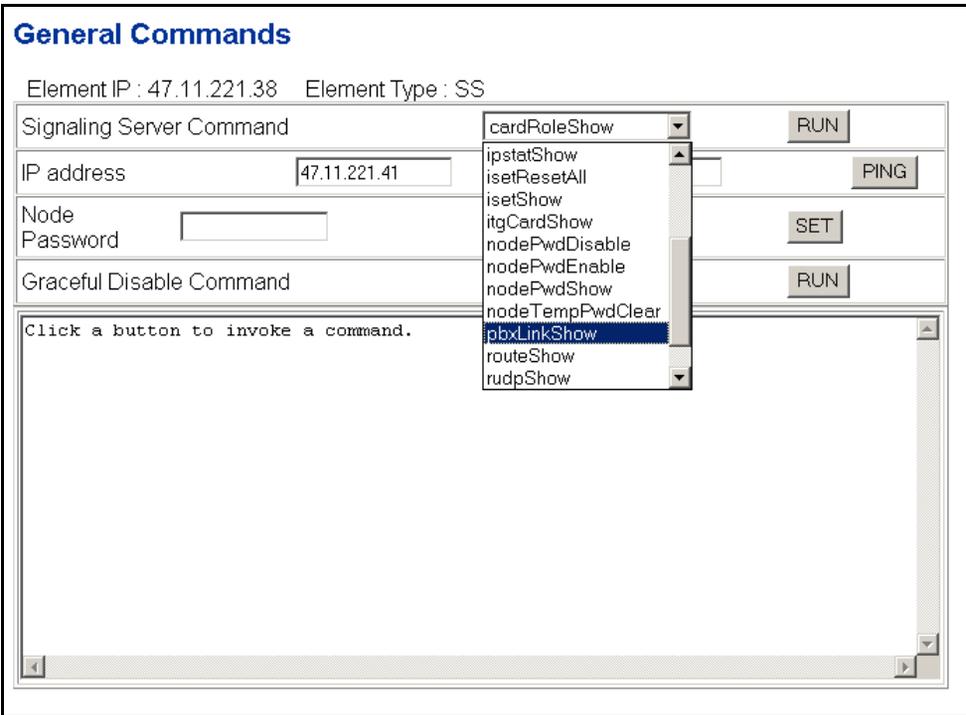
26 Click **Run**.

The output appears in the window. See Figure 137 on .

Figure 137
OM output
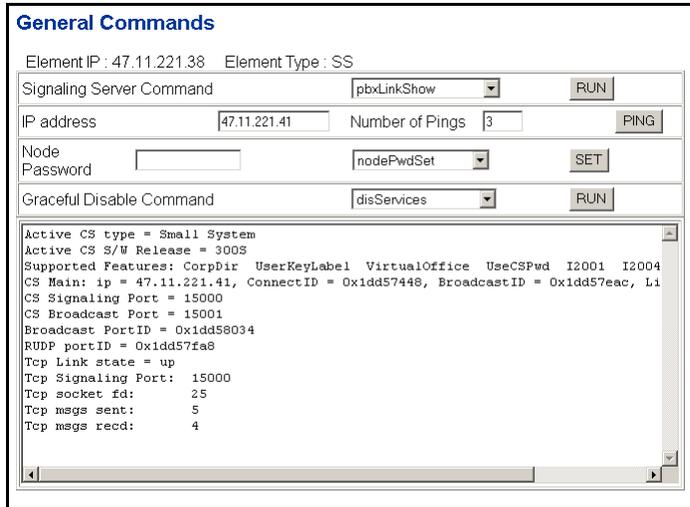
Note: The **pbxLinkShow** command can also be entered at the IPL>
command line. Alternatively, look at the display on the card's faceplate
and ensure it is not displaying an alarm.

The **pbxLinkShow** command output is similar to the following:

```
Active CS type = Succession CSE 1K
Active CS S/W Release = 201R
Supported Features: GetCSVsn TCP ShiftKey I2050
I2002 CorpDir UserKeyLabel VirtualOffice UseCSPwd
CS Main: ip = 47.104.39.112, ConnectID = 0x2bbfb4c,
BroadcastID = 0x2bc059c, Link is up
CS Signaling Port = 15000
CS Broadcast Port = 15001
Broadcast PortID = 0x2bc06fc
RUDP portID = 0x2bc0684
Tcp Link state = up
Tcp Signaling Port: 15000
Tcp socket fd: 30
Tcp msgs sent: 77
Tcp msgs recd: 47
```

27 Select **System Status | IP Telephony** from the Navigation Tree. The IP
   Telephony Information page appears. Expand the node containing the
   Voice Gateway Media Card.

28 Click the **GEN CMD** button associated with the Voice Gateway Media
   Card. The **General Commands** page opens. Click the **cardRoleShow**
   command from the drop-down list box.

   If the card role is not Follower as expected, Telnet to the card's IPL> CLI
   and enter the **clearLeader** command to remove the clearLeader flag.

29 Verify the card software and firmware version on the new card and, if
   necessary, upgrade the software and the firmware. Use the procedures
   outlined in the section "Upgrade the Voice Gateway Media Card software
   and Internet Telephone firmware" on page 302.

────────────── **End of Procedure** ──────────────

Delete a Follower Voice Gateway Media Card from the node

To delete a Voice Gateway Media Card from the node, follow the steps in Procedure 77.

**Procedure 77**
Deleting a follower Voice Gateway Media Card from the node

1   Click **Configuration** in the Navigation Tree.

2   In the Configuration menu, click **IP Telephony**. The **Node Summary** page appears.

3   Click the **Edit** button for the node containing the Voice Gateway Media Card to be deleted. The **Edit** page appears.

4   Expand the **Cards** section.

5   Confirm the card to be deleted and then click the **Remove** button for that card. See Figure 138 on .

Figure 138
Configuration > Node Summary > Edit > Remove Card
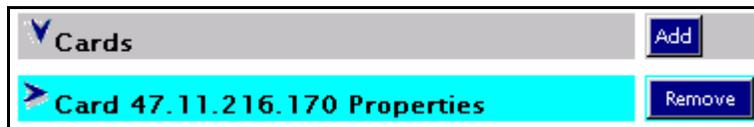
6   Click **Submit** and then click **OK** to save the node change. The Edit page closes, and the Node Summary page opens.

7   Click the **Transfer** button associated with the node containing the card that was removed. Click **OK** to confirm the transfer.

8   The Transfer Progress page opens and the changes are transferred to the Call Server. Click **OK** in the Progress Check Complete dialog box.

9   Remove the Voice Gateway Media Card.

CAUTION WITH ESDS DEVICES
Follow anti-static procedures and place the Voice Gateway Media Card in an appropriate anti-static package.

10 Remove the Voice Gateway Media Card configuration data from the Call Server.

    a. Identify the TN of the Voice Gateway Media Card.

    b. In LD 20, enter the **LTN** (List Terminal Number) command where TYPE = VGW, to list the TNs on the Voice Gateway Media Card TN. This returns a list of units equipped on the card. Verify the number of units that are equipped on the card. Note the first unit equipped on the card.

    c. In LD 14, use the **Out n** command, where **n** equals the number of units that are equipped on the card.

11 At the TN prompt, enter the TN for the first unit that was equipped on the card. As the units are deleted, verify that the intended units are outed.

———— **End of Procedure** ————

Delete the Leader Voice Gateway Media Card from the node

In the usual system configuration, the Succession Signaling Server is the Leader of the node. However, if a second or subsequent node is configured on the system, then a Voice Gateway Media Card is configured as the Leader for that node. If the Leader card for a second or subsequent node (that is, the card in Element Manager that displays the card role as Leader) is deleted, then another card in the node must be selected and the **setLeader** command must be issued on that card. A node must have a Leader card for it to operate correctly when the node is powered up.

Note: The role of a card can be viewed in Element Manager; however, it cannot be changed. Element Manager displays the card role based on the setLeader status of the card.

Follow the steps in the Procedure 78 on to first select a new Leader card and then to delete the current Leader Voice Gateway Media Card.

Procedure 78
Deleting the Leader Voice Gateway Media Card

1   Click **System Status** in the Navigation Tree and then click **IP Telephony**.

2   In the IP Telephony Information page, expand the node containing both the Leader card to be deleted and the card that will become the new Leader.

3   Select a card in the node to become the new Leader (Card A).

4   Click the **Telnet** button to the right of the Card A and log into the card.

5   Enter the **setLeader** command. Card A becomes the new Leader.

6   In the IP Telephony Information page, expand the node containing the "old" Leader card (Card B) which is to be deleted.

7   Click the **Telnet** button to the right of the Card B and log into the card.

8   Enter the **clearLeader** command. This command removes the IP address information from NVRAM and also clears the Leader flag.

9   Remove the "old" Leader card (Card B) from the Media Gateway.

10   Reboot Card A. Wait for the card to come up as the Leader.

11   Click **Configuration** and then **IP Telephony**.

12   On the Node Summary page, click **Edit** for the node.

13   On the **Edit** page, click the **Remove** button for the "old" Leader card (Card B) that was removed.

14   Click **OK** to confirm the deletion of the card.

15   Click **Submit**.

16   In the **Node Summary** page, click the **Transfer** button associated with the node containing the new Leader card and the deleted Leader card.

—————————— **End of Procedure** ——————————

Change the IP addresses of an IP Telephony node in Element Manager

Prior to changing any IP address, understand the "Codecs" on page 113, and consult with the IP network administrator.

IP address configuration changes are completed in four sections of the Edit Page. The four sections are:

- Node – configure network connections in this section.
  See Figure 139 on page 454.

- Card – card properties are set in this section.
  See Figure 140 on page 456.

- SNMP – SMNP traps are enabled and configured in this section
  See Figure 141 on page 458.

- LAN Configuration – ELAN/TLAN settings and card routing table entries are configured in this section.
  See Figure 142 on page 459.

To change the IP address of an IP Telephony node, follow the steps in Procedure 79 on page 453.

Procedure 79
Changing the IP addresses of an IP Telephony node in Element Manager

1   Click **Configuration** in the Navigation Tree.

2   In the Configuration menu, click **IP Telephony**. The **Node Summary** page appears.

3   Click the **Edit** button for the node that is having the IP address changes. The **Edit** page appears.

4   Expand the **Node** section, if it is not already expanded. See Figure 139 on page 454.

Figure 139
Node properties

a. **Node ID:** The Node ID appears automatically.

b. **Voice LAN (TLAN) Node IP address:** Enter Voice LAN (TLAN)
   Node IP address in dotted decimal format. The Voice LAN Node IP
   is on the TLAN. The Node IP address is the IP address used by the
   Internet Telephones to communicate with the Voice Gateway Media
   Cards on the TLAN. If a Voice Gateway Media Card becomes the
   primary card (Leader) during an election, it assigns itself the Node IP
   address.

   • If the node IP is changed, this affects the configuration of the
     Connect Server IP address in the DHCP Server for the Internet
     Telephones.

   • If the Internet Telephones are using partial DHCP mode, manually
     reconfigure the IP address of each Internet Telephone.

c. **Management LAN (TLAN) gateway IP address:** Enter the Management LAN (ELAN) gateway IP address in dotted decimal format. This is the IP address of the gateway of the subnet to which the Voice Gateway Media Card belongs. This is the IP address of the router interface on the ELAN, if present. If there is no management LAN gateway, enter 0.0.0.0.

- When a Management LAN gateway is added to the ELAN, it must restrict access so that only authorized traffic is permitted on the ELAN.

- The router must disable the BootP relay agent for the ELAN interface.

- The router must block all broadcast and multicast traffic from the ELAN and enable only proper access; that is, only authorized traffic and users coming through the Management LAN gateway.

d. **Management LAN (ELAN) subnet mask:** Enter the Management LAN subnet mask address in dotted decimal format. This is the subnet mask that is used along with the ELAN IP address to identify to which subnet the Voice Gateway Media Card belongs. When changing these subnet masks, consider the possibility of conflict between the ELAN and TLAN IP addresses. Consult with the IP administrator before making any changes to subnets. Refer to "Codecs" on page 113.

When changing the Management LAN (ELAN) subnet, this must be coordinated with the IP address on the Call Server (Active ELNK) subnet. Changes must also be co-ordinated with the following:

- Management LAN gateway, and other IP devices on the ELAN

- any other devices on the ELAN and customer's enterprise network (CLAN) that need to communicate with IP Line 3.1

- devices that are looking to receive SNMP traps

e. **Voice LAN (ELAN) subnet mask:** Enter the Voice LAN subnet mask address in dotted decimal format. This is the subnet mask that is used, along with the TLAN IP address, to identify the subnet to which the Voice Gateway Media Card belongs. Coordinate with the Voice LAN gateway (router). When changing the Voice LAN (TLAN) subnet mask, the change must be coordinated with changing the subnet mask of the Voice LAN (TLAN) gateway (router) interface.

5   Expand the **Cards** section and select the card to be changed. See Figure 140.

Figure 140
Cards

6 Enter the **Card Properties** data for the Leader and Follower cards:

a. **Role:** There must be at least one card in the node. This card is the Leader. Every IP Telephony node must have only one Leader. All other cards function as Followers. This field is read-only.

b. **Management LAN (ELAN) IP address:** This is the ELAN IP address for the card. Element Manager and the system use this address to communicate with the card.

    If changing the Management LAN IP address of the Leader card, Telnet to the card and use the **setLeader** command to make the same change (new Management IP address) in the NVRAM of the Leader card.

    The Leader must be reset to resume communication with the node.

Note: Prior to resetting the Leader, unplug all the other cards to prevent any other card from becoming the Master. When the Leader restarts, plug the cards back in. These other cards receive their new configuration from Leader 0.

c. **Management LAN (ELAN) MAC address:** This is the motherboard Ethernet address from the "Voice Gateway Media Card installation summary sheet" on page 133. All other IP configuration depends on the accurate configuration of the Management MAC address. The MAC address is located on the faceplate of the Voice Gateway Media Card and is labelled as MOTHERBOARD Ethernet address. The Management MAC address corresponds to the ELAN address.

d. **Voice LAN (TLAN) IP address:** This is the card Voice IP address. This address is also known as the card TLAN IP address. In an IP Telephony node, all cards must be assigned an address on the same TLAN subnet. The card Voice IP address must be distinct from the node IP address.

e. **Voice LAN (TLAN) gateway IP address:** This is the IP address of the router interface on the TLAN. All cards in the IP Telephony node must be on the TLAN; therefore, they all share the same Voice LAN / TLAN gateway IP address.

7   Click **SNMP.** See Figure 141 on .

Figure 141
SNMP

a.   **Read only community name:** Leave the default selection.

b.   **Read/write community name:** Leave the default selection.

c.   **Enable SNMP traps:** Check the Enable SNMP traps checkbox, if configuring one or more SNMP management IP addresses to receive SNMP traps from cards in the IP Telephony node.

d.   **IP address:** If SNMP traps are enabled, the SNMP traps are sent to the IP address entered here.

e.   **Subnet mask:** If SNMP traps are enabled, this is the subnet mask of where SNMP traps are sent.

IP addresses that are added here create special card routing tables that direct packets out the ELAN and ELAN gateway. Exercise caution when adding entries since the entry could result in one-way voice transmission if a change results in voice packets being streamed out the ELAN instead of the TLAN interface.

To add an SNMP Manager IP address, type the IP address in the SNMP traps entry fields, and click **Add**. Add SNMP Manager IP addresses for the following:

•   the local or remote OTM server

- PPP IP address configured in the Netgear RM356 Modem Router, or equivalent, on the ELAN for the remote support OTM PC

- the SNMP manager for remote alarm monitoring

Note: A net route or host route through the Management gateway is added to the Voice Gateway Media Cards IP Routing Table for each SNMP management address that is added to the SNMP traps list.

Changes can be made to the SNMP traps without affecting other IP addresses. Change the SNMP traps as required, based on the destination host to be reached.

8 Expand the **LAN Configuration** section. See figure Figure 142 on .

Figure 142
LAN configuration

9 Enter the following **Management LAN (ELAN) configuration** settings:

a. Call Server IP address: This is the IP address of the Call Server on the ELAN. Enter the Call Server ELAN IP Address (Active ELNK).

Note: The Call Server ELAN IP address must correspond to the Active ELNK IP address configured in LD 117. It must be on the same subnet as the ELAN for the IP Line node.

b. Survivable Succession Media Gateway IP address: This is the IP address of the Survivable Succession Media Gateway on the ELAN.

Note 1: The Survivable Succession Media Gateway IP address must correspond to the Active ELNK IP address. If configured, all Voice Gateway Media Cards in the same node should be in the same Survivable Cabinet.

Note 2: The Survivable Media Gateway associated with the primary Succession Signaling Server IP Telephony node is called the Alternate Call Server. It is usually located in the same equipment rack with the Call Server and Succession Signaling Server. Therefore it is usually connected to the same ELAN subnet as the Call Server and the primary Succession Signaling Server IP Telephony node. The Alternate Call Server Media Gateway is equipped with sufficient trunk cards and Voice Gateway Media Cards, and centralized Call Pilot. This provides a large degree of survivability in case of Call Server equipment failure for Internet Telephone users who normally register through the Succession Signaling Server.

Refer to *Succession 1000 System: Installation and Configuration* (553-3031-210)) for more information about survivability on the Succession 1000.

Refer to *Small System: Installation and Configuration* (553-3011-210) and *Large System: Installation and Configuration* (553-3021-210) for more information about survivability on the Meridian 1 and Succession 1000M.

c. **Signaling port:** The default value is 15000. The range is 1024 to 65535.

d. **Broadcast port:** The default value is 15001. The range is 1024 to 65535.

10 Under **Voice LAN (TLAN) configuration**:

    a. Signaling port: The default value is 5000. The range is 1024 to 65535.

Note: The TLAN Signaling occurs on UDP ports 7300, 4100, 5100, and 5000.

    b. **Voice port**: Change the Voice port only as instructed by the IP network administrator to improve Quality of Service for the Internet Telephones. This field displays the range for RTP packets sent to the Internet Telephones. For example, if RTP Header compression is used to reduce voice bandwidth on narrow band WAN links, then the TLAN voice port range needs to be set to 16384 or higher.

        The exact range is provided by the system administrator. In general, use the default value of 5200. If, however, there are numerous telephones working over low bandwidth WAN links using CISCO RTP header compression, then change the voice port to a number in the range of 16384 to 32767. Coordinate this value change with the IP network administrator.

Note: The TLAN Voice port range is 1024 to 65535. The default Voice ports are 5200 – 5295. A check is performed to prevent the TLAN Voice and signaling UDP ports from having the same range.

11 If entries must be made to the card routing table, click the **Add** button to the right of **Routes**. The Routes fields expand. See Figure 143 on .

Figure 143
Routes

Enter the I**P address** and **Subnet mask** for any host that is not on the ELAN subnet but requires access to the Voice Gateway Media Card across the ELAN. A Telnet session for maintenance from a remote PC is an example of when this would be needed. The address of the remote PC would be added in the Route list.

The default route on the card causes packets for unknown subnets to be sent out the TLAN interface. Packets from an external host arrive on the ELAN interface. Responses are sent on the TLAN interface. This can cause one way communication if the TLAN is not routed to the ELAN. It is necessary to add an entry in the Route list to correct the routing so that response packets are sent on the ELAN. Each entry creates a route entry in the card's route table that directs packets out the ELAN interface. See Figure 71 on).

> **CAUTION**
>
> Use caution when assigning card routing table entries. Do not include the IP address of an Internet Telephone. Otherwise, voice traffic to these Internet Telephones is incorrectly routed through the ELAN and ELAN gateway. To avoid including the wrong IP address, Nortel Networks recommends that Host IDs be defined for the card routing table entries.

To add additional routes, click the **Add** button again and enter the route information. Repeat this step for each route to be added.

12 Click **Submit** and then click **OK**.

13 In the Node Summary page, click the **Transfer** button associated with the node that had the IP address changes.

———————————— **End of Procedure** ————————————

Restart a Voice Gateway Media Card

If the IP address of a single Voice Gateway Media Card has changed, it must be restarted in order for the changes to take effect.

Note: If IP addresses that affect the entire node are changed, all cards in the node must be restarted. See "Restart all the Voice Gateway Media Cards" on .

Changes to the SNMP IP addresses take place immediately when the transfer occurs; restarting the cards is not required.

If the IP address of a Voice Gateway Media Card has changed, restart only that card.

Follow the steps in Procedure 80 to restart a specific card using the CLI. Alternatively, a Voice Gateway Media Card can be restarted from within Element Manager. Follow the steps in Procedure 81 on to restart the card using Element Manager.

Procedure 80
Restarting a Voice Gateway Media Card at the CLI

1   To prevent interruption to the speech path, log into LD 32.

2   Type the **DISI** command. This command disables the voice gateway channels when they become idle. DISI removes the call traffic but does not remove the Internet Telephones that are registered on that Voice Gateway Media Card. The Graceful TPS Disable command **disiTPS** does this.

3   Type **disiTPS** at the card's IPL> prompt to disable the TPS service on the Voice Gateway Media Card. This Graceful TPS Disable command prevents new Internet Telephones from registering on the card. All Internet Telephones registered on the card are re-directed to another Voice Gateway Media Card when the telephone becomes idle.

After the command is entered, an idle Internet Telephone should be updated with the Watchdog reset message. However, the TPS sends a soft reset message to the Internet Telephone, re-directing it to the Connect Server. The disabled TPS does not accept new registrations, so the Internet Telephones must register with another TPS in the node. Eventually, as all of the TPS's Internet Telephones become idle, they are registered with other TPSs. The Voice Gateway Media Card can then be removed with no impact to any users.

Procedure 81
**Restarting a Voice Gateway Media Card in Element Manager**

1   Click the **System Status** from the Navigation Tree. Click **IP Telephony**. The IP Telephony Information page opens.

2   Expand the node containing the Voice Gateway Media Card.

3   Click the **Reset** button associated with the Voice Gateway Media Card. See Figure 144 on .

Figure 144
Reset button

IP Telephony Information

	Node ID: 666	Node IP: 192.168.11.88	Total elements: 1								
	Node ID: 818	Node IP: 47.11.215.75	Total elements: 1								
	Node ID: 432	Node IP: 47.11.215.133	Total elements: 2								
Index	ELAN IP	Type	TN						ELAN	TLAN	
● 1	47.11.216.168	ITG Pentium	4 0	GEN CMD	SYS LOG	OM RPT	Reset	Telnet	Telnet	Status
● 2	47.11.216.142	ITG Pentium	6 0	GEN CMD	SYS LOG	OM RPT	Reset	Telnet	Telnet	Status
	Node ID: 435	Node IP: 47.11.215.134	Total elements: 1								
	Node ID: 555	Node IP: 47.11.193.90	Total elements: 9								

4   Click **OK** to confirm the Voice Gateway Media Card reset. See Figure 145 on .

Figure 145
Card Reset dialog box

Microsoft Internet Explorer

? You are about to reset 47.104.39.115, you will lose connection with it for 5 minutes . Are you sure you want to do this?

OK   Cancel
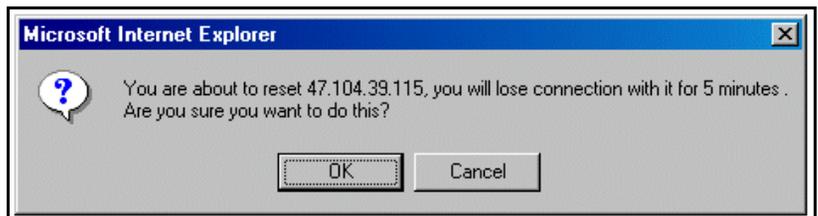
End of Procedure

Restart all the Voice Gateway Media Cards

All the Voice Gateway Media Cards have to be restarted if there has been a change to the following:

- node IP address

- subnet of either the TLAN or ELAN (by changing the subnet mask or the subnet fields of the IP address)

These changes affect the whole node. As a result, all the cards have to be restarted.

If the Management (ELAN) IP address of the Leader has changed, all the cards have to be restarted. Even though this is a change to a single card, this change affects all cards, as this address is used to transmit properties to the node.

Procedure 82
Restarting all Voice Gateway Media Cards

1   Telnet to the card.

2   Use the **setLeader** command to set the new IP address. The Leader uses this new IP address when it reboots.

3   Reboot the Leader using the **cardReset** command. The Leader card reads the new IP address from NVRAM.

4   Restart all the other cards.

——————— **End of Procedure** ———————

Update other node properties

Some basic Voice Gateway Media Card configuration must be performed from the IP Telephony Node Edit page.

To update the node properties in the following sections:

- DSP Profile section – follow the steps in Procedure 32 on

- QoS section – follow the steps in Procedure 33 on

Telnet to a Voice Gateway Media Card

To access the CLI on a Voice Gateway Media Card using Telnet from Element Manager, follow the steps in Procedure 83 on .

Procedure 83
**Accessing a Voice Gateway Media Card using Telnet**

1   Click the **System Status** from the Navigation Tree. Click **IP Telephony**. The IP Telephony Information page opens.

2   Expand the node containing the Voice Gateway Media Card.

3   Click the **Telnet** button associated with the Voice Gateway Media Card. See Figure 146 on .

Figure 146
Telnet

4   Click **OK** to confirm the Telnet session. See Figure 147 on .

Figure 147
Telnet to ELAN or TLAN dialog boxes

5 A Telnet window opens and automatically connects to the Voice Gateway Media Card by using the TLAN or ELAN IP Address.

6 Enter a user name and password to access the IPL> CLI.

Note: For Meridian 1 systems, the default user name and password are both **itgadmin**. However, for security reasons, the user name and password should have been changed during installation.
For Succession 1000 systems, use the PWD1 user ID and password.

7 The IPL> prompt appears if the login is successful. Type **?** at the prompt to display a list of available IPL> CLI commands. See "IP Line CLI commands" on for a detailed list of commands.

———————— **End of Procedure** ————————

Check the Voice Gateway Channels

To check the Voice Gateway Channels running on a Voice Gateway Media Card, follow the steps in Procedure 84.

Procedure 84
Checking the Voice Gateway Channels

1   Click **System Status**, and then **IP Telephony**. The IP Telephony Information page opens.

2   Expand the node to show all its elements. See Figure 148 on page 469.

Figure 148
IP Telephony Information

3   Click the **GEN CMD** button associated with the Voice Gateway Media Card.

The **General Commands** pages opens. See Figure 149 on page 470.

Figure 149
General Command

4 Select **vgwShowAll** from the ITGL Command drop-down list box.

5 Click **RUN**.

The output of the **vgwShowAll** command is displayed in the text area at the bottom of the page. See Figure 150 on .

Figure 150
vgwShowAll output

```
 Element IP : 47.11.221.48    Element Type : Succession Media Card

ITGL Command                          vgwShowAll        ▼        RUN

IP address        47.11.221.41            Number of Pings         3      PING

VGW Channels            PRINT

Node
Password                                  nodePwdSet        ▼       SET

Graceful Disable Command                  disServices       ▼       RUN

VGW Service is: Enabled

Chan ChanState  DspMode   Codec       Tn      Reg AirTime       rxTsap
---- ---------- --------- ---------- ------ --- ------- -------------------- ---
   0 Idle       Closed    n/a        0x0808 yes       0         0.0.0.0:0000
   1 Idle       Closed    n/a        0x0809 yes       0         0.0.0.0:0000
   2 Idle       Closed    n/a        0x080a yes       0         0.0.0.0:0000
   3 Idle       Closed    n/a        0x080b yes       0         0.0.0.0:0000
   4 Idle       Closed    n/a        0x0848 yes       0         0.0.0.0:0000
   5 Idle       Closed    n/a        0x0849 yes       0         0.0.0.0:0000
   6 Idle       Closed    n/a        0x084a yes       0         0.0.0.0:0000
   7 Idle       Closed    n/a        0x084b yes       0         0.0.0.0:0000
   8 Idle       Closed    n/a        0x0888 yes       0         0.0.0.0:0000
   9 Idle       Closed    n/a        0x0889 yes       0         0.0.0.0:0000
  10 Idle       Closed    n/a        0x088a yes       0         0.0.0.0:0000
```

6   To view the VGW Channel configuration, go to the **VGW Channels** section of the General Commands page, and then click the **PRINT** button. See Figure 151 on page 471.

Figure 151
VGW Channels PRINT

```
VGW Channels                    PRINT
```

The output of the VGW Channels PRINT command is shown in Figure 152 on page 472.

Figure 152
Output of VGW Channels PRINT
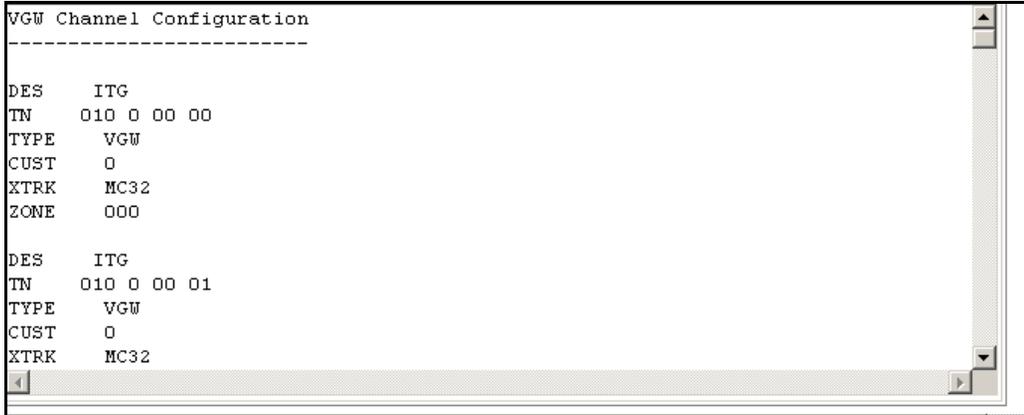
```
VGW Channel Configuration
------------------------

DES    ITG
TN    010 0 00 00
TYPE    VGW
CUST    0
XTRK    MC32
ZONE    000

DES    ITG
TN    010 0 00 01
TYPE    VGW
CUST    0
XTRK    MC32
```

———————————— **End of Procedure** ————————————

Setting the Internet Telephone Installer Password

Element Manager includes the CLI commands for setting the administrative and temporary Internet Telephone Installer Password. For detailed information about the Internet Telephone Installer Password, refer to the section "Internet Telephone Installer Password" on page 345.

To set the Internet Telephone Installer Password in Element Manager, follow the steps in Procedure 85.

Procedure 85
Setting the administrative and temporary Internet Telephone Installer Passwords

1 Click **System Status**, and then **IP Telephony**. The IP Telephony Information page opens.

2 Expand the node to show all its elements. See Figure 153 on page 473.

Figure 153
IP Telephony Information

3 Click the **GEN CMD** button associated with the Voice Gateway Media Card.

The **General Commands** pages opens. See Figure 154.

Figure 154
General Command

Two sections of the General commands page are used to set the Internet Telephone Installer Password:

- ITGL Command section
- Node Password section

4   In the ITGL Command section, select **nodePwdShow** from the
drop-down list box and click the **RUN** button.

The output of the **nodePwdShow** command is displayed in the text area
at the bottom of the page. If in the default state, the Internet Telephone
Installer Password has never been set. The nodePwdShow command
should display the following:

NodeID	PwdEna	Pwd	TmpPwd	Uses	Timeout
======	=======	========	========	=======	===========
123	No				0d 0h 0m 0s

where:

NodeID – the Internet Telephone Installer Password configuration applies
to all Voice Gateway Media Cards on the same TLAN that belong to this
Node ID.

PwdEna – by default the cards should be in disabled state (PwdEna=No).
The PwdEna setting specifies the enabled (Yes) or disabled (No) state of
the Internet Telephone Installer Password.

Pwd – this is the administrator Internet Telephone Installer Password. In
the default state, the administrator password is null.

TmpPwd – this is the temporary Internet Telephone Installer Password.
In the default state, the temporary password is null.

Uses – the Uses parameter applies to the temporary Internet Telephone
Installer Password. In the default state, this setting is null. If the card is not
in the default state, the Uses parameter is a numeric value from 0 –1000.
This number specifies the remaining number of uses for the temporary
password. If zero is entered for the Uses parameter when setting the
temporary password, the Time parameter is mandatory. When the Time
parameter is in effect, the password expiration is based on time instead
of the number of uses.

Timeout –the Timeout heading corresponds to the Time parameter of the
temporary Internet Telephone Installer Password. In the default state the
Time is null. If the card is not in the default state, this setting specifies the
duration in hours in which the temporary password is valid. The range is
0 – 240 hours (which is a maximum of 10 days). The number specified
under Timeout indicates the remaining time to expire of the temporary
password. The Time parameter is optional if the Uses parameter is
non-zero. The Time parameter is mandatory if Uses is set to zero.

If both the Uses and Time parameters are entered, the password expires based on whichever happens first, that is, the number of Uses is reduced to zero or the Time has expired. If both the Uses and Time parameters are entered and are set to zero, it is the same as not setting the temporary password.

5   Next, set the administrator Internet Telephone Installer Password in the **Node Password** section. See Figure 155.

Figure 155
Node Password

This enables and sets the administrator password. The "password" parameter can be null, or 6 to 14 digits in length. The valid characters are 0-9 * #. This command can be entered at any time. The new password entered overwrites the previous password.

6   Enter a password and click **SET**.

The text area returns the message '**Please run nodePwdShow to verify the result.**"

7   In the ITGL Command section, select **nodePwdShow** from the drop-down list box and click **RUN**.

8   The text area data output is similar to the following:

```
NodeID    PwdEna    Pwd        TmpPwd     Uses      Timeout
======    =======   ========   ========   =======   ===========
123       Yes       1234567                          0d 0h 0m 0s
```

> **WARNING**
>
> If the SET button in the Node Password section is clicked and no password is entered in the text box, then the password is enabled but is null. In the above output, the PwdEna field displays "Yes" and the Pwd field is blank.

9   Click **SET**.

The text area returns the message '**Please run nodePwdShow to verify the result.**"

10 In the ITGL Command section, select **nodePwdShow** from the drop-down list box and click **RUN**.

The text area data output is similar to the following:

NodeID	PwdEna	Pwd	TmpPwd	Uses	Timeout
========	========	========	========	========	============
123	Yes	1234567	9876543	2	0d 2h 0m 0s

11 To clear the temporary Internet Telephone Installer password, select the **nodeTempPwdClear** command from the ITGL Command drop down list box and then click **RUN**.

12 In the ITGL Command section, select **nodePwdShow** from the drop-down list box and click **RUN**.

The text area data output is similar to the following:

NodeID	PwdEna	Pwd	TmpPwd	Uses	Timeout
========	========	========	========	========	============
123	Yes	1234567			0d 0h 0m 0s

End of Procedure

Voice Gateway Media Card maintenance

Contents

This section contains information on the following topics:

Introduction

This chapter provides information on maintenance functions of the Voice Gateway Media Card.

Note: Check the Nortel Networks Web site for information on the latest software, firmware, and application releases.

Faceplate maintenance display codes

The Voice Gateway Media Card's maintenance display provides the diagnostic status of the card during power-up, its operational state when in service, and error information on the functional state of the card.

- Table 53 on lists the normal and fault display codes for the ITG-P 24-port line card.

- Table 54 on list the normal and fault display codes for the Succession Media Card 8-port and 32-port line card.

During power-up, the card performs multiple self-tests, including an internal RAM test, ALU test, address mode test, boot ROM test, timer test, and external RAM test. If any of these tests fail, the card enters a maintenance loop, and no further processing is possible. A failure message is printed on the display to indicate which test failed. For example, if the timer test fails on the ITG-P 24-port line card, F:05 is displayed.

If the other tests fail (up to and including the EEPROM test), a message is displayed for three seconds. If more than one test fails, the message displayed indicates the first failure. If verbose mode has been selected (by the test input pin on the backplane), the three second failure message is not displayed.

If the maintenance display on the ITG-P 24-port line card shows a persistent T:20 indicating an IP Line 3.1 software failure, and if this occurs after the card was reset during a loadware download procedure, call the Nortel Networks technical support for assistance in attempting to download new software onto the card.

Table 53
ITG-P 24-port line card faceplate maintenance display codes
(Part 1 of 2)

Normal code	Fault code	Message
T:00	F:00	Initialization
T:01	F:01	Testing Internal RAM
T:02	F:02	Testing ALU
T:03	F:03	Testing address modes
T:04	F:04	Testing Boot ROM
T:05	F:05	Testing timers
T:06	F:06	Testing watchdog
T:07	F:07	Testing external RAM
T:08	F:08	Testing Host DPRAM
T:09	F:09	Testing DS30 DPRAM
T:10	F:10	Testing Security Device
T:11	F:11	Testing Flash memory
T:12	F:12	Programming PCI FPGA
T:13	F:13	Programming DS30 FPGA
T:14	F:14	Programming CEMUX FPGA
T:15	F:15	Programming DSP FPGA
T:16	F:16	Testing CEMUX interface
T:17	F:17	Testing EEPROM

Table 53
ITG-P 24-port line card faceplate maintenance display codes
(Part 2 of 2)

Normal code	Fault code	Message
T:18	F:18	Booting processor, waiting for response with self-test information.
T:19	F:19	Waiting for application start-up messages from processor.
T:20		CardLAN enabled, transmitting BootP requests. If this display persists, then the ITG-P 24-port line card is running in BIOS ROM mode due to card software failure.
T:00	F:00	Initialization
T:01	F:01	Testing Internal RAM
T:02	F:02	Testing ALU
T:03	F:03	Testing address modes

If a test fails on the Succession Media Card, F:XX appears on the Hex display for three seconds after T:13 message (Testing SEEPROM). For example, if the 8051 co-processor test failed, F:05 is displayed on the Succession Media Card faceplate. If more that one test fails, the message indicates the first failure

Table 54
Succession Media Card faceplate maintenance display codes
(Part 1 of 3)

Normal code	Fault code	Message
T:00	F:00	Initialization
T:01	F:01	Testing Internal RAM
T:02	F:02	Testing ALU

Table 54
Succession Media Card faceplate maintenance display codes
(Part 2 of 3)

Normal code	Fault code	Message
T:03	F:03	Testing address modes
T:04	F:04	Testing watchdog
T:05	F:05	Testing 8051 co-processor
T:06	F:06	Testing timers
T:07	F:07	Testing external RAM
T:08	F:08	Testing dongle
T:09	F:09	Programming timeswitch FPGA
T:10	F:10	Programming ISPDI FPGA
T:11	F:11	Testing host dual port RAM
T:12	F:12	Testing DS-30 dual port RAM
T:13	F:13	Testing SEEPROM
T:14	F:14	Booting Host processor, waiting for response with selftest information
T:15	F:15	Not used at present
T:16	F:16	Not used at present
T:17	F:17	Not used at present
T:18	F:18	Not used at present
T:19	F:19	Not used at present
T:20	F:20	Waiting for application start-up message from Host processor

Table 54
Succession Media Card faceplate maintenance display codes
(Part 3 of 3)

Normal code	Fault code	Message
T:21	F:21	CardLAN enabled, waiting for request configuration message
T:22	F:22	CardLAN operational, A07 enabled, display now under host control

If the IXP encounters any failures during its initialization, an H:XX error code is displayed. Table 55 on shows the list of error codes.

Table 55
List of error codes for the Succession Media Card

Code	Description
H:00	Host Processor not booting
H:01	SDRAM test failure
H:02	SRAM test failure
H:04	PCMCIA device failure
H:08	Network interface failure
H:10	Meridian 1 interface failure
H:20	DSP interface failure
H:40	NVRAM/EEPROM interface failure
H:80	PCM connector failure

System error messages

When an error or specific event occurs, SNMP sends an alarm trap to OTM or any SNMP manager that is configured in the SNMP Manager's list in the ITG Card properties. It also puts the system error message into the error log file containing error messages.

View the error log in OTM IP Line 3.1 by clicking the **Open Log File** button on the **Maintenance** tab of the **ITG Card Properties**. Alternatively, view the log file in any text browser after uploading it to an FTP host using the **LogFilePut** command.

ITG and ITS messages incorporate the severity category of the message in the first digit of the four digit number. Message numbers beginning with 0 do not follow this format.

1 = Critical
2 = Major
3 = Minor
4 = Warning
5 = Cleared (Info)
6 = Indeterminate (Info)

Error messages with a severity category of "Critical" are displayed on the Voice Gateway Media Card's maintenance faceplate display in the form: "**Gxxx**" or "**Sxxx**", where **xxx** is the last three digits of the ITG or ITS message. The Succession Signaling Server does not have a faceplate display. Alarms appear in the Succession Signaling Server 's report log or by way of SNMP on an Alarm browser.

Table 56 on lists the critical ITG messages and Table 57 on lists the critical ITS messages.

All listed alarms can be sent by a Voice Gateway Media Card. Any alarm that can be sent by the Signalling Server has an "X" in the column labeled "Succession Signaling Server."

For a complete listing of other error messages, see *Software Input/Output: System Messages* (553-3001-411).

Table 56
Critical ITG Error messages (Part 1 of 4)

Maintenance Display	Corresponding Critical Error Message	Succession Signaling Server	Description
G000	ITG1000	X	Card (re)booted.
G001	ITG1001	X	Task spawn failure <name>.
G002	ITG1002	X	Memory allocation failure.
G003	ITG1003	X	File IO error <operation> <object> <errno> <errtext>.
G004	ITG1004	X	Network IO error <operation> <object> <errno> <errtext>.
G005	ITG1005	X	Message queue error <operation> <object> <errno> <errtext>.
G006	ITG1006	X	Unexpected state encountered <file> <line> <state>.
G007	ITG1007	X	Unexpected message type <file> <line> <msg>.
G008	ITG1008	X	Null pointer encountered <file> <line> Name of pointer.
G009	ITG1009	X	Invalid block <file> <line> Type of block.

Table 56
Critical ITG Error messages (Part 2 of 4)

Maintenance Display	Corresponding Critical Error Message	Succession Signaling Server	Description
G010	ITG1010	X	Unable to locate data block <file> <line> Type of block.
G011	ITG1011	X	File transfer error: <operation> <file> <host>
G012	ITG1012	X	Module initialization failure: <moduleName>
G013	ITG1013		Ethernet receiver buffer unavailable, packet(s) discarded.
G014	ITG1014	X	Ethernet carrier: <ifName> <state>
G015	ITG1015		Ethernet device failure: <ifName>
G017	ITG1017	X	Invalid or unknown SSD message: <ssdType> <TN> <msg>
G019	ITG1019		DSP channel open failure <channel>.
G020	ITG1020	X	Configuration error <param> <value> <reason>.
G021	ITG1021		DSP successfully reset <dsp>.
G022	ITG1022		DSP channel not responding, channel disabled <channel>.
G023	ITG1023		DSP device failure: <dsp> <errnum> <errtext>
G025	ITG1025		DSP download: <dsp> <reason>
G027	ITG1027		DSP memory test: <dsp> <reason>
G028	ITG1028	X	Voice packet loss: <channel> <%packetLoss> <direction> <dstAddr>

Table 56
Critical ITG Error messages (Part 3 of 4)

Maintenance Display	Corresponding Critical Error Message	Succession Signaling Server	Description
G029	ITG1029		Error in DSP task <file> <line> <errno> <errtext>.
G030	ITG1030		Allocation failure in DSP memory pool.
G031	ITG1031	X	Invalid Codec number: <Codec>
G032	ITG1032		Attempt to open a DSP that is already open: <channel>
G033	ITG1033		Failed to send data to DSP channel: <channel>
G034	ITG1034		DSP channel unexpectedly closed: <channel>
G035	ITG1035		Encountered and unexpected open DSP channel, closed it: <channel>
G037	ITG1037		Wrong image downloaded. Binary was created for <cardType> card.
G038	ITG1038		IPL login protection (login available/locked)
G039	ITG1039		Bad DSP channel <channel id>
G040	ITG1040		Last reset reason for card: <reasonString> where the reason String can be: Reboot command issued (by software or through CLI); Watchdog Timer Expired; Manual reset; Internal XA problem; or Unknown

Table 56
Critical ITG Error messages (Part 4 of 4)

Maintenance Display	Corresponding Critical Error Message	Succession Signaling Server	Description
G041	ITG1041	X	perceivedSeverity = alarmSeverityWarning probableCause = alarmCauseRemoteTransmissionError OTM displays the text "F/W file(s) not received but internet phones have registered. May have mixed F/W versions across phones. When F/W file(s) received, internet phones will automatically be updated."
G042	ITG1042		perceivedSeverity = alarmSeverityWarning probableCause = alarmCauseOutOfMemory OTM displays the text "Insufficient flash drive space to store F/W file."

Table 57
Critical ITS Error messages (Part 1 of 2)

Maintenance Display	Corresponding Critical Error Message	Succession Signaling Server	Description
S000	ITS1000	X	VTI function call time-out.
S001	ITS1001	X	User terminal registration failed. <ip> <hwid> <errno> <errtext>.
S002	ITS1002	X	Connect service activation error <reason>.
S003	ITS1003	X	Duplicate master <node> <ip1> <ip2>.
S004	ITS1004	X	Invalid node ID <ip> <hwid>.
S005	ITS1005	X	Corrupted node ID/TN field <ip> <hwid>.
S006	ITS1006	X	Received corrupted UNIStim message <message dump>.
S007	ITS1007	X	Received unknown UNIStim message <message dump>.
S008	ITS1008	X	Terminal connection status: <ip> <status>.
S009	ITS1009	X	Call Server communication link:<state>.
S010	ITS1010	X	Terminal doesn't support Codec: <ip><Codec>.
S011	ITS1011	X	<IP Address>: Last reset reason for phone: <reasonID> (<reasonString>)

Table 57
Critical ITS Error messages (Part 2 of 2)

Maintenance Display	Corresponding Critical Error Message	Succession Signaling Server	Description
S012	ITS1012	X	User entered the wrong Internet Telephone Installer Password three times during Branch User Config. The set is locked out from doing any User Config for one hour. Action: Wait for the set to unlock in one hour, or use the IPL CLI command clearLockout to unlock the set.
S013	ITS1013	X	User entered the wrong Craftsperson Node Level TN Entry Password three times. The set is locked out. Action: To remove the lock, use Overlay 32 to disable, and then enable the Internet Telephone.

IP Line and Internet Telephone maintenance and diagnostics – LD 32

Table 58 summarizes the system maintenance commands available in LD 32.

For more information on the ECNT commands, refer to "Counting Internet Telephones" on .

Table 58
LD 32 – Maintenance commands for the Voice Gateway Media Card (Part 1 of 3)

Command	Description
DISC l s c	Disable the specified card, where: l = loop, s = shelf, c = card. *Note 1:* Disable the Voice Gateway Media Card before transmitting card properties from the OTM IP Line 3.1 application. *Note 2:* The card reset button is available only in the OTM IP Line 3.1 application when the card is disabled. *Note 3:* When the Voice Gateway Media Card is disabled in LD 32, it does not disable the active Leader or backup Leader functions.
DISI l s c	Disable the specified card when idle, where: l = loop, s = shelf, c = card *Note 1:* This temporarily prevents the IP Telephony node from seizing the port from incoming calls. *Note 2:* Use the DISI command to disable the Voice Gateway Media Card instead of the DISC command. The disabled state of the Voice Gateway Media Card is indicated by the NPR0011 message.
DISU l s c u	Disable the specified unit, where: l = loop, s = shelf, c = card, u = unit

Table 58
LD 32 – Maintenance commands for the Voice Gateway Media Card (Part 2 of 3)

Command	Description
ECNT CARD L S C <customer>	Counts and prints the number of Internet Telephones registered for the specified card.
	• If the <customer> parameter is specified, the count is specific to that customer. A card must be specified to enter a customer; otherwise, the count is across all customers.
	• If no parameters are entered, the count is printed for all zones. A partial TN can be entered for the card (L or L S) which then prints the count per that parameter. A customer cannot be specified in this case.
	Example:
	ECNT CARD 81 << Card 81 >> Number of Registered Ethersets: 5 Number of Unregistered Ethersets: 27
ECNT ZONE zoneNum <customer>	Counts and prints the number of Internet Telephones registered for the specified zone.
	• If <customer> parameter is specified, the count is specific to that customer. A zone must be specified to enter a customer; otherwise, the count is across all customers.
	• If no parameters are entered, the count is printed for all zones.
	Example:
	ECNT ZONE 0 0 << Zone 0 Customer 0 >> Number of Registered Ethersets: 4 Number of Unregistered Ethersets: 17
ENLC l s c	Enable the specified card, where: l = loop, s = shelf, c = card
ENLU l s c u	Enable the specified unit, where: l = loop, s = shelf, c = card, u = unit

Table 58
LD 32 – Maintenance commands for the Voice Gateway Media Card (Part 3 of 3)

Command	Description
IDC l s c	Print the Card ID information for the specified card, where: l = loop, s = shelf, c = card ***Note 1:*** This command displays the PEC (Product Engineering Code) and serial number for the card. The IP Line PEC is NTZC80AA.
STAT l s c	Print the Meridian 1, Succession 1000M, and Succession 1000 software status of the specified card, where: l = loop, s = shelf, c = card
STAT l s c u	Print the Meridian 1, Succession 1000M, and Succession 1000 software status of the specified unit, where: l = loop, s = shelf, c = card, u = unit

TNs

For Nortel Networks Internet Telephones, there are two kinds of TNs to consider:

- physical TN – represents a physical unit of the Voice Gateway Media Card

- virtual TN – configured on a virtual superloop and represents an Internet Telephone

Physical TNs

Physical TNs, that are seen as trunk units, are managed using existing LD 32 commands.

Virtual TNs

Because virtual TNs are configured on a virtual superloop, virtual TN maintenance has no meaning; that is, what is already provided by the Meridian 1, Succession 1000M, and Succession 1000 for phantom loops.

In LD 32, any command affecting a phantom loop leads to an NTP665 message because the loop does not physically exist. LD 32 supports STAT, DISU, ENLU, and IDU commands on an Internet Telephone Virtual TN. All other commands generate the NPR047 message.

Maintenance commands for the Internet Telephone

Table 59 contains the maintenance commands in LD 32 for the Internet Telephone.

Table 59
LD 32 maintenance commands for Internet Telephones

Command	Description
STAT l s c u STAT cu	Display the Internet Telephone state. UNEQ, IDLE, BUSY, and DSBL have the usual meaning. IDLE and DSBL state are precise by the following information: • UNREGISTERED identifies an Internet Telephone that is configured in the system but that has not yet registered. • REGISTERED identifies an Internet Telephone that has registered.
DISU l s c u DISU cu	Change the Internet Telephone state to DSBL. UNREGISTERED/REGISTERED state is not modified.
ENLU l s c u ENLU cu	Change the Internet Telephone state to IDLE. UNREGISTERED/REGISTERED state is not modified.
IDU l s c u IDU cu	Displays selected Internet Telephone information. Displays the TN number, MAC address, device code, NT code, color code, release code, software code, serial number, Internet Telephone IP address, and TPS IP address.
STVT CUST# ROUT# START_MB# END_MB#	Displays the specified information. Displays the status of the Virtual Trunk for a specified customer, customer route number, and a specified customer's range of route numbers.

IDU command

Since the system must request the information from the Internet Telephone, the IDU is effectively a PING command and can be used to test the end-to-end IP connectivity of the Internet Telephone.

An example of the output format of the IDU command in LD 32 is as follows.

```
>LD 32
.IDU 61 0
I2002 TN 061 0 00 00 V
MAC:000000000000
TN ID CODE: i2004
NT CODE: NT2K00GI
COLOR CODE: 66
RLS CODE: 0 *
SW:
SER NUM: 76C764
SET IP ADR: 047.011.215.127
TPS IP ADR: 047.011.216.195
```

This format applies only for Internet Telephone Virtual TNs.

If the Internet Telephone is not registered with the system, an NPR0048 message is generated. If the Internet Telephone is registered but idle, the system prints the Internet Telephone IP address and Voice Gateway Media Card IP address and generates an NPR0053 message.

IP Line CLI commands

IP Line CLI commands are designed to supplement Overlay commands and to introduce features specific to the ITG-P 24-port line card, Succession Media Cards, and Succession Signaling Server platform.

All the CLI commands listed in Table 60 to Table 77 are supported on the ITG-P 24-port line card and Succession Media Cards. The CLI commands are also available on the Succession Signaling Server if an "**X**" is shown in the Succession Signaling Server column of the table.

The IP Line CLI commands are accessed by connecting a TTY to the MAINT port on the Voice Gateway Media Card faceplate. Alternatively, the Telnet command can be used to access the CLI. These IP Line CLI commands are entered at the **IPL>** prompt. Instructions for connecting to the maintenance port of the Succession Signaling Server are described in *Succession 1000 System: Installation and Configuration* (553-3031-210). Refer to the "Succession Signaling Server maintenance ports" section.

The commands are grouped into the following categories:

Table 60 lists the general purpose IPL> commands.

Table 60
General purpose commands (Part 1 of 4)

IPL> Command	Description	Succession Signaling Server
i	Displays the current task list.	X
itgHelp	Displays the complete command list. **?** also shows the command list.	
logout	Exits the IPL> Command Line Interface.	
routeAdd	Adds a route to the network routing table.	X
routeShow	Displays the current host and network routing tables.	X
logPrintOff	Turns off logging in the TTY session currently logged in.	
logPrintOn	Turns on logging in the TTY session currently logged in.	
chkdsk	chkdsk "/C:" Checks the internal file system for errors. chkdsk "/C:", 1 Repairs the file system errors and saves the damaged cluster in files. chkdsk "/C:", 2 Repairs file system errors and returns damaged clusters to the free pool.	

Table 60
General purpose commands (Part 2 of 4)

IPL> Command	Description	Succession Signaling Server
ping "host", "numpackets"	Sends an ICMP ECHO_REQUEST packet to a network host. The host matching the destination address in the packets responds to the request. If a response is not returned, the sender times out. This command is useful to determine if other hosts or Voice Gateway Media Cards are communicating with the sender card. The "numpackets" parameter specifies how many packets to send. If it is not included, ping runs until it is stopped by Ctrl-C (also exits the IPL> Command Line Interface). Example: IPL> **ping** "47.82.33.123", 10	X
electShow	Displays a list of cards in the node and information about each card. This includes showing all registered followers to a leader. The output has two sections: • cards currently registered • cards that are in the BOOTP.TAB configuration but not yet registered.	
itgCardShow	Displays Voice Gateway Media Card information.	X
itgMemShow	Displays memory usage.	X
ifShow	Displays detailed IP address information, including MAC addresses.	X
IPInfoShow	Displays IP address information.	X

Table 60
General purpose commands (Part 3 of 4)

IPL> Command	Description	Succession Signaling Server
serialNumShow	Displays card serial number. This command displays the same Voice Gateway Media Card serial number that is displayed in the LD 32 IDC command.	
firmwareVersionShow	Displays firmware version number.	
numChannelsShow	Displays number of available channels.	
swVersionShow	Displays software version.	X
logFileOn	Turns on error logging to the syslog file.	
logFileOff	Turns off error logging to the syslog file.	
logShow	Displays information about the current logging configuration. Indicates whether logging is on or off.	
logConsoleOn	Turns on error logging to the console.	
logConsoleOff	Turns off error logging to the console.	
isetShow	Displays general information for all registered Internet Telephones. For example, the command displays the IP address of the Internet Telephone, the VTN that the Internet Telephone is associated with, indicates the type of Internet Telephone such as i2002, i2004, or i2050, and provides the type of registration and the new registration status.	X
isetShowByTN	Displays general information about all registered Internet Telephones, sorted by TN.	X
isetShowByIP	Displays general information about all registered Internet Telephones, sorted by IP address.	X

Table 60
General purpose commands (Part 4 of 4)

IPL> Command	Description	Succession Signaling Server
pbxLinkShow	Displays information about the link to the CPU, including the configuration and link status.	X
itgAlarmTest	Generates **ITGxxxx** test alarms.	X
itsAlarmTest	Generates **ITSxxxx** test alarms.	X
itgPLThreshold	Sets the Internet Telephone and gateway alarm packet loss threshold (units 0.1%). An alarm is generated when the threshold is reached.	
eImShow	Displays a list of supported languages.	X
itgChanStateShow	Displays the state for channels; for example, if they are idle or busy.	

Table 61 lists the file transfer commands.

Table 61
File Transfer commands (Part 1 of 5)

IPL> Commands	Description	Succession Signaling Server
swDownload "hostname", "username", "password", "directory path", "filename"	Loads a new version of software from the FTP host to the Voice Gateway Media Card. Updates the software on the Voice Gateway Media Card with the binary file received from an FTP server corresponding to the *hostname* IP address. The Voice Gateway Media Card FTP client performs a Get which downloads the file to the flash bank. A checksum is calculated to verify correct delivery. Once the new software version is successfully downloaded, the Voice Gateway Media Card must be rebooted with cardReset to run the new software. ***Note:*** *Hostname* refers to the either IP address of the FTP host, or the Voice Gateway Media Card itself or another Voice Gateway Media Card when a PC Card in the /A: drive of the Voice Gateway Media Card contains the software binary file. Example: IPL> **swDownload** "47.82.32.346", "anonymous", "guest", "/software", "VxWorks.mms"	

Table 61
File Transfer commands (Part 2 of 5)

IPL> Commands	Description	Succession Signaling Server
configFileGet "hostname", "username", "password", "directory path", "filename"	Sends an updated CONFIG.INI file from OTM to the Voice Gateway Media Card. Updates the CONFIG.INI file on the Voice Gateway Media Card with the CONFIG.INI file on the specified host, account, and path. The configFileGet task on the ITG host initiates an FTP session with the given parameters and downloads the file to flash file system. The CONFIG.INI file also contains the gatekeeper IP address, gateway password, and gateway DN-port mapping table. Example: IPL> **configFileGet** "ngals042", "anonymous", "guest", "/configDir", "config.ini"	X
bootPFileGet "hostname", "username", "password", "directory path", "filename"	Updates the BOOTPtab file on the Voice Gateway Media Card with the BOOTPtab file on the specified host, account and path. The bootpFileGet task on the ITG host initiates an FTP session with the given parameters and downloads the file to flash file system. Example: IPL> **bootPFileGet** "ngals042", "anonymous", "guest", "/bootpDir", "bootptab"	X

Table 61
File Transfer commands (Part 3 of 5)

IPL> Commands	Description	Succession Signaling Server
hostFileGet "hostname", "username", "password", "directory path", "filename", "ITGFileName", listener	Transfers any file from OTM to the Voice Gateway Media Card. This command gets any file from the host and does a Get using FTP to the Voice Gateway Media Card. *Note:* ITGFileName is the full path AND filename of where the file is to be placed. The listener parameter indicates which module to inform of the successful file transfer. It can be set to −1 to be disabled. Example: IPL> **hostFileGet** "ngals042", "anonymous", "guest", "/hostfileDir", "hostFile.txt", "/C:ITGFILRDIR/ITGFILE.TXT", -1	X
currOMFilePut "hostname", "username", "password", "directory path", "filename"	Sends the current Operational Measurements (OM) file to the specified host. The OMFilePut task on the ITG host initiates an FTP session with the given parameters and downloads the Voice Gateway Media Card's Operational Measurements file to the specified location on the host. Example: IPL> **currOMFilePut** "ngals042", "anonymous", "guest", "/currDir", "omFile"	X

Table 61
File Transfer commands (Part 4 of 5)

IPL> Commands	Description	Succession Signaling Server
prevOMFilePut "hostname", "username", "password", "directory path", "filename"	Sends the previous Operational Measurements (OM) file to the specified host. The OMFilePut task on the ITG host initiates an FTP session with the given parameters and downloads the Voice Gateway Media Card's Operational Measurements file to the specified location on the host. Example: IPL> **prevOMFilePut** "ngals042", "anonymous", "guest", "/prevDir", "omFile"	
LogFilePut "hostname", "username", "password", "directory path", "filename"	Sends the syslog file from the Voice Gateway Media Card to OTM. The LogFilePut task on the ITG host initiates an FTP session with the given parameters and downloads the Voice Gateway Media Card's log file to the specified location on the host. Example: IPL> **LogFilePut** "ngals042", "anonymous", "guest", "/currDir", "logFile"	
bootPFilePut "hostname", "username", "password", "directory path", "filename"	Sends the BOOTPtab file from the Voice Gateway Media Card to OTM. Example: IPL> **bootPFilePut** "ngals042", "anonymous", "guest", "/bootpDir", "bootpFile"	X

Table 61
File Transfer commands (Part 5 of 5)

IPL> Commands	Description	Succession Signaling Server
hostFilePut "hostname", "username", "password", "directory path", "filename", ITGFileName	Transfers any file from the Voice Gateway Media Card to the OTM PC. Example: IPL> **hostFilePut** "ngals042", "anonymous", "guest", "/hostDir", "hostFile", "/C:/CONFIG/CONFIG1.INI"	X
omFilePut "hostname", "username", "password", "directory path", "filename", ITGFileName	Sends the current Operational Measurements (OM) file to the specified host. Example: IPL> **OMFilePut** "ngals042", "anonymous", "guest", "/hostDir", "omFile"	X

Table 62 lists the IP configuration IPL> commands.

Table 62
IP Configuration commands

IPL> Command	Description	Succession Signaling Server
NVRIPSet	Sets the IP address in NVRAM.	
NVRGWSet	Sets the default gateway address in NVRAM.	
NVRSMSet	Sets the subnet mask in NVRAM.	
NVRIPShow	Prints the values of the IP parameters that reside in NVRAM.	
NVRClear	Clear IP parameters in NVRAM.	
nvramLeaderSet	Sets the Leader bit in NVRAM.	
nvramLeaderClr	Clears the Leader bit in NVRAM, but does not erase the IP parameters in NVRAM.	
setLeader	Sets a Leader card, including the IP address, gateway, subnet mask, boot method to static, and Leader bit in NVRAM. This one command does all the necessary actions to make a Leader.	
clearLeader	Clears the Leader information in NVRAM, sets the boot method to use BOOTP, and removes the old configuration files. This command makes a Leader card into a Follower card.	
tLanDuplexSet	Sets the TLAN Ethernet duplex mode.	
tLanSpeedSet	Sets the TLAN Ethernet speed.	

Table 63 lists the Reset IPL> commands.

Table 63
Reset commands

IPL> Command	Description	Succession Signaling Server
cardReset	Resets a Voice Gateway Media Card. This command performs a warm reboot of the Voice Gateway Media Card. The card must be in the OOS state to use this command.	
isetReset "tn" l s c u isetReset "tn" c u	Resets the Internet Telephone on Option 51C/61C/81/81C. Resets the Internet Telephone on Small Systems and Succession 1000 systems.	X
isetResetAll	Resets all registered Internet Telephones.	X
resetOM	Resets the operational measurement file timer. This command resets all operational measurement parameters collected since last log dump.	X
lastResetReason	Displays the reason for the last card reset.	

Table 64 lists the DSP IPL> commands applicable to the Voice Gateway Media Card.

Table 64
DSP commands

IPL> Command	Description	Succession Signaling Server
DSPReset	Resets the specified DSP.	
DSPNumShow	Displays the number of DSPs on the Voice Gateway Media Card.	

Table 65 lists the upgrade IPL> commands.

Table 65
Upgrade commands

IPL> Command	Description	Succession Signaling Server
umsPolicyShow	Displays the current upgrade policy.	X
umsUpgradeAll	Upgrades all registered telephones according to policy and firmware file.	X
umsUpgradeTimerShow	Shows the upgrade schedule.	X
umsUpgradeTimerCancel	Cancels the scheduled upgrade.	X

Table 66 lists the command to change the IPL> shell password.

Table 66
IPL> Shell command

IPL> command	Description	Succession Signaling Server
shellPasswordSet	Changes the current user name and password of the IPL> CLI shell.	

Table 67 lists the Internet Telephone Installer Password commands.

Table 67
Internet Telephone Installer Password commands (Part 1 of 4)

IPL> command	Description	Succession Signaling Server
nodePwdSet "password"	Sets and enables the administrative Internet Telephone Installer (node) Password. This is also known as the node level Internet Telephone Installer Password. If a null password (0 characters in length) is configured, all Internet Telephones that attempt to register after this command has been issued display a prompt for node password before the TN can be modified. The "password" parameter must be null or 6 to 14 digits in length; The valid characters are 0 – 9 * #. The null password causes the Node ID and Password screen on the Internet Telephone to be skipped during restart. This command can be entered at any time; the new password entered overwrites the prior password.	X
nodePwdShow	Displays the settings of the Internet Telephone Installer Password. The command displays the current password, the state of password entry (enable/disable), the temporary password, and the number of uses and time to expiry.	X
nodePwdEnable	Enables the administrative Internet Telephone Installer Password setting. After this command is entered, all Internet Telephones registering display the password screen.	X

Table 67
Internet Telephone Installer Password commands (Part 2 of 4)

IPL> command	Description	Succession Signaling Server
nodePwdDisable	Disables both the administrative and the temporary Internet Telephone Installer Password settings. After this command is entered, all Internet Telephones display the original Node ID and TN screen during registration.	X

Table 67
Internet Telephone Installer Password commands (Part 3 of 4)

IPL> command	Description	Succession Signaling Server
nodeTempPwdSet "tempPwd", uses, <time>	Sets the temporary Internet Telephone Installer Password. This password is disabled by default. The password must be a string 6 to 14 digits in length. A null password cannot be entered. The valid tempPwd characters are 0 – 9 * #. The uses parameter is a numeric value from 0-1000. This parameter specifies the number of uses for which the temporary password is valid. The range for the time parameter is 0 – 240 hours, which is a maximum of 10 days. The time parameter specifies the duration in hours that the password is valid. • If the uses parameter is set to zero, the time parameter is mandatory. As a result, the password only expires based on time. • If the uses parameter is non-zero, the time parameter is optional. • If both the uses and time parameters are entered, the password expires on whichever comes first, that is, uses is reduced to zero or the time has expired. • If both uses and time are entered and both are set to zero, it is the same as not setting the temporary password at all. This command can be entered at any time and the new parameters overwrite the existing temporary password's parameters.	X

Table 67
Internet Telephone Installer Password commands (Part 4 of 4)

IPL> command	Description	Succession Signaling Server
nodeTempPwdClear	Deletes the temporary Internet Telephone Installer Password. It also reset the uses and time parameters to zero.	X

Table 68 lists the Voice Gateway commands used on the Voice Gateway Media Card.

Table 68
Voice Gateway commands

IPL> command	Description	Succession Signaling Server
vgwPLLog	Toggles gateway packet loss logging on and off.	
vgwShow	Displays information about the active (non-idle and equipped) gateway channels. Entering this command with the IP address of an Internet Telephone at the Command Line Interface of any node's Voice Gateway Media Card displays the identification of the card that has a gateway channel in use by the Internet Telephone. This is useful when you need to identify from which card to collect gateway statistics (for example, packet loss).	
vgwShowALL	Displays information about all gateway channels.	

Table 69 lists the commands used with the Data Path Capture Tool.

Table 69
Data Path Capture Tool commands

IPL> command	Description	Succession Signaling Server
captureStart	Begins the capture operation. When the command is entered, data for the gateway channel <tcid> (0-23 for ITG-P Line Card and 0-31 for Succession Media Card) begins to be captured to the circular queue.	
captureStop	Stops the audio data capture.	
captureSaveLocal	Dumps the contents of the circular queue to the specified file on the memory PC Card inserted in the /A: drive on the Voice Gateway Media Card's faceplate.	
captureSaveRemote	FTPs the contents of the circular queue to the specified file on the remote server.	
captureFree	Frees the capture queue.	

LD 117 PRT commands

Table 70 on lists the LD 117 commands to translate an Internet Telephone's DN to its IP address and its IP address to its DN.

Table 70
LD 117 PRT commands

IPL> command	Description	Succession Signaling Server
PRT DNIP <DN> [<CustomerNo>]	Prints a list of IP addresses for every Internet Telephone registered with the specified DN.	
PRT IPDN <IPAddress>	Prints a list of DNs configured for the specified IP address(es).	

Graceful TPS CLI commands

Table 72 lists the commands used to gracefully disable the TPS and Voice gateway services and the commands to enable these services after they have been disabled.

The following Graceful TPS CLI commands are available at the IP Line shell.

Table 71
Graceful TPS commands (Part 1 of 3)

Command	Description
disiTPS	Disables the LTPS service only. No new Internet Telephones are registered on the card and all registered telephones are reset when they become idle. This command applies to both the Voice Gateway Media Card and Succession Signaling Server. On the Succession Signaling Server, this command affects only the LTPS. It does not affect the virtual trunks or gatekeeper components, which means the node mastership is not moved to another TPS.

Table 71
Graceful TPS commands (Part 2 of 3)

Command	Description
disiVGW	Disables the Voice Gateway only.
	All Voice Gateways unregister with the Call Server when they become idle. This command is applicable only to the Voice Gateway Media Card or the standalone IP Line application.
disiAll	Disables both the LTPS service and the Voice Gateway channels. This command is a combination of both disiTPS and disiVGW commands.
	On the Succession Signaling Server, this command affects only the LTPS. It does not affect the virtual trunks or gatekeeper components, which means the node mastership is not moved to another TPS.
enaTPS	Enables the LTPS service.
	This command is used after the disTPS command to bring the LTPS back into service.
	This command applies to both Voice Gateway Media Cards and the Succession Signaling Server. On the Succession Signaling Server, this command affects the LTPS only. It does not affect the virtual trunks or gatekeeper components.
enaVGW	Enables the Voice Gateway.
	All gateway channels register with the Call Server. This command is applicable only to the Voice Gateway Media Card or the standalone IP Line application.
enaAll	Enables both the LTPS service and the Voice Gateway channels. This command is a combination of both enaTPS and enaVGW commands.
	On the Succession Signaling Server, this command affects only the LTPS. It does not affect the virtual trunks or gatekeeper components.

Table 71
Graceful TPS commands (Part 3 of 3)

Command	Description
disableServices	Causes the Voice Gateway Media Card or Succession Signalling Server to gracefully switch the registered resources to the other Voice Gateway Media Cards or Succession Signalling Servers located in the same node. This command does not interrupt established calls.
forceDisableServices	Forces all registered resources on the Voice Gateway Media Card or Succession Signalling Server to re-register with the other Voice Gateway Media Cards or Succession Signalling Servers in the node. This command interrupts established calls.
enableServices	Enables all the Voice Gateway Media Cards or Succession Signalling Servers to accept registrations of resources.
levelRegistations	Causes the Voice Gateway Media Card or Succession Signalling Server to attempt to balance the registration load between this card/server and the rest of the node components.

Table 72
Graceful Disable commands (Part 1 of 2)

IPL> command	Description	Succession Signaling Server
disServices	Causes the Voice Gateway Media Card or Succession Signalling Server to gracefully switch the registered resources to the other Voice Gateway Media Cards or Succession Signalling Servers located in the same node. This command does not interrupt established calls	X
disiAll	Gracefully disables both the LTPS and voice gateway service on the Voice Gateway Media Card. Gracefully disables the LTPS on the Succession Signaling Server.	X

Table 72
Graceful Disable commands (Part 2 of 2)

IPL> command	Description	Succession Signaling Server
disiTPS	Gracefully disables the LTPS service on the Voice Gateway Media Card. Prevents new Internet Telephones registering on the card, and all registered Internet Telephones are redirected to another card when idle.	X
disiVGW	Gracefully disables voice gateway service.	
enaAll	Enables both the LTPS and voice gateway service on the Voice Gateway Media Card. Enables the LTPS on the Succession Signaling Server.	X
enlServices	Enables all the Voice Gateway Media Cards or Succession Signalling Servers to accept registrations of resources	X
enaTPS	Enables the LTPS service.	X
enaVGW	Enables the voice gateway service.	
forcedisServices	Forces all registered resources on the Voice Gateway Media Card or Succession Signalling Server to re-register with the other Voice Gateway Media Cards or Succession Signalling Servers in the node. This command will interrupt established calls	X
loadBalance	Causes the Voice Gateway Media Card or Succession Signalling Server to attempt to balance the registration load between this card/server and the rest of the node components.	X

Internet Telephone Loss Plan (UK)

These commands set and adjust the gains for the UK (or other places where loss plan adjustment of Internet telephones is needed).

Table 73
Internet Telephone Loss Plan commands

IPL> command	Description	Succession Signaling Server
UKLossPlanSet	Increases the Tx level of the Internet Telephone to match the requirement for the UK.	X
UKLossPlanClr	Removes the loss plan adjustment and returns the Internet Telephone to the default loss plan levels.	X
lossPlanPrt	Prints the current Internet Telephone loss plan settings.	X
lossPlanSet <transducer> <rlrOffset> <slrOffset>	Allows a variable offset from the default loss plan to be entered for the specified transducer (handset, handsfree, or headset). The rlrOffset adjusts the level heard at the Internet Telephone. The slrOffset adjusts the level transmitted from the Internet Telephone. Positive numbers reduce the level (add loss). Negative numbers increase the level (add gain).	X
lossPlanClr	Removes the loss plan adjustment and returns the Internet Telephone to the default loss plan levels.	X

Nortel Networks recommends that the loss plan commands be entered on the node's Leader card while it is the node master. This ensures that the data is correctly propogated to all cards in the node. When installing a new Leader card in a node with modified levels, always enter the loss plan command on the Leader card's CLI, even if the command was previously entered on another card's CLI.

Note: When a node has a modified loss plan (that is, the command **ULKLossPlanSet** or **lossPlanSet** has been used), a new card that is added to the node is updated with the modified loss plan 30 seconds after the card has booted. Prior to the modified loss plan being received by the new card, calls made by Internet Telephones registered to that new card have the default loss plan levels.

CAUTION

Care must be taken when altering the Internet Telephone's loss plan. Increasing the gain increases the possibility of echo and other audio problems. Only adjust the levels when instructed by this document or by Nortel Networks support staff.

Patching tool

A patch is a piece of code that is inserted or patched into an executable program. The patching tool enables loadware on the Voice Gateway Media Cards to be patched or fixed without having to upgrade the card loadware and without service interruption. All patch commands on the Voice Gateway Media Cards and Succession Signaling Server are accessible at the IPL> prompt. These commands are summarized in Table 74 on .

Note: The parameter string supplied to the command must be enclosed with double quotes. For example, the syntax for the **pload** command is

pload "patch1.p"

These commands are used to manage patches on the Voice Gateway Media Card. Patches must be downloaded from a workstation to the Voice Gateway Media Card using a modem, an FTP session, or Element Manager. Patch files are stored in Flash memory and are loaded into DRAM memory. Once a patch is in DRAM memory it can be activated, deactivated, and its status can be monitored.

Perform the following tasks prior to loading a patch:

• Verify that the patch matches the platform's CPU type.

- • Verify the loadware version on the card.

- • Block the installation if there is a mismatch.

The installation of a patch is blocked if either the CPU type or the loadware version of the card is different than the patch. If the installation is blocked, the reason for blocking the install is printed at the CLI. The CPU type and loadware version are also verified during a power-up or reboot cycle. This prevents active patches from being re-installed if the loadware version of the card is changed.

Table 74 lists the patch commands.

Table 74
Patch commands (Part 1 of 4)

Command	Description
pload	Loads a patch file from the file system in Flash memory into DRAM memory. The loaded patch is inactive until it is put into service using the pins command.
	When a patch is successfully loaded, the pload command returns a **patch handle number**. The patch handle number is used as input to other patch commands (pins, poos, pout, and plis).
	Syntax:
	pload "[patch-filename]"
	where [patch-filename] is the filename or path of the patch file. If a filename alone is provided, the patch must be in the /C:/u/patch directory; otherwise, the full or relative path must be provided.
	If the pload command is issued without a parameter, enter the patch filename and other information when prompted.

Table 74
Patch commands (Part 2 of 4)

Command	Description
pins	Puts a patch that has been loaded into memory (using the pload command) into service. This command activates a patch. If issued successfully, the pins command indicates that global procedures, functions, or areas of memory are affected by the patch. When prompted, choose to proceed or not to proceed. Syntax: pins "[handle]" where [handle] is the number returned by the pload command If the pins command is issued without a parameter, enter a handle when prompted.
poos	Deactivates a patch (takes it out-of-service) by restoring the patched procedure to its original state. Syntax: poos "[handle]" If the poos command is issued without a parameter, enter a handle when prompted.
pout	Removes a patch from DRAM memory. The patch must be taken out-of-service (using the poos command) before it can be removed from the system. Syntax: pout "[handle]" If the pout command is issued without a parameter, enter a handle when prompted.

Table 74
Patch commands (Part 3 of 4)

Command	Description
pstat	Gives summary status information for one or all loaded patches.
	For each patch, the following information is displayed: patch handle, filename, reference number, whether the patch is in-service or out-of-service, the reason why the patch is out-of-service (if applicable), and whether the patch is marked for retention or not.
	Note: Patch retention means that if a reset occurs, then the patch is automatically reloaded into memory and its state (active or inactive) is restored to what it was prior to the system going down.
	Syntax:
	pstat "[handle]"
	If the handle is provided, only the information for the specified patch is displayed. If the pstat is issued without a parameter, information for all the patches is displayed.
plis	Gives detailed patch status information for a loaded patch.
	Syntax:
	plis "[handle]"
	If the pout command is issued without a parameter, enter a handle when prompted.

Table 74
Patch commands (Part 4 of 4)

Command	Description
pnew	Creates memory patches for the Voice Gateway Media Card. • The release of the patch is assumed to be the same as that of the current load. • The address to be patched is checked to ensure that it is in range. • For each address that is changed, the "old" contents are assumed to be the current contents of that memory address. • If a path is not provided for the new path filename then it is assumed that the patch is in the /C:/u/patch directory. Once a memory patch is created using the pnew command, it is loaded and activated like any other patch. Syntax: pnew ***Note:*** The pnew command has no parameter(s).

Patch Directories

There are two patch directories on a Voice Gateway Media Card:

1   /C:/u/patch

This is the default directory for patch files. Patch files should be copied to this directory.

2   /C:/u/patch/reten

Use this directory to store patch retention control files. Do not use this directory to store patches and do not remove files from this directory.

Patch Synchronization Across a Node

Element Manager provides a mechanism for downloading and putting patches in service across a node.

Patch synchronization across a node cannot be carried out from the IPL> prompt.

Table 75 lists the Patching Tool commands.

Table 75
Patching Tool commands

IPL> command	Description	Succession Signaling Server
pins	Puts a patch into service that has been loaded into memory using the pload command.	X
plis	Gives detailed patch status information for a loaded patch.	X
pload	Loads a patch file from the file system on Flash memory into DRAM memory	X
pnew	Creates memory patches for the Voice Gateway Media Card.	X
poos	Deactivates a patch by restoring the patched procedure to its original state.	X
pout	Removes a patch from DRAM memory.	X
pstat	Gives summary status for one or all loaded patches.	X

Lamp audit and Keep Alive functions

The Lamp Audit function provides a continuous source of heartbeat messages to ensure the Internet Telephone is powered and the IP connection is alive. Since there is a reliable UDP connection from the core through to the Internet Telephones, any failure of the Internet Telephone, the Voice Gateway Media Card, or the IP connection is detected.

Network Signaling Diagnostics
Network Signaling Diagnostics can be run as part of the midnight routines.

Internet Telephone Keep Alive
When the Voice Gateway Media Card detects that the Internet Telephone has been disconnected, the Voice Gateway Media Card logs the event and sends an UNREGISTER message to the system for that Internet Telephone.

Card or ELAN failure

When the Call Server detects a loss of connection with the Voice Gateway Media Card, the Call Server logs a message and unregisters all the Internet Telephones and gateway channels associated with that Voice Gateway Media Card.

Maintenance audit enhancement

IP Line 3.1 provides a background audit that watches for tasks that go into a suspended state. Under normal operation, a task should not go into a suspended state. However, if it occurs, the card's processing is affected.

If the audit task finds a suspended task, it performs the following actions:

• outputs a stack and register dump to the debug port

• outputs a file on the /C: drive

• resets the card

This function provides an automatic way to return the card to service and provides critical debug information. The information is output to the EXCPLOG.n files (where n is a number from 0-3) that are located in the /C:/LOG directory. The new information is placed in these files where it cannot be overwritten by the usual information output to the SYSLOG file when the card reboots.

The auditRebootSet command disables the card reboot if any task is found in a suspended state.

The maintenance audit enhancement differentiates between tasks that are critical and non-critical.

• A critical task is any task that the IP Line application needs to function. When a critical task is not functioning properly, it causes noticeable degradation in the IP Line application.

• A non-critical task is any other task that does not cause noticeable degradation to the IP Line application.

If a critical task is found suspended, the stack and register information is dumped and the card is then reset. If a task on the critical task list disappears, it is treated as a suspended task. Therefore, a missing critical task triggers a reboot and a missing non-critical task does not trigger a reboot.

If a non-critical task is found suspended, the information is dumped but the card is not reset. The card is reset when the Voice Gateway Media Card clock reaches 2:00 AM (default reset time). The reset time is configurable from the CLI. This eliminates card resets that impact service for non-critical tasks by delaying them to a non-service impacting time.

Additional CLI commands have been added enabling any task to be marked as critical or non-critical, regardless of its default designation. This could be used, for example, to mark a "misbehaving" task as non-critical to avoid a card reset. This would enable the problem to be debugged.

The maintenance audit is available only for the IP Line 3.1 application running on the ITG-P 24-port and Succession Media Card line cards. It is not available on the Succession Signaling Server as it does not have the exception handler, stack dump, and syslog file functions of the other cards.

Critical task list

All application tasks default to the critical task list. These applications include: TPS, VTM, SET, VTILIB, UMS, UMC, RDP, VGW, RTP, RTCP, ELC, baseMMintTask, and A07.

The following VxWorks system tasks are also on the critical task list: tShell, tNetTask, tExcTask, and tTelnetd.

All other tasks are on the non-critical task list. The monitor task is called tMonTask.

Any data entered at the CLI that deviates the operation from the default is saved in the /C:/CONFIG/AUDIT.INI text file. The contents of the file are loaded as the application boots up and provides the required non-volatile storage for entered settings. It is applicable only to the card on which it resides. It can be manually copied from one card to all other cards in the node if desired.

History file

A history file is created when the card starts. The text file is called audit.his and it is stored in the /C:/LOG directory. This file contains a list of the problems found and the actions taken by the maintenance audit. The audit.his file has a fixed size of 4096 bytes.

The most recent records in the file overwrite the oldest records with newer events appear at the beginning of the file. A record in the file is a one-line string with maximum size of 256 characters.

The format for the records in the history file is:

index : (timeString) TMxx taskName: DescriptionString

where:

- index – monotonically increasing record count; wraps after 9999 events
- (timeString) – the time the event was detected
- TMxx – record type: 0-reboot, 1-Suspend, and 2-TaskDisappear
- taskName – the name of problematic task
- DescriptionString – a description of the action taken

An example of the output follows.

```
IPL> auditHistoryShow

0001 :(APR 25 12:26:25) TM01 tCSV:Suspend

0002 :(APR 25 12:26:50) TM01 tSET:Suspend

0003 :(APR 25 12:26:50) TM00 tExcTask:Reboot

0004 :(APR 25 12:35:55) TM02 tELC:Disappear

0005 :(APR 25 12:35:55) TM00 tELC:Reboot

0006 :(APR 25 12:48:27) TM01 tUMC:Suspend

0007 :(APR 25 12:48:27) TM00 tExcTask:Reboot
```

```
0008 :(APR 25 13:15:56) TM01 tUMC:Suspend

0009 :(APR 25 13:15:56) TM00 tExcTask:Reboot

0010 :(APR 25 13:29:35) TM01 tLogTask:Suspend

0011 :(APR 25 13:45:35) TM01 tLogTask:Suspend
```

Maintenance audit CLI commands

There are five CLI commands that support the maintenance audit function as outlined in Table 76.

Table 76
Maintenance audit commands (Part 1 of 2)

Command	Description
auditShow	Displays the following information: • whether a card reboot is enabled • the time a card reboot will occur if a non-critical task is found suspended • a list of all tasks being monitored and their designation (critical or non-critical) Example: **IPL> auditShow** **Reboot when detect a suspended task --- Disabled** **Critical Task: tTPS tVTM tSET tVTI tUMS tUMC tRDP tPBX tVGW tRTP tRTCP tELC baseMMintTask tA07 tShell tNetTask tExcTask tTelnetd** **Non-Critical Task: tTest**
auditHistoryShow	Displays the contents of the audit.his file.

Table 76
Maintenance audit commands (Part 2 of 2)

Command	Description
auditRebootSet 0/1	Globally disables the card reboot from this audit task.
	By default, this is set to 1. If it is set to 0, no card reboot occurs when a suspended task is found for critical or non-critical tasks.
	The debug information is dumped; however, recovery requires a manual reset of the card.
auditRebootTimeSet "timeString"	Sets the reset time for non-critical tasks to the value defined by the timeString parameter.
	The timeString is formatted as HH:MM and is in 24-hour clock format. By default, the time is set to 02:00 (2 AM).
auditTaskSet tTaskName, 0/1	Forces a task to be considered critical or non-critical.
	This command overrides the audit's default setting for the task. The tTaskName parameter specifies the task (the VxWorks taskname), as displayed by the "i" command.
	The value of 0 marks the task as non-critical, the value of 1 marks it as critical.

Table 77 lists the Audit commands.

Table 77
Audit commands

Command	Description	Succession Signaling Server
auditHistoryShow	Displays the recent history of the audit task's activity.	
auditRebootSet	Distributes globally the audit task from resetting the card.	
auditRebootTimeSet	Sets the time of non-critical task triggered card resets.	
auditShow	Displays audit task information, such as a list of tasks and the time for non-critical tasks triggered resets.	
auditTaskSet	Enables manual setting of a task to critical or non-critical status.	

Voice Gateway Media Card self-tests

During power-up, the Voice Gateway Media Card performs diagnostic tests to ensure correct operation. The faceplate RS-232 port on the Voice Gateway Media Card can be used to monitor the progress of these tests. When the processor responds correctly, the 8051XA controller switches its serial port to provide Card LAN communication and connects the processor with the external RS-232 port.

Troubleshoot a software load failure

Symptoms

OTM cannot establish connection with the Voice Gateway Media Card. The faceplate LCD display reads "BIOS."

Problem

The Voice Gateway Media Card has booted the BIOS load.

Diagnosis

In the event of a failure to load and run the IP Line 3.1 software, the Voice Gateway Media Card defaults to the BIOS load. This load consists of a prompt that enables commands to reload the IP Line loadware and reboot (see below).

There are three known reasons for the failure to load the IP Line software:

- Not enough memory due to a faulty or missing SIMM.

- Corruption of the IP Line loadware image in flash memory.

- The escape sequence to boot from the BIOS has been inadvertently sent down the serial line due to noise.

To determine the cause of the IP Line load failure, reboot and monitor the booting sequence through the serial port. Capture the booting sequence to aid in communication with technical support personnel.

Examples of booting sequences

Case 1

The following excerpt from the booting sequence indicates the amount of memory onboard.

```
Memory Configuration
Onboard: 4MB
SIMM: 16MB
Total: 20MB
```

In the absence or failure of the SIMM, the total memory is 4MB; that is not enough memory to support the IP Line application.

Case 2

The following excerpt from the booting sequence indicates the Voice Gateway Media Card locating and loading the IP Line loadware from flash memory:

```
Cookie array value: 0x111111100

Checksum Validation at Bank Address: 0xF9800000
Checksum in ROM = 35582602
Length of bank = 0004FEF8
Calculated Checksum = 35582602

Checksum array value: 0x11111100

Loading code from address: F9800010
Verifying ROM to RAM copy...
ROM to RAM copy completed OK
Jumping to VxWorks at 0x00E00000
EIP = 0x00E0011E
Jumping to romStart at 0x00E00300
```

In the event of a software load failure, the boot sequence indicates that the BIOS is being loaded:

```
Cookie array value: 0x11111111
Booting from BIOS ROM
```

Case 3

The boot sequence indicates that the "xxx" sequence has been entered and the BIOS is being loaded.

Solutions

Case 1

If a SIMM is missing, install a 16MB SIMM into the SIMM slot which is underneath the daughterboard. If the SIMM is present, check that the SIMM is properly seated. Otherwise, the SIMM is faulty and needs replacement.

Case 2

Re-attempt a software download from the OTM host. Use the following commands:

```
upgradeErase
upgrade "hostname","hostAccount","hostPassword",
        "hostDirectoryPath","hostSWFilename"
```

After the software loads to flash, reboot the card:

```
sysReboot
```

If the failure to load the IP Line software into RAM persists, then the flash device is faulty. Replace the Voice Gateway Media Card.

Case 3

The escape sequence "xxx" is rarely transmitted. Reboot the card.

Warm reboot of the Voice Gateway Media Card

The **cardReset** IP Line CLI command performs a warm reboot of an out-of-service Voice Gateway Media Card:

Test the Voice Gateway Media Card DSPs

At the IPL> CLI, the following two tests can be performed on the IP Line DSPs:

• To run a self-test on the DSP daughterboard: **DSPselfTest**

   Note: If the DSP self-test fails, the Voice Gateway Media Card must be replaced.

• To run a PCM loopback test, a Send loopback test, or a Receive loopback test on the DSP daughterboard, respectively:

   DSPPcmLpbkTestOn ("DSPPcmLpbkTestOff" to stop the test)
   DSPSndLpbkTestOn ("DSPSndLpbkTestOff" to stop the test)
   DSPRcvLpbkTestOn ("DSPRcvLpbkTestOff" to stop the test)

   Note: The DSPs and all associated ports must be disabled before performing these tests.

Work with alarm and log files

Alarm and log file output is turned on using the IPL> CLI. The following commands can be performed at the IPL> prompt:

- To turn on or turn off the error log file, type: **logFileOn** or **logFileOff**.

- To display the modes of all log files and alarms, type: **logFileShow**.

Troubleshoot an Internet Telephone Installation

If an Internet Telephone cannot be installed because the prompt for the node ID or TN does not display:

Procedure 86
Troubleshooting an Internet Telephone installation

1   Log in to one Voice Gateway Media Card in the node.

2   Type the **nodePwdShow** command at the IPL> prompt.

3   If the administrative password is enabled (PwdEna=Yes) and there is a null (zero-length) password (the Pwd field is blank), then Internet Telephone cannot be installed on that Voice Gateway Media Card.

NodeI D	PwdEn a	Pwd ====== ==	TmpPw d ====== ==	Uses ===== ==	Timeout ==========
===== =	===== ==				0d 0h 0m 0s
123	Yes				

4   Use the **nodePwdSet "password"** command to set the administrative password and to enable telephones to be installed. Ensure the "password" parameter is included.

——————————— **End of Procedure** ———————————

Maintenance telephone

An Internet Telephone functions as a maintenance telephone when the CLS is defined as MTA (Maintenance Telephone Allowed) in the Multi-line Telephone Administration program (LD 11). A maintenance telephone enables commands to be sent to the system; however, only a subset of the commands that can be entered from a system terminal can be used. To access the system using the maintenance telephone, a Special Service Prefix (SPRE) code (defined in the Customer Data Block) is entered and followed by "91". To enter commands, press the keys that correspond to the letters and numbers of the command (for example, to enter LD 42 return, key in 53#42##).

The following overlays (LDs) are accessible from an Internet Telephone operating as a maintenance telephone: 30, 32, 33, 34, 36, 37, 38, 41, 42, 43, 45, 46, 60, and 62.

Note: The above maintenance overlay operations are supported on Internet Telephones except for the Tone and Digit Switch (TDS) commands of LD 34 and TONE command of LD 46.

Upgrade Voice Gateway Media Card 8051 XAController firmware

The minimum versions of the 8051 XAController firmware for the Voice Gateway Media Card are:

- Version 6.7 for the Succession Media Card

- Version 5.7 for the ITG-P 24-port line card

Check the Nortel Networks Web site for the most current version of the firmware. To download firmware files from Nortel Networks, see Procedure 108 on .

Once the most current version of the firmware has been downloaded, follow the steps in:

- Procedure 87 on page 538 to upgrade the 8051 XAController firmware on the ITG-P 24-port line card

- Procedure 88 on page 541 to upgrade the 8051 XAController firmware on the Succession Media Card

Upgrade the ITG-P 24-port line card 8051 XAController firmware

Follow the steps in Procedure 87 to upgrade the 8051 XAController firmware on the ITG-P 24-port line card. Enter all the upgrade commands at the VxWorks shell prompt. Copy the F/W binary file (on a PC Card plugged into the card's faceplate) to the card's /C: drive or to a network server accessible by the card.

Procedure 87
Upgrading the ITG-P 24-port 8051 XAController firmware

1   Check if the 8051 XAController firmware upgrade is required. Check the firmware version by entering the firmwareVersionShow command:

IPL> firmwareVersionShow
Firmware Version = ITG Firmware Rls 4.0
value = 40 = 0x28 = '('
IPL>

Note: If the F/W version is version 5.7 or greater, the upgrade is not needed.

2   Depending on the location of the firmware file, enter one of the following commands as shown in Table 78:

The file name for the 8051 XAController firmware for the ITG-P 24-port line card is ITGPFW57.BIN

Table 78
Upgrade command based on file location

— File is located on the card's /C: drive (The file was previously FTP'd to /C:):   upgradeXa "127.0.0.1","userid","password","</C:/path>","<fw_filename>"
— File is located on a PC Card plugged in the card's faceplate: upgradeXa "127.0.0.1","userid","password","</A:/path>","<fw_filename>"
— File is located on another card's /C: drive (The file was previously FTPed to /C:):   upgradeXa "<ITG ELAN IPaddr>","userid","password","<path>","<fwfilename>"
— File is located on the OTM PC: upgradeXa "<PC's IP addr>","itguser","itguser","","<fw_filename>"
— File is located on a network FTP server: upgradeXa "<server's IP addr>","<uid>","<pswd>","<path>","<fw_filename>"

3 If the upgrade process is successful, the following is displayed:

Upgrade packet: 0..100..200..300..400..500..600..700..800..
tUpgradeXa: 8051XA Upgrade completed OK
tUpgradeXa: Reboot the pack to run new loadware

Note: If these messages do not display, the upgrade was not successful. Repeat step 2 again. Do not continue with steps 4 and 5.

4 Reboot the card if both of the following are true:

• the download is successful

• the software version on the card that was checked in step 1 is version 4.0 or later

However, if the software version is prior to version 4.0, enter the following commands:

xaSend 0,0x11
W 05555,AA
W 02AAA,55
W 05555,80
W 05555,AA
W 02AAA,55
W 05555,30

Note 1: There is a space after xaSend and the letter "W". No other spaces are allowed. All letters are in uppercase.

Note 2: Ignore any syntax error messages that print out after the xaSend command is entered.

After the last command is entered, the card automatically reboots.

5   When the card boots up with firmware version x.x, the following messages are printed:

```
ITG Firmware Rls x.x
8051XA Firmware Version x.x (Pentium) <date>
(C) Nortel Networks Inc., 1996-2001
32K External RAM detected
All FPGAs are configured
No dongle detected
8K DPRAM detected

Bank 0 Checksum - 54A9H
....
```

——————————— **End of Procedure** ———————————

Upgrade the Succession Media Card 8051 XAController firmware

Upgrades of the Succession Media Card 8051 XAController firmware can be required at times. For instance, the firmware can be upgraded to enable the display of the last reset reason. If the Succession Media Card is a Release 8 vintage or older, it cannot be upgraded unless the 8051 OTP part is changed on the board. Vintages of the card after Release 8 can be upgraded as described in this section. The release label is on the faceplate (below the Hex display).

Follow the steps in Procedure 88 to upgrade the Succession Media Card 8051 XAController firmware.

Procedure 88
Upgrading the Succession Media Card 8051 XAController firmware

1   Determine if the firmware upgrade is required and if the card can have its firmware upgraded by this process.

```
IPL> firmwareVersionShow
Firmware Version = ITG Firmware Rls 6.5
value = 40 = 0x28 = '('
IPL>
```

2   Check the release label on the faceplate (below the Hex display) and ensure it is newer than Release 8.

3   Reboot the card.

While the card is booting, break into the BIOS by entering **jkl** when prompted.

4   At the prompt enter the following commands:

```
-> initMm
value = 0 = 0x0
-> spawnMm
value = 0 = 0x0
```

5   Depending on the location of the software file, enter one of the following commands as shown in Table 79.

The file name for the 8051 XAController firmware for the Succession Media Card is SMCFW65.BIN.

Table 79
Upgrade command based on file location

— File is located on the card's /C: drive (The file was previously FTPed to /C:):   **upgradeXa "127.0.0.1","userid","password","</C:/path>","<fw_filename>"**
— File is located on a PC Card plugged in the card's faceplate: **upgradeXa "127.0.0.1","userid","password","</A:/path>","<fw_filename>"**
— File is located on another card's /C: drive (The file was previously FTPed to /C:):   **upgradeXa "<ITG ELAN IPaddr>","userid","password","<path>","<fw_filename>"**
— File is located on the OTM PC: **upgradeXa "<PC's IP addr>","itguser","itguser","","<Fw_filename>"**
— File is located on a network FTP server: **upgradeXa "<server's IP addr>","<uid>","<pswd>","<path>","<Fw_filename>"**

6   If the upgrade process is successful, the following is displayed:

```
Upgrade packet:
0..100..200..300..400..500..600..700..800..900..100
0..1100..1200..
1300..1400..1500..1600..1700..1800..1900..
tUpgradeXa: 8051XA Upgrade completed OK
tUpgradeXa: Reboot the pack to run new loadware
```

Note: If the upgrade is not successful, these messages do not display. Repeat step 5 again.

7   Reboot the card.

8   When the card boots up with version 6.5 software (for instance), the following messages are printed:

```
MC Firmware Rls 6.5
8051XA Firmware Version 6.5 8 February 2002
(C) Nortel Inc. 2001
EPLD Version: 3.0
32K External RAM detected
8K DPRAM detected
All FPGAs are configured
No dongle detected

Bank 1 Checksum - 7354H
SRAM test okay
SDRAM Addr test okay
....
```

———————— **End of Procedure** ————————

Replace the Succession Media Card's CompactFlash

The Succession Media Card must have the CompactFlash card installed in order to be used as a Voice Gateway Media Card. If the CompactFlash card is removed from the Succession Media Card, another CompactFlash card must be installed before using the Succession Media Card.

If it is necessary to remove the CompactFlash card, follow the steps in Procedure 89 on page 544. To re-install a CompactFlash card, see Procedure 2 on page 146.

Procedure 89
Removing the CompactFlash

1   Squeeze the tangs at the base of the Retaining Pin (the tangs are labeled **1** in Figure 156). Continue to squeeze the tangs and press the Retaining Pin down to remove it from the card (labeled **2** in Figure 156).

Figure 156
Squeeze the Retaining Pin tangs
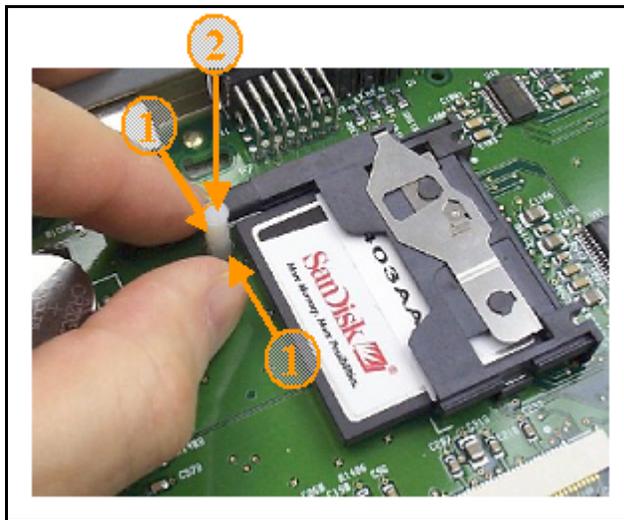
2   Press the Eject button to release the CompactFlash card from the socket (see **1** in Figure 157).

Figure 157
Press Eject button

3   Slide the card out of the socket (labeled **2** in Figure 158) and carefully remove the CompactFlash card (labeled **3** in Figure 158).

Figure 158
Removing the CompactFlash card
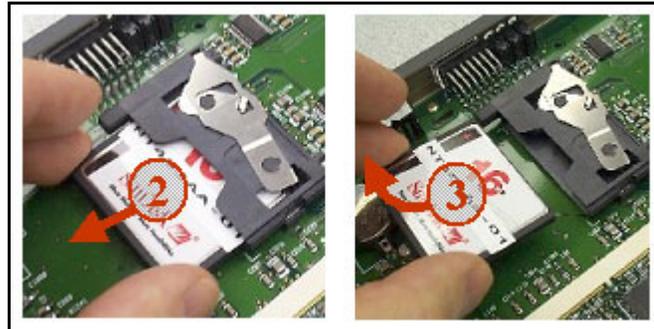
4   Return the CompactFlash card to an anti-static package.

───────────── **End of Procedure** ─────────────

Voice Gateway Media Card maintenance using OTM 2.1

Contents

This section contains information on the following topics:

Introduction

This chapter provides information on using Optivity Telephony Management (OTM) 2.1 to perform maintenance functions on the Voice Gateway Media Card.

Where reference is made to OTM, the latest version, OTM 2.1, is assumed.

CAUTION

This procedure is not supported for a node which resides on a Succession 1000 system.

Replace a Voice Gateway Media Card

Replace the Voice Gateway Media Card when the card is removed or when the following conditions occur:

- If the Voice Gateway Media Card displays a code of the form F:xx on the faceplate LED following a reboot, this indicates an unrecoverable hardware failure. The card cannot register with the systems. The exception is the F:10 code, which indicates that the Security Device is missing from the card.

- If the Management (ELAN) Ethernet interface or the Voice (TLAN) Ethernet interface on the Voice Gateway Media Card has failed. This is indicated by failing to show a link pulse on the voice IP interface status LED or on the switch. It can also be indicated if the maintenance port continuously prints 'lnIsa0 Carrier Failure' messages after determining that the hub or switch port and ELAN cable are good.

- If a voice channel on the Voice Gateway Media Card has a consistent voice quality fault. For example, persistent noise or lack of voice path, even after resetting the card and retransmitting the card properties.

  Note: There are separate procedures for replacing a Leader Voice Gateway Media Card and a Follower Voice Gateway Media Card. Be aware of the role the card is to play before replacing the card.

Replace a Leader Voice Gateway Media Card

To replace a Leader Voice Gateway Media Card, follow the steps in
Procedure 90 on .

> ⚠ **CAUTION**
>
> This procedure is not supported for a node which resides
> on a Succession 1000 system.

Procedure 90
Replacing a Leader Voice Gateway Media Card

1 Locate the faulty card in the OTM IP Telephony database by the TN, MAC
address, and IP address.

2 Disable the faulty Voice Gateway Media Card in LD 32 with the **DISI**
command. The system displays "NPR0011" when the card has been
completely disabled by the DISI command.

3 Use the **disiTPS** command at the IPL> CLI to disable the TPS on the
faulty Voice Gateway Media Card.

Note: This forces all Internet Telephones registered on this card to
re-register. If there are sufficient resources, this can take up to several
minutes. If there are not sufficient resources, Internet Telephones can
remain unregistered indefinitely.

4 Use the **isetShow** command to monitor the status of the card and the
reregistration of the Internet Telephones. The Voice Gateway Media Card
card is completely disabled when there are no Internet Telephones
registered on the card.

5 Remove the faulty Voice Gateway Media Card from the system.

6 Install the replacement Voice Gateway Media Card into the card slots in
the Meridian 1/ Succession 1000M IPE module, Option 11C/Succession
1000M Cabinet, or Succession 1000 Media Gateway/Media Gateway
Expansion. To do this:

   a. Pull the top and bottom locking devices away from the card faceplate.

   b. Insert the Voice Gateway Media Card into the card guides and gently
push it until it makes contact with the backplane connector. Hook the
locking devices.

Note 1: When cards are installed, the red LED on the faceplate remains lit until the card is configured and enabled in the software, at which point the red LED turns off. If the LED does not follow the pattern described or operates in any other manner (such as continually flashing or remaining weakly lit), replace the card.

Note 2: Observe the faceplate maintenance display to see startup self-test results and status messages. A display of the type **F:xx** indicates a failure. Refer to Table 53 on page 481 for a listing of the ITG-P 24-port line card's display codes and to Table 54 on page 482 for a listing of the Succession Media Card's display codes.

7   Follow the steps in Procedure 20 "Setting the Leader 0 IP address" on page 217 to configure the new card as a Leader card.

8   In the **OTM Navigator**, select the **Services** folder. Double-click on the **IP Telephony** icon. The **IP Telephony** window opens. Select the node in the upper part of the window.

9   Click on Leader 0 or any Voice Gateway Media Card in the node.

10   Click **Configuration | Node | Properties**. The **Node Properties** window opens.

11   Click the **Configuration** tab.

12   Select the card to be replaced.

13   Change the **Management MAC** to the MAC address of the replacement Voice Gateway Media Card. The MAC address is the Motherboard Ethernet address labeled on the faceplate of the replacement Voice Gateway Media Card.

14   Click **Change**, and then **OK**.

15   Select Leader 0 or any Voice Gateway Media Card in the node in the **IP Telephony** window.

16   Use the **Configuration | Synchronize | Transmit**. The **Transmit Options** window opens.

17   Under **Transmit options**, select the **Transmit to Selected Nodes** radio button and check the **Node Properties to Active Leader** check box.

18   Click **Start transmit**. This updates the node properties on the active Leader card with the MAC Address of the replacement Voice Gateway Media Card. The results of the transmit are displayed under **Transmit control**. When the transmit is successful, click **Close**.

19 In the OTM **IP Telephony** window, select **View | Refresh** and verify that the replacement Voice Gateway Media Card state is showing "Unequipped."

———————————— **End of Procedure** ————————————

Replace a Follower Voice Gateway Media Card

Follow the steps in Procedure 91 on to replace a Follower Voice Gateway Media Card.

Procedure 91
Replacing a Follower Voice Gateway Media Card

1 Locate the faulty card in the OTM IP Telephony database by the TN, MAC address, and IP address.

2 Disable the faulty Voice Gateway Media Card in LD 32 with the **DISI** command. The system displays "NPR0011" when the card has been completely disabled by the DISI command.

3 Use the **disiTPS** command at the IPL> CLI to disable the TPS on the faulty Voice Gateway Media Card.

   Note: This forces all Internet Telephones registered on this card to re-register. If there are sufficient resources, this can take up to several minutes. If there are not sufficient resources, Internet Telephones can remain unregistered indefinitely.

4 Use the **isetShow** command to monitor the status of the card and the reregistration of the Internet Telephones. The Voice Gateway Media Card card is completely disabled when there are no Internet Telephones registered on the card.

5 Remove the faulty Voice Gateway Media Card from the system.

   Note 3:

6 In the **OTM Navigator**, select the **Services** folder. Double-click on the **IP Telephony** icon. The **IP Telephony** window opens. Select the node in the upper part of the window.

7 Click on Leader 0 or any Voice Gateway Media Card in the node.

8 Click **Configuration | Node | Properties**. The **Node Properties** window opens.

9 Click the **Configuration** tab.

10 Select the card to be replaced.

11 Change the **Management MAC** to the MAC address of the replacement Voice Gateway Media Card. The MAC address is the Motherboard Ethernet address labeled on the faceplate of the replacement Voice Gateway Media Card.

12 Click **Change**, and then **OK**.

13 Select Leader 0 or any Voice Gateway Media Card in the node in the **IP Telephony** window.

14 Use the **Configuration | Synchronize | Transmit**. The **Transmit Options** window opens.

15 Under **Transmit options**, select the **Transmit to Selected Nodes** radio button and check the **Node Properties to Active Leader** check box.

16 Click **Start transmit**. This updates the node properties on the active Leader card with the MAC Address of the replacement Voice Gateway Media Card. The results of the transmit are displayed under **Transmit control**. When the transmit is successful, click **Close**.

17 Install the replacement Voice Gateway Media Card into the card slots in the Meridian 1/ Succession 1000M IPE module, Option 11C/Succession 1000M Cabinet, or Succession 1000 Media Gateway/Media Gateway Expansion. To do this:

   a. Pull the top and bottom locking devices away from the card faceplate.

   b. Insert the Voice Gateway Media Card into the card guides and gently push it until it makes contact with the backplane connector. Hook the locking devices.

   Note 1: When cards are installed, the red LED on the faceplate remains lit until the card is configured and enabled in the software, at which point the red LED turns off. If the LED does not follow the pattern described or operates in any other manner (such as continually flashing or remaining weakly lit), replace the card.

18 Observe the faceplate maintenance display to see startup self-test results and status messages. A display of the type **F:xx** indicates a failure. Refer to Table 53 on for a listing of the ITG-P 24-port line card's display codes and to Table 54 on for a listing of the Succession Media Card's display codes.

19 In the OTM **IP Telephony** window, select **View | Refresh** and verify that the replacement Voice Gateway Media Card state is showing "Unequipped."

—————— **End of Procedure** ——————

Verify the Voice Gateway Media Card loadware and firmware

To verify the loadware on the Voice Gateway Media Card and the firmware on the Internet Telephone, follow the steps in Procedure 92.

> ⚠️ **CAUTION**
>
> This procedure is not supported for a node which resides on a Succession 1000 system.

Procedure 92
Verifying the Voice Gateway Media Card software and firmware

> *Note:* Refer also to Procedure 23, "Verifying card loadware and Internet Telephone firmware using OTM 2.1" on page 227.

1 Check the Nortel Networks Customer Support Web site for the latest IP Line software and Internet Telephone firmware releases. Download the appropriate IP Line 3.1 file.

- Download the **IP Line 3.1xx.sa.zip** for the Succession Media Card. This zipped file contains the IP Line 3.1 loadware for the Succession Media Card, the Internet Telephone firmware, and a readme.txt file.

- Download the **IP Line 3.1xx.p2.zip** for the ITG-P card. This zipped file contains the IP Line 3.1 loadware for the ITG-P card, the Internet Telephone firmware, and a readme.txt file.

See Procedure 108 on page 649 for the steps for downloading files from the Nortel Networks Web site.

Note: The IP Line software and Internet Telephone firmware files are contained in the **IP Line 3.1.xx SA** file in the **Internet Telephony Gateway** product list on the Nortel Networks Web site.

The zipped file contains:

- the **IPL310xx.p2** and **IPL310xx.sa** software files. The IPL310xx.p2 file is the IP Line 3.1 application for the ITG-P 24-port line card and the IPL310xx.sa is the IP Line 3.1 application for the Succession Media Card.

- the **0602Bxx.BIN** (i2004) and **0603Bxx.BIN** (i2002) firmware files.

  For example, a firmware version can be labelled 0602B38. This means Internet Telephone firmware version 1.38.

  — The 02 represents the i2004 Internet Telephone.

  — The letter B represents the Version number 1.

  — 38 represents the Release number .38.

- A **readme.txt** file. The readme.txt file explains important considerations for installing the new software and firmware versions. The readme file also includes identifying information for the software and firmware files such as the date and time, size and checksum.

2   Locate the saved file and double-click the zipped file. The zipped file opens in a compression utility program and the uncompressed files are listed.

3   Compare the latest software and firmware versions available from the Nortel Networks Web site with the software and firmware version currently on the Voice Gateway Media Card.

   a.   In the **IP Telephony** window, double-click the replacement Voice Gateway Media Card in the bottom of the window to open the **Card Properties** window.

   b.   Leave the defaults in the Maintenance tab of the Card Properties window. Click the **Configuration** tab.

   c.   Verify that the **S/W version** shows the latest recommended Voice Gateway Media Card software version.

     d.   Verify that the **i2002 or i2004 F/W version** is the latest recommended release of the i2002 or i2004 Internet Telephone firmware. Click **OK**.

4   If the card's software and firmware are not up-to-date, transfer the downloaded files (*.p2, *.sa, and firmware file(s)) from an Internet-enabled PC to the OTM PC.

5   Upgrade the software and/or firmware if required. Refer to "Upgrading Voice Gateway Media Card software from the OTM 2.1 PC" on and "Upgrading the Internet Telephone firmware" on .

———————————   **End of Procedure**   ———————————

Transmit card properties to the cards

To transmit cards properties to the Voice Gateway Media Cards, follow the steps in Procedure 93.

> **CAUTION**
>
> This procedure is not supported for a node which resides on a Succession 1000 system.

Procedure 93
Transmitting card properties

1   In the **OTM Navigator**, select the **Services** folder. Double-click on the **IP telephony** icon. The **IP Telephony** window opens.

2   Select the replacement Voice Gateway Media Card.

3   Click **Configuration** | **Synchronize** | **Transmit**.

4   The **Transmit Options** window opens. See Figure 159 on .

Figure 159
Transmit Options dialog box
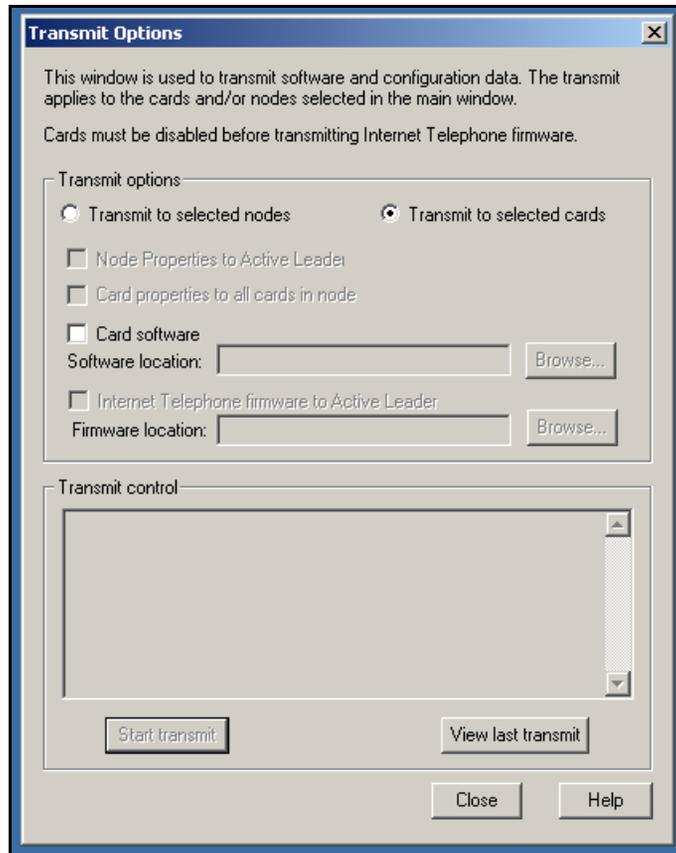
5   Select the **Transmit to selected cards** radio button.

6   Click the **Start transmit** button.

The transmission status is displayed under **Transmit control**. Confirm that Card Properties are transmitted successfully.

7   When the transmission is successful, click **Close**.

8   Use the LD 32 **ENLC** command to re-enable the Voice Gateway Media Card.

9   Verify that the card is enabled in the **IP Telephony** window. Locate the card in the list at the bottom of the screen. Look under the **Card state** column and verify that the status of the card is **Enabled**.

10   Update the Installation Summary Sheet with the new MAC address. See "Voice Gateway Media Card installation summary sheet" on .

11   Verify the TN, management interface MAC address, and IP address for each Voice Gateway Media Card. Compare the displayed values with those on the Voice Gateway Media Card Installation Summary Sheet.

—————————————— **End of Procedure** ——————————————

Access the IPL> CLI from OTM

To access the IPL> CLI from OTM, follow the steps in Procedure 70, "Accessing a Voice Gateway Media Card using Telnet" on .

Add a "dummy" node for retrieving and viewing IP Telephony node configuration

Follow the steps in Procedure 94 on to create a "dummy" IP Telephony node for retrieving and viewing the IP Telephony node configuration, without overwriting the existing IP Line configuration data for an existing node in the OTM IP Telephony database.

Retrieving the actual IP Telephony node configuration to the "dummy" node is useful in the following cases:

• to isolate IP Telephony node configuration faults

• to determine which copy of the database is correct, in order to determine the desired direction of database synchronization:

— transmit OTM IP Line to an IP Telephony node

or

— retrieve IP Telephony node to OTM IP Line

Add the dummy node manually or by retrieving the IP Telephony node configuration data from an existing node.

The site name, system name, and customer number must exist in the OTM Navigator before a new IP Telephony node can be added.

Follow the steps in Procedure 94 to create the "dummy" IP Telephony node.

CAUTION

This procedure in is not supported for a node which resides on a Succession 1000 system.

Procedure 94
Creating the "dummy" IP Telephony node to retrieve configuration

1   In **OTM Navigator**, click **Sites | Configuration | Add Site.** See
    Figure 160 on .

Figure 160
OTM Navigator – Configuration | Add Site
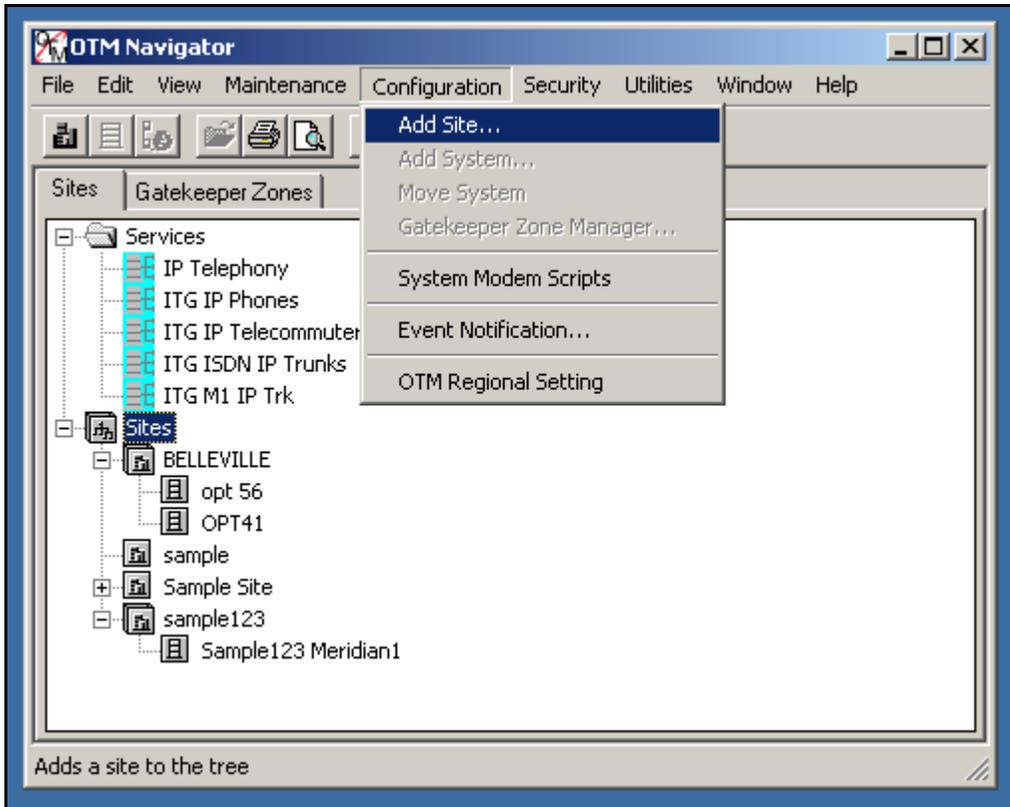
2 The **New Site Properties** window opens. See Figure 161 on .

Figure 161
New Site Properties

In the **New Site Properties** window, set the following:

a. **Site Name:** Add a site named "Retrieve IP Telephony data."

b. **Short Name:** Enter a short name for the site.

Under **Site Location**, add the **Address**, **City**, **State/Province**, **Country**, and **Zip/Postal Code** of the site.

Under **Contact Information**, add the **Name**, **Phone Number**, **Job Title**, and any **Comments** for the site contact person(s).

3 Click **Apply**, and then **OK**.

4   In **OTM Navigator**, click **Configuration | Add System**. The **Add System** window opens.

5   Add a system named "Dummy," of type "Meridian 1," under the site named "Retrieve IP Telephony data."

Under System Type, click **Meridian 1**, and then click **OK**. The **New System Properties** window opens. See Figure 162.

Figure 162
System Properties – General Tab

6   Click the **Customers** tab. See Figure 163 on .

Figure 163
System Properties – Customers tab
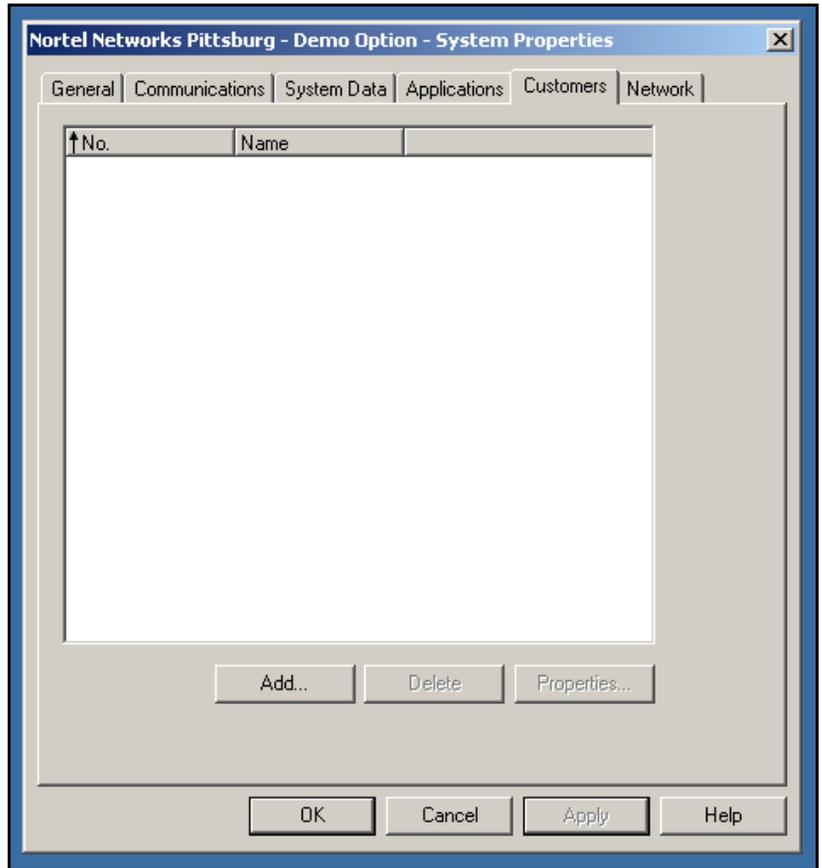
7   Click **Add**. Add Customer Number "99" on the "dummy" Meridian 1 system.

––––––––––––––––––––– **End of Procedure** –––––––––––––––––––––

Retrieve IP Line configuration from the IP Telephony node

Procedure 95 on is an optional procedure that can be used in the following cases:

- when adding an IP Telephony node on OTM by retrieving an existing node

- when there is a possibility that the IP Telephony node configuration on the Voice Gateway Media Card differs from the OTM IP Telephony database (for example, during maintenance and fault isolation procedures)

- when there are multiple OTM IP Line PCs with multiple instances of the database (administration)

<table>
<tr>
<td>⚠</td>
<td>

CAUTION

This procedure is not supported for a node which resides on a Succession 1000 system.

</td>
</tr>
</table>

Procedure 95
Retrieving IP Line configuration data from the IP Telephony node

Use the OTM IP Line **Configuration | Synchronize | Retrieve** command to retrieve the IP Line configuration information from the IP Telephony node.

1   In the **OTM Navigator**, select the **Services** folder and then double-click on the **IP Telephony** icon. The **IP Telephony** window opens.

2   Select Leader 0 or any card from the node.

3   In the **IP Telephony** window, click **Configuration | Synchronize | Retrieve**.

The **Retrieve Options** window opens.

4   Leave the defaulted "Node Properties" option selected, or click the "Card Properties," depending upon the situation:

   a.   Leave the defaulted "Node Properties" in the following situations:

   —   when the OTM IP Line data is out of date and all OTM IP Telephony node data will be synchronized with the data from the Voice Gateway Media Cards on the node

   —   when adding a node in OTM by retrieving data from an existing node with more than one card

   b.   Select "Card Properties" when attempting to isolate a problem with IP Line configuration on a particular card.

5   Select the check boxes for the IP Line configuration data to be retrieved, depending on the situation:

   a.   Select **Node Properties** and **Card Properties**, if the OTM IP Line data is out of date and all OTM IP Telephony node data will be synchronized with the data from the Voice Gateway Media Cards on the node.

   b.   Select **Card Properties** if adding a node on OTM by retrieving data from an existing node that consists of more than one card.

   c.   Select any combination of check boxes as indicated by problem symptoms when attempting to isolate a problem on a particular card. Use the "dummy" node for this purpose.

6   Click the **Start retrieve** button.

7   Monitor the progress of the retrieval under **Retrieve control** box.

The retrieved Node Properties and Card Properties overwrite the existing OTM IP Line configuration data for the respective node or card.

——————————   **End of Procedure**   ——————————

Voice Gateway Media Card maintenance using Element Manager

Contents

This section contains information on the following topics:

Introduction

This chapter provides information about the maintenance functions for the Voice Gateway Media Card performed in Element Manager.

Replace a Voice Gateway Media Card

Replace the Voice Gateway Media Card when the card is removed or when the following conditions occur:

- if the Voice Gateway Media Card displays a code of the form F:xx on the faceplate LED following a reboot. This code indicates an unrecoverable hardware failure. The card cannot register with the system. The exception is the F:10 code, which indicates that the Security Device is missing from the card.

- if the Management (ELAN) Ethernet interface or the Voice (TLAN) Ethernet interface on the Voice Gateway Media Card has failed. This is indicated by failing to show a link pulse on the voice IP interface status LED or on the switch. It can also be indicated if the maintenance port continuously prints 'lnIsa0 Carrier Failure' messages after determining that the hub or switch port and ELAN cable are good.

- if a voice channel on the Voice Gateway Media Card has a consistent voice quality fault, such as persistent noise or lack of voice path, even after resetting the card and re-transmitting the card properties.

Replace a Follower Voice Gateway Media Card

To replace a Follower Voice Gateway Media Card, follow the steps in Procedure 96 on .

Procedure 96
Replacing a Follower Voice Gateway Media Card

1   Locate the faulty card by the TN, MAC address, and IP address.

2   Disable the faulty Voice Gateway Media Card in LD 32 with the **DISI** command. The system outputs "NPR0011" when the card has been completely disabled by the DISI command.

3   Use the **disiTPS** command at the IPL> CLI to disable the TPS on the faulty Voice Gateway Media Card.

Note: This forces all Internet Telephones registered on this card to re-register. If there are sufficient resources, this can take up to several minutes. If there are not sufficient resources, Internet Telephones can remain unregistered indefinitely.

4 Use the **isetShow** command to monitor the status of the card and the re-registration of the Internet Telephones. The Voice Gateway Media card is completely disabled when there are no Internet Telephones registered on the card.

5 Remove the faulty Voice Gateway Media Card from the system.

6 Install the replacement Voice Gateway Media Card into the card slot in the system. To do this:

   a. Pull the top and bottom locking devices away from the card faceplate.

   b. Insert the Voice Gateway Media Card into the card guides and gently push the card until it makes contact with the backplane connector. Hook the locking devices.

   Note 1: When cards are installed, the red LED on the faceplate remains lit until the card is configured and enabled in the software, at which point it turns off. If the LED does not follow the pattern described or operates in any other manner (such as continually flashing or remaining weakly lit), replace the card.

   Note 2: Observe the faceplate maintenance display to see startup self-test results and status messages. A display of the type F:xx indicates a failure. See Table 53 on page 481 for a listing of the ITG-P 24-port line card's display codes and to Table 54 on page 482 for a list of the Succession Media Card's display codes.

7 In Element Manager, click **Configuration** in the Navigation Tree.

8 In the Configuration menu, click **IP Telephony**. The **Node Summary** page appears.

9 Click the **Edit** button associated with the node containing the card to be replaced. The **Edit** page appears.

10 Expand the **Cards** section.

11 Select the Voice Gateway Media Card from the list of cards in the node. See Figure 164 on page 570.

Figure 164
Cards

12 Change the **Management LAN (ELAN) MAC address** field to the MAC address of the replacement Voice Gateway Media Card. The MAC address is the Motherboard Ethernet address labeled on the faceplate of the replacement Voice Gateway Media Card.

13 Click **Submit**. The Node Summary pages opens.

14 Click the **Transfer** button associated with the node containing the Voice Gateway Media Card.

15 After the transfer is complete, restart the new card. Restarting the card, causes the follower card to obtains its BOOTP parameters from the Leader, and also establishes ELAN and TLAN connectivity.

16 Follow Procedure 41 on page 300 to load the CONFIG.INI file onto the card.

17 Follow Procedure 46 on page 315 to download the latest software to the Voice Gateway Media Card.

18 Follow Procedure 47 on page 319 to reboot the card and run the new software.

19 Follow Procedure 48 on page 320 to update the card's firmware.

———————— **End of Procedure** ————————

Replace a Leader Voice Gateway Media Card

To replace a Leader Voice Gateway Media Card, follow the steps in Procedure 97 on page 571.

Procedure 97
Replacing a Leader Voice Gateway Media Card

1 Locate the faulty card by the TN, MAC address, and IP address.

2 Disable the faulty Voice Gateway Media Card in LD 32 with the **DISI** command. The system outputs "NPR0011" when the card has been completely disabled by the DISI command.

3 Use the **disiTPS** command at the IPL> CLI to disable the TPS on the faulty Voice Gateway Media Card.

Note: This forces all Internet Telephones registered on this card to re-register. If there are sufficient resources, this can take up to several minutes. If there are not sufficient resources, Internet Telephones can remain unregistered indefinitely.

4 Use the **isetShow** command to monitor the status of the card and the re-registration of the Internet Telephones. The Voice Gateway Media Card is completely disabled when there are no Internet Telephones registered on the card.

5 Remove the faulty Voice Gateway Media Card from the system.

6 Install the replacement Voice Gateway Media Card into the card slot in the system. To do this:

a. Pull the top and bottom locking devices away from the card faceplate.

b. Insert the Voice Gateway Media Card into the card guides and gently push the card until it makes contact with the backplane connector. Hook the locking devices.

Note 1: When cards are installed, the red LED on the faceplate remains lit until the card is configured and enabled in the software, at which point in turns off. If the LED does not follow the pattern described or operates in any other manner (such as continually flashing or remaining weakly lit), replace the card.

Note 2: Observe the faceplate maintenance display to see startup self-test results and status messages. A display of the type F:xx indicates a failure. Refer to Table 53 on for a listing of the ITG-P 24-port line card's display codes and to Table 54 on for a listing of the Succession Media Card's display codes.

7   Go to the VxWorks shell. Set the Voice Gateway Media Card as a Leader using the ELAN IP address and subnet mask.

8   Restart the card. The card obtains the ELAN IP address and subnet mask.

9   In Element Manager, click **Configuration** in the Navigation Tree.

10 In the Configuration menu, click **IP Telephony**. The **Node Summary** page appears.

11 Click the **Edit** button associated with the node containing the card to be replaced. The **Edit** page opens.

12 Expand the **Cards** section.

13 Select the Voice Gateway Media Card from the list of cards in the node. See Figure 164 on .

Figure 165
Cards

14 Change the **Management LAN (ELAN) MAC address** field to the MAC address of the replacement Voice Gateway Media Card. The MAC address is the Motherboard Ethernet address labeled on the faceplate of the replacement Voice Gateway Media Card.

15 Follow Procedure 40 on page 297 to load the CONFIG.INI file to the card.

16 Follow Procedure 46 on page 315 to download the latest software to the Voice Gateway Media Card.

17 Follow Procedure 47 on page 319 to reboot the card and run the new software.

18 Follow Procedure 48 on page 320 to update the card's firmware.

——————— **End of Procedure** ———————

Verify Voice Gateway Media Card software and firmware

The following steps are required to verify and upgrade the card software and telephone firmware:

1   Check the version of the software currently installed on the Voice Gateway Media Card. Refer to Procedure 42 on page 306.

2   Check the version of the firmware that is currently running on the Voice Gateway Media Card. Refer to Procedure 43 on page 309.

3   Download the most up-to-date version of the software and firmware files from the Nortel Networks Web site. Refer to Procedure 44 on page 312.

4   Upload the software and firmware files using the File Upload system utility in Element Manager. Refer to Procedure 45 on page 314.

5   Upgrade the Voice Gateway Media Card software. Refer to Procedure 46 on page 315.

6   Restart the Voice Gateway Media Card. Refer to Procedure 47 on page 319.

7   Upgrade and distribute the firmware to the Internet Telephones on the Voice Gateway Media Card. Refer to Procedure 48 on page 320.

Access CLI commands from Element Manager

The following list of informational CLI commands are available from Element Manager:

Voice Gateway Media Card CLI Commands	**Succession Signaling Server CLI Commands**
• cardRoleShow	• cardRoleShow
• disiAll	• disiAll
• disiTPS	• disiTPS
• dspSWVersionShow	• electShow
• DSPNumShow	• i
• electShow	• ifShow
• i	• IPInfoShow
• ifShow	• ipstatShow
• IPInfoShow	• isetShow

- ipstatShow
- isetShow
- itgCardShow
- nodePwdDisable
- nodePwdEnable
- nodePwdShow
- nodeTempPwdClear
- pbxLinkShow
- routeShow
- rudpShow
- umsPolicyShow
- ping
- nodePwdSet
- nodeTempPwdSet
- isetResetAll
- umsUpgradeAll
- vgwShowAll

- itgCardShow
- nodePwdDisable
- nodePwdEnable
- nodePwdShow
- nodeTempPwdClear
- pbxLinkShow
- routeShow
- rudpShow
- umsPolicyShow
- ping
- isetResetAll
- umsUpgradeAll

Refer to "IP Line CLI commands" on page 496 for descriptions of these commands.

To access these commands in Element Manager, follow the steps in Procedure 98 on page 575.

Procedure 98
Accessing the CLI commands from Element Manager

1   Select **System Status** and then **IP Telephony** from the Navigation Tree. The IP Telephony Information pages opens.

2   Expand the node containing the Voice Gateway Media Card.

3   Click the **GEN CMD** button associated with the Voice Gateway Media Card. The **General Commands** page opens. See Figure 166 on page 576.

Figure 166
System Status > IP Telephony > GEN CMD button > General Commands

> *Note:* The first section shown on the top of the General Commands
> page, under Element IP, is **ITGL Commands** or **Signaling Server
> Command**. The section display depends on whether a card or
> Succession Signaling Server was selected in the IP Telephony
> Information page.

4 In the ITGL Commands (or Signaling Server Command) section, select
the CLI command from the drop-down list box and click **RUN**.

The output of the command is displayed in the text area at the bottom of
the General Commands page.

—————— **End of Procedure** ——————

Sample Output of Element Manager CLI commands

cardRoleShow

```
Card Role = Follower
```

disiAll

There is no output or message returned in the text area from the **disiAll** command.

disiTPS

There is no output or message returned in the text area from the **disiTPS** command.

dspSWVersionShow

```
DSP software version R8.01
```

DSPNumShow

```
Number of DSPs = 8
```

electShow

The following is an example of the output on a Succession Signaling Server:

```
oam> electShow

Node ID        : 541

Node Master    : No

Up Time        : 10 days, 3 hours, 5 mins, 30 secs

TN             : 10 00

Host Type      : SMC

TLAN IP Addr   : 47.11.151.148

ELAN IP Addr   : 47.11.221.48

Election Duration       : 15

Wait for Result time    : 35

Master Broadcast period : 30

===== master tps =====

Host Type    TN              TLAN IP Addr

ISP 1100     00 00           47.11.151.144

Next timeout    : 30 sec

AutoAnnounce    : 1

Timer duration  : 60 (Next timeout in 7 sec)

====== all tps ======

Num  TN             Host Type   ELAN MAC              TLAN
IP Addr     ELAN IP Addr    Up Time        NumOfSets
TimeOut

001  10 00          SMC         00:60:38:bd:d1:01
47.11.151.148   47.11.221.48    010 03:05:30  0
0

002  00 00             ISP 1100    00:02:b3:c5:51:2c
47.11.151.144   47.11.221.38    010 05:24:41  0
-73

====== All cards in node configuration are
```

```
registered ======
```

• When all cards configured in a node are registered, the last part of the
  output displays the following:

```
====== All cards in node configuration are
registered ======
```

+master tps

```
PlatForm     TN          TLAN
ISP 1100    0000     47.104.39.245
Next timeout = 71 sec
AutoAnnounce: 1
Timer duration  : 60 (Next timeout in 25 sec)
```

all tps

Num	Platform	TN	TLAN	ELAN	TimeOut
0	ITG SA	080c	47.104.39.243	47.104.39.115	0
1	ISP 1100	0000	47.104.39.246	47.104.39.118	0
2	ISP 1100	0000	47.104.39.245	47.104.39.117	0
3	ITG SA	0c04	47.104.39.244	47.104.39.116	1

i

NAME	ENTRY	TID	PRI	STATUS	PC	SP	ERRNO	DELAY
tExcTask	_excTask	339a824	0	PEND	2aca80	339a758	3006b	0
tShell	_shell	2e31e30	1	PEND	231e08	2e316d4	0	0
...	...	...	...	...	...	...	...	...
tSET	19be9c	2b6263c	200	PEND	256d84	2b62518	320001	0
tSyslogd	10a58	3aff168	255	READY	22f6d0	3afeac4	0	0

ifShow

```
ixpMac (unit number 1):
Flags: (0x8863) UP BROADCAST MULTICAST ARP RUNNING
Type: ETHERNET_CSMACD
Internet address: 47.104.39.115
Broadcast address: 47.104.39.127
Netmask 0xff000000 Subnetmask 0xffffff80
Ethernet address is 00:60:38:bd:bb:cd
Metric is 0
Maximum Transfer Unit size is 1500
298604 packets received; 23909 packets sent
278631 multicast packets received
4608 multicast packets sent
0 input errors; 0 output errors
0 collisions; 0 dropped
lo (unit number 0):
Flags: (0x8069) UP LOOPBACK MULTICAST ARP RUNNING
Type: SOFTWARE_LOOPBACK
Internet address: 127.0.0.1
Netmask 0xff000000 Subnetmask 0xff000000
Metric is 0
Maximum Transfer Unit size is 32768
4 packets received; 4 packets sent
0 multicast packets received
0 multicast packets sent
0 input errors; 0 output errors
0 collisions; 0 dropped
ixpMac (unit number 0):
Flags: (0x8863) UP BROADCAST MULTICAST ARP RUNNING
Type: ETHERNET_CSMACD
Internet address: 47.104.39.243
Broadcast address: 47.104.39.255
Netmask 0xff000000 Subnetmask 0xffffff80
Ethernet address is 00:60:38:bd:bb:cc
Metric is 0
Maximum Transfer Unit size is 1500
88686 packets received; 15027 packets sent
78030 multicast packets received
5044 multicast packets sent
0 input errors; 0 output errors
0 collisions; 0 dropped
```

IPInfoShow

```
Maintenance Interface =  ixpMac1
Maintenance IP address = 47.104.39.115
Maintenance subnet mask = 255.255.255.128
Voice Interface =  ixpMac0
Voice IP address = 47.104.39.243
Voice subnet mask       = 255.255.255.128
```

ROUTE NET TABLE

destination	gateway	flags	Refcnt	Use	Interface
0.0.0.0	47.104.39.129	3	0	675	ixpMac0
47.104.39.0	47.104.39.115	101	0	0	ixpMac1
47.104.39.128	47.104.39.243	101	0	0	ixpMac0

ROUTE HOST TABLE

destination	gateway	flags	Refcnt	Use	Interface
127.0.0.1	127.0.0.1	5	0	0	lo0

ipstatShow

```
total 128099
badsum     0
tooshort    0
toosmall    0
badhlen    0
badlen    0
infragments    0
fragdropped    0
fragtimeout    0
forward    0
cantforward  486
redirectsent    0
unknownprotocol     0
nobuffers    0
reassembled    0
outfragments    0
noroute    0
```

isetShow

```
Set Information
-------------------
No sets registered
```

itgCardShow

```
Index        : 2

      Type         : EXUT

      Role         : Follower

      Node         : 541

      Leader IP    : 47.11.151.145

      Card IP      : 47.11.151.148

      Card TN      : Slot 10

      Card State   : ENBL

      Uptime       : 10 days, 3 hours, 11 mins, 24
secs  (875484 secs)

      Codecs       : G711Ulaw(default), G711Alaw,
G711CC, T38FAX

ELAN (ixpMac1) stat: 10 Mbps, Half duplex  (Carrier
OK)

TLAN (ixpMac0) stat: 100 Mbps, Full duplex  (Carrier
OK)
```

nodePasswordDisable

Please run nodePwdShow to verify the result.

Run nodePwdShow and get the following results:

NodeID	PwdEna	Pwd	TmpPwd	Uses	TimeOut
========	========	=====	========	======	==========
444	No			0	0d 0h 0m 0s

nodePasswordEnable

`Please run nodePwdShow to verify the result.`

Run nodePwdShow and get the following results:

NodeID	PwdEna	Pwd	TmpPwd	Uses	TimeOut
444	No			0	0d 0h 0m 0s

nodePasswordShow

NodeID	PwdEna	Pwd	TmpPwd	Uses	TimeOut
444	No			0	0d 0h 0m 0s

nodeTempPwdClear

`Please run nodePwdShow to verify the result.`

Run nodePwdShow and get the following results:

NodeID	PwdEna	Pwd	TmpPwd	Uses	TimeOut
444	No			0	0d 0h 0m 0s

pbxLinkShow

```
Active CS type = Succession CSE 1K
Active CS S/W Release = 201R
Supported Features: GetCSVsn  TCP  ShiftKey  I2050
I2002 CorpDir UserKeyLabel VirtualOffice UseCSPwd
CS Main: ip = 47.104.39.112, ConnectID = 0x2bbfb4c,
BroadcastID = 0x2bc059c, Link is up
CS Signaling Port = 15000
CS Broadcast Port = 15001
Broadcast PortID = 0x2bc06fc
RUDP portID = 0x2bc0684
Tcp Link state = up
Tcp Signaling Port:  15000
Tcp socket fd:       30
Tcp msgs sent:       77
Tcp msgs recd:       47
```

routeShow

ROUTE NET TABLE

destination	gateway	flags	Refcnt	Use	Interface
0.0.0.0	47.104.39.129	3	0	675	ixpMac0
47.104.39.0	47.104.39.115	101	0	0	ixpMac1
47.104.39.128	47.104.39.243	101	0	0	ixpMac0

ROUTE HOST TABLE

destination	gateway	flags	Refcnt	Use	Interface
127.0.0.1	127.0.0.1	5	0	0	lo0

rudpdShow

```
                RUDP Port Summary


          Port ID          Src IP      Src Port

     +----------+---------------+--------+

       0x02bcb904            0.0.0.0     15001

       0x02bcb878      47.11.221.48     15000

       0x02b4b748     47.11.151.148      7300

       0x0231d808     47.11.151.148      5100
```

RUDP Connection Summary

Src IP	Src Port	Connect ID	Dst IP	Dst Port	Status	Msg rcv	Msg sent	Retries
0.0.0.0	15001	0x02bcb77c	47.11.221.41	15000	DUDP	1	0	0
47.11.221.48	15000	0x02bcad18	47.11.221.41	15000	Established	2	44305	3075

umsPolicyShow

```
Total firmware = 2
```

FirmWare	TermType	PolicyName	Server	FileName	Limit	When	Upgrade	Protocol	Retry
0602B38	i2004	DEFAULT_I2004	47.104.39.243	/ums/i2004.fw	10	ALWAYS	ANY	TFTP	-1
0603B38	i2002	DEFAULT_I2002	47.104.39.245	/ums/i2002.fw	10	ALWAYS	ANY	TFTP	-1

vgwShowAll

VGW Service is: Enabled

Chan	ChanState	DspMode	Codec	Tn	Reg	AirTime	rxTsap	txTsap
0	Idle	Closed	n/a	0x080c	yes	0	0.0.0.0:0000	0.0.0.0:0000
1	Idle	Closed	n/a	0x080d	yes	0	0.0.0.0:0000	0.0.0.0:0000
2	Idle	Closed	n/a	0x080e	yes	0	0.0.0.0:0000	0.0.0.0:0000
3	Idle	Closed	n/a	0x080f	yes	0	0.0.0.0:0000	0.0.0.0:0000
4	Idle	Closed	n/a	0x084c	yes	0	0.0.0.0:0000	0.0.0.0:0000
5	Idle	Closed	n/a	0x084d	yes	0	0.0.0.0:0000	0.0.0.0:0000
6	Idle	Closed	n/a	0x084e	yes	0	0.0.0.0:0000	0.0.0.0:0000
7	Idle	Closed	n/a	0x084f	yes	0	0.0.0.0:0000	0.0.0.0:0000
8	Idle	Closed	n/a	0x088c	yes	0	0.0.0.0:0000	0.0.0.0:0000
9	Idle	Closed	n/a	0x088d	yes	0	0.0.0.0:0000	0.0.0.0:0000
10	Idle	Closed	n/a	0x088e	yes	0	0.0.0.0:0000	0.0.0.0:0000
11	Idle	Closed	n/a	0x088f	yes	0	0.0.0.0:0000	0.0.0.0:0000
12	Idle	Closed	n/a	0x08cc	yes	0	0.0.0.0:0000	0.0.0.0:0000
13	Idle	Closed	n/a	0x08cd	yes	0	0.0.0.0:0000	0.0.0.0:0000
14	Idle	Closed	n/a	0x08ce	yes	0	0.0.0.0:0000	0.0.0.0:0000
15	Idle	Closed	n/a	0x08cf	yes	0	0.0.0.0:0000	0.0.0.0:0000
16	Idle	Closed	n/a	0x090c	yes	0	0.0.0.0:0000	0.0.0.0:0000
17	Idle	Closed	n/a	0x090d	yes	0	0.0.0.0:0000	0.0.0.0:0000
18	Idle	Closed	n/a	0x090e	yes	0	0.0.0.0:0000	0.0.0.0:0000
19	Idle	Closed	n/a	0x090f	yes	0	0.0.0.0:0000	0.0.0.0:0000
20	Idle	Closed	n/a	0x094c	yes	0	0.0.0.0:0000	0.0.0.0:0000
21	Idle	Closed	n/a	0x094d	yes	0	0.0.0.0:0000	0.0.0.0:0000
22	Idle	Closed	n/a	0x094e	yes	0	0.0.0.0:0000	0.0.0.0:0000
23	Idle	Closed	n/a	0x094f	yes	0	0.0.0.0:0000	0.0.0.0:0000
24	Idle	Closed	n/a	0x098c	yes	0	0.0.0.0:0000	0.0.0.0:0000
25	Idle	Closed	n/a	0x098d	yes	0	0.0.0.0:0000	0.0.0.0:0000
26	Idle	Closed	n/a	0x098e	yes	0	0.0.0.0:0000	0.0.0.0:0000
27	Idle	Closed	n/a	0x098f	yes	0	0.0.0.0:0000	0.0.0.0:0000
28	Idle	Closed	n/a	0x09cc	yes	0	0.0.0.0:0000	0.0.0.0:0000
29	Idle	Closed	n/a	0x09cd	yes	0	0.0.0.0:0000	0.0.0.0:0000
30	Idle	Closed	n/a	0x09ce	yes	0	0.0.0.0:0000	0.0.0.0:0000
31	Idle	Closed	n/a	0x09cf	yes	0	0.0.0.0:0000	0.0.0.0:0000

Access the IPL> CLI from Element Manager

To access the IPL> CLI from with Element Manager, follow the steps in Procedure 83, "Accessing a Voice Gateway Media Card using Telnet" on .

Convert IP Trunk Cards to Voice Gateway Media Cards

Contents

This section contains information on the following topics:

Introduction

Succession Media Card 32-port trunk cards and ITG-P 24-port trunk cards that are no longer being used as IP Trunk cards can be converted to Voice Gateway Media Cards running the IP Line 3.1 application.

Recommendation

Nortel Networks recommends using the OTM 2.1 ITG ISDN trunk service, used to manage the trunk node, to download the IP Line 3.1 application loadware to the existing trunk cards.

Post-conversion

After the trunk cards have been converted to run the IP Line 3.1 application, perform the following actions:

• manually add the converted Voice Gateway Media Cards to an IP Telephony node

• configure the corresponding VGW TNs on the Succession Call Server

To perform these actions using OTM 2.1, refer to "Add a Voice Gateway Media Card to the node" on .

To perform these actions using Element Manager, refer to "Add a Voice Gateway Media Card to the node" on .

Note: ITG Trunk 2.x nodes that contain Succession Media Cards must be upgraded to IP Trunk 3.0 and rebooted. This is necessary to enable OTM 2.1 to transmit the IP Line 3.1 application to the trunk cards that are to be converted.

Before you begin

Before beginning the conversion procedure, ensure that all IP Trunk 3.0 cards have received their IP address configuration data from the Active Leader (Leader 0 or Leader 1) and are functioning in the role of Active Leader, Backup Leader, or Follower.

Convert the IP Trunk cards

Follow the steps in Procedure 99 on to convert the IP Trunk cards to Voice Gateway Media Cards.

Procedure 99
Converting IP Trunk card to Voice Gateway Media Cards

1   Download the Succession 3.0 IP Line 3.1 software (IPL31070.P2 and
    IPL31070.SA) from the Nortel Networks Software Download web page to
    the OTM Server. Alternatively, place the Succession Signaling Server
    Installation CD in the drive of the OTM Server, or use FTP to obtain the
    IP Line 3.1 software from the Succession Signaling Server.

2   Use the OTM 2.1 ITG ISDN Trunk service to select the node, or to select
    all cards in the node of the same host type (Succession Media Card or
    ITG-P).

3   Right-click and select **Configuration** | **Synchronize** | **Transmit**. Click the
    appropriate radio buttons for selected node or selected cards, and for the
    card software.

4   Click **Browse** and locate the IP Line 3.1 loadware file for the appropriate
    card type (Succession Media Card or ITG-P). Click **Open** | **Start
    Transmit**.

    Monitor the progress in the Transmit Control window to ensure that the
    IP Line 3.1 loadware is transmitted successfully to all selected cards.

5   At the Call Server CLI, use the LD 32 **DISI** command to disable each
    IP Trunk card that is being converted.

6   In the OTM 2.1 ITG ISDN Trunk service, double-click on each disabled
    card that is being converted. Click the **Reset** button for each card.

7   Verify the 8051XA firmware version of each SMC and ITG-P card.

    In OTM 2.1 ITG ISDN Trunk service, telnet to each card and log into the
    IPL> shell. Check the firmware version by entering the following:

    ```
    IPL>firmwareVersionShow
    ```

    If the firmware version is not the latest version, follow the steps in
    Table 80 on .

Table 80
File download locations

If	Then
Succession Media card firmware version is less than 6.7	1. Access the www.nortelnetworks.com website. 2. Select **Support** | **Software Downloads** | **Product Family** | **Succession** | **IP Line**. 3. Download the "Succession Media Card Release 6.7 Firmware Upgrade and Instruction" document. 4. Download "Succession Media Card Release 6.7 firmware". Follow the procedures in the "Succession Media Card Release 6.7 Firmware Upgrade and Instruction" document to upgrade the 8051XA firmware and reboot the Succession Media Card card. *Note:* Disable the IP Trunk cards gracefully, one by one. Upgrade the firmware, reboot and then enable each card before performing the 8051XA firmware upgrade on the next card.
ITG-P firmware version is less than 5.7	1. Access the www.nortelnetworks.com website. 2. Select **Support** | **Software Downloads** | **Product Family** | **Succession** | **IP Line**. 3. Download the "ITG-Pentium Rel. 5.7 Firmware Upgrade and Instruction" document. 4. Download "ITG-Pentium Release 5.7 Firmware". Follow the procedures in the "ITG-Pentium Rel. 5.7 Firmware Upgrade and Instruction" document to upgrade the 8051XA firmware and reboot the ITG-P card. *Note:* Disable the IP Trunk cards, gracefully one by one. Upgrade the firmware, reboot and then enable each card before performing the 8051XA firmware upgrade on the next card.

8 If part of the IP trunk node is being retained, then the IP Trunk cards that are being converted must be deleted from the existing IP Trunk node in OTM. The IP Trunk node properties must be transmitted from OTM to the Leader of the IP Trunk node.

If none of the IP Trunk node is being retained, delete the node in OTM 2.1.

——————————— **End of Procedure** ———————————

Add the converted cards to an IP Telephony node

Before adding the converted cards to an IP Telephony node, ensure the following:

- the Succession Signaling Server is functioning properly

- the ELAN and TLAN connections are properly configured

- the Succession Signaling Server is configured as the Leader in the node

- the Call Server software is upgraded to Succession 3.0 Software

- all unused IP Trunk TNs have been removed from the Call Server database

- all IP Trunk cards have been converted to Voice Gateway Media Cards (upgraded to the IP Line 3.1 application)

- a PC is connected to the LAN

Choose one of the following methods:

1 "Manually add converted Voice Gateway Media Cards to the existing IP Telephony node" on .

2 "Import all converted Voice Gateway Media Cards into a new IP Telephony node" on . Use this method if the entire IP Trunk node has been converted and the converted Voice Gateway Media Cards do not have to be added to a larger existing node.

Manually add converted Voice Gateway Media Cards to the existing IP Telephony node

Follow the steps in Procedure 100 to add the converted Voice Gateway Media Cards to an existing IP Telephony node using Element Manager.

Procedure 100
Adding the converted Voice Gateway Media Cards into an existing IP Telephony node

1   Log in to Element manager from the web browser by entering the IP address of the Succession Signaling Server.

2   Enter the User ID and password (usually the same as the Succession Call Server User ID and password).

3   When logged into Element Manager, click **Configuration | IP Telephony.** The Node Summary window opens.

4   In the Node Summary window, click the **Edit** button of the IP Telephony node to which the converted cards will be added as Followers. The Edit window opens.

5   In the Edit window, click the **Add** button in the **Card** field. The card properties fields are displayed.

6   Enter the data for the following fields:

   • card ELAN IP address

   • ELAN MAC address

   • card TLAN IP address

   • card TLAN gateway IP address

   • card TN

   • select the card processor type (ITG-P or Succession Media Card)

   • enable the Internet telephone TPS

The following is an example of the card properties data:

Table 81
Example of card properties data

ELAN IP address	47.11.215.115
ELAN MAC address	00:60:38:bd:fe:80
TLAN IP address	471.11.215.234
TLAN gateway IP address	471.11.215.1
Card TN	9
Card Processor Type	Succession Media Card
H.323 ID	
Enable Internet Telephone TPS	checkmark
System name	MGC1
System location	BWM system 1
System contact	John Smith

7 Repeat the previous step for each card that is to be added to the node.

8 When the card property data has been entered for all the cards, click the **Save and Transfer** button.
This saves the configuration changes to the Succession Call Server and transfers the changes to the Succession Signaling Servers and Voice Gateway Media Cards in the node. The BOOTP and CONFIG.INI files are saved on the Succession Call Server and transferred to the Succession Signaling Server Leader. The BOOTP table is updated so that the converted cards can receive their IP address configuration.

The Transfer Progress window opens.

Note: It might be necessary to press the Reset button on the faceplate of the converted cards to trigger a new BOOTP request. Do not continue with this procedure until all converted cards have received their IP addresses.

9 Click the **Transfer to Failed Elements button** to transfer the bootp.tab and config.ini files to the converted cards.

10 Configure the new Voice Gateway TNs on the Succession Call Server using one of the following methods:

    a. Use LD 14 from the Succession Call Server CLI to configure the new Voice Gateway TNs.

    or

    b. In the Element Manager Navigator window, click **Configuration | IP Telephony.**
The Node Summary window opens.

    Click on the arrowhead.

    Click the appropriate Voice Gateway Media Card.

    Click **ADD VGW CHANNELS**.

Note: if an Alert Box appears, log into the CLI of the Succession Call Server. Use LD 22 to determine if package 167 is enabled or restricted.

REQ	
PRT	
TYPE:	167

If it is restricted, obtain a new keycode to enable GPRI package 167.

In LD 73, perform the following:

REQ	
NEW	
TYPE:	DDB

Press <CR> through the overlay, accepting all the defaults.

─────── **End of Procedure** ───────

Import all converted Voice Gateway Media Cards into a new IP Telephony node

Follow the steps in Procedure 101 on to import all newly-converted Voice Gateway Media Cards into a new IP Telephony node using Element Manager.

Procedure 101
Importing all converted Voice Gateway Media Cards into a new IP Telephony node

1   Log in to Element manager from the web browser by entering the IP address of the Succession Signaling Server.

2   Enter the User ID and password (usually the same as the Succession Call Server User ID and password).

3   When logged into Element Manager, click **Configuration | IP Telephony.** The Node Summary window opens. See Figure 167.

Figure 167
Node Summary window
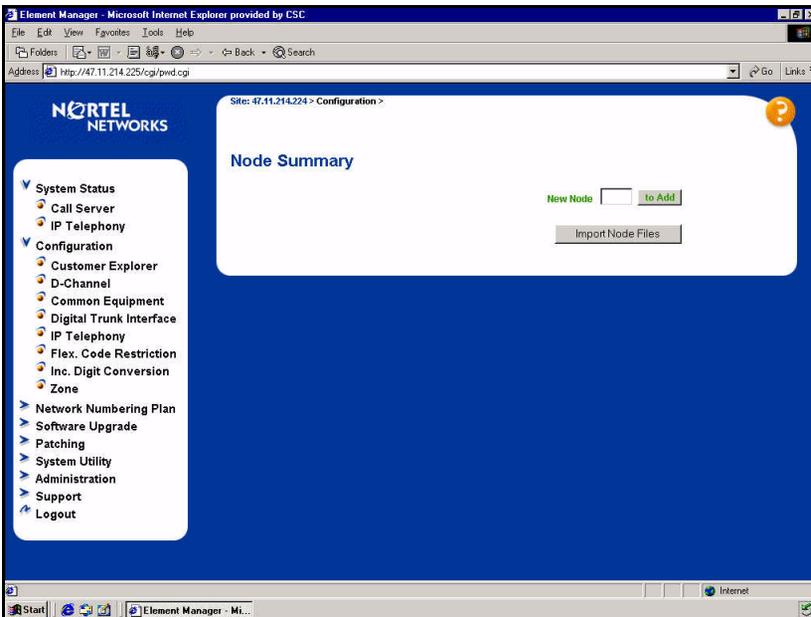
4   Click the **Import Node Files** button**.** The **Import Node Files** window opens. See Figure 168.

Figure 168
Import Node Files window
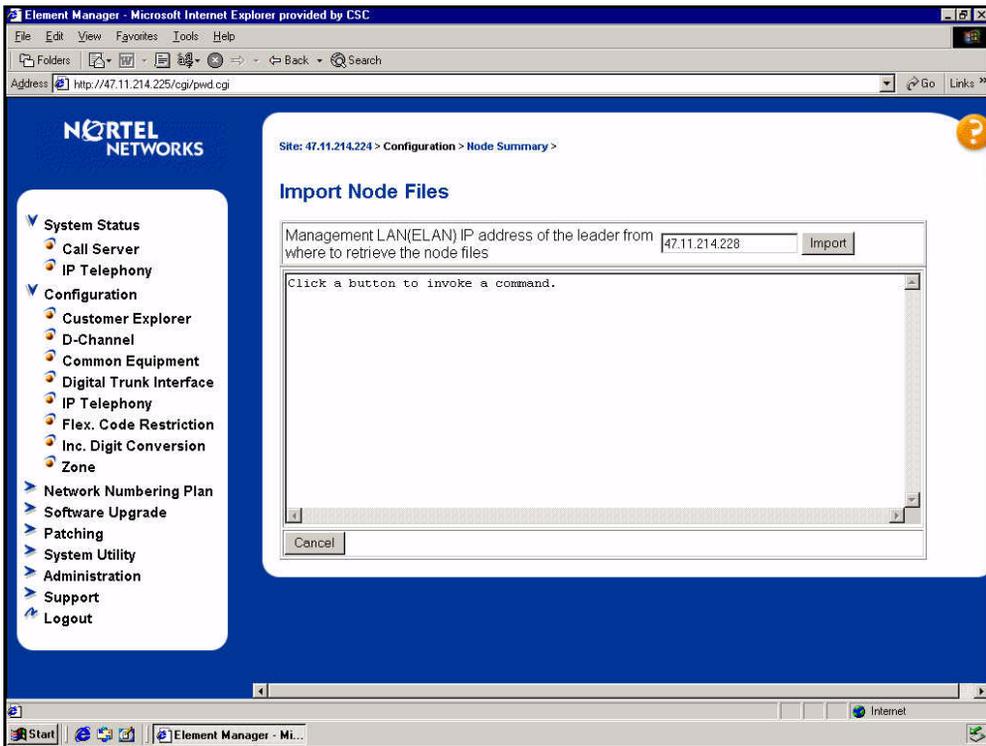
5   In the box, enter the Leader ELAN IP address of the former Leader 0 of the IP Trunk node that has been converted. Click **Import.**

The following text is displayed.

```
The BOOTP.1 and CONFIG1.INI files were retrieved from
Voice Gateway Media Card x.x.x.x.
```

6 As the BOOTP.1 file does not have a node ID, enter the node ID for this node.

If a Succession Signaling Server has already been installed, the Succession Signaling Server will be the leader for this node, and if Internet telephones have been configured to point to the Succession Signaling Server node ID, use the node ID of that Succession Signaling Server to create this node. Add the Succession Signaling Server to this node in Step 8.

See Figure 169.

Figure 169
BootP.1 information window
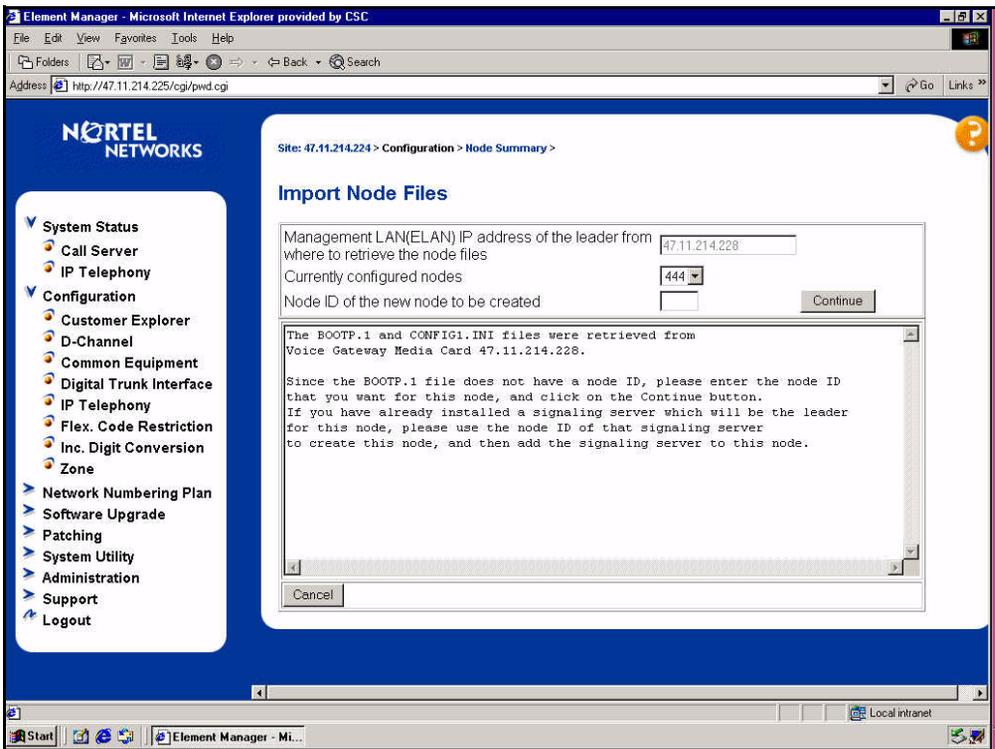
7 Enter the node ID. Click **Continue**.

When the new node has been created with the imported data, the following warning is displayed.

```
Warning: Call Server address in CONFIG.INI is o.o.o.o.
Please edit the node and update it.
BOOTP.TAB AND CONFIG.INI files for node yyy were
retrieved from Voice Gateway Media Card x.x.x.x. and
stored on Call Server z.z.z.z. The new node will appear
on the Node Summary page (Configuration > IP
Telephony).
```

8   In the Node Summary window, click the **Edit** button for the new node. See Figure 170.

Figure 170
Edit and transfer new node information
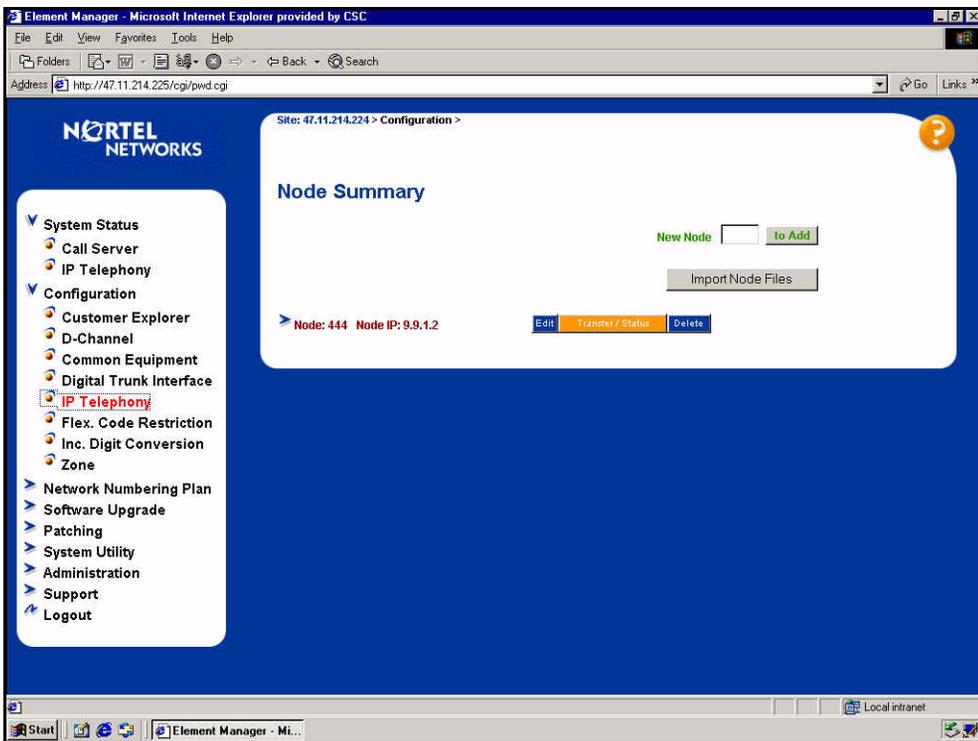
Perform the following actions:

a. Enter the correct IP address of the Call Server.

b. Add the Succession Signaling Server (if it exists and is not already part of a larger IP Telephony node).

c. Add any additional Voice Gateway Media Cards.

9 After all required fields for the card properties have been entered, click **Save and Transfer**. This saves the configuration changes to the Call Server and transfers the changes to the Succession Signaling Servers and Voice Gateway Media Cards in the node.

The **Transfer Progress** window is displayed.

The BOOTP.1 and CONFIG.INI file are saved on the Call Server and transferred to the Succession Signaling Server Leader. The BOOTP table is updated so that the converted cards can receive their IP addresses.

Note: It might be necessary to press the Reset button on the faceplate of the converted cards to trigger a new BOOTP request. Do not continue with this procedure until all converted cards have received their IP addresses.

10 Configure the new Voice Gateway TNs on the Call Server using one of the following methods:

a. Use LD 14 from the Call Server CLI to configure the new Voice Gateway TNs.

or

b. In the Element Manager Navigator window, click **Configuration | IP Telephony.**

The Node Summary window opens.

Click on the arrowhead.

Click the appropriate Voice Gateway Media Card.

Click **ADD VGW CHANNELS**

Note: if an Alert Box appears, log into the CLI of the Succession Call Server. Use LD 22 to determine if package 167 is enabled or restricted.

REQ	If no Succession Signaling Server is added to the imported node, Telnet to the former IP Trunk Leader
PRT	
TYPE:	167

If it is restricted, obtain a new keycode to enable GPRI package 167.

In LD 73, perform the following:

REQ	
NEW	
TYPE:	DDB

Press <CR> through the overlay, accepting all the defaults.

11 If no Succession Signaling Server is added to the imported node, Telnet to the former IP Trunk Leader 0 card and use the **clearLeader** command to remove the Leader Flag from Leader 0.

———————————— **End of Procedure** ————————————

Appendix A: I/O, maintenance, and extender cable description

Contents

This section contains information on the following topics:

Introduction

This appendix describes the NTMF94EA, NTAG81CA, and NTAG81BA cables and explains how to replace the NT8D81BA backplane ribbon cable and install the NTCW84JA filter, if required.

NTMF94EA I/O cable

The NTMF94EAcable provides the ELAN and TLAN ports that provide the interface from the Voice Gateway Media Card to the customer's network equipment. This cable also has one DB9 serial port that provides serial connection between the card and the customer PC or TTY. See Figure 171 on page 605.

It is important to use the mounting screw provided to secure the top of the NTMF94EA cable 25-pair Amphenol connector to the system. The screw ties the LAN cable shield to the Meridian 1, Succession 1000M, and Succession 1000 frame ground for EMC compliance.

The NTMF94EA cable provides a factory installed, shielded, RJ-45 to RJ-45 coupler at the end of both the ELAN and the TLAN ports. An unshielded coupler is provided to prevent ground loops (if required). Refer to "Prevent ground loops on connection to external customer LAN equipment" on page 609, to determine if the unshielded coupler should be used. Both ends of the RJ-45 ports of the cables are labeled to distinguish the TLAN and the ELAN. The ports provide the connection point to the customer's ELAN and TLAN equipment. Use shielded Category 5 cable to connect to the customer's equipment.

To improve EMC performance, use standard cable ties to bundle all LAN cables as they route out of the system.

> *Note:* To avoid damage to Category 5 cable, do not overtighten cable ties.

Figure 171
NTMF94EA ELAN, TLAN and RS-232 serial maintenance I/O cable

Mounting Screw

Shielded 25-pair
Amphenol Connector

Shielded RJ-45
Mating Coupler

To Switch

Shielded RJ-45 Cable

Ferrite

To Switch

9 Pin D-Sub
Female
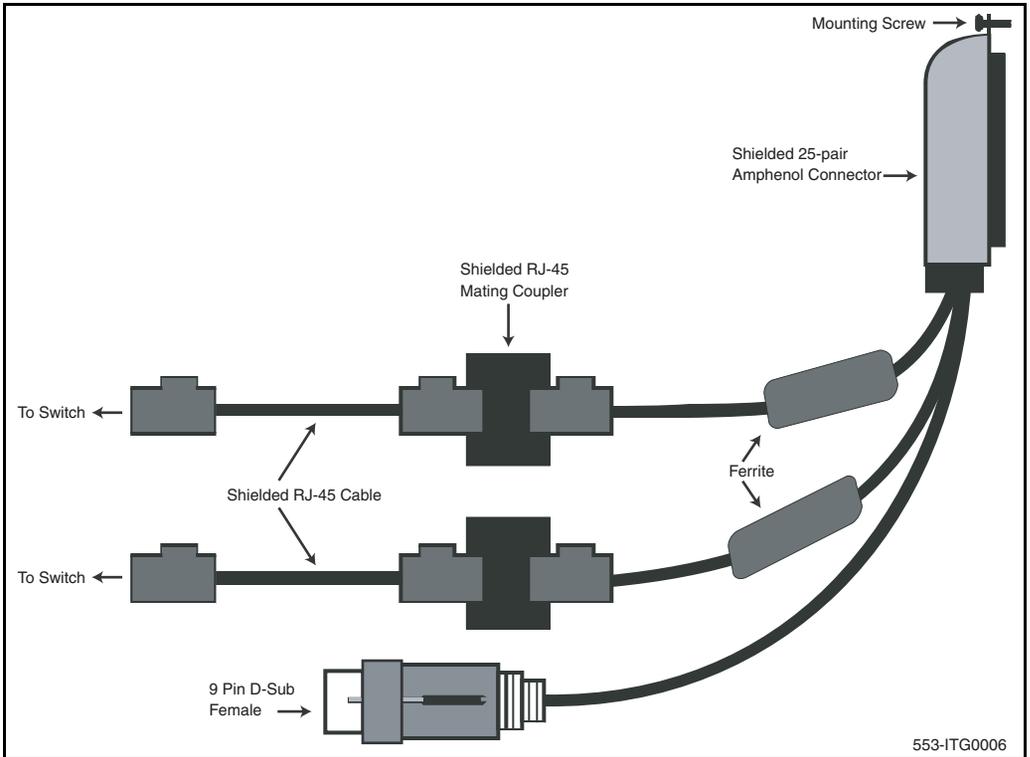
553-ITG0006

Connector pin assignments

Table 82 shows the I/O connector pin designations for the Voice Gateway Media Card.

Table 82
Voice Gateway Media Card I/O Panel Pinout (Part 1 of 2)

Pin	Normal Assignment	ITG Assignment	Pin	Normal Assignment	ITG Assignment
2	R1	Not Used	26	T0	Not Used
3	R2	Not Used	27	T1	Not Used
4	R3	Not Used	28	T2	Not Used
5	R4	Not Used	29	T3	Not Used
6	R5	AGND	30	T4	AGND
7	R6	Not Used	31	T5	Not Used
8	R7	Not Used	32	T6	Not Used
9	R8	Not Used	33	T7	Not Used
10	R9	AGND	34	T8	AGND
11	R10	PGT0	35	T9	PGT1
12	R11	PGT2	36	T10	PGT3
13	R12	PGT4	37	T11	PGT5
14	R13	PGT6	38	T12	PGT7
15	R14	PGT8	39	T13	PGT9
16	R15	PGT10	40	T14	PGT11
17	R16	SGNDA	41	T15	BDCDA-
18	R17	BSINA-	42	T16	BSOUTA-
19	R18	BDTRA-	43	T17	SGND
20	R19	BDSRA-	44	T18	BRTSA-

Table 82
Voice Gateway Media Card I/O Panel Pinout (Part 2 of 2)

Pin	Normal Assignment	ITG Assignment	Pin	Normal Assignment	ITG Assignment
21	R20	BCTSA-	45	T19	BSINB-
22	R21	BSOUTB-	46	T20	BDCDB-
23	R22	BDTRB-	47	T21	BDSRB-
24	R23	DI+	48	T22	DI-
25	no connect	DO+	49	T23	DO-
2	R1	no connect	50	no connect	no connect

Table 83
NTMF94EA cable pin description

I/O Panel: P1	Signal Name	P2, P3,P4	Color
P1-21	BSOUTB-	P2-2	RED
P1-22	BDTRB-	P2-4	GREEN
	SGRND	P2-5	BROWN
P1-45	BSINB-	P2-3	BLUE
P1-46	BDCDB-	P2-1	ORANGE
P1-47	BDSRB-	P2-6	YELLOW
P1-25	SHLD GRND		
P1-50	SHLD GRND		
P1-18	RXDB+	P4-3	GREEN/WHITE
P1-19	TXDB+	P4-1	ORANGE/WHITE
P1-43	RXDB-	P4-6	WHITE/GREEN
P1-44	TXDB-	P4-2	WHITE/ORANGE
P1-23	RX+	P3-3	GREEN/WHITE
P1-24	TX+	P3-1	ORANGE/WHITE
P1-48	RX-	P3-6	WHITE/GREEN
P1-49	TX-	P3-2	WHITE/ORANGE
P1-25	SHLD GRND		BARE
P1-50	SHLD GRND		BARE

Prevent ground loops on connection to external customer LAN equipment

The shielded RJ-45 coupler is the connection point for the customer's shielded Category 5 LAN cable to the hub, switch, or router supporting the TLAN and ELAN. Use shielded Category 5 RJ-45 cable to connect to the customer's TLAN/ELAN equipment. Follow the steps in Procedure 102 to prevent ground loops when connecting to external customer LAN equipment.

Procedure 102
Preventing ground loops

1 Connect the customer-provided shielded Category 5 LAN cable to the external LAN equipment. Ensure that the external LAN equipment is powered-up.

2 Use an ohmmeter to measure resistance to ground between the free end of the shielded RJ-45 cable and the building ground.

The ohmmeter must measure Open to ground before plugging it into the shielded RJ-45 coupler on the end of the NTMF94EA.

3 If the ohmmeter does not measure Open, install the unshielded RJ-45 coupler (provided) on the end of the NTMF94EA to prevent ground loops to external LAN equipment.

WARNING
The serial maintenance ports on the faceplate connector and the DB-9 female connector of the NTMF9DA cable assembly are identical. Do not connect a serial device to both access points simultaneously. This results in incorrect and unpredictable operation of the Voice Gateway Media Card.

———— **End of Procedure** ————

NTAG81CA maintenance cable description

The NTAG81CA maintenance cable is connected between the 9-pin D-type RS-232 input on a standard PC and the MAINT connector on the NT8R17AB faceplate or through the I/O cable serial port. See Figure 172 on page 610.

Figure 172
NTAG81CA Maintenance cable
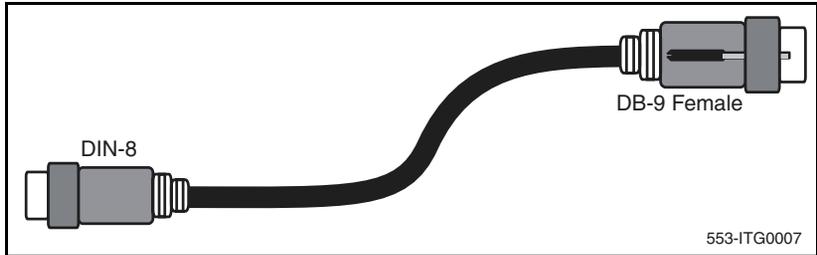
The NTAG91CA maintenance cable pin description is outlined in Table 84.

Table 84
NTAG81CA maintenance cable pin description

Signals (MIX Side)	8-pin Mini-DIN (MIX Side) Male	9-pin D-Sub (PC Side) Female	Signals (PC Side)
DTRB-	1	6	DSR-
SOUTB-	2	2	SIN-
SINB-	3	3	SOUT-
GND	4	5	GND
SINA-	5	nc	nc
CTSA-	6	nc	nc
SOUTA-	7	nc	nc
DTRA-	8	nc	nc

NTAG81BA maintenance extender cable

The NTAG81BA maintenance extender (3 m) cable connects the NTAG81CA cable to a PC or terminal. It has a 9-pin D-type connector at both ends; one male and one female. See Table 85. The cable can also be used to extend the serial port presented by the NTMF94EA I/O panel cable. The extender cable is shown in Figure 173 on .

Table 85
NTAG81BA Maintenance cable pin description

9-pin D-Sub (Male)	9-pin D-Sub (Female)
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9

Figure 173
NTAG81BA Maintenance Extender cable

553-9245

Replace the NT8D81BA cable with the NT8D1AA cable and install the NTCW84JW special IPE filter

This procedure explains how to replace the NT8D81BA cable with the NT8D81AA cable and how to install the NTCW84JA special IPE filter in the IPE module.

Cables are designated by the letter of the I/O panel cutout, such as A, B, and C, where the 50-pin cable connector is attached. Each cable has three 20-pin connectors (16 positions are used), designated 1, 2, and 3, that attach to the backplane. Using the designations described, the backplane ends of the first cable are referred to as A-1, A-2, and A-3. The locations of the cable connectors on the backplane are designated by the slot number (L0 through L9 for NT8D11, L0 through L15 for NT8D37) and the shroud row (1, 2, and 3). Using these designations, the slot positions in the first slot are referred to as L0-1, L0-2, and L0-3.

In NT8D37BA and NT8D37EC (and later vintage) IPE Modules, all 16 IPE card slots support 24-pair cable connections. Table 86: "NT8D37 cable connections" on shows the cable connections from the backplane to the inside of the I/O panel.

Table 86
NT8D37 cable connections

Backplane slots – shroud rows	I/O panel/cable designation
L0–1, 2, 3	A
L1–1, 2, 3	B
L2–1, 2, 3	C
L3–1, 2, 3	D
L4–1, 2, 3	E
L5–1, 2, 3	F
L6–1, 2, 3	G
L7–1, 2, 3	H
L8–1, 2, 3	K
L9–1, 2, 3	L
L10–1, 2, 3	M
L11–1, 2, 3	N
L12–1, 2, 3	R
L13–1, 2, 3	S
L14–1, 2, 3	T
L15–1, 2, 3	U

Figure 174 on shows the designations for the backplane end of the cables, the backplane slot designations for the cable connections, and the associated network segments for the backplane slots.

Figure 174
Backplane slot designations

553-5391
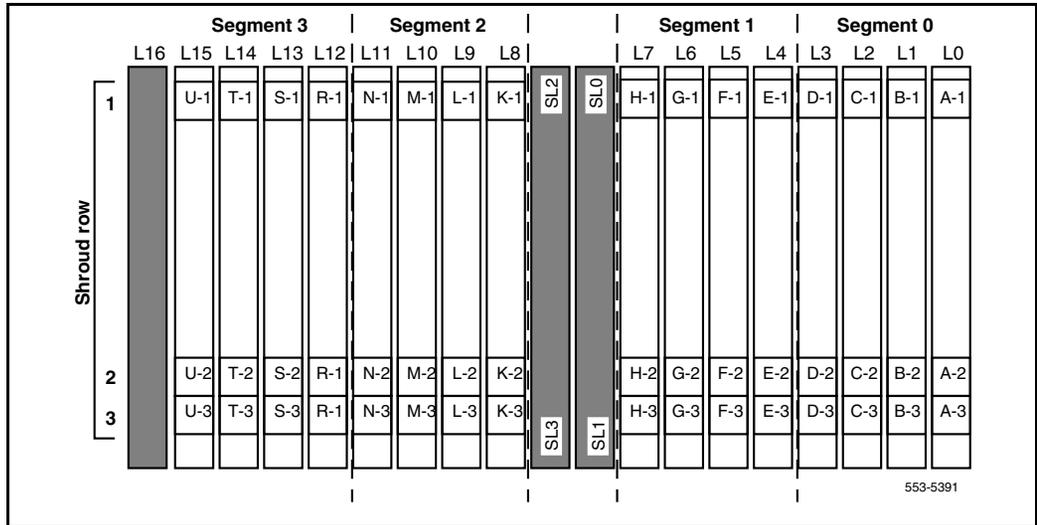
Tools list

The following tools are required to perform this procedure.

- Ty-wrap cutter

- Ty-wraps

- Needle nose pliers

- Slotted screwdriver

Remove the NT8D81BA cable

Follow the steps in Procedure 103 on page 615 to remove the NT8D81BA cable.

Procedure 103
Removing an NT8D81BA cable

1   Identify the I/O panel and backplane designation that corresponds to the LEFT slot of the pair of card slots, viewed from the front, in which the ITG ISL Trunk card is installed.

2   Disconnect the filter from the I/O panel using a screwdriver and needle nose pliers. Retain the fasteners.

3   Power down the IPE shelf.

4   Remove the IPE module I/O safety panel.

5   To remove the ribbon cables from the IPE backplane, apply gentle pressure on the tab on the right side of the shroud while pulling on the connector until it pulls free from the shroud.

    Remove connector 1 first, then remove connectors 2 and 3.

6   Discard NT8D81BA cable.

──────────────   **End of Procedure**   ──────────────

Install the NTCW84JA filter and NT8D81AA cable

Follow the steps in Procedure 104 to install the NTCW84JA filter and NT8D81AA cable.

Procedure 104
Installing an NTCW84JA filter and NT8D81AA cable

1   Install the NTCW84JA special IPE filter connector in the vacant I/O panel slot using retained hardware.

2   Install the NT8D81AA ribbon cable connectors in the IPE module backplane shroud. Be sure to install the connector so the label is facing right with the arrow pointing up and the connector is fully engaged into the shroud:

    a.   Install connector 1, (labeled UP1^) into backplane shroud 1.

    b.   Install connector 2, (labeled UP2^) into backplane shroud 2.

    c.   Install connector 3, (labeled UP3^) into backplane shroud 3.

3   Dress the ribbon cables back individually inside the rear of IPE module and restore the original arrangement. Start with the cables that are going to be underneath.

4   Attach the NTCW84JA special IPE filter to the NT8D81AA 50-pin connector using bail clips.

5   Restore power to the IPE module.

6   Replace the I/O safety panel.

———————————— **End of Procedure** ————————————

Appendix B: RM356 Modem Router

Contents

This section contains information on the following topics:

Introduction

Management and support of the IP Line network depend on IP networking protocols including SNMP, FTP, and Telnet. Install a Modem Router on the Meridian 1 and Succession Communication Server for Enterprise 1000 site LAN (called the Embedded LAN or ELAN as opposed to the customer's enterprise network or CLAN) in order to provide remote support access for IP Line and other IP-enabled Nortel Networks products.

> **WARNING**
> Nortel Networks strongly recommends that the RM356 Modem Router be installed for management and support.

The Netgear RM356 Modem Router integrates the functions of a V.90 modem, a PPP remote access server, an IP router, and a 4-port 10BaseT Ethernet hub, and provides a range of security features configured to comply with the customer's data network security policy. Do not install a Modem Router on the ELAN without the explicit approval of the customer's IP network manager. The RM356 Modem Router is not secure unless it is configured correctly according to the customer's network security policy and practices.

Figure 175 on page 619 shows an example of a remote network.

RM356 Modem Router security features

The security features of the RM356 Modem Router include:

- Password Authentication Protocol (PAP) for dial-in PPP connection

- RM356 manager password

- CLID for dial-in user authentication (requires CO.line with Calling Line ID)

- Callback for dial-in user authentication

- Dial-in user profiles

- Static IP routing

- IP packet filtering

- Idle timeout disconnect for dial-in PPP connection

Figure 175
Remote support using Netgear RM356 Modem Router
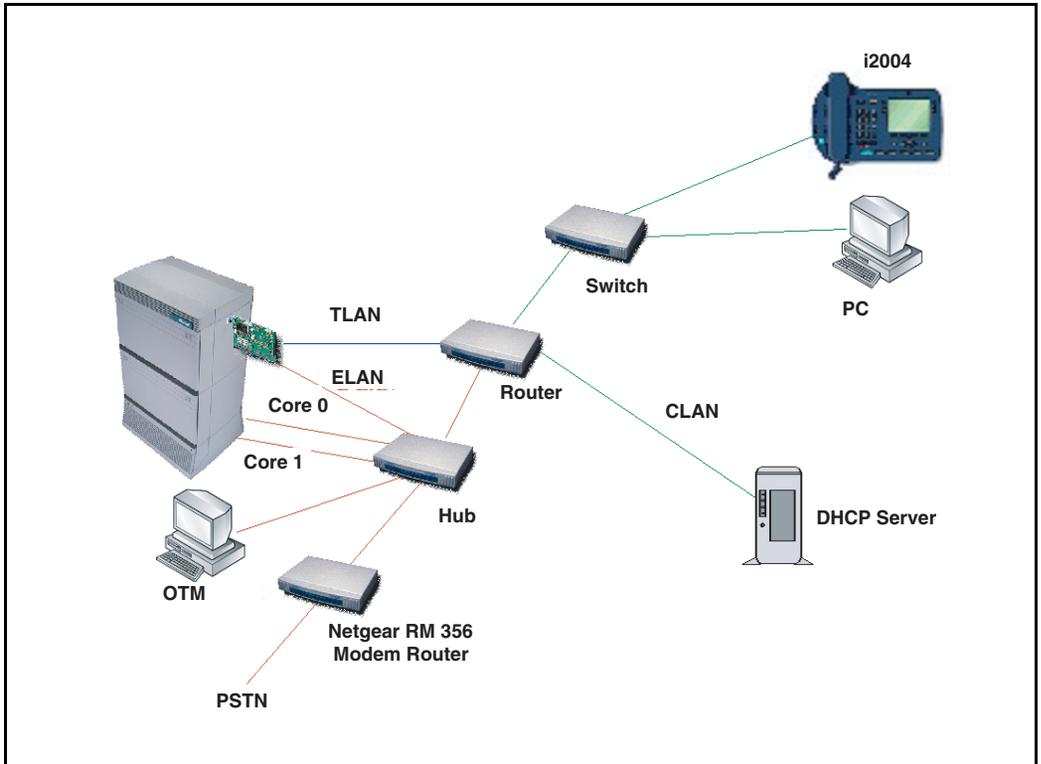
Install the RM356 Modem Router

Follow the steps in Procedure 105 to install the RM356 Modem Router.

Procedure 105
Installing the RM356 Modem Router

1   Place the Modem Router at a conveniently visible and physically secure location near an ac power outlet, an analog telephone line, and a 10BaseT Ethernet cable.

Up to four hosts or hubs can be connected to the integrated 10BaseT hub in the rear of the RM356 Modem Router.

2   Use shielded Cat5 10BaseT Ethernet cables to connect the Modem Router to the ELAN switch. Other IP-enabled Nortel Networks products on the ELAN can be connected to the RM356 Modem Router, including the Meridian 1, Succession 1000M, Succession 1000, a local Optivity Telephone Manager (OTM) 2.1 PC, Symposium Call Center Server, and Call Pilot.

Note: The up-link connection to an additional ELAN hub or optional gateway on the customer's enterprise network (CLAN) requires either a cross-over 10BaseT Ethernet cable or a special up-link port on the 10BaseT hub to which the RM356 is connected.

3   Connect the Modem Router to the ac power source. The power LED lights. After several seconds, the test LED flashes slowly four times, then stays off.

For each of the four 10BaseT ports on the integrated hub, there is a link/data LED that lights steadily to indicate a good link connection (if a cable is connected to a host or hub) or is flashing to indicate data received on the LAN.

4   Connect the RJ-45 plug end of the local manager cable to the RS-232 Manager port RJ-45 jack on the rear of the Modem Router.

5   Connect the other end of the manager cable to an RS-232 terminal or PC COM port configured for the following communication parameters:

   •   9600 baud

   •   8 bits

   •   no parity bit

   •   1 stop bit

6   The local maintenance cable connects directly to Data Terminal
    Equipment (DTE).

    Note: The analog telephone line must be either a CO line or a PBX
    extension with a Direct Inward Dialing (DID) number, whichever complies
    with the customer's network security policy.

────────────   **End of Procedure**   ────────────

Configure the RM356 Modem Router from the manager menu

This procedure can be performed from a terminal or PC connected to the local
RS-232 manager port on the rear of the Modem Router. Alternatively, the
manager menu can be accessed by Telnet after the IP addressing and routing
have been set up initially from the local manager port.

Use the following keys in the RM356 manager menu:

•   the arrow keys to navigate

•   the spacebar key to toggle pre-defined configuration values for a field

•   the Enter key to save data changes to ROM and exit the current menu

•   the Esc key to exit the current menu without saving changes

•   enter menu selection number when prompted to display a sub-menu,
     configuration form, or command prompts

Follow the steps in Procedure 106 on to configure the RM356
Modem Router.

Procedure 106
Configuring the RM356 Modem Router

1 Press the **Enter** key from the terminal or manager menu. The **Enter Password:** prompt is displayed for 10 seconds.

2 Enter the default RM356 manager password **1234**. The **RM356 Main Menu** is displayed. See for a complete view of the RM356 Modem Router menus.

```
RM356 Main Menu

  Getting Started                 Advanced Management
     1. General Setup                21. Filter Set
     2. MODEM Setup               Configuration
     3. Ethernet Setup
     4. Internet Access Setup        23. System Password
                                     24. System Maintenance
  Advanced Applications
     11. Remote Node Setup
     12. Static Routing Setup
     13. Default Dial-in Setup
     14. Dial-in User Setup        99. Exit


     Enter Menu Selection Number:
```

3 At the **Enter Menu Selection Number:** prompt, enter menu selection number **1** to access the General Setup under **Getting Started**. The **Menu 1 - General Setup** sub-menu is displayed.

```
Menu 1 - General Setup


System Name= Room_304_RCH_Training_Center
Location= Sherman Ave., Richardson, TX
Contact Person's Name= John Smith, 972 555-1212


Press ENTER to Confirm or ESC to Cancel:
```

4 Under General Setup, type in the **System Name** (19 characters, no spaces), **Location**, and **Contact Person's Name** for the Meridian 1, Succession 1000M, and Succession 1000 site.

Use the up and down arrow keys to move the cursor to the prompt **Press ENTER to Confirm or ESC to Cancel:** at the bottom of the menu. Press **Enter** to confirm and save data to ROM.

5   Enter menu selection number **2** to access the MODEM Setup under the
Getting Started section. The **Menu 2 - Modem Setup** sub-menu is
displayed.

```
Menu 2 - MODEM Setup


Modem Name= MODEM
Active= Yes
Direction= Incoming
Phone Number=
Advanced Setup= No


Press ENTER to Confirm or ESC to Cancel:
```

6   Use the arrow keys to navigate and space bar to toggle values. Type in
Modem Name. Set **Active = Yes** and **Direction = Incoming**. Type in the
Modem Router's **Phone Number** for reference.

7   Press **Enter** to confirm and save data to ROM.

8   Enter menu selection number **3**, to access Ethernet Set under the **Getting
Started** section. The **Menu 3: Ethernet Setup** sub-menu is displayed.

```
Menu 3 - Ethernet Setup


1. General Setup
2. TCP/IP and DHCP Setup


Enter Menu Selection Number:
```

9   Enter menu selection **2**, under **Ethernet Setup**. The **Menu 3.2 - TCP/IP and DHCP Ethernet Setup** is displayed.

```
Menu 3.2 - TCP/IP and DHCP Ethernet Setup


DHCP Setup:
DHCP= None
Client IP Pool Starting Address= N/A
Size of Client IP Pool= N/A
Primary DNS Server= N/A
Secondary DNS Server= N/A

TCP/IP Setup:
IP Address= 47.177.16.254
IP Subnet Mask= 255.255.255.0
RIP Direction= None
Version= RIP-2B


Press ENTER to Confirm or ESC to Cancel:


Press Space Bar to Toggle.
```

10   Under DHCP Setup, toggle **DHCP = None** using the space bar.

Under TCP/IP Setup, type in the **IP Address** and the **IP Subnet Mask** for the Modem Router's Ethernet interface on the ELAN. Toggle **RIP Direction = None**.

11   Press **Enter** to confirm and save data to ROM, then press **Esc** to return to the RM356 Main Menu.

12   Enter menu selection number **12**, under the **Advanced Applications** section. The **Menu 12 - Static Route Setup** sub-menu is displayed.

```
Menu 12 - Static Route Setup


1. DefaultGW
2. _____
3. _____
4. _____
Enter Menu Selection Number:
```

Note 1: If firewall security is properly configured in the customer's Management GW router, and if the Modem Router is allowed access over the CLAN to other IP Telephony nodes on remote ELANs, define a default network route pointing to the Management GW IP address on the local ELAN. Alternatively, define up to four different static network routes or host routes in the Modem Router to limit routing access from the Modem Router to the CLAN.

Note 2: To prevent access from the Modem Router to the CLAN through the Management GW router on the ELAN, disable RIP by setting **RIP Direction = None**, and remove all static routes or disable a particular static route by setting **Active = No**.

13 Enter menu selection number **1** to edit the first static route.
Menu 12.1 - Edit IP Static Route is displayed.

```
Menu 12.1 - Edit IP Static Route


Route #: 1
Route Name= DefaultGW
Active= Yes
Destination IP Address= 0.0.0.0
IP Subnet Mask= 0.0.0.0
Gateway IP Address= 47.177.16.1
Metric= 2
Private= No


Press ENTER to Confirm or ESC to Cancel:
```

14 Type in a descriptive **Route Name** using no spaces, for example, DefaultGW. Toggle **Active = Yes/No** for security purposes. The **Gateway IP Address** is the Management GW IP address on the ELAN where the Modem Router is connected.

15 Press **Enter** to confirm and save data to ROM, then press **Esc** to return from the sub-menu to the RM356 Main Menu.

16 Enter menu selection number **13**, under the **Advanced Applications** section. The **Menu 13 - Default Dial-in Setup** sub-menu is displayed.

```
Menu 13 - Default Dial-in Setup

  Telco Options:                    IP Address Supplied By:
     CLID Authen= None                 Dial-in User= No
                                       IP Pool= Yes
                                       IP Start Addr= 47.177.16.253

  PPP Options:                      Session Options:
     Recv Authen= PAP                  Input Filter Sets=
     Compression= No                   Output Filter Sets=
     Mutual Authen= No                 Idle Timeout= 1200
     PAP Login= N/A
     PAP Password= N/A

  Callback Budget Management:
     Allocated Budget(min)=
     Period(hr)=


     Press ENTER to Confirm or ESC to Cancel:


     Press Space Bar to Toggle.
```

17 Under Telco Options, toggle **CLIDAuthen = None/Preferred/ Required**. CLID requires a CO line subscribed for CLID service where available.

- Preferred means some dial-in user profiles require CLID, but others do not.

- Required means no dial-in call is connected unless CLID is provided and user profiles require CLID for authentication.

Under PPP Options, toggle **Recv Authen = PAP**. Windows 9x Dial-up Networking (DUN) is not compatible with CHAP/PAP or CHAP on the Modem Router. Calls are disconnected after a few minutes. Toggle **Compression= No**. Windows 9x DUN is not compatible with software compression on the Modem Router. Calls are randomly disconnected. Toggle **Mutual Authen= No**.

Under IP Address Supplied By, toggle **Dial-in User= No** and **IP Pool = Yes**. For **IP Start Addr =**, type in the ELAN IP address that will be assigned to the Dial-up Networking (DUN) PPP client on the remote OTM 2.1 PC.

Note: The remote OTM PC receives this ELAN IP address when DUN makes a dial-in PPP connection to the Modem Router. As long as DUN remains connected to the Modem Router, IP applications on the remote OTM PC function as if the PC were located on the customer's ELAN.

Under Session Options, configure **Input Filter Sets =** and **Output Filter Sets =** according to the customer's IP network security policy and practices. The default setting; however, is no Filter Sets. Set **Idle Timeout = 1200**. 1200 seconds provides 20 minutes idle timeout disconnect for remote support purposes.

Press **Enter** to confirm and save data to ROM and then press **Esc** to return from the sub-menu to the main menu.

18 Enter menu selection number **14**, under the **Advanced Applications** section. The **Menu 14 - Dial-in User Setup** is displayed.

```
Menu 14 - Dial-in User Setup


1. itgadmin
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____


Enter Menu Selection Number:
```

Note: Up to eight dial-in user profiles can be defined according to the customer's network security policy.

19 Enter menu selection **1** to edit the first dial-in user profile.
Menu 14.1 - Edit Dial-in User is displayed.

```
Menu 14.1 - Edit Dial-in User


User Name= itgadmin
Active= Yes
Password= ********
Callback= No
Phone # Supplied by Caller= N/A
Callback Phone #= N/A
Rem CLID=
Idle Timeout= 500


Press ENTER to Confirm or ESC to Cancel:
```

20 Type in the **User Name**, such as itgadmin.

21 Toggle **Active = Yes/No** for security purposes.

22 Type in a **Password** for PAP. The DUN client on the remote OTM 2.0 PC must provide the user name and password defined here when dialing up the Modem Router.

23 Set **Callback = Yes/No** according to the customer's network security policy and practices. Nortel Networks Customer Technical Services (CTS) does not currently accept Callback security calls from the Modem Router.

24 Set **Rem CLID =** to the **PSTN Calling Number** that is displayed when the remote OTM 2.0 PC dials up the Modem Router, if CLID authentication is required for the user profile. CLID depends on providing a C.O. line subscribed for CLID service for the Modem Router's telephone line connection.

25 Set **Idle Timeout = 1200**, where 1200 seconds provides 20 minutes idle timeout disconnect for Nortel Networks remote support purposes.

26 Press **Enter** to confirm and save data to ROM, then press **Esc** to return from the sub-menu to the RM356 Main Menu.

27 Enter menu selection number **23**, under the **Advanced Management** section of the RM356 Main Menu. **Menu 23 - System Password** is displayed.

```
Menu 23 - System Password


Old Password= ?
New Password= ?
Retype to confirm= ?


Enter here to CONFIRM or ESC to CANCEL:
```

28 Type in the **Old Password**. Navigate down and type a **New Password**. Navigate down to **Retype to confirm** and then retype the new password.

Press **Enter** to save the save the changes.

Note: Never leave the RM356 system manager password defaulted to 1234 after the Modem Router has been installed and configured on the ELAN. The Modem Router's security features are ineffective if the manager password is not changed on a regular basis according to good network security practices.

———— **End of Procedure** ————

RM356 Modem Router manager menu description

This section displays the various menus of the RM356 Modem Router:

```
                    RM356 Main Menu
Getting Started                    Advanced Management
  1. General Setup          21. Filter Set Configuration
  2. MODEM Setup
  3. Ethernet Setup          23. System Password
  4. Internet Access Setup   24. System Maintenance

Advanced Applications
 11. Remote Node Setup
 12. Static Routing Setup
 13. Default Dial-in Setup
 14. Dial-in User Setup            99. Exit
```

```
            Enter Menu Selection Number:


                 Menu 1 - General Setup


   System Name= Room_304_RCH_Training_Center
    Location= Sherman Ave., Richardson, TX
Contact Person's Name= John Smith, 972 555-1212


   Press ENTER to Confirm or ESC to Cancel:


              Menu 2 - MODEM Setup


  Modem Name= MODEM
  Active= Yes
  Direction= Incoming
  Phone Number=
  Advanced Setup= No
  Press ENTER to Confirm or ESC to Cancel:


                Menu 3 - Ethernet Setup


  1. General Setup
  2. TCP/IP and DHCP Setup


          Enter Menu Selection Number:


         Menu 3.1 - General Ethernet Setup


  Input Filter Sets= 2
  Output Filter Sets=


  Press ENTER to Confirm or ESC to Cancel:


  Menu 3.2 - TCP/IP and DHCP Ethernet Setup
```

```
                   DHCP Setup:
                     DHCP= None
                     Client IP Pool Starting Address= N/A
                     Size of Client IP Pool= N/A
                     Primary DNS Server= N/A
                     Secondary DNS Server= N/A

                   TCP/IP Setup:
                     IP Address= 47.177.16.254
                     IP Subnet Mask= 255.255.255.0
                     RIP Direction= None
                        Version= RIP-2B

                   Press ENTER to Confirm or ESC to Cancel:

Press Space Bar to Toggle.



                   Menu 12 - Static Route Setup

            1. DefaultGW
            2. _____
            3. _____
            4. _____


                   Enter Menu Selection Number:

            Menu 12.1 - Edit IP Static Route

            Route #: 1
            Route Name= DefaultGW
            Active= Yes
            Destination IP Address= 0.0.0.0
            IP Subnet Mask= 0.0.0.0
            Gateway IP Address= 47.177.16.1
            Metric= 2
```

```
                    Private= No

              Press ENTER to Confirm or ESC to Cancel:

                 Menu 13 - Default Dial-in Setup

   Telco Options:                   IP Address Supplied By:
      CLID Authen= None                 Dial-in User= No
                                        IP Pool= Yes
   PPP Options:                     IP Start Addr= 47.177.16.253
      Recv Authen= PAP
      Compression= No                   Session Options:
      Mutual Authen= No                   Input Filter Sets=
        PAP Login= N/A                    Output Filter Sets=
        PAP Password= N/A                 Idle Timeout= 1200

   Callback Budget Management:
      Allocated Budget(min)=
      Period(hr)=

              Press ENTER to Confirm or ESC to Cancel:


Press Space Bar to Toggle.


                 Menu 14 - Dial-in User Setup


              1. itgadmin
              2. _____
              3. _____
              4. _____
              5. _____
              6. _____
              7. _____
              8. _____


              Enter Menu Selection Number:
```

```
           Menu 14.1 - Edit Dial-in User

        User Name= itgadmin
        Active= Yes
        Password= ********
        Callback= No
          Phone # Supplied by Caller= N/A
          Callback Phone #= N/A
        Rem CLID=
        Idle Timeout= 500


        Press ENTER to Confirm or ESC to Cancel:
```

```
         Menu 21 - Filter Set Configuration

 Filter                              Filter
 Set #         Comments              Set #         Comments
 ------   -----------------          ------   -----------------
    1     NetBEUI_WAN                   7     _____
    2     NetBEUI_LAN                   8     _____
    3     _____             9     _____
    4     _____            10     _____
    5     _____            11     _____
    6     _____            12     _____


         Enter Filter Set Number to Configure= 0

         Edit Comments=

         Press ENTER to Confirm or ESC to Cancel:
```

```
                      Menu 21.1 - Filter Rules Summary

# A Type                     Filter Rules                 M m n
- - ----  ----------------------------------------------- - - -
1 Y IP    Pr=17, SA=0.0.0.0, SP=137, DA=0.0.0.0           N D N
2 Y IP    Pr=17, SA=0.0.0.0, SP=138, DA=0.0.0.0           N D N
3 Y IP    Pr=17, SA=0.0.0.0, SP=139, DA=0.0.0.0           N D N
4 Y IP    Pr=6, SA=0.0.0.0, SP=137, DA=0.0.0.0            N D N
5 Y IP    Pr=6, SA=0.0.0.0, SP=138, DA=0.0.0.0            N D N
6 Y IP    Pr=6, SA=0.0.0.0, SP=139, DA=0.0.0.0            N D F


             Enter Filter Rule Number (1-6) to Configure:


                    Menu 23 - System Password

                Old Password= ?
                New Password= ?
                Retype to confirm= ?


             Enter here to CONFIRM or ESC to CANCEL:


                  Menu 24 - System Maintenance

                1.   System Status
                2.   Terminal Baud Rate
                3.   Log and Trace
                4.   Diagnostic
                5.   Backup Configuration
                6.   Restore Configuration
                7.   Software Update
                8.   Command Interpreter Mode
                9.   Call Control

                 Enter Menu Selection Number:
```

```
                 Menu 24.1 -- System Maintenance - Status

Port Status   Speed  TXPkts  RXPkts  Errs  Tx B/s  Rx B/s   Up Time
 1   Idle    0Kbps   16206   12790     0      0       0     0:00:00


     Total Outcall Time:      0:00:00


   Ethernet:                        Name: Room_304_RCH_Traini
      Status:  10M/Half Duplex   RAS S/W Version: V2.13 | 9/25/98
    TX Pkts: 135579               Ethernet Address:00:a0:c5:e0:5b:a6
    RX Pkts: 662866
    Collisions: 49


   LAN Packet Which Triggered Last Call:


                          Press Command:


        COMMANDS: 1-Drop Port 1  9-Reset Counters   ESC-Exit
```

Menu 24.2 -- System Maintenance - Change Terminal Baud Rate

Terminal Baud Rate: 9600

                   Press ENTER to Confirm or ESC to Cancel:

Press Space Bar to Toggle.

              Menu 24.3 == System Maintenance - Log and Trace

              1. View Error Log
              2. Syslog and Accounting

                        Please enter selection:

```
  0    179754 PINI  INFO  SMT Session End
  1    179761 PP09  INFO  Password pass
  2    179761 PINI  INFO  SMT Session Begin
```

```
 3      179763 PINI   INFO   SMT Session End
 4      179772 PP09   INFO   Password pass
 5      179772 PINI   INFO   SMT Session Begin
 6      179775 PINI   INFO   SMT Session End
 7      179783 PP09   INFO   Password pass
 8      179783 PINI   INFO   SMT Session Begin
 9      179788 PINI   INFO   SMT Session End
10      179796 PP09   INFO   Password pass
11      179796 PINI   INFO   SMT Session Begin
12      179798 PINI   INFO   SMT Session End
13      179812 PP09   INFO   Password pass
14      179812 PINI   INFO   SMT Session Begin
15      179815 PINI   INFO   SMT Session End
16      179830 PP09   INFO   Password pass
17      179830 PINI   INFO   SMT Session Begin
18      179834 PINI   INFO   SMT Session End




            Menu 24.3.2 -- System Maintenance - Syslog and Accounting

                    Syslog:
                    Active= No
                    Syslog IP Address= ?
                    Log Facility= Local 1


                    Press ENTER to Confirm or ESC to Cancel:

Press Space Bar to Toggle.

                 Menu 24.4 - System Maintenance - Diagnostic

     MODEM                                    System
        1.   Drop MODEM                         21. Reboot System
        2.   Reset MODEM                        22. Command Mode
        3.   Manual Call
```

```
   4.  Redirect to MODEM


TCP/IP
  11. Internet Setup Test
  12. Ping Host


                    Enter Menu Selection Number:


          Manual Call Remote Node= N/A
          Host IP Address= N/A


        Menu 24.7 -- System Maintenance - Upload Firmware


          1. Load RAS Code
          2. Load ROM File


                    Enter Menu Selection Number: 1
```

Appendix C: Product integrity

Contents

This section contains information on the following topics:

Introduction

This chapter presents information about the Voice Gateway Media Card's reliability, environmental specifications, and electrical regulatory standards.

Reliability

Reliability is measured by the Mean Time Between Failures (MTBF).

Mean time between failures (MTBF)

The Mean Time Between Failure (MTBF) is 46 years for Voice Gateway Media Cards. Failures per 10^6 hours of operation are 2.483, based on 40 degrees C (140 degrees F).

Voice Gateway Media Card power consumption

The worst case current drawn by the Voice Gateway Media Cards from each Backplane voltage supply is provided in Table 87 on :

Table 87
Voice Gateway Media Card power consumption

Card Type	Power Consumption
ITG-Pentium 24-port line card	± 15 volt = 19.3 watts => 0.640 amps +5 volt = 10.5 watts => 2.1 amps
Succession Media Card	+ 15 volt = 6 watts => 0.2 amps +5 volt = 7.25 watts => 1.45amps

Environmental specifications

Table 88 shows the environmental specifications of the Voice Gateway Media Card. The Voice Gateway Media Card provides external interface protection to –52 V dc, but does not provide lightning or hazardous voltage protection.

Table 88
Voice Gateway Media Card – environmental specifications

Parameter	Specifications
Operating temperature	0° to +60° C (+32 to +140° F), ambient
Operating humidity	5 to 95% RH (non-condensing)
Storage temperature	–40° to +70° C (–40° to +158° F)

Measurements of performance in regards to temperature and shock were made under test conditions as described in Table 89 on page 641.

Temperature-related conditions

Refer to Table 89 for a display of acceptable temperature and humidity ranges for the Voice Gateway Media Card.

Table 89
Voice Gateway Media Card – environmental specifications

Specification	Minimum	Maximum
Normal Operation		
Recommended	15° C	30° C
Relative humidity	20%	55% (non-condensing)
Absolute	10 ° C	45° C
Relative humidity	20% to	80% (non-condensing)
Short Term (less than 72 hr)	–40° C	70° C
Rate of change	Less than 1° C for every 3 minutes	
Storage		
Recommended	–20° C	60° C
Relative humidity	5%	95% (non-condensing)
	–40° C to 70° C, non-condensing	
Temperature Shock		
In 3 minutes	–40° C	25° C
In 3 minutes	70° C	25° C
	–40° to 70° C, non-condensing	

Electrical regulatory standards

Table 90, Table 91 on page 644, and Table 92 on page 644 list the safety and electro-magnetic compatibility regulatory standards (by geographic region) for the Voice Gateway Media Card.

Specifications for the Voice Gateway Media Card meet or exceed the standards listed in these regulations.

Safety

Table 90 provides a list of safety regulations met by the Voice Gateway Media Card, along with the type of regulation and the country/region covered by each regulation.

Table 90
Safety regulations

Regulation Identifier	Regulatory Agency
UL 1459	Safety, United States, CALA
CSA 22.2 225	Safety, Canada
EN 41003	Safety, International Telecom
EN 60950/IEC 950	Safety, International
BAKOM SR 784.103.12/4.1/1	EMC/Safety (Switzerland)
AS3260, TS001 – TS004, TS006	Safety/Network (Australia)
JATE	Safety/Network (Japan)

Electro-magnetic Containment

Electro-Magnetic Containment (EMC) compliance requirements depend on the regulations in effect for the country where the Meridian 1, Succession 1000M, and Succession 1000 is located. CISPR 22 Class B defines more stringent EMC limits than CISPR 22 Class A requirements (that is, equipment that meets CISPR 22 Class B exceeds CISPR 22 Class A requirements and can be used globally).

The ITG-P 24-port line card and the Succession Media Cards are approved for CISPR 22 Class A (and FCC Part 15 Class A) limits and approved to CISPR 22 Class B limits with the following configurations:

- ITG-P 24-port line card

  — For Small Systems, there is no limit to the number of ITG-P 24-port line cards that can be installed on a shelf to meet CISPR 22 Class A (and FCC Part 15 Class A) limits. However, to meet CISPR 22 Class B limits, there is a limit of two cards for each shelf.

  — For Large Systems, there is no limit to the number of ITG-P 24-port line cards that can be installed on a shelf to meet CISPR 22 Class A (and FCC Part 15 Class A) limits and CISPR 22 Class B limits.

- Succession Media Card

  — For Small Systems, there is no limit to the number of Succession Media cards that can be installed on a shelf to meet CISPR 22 Class A (and FCC Part 15 Class A) limits and CISPR 22 Class B limits. If the Succession Media Cards are installed in a shelf that already has ITG-P 24-port line cards, then the ITG-P 24-port line card's EMC requirements supersedes the Succession Media Card EMC requirements.

  — For Large Systems, there is no limit to the number of Succession Media Cards that can be installed on a shelf to meet CISPR 22 Class A (and FCC Part 15 Class A) limits. To meet CISPR 22 Class B limits, there is a limit of ten Succession Media Cards that can be installed on one shelf. If the Succession Media cards are to be installed in a shelf that already has ITG-P 24-port line cards, then the ITG-P 24-port line card's EMC requirements supersedes the Succession Media Card's EMC requirements.

Table 91 lists Electro-magnetic emissions regulations met by the Voice Gateway Media Card, along with the country's standard that lists each regulation.

Table 91
Electro-Magnetic emissions

Regulation Identifier	Regulatory Agency
FCC part 15 Class A	United States Radiated Emissions
CSA C108.8	Canada Radiated Emissions
EN50081-1	European Community Generic Emission Standard
EN55022/CISPR 22 CLASS B	Radiated Emissions (Basic Std.)
BAKOM SR 784.103.12/4.1/1	EMC/Safety (Switzerland)
SS-447-20-22	Sweden EMC standard
AS/NZS 3548	EMC (Australia/New Zealand)
NFC 98020	France EMC standard

Table 92 lists Electro-magnetic immunity regulations met by the Voice Gateway Media Card, along with the country's standard that lists each regulation.

Table 92
Electro-Magnetic immunity (Part 1 of 2)

Regulation Identifier	Regulatory Agency
CISPR 22 Sec. 20 Class B	I/O conducted noise
IEC 801-2 (level 4)	ESD (Basic Standard)
IEC 801-3 (level 2)	Radiated Immunity (Basic Standard)
IEC 801-4 (level 3)	Fast transient/Burst Immunity (Basic Standard)
IEC 801-5 (level 4, preliminary)	Surge Immunity (Basic Standard)

Table 92
Electro-Magnetic immunity (Part 2 of 2)

Regulation Identifier	Regulatory Agency
IEC 801-6 (preliminary)	Conducted Disturbances (Basic Standard)
BAKOM SR 784.103.12/4.1/1	EMC/Safety (Switzerland)
SS-447-20-22	Sweden EMC standard
AS/NZS 3548	EMC (Australia/New Zealand)
NFC 98020	France EMC standard

Appendix D: Subnet Mask Conversion from CIDR to Dotted Decimal Format

Introduction

Subnet masks are expressed in Classless InterDomain Routing (CIDR) format, appended to the IP address, such as 10.1.1.1/20. The subnet mask must be converted from CIDR format to dotted decimal format in order to configure IP addresses.

The CIDR format expresses the subnet mask as the number of bits counting from the most significant bit of the first IP address field. A complete IP address consists of 32 bits. Therefore, a typical CIDR format subnet mask is in the range from /9 to /30. Each decimal number field in the dotted decimal format has a value from 0 to 255, where decimal 255 represents binary 1111 1111.

Follow the steps in Procedure 107 on to convert a subnet mask from CIDR format to dotted decimal format.

Procedure 107
Converting a subnet mask from CIDR format to dotted decimal format

1   Divide the CIDR format value by 8. The quotient (the number of times that eight divides into the CIDR format value) equals the number of dotted decimal fields containing 255.

In the example above, the subnet mask is expressed as /20. Twenty divided by eight equals a quotient of two, with a remainder of four. Therefore, the first two fields of the subnet mask in dotted decimal format are 255.255.

2   If there is a remainder, refer to Table 93 to obtain the dotted decimal value for the field following the last field containing "255". In the example of /20 above, the remainder is four. In Table 93, a remainder of four equals a binary value of 1111 0000 and the dotted decimal value of the next and last field is 240. Therefore the first three fields of the subnet mask are 255.255.240.

3   If there are any remaining fields in the dotted decimal format, they have a value of 0. Therefore, the complete subnet mask in dotted decimal format is 255.255.240.0.

——————————— **End of Procedure** ———————————

Table 93
CIDR format remainders

Remainder of CIDR format value divided by eight	Binary value	Dotted decimal value
1	1000 0000	128
2	1100 0000	192
3	1110 0000	224
4	1111 0000	240
5	1111 1000	248
6	1111 1100	252
7	1111 1110	254

Appendix E: Download IP Line 3.1 files from Nortel Networks web site

Contents

This section contains information on the following topics:

Introduction

This appendix provides instruction for downloading files from the Nortel Networks web site.

Download files from Nortel Networks web site

Follow the steps in Procedure 108 to download IP Line 3.1-related software and firmware files from the Nortel Networks web site.

Procedure 108
Downloading files from the Nortel Networks web site

1   Connect to **http://www.nortelnetworks.com** using any PC with Internet access.

2   Click **Software Downloads** under **Support**. The Software Downloads page opens and displays the list **Product Family**.

3   Select **Meridian** or **Succession**.

    a. If Meridian was selected**,** click **IP Line and Internet Telephony Gateway (ITG) Line product**, and select **Software**.

    This product list includes the following:

    — IP LIne 3.1 for Succession Media cards (this *.zip file contains the IP Line 3.1 loadware for the Succession Media Cards, the Internet Telephone firmware, and a readme.txt file)

    — IP LIne 3.1 for ITG-P cards (this *.zip file contains the IP Line 3.1 loadware for the ITG-P cards, the Internet Telephone firmware, and a readme.txt file)

    — Succession Media Cards firmware

    — ITG-P 24-port line card firmware

    — IP Line 3.1 Readmefirst document

    b. If Succession was selected, click **Succession 1000M** or **Succession 1000**, and select **Software**.

    This product list includes the following:

    — Succession Signaling Server 3.1 CD-ROM Image (this image contains the IP Line 3.1 loadware for the Succession Media cards and the ITG-P 24-port card, the Internet telephone firmware, and other key components)

    — Succession Media Cards firmware

    — ITG-P 24-port line card firmware

4 Click the file to be downloaded.

5 If not already logged into the My Nortel Networks account, enter the User ID and Password on the **Sign In** page and then click **Sign In**.

6 If not registered to access this Web site, refer to the Meridian 1, Succession 1000M, or Succession 1000 product bulletin for directions on how to register.

7   Once logged in, ignore the security alert.

8   The **Software Downloads: Software Details Information** page appears. Click the link next to **File Download**.

9   In the **Save As** window, choose the desired path to save the file to local disk on the PC and click **Save**.

———————— **End of Procedure** ————————

Index

W

warm reboot, 535

Z

Zones, 53

Meridian 1, Succession 1000,
Succession 1000M

IP Line

Description, Installation, and

Operation

NORTEL
NETWORKS ™