**Nortel Networks Communication Server 1000**

Nortel Networks Communication Server 1000 Release 4.0

# IP Line

## Description, Installation, and Operation

Document Number: 553-3001-365
Document Release: Standard 3.00
Date: September 2004

Produced in Canada

Information is subject to change without notice. Nortel Networks reserves the right to make changes in design or components as progress in engineering and manufacturing may warrant.

# Revision history

**September 2004**

Standard 3.00. This document is up-issued for Nortel Networks Communication Server 1000 Release 4.0.

**May 2004**

Standard 2.00. This document is up-issued to support the Nortel Networks Mobile Voice Client 2050 (MVC 2050).

**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),
- *Communication Server 1000M and Meridian 1: Small System Planning and Engineering* (553-3011-120), and
- *Communication Server 1000M and Meridian 1: 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 the IP Line 4.0 application for Nortel Networks Communication Server (CS) 1000 Release 4.0 and Meridian 1 systems and describes 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 4.0. 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 Communication Server 1000 Release 4.0 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:

- Communication Server 1000S (CS 1000S)
- Communication Server 1000M Chassis (CS 1000M Chassis)
- Communication Server 1000M Cabinet (CS 1000M Cabinet)
- Communication Server 1000M Half Group (CS 1000M HG)
- Communication Server 1000M Single Group (CS 1000M SG)
- Communication Server 1000M Multi Group (CS 1000M MG)
- Communication Server 1000E (CS 1000E)
- Meridian 1 PBX 11C Chassis (Meridian 1 PBX 11C Chassis)
- Meridian 1 PBX 11C Cabinet (Meridian 1 PBX 11C Cabinet)
- Meridian 1 PBX 51C
- Meridian 1 PBX 61C
- Meridian 1 PBX 61C CP PII
- Meridian 1 PBX 81
- Meridian 1 PBX 81C
- Meridian 1 PBX 81C CP PII

*Note:* When upgrading software, memory upgrades may be required on the Signaling Server, the Call Server, or both.

## System migration

When particular Meridian 1 systems are upgraded to run CS 1000 Release 4.0 software and configured to include a Signaling Server, they become CS 1000M systems. Table 1 lists each Meridian 1 system that supports an upgrade path to a CS 1000M system.

**Table 1**
**Meridian 1 systems to CS 1000M systems**

| This Meridian 1 system... | Maps to this CS 1000M system |
|---|---|
| Meridian 1 PBX 11C Chassis | CS 1000M Chassis |
| Meridian 1 PBX 11C Cabinet | CS 1000M Cabinet |
| Meridian 1 PBX 51C | CS 1000M Half Group |
| Meridian 1 PBX 61C | CS 1000M Single Group |
| Meridian 1 PBX 61C CP PII | CS 1000M Single Group |
| Meridian 1 PBX 81 | CS 1000M Multi Group |
| Meridian 1 PBX 81C | CS 1000M Multi Group |
| Meridian 1 PBX 81C CP PII | CS 1000M Multi Group |

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

- *Communication Server 1000M and Meridian 1: Small System Upgrade Procedures* (553-3011-258)
- *Communication Server 1000M and Meridian 1: Large System Upgrade Procedures* (553-3021-258)
- *Communication Server 1000S: Upgrade Procedures* (553-3031-258)

# Conventions

### Terminology

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

- Communication Server 1000S (CS 1000S)
- Communication Server 1000M (CS 1000M)
- Communication Server 1000E (CS 1000E)
- Meridian 1

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

- Communication Server 1000M Chassis (CS 1000M Chassis)
- Communication Server 1000M Cabinet (CS 1000M Cabinet)
- Meridian 1 PBX 11C Chassis (Meridian 1 PBX 11C Chassis)
- Meridian 1 PBX 11C Cabinet (Meridian 1 PBX 11C Cabinet)

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

- Communication Server 1000M Half Group (CS 1000M HG)
- Communication Server 1000M Single Group (CS 1000M SG)
- Communication Server 1000M Multi Group (CS 1000M MG)
- Meridian 1 PBX 51C
- Meridian 1 PBX 61C
- Meridian 1 PBX 61C CP PII
- Meridian 1 PBX 81
- Meridian 1 PBX 81C
- Meridian 1 PBX 81C CP PII

# 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)
- *Transmission Parameters* (553-3001-182)
- *Signaling Server: Installation and Configuration* (553-3001-212)
- *Branch Office: Installation and Configuration* (553-3001-214)
- *Optivity Telephony Manager: Installation and Configuration* (553-3001-230)
- *Features and Services* (553-3001-306)
- *Emergency Services Access: Description and Administration* (553-3001-313)
- *Optivity Telephony Manager: System Administration* (553-3001-330)
- *Element Manager: System Administration* (553-3001-332)
- *IP Phones: Description, Installation, and Operation* (553-3001-368)
- *Software Input/Output: System Messages* (553-3001-411)
- *Communication Server 1000M and Meridian 1: Small System Planning and Engineering* (553-3011-120)
- *Communication Server 1000M and Meridian 1: Large System Planning and Engineering* (553-3021-120)
- *Communication Server 1000S: Planning and Engineering* (553-3031-120)
- *Communication Server 1000S: Installation and Configuration* (553-3031-210)
- *Communication Server 1000S: Upgrade Procedures* (553-3031-258)
- *Communication Server 1000S: Maintenance* (553-3031-500)
- *Communication Server 1000E: Planning and Engineering* (553-3041-120)

- *IP Phone 2001 User Guide*
- *IP Phone 2002 User Guide*
- *IP Phone 2004 User Guide*
- *Nortel Networks IP Softphone 2050 User Guide*
- *Nortel Networks Mobile Voice Client 2050 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

CS 1000 Release 4.0 introduces the IP Line 4.0 application.

The IP Line 4.0 application provides an interface that connects an IP Phone to a Meridian 1 PBX and a CS 1000 Call Server.

> ***Note:*** IP Line 4.0 does not operate on Meridian 1 or CS 1000 systems running software earlier than CS 1000 Release 4.0.

**IMPORTANT!**

IP Line 3.1 (or earlier) is not supported in CS 1000 Release 4.0.

## Features

IP Line 4.0 introduces the following features:

- support for the Nortel Networks IP Phone Key Expansion Module (KEM)

- support for the Nortel Networks IP Phone 2001
- IP Call Recording
- Personal Directory for IP Phones
- Callers List for IP Phones
- Redial List for IP Phones
- password protection for the Personal Directory, Callers List, and Redial List
- centralized database and administration for the Personal Directory, Callers List, and Redial List
- support for UNIStim File Transfer Protocol (UFTP) for IP Phone firmware downloads
- support for traversal of Network Address Translation (NAT) devices

## Voice Gateway Media Cards

If a Media Card 32-port card, a Media Card 8-port card, or an ITG-P 24-port card is running IP Line 4.0 software, it is known as a Voice Gateway Media Card.

### DHCP server

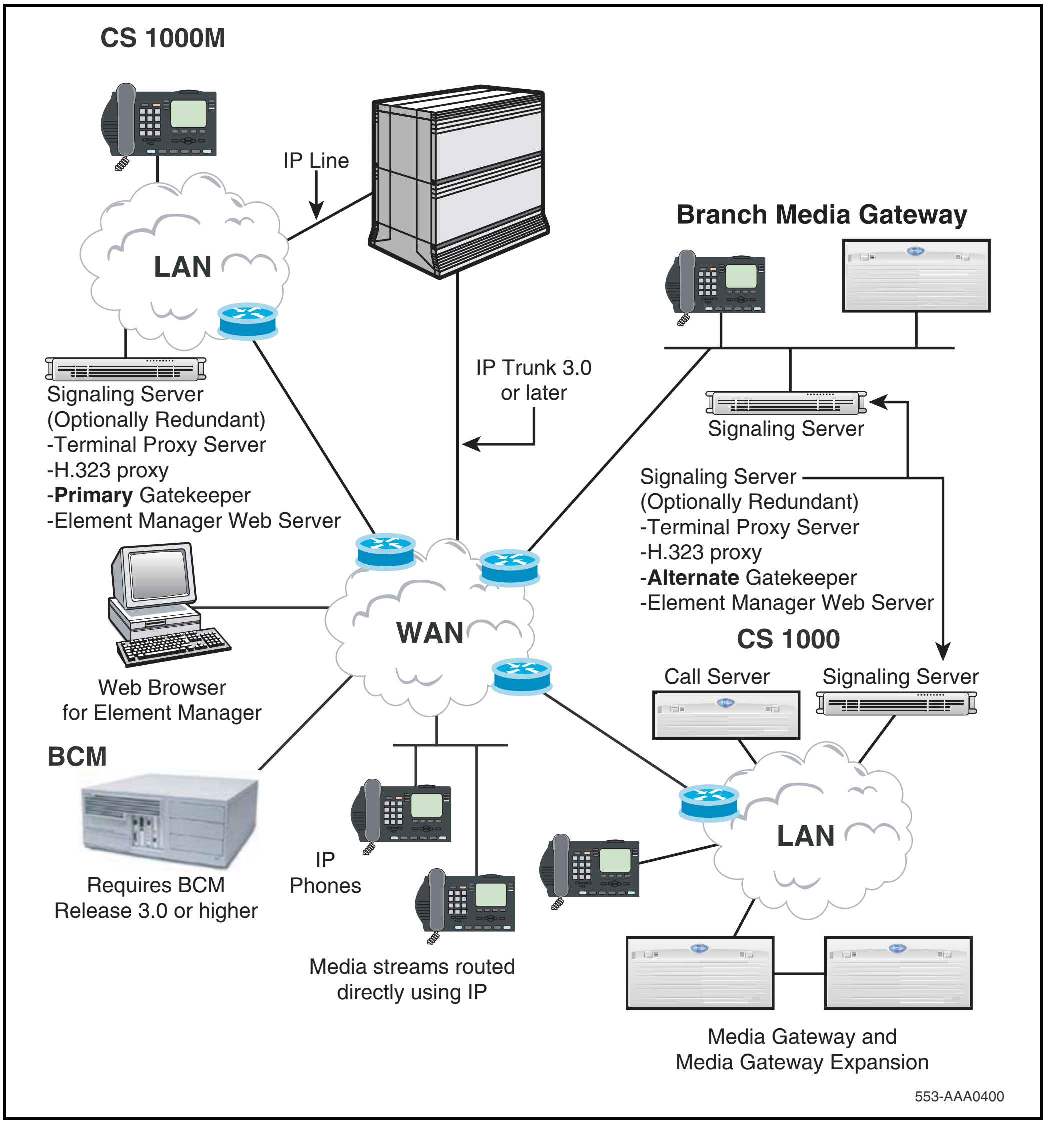
A Dynamic Host Configuration Protocol (DHCP) server can be used to provide the required information to enable the IP Phone network connection and connect to the Voice Gateway Media Card.

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

# Interworking

The IP Phone uses the IP network to communicate with the Voice Gateway Media Card and the optional DHCP server. Figure 1 on page 22 shows a diagram of the system architecture.

**Figure 1**
**System architecture**



# Applicable systems

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

## Unsupported products

The following remote service products do not support the Media Card 32-port line card, 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

CS 1000 Release 4.0 software is the minimum system software for IP Line 4.0.

## OTM 2.2 and Element Manager

Optivity Telephony Manager (OTM) 2.2 and Element Manager are used throughout this document as the primary interface for Voice Gateway Media Cards and IP Line 4.0.

OTM 2.2 is the minimum required version.

### CS 1000 systems

Either OTM 2.2 or Element Manager can be used as the configuration, administration, and maintenance interface for IP Line 4.0 on a CS 1000 system.

If trying to use OTM 2.2 to perform an action available through Element Manager, then OTM 2.2 launches Element Manager automatically.

OTM 2.2 is used for configuration activities not supported by Element Manager, such as terminal administration.

### Meridian 1

OTM 2.2 is used as the configuration, administration, and maintenance interface for IP Line 4.0 on a Meridian 1. Element Manager cannot be used, as Element Manager is located on a Signaling Server, and there is no Signaling Server in a Meridian 1.

### Corporate Directory

OTM 2.2 is necessary for creation of the Corporate Directory database.

### SNMP and alarms

Element Manager does not provide a SNMP alarm browser, so the OTM 2.2 Alarm Manager is recommended when SNMP alarm collection is required.

## System configurations

Although IP Line 4.0 can be used in different system configurations and its use can vary in those configurations, there are four basic system configurations. See Table 2.

**Table 2**
**Possible system configurations**

| | System | Signaling Server present |
|---|---|---|
| 1 | Meridian 1 | No |
| 2 | CS 1000E | Yes |
| 3 | CS 1000M | Yes |
| 4 | CS 1000S | Yes |

IP Line 4.0 can use the Signaling Server if the Signaling Server is deployed in the system configuration.

## Meridian 1

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

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

> ***Note:*** If a Media Card 32-port card, a Media Card 8-port card, or an ITG-P 24-port card is running IP Line 4.0 software, it is known as a Voice Gateway Media Card.

## CS 1000 systems

CS 1000 systems have a Signaling Server in their network configuration. The Signaling Server is a server that provides signaling interfaces to the IP network. The Signaling Server's central processor drives the signaling for IP Phones and IP Peer networking.

In IP Line 4.0, the LTPS executes on the Signaling Server and the voice gateway executes on the Voice Gateway Media Cards. All IP Phones register with the Signaling Server. The Voice Gateway Media Cards only provide access to the voice gateway.

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

### Signaling Server redundancy

There are several methods of redundancy for a Signaling Serve. See Table 3.

**Table 3**
**Methods of Signaling Server redundancy (Part 1 of 2)**

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

**Table 3**
**Methods of Signaling Server redundancy (Part 2 of 2)**

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

# Software delivery

IP Line 4.0 supports software delivery through the following formats:

**1** CompactFlash

**2** Signaling Server CD-ROM

**3** Download from the Nortel Networks web site

*Note:* Stand-alone IP Line 4.0 software is not available through CD-ROM.

The IP Line 4.0 software and related documentation (such as *Readme First* documents) can be downloaded from the Nortel Networks web site.

## Required packages

The IP Phones require the software packages listed in Table 4.

**Table 4**
**Required packages**

| Package | Package number |
|---|---|
| M2000 Digital Sets (DSET) | 88 |
| Aries Digital Sets (ARIE) | 170 |

> ***Note:*** To configure IP Line 4.0 in groups 5-7 on Option 81C CP PII or CS 1000M MG, the Fiber Network (FIBN) software package 365 is required.

# IP Line package components lists

## CS 1000 and Meridian 1 package components

Table 5 lists the IP Line 4.0 package components for CS 1000 and Meridian 1 systems.

**Table 5**
**IP Line 4.0 Media Card 32-port line card package components (Part 1 of 2)**

| Component | Code |
|---|---|
| Media Card 32-port - IP Line 4.0 Voice Gateway Systems Package includes the following:<br>• Media Card 32-port assembly NTVQ01BB<br>• IP Line 4.0 Voice Gateway CompactFlash NTM403AB<br>• ITG EMC Shielding Kit (NTVQ83AA)<br>• Readme First Document<br>• Shielded 50-pin to Serial/ELAN/TLAN adaptor<br>• PC Maintenance cable (NTAG81CA)<br>• IP Line 4.0 NTP (CD-ROM)<br>• ITG-specific Meridian 1 Backplane 50-pin I/O Panel Filter Connector (NTCW84JA) (see Note) | NTDU41DB |

**Table 5**
**IP Line 4.0 Media Card 32-port line card package components (Part 2 of 2)**

| Component | Code |
|---|---|
| IP Line 4.0 Voice Gateway NTP (CD-ROM), includes:<br>• *IP Line: Description, Installation, and Operation* (553-3001-365)<br>• *IP Phones: Description, Installation, and Operation* (553-3001-368)<br>• *IP Phone 2001 User Guide*<br>• *IP Phone 2001 Quick Reference Card*<br>• *IP Phone 2002 User Guide*<br>• *IP Phone 2002 Quick Reference Card*<br>• *IP Phone 2004 User Guide*<br>• *IP Phone 2004 Quick Reference Card*<br>• *IP Softphone 2050 and Mobile Voice Client 2050 User Guide* | NTDW81AF |
| ***Note:*** The I/O panel filter connector is not required for Meridian 1 Option 11C Cabinet, Meridian 1 Option 11C Chassis, CS 1000M Cabinet, CS 1000M Chassis, or CS 1000S systems. | |

## IP Line 4.0 Media Card 8-port card package components

Table 6 lists the IP Line 4.0 Media Card 8-port card package components. The Media Card 8-port card is intended for branch office configurations. The card is applicable to the CS 1000 and Meridian 1 systems.

**Table 6**
**IP Line 4.0 Media Card 8-Port card package components**

| Component | Code |
|---|---|
| Media Card 8-port - IP Line 4.0 Voice Gateway Systems Package includes:<br>• Media Card 8-port Assembly NTVQ01AB<br>• IP Line 4.0 CompactFlash NTM403AB<br>• ITG EMC Shielding Kit NTVQ83AA<br>• Readme First Document<br>• Shielded 50-pin to Serial/ELAN/TLAN adaptor<br>• PC Maintenance Cable NTAG81CA<br>• IP Line 4.0 NTP (CD-ROM) NTDW81AF<br>• ITG-specific Meridian 1 Backplane 50-pin I/O Panel Filter Connector (NTCW84JA) (see Note) | NTDU41EB |
| ***Note:*** The I/O panel filter connector is not required for Meridian 1 Option 11C Cabinet, Meridian 1 Option 11C Chassis, CS 1000M Cabinet, CS 1000M Chassis, or CS 1000S systems. | |

## Documentation

The following documents are available on the IP Line 4.0 CD-ROM and on the Nortel Networks web site:

- *IP Line: Description, Installation, and Operation* (553-3001-365)
- *IP Phones: Description, Installation, and Operation* (553-3001-368)
- *IP Phone 2001 User Guide*
- *IP Phone 2001 Quick Reference Card*
- *IP Phone 2002 User Guide*
- *IP Phone 2002 Quick Reference Card*
- *IP Phone 2004 User Guide*
- *IP Phone 2004 Quick Reference Card*
- *IP Softphone 2050 and Mobile Voice Client 2050 User Guide*

# Voice Gateway Media Cards

Voice Gateway Media Card is a term used to encompass the Media Card 32-port line card, 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 CS 1000M systems, and into a Media Gateway 1000S and Media Gateway 1000S Expander in the CS 1000S system.

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

The Media Card has the following features:

- 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 IP Phones for the 32-port version, while 32 IP Phones are supported on the 8-port version (if a Signaling Server is not present in the network configuration).

The 8-port version is typically intended for the Media Gateway 1000B used with the Branch Office feature in branch office locations.

Table 7 provides a comparison of the ITG-P 24-port line card and Media Card 32-port and 8-port line cards.

**Table 7**
**Comparison of ITG-P 24-port and Media Card 32-port and 8-port line cards (Part 1 of 2)**

| Item | ITG-P 24-port line card | Media Card 32-port line card | 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<br>(8 ports for each DSP) | 8.1 High Density version<br>(8 ports for each DSP) |
| Number of IP Phones that can register on each Voice Gateway Media Card | 96<br>(in a Meridian 1 – see note) | 128<br>(in a Meridian 1 – see note) | 32<br>(in a Meridian 1 – see note) |
| Image file name prefixes shown by swVersionShow command | IPL P | IPL SA | IPL SA |

**Table 7**
**Comparison of ITG-P 24-port and Media Card 32-port and 8-port line cards (Part 2 of 2)**

| Item | ITG-P 24-port line card | Media Card 32-port line card | 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 CS 1000 system, then the IP Phones register to the Signaling Server instead of the Voice Gateway Media Card, and are not subject to these restrictions. A Signaling Server can register a maximum of 5000 IP Phones. | | | |

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

> ***Note:*** The ELAN (Embedded LAN) subnet isolates critical telephony signaling between the Call Server and the other components. The ELAN subnet is also known as the Management LAN subnet.
> The TLAN (Telephony LAN) subnet carries telephony/voice/signaling traffic. The TLAN subnet, also known as the Voice LAN subnet, 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 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 Virtual TN (VTN) feature allows each Voice Gateway Media Card to support more IP Phones than there are physical bearer channels. There are 24 bearer channels on each ITG-P card and 8 or 32 channels on each Media Card.

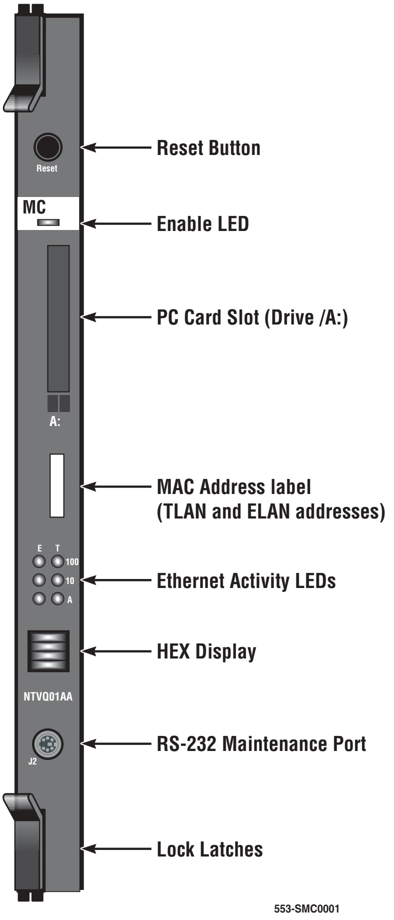
Both cards support a 4:1 concentration of registered IP Phones (IP Phones type 2002 and 2004, IP Softphone 2050, and Mobile Voice Client (MVC) 2050) to gateway channels. The ITG-P supports 96 registered IP Phones. The Media Card supports 32 registered IIP Phones (when the card has 8 channels) or 128 registered IP Phones (when the card has 32 channels). The IP Phones require the services of the bearer channels only when they are busy on a call that requires a TDM circuit such as an IP Phone-to-digital telephone/trunk/voice mail/conference. When an IP Phone is idle or there is an IP-to-IP call, no gateway channel is required.

When the total number of IP Phones that are registered or are attempting to register reaches the limit (96 on the ITG-P, 32 or 128 on the Media Card), the Voice Gateway Media Card recognizes this and no more IP Phones 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 IP Phones associated with the card.

## Media Card controls, indicators, and connectors

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

**Figure 2**
**Media Card faceplate**



## Faceplate components

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

### *Reset button*

Use the Reset button on the faceplate to manually reset the 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.

**WARNING**

Do not format the PC Card using a Windows application. As well, only format the PC Card using the type of card on which it will be running. For example, a PC Card formatted using a Small System Controller (SSC) card is only readable by the SSC card. It is not readable by the ITG-P 24-port card or the Media Card. A PC Card formatted using a Voice Gateway Media Card (ITG-P 24-port card or Media Card) is only readable by another Voice Gateway Media Card. It is not readable by the SSC card.

### *MAC address label*

The MAC address label on the card’s faceplate is labeled **ETHERNET ADDRESS**. It shows the TLAN and ELAN network interface MAC addresses. The Management /ELAN network interface MAC address for each card is assigned during manufacturing and is unchangeable. The MAC address label on the 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 network interface and three for the TLAN network interface. The LEDs indicate the following links on the ELAN network interface and TLAN network interface (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.

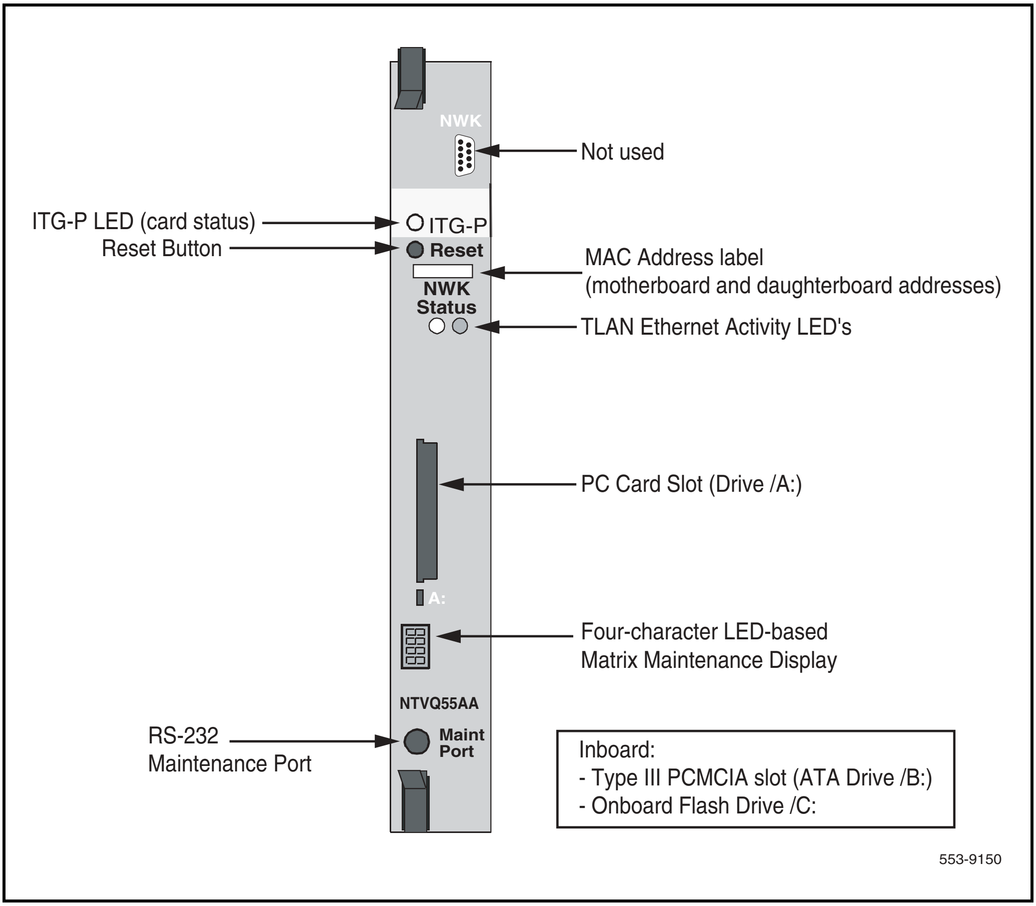
### *RS-232 Maintenance Port*

The 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 card controls, indicators, and connectors

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

**Figure 3**
**ITG-P 24-port card faceplate**



## 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 4.0 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 button to reset the card without having to cycle power to the card. This button 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 network interface address corresponds to the Management MAC address. The Management MAC address for each card is assigned during manufacturing and is unchangeable. The ELAN network interface 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 network interface activity LEDs (labeled NWK Status LEDs)

The two NWK Status LEDs display TLAN network interface activity.

- Green – the LED is on if the carrier (link pulse) is received from the TLAN network interface switch.
- Yellow – the LED flashes when there is data activity on the TLAN network interface. During heavy traffic, the yellow LED can stay continuously lit.

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

**WARNING**

Do not format the PC Card using a Windows application. As well, only format the PC Card using the type of card on which it will be running. For example, a PC Card formatted using a Small System Controller (SSC) card is only readable by the SSC card. It is not readable by the ITG-P 24-port card or the Media Card. A PC Card formatted using a Voice Gateway Media Card (ITG-P 24-port card or Media Card) is only readable by another Voice Gateway Media Card. It is not readable by the SSC card.

### 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 64: "ITG-P 24-port line card faceplate maintenance display codes" on page 569 and Table 65: "Media Card faceplate maintenance display codes" on page 571.

### 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 connections to the following:

- ELAN network interface
- TLAN network interface
- 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).

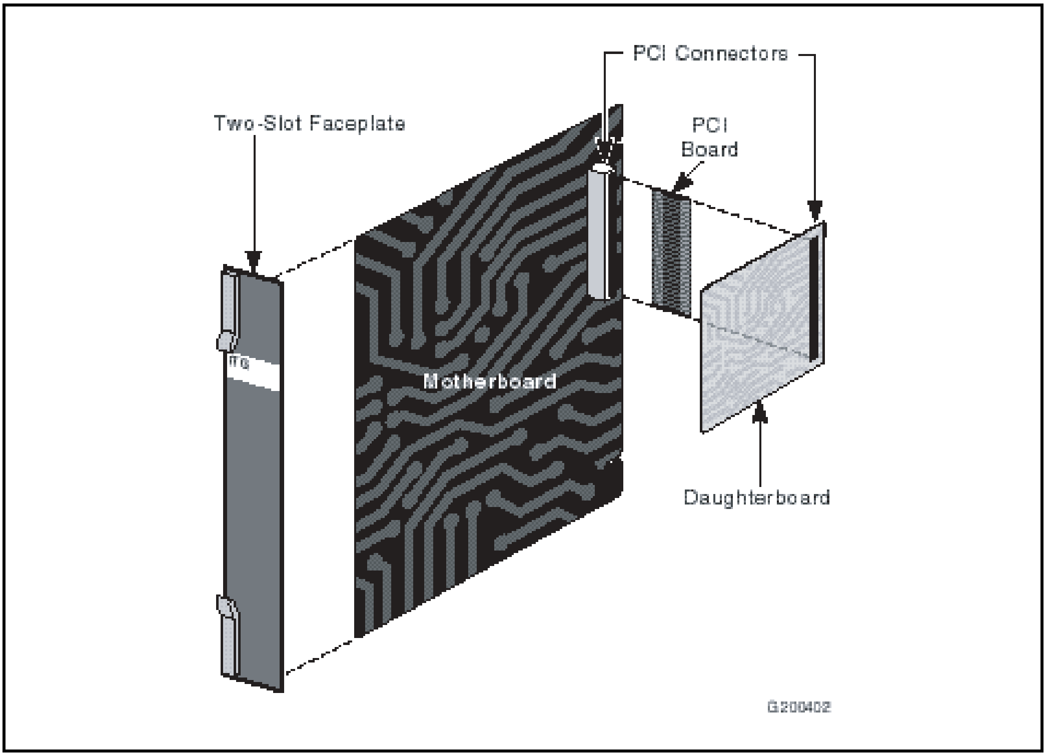
### *Card LAN*

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 page 43.

**Figure 4**
**ITG-P 24-port line card physical assembly**



## Functional description of the Voice Gateway Media Cards

The Media Card and ITG-P 24-port line cards 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 Line Terminal Proxy Server (LTPS) or "virtual line card" for the IP Phones, based on whether a Signaling Server is used in the configuration or not.

### Gateway functional description

The Gateway performs the following functions:

- registers with the system using the TN Registration messages
- accepts commands from the system to connect/disconnect audio channel
- uses Realtime Transport Protocol/Realtime Conferencing Protocol (RTP/RTCP) protocol to transport audio between the gateway and the IP Phone
- encodes/decodes audio from PCM to and from the IP Phone's format
- provides echo cancellation for the speaker on IP Phones for echoes originating in the circuit-switched voice network (not applicable to the IP Softphone 2050 or MVC 2050 as they have no handsfree capability)

### Gateway functionality on the Meridian 1

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

The Gateway portion of the card connects to the Meridian 1 through the DS-30X backplane. The Gateway portion also receives call speech-path setup and codec selection commands through the ELAN network interface. The IP Phone connects to both the Gateway and the LTPS functions through the TLAN network interface.

### Gateway functionality on the CS 1000 systems

A Signaling Server is always present in the CS 1000 systems. The LTPS executes on the 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 LTPS maintains a count of the number of IP Phones 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 IP Phone.

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.

## IP Phone registration

### IP Phone registration on a Meridian 1 system

Table 8 describes the maximum number of IP Phones that can be registered to each type of line card in a Meridian 1 system.

**Table 8**
**Maximum number of IP Phones that can register to a Voice Gateway Media Card in a Meridian 1**

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

For more information, refer to "System capacities" in *Communication Server 1000M and Meridian 1: Large System Planning and Engineering* (553-3021-120), *Communication Server 1000M and Meridian 1: Small System Planning and Engineering* (553-3011-120), and *Communication Server 1000S: Planning and Engineering* (553-3031-120).

### IP Phone registration on a CS 1000 system

On a CS 1000 system, the IP Phones register with the LTPS on the Signaling Server. If a secondary Signaling Server exists, the IP Phone registrations are split between the primary and secondary Signaling Servers to aid in load balancing. In that case, the IP Phone registrations alternate between the primary and secondary Signaling Servers.

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

**IMPORTANT!**

Each Signaling Server supports the registration of up to 5000 IP Phones.

For more information on Signaling Server failure and redundancy, see *Communication Server 1000S: Planning and Engineering* (553-3031-120), *Communication Server 1000E: Planning and Engineering* (553-3041-120), 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 IP Phones
- manages all the IP Phones between the applications and the UNIStim messaging to the IP Phone
- maintains context-sensitive states of the IP Phone (for example, display or lamp state)
- isolates IP Phone-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 IP Phones

The following information describes the process by which an IP Phone registers and unregisters with a Meridian 1 or CS 1000 system.

## Registration

Table 9 describes the registration process.

**Table 9**
**Registration process**

| Step | Description |
|---|---|
| 1 | The IP Phone receives the IP address of the Connect Server (co-located with the LTPS) through either DHCP or manual configuration. |
| 2 | The IP Phone contacts the Connect Server. |
| 3 | The Connect Server instructs the IP Phone 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 IP Phone to the Node Master. |
| 5 | The IP Phone contacts the Node Master. The Node Master redirects the IP Phone to the LTPS. |
| 6 | The IP Phone contacts the LTPS. |
| 7 | If the IP Phone is valid, the LTPS registers it with the system. |

## Unregistration

Table 10 describes the unregistration process.

**Table 10**
**Unregistration process**

| Step | Description |
|---|---|
| 1 | If the LTPS detects a loss of connection with one of its registered IP Phones, it logs the event. |
| 2 | The LTPS then sends an unregister message to the system for that IP Phone. |

## Signaling and messaging

The IP Line 4.0 application sends Scan and Signaling Distribution (SSD) messages to the Call Server through the system's ELAN subnet. When tone service is provided, the service is signaled to the LTPS using new SSD messages sent through the ELAN subnet.

## Signaling protocols

The signaling protocol between the IP Phone 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:

- signaling between the Call Server and the Voice Gateway Media Cards
- signaling between the IP Telephony node and the IP Phones

#### *Description*

Signaling messages between the Voice Gateway Media Card and IP Phones 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 IP Phone.

UNIStim is the stimulus-based protocol used for communication between an IP Phone and an LTPS on the Voice Gateway Media Card or Signaling Server.

## ELAN TCP transport

Although TCP is used for the signaling protocol between the 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 Call Server and the Voice Gateway Media Card.

There is no change to UNIStim signaling. IP Phones 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 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 CS 1000 and Meridian 1 CPUs. TCP transports messages, while RUDP establishes and maintains the link.

If the version does not satisfy the minimum supported version (CS 1000 Release 4.0), 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 IP Phone, such as key layout and class of service, without requiring the IP Phone to be dedicated (hard-wired) to a given TN on the Voice Gateway Media Card.

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

To create an IP Phone using VTNs, create a virtual superloop in LD 97.

- Up to 1024 VTNs can be configured on a single virtual superloop for Large Systems, CS 1000M Cabinet and CS 1000M Chassis systems, and CS 1000E 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 CS 1000S systems. Table 11 describes the virtual superloop and virtual card mapping on a CS 1000S system. Each superloop has two ranges of cards.

**Table 11**
**Virtual superloop/virtual card mapping for CS 1000S**

| 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 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 an IP Phone, such as key layout and class of service, without requiring a physical IP Phone to be directly connected to the Call Server.

The concentration of IP Phones 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-IP Phone 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 IP Phones (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 IP Phone (virtual TNs)- to-IP Phone calls.

# Licenses

CS 1000 Release 4.0 introduces the Basic IP User License**,** a new License for the IP Phone 2001. The existing IP User License is used for the IP Phone 2002, IP Phone 2004, IP Softphone 2050 and the Mobile Voice Client (MVC) 2050.

> ***Note:*** If insufficient Basic IP User Licenses are available for the IP Phone 2001, then the IP User License can also be used for configuration of the IP Phone 2001.

If there are no Basic IP User Licenses available for IP Phone 2001 configuration and IP User Licenses are used, then an error message is generated.

> "**SCH1976**: Basic IP User License counter has reached its maximum value. IP User License was used to configure <data> basic IP Phone(s) type 2001. Action: (Recommended) Purchase additional Basic IP User Licenses for IP Phones type 2001, instead of using higher-priced IP User Licenses."

Each time an IP Phone is configured, the system TN ISM counter is decremented.

Customers must purchase one License for each IP Phone installed on CS 1000 and Meridian 1 systems. A new License uses the existing keycode to enable the IP Phone in the system software. The default is zero.

To expand the License limits for the IP Phones, order and install a new Meridian 1 or CS 1000 keycode. Refer to the Incremental Software Management feature module in the *Features and Services* (553-3001-306) NTP.

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

## License limits

The total number of TNs configured with Basic IP User Licenses must not exceed 32767. The total number of TNs configured with IP User Licenses must not exceed 32767. The total number of IP phones configured within the system must not exceed the allowed system capacity limit controlled by customer keycodes).

# Zones

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 IP Phones 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 page 118)

- Zones and Virtual Trunks (see *IP Trunk: Description, Installation, and Operation* (553-3001-363))
- Zones and branch office locations (see *Branch Office: Installation and Configuration* (553-3001-214))

# Administration

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

- the IP Line 4.0 application GUI provided by OTM 2.2
- 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 Signaling Server

## IP Line 4.0 application in OTM 2.2

For Meridian 1 systems, OTM 2.2 is required for IP Line 4.0. OTM 2.2 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 CS 1000 systems. Element Manager's web interface enables IP Line 4.0 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 Media Gateway 1000B.

## Description

Element Manager is a simple and user-friendly web-based interface that supports a broad range of system management tasks, including:

- configuration and maintenance of IP Peer and IP telephony features
- configuration and maintenance of traditional routes and trunks
- configuration and maintenance of numbering plans
- configuration of Call Server data blocks (such as configuration data, customer data, Common Equipment data, D-channels)
- maintenance commands, system status inquiries, backup and restore functions
- software download, patch download, patch activation

Element Manager has many features to help administrators manage systems with greater efficiency. Examples are as follows:

- Web pages provide a single point-of-access to parameters that were traditionally available through multiple overlays.
- Parameters are presented in logical groups to increase ease-of-use and speed-of-access.
- The “hide or show information” option enables administrators to see information that relates directly to the task at hand.
- Full-text descriptions of parameters and acronyms help administrators reduce configuration errors.
- Configuration screens offer pre-selected defaults, drop-down lists, checkboxes, and range values to simplify response selection.

The Element Manager web server resides on the Signaling Server and can be accessed directly through a web browser or Optivity Telephony Manager (OTM). The OTM navigator includes integrated links to each network system and their respective instances of Element Manager.

## Command Line Interface

### Definition

The Command Line Interface (CLI) provides a text-based interface to perform specific 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 network interface IP address.

**IMPORTANT!**

In the case of an IP Telephony node with no Signaling Server, the CLI must be used to configure the Leader card of the IP Telephony node. This enables OTM 2.2 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 page 585.

## Overlays

For information on the overlays, refer to *Software Input/Output: Administration* (553-3001-311).

# Features

## Contents

This section contains information on the following topics:

# Introduction

Table 12 outlines the features available for CS 1000 and Meridian 1 systems with CS 1000 Release 4.0 software.

**Table 12**
**IP Line 4.0 feature support (Part 1 of 3)**

| Feature | Meridian 1 | CS 1000M | CS 1000S |
|---|---|---|---|
| Support for Media Card | Yes | Yes | Yes |
| Support for Element Manager | No | Yes | Yes |
| Support for Signaling Server | Yes | Yes | Yes |
| Support of the following IP Phones:<br>• IP Phone 2001<br>• IP Phone 2002<br>• IP Phone 2004<br>Support of the following software clients:<br>• IP Softphone 2050<br>• Mobile Voice Client (MVC) 2050<br>Support of the IP Phone Key Expansion Module (KEM) * | Yes | Yes | Yes |
| Network Address Translation (NAT) Traversal * | No | Yes | Yes |
| Personal Directory, Callers List, and Redial List with password protection* | No | Yes | Yes |

a. Node level patching is not provided by OTM 2.2. The patching CLI command of the Media Card 32-port line card, Media Card 8-port line card, and ITG-Pentium 24-port line card can be used.
* = introduced in IP Line 4.0

**Table 12**
**IP Line 4.0 feature support (Part 2 of 3)**

| Feature | Meridian 1 | CS 1000M | CS 1000S |
|---|---|---|---|
| UNIStim File Transfer Protocol (UFTP) for IP Phone firmware downloads * | Yes | Yes | Yes |
| IP Call Recording * | Yes | Yes | Yes |
| pbxLink connection failure detection | Yes | Yes | Yes |
| LD 117 STAT SERV enhancement * | Yes | Yes | Yes |
| Dynamic Loss Plan | 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 |
| 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 |

a. Node level patching is not provided by OTM 2.2. The patching CLI command of the Media Card 32-port line card, Media Card 8-port line card, and ITG-Pentium 24-port line card can be used.
* = introduced in IP Line 4.0

**Table 12**
**IP Line 4.0 feature support (Part 3 of 3)**

| Feature | Meridian 1 | CS 1000M | CS 1000S |
|---|---|---|---|
| Watchdog Timer | Yes | Yes | Yes |
| Password Guessing Protection | Yes | Yes | Yes |
| Ringer and buzzer volume adjustment | Yes | Yes | Yes |
| Set-based installation | Yes (Small Systems only) | Yes (Small Systems only) | Yes |
| Maintenance Audit enhancement | Yes | Yes | Yes |
| Multi-language support | Yes | Yes | Yes |
| Enhanced Redundancy for IP Line nodes | | | |
| IP Softphone 2050 user-selectable codec (not applicable to MVC 2050 as it only supports G.711 codec) | Yes | yes | Yes |
| a. Node level patching is not provided by OTM 2.2. The patching CLI command of the Media Card 32-port line card, Media Card 8-port line card, and ITG-Pentium 24-port line card can be used.<br>* = introduced in IP Line 4.0 | | | |

# NAT Traversal feature

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 (router) exists between a private network and a public network. The NAT device maps private addresses to public addresses.

With the CS 1000 Release 4.0 NAT Traversal feature, several IP Phones are now supported behind a single Cone NAT router with, or without, Virtual Private Network (VPN) capabilities. This support enables large-scale deployment of Voice over Internet Protocol (VoIP) in teleworking and Small Office/Home Office (SOHO) environments.

Supported Cone NAT routers include:

- Full Cone
- Restricted Cone
- Port Restricted Cone

> ***Note:*** A Cone NAT router with more than one IP Phone connected to it must support hairpinning. Hairpinning occurs when an IP Phone behind a NAT router can send packets to the Public IP address and port of another IP Phone connected to the same NAT router.

**IMPORTANT!**

Symmetric NAT routers are not supported. If the IP Phone is behind a Symmetric NAT, IP Phone registration is unsuccessful and the IP Phone displays a “NAT Error! ITG3053” message.

## Echo Servers

NAT Traversal is a function of the CS 1000 Release 4.0 software, and not a function of the NAT router. NAT Traversal uses two Echo Servers residing on the Signaling Server. Echo Server 1 detects the presence of a NAT router, while Echo Server 2 detects the type of NAT router. Both Echo Server 1 and Echo Server 2 are required for the NAT Traversal feature to function properly.

If a compatible NAT router is detected, successful IP Phone registration occurs and the software invokes the NAT Mapping Keep Alive function to prevent loss of the IP connection. If a non-compatible NAT is detected, an error is displayed on the IP Phone’s display and the IP Phone is not allowed to register.

## Mapping

When an IP Phone is used in a private network behind a NAT device, the NAT router strips the IP Phone's private IP address and private port number and assigns it a public IP address and public port number.

To support multiple IP Phones behind one NAT device, it is necessary for NAT to map between public and private IP addresses, and ports for each IP Phone behind it. There is a mapping for both a signaling port and a media (voice) port.

Placing an IP Phone behind Multiple NAT devices is an unsupported configuration. If it is necessary to have a configuration with multiple NATs between the IP Phone 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 IP Phone from the LTPS. The LTPS is only aware of any IP Phone based on the public IP address and port of the signaling messages. A signaling message originates from the IP Phone on the private side from port 5000. That signaling message is then mapped from the private side to a public IP and port and that is the IP address seen by the LTPS.

Signaling messages between the Voice Gateway Media Card and IP Phones are carried by RUDP. Each RUDP connection is distinguished by its IP address and port number.

The NAT device performs private-to-public mapping for the signaling port for each IP Phone behind it to support multiple IP Phones. The TPS uses fixed port numbers for signaling. The NAT device must perform consistent private-to-public mapping for these port numbers. Table 13 lists the UDP port number used.

**Table 13**
**Signaling UDP Ports**

| UDP Port | Device | Use |
|---|---|---|
| 5000 | IP Phone | incoming signaling messages to the IP Phones, including UFTP messaging |
| 5100 | LTPS | incoming call processing messages to the LTPS |
| 5105 | UFTP | incoming UFTP packets to the UFTP server |
| 4100 | LTPS | incoming registration message to Connect Server |
| 7300 | LTPS | 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.

Do not change this port at any time. Map this port to port 5200 on the IP Phones.

**Table 14**
**IP Line UDP Ports**

| UDP Port | Device | Use |
|---|---|---|
| 5200-5262 | Media Card | RTP packets<br>(configurable starting port number –<br>IP Phone's port matches it) |
| 5201-5263 | Media Card | RTCP packets into Media Card<br>(port number is RTP port number + 1) |
| 5200-5246 | ITG-P 24-port line card | RTP packets<br>(configurable starting port number -<br>IP Phone's port matches it) |
| 5201-5247 | ITG-P 24-port line card | RTCP packets into Media Card<br>(port number is RTP port number + 1) |
| 5200 | IP Phone | RTP packets into IP Phone<br>(port matches first RTP port of the Voice Gateway Media Card) |
| 5201 | IP Phone | RTCP packets into IP Phone<br>(port matches first RTCP port of the Voice Gateway Media Card) |

## NAT Mapping Keep Alive

The normal operation of the LTPS and the IP Phone requires the LTPS to send a periodic Watchdog Reset UNIStim message. This message resets the hardware watchdog timer running on the IP Phone and specifies the period for the time-out. If the LTPS does not send the Watchdog Reset message before the watchdog timer expires, the IP Phone resets and begins a new registration cycle with the LTPS.

To avoid loss of the IP connection, CS 1000 Release 4.0 introduces NAT Mapping Keep Alive which sends the Watchdog Reset message more frequently. Default values are recommended. However, if it is necessary to increase the frequency of the Reset Watchdog message, increase the NAT Mapping Keep Alive timer value.

NAT Traversal can be configured to provision the length of time the audio and signaling port mapping is refreshed. This configuration can be done in Element Manager, on the Call Server in LD 117, or in OTM through a window to the Call Server.

By default, all IP Phones behind a NAT device have the signaling and audio path kept alive. The default value is 30 seconds. The value can be decreased to 20 seconds or increased to 600 seconds.

## Mute and Hold considerations

IP Line 4.0 must handle two special situations when interworking with NAT: Mute and Hold.

### Mute

Table 15 describes the Mute process.

**Table 15**
**Mute process (Part 1 of 2)**

| | Description |
|---|---|
| Problem | |
| 1 | When a user enables Mute, the LTPS sends a Mute Transmit (Tx) command to the IP Phone. That command forces the IP Phone to generate silence in the transmit direction. |
| 2 | If the IP Phone is using an evocator that implements silence suppression, for example G.729AB, the IP Phone sends one silence frame to the far end, and then stops sending any further frames until Mute is cancelled. |
| 3 | Data sent from the IP Phone stops. |

**Table 15**
**Mute process (Part 2 of 2)**

| | **Description** |
|---|---|
| 4 | The NAT device sees that the IP Phone's UDP connection is not active in the transmit direction and starts aging the translation. |
| 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 time-out 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 IP Phone 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 IP Phone 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 IP Phone periodically sends an extra non-RTP packet to the far end to keep the NAT translation alive, ensuring that the NAT's session time-out 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 (IP Phone or gateway channel. |

### Hold

The Hold function differs from the Mute function as Hold does not cause problems with the audio stream. Table 16 describes the Hold process.

**Table 16**
**Hold process**

| | Description |
|---|---|
| 1 | When an IP Phone user places a call on Hold, the audio stream in both the Transmit (Tx) and Receive (Rx) directions closes. |
| 2 | The NAT device begins aging the translation.<br>When the audio stream is closed and no voice path is present, the IP Phone defaults to sending periodic non-RTP packets to keep the NAT translation alive. Therefore, when a call is put on Hold, the IP Phone defaults to sending these non-RTP packets |
| 3 | When the call is retrieved from Hold, a new set of open audio-stream messages are issued by the LTPS and new connections are established reusing the same NAT translation |

## NAT and VLANs

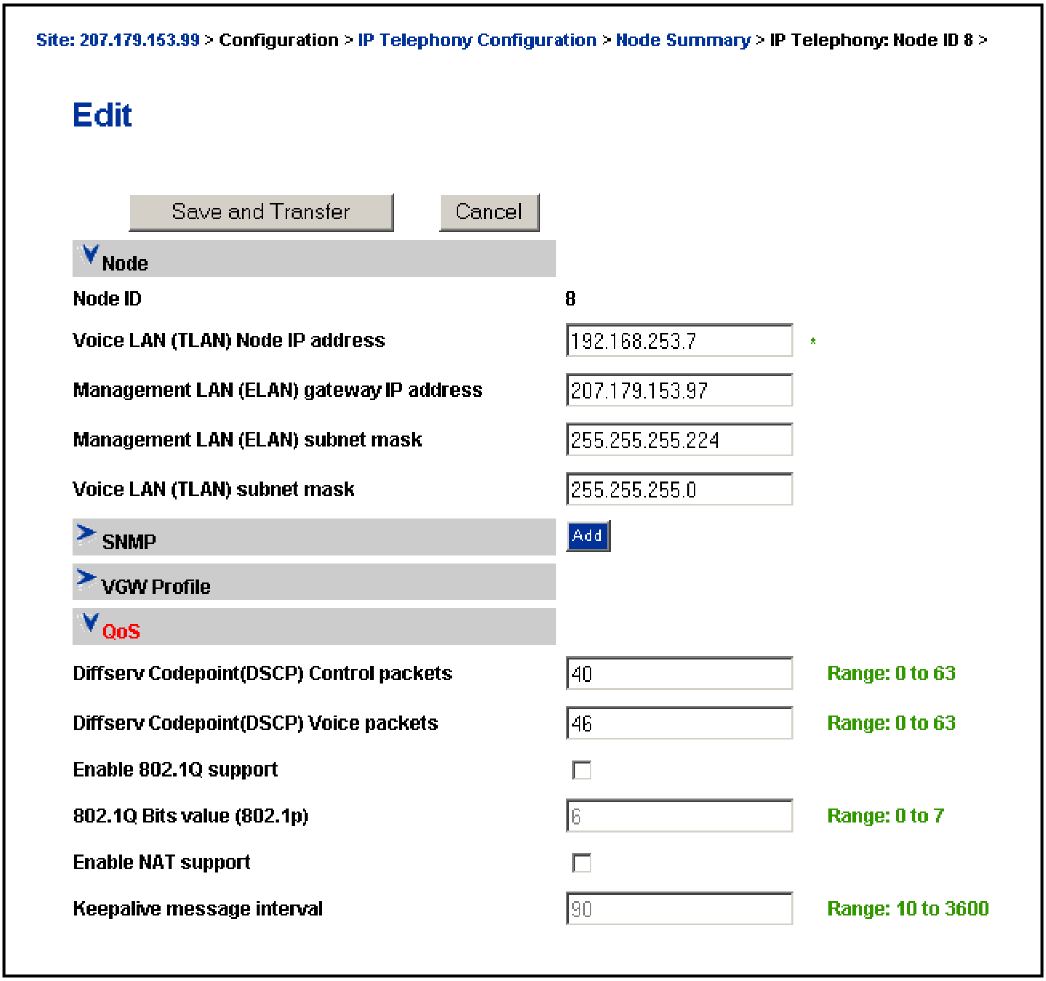
Support of Virtual LANs (VLANs) is entirely dependent on the Layer 2 switch to which the IP Phone is immediately connected. Users behind a NAT router may find that the configuration of a VLAN ID is unsupported by their NAT router. Refer to the documentation of the NAT router to determine if a VLAN ID is supported.

Users who attempt to use an IP Phone with VLAN enabled on a NAT router that does not support VLANs cannot connect to the CS 1000 system. If DHCP is used, the IP Phone cannot even obtain an IP address.

> *Note:* Most NAT routers do not support 802.1Q Tagging. If 802.1Q Tagging is not supported on the NAT device, the checkbox **Enable 802.1Q support** in Element Manager’s Node Summary Page under the “QoS” Section must be left unchecked. If 802.1Q Tagging is enabled for

IP Phones behind NAT, the IP Phones are able to send the initial "Resume Connection" message, but then the IP Phones reset and no call path is established.

**Figure 5**
**802.1Q Tagging on Node Summary page in Element Manager**



Site: 207.179.153.99 > Configuration > IP Telephony Configuration > Node Summary > IP Telephony: Node ID 8 >

Edit

Node

| | | |
|---|---|---|
| Node ID | 8 | |
| Voice LAN (TLAN) Node IP address | 192.168.253.7 | * |
| Management LAN (ELAN) gateway IP address | 207.179.153.97 | |
| Management LAN (ELAN) subnet mask | 255.255.255.224 | |
| Voice LAN (TLAN) subnet mask | 255.255.255.0 | |

SNMP

VGW Profile

QoS

| | | |
|---|---|---|
| Diffserv Codepoint(DSCP) Control packets | 40 | Range: 0 to 63 |
| Diffserv Codepoint(DSCP) Voice packets | 46 | Range: 0 to 63 |
| Enable 802.1Q support | □ | |
| 802.1Q Bits value (802.1p) | 6 | Range: 0 to 7 |
| Enable NAT support | □ | |
| Keepalive message interval | 90 | Range: 10 to 3600 |

## NAT Traversal and Proactive Voice Quality Management

IP Line 4.0 introduces Proactive Voice Quality Management.

Real-Time Control Protocol (RTCP) signaling provides statistics (for example, latency, packet loss, and jitter) about the Real-Time Transfer Protocol (RTP) stream. For the RTCP signaling to be successful, the PUBLIC RTCP port number must be the RTP port number + 1. For example, if the PUBLIC RTP port is 12000, then the PUBLIC RTCP port must be 12001.

The NAT router typically assigns the RTCP port number as RTP port number + 1.However, the NAT router is not guaranteed to properly assign the RTCP port number. When the RTCP port number is not properly assigned, the RTCP message exchange fails and the Proactive Voice Quality Management feature does not receive the required RTCP data. A message is printed to the LTPS console and syslog file and an SNMP trap (ITG3054) is generated.

The NAT Traversal feature attempts a “best effort” approach to initiate the NAT router to properly assign the RTPC port number. The “best effort” approach is dependent on the NAT router’s implementation, may vary from NAT router to NAT router, and cannot be guaranteed by the NAT Traversal feature.

## Configuring NAT Traversal in Element Manager

To configure and print the Echo Servers IP addresses/port numbers and NAT Keep Alive time-out setting using Element Manager, select **Configuration > IP Telephony > Network Address Translation Parameters**.

## Configuring NAT Traversal in LD 117

Commands have been added to LD 117 to configure and print the Echo Servers IP addresses/port numbers and NAT Keep Alive time-out setting.

No configuration is required for the Echo Servers to work. The default IP address of 0.0.0.0 means that Echo Server 1 uses the TLAN network interface IP address. The default IP address of 0.0.0.0 means that Echo Server 2 uses the Node IP address.

*Note:* An IP address of 0.0.0.0 means the default local Echo Server will be enabled.

**IMPORTANT!**

The NAT Traversal feature is essentially automatic. Changing the IP addresses or ports should only be done in exceptional cases when an Echo Server external to the CS 1000 system is used.

If IP addresses are specified, they must be for servers external to the system. The IP addresses cannot be the same. Duplicate IP addresses can only be used if the default of 0.0.0.0 is used. If the IP addresses are the same (and not 0.0.0.0), an error message is generated and the input is not accepted.

**Table 17**
**LD 117 commands for NAT (Part 1 of 2)**

| Command | Description |
|---|---|
| CHG ES1 <Echo Server 1 IP Address> <Echo Server 1 Port> | Change Echo Server 1's IP address and port number, where:<br>• Default Echo Server 1 IP Address = 0.0.0.0<br>• Default Echo Server 1 Port number = 10000<br>***Note:*** Echo Server 1 default IP address uses the TLAN IP address of the LTPS. |
| CHG ES2 <Echo Server IP Address> <Echo Server Port> | Change the Echo Server 2 IP address and port number, where:<br>• Default Echo Server 2 IP Address = 0.0.0.0<br>• Default Echo Server 2 Port number = 10000<br>***Note:*** Echo Server 2 default IP address uses the<br>node IP address on the node's master card. |
| PRT ES1 | Print Echo Server 1's IP address and port number. |
| PRT ES2 | Print Echo Server 2's IP address and port number. |
| PRT ESS | Print both Echo Servers IP addresses and port numbers. |

**Table 17**
**LD 117 commands for NAT (Part 2 of 2)**

| Command | Description |
|---|---|
| CHG NKT <time-out setting> | Change NAT Mapping Keep Alive Time-out setting of port mapping for devices behind a NAT router, where:<br>time out setting = 20-(30)-600 seconds |
| PRT NKT | Print NAT Mapping Keep Alive Time-out setting of port mapping for devices behind a NAT router. |

### CHG ES1/CHG ES2

If the IP addresses entered for ES1 and ES2 are the same and both are not 0.0.0.0 or for external servers, an error message is generated and the input is not accepted. Any value between 1000 and 60000 can be entered for the port. If the port value is outside of that range, an error message is generated. Just the port (and not the IP addresses) can also be configured. This is accomplished by entering data similar to the following:

```
=>chg es1 0 5400
```

The value 0 for the IP address is interpreted as: 0.0.0.0. This means the Echo Server runs locally using the configured port value.

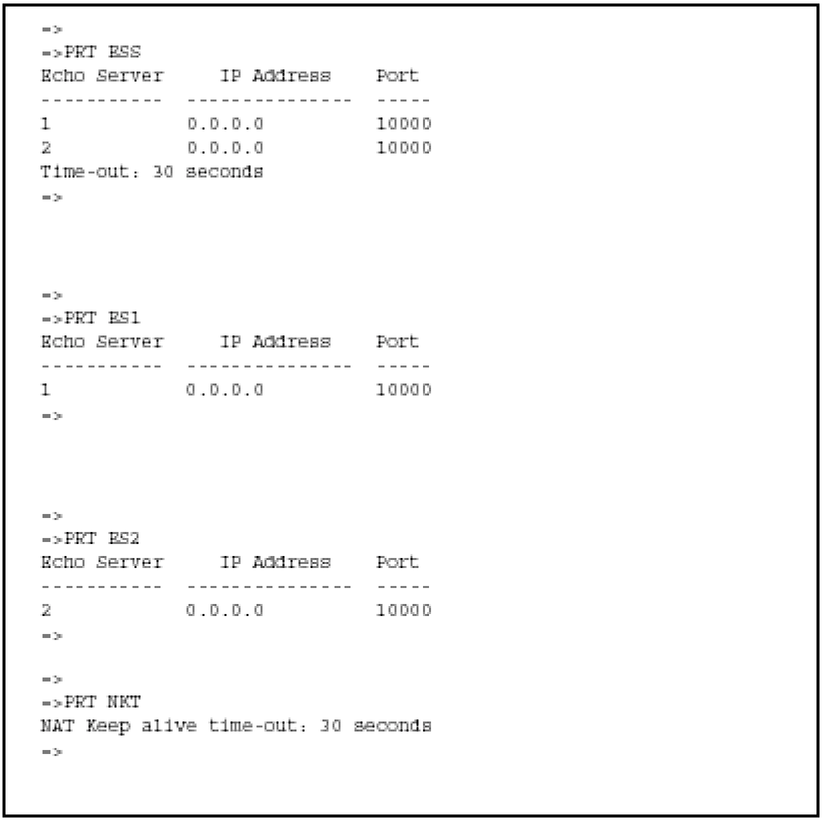
The port values both default to 10000. If an IP address is configured, it is also necessary to configure the port. An error message is generated if no port is configured but an IP address is configured.

If both Echo Servers are not configured then the LTPS on the Signaling Server or the Voice Gateway Media Card uses two local instances of the Echo Server. If both Echo Servers are configured, then the LTPS uses the external Echo Servers. If an external Echo Server fails, that functionality is lost unless the external Echo Server implements a transparent redundancy scheme. The external Echo Server is responsible for its redundancy and reliability.

### PRT commands

Figure 6 is an example of the output of the PRT commands when the defaults are used. If other IP addresses or port numbers have been configured, then these appear in place of the 0.0.0.0 or 10000 in the examples in Figure 6.

**Figure 6**
**PRT commands output**



```
->
->PRT ESS
Echo Server     IP Address    Port
-----------  --------------  -----
1            0.0.0.0         10000
2            0.0.0.0         10000
Time-out: 30 seconds
->



->
->PRT ES1
Echo Server     IP Address    Port
-----------  --------------  -----
1            0.0.0.0         10000
->



->
->PRT ES2
Echo Server     IP Address    Port
-----------  --------------  -----
2            0.0.0.0         10000
->

->
->PRT NKT
NAT Keep alive time-out: 30 seconds
->
```

## CLI commands

The following CLI commands provide information about IP Phones behind a NAT device and the Echo Servers

### isetShow

When the isetShow command is used, a NAT column lists the NAT type if an IP Phone is behind a NAT, where:

- C – Cone NAT
- S – Symmetric NAT
- U – Unknown. Behind a NAT of unknown type (response received from only Echo Server 1).
- P – Pending. Waiting for response from the IP Phone or the IP Phone never received a response from Echo Server 1.
- . . - Blank space. Indicates the IP Phone is not behind any kind of NAT (normal case).

For example (partial output from the left side of the screen):

```
IP Address    NAT  Type  RegType
47.11.215.183     i2001 Regular
47.11.179.168  C  i2004 Regular
47.11.179.167   C   i2004 Regular
```

### isetReset

The **isetReset** command resets an IP Phone based on the entered IP address or TN. The IP address must be the Public IP address for IP Phones behind a NAT. If the entered IP address identifies an IP Phone that is behind a NAT and no other IP Phone are sharing the address, then the IP Phone is reset.

However, if the entered IP address identifies multiple IP Phones (multiple IP Phones behind a NAT sharing the same public IP address), then an error message is printed. This message indicates there is more than one IP Phone with the IP address, lists the IP Phones and their TNs, and recommends using the **isetReset** TN command.

For example:

```
oam> isetReset “47.11.217.102”
```

```
WARNING: There are 2 IP Phones that use the public IP
address of 47.11.217.102 Please reset the IP Phone using
the TN: isetReset "TN".
```

The number of IP Phones that share the same public IP address is printed.

> ***Note:*** Commands such as **isetScpwQuery**, **isetScpwModify**, and **isetScpwVerify** have the same error handling as **isetReset**. If an IP address is entered that multiple IP Phones are using, an error message prints. For example,

```
WARNING: There are 2 IP Phones that use the public IP
address of 47.11.217.102.
```

### isetGet

The **isetGet** command can search on the NAT type.

NAT = xxx where x is:

- C – the IP Phone is behind a Cone NAT
- S – the IP Phone is behind a Symmetric NAT
- U – the IP Phone is behind a NAT of unknown type (response only received from Echo Server 1)
- P - waiting on a response from the IP Phone or the IP Phone never received a response from Echo Server 1
- . . - Blank space: the IP Phone is not behind any kind of NAT (normal case)
- Y - true when an IP Phone's NAT is C, S or U
- N - true when an IP Phone's NAT is . . (blank), meaning no NAT detected

For example:

```
IPL> isetGet “NAT == Y”
```

returns the output (partial output from the left side of the screen):

```
IP Address   NAT Type RegType State Up Time
47.11.179.168 C i2004 Regular online 0 04:20:34
47.11.179.167  C i2004 Regular online 0 03:48:17
```

### isetNATShow

IP Line 4.0 introduces the **isetNATShow** command. This command outputs information about IP Phones behind a NAT device.

The public and private IP address and ports are provided for both signaling and media.

In most cases, the private signaling port information is available. If the firmware on the IP Phone is outdated, the private signaling port information is not printed.

If the IP Phone is found to be behind a Symmetric NAT device, the media IP information is not printed out.

The following is an example of output for a Symmetric NAT device.

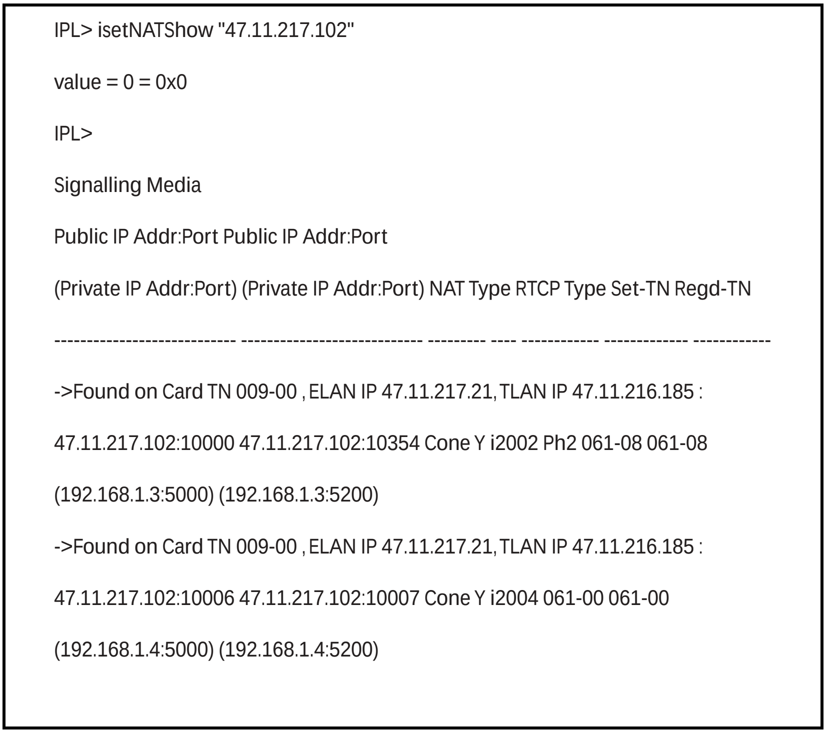
```
Signalling                  Media

Public IP Addr:Port        Public IP Addr:Port

(Private IP Addr:Port)    (Private IP Addr:Port) NAT Type RTCP
Type Set-TN Regd-TN

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

47.11.217.102:10000 <<No Speech Possible>> Symmetric Y i2002 Ph2
061-08 061-08

(192.168.1.3:5000)
```

The type of NAT is indicated, as detected by Echo Server 2. The support of RTCP signaling is indicated by Y; if N is displayed, then features that depend on RTCP, such as Proactive Voice Quality Management (PVQM), will not work.

An IP Phone's  TN or public signaling IP address can be entered after the command. Entering the **isetNATShow** command at the CLI of any card in an IP Telephony Node along with the TN or IP address of a particular IP Phone displays the information shown in the previous example, as well as the identification of the card with which the IP Phone is registered. This is useful when it is necessary to identify the card on which to enable a message monitor, or to connect a sniffer, when debugging a specific IP Phone's problem.

Figure 7 on page 78 shows a sample output.

**Figure 7**
**isetNATShow sample output**



```
IPL> isetNATShow "47.11.217.102"

value = 0 = 0x0

IPL>

Signalling Media

Public IP Addr:Port Public IP Addr:Port

(Private IP Addr:Port) (Private IP Addr:Port) NAT Type RTCP Type Set-TN Regd-TN

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

->Found on Card TN 009-00 , ELAN IP 47.11.217.21, TLAN IP 47.11.216.185 :

47.11.217.102:10000 47.11.217.102:10354 Cone Y i2002 Ph2 061-08 061-08

(192.168.1.3:5000) (192.168.1.3:5200)

->Found on Card TN 009-00 , ELAN IP 47.11.217.21, TLAN IP 47.11.216.185 :

47.11.217.102:10006 47.11.217.102:10007 Cone Y i2004 061-00 061-00

(192.168.1.4:5000) (192.168.1.4:5200)
```

The command “isetShow” and “isetNATShow” can display the information about an IP Phone based on IP or TN. The “IP” is the Public IP address used for signaling. If “isetShow” or “isetNATShow” is typed with a Public IP address used by multiple IP Phones, then all those IP Phones are displayed, even if the IP Phones are registered to different cards. Therefore, the “isetShow” and “isetNATShow” now display the information similar to the following example:

```
Signaling....
Public...
(Private...
----
->Found on Card TN 009-00, ELAN IP....
47.11.217.102....
```

Notice how the “Found on” line is below the title, and is displayed before every IP Phone.

> ***Note:*** If a PVQM command is entered with an IP address that multiple IP Phones are using, then an error message is also printed.

```
WARNING: There are 2 IP Phones that use the public IP
address of 47.11.217.102
```

These PVQM commands include:

- RTPStatShow
- RTPTraceShow
- RTPTraceStop
- rPing
- rPingStop
- rTraceRoute
- rTraceRouteStop
- eStatShow
- RUDPStatShow
- isetInfoShow

### echoServerShow

The **echoServerShow** command provides both configuration information about the Echo Servers and information about interactions with the Echo Servers for the IP Phones on a specific LTPS. Use this command on an LTPS card to investigate a problem with an IP Phone registered to that LTPS card. This is a per-card command that provides information on the Echo Servers from the viewpoint of the LTPS on the card where the command is entered.

The command has one optional parameter, “action”; the only valid value is 99. When **echoServerShow 99** is entered, the counter values are reset after they are displayed. When just **echoServerShow** is entered, the counter values are displayed without being reset.

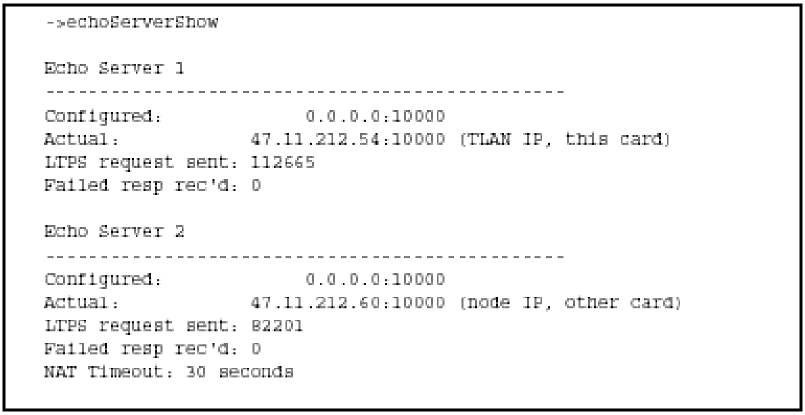
The output for each Echo Server displays the following information:

- Configured – the IP address: port configured for this Echo Server in LD 117
- Actual – the IP address: port used for this Echo Server, followed by an explanation in parenthesis. This is different from the "Configured" parameter only when the default address (0.0.0.0) has been configured. The explanation in parenthesis is one of the following:
  - (TLAN IP, this card) – the IP address used is the TLAN network interface of this card; the Echo Server is active on this card.
  - (node IP, this card) – the IP address used is the Node IP address; the Echo Server is active on this card because it is the node master.
  - (node IP, other card) – the IP address used is the Node IP address, but anther card is currently the Node master; the Echo Server is not active on this card.
  - (not this card) – the IP address is not this card's TLAN IP address or the Node's IP address; the Echo Server is not active on this card.
- LTPS request sent – the number of **Resolve Port Mapping Request** messages sent from the LTPS to IP Phones, with this Echo Server identified as the one to contact.
- Failed resp rec.d – the number of **Resolve Port Mapping Ack** messages received from the IP Phones that had the public IP address and port configured as 0.0.0.0:0000. Each increment of this counter indicates an IP Phone never received the **Discover Port Mapping Ack** response from the Echo Server (all 10 attempts failed).

The two peg counts give an indication of the interaction this LTPS is having with the Echo Server. It is not a direct sign of the health of the Echo Server; network conditions for IP Phones registered to this LTPS may be preventing communication with this Echo Server while another LTPS's IP Phones have no problem. The **echoServerShow** command helps understand why a particular IP Phone registered to a LTPS may be having difficulties or to uncover patterns of communication problems between IP Phones and Echo Servers.

A sample output is shown in Figure 8 on page 81.

**Figure 8**
**echoServerShow sample output**

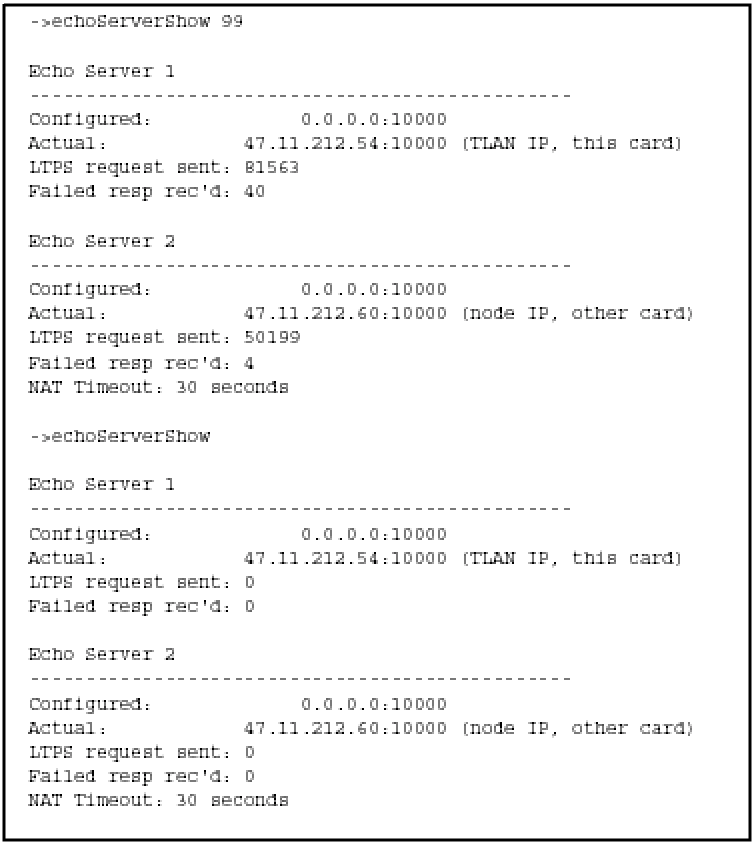


```
->echoServerShow

Echo Server 1
------------------------------------------------
Configured:             0.0.0.0:10000
Actual:            47.11.212.54:10000 (TLAN IP, this card)
LTPS request sent: 112665
Failed resp rec'd: 0

Echo Server 2
------------------------------------------------
Configured:             0.0.0.0:10000
Actual:            47.11.212.60:10000 (node IP, other card)
LTPS request sent: 82201
Failed resp rec'd: 0
NAT Timeout: 30 seconds
```

When the **echoServerShow** command with the reset parameter 99 is entered, the counter values are displayed and then reset. If the **echoServerShow** command is entered again and no requests have since been sent, the counter values are displayed as 0.

A sample output is shown in Figure 9 on page 82.

**Figure 9**
**echoServerShow 99 sample output**



```
->echoServerShow 99

Echo Server 1
------------------------------------------------
Configured:             0.0.0.0:10000
Actual:            47.11.212.54:10000 (TLAN IP, this card)
LTPS request sent: 81563
Failed resp rec'd: 40

Echo Server 2
------------------------------------------------
Configured:             0.0.0.0:10000
Actual:            47.11.212.60:10000 (node IP, other card)
LTPS request sent: 50199
Failed resp rec'd: 4
NAT Timeout: 30 seconds

->echoServerShow

Echo Server 1
------------------------------------------------
Configured:             0.0.0.0:10000
Actual:            47.11.212.54:10000 (TLAN IP, this card)
LTPS request sent: 0
Failed resp rec'd: 0

Echo Server 2
------------------------------------------------
Configured:             0.0.0.0:10000
Actual:            47.11.212.60:10000 (node IP, other card)
LTPS request sent: 0
Failed resp rec'd: 0
NAT Timeout: 30 seconds
```

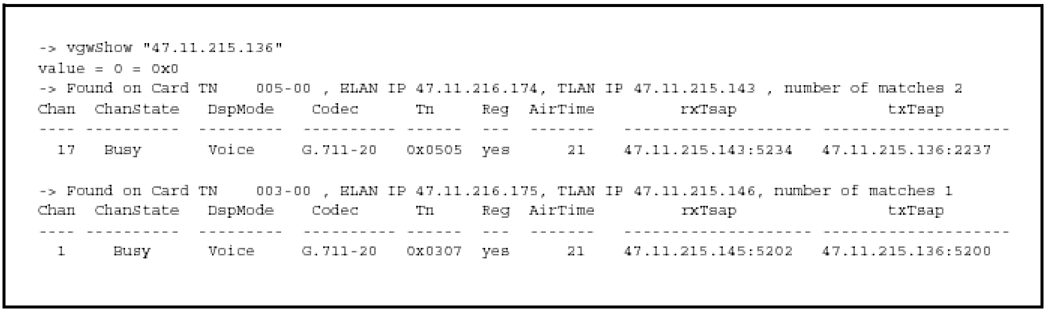
## vgwShow

The **vgwShow** command has been modified to allow the optional entry of an IP Phone’s IP address and port. A search is made of all the Voice Gateway Media Cards in the node to find the IP Phone’s IP address and port. With the introduction of NAT Traversal, more than one IP Phone may map to a single IP address. The command input is modified to allow the entry of the public port number for a specific IP Phone.

**vgwShow <“IPAddr”>, <port>**

If no port number is entered, the first entry found with the specified IP address on a Voice Gateway Media Card is returned. An example is shown in Figure 10.

**Figure 10**
**vgwShow with IP address command output**



```
-> vgwShow "47.11.215.136"
value = 0 = 0x0
-> Found on Card TN    005-00 , ELAN IP 47.11.216.174, TLAN IP 47.11.215.143 , number of matches 2
Chan  ChanState   DspMode    Codec      Tn      Reg  AirTime         rxTsap               txTsap
---- ----------  ---------  ---------- ------   ---  -------   ------------------- -------------------
  17   Busy       Voice     G.711-20   0x0505  yes      21    47.11.215.143:5234   47.11.215.136:2237

-> Found on Card TN    003-00 , ELAN IP 47.11.216.175, TLAN IP 47.11.215.146, number of matches 1
Chan  ChanState   DspMode    Codec      Tn      Reg  AirTime         rxTsap               txTsap
---- ----------  ---------  ---------- ------   ---  -------   ------------------- -------------------
  1     Busy      Voice     G.711-20   0x0307  yes      21    47.11.215.145:5202   47.11.215.136:5200
```

When the IP address is found in the list of VGW channels for a card other than where the command was entered, the VGW channel information for the first occurrence is returned, plus a count of the number of times the IP address occurs in that card's list. Multiple instances can occur when the customer's network is configured so that multiple IP Phones are behind a NAT device sharing the NAT device's public IP address.

If there is more than one match, the administrator can log into that specific card and enter the **vgwShow** command without entering an IP address and port number. That will print all the busy channels on the card. To quickly find a particular IP Phone, use the IPDN or DNIP commands in LD 117 to obtain the IP Phone's media stream public IP address and port number; then enter the public IP address and port number as parameters for the **vgwShow** command.

## Firmware download using UNIStim FTP

Previously, IP Phones on CS 1000 and Meridian 1 systems downloaded their firmware using Trivial File Transfer Protocol (TFTP). Firewalls often have their well-known TFTP port (port 69) disabled to maintain security. When port 69 is blocked, IP Phones cannot obtain firmware downloads. This situation prevents the IP Phone from registering and coming into service.

In order to eliminate the file transfer problem with the firewalls and TFTP, CS 1000 Release 4.0 implements a UNIStim File Transfer Protocol (UFTP) download solution.

UFTP enhances security, because it is a proprietary protocol, as opposed to TFTP which is an open protocol. It enables customers to improve their firewall security by closing port 69 to block TFPT in their firewall and policy-based switches and routers.

**IMPORTANT!**

For the UFTP IP Phone firmware download to work, it is necessary to explicitly open port 5100 (UNIStim signaling) and port 5105 (UFTP signaling).

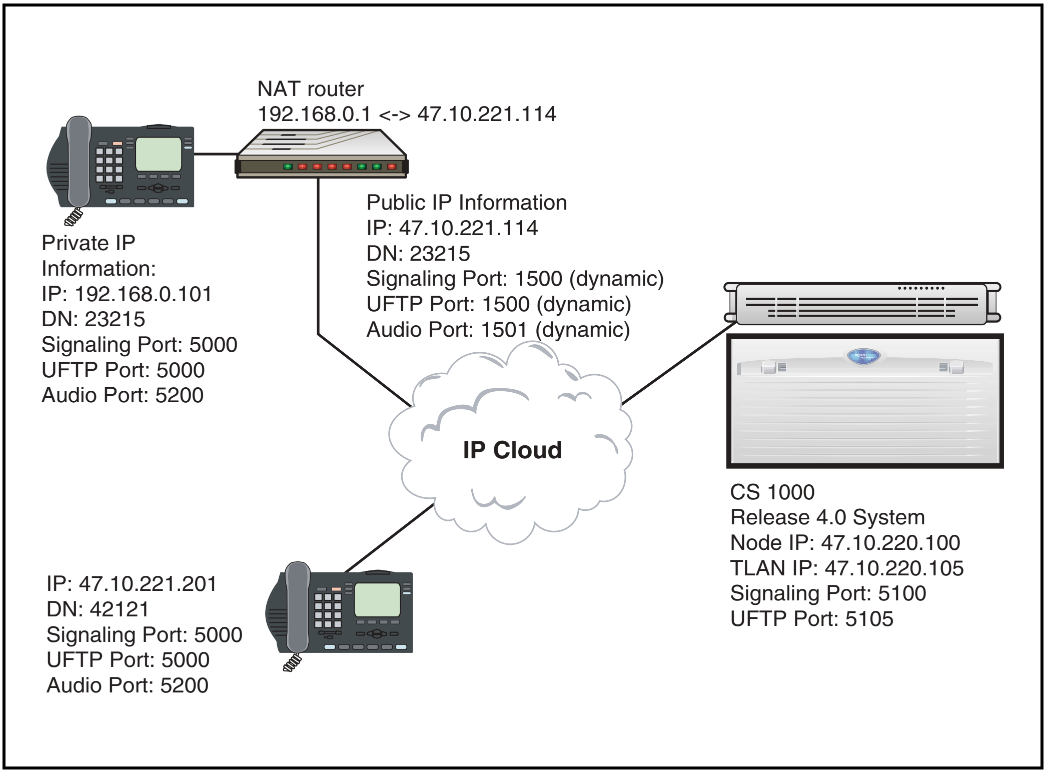
If a network firewall is in use, ports 5100 (UNIStim signaling) and 5105 (UFTP signaling) must be explicitly opened in the IP Phone-to-UFTP server direction. Opening these ports enables UNIStim and UFTP firmware download messages to travel through the firewall. Both of these ports can be safety enabled by firewalls. See Table 18.

**Table 18**
**Source/destination port usage on either side of the connection**

| Port | IP Phone signaling | IP Phone UFTP | UFTP Server |
|---|---|---|---|
| Source port | 5000 (see note) | 5000 (see note) | 5105 |
| Destination port | 5100 | 5105 | 5000 (see note) |

*Note:* The UFTP firmware download is compatible with the NAT Traversal feature. If the IP Phone is behind a Network Address Translation (NAT) device, then a different public signaling port is used. The public signaling port is assigned dynamically. See Figure 11 on page 85.

**Figure 11**
**Using NAT with UFTP**



Two Download log files log the results of the UFTP firmware downloads: “uftplog0.txt” and “uftplog1.txt”. One file is active and one file is inactive. When a file is full, it becomes the inactive file, and the other file is written to. The active file displays the most recent entries.

On Voice Gateway Media Cards, the log files are located in the /C:/LOG directory. The Download log files are limited to 10K each for a total of 20K. Approximately 128 log messages can be saved in each log file.

On the Signaling Server, the log files are located in the /U/LOG directory. The Download log files are limited to 400K each, for a total of 800K. Approximately 5000 log messages can be saved in each log file.

The Download log files are generated during initialization of the UFTP Server task. If the Download log files do not exist during the start-up of the UFTP Server task, new Download log files are created.

The Download log file is a circular file, writing over the oldest information when the log file is full. Each log file entry contains the following download information about the IP Phone:

- F/W download date
- F/W download start time
- F/W download status (specifies if the download succeeded or failed)
- IP Address of the IP Phone
- IP Phone type
- • F/W download error code. If the F/W download was successful, this field is empty. The following is the list of all possible error codes:
  - 00 = F/W not exist
  - 01 = F/W size is 0
  - 02 = F/W corrupted
  - 03 = RUDP connection down
  - 04 = Response time out
  - 05 = Reason: Unknown

The format of the download log message is:

<Date> <Download start time> <Download Status> <IP address of the IP Phone> < IP Phone type> <Error Code>

The following is an example of the Download log message:

```
31/01/04 17:04:36 F/W Dnld fail:(47.11.215.44) i2004 Ph2
(F/W Corrupted)
31/01/04 17:05:46 F/W Dnld success:(47.11.215.44) i2004
```

## CLI commands

CS 1000 Release 4.0 introduces the following CLI commands to support UFTP firmware downloads:

- uftpNodeShow
- uftpShow
- uftpRunTimeDataReset
- activeDlogShow
- nActiveDlogShow
- dnldFailShow

### uftpNodeShow

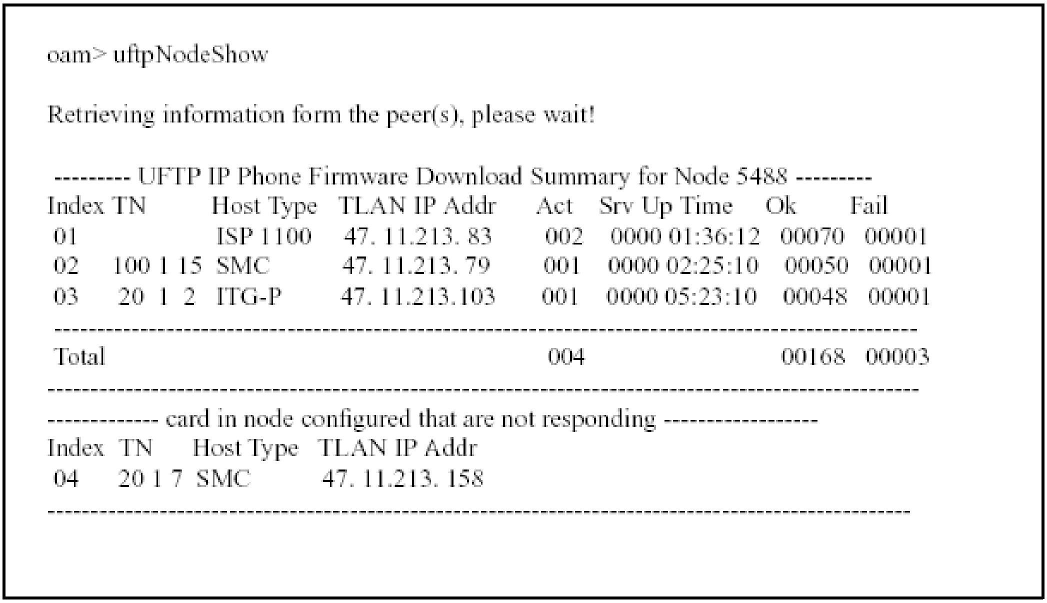
The **uftpNodeShow** command provides a complete UFTP IP Phone firmware download summary of each node. This includes the configured cards in the node that are not responding.

Each node summary contains the following information:

- Index
- TN - LL S CC or C C
- Host Type
- TLAN IP Address
- Data Period
- Active Download Count (Act)
- Server Up Time (Srv Up Time)
- Successful Download Count (Ok)
- Failure Download Count (Fail)

Figure 12 on page 88 is an example of output from the **uftpNodeShow** command.

**Figure 12**
**uftpNodeShow command output**



```
oam> uftpNodeShow

Retrieving information form the peer(s), please wait!

 --------- UFTP IP Phone Firmware Download Summary for Node 5488 ---------
Index TN          Host Type   TLAN IP Addr      Act    Srv Up Time     Ok       Fail
 01               ISP 1100     47. 11.213. 83    002    0000 01:36:12  00070   00001
 02     100 1 15  SMC          47. 11.213. 79    001    0000 02:25:10   00050   00001
 03      20  1  2  ITG-P       47. 11.213.103    001    0000 05:23:10   00048   00001
 ------------------------------------------------------------------------------------------------
 Total                                            004                   00168   00003
-------------------------------------------------------------------------------------------------
------------- card in node configured that are not responding ------------------
Index  TN      Host Type   TLAN IP Addr
 04     20 1 7  SMC          47. 11.213. 158
------------------------------------------------------------------------------------------------
```

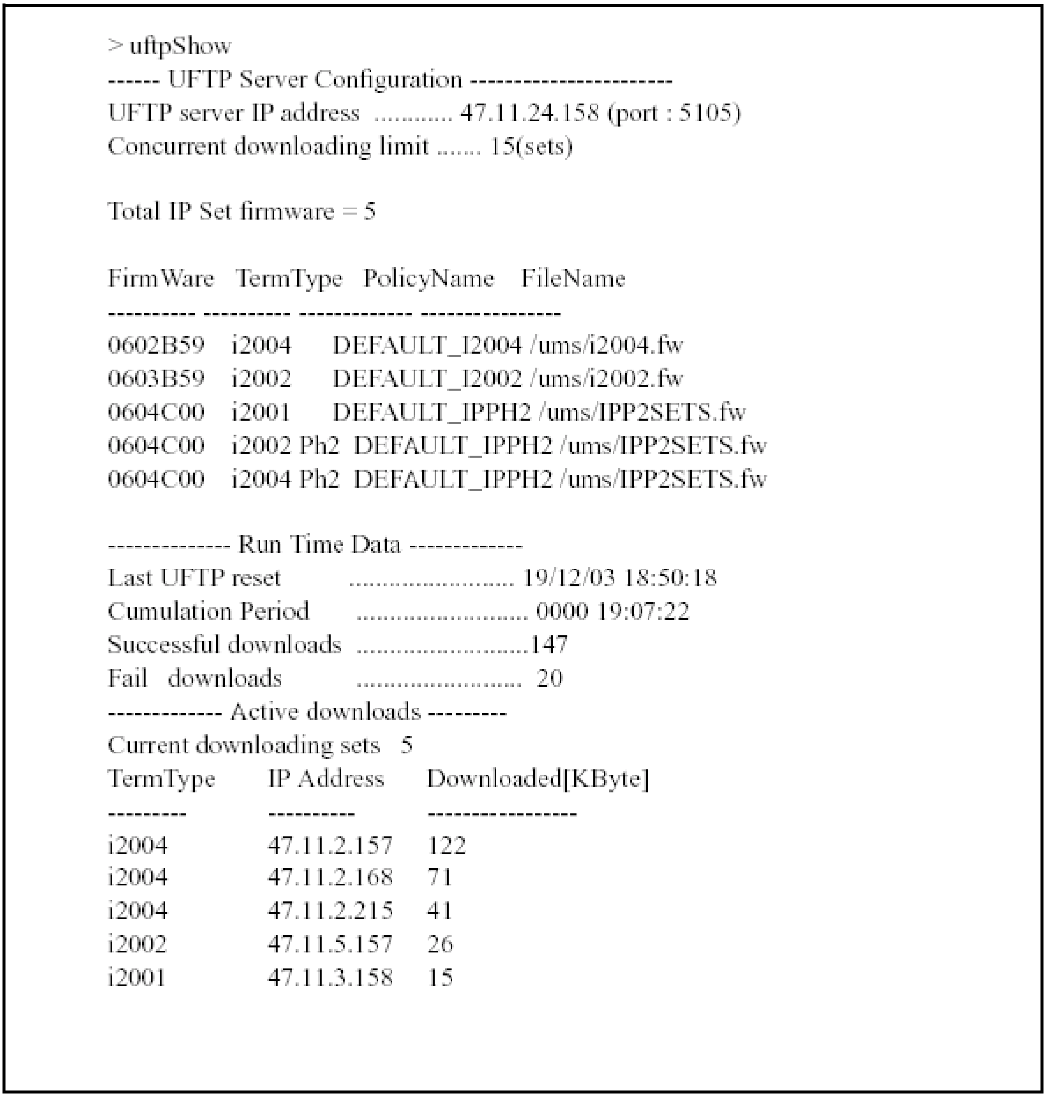
## uftpShow

The **uftpShow** command displays the following information:

- configuration information about UFTP
- count of successful downloads since the Signaling Server/Voice Gateway Media Card reboot
- count of downloads that failed or prematurely ended since the Signaling Server/Voice Gateway Media Card reboot
- number of active downloads, and a list of each, including:
  - — type of IP Phone
  - — IP addresses of the IP Phones that downloaded firmware
  - — number of bytes downloaded

Figure 13 on page 89 is an example of output from the **uftpShow** command.

**Figure 13**
**uftpShow command output**



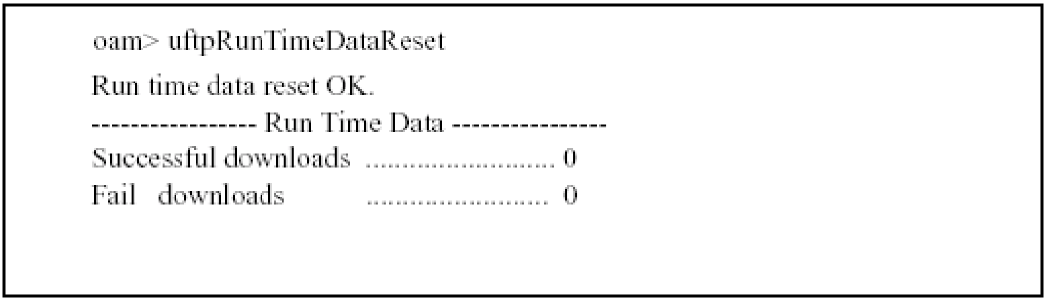
```
> uftpShow
------ UFTP Server Configuration -----------------------
UFTP server IP address  ............ 47.11.24.158 (port : 5105)
Concurrent downloading limit ....... 15(sets)

Total IP Set firmware = 5

FirmWare   TermType   PolicyName    FileName
---------- ---------- ------------- ----------------
0602B59   i2004      DEFAULT_I2004 /ums/i2004.fw
0603B59   i2002      DEFAULT_I2002 /ums/i2002.fw
0604C00   i2001      DEFAULT_IPPH2 /ums/IPP2SETS.fw
0604C00   i2002 Ph2  DEFAULT_IPPH2 /ums/IPP2SETS.fw
0604C00   i2004 Ph2  DEFAULT_IPPH2 /ums/IPP2SETS.fw

-------------- Run Time Data -------------
Last UFTP reset         .......................... 19/12/03 18:50:18
Cumulation Period       ........................... 0000 19:07:22
Successful downloads  ...........................147
Fail   downloads          .........................  20
------------- Active downloads ---------
Current downloading sets   5
TermType         IP Address       Downloaded[KByte]
---------        ----------       -----------------
i2004            47.11.2.157      122
i2004            47.11.2.168      71
i2004            47.11.2.215      41
i2002            47.11.5.157      26
i2001            47.11.3.158      15
```

### uftpRunTimeDataReset

The **uftpRunTimeDataReset** command is used to reset the run time data field in the UFTP data block.

Figure 14 is an example of output from the **uftpRunTimeDataReset** command.

**Figure 14**
**uftpRunTimeDataReset command output**



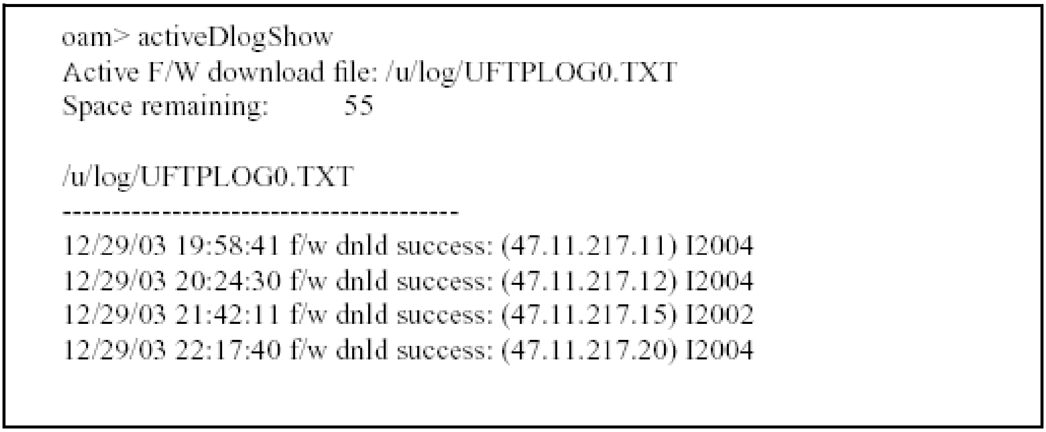
```
oam> uftpRunTimeDataReset
Run time data reset OK.
----------------- Run Time Data ----------------
Successful downloads ........................... 0
Fail   downloads        .......................... 0
```

### activeDlogShow

The **activeDlogShow** command displays the active log file information for UFTP IP Phone firmware downloads. When no parameter is entered, the output displays the contents of the entire active log file. When a line number is entered, **activeDlogShow[numOfLine]**, the output displays the active log file by the number of lines.

Figure 15 on page 91 is an example of output from the **activeDlogShow** command.

Figure 15
activeDlogShow command output



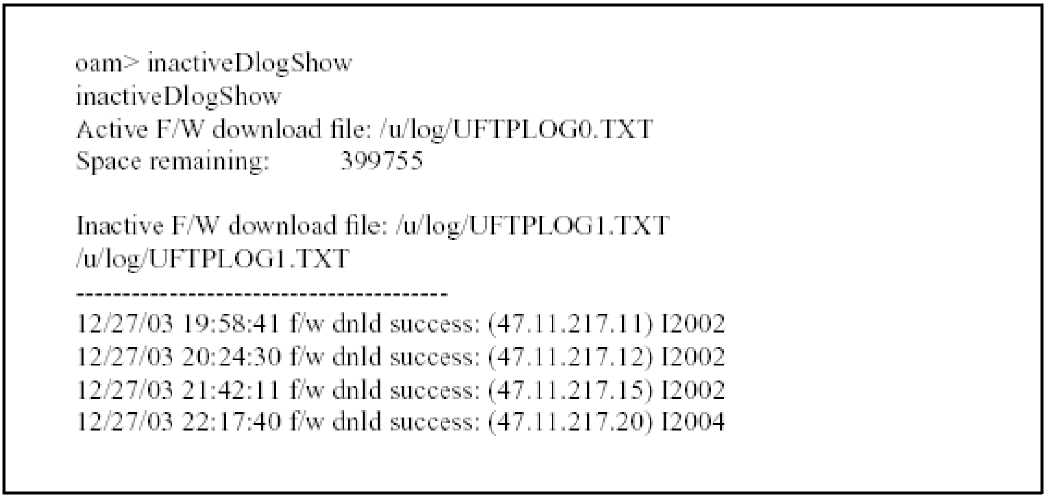
```
oam> activeDlogShow
Active F/W download file: /u/log/UFTPLOG0.TXT
Space remaining:        55

/u/log/UFTPLOG0.TXT
----------------------------------------
12/29/03 19:58:41 f/w dnld success: (47.11.217.11) I2004
12/29/03 20:24:30 f/w dnld success: (47.11.217.12) I2004
12/29/03 21:42:11 f/w dnld success: (47.11.217.15) I2002
12/29/03 22:17:40 f/w dnld success: (47.11.217.20) I2004
```

### inActiveDlogShow

The **inActiveDlogShow** command displays the non-active dlog file information for UFTP IP Phone firmware downloads. When no parameter is entered, the output displays the contents of the entire file. When a line number is entered, **inActiveDlogShow [numOfLine]**, the output displays the non-active dlog file by the number of lines.

Figure 16 on page 92 is an example of output from the **inActiveDlogShow** command.

**Figure 16**
**inActiveDlogShow command output**



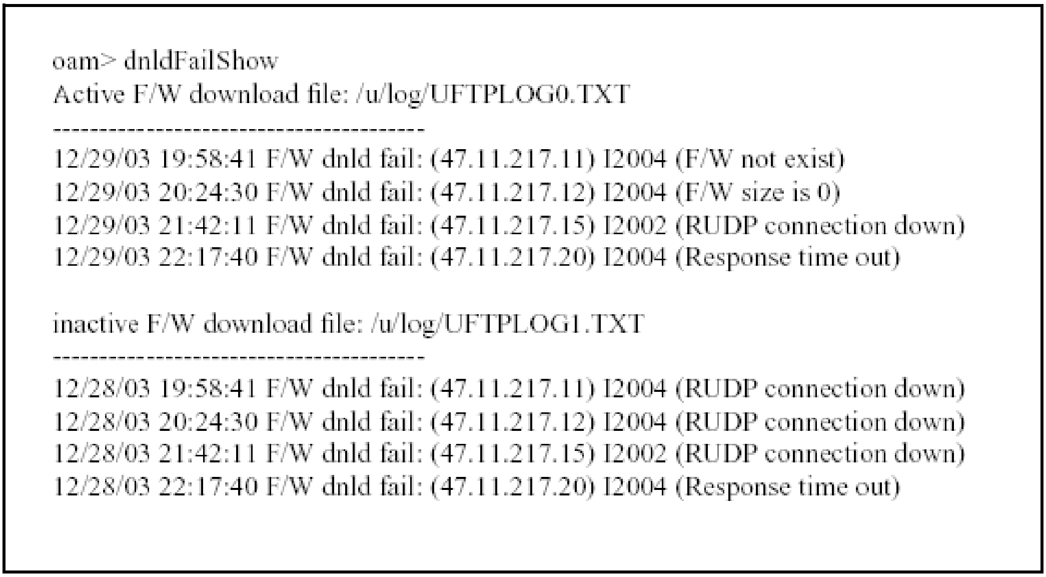
```
oam> inactiveDlogShow
inactiveDlogShow
Active F/W download file: /u/log/UFTPLOG0.TXT
Space remaining:        399755

Inactive F/W download file: /u/log/UFTPLOG1.TXT
/u/log/UFTPLOG1.TXT
----------------------------------------
12/27/03 19:58:41 f/w dnld success: (47.11.217.11) I2002
12/27/03 20:24:30 f/w dnld success: (47.11.217.12) I2002
12/27/03 21:42:11 f/w dnld success: (47.11.217.15) I2002
12/27/03 22:17:40 f/w dnld success: (47.11.217.20) I2004
```

## dnldFailShow

The **dnldFailShow** command displays the “download failed” status logged in the active and inactive files. When no parameter is entered, the output displays the all the failed UFTP download information in the active and inactive files. When a line number is entered, **dnldFailShow[numOfLine]**, the output displays the download fail status in the active and inactive files by the number of lines.

Figure 17 on page 93 is an example of output from the **dnldFailShow** command.

**Figure 17**
**dnldFailShow command output**



```
oam> dnldFailShow
Active F/W download file: /u/log/UFTPLOG0.TXT
---------------------------------------
12/29/03 19:58:41 F/W dnld fail: (47.11.217.11) I2004 (F/W not exist)
12/29/03 20:24:30 F/W dnld fail: (47.11.217.12) I2004 (F/W size is 0)
12/29/03 21:42:11 F/W dnld fail: (47.11.217.15) I2002 (RUDP connection down)
12/29/03 22:17:40 F/W dnld fail: (47.11.217.20) I2004 (Response time out)

inactive F/W download file: /u/log/UFTPLOG1.TXT
---------------------------------------
12/28/03 19:58:41 F/W dnld fail: (47.11.217.11) I2004 (RUDP connection down)
12/28/03 20:24:30 F/W dnld fail: (47.11.217.12) I2004 (RUDP connection down)
12/28/03 21:42:11 F/W dnld fail: (47.11.217.15) I2002 (RUDP connection down)
12/28/03 22:17:40 F/W dnld fail: (47.11.217.20) I2004 (Response time out)
```

## Personal Directory, Callers List, and Redial List

IP Line 4.0 introduces the Personal Directory, Callers List, and Redial List features. These features are supported on CS 1000 systems running CS 1000 Release 4.0 software.

The Personal Directory allows a user to enter or copy names to a personal directory, and delete those entries if desired.

The Callers List and Redial List are call log features. The content of these lists is generated during call processing. A user can scroll through the Callers List to see who has called. The user can dial a number from the Redial List.

The Personal Directory, Callers List, and Redial List use a separate central database, called the IP Phone Application Server, to store directory data and user profile options.

*Note:* Since the IP Phone Application Server is part of the IP Line 4.0 software on the Signaling Server, the Personal Directory, Callers List, and Redial List are only supported on CS 1000 systems.

Password protection is available to control access to a user's Personal Directory, Callers List, and Redial List.

**IMPORTANT!**

CPND must be configured on the system to enable Personal Directory, Callers List, and Redial List.

Fore more information, refer to "Personal Directory, Callers List, and Redial List" on page 145.

# IP Call Recording

IP Call Recording provides the IP address and port information for an IP Phone in new Information Elements (IE) over Application Module Link (AML) for Meridian Link Services (MLS). This information correlates the TN of a specific IP Phone with its associated IP address for a call recording application. When enabled in LD 17, IP Call Recording sends a modified AML message for each call. The modified message identifies the call's IP endpoint and makes it possible to correlate the RTP packets for that call to a particular IP Phone

IP Call Recording introduces a new IE pair:

- This Party IP IE (monitored party)
- Other Party IP IE (remote party)

The IP IE pair is similar to the existing IE pairs:

- For DNs: This Party DN IE, Other Party DN IE
- For TNs: This Party TN IE, Other Party TN IE

The IP IEs are optional in the Unsolicited Message Status (USM) (Active) and USM (Restore) messages. Note the following:

- If the USM message applies to a monitored key on a digital telephone, then the IP IEs are not sent.
- If the USM message applies to a monitored key on an IP Phone, then the IP IEs are sent: one for the monitored party and one for the remote party.

A call recording application is provided with status update messages for the call keys of any IP Phone it is monitoring. These USM messages contain the IP address and port number information for the monitored IP Phone and the remote party in the active call. By using a Layer 2 switch that supports port mirroring, the call recording device can monitor the media stream for the active call and record it.

## Administration

LD 17 introduces the Enhanced Unsolicited Status Message (USM) IE enable (IPIE) prompt.

The IPIE prompt enables or disables IP Call Recording on a system-wide basis. The functionality is disabled by default. When enabled, a modified Application Module Link (AML) message that identifies the IP endpoint is sent for each call. The IPIE prompt is added in LD 17 under system parameters (PARM).

**LD 17 – IP Call Recording (Part 1 of 2)**

| Prompt | Response | Description |
|---|---|---|
| REQ | CHG | Change existing data. |
| TYPE | PARM | Change system parameters. |
| LPIB | 96 – 7500 | Low priority Input Buffers |
| ... | | |
| NDRG | (NO) YES | New Distinctive Ringing |
| MARP | (YES) NO | Multiple Appearance Redirection Prime feature allowed. |

**LD 17 – IP Call Recording (Part 2 of 2)**

| Prompt | Response | Description |
|---|---|---|
| IPIE | (NO) YES | Enhanced Unsolicited Status Message (USM) IE enable.<br>YES = Allow “This Party IP IE” and “Other Party IE” to send with USM. |
| FRPT | (NEFR) OLFR | (Deny) or allow access to incoming calls by FRE station. |
| ... | | |

OTM and Element Manager do not support LD 17. However, OTM does support the corresponding print overlay, LD 22, which prints the prompt IPIE.

## pbxLink connection failure detection

IP Line 4.0 introduces pbxLink connection failure detection. The pbxLink connection failure detection feature provides a means of detecting the link status of Voice Gateway Media Cards. An alarm is generated if the pbxLink is not detected after a warm or cold start of the Call Server.

The Call Server monitors the pbxLink.

The Call Server maintains a list of all known registered elements (Signaling Servers and Voice Gateway Media Cards). When booted, a Call Server has a 5-minute delay to enable these known elements to re-establish contact with the Call Server.

If a known element fails to register with the Call Server, an ELAN0028 alarm is generated.

If an unknown Signaling Server or Voice Gateway Media Card registers with the Call Server, an ELAN0029 alarm is generated.

## Displaying pbxLink information

### Element Manager

For CS 1000 systems, use the Element Manager **System Status > IP Telephony > Node > Gen Cmds > Group - pbxLink > Command - pbxLinkShow** window to display the pbxLink information.

### CLI

For a Meridian 1 or CS 1000 system, use the LD 117 STAT SERV command at the Command Line Interface (CLI) of the Call Server to display the pbxLink information.

# LD 117 STAT SERV enhancement

The suite of STAT SERV (Statistic Services) commands enables a technician to display link-status information for Voice Gateway Media Cards that are registered to a Call Server.

STAT SERV can provide consolidated link-status information by application type, IP address, host name, and IP Telephony Node ID.

Prior to CS 1000 Release 4.0 software, STAT SERV status information included the following:

- node ID
- host name
- ELAN IP address
- element role
- platform type
- connection ID
- enabled applications
- registered/unregistered endpoints, such as IP Phones and Voice Gateway Media Cards.

In CS 1000 Release 4.0 software, the STAT SERV command has been enhanced to provide information about the pbxLink and enabled applications. It also provides a Signaling Server resource count to aid in determining the number of virtual trunks that can be configured.

## pbxLink information

The STAT SERV command provides the following pbxLink information:

- the time the pbxLink was last established
- the time the pbxLink was lost, if previously established
- the time the pbxLink last attempted to establish a connection, if the pbxLink failed to establish
- the Signaling Server resource count

## Application information

If an active link to an element is established, the Call Server obtains information about the applications running on the element.

Table 19 lists the applications and describes the information provided by those applications.

**Table 19**
**Queried information in STAT SERV (Part 1 of 2)**

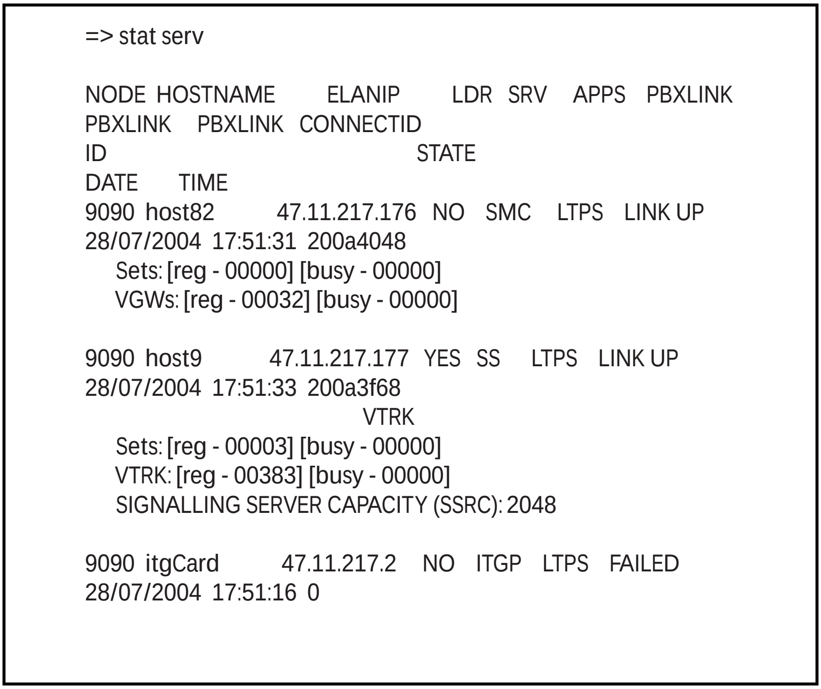
| Application / element | Information provided |
|---|---|
| LTPS application | number of registered IP Phone<br>number of busy IP Phones |
| VTRK application | number of registered VTRKs<br>number of busy VTRKs |

**Table 19**
**Queried information in STAT SERV (Part 2 of 2)**

| Application / element | Information provided |
|---|---|
| Voice Gateway Media Cards | number of registered Voice Gateway Media Cards<br>number of busy Voice Gateway Media Cards |
| Signaling Servers and Voice Gateway Media Cards | time that the element established its link with the Call Server<br>elements that failed to register or lost their link |

Figure 18 shows an example of LD 117 STAT SERV output.

**Figure 18**
**Sample LD 117 STAT SERV output**



```
=> stat serv

NODE  HOSTNAME        ELANIP        LDR  SRV    APPS   PBXLINK
PBXLINK    PBXLINK   CONNECTID
ID                                          STATE
DATE       TIME
9090  host82          47.11.217.176   NO    SMC    LTPS   LINK UP
28/07/2004  17:51:31  200a4048
    Sets: [reg - 00000] [busy - 00000]
    VGWs: [reg - 00032] [busy - 00000]

9090  host9           47.11.217.177   YES   SS     LTPS   LINK UP
28/07/2004  17:51:33  200a3f68
                                     VTRK
    Sets: [reg - 00003] [busy - 00000]
    VTRK: [reg - 00383] [busy - 00000]
    SIGNALLING SERVER CAPACITY (SSRC): 2048

9090  itgCard         47.11.217.2    NO    ITGP   LTPS   FAILED
28/07/2004  17:51:16  0
```

Table 20 lists the descriptions for the fields in the STAT SERV response.

**Table 20**
**STAT SERV response fields and description (Part 1 of 3)**

| STAT SERV response field | Description |
|---|---|
| NODE ID | Identifies the related node.<br>Value is a number from 0 – 9999. |
| HOSTNAME | Identifies the alias that the host has been given by the system.<br>Value is a string. |
| ELANIP | Identifies the element's IP connection to the Call Server.<br>Value is an IP address. |
| LDR | Specifies if the element is the Leader for the related node.<br>Value is YES or NO. |
| SRV | Specifies the element type.<br>Values are:<br>• SMC – Media Card 32-port card<br>• ITGP – ITG-P 24-port card<br>• SS – Signaling Server |
| APPS | Specifies the application running on the element.<br>Values are:<br>• LTPS<br>• VTRK |

**Table 20**
**STAT SERV response fields and description (Part 2 of 3)**

| STAT SERV response field | Description |
|---|---|
| PBXLINK STATE | Specifies the element's current pbxLink state.<br>Values are:<br>• LINK UP<br>• LOST<br>• FAILED<br>• INV CONN (element is connected, but its configuration was not found on the Call Server, indicating that this element might be connected to the wrong Call Server) |
| PBXLINK DATE/TIME | Specifies when the element's pbxLink state last changed. |
| CONNECTED | Specifies the element's connection ID. |
| sets | Values are:<br>• reg – the number of IP Phones registered to the element<br>• busy – the number of IP Phones that are currently busy |
| vgws | Values are:<br>• reg – how many voice gateways (DSP resources) are configured on the element<br>• busy – how many voice gateways (DSP resources) are active/busy on the element |

**Table 20**
**STAT SERV response fields and description (Part 3 of 3)**

| STAT SERV response field | Description |
|---|---|
| VTRK | Values are:<br>• reg – how many VTRK channels are configured on the element<br>• busy – how many VTRK channels are active/busy on the element |
| SSRC | Signaling Server capacity |

# IP Phone support

The IP Line 4.0 application supports the following IP Phones:

- IP Phone 2001
- IP Phone 2002
- IP Phone 2004
- IP Softphone 2050
- Mobile Voice Client (MVC) 2050

For detailed information about IP Phones, see the following guides:

- *IP Phone 2001 User Guide*
- *IP Phone 2002 User Guide*
- *IP Phone 2004 User Guide*
- *Nortel Networks IP Softphone 2050 User Guide*
- *IP Phones: Description, Installation, and Operation* (553-3001-368)

Table 21 shows a comparison of the IP Phone 2001, IP Phone 2002, and IP Phone 2004.

**Table 21**
**Comparison of the IP Phone 2001, IP Phone 2002, and IP Phone 2004 (Part 1 of 2)**

| Feature | IP Phone 2001 | IP Phone 2002 | IP Phone 2004 |
|---|---|---|---|
| **Display** | | | |
| Display size and format | 1 line display<br>24 characters | 1 line display<br>24 characters | 3 line display<br>24 characters on each line |
| Information Line | 1 line – 24 characters | 1 line – 24 characters | 3 lines – 24 characters on each line |
| Dedicated Data/Time field | No | No | Yes |
| Context Label field | No | No | Yes |
| **Keys** | | | |
| Soft Keys | 4 soft keys, soft-labeling 6 characters long | 4 soft keys, soft-labeling 6 characters long | 4 soft keys, soft-labeling 7 characters long |
| Feature Keys | No | 4 soft keys, soft-labeling 10 characters long | 6 soft keys, soft-labeling 10 characters long |
| **Other features** | | | |
| DHCP support | Yes | Yes | Yes |
| Transducers | Handset (HD) | Headset (HS) / Handset (HD) / Handsfree (HF) | Headset (HS) / Handset (HD) / Handsfree (HF) |
| Mute key | No | Yes | Yes |
| Navigation keys | Left and right | Up, down, left, and right | Up, down, left, and right |

**Table 21**
**Comparison of the IP Phone 2001, IP Phone 2002, and IP Phone 2004 (Part 2 of 2)**

| Feature | IP Phone 2001 | IP Phone 2002 | IP Phone 2004 |
|---|---|---|---|
| Voice codec support | G.711, G729A, G729AB, G.723.1 | 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 | Automatic firmware version checking and download |
| 3-port unmanaged Layer 2 switch for data and voice | No | Built-in | Built-in<br>***Note:*** Earlier models have an external switch. |
| Corporate Directory access | No | Yes | Yes |

## IP Phone Key Expansion Module

IP Line 4.0 supports the Nortel Networks IP Phone Key Expansion Module (KEM).

The IP Phone KEM is a hardware component that attaches to the Nortel Networks IP Phone 2002 and IP Phone 2004 and provides additional line appearances and feature keys.

> ***Note:*** The IP Phone KEM is not supported on the Nortel Networks IP Phone 2001.

Up to two IP Phone KEMs can be attached to an IP Phone 2002 or IP Phone 2004. With two IP Phone KEMs attached, the IP Phone 2004 can have up to 60 lines/feature keys, while the IP Phone 2002 can have up to 52 lines/feature keys.

> ***Note:*** The IP Phone 2004 can also have up to 60 lines/feature keys using the shift key and one IP Phone KEM. With two IP Phone KEMs attached, the shift key does not affect the IP Phone KEMs since the maximum number of lines/feature keys is already available. The IP Phone 2002 does not support shift key functionality.

When an IP Phone KEM is installed on an IP Phone 2002 or IP Phone 2004, the controls on the IP Phone affect both the IP Phone itself and the IP Phone KEM.

The IP Phone KEM must be configured in LD 11 before it can be used.

For information on using the IP Phone KEM, refer to *IP Phone Key Expansion Module User Guide*.

## Corporate Directory

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

The Corporate Directory database is created using OTM 2.2 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 IP Phones. The Signaling Server can support Corporate Directory access for the same number of IP Phones that are registered.

The Directory key on the IP Phone 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 IP Phones (see “Corporate Directory: LD 11 configuration” on page 415).

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

- *Optivity Telephony Manager: Installation and Configuration* (553-3001-230)
- *IP Phones: Description, Installation, and Operation* (553-3001-368).

# Element Manager support

Element Manager enables configuration of IP Line 4.0 using a web browser on CS 1000 systems.

Each 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 Signaling Server and the Signaling Server acts as a file server.

When a web browser is opened and the IP address of the 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 Call Server. The Voice Gateway Media Cards are notified to FTP the files from the Call Server.

OTM 2.2's Navigators incorporate links to each Element Manager web server in a network.

## BOOTP and CONFIG.INI

If the Voice Gateway Media Card is a Follower of a primary Signaling Server, it generates a BOOTP request to retrieve its network information. The request for IP address, node ID, and node IP is directed to a BOOTP server within its node. If the BOOTP request fails, the Voice Gateway Media Card uses the last configuration. This fallback configuration data is stored locally on the Voice Gateway Media Card. If the BOOTP request is successful, the Voice Gateway Media Card refreshes its current fallback configuration data.

If the Voice Gateway Media Card is located in a stand-alone IP Telephony node, and is designated as the Leader for its node, it provides BOOTP service to all other configured Voice Gateway Media Cards within its node. The Leader determines its own network information using a combination of locally stored static information and the bootp.tab file.

If the Voice Gateway Media Card is located in a stand-alone IP Telephony node, and is designated as a Follower, it generates a BOOTP request to retrieve its network information. The request for IP address, node ID, and node IP is directed to a BOOTP server within its node. If the BOOTP request fails, the Voice Gateway Media Card uses the last configuration. This fallback configuration data is stored locally on the Voice Gateway Media Card. If the BOOTP request is successful, the Voice Gateway Media Card refreshes its current fallback configuration data.

The Voice Gateway Media Card reads the contents of the CONFIG.INI file located on its disk for additional configuration parameters.

# Call Statistics collection

IP Line 4.0 enables statistics on the Quality of Service (QoS) of calls connected by the Call Server to be collected.

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

- blocked calls
- bandwidth used
- call attempts and completions

## Counting IP Phones

The commands to count registered IP Phones 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 22 describes these commands.

**Table 22**
**LD 32 commands to count registered IP Phones (Part 1 of 2)**

| Command | Description |
|---|---|
| ECNT CARD L S C <customer> | Counts and prints the number of IP Phones registered for the specified card.<br>• 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.<br>• 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.<br>Example:<br>ECNT CARD 81<br><< Card 81 >><br>Number of Registered Ethersets: 5<br>Number of Unregistered Ethersets: 27 |
| ECNT ZONE zoneNum <customer> | Counts and prints the number of IP Phones registered for the specified zone.<br>• 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.<br>• If no parameters are entered, the count is printed for all zones.<br>Example:<br>ECNT ZONE 0 0<br><< Zone 0 Customer 0 >><br>Number of Registered Ethersets: 4<br>Number of Unregistered Ethersets: 17 |

Table 22
LD 32 commands to count registered IP Phones (Part 2 of 2)

| Command | Description |
|---|---|
| ECNT NODE nodeNum | Counts and prints the number of IP Phones registered for the specified node.<br>• If the nodeNum parameter is not entered, the count is printed for all nodes.<br>Example:<br>ECNT NODE 8765<br><< Zone 8765 >><br>Number of Registered Ethersets: 3 |
| ECNT SS <hostName> | Counts and prints the number of IP Phones registered for the specified Signaling Server.<br>• If hostName parameter is not entered, the count is printed for all Signaling Servers.<br>Example:<br>ECNT SS<br><< Signaling Server: BVWAlphaFox IP 10.10.10.242>><br>Number of Register Ethersets: 1000<br>***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 23: “ECNT Card command error messages” on page 111.
- Table 24: “ECNT Zone command error messages” on page 111.

- Table 25: “ECNT Node command error messages” on page 112.
- Table 26: “ECNT SS command error message” on page 112.

**Table 23**
**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.<br>Customer out of range. Range: [0-31] |

**Table 24**
**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.<br>Customer out of range. Range: [0-31] |

**Table 25**
**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 26**
**ECNT SS command error message**

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

## IP Phone Zone Traffic Report 16

A system traffic report, IP Phone Zone Traffic Report 16 in LD 2 is created on the system to print IP Phone 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-zone calls made
- Total inter/intra zone 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. LD 2 commands that are related to setting the system threshold are used with a value defined for the bandwidth threshold.

**Table 27**
**System threshold commands**

| Command | Description |
|---|---|
| TTHS TH tv | Prints the current system thresholds. |
| STHS TH tv -- TV | Sets the system thresholds. |
| ***Note 1:*** A TH value of 5 is used for the zone bandwidth threshold.<br>***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
```

Table 28 describes the intrazone IP Phone Zone Traffic Report 16 output data.

**Table 28**
**IP Phone Zone Traffic Report 16 intrazone data output (Part 1 of 2)**

| Data | Description |
|---|---|
| zone | number of the zone |
| cmi | intrazone calls made (successful) |
| cbi | intrazone calls blocked |
| pi | intrazone peak bandwidth (%) |

**Table 28**
**IP Phone Zone Traffic Report 16 intrazone data output (Part 2 of 2)**

| Data | Description |
|---|---|
| ai | intrazone average bandwidth usage (%) |
| vi | intrazone bandwidth usage threshold violations |
| cul | counts of unacceptable latency samples |
| cupl | counts of unacceptable packet loss |
| cuj | counts of unacceptable jitter samples |
| cur | counts of unacceptable R factor samples |
| cuerl | counts of unacceptable Echo Return Loss |
| cwl | counts of warning latency samples |
| cwj | counts of warning jitter samples |
| cwpl | counts of warning packet loss samples |
| cwr | counts of warning R factor samples |
| cwerl | counts of warning Echo return Loss |
| cmip | counts of measuring interval samples |

Table 29 describes the interzone IP Phone Zone Traffic Report 16output data.

**Table 29**
**IP Phone Zone Traffic Report 16 interzone data output (Part 1 of 2)**

| Data | Description |
|---|---|
| zone | number of the zone |
| cmo | interzone calls made |
| cbo | interzone calls blocked |
| po | interzone peak bandwidth (%) |
| ao | interzone average bandwidth usage (%) |

**Table 29**
**IP Phone Zone Traffic Report 16 interzone data output (Part 2 of 2)**

| Data | Description |
|---|---|
| vo | interzone bandwidth usage threshold violations |
| cwpl | counts of warning packet loss |
| cwl | counts of warning latency samples |
| cwj | counts of warning jitter samples |
| cupl | counts of unacceptable packet loss |
| cul | counts of unacceptable latency samples |
| cuj | counts of unacceptable jitter samples |
| cur | counts of unacceptable R factor samples |
| cuerl | counts of unacceptable Echo Return Loss |
| cwr | counts of warning R factor samples |
| cwerl | counts of warning Echo Return Loss |
| cmip | counts of interval measuring samples |

The following is an example of the output from Traffic Report 16.

```
>ld 2
TFC000
.invs 16
0000 TFS016
ZONE 003

INTRAZONE 00005 00000 00002 00000 00000 00051 00000 00020
00000 00000 00000 00000 00000 00000 00000 00000
INTERZONE 00003 00000 00007 00006 00000 00006 00000 00006
00000 00000 00000 00000 00000 00000 00000 00000

ZONE 006

INTRAZONE 00008 00000 00001 00000 00000 00050 00000 00048
00001 00000 00000 00000 00000 00002 00025 00000
INTERZONE 00003 00000 00007 00006 00000 00007 00000 00007
00001 00000 00000 00000 00000 00000 00007 00000
```

All other commands (SOPS, COPS, TOPS) function in the normal manner. Table 30 shows the SOPS, COPS, and TOPS commands:

**Table 30**
**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 4.0 gives the IP Phone user the ability to program the label on the feature key. This label change is saved and then displayed on the feature key.

### Availability

Table 31 describes the feature key availability on the IP Phones.

**Table 31**
**Feature key availability on IP Phones**

| Model | Number of feature keys | Number of feature keys using Shift key | Maximum label character length |
|---|---|---|---|
| IP Phone 2002 | 4 | N/A | 10 |
| IP Phone 2004 | 6 | 12 | 10 |
| IP Softphone 2050 | 6 | 12 | 10 |
| MVC 2050 | 6 | 12 | 10 |

*Note:* There are no feature keys on the IP Phone 2001.

The feature key labels for each IP Phonee 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 IP Phone registers with the Call Server, the Call Server looks up the feature key label in the memory, based on the TN of the IP Phone. If the labels are found, they are sent to the IP Phone 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 *IP Phones: Description, Installation, and Operation* (553-3001-368).

# Private Zone configuration

Private Zones are available for the CS 1000 and Meridian 1 systems.

## 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 IP Phone users share the IP Line DSP resources. The DSPs can be provisioned using a DSP-to-IP Phone 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 4.0 provides 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 IP Phone.

A zone can be configured as shared or private.

## Shared Zone

The current default zone type is a Shared Zone. IP Phones 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 zone where the IP Phone 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 IP Phones that have also been configured for that Private Zone. If more DSP resources are required by these IP Phones than what are available in the zone, DSPs from other Shared Zones are used.

IP Phones 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 zone where the IP Phone is configured.
- Select any available channel from the pool of Shared Zones' channels.

## LD 117

VGW channels and IP Phones 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, in this example 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 32 gives a sample output of the **PRT ZONE** or **PRT ZONE ALL** command.

**Table 32**
**Sample output from PRT ZONE or PRT ZONE ALL command**

| | | | Intrazone | | | | Interzone | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Zone | State | Type | Bandwidth (Kbps) | Strategy | Usage (%) | Peak (Kbps) | Bandwidth (Kbps) | Strategy | Usage (%) | Peak (Kbps) | HO/BRCH |
| 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 IP Phone 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 an IP Phone is configured in a Shared Zone, the 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 IP Phones 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 IP Phone is configured in a Shared Zone. Only IP Phones 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 IP Phones in the Shared Zone, ensure that only enough private channels are configured to cover the IP Phones in the Private Zone. Do not configure more channels than are required in the Private Zone as the Shared Zone IP Phones cannot access these channels.

## Run-time configuration changes

IP Line 4.0 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 AudioPort parameter in the “config.ini” file on the Voice Gateway Media Card requires a reboot of the card
- changing the IP address of a particular card so it can retrieve its new IP address information.

### Supported run-time changes

Therefore, IP Line 4.0 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 Call Server’s ELAN network interface is re-initialized to implement the configuration change, the IP Phones and gateway channels registrations are unregistered on the Call Server. The Call Server releases the calls. When the link is re-established, the LTPS synchronizes the call states and releases the active calls. Service is interrupted during this re-establishment period and the following are affected:

  — New IP Phones cannot register.

- — Registered IP Phones 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 IP Phone s 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 2.2.

## Network wide Virtual Office

Network Wide Virtual Office is supported for the CS 1000 systems.

IP Line 4.0 provides the Network Wide Virtual Office feature. This feature enables a user to use any IP Phone within the network.

The Virtual Office feature provides a call service to "travelling" users who want to use a different physical IP Phone (other than the IP Phone they normally use). Users can log into another IP Phone 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 IP Phones. For example, if users go to another office or to a different location within the same office, they can log into any available IP Phone and have all the features of their home/office IP Phone. When the user logs off the IP Phone, the features that were "transferred" to that IP Phone 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 IP Phone to any of the systems.

### Requirements

A Signaling Server or stand-alone gatekeeper is required in the network.

### Supported IP Phones

Virtual Office is supported for the IP Phone 2001, IP Phone 2002 and IP Phone 2004, the IP Softphone 2050, and the MVC 2050. An IP Phone 2004, IP Softphone 2050, or MVC 2050 users can log in from an IP Phone 2002 under certain conditions. See "Set type checking and blocking" on page 140.

Table 33 shows which users can log in to particular IP Phones.

**Table 33**
**Virtual Office login from various IP Phones (Part 1 of 2)**

| IP Phone User | Virtual Office login |
|---|---|
| An IP Phone 2001 user... | ... can Virtual Office log in from another IP Phone 2001, an IP Phone 2002, an IP Phone 2004, an IP Softphone 2050, and an MVC 2050. |
| An IP Phone 2002 user... | ...can Virtual Office log-in from another IP Phone 2002, an IP Phone 2004, an IP Softphone 2050, and an MVC 2050.<br>... can log in under certain conditions when the user attempts a Virtual Office login from an IP Phone 2001. See "Set type checking and blocking" on page 140. |

**Table 33**
**Virtual Office login from various IP Phones (Part 2 of 2)**

| IP Phone User | Virtual Office login |
|---|---|
| An IP Phone 2004 user... | ...can Virtual Office log in from an IP Phone 2004, an IP Softphone 2050, and an MVC 2050.<br>...can log in under certain conditions when the user attempts a Virtual Office login from an IP Phone 2001 and IP Phone 2002. See "Set type checking and blocking" on page 140. |
| An IP Softphone 2050 user... | ...can virtually login from an IP Phone 2004, another IP Softphone 2050, or an MVC 2050.<br>...can log in under certain conditions when the user attempts a Virtual Office login from an IP Phone 2001 and IP Phone 2002. See "Set type checking and blocking" on page 140. |
| An MVC 2050 user... | ...can virtually log in from an IP Phone 2004, an IP Softphone 2050, or another MVC 2050.<br>...can log in under certain conditions when the user attempts a Virtual Office login from an IP Phone 2001 and IP Phone 2002. See "Set type checking and blocking" on page 140. |

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

- The IP Phone where the user wants to virtually login (destination) must have Virtual Office User Allowed (VOUA) configured.
- The IP Phone 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 *Communication Server 1000S: Maintenance* (553-3031-500) or *Software Input/Output: Maintenance* (553-3001-511) for more information.

### Passwords and IP Phone Registration

An IP Phone registers using the TN (in its EEPROM). A valid user ID and password are used to determine the Home LTPS for the IP Phone during the Virtual Office connection. A Gatekeeper is required if the Home LTPS is not the LTPS where the IP Phone 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 IP Phone 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 *IP Phones: Description, Installation, and Operation* (553-3001-368).

## Branch Office and Media Gateway 1000B

The Media Gateway 1000B (MG 1000B) provides a means of extending CS 1000 Release 4.0 features to one or more remotely-located branch offices using the Branch Office feature. A branch office is a remote location in the network where IP Phones, PSTN access, and TDM telephones are located.

### 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 IP Phones in both the main office and the MG 1000B in the branch office location. The MG 1000B in the branch office location provides access to the local PSTN.

### Connections

The MG 1000B is connected to the main office over virtual trunks on a WAN or LAN. IP Phone calls and IP network connections are controlled by, and come from, the main office. If the main office fails to function, or a network outage occurs, the Small System Controller (SSC) in the MG 1000B provides service to the IP Phones located in the branch office location. The IP Phones then survive an outage between the MG 1000B and the main office.

### Components

The basic hardware of an MG 1000B includes the Media Gateway and the Signaling Server. The Media Gateway provides access to the local PSTN for users in the branch office location. It also provides support for analog devices such as fax machines or telephones in the branch office location.

For detailed information about MG 1000B, refer to *Branch Office: Installation and Configuration* (553-3001-214).

# 802.1Q support

The IP Phone 2001, IP Phone 2002, and IP Phone 2004 support 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 802.1Q on IP Phones

The 802.1Q support for the IP Phones is configured and controlled using the IP Phone’s user interface or DHCP. The DHCP approach eliminates the need to manually configure 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. Two fields in OTM 2.2 and Element Manager are used to set the “p” bits:

1 A **checkbox** that, when selected, means the priority bits should be set to the value specified by the 802.1Q priority bit value field. If the checkbox is unselected, the IP Phone sends out the default priority of 6.

2 A **802.1Q priority bit value field**. This field sets the value that the IP Phones 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 IP Phone 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 IP Phone using the IP Phone keypad, or automatically retrieved using DHCP (automatic VLAN discovery)

> ***Note:*** For more information about manual or automatic IP Phone configuration, refer to *IP Phones: Description, Installation, and Operation* (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 IP Phones.

**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 IP Phone’s 802.1Q

The 802.1Q header in the outgoing packets from the IP Phones is enabled by one of the following:

- If the IP Phone’s VLAN GUI response is set to 1, then the 802.1Q functionality is enabled. All packets from the IP Phone have the 802.1Q header as part of the Ethernet frame.
- If the IP Phone’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 or Element Manager configuration enables the use of the “p” bits, once downloaded to the IP Phone, the 802.1Q functionality is enabled.

## 802.1Q and the Voice Gateway Media Cards

The ITG-P 24-port and Media Card line cards cannot send the 802.1Q header because the cards' operating system does not support it. The switch ports connecting the Voice Gateway Media Card's TLAN network interface 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 and Element Manager is for the control of the priority bits in the 802.1Q header sent by the IP Phones only.

# Data Path Capture tool

IP Line 4.0 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.

# IP Phone firmware

## Minimum firmware version

Refer to the ReadmeFirst documentation to determine the IP Phone minimum firmware (F/W) versions supported by IP Line 4.0.

## Firmware download

The firmware files for the IP Phones are downloaded from OTM 2.2 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 IP Phone normally does not have to be pre-loaded with the firmware file because, during normal operation, the IP Phone's firmware is automatically upgraded as part of the registration to the LTPS. If the firmware cannot be upgraded, perhaps due to firewall restrictions, then the IP Phone must be upgraded with the current firmware version before distributing the IP Phone.

### Firmware filenames

The IP Phone firmware files are released on CD-ROM. The files are also available from the Nortel Networks web site.

The IP Phone firmware files are labelled as follows:

- 0602Bnn.BIN is the filename for the Phase I IP Phone 2004 firmware where Bnn = F/W version 1.nn.
- 0603Bnn.BIN is the filename for the Phase I IP Phone 2002 firmware where Bnn = F/W version 1.nn.
- 0604Dnn.BIN is the file name for the Phase II IP Phone 2001, IP Phone 2002, and IP Phone 2004 where Dnn = F/W version 4.nn

If the external file server option is used (in OTM 2.2 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
- 0604Dnn.BIN must be renamed to IPP2SETS.fw

For the external file server options:

- see Procedure 29 on page 291 for OTM 2.2
- see Procedure 47 on page 363 for Element Manager

## Meridian 1

### Default location of firmware files

The firmware files for the IP Phones 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 Phase I IP Phone 2004 as i2004.fw, the firmware file for the Phase I IP Phone 2002 as i2002.fw, and the firmware file for the Phase II IP Phone 2001, IP Phone 2002, and IP Phone 2004 as IPP2SETS.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 4.0

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

The IP Line 4.0 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 2.2.
  OTM 2.2 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 4.0 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 4.0. The Master card notifies the Followers about changes to the status of the firmware file using a broadcast on the TLAN network interface.

The UFTP download mechanism is used to download the IP Phone firmware files.

### 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 IP Phone’s firmware version is not checked and the IP Phone registers with the firmware version that is currently on the IP Phone.

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 start-up 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.

## CS 1000 systems

### Default location of firmware files

For CS 1000 system configurations, the default storage location for the firmware files is on the 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 4.0

Due to the limited flash drive space on the Voice Gateway Media Cards, IP Line 4.0 manages the firmware file in the following manner:

**1** Each IP Phone type has one firmware file. 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 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 IP Phones are checked against the upgrade policy at the time they register. If a firmware update is required, the firmware is downloaded from the Signaling Server or the Voice Gateway Media Card's TFTP server to the IP Phone.

The firmware file for the Phase I IP Phone 2004 is saved as i2004.fw, as i2002.fw for the Phase I IP Phone 2002, and as IPP2SETS.fw for the Phase II IP Phone 2001, IP Phone 2002, and IP Phone 2004. These filenames are required for the upgrade manager to find certain files in either the stand-alone 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 CS 1000 systems, the Signaling Server acts as the file server and the Master function is on the 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 IP Phones registered to the Voice Gateway Media Card. Even after the gateway channels are disabled, all IP Phones registered to the card are impacted when the card is unplugged or reset. Also, if a Voice Gateway Media Card or Signaling Server is the node Master when it is removed, the IP Phone registration service is interrupted until the next election occurs.

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

The Graceful TPS command:

- prevents new IP Phones from registering
- soft-resets any idle, registered IP Phones

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

## Operation of the LTPS DISI

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

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

- The card soft resets the remaining busy registered IP Phones 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 Signaling Server's node mastership is not transferred.

**IMPORTANT!**

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

To ensure that the IP Phones re-register only to the secondary Signaling Server, Nortel Networks recommends that the command **disableServices** be used on the Signaling Server instead of **disiTPS**. Using the **disiTPS** command alone on the on the 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 an IP Phone 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 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 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 logged and saved when a card resets. The reset reason is displayed as a message during the start-up 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 start-up 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 99 on page 639.
- Media Card – Version 6.0 of the firmware file is the required minimum to enable the Watchdog Timer functionality on the Media Card line cards. To upgrade the firmware version of the Media Card line cards to support the Watchdog functionality, see Procedure 100 on page 642.

# 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 LTPS and CS 1000 and Meridian 1.

Table 34 shows which codecs are supported on the systems.

**Table 34**
**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 4.0, 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 page 179.

# Set type checking and blocking

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

However, if the registration request is a virtual login, this check is not performed. All IP Phones 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 IP Phone 2004 or IP Softphone 2050 user logs in from an IP Phone 2002, or when an IP Phone 2004, IP Phone 2002, or IP Softphone 2050 user logs in from an IP Phone 2001.

Special checking is required to prevent a user from logging in from an IP Phone that cannot display an incoming call because the IP Phone used to log in does not have the DN/Feature key(s) to display the incoming call. If the login were allowed to occur, the IP Phone could ring 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 DN/Feature key types appear on any keys not present on the type of IP Phone being used for the login, the login is blocked.

> ***Note:*** The login from an IP Phone 2002 is blocked for users configured for ACD.

### IP Phone 2002 login restrictions

Because the IP Phone 2002 supports only 4 feature keys, a restricted VO login is applied to IP Phone 2004 and IP Softphone 2050 TNs when they log in using an IP Phone 2002. When the IP Phone 2004 or IP Softphone 2050 user logs in from an IP Phone 2002, the login 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

### IP Phone 2001 login restrictions

Because the IP Phone 2001 does not support any feature keys, a restricted VO login is applied to IP Phone 2002, IP Phone 2004, and IP Softphone 2050 TNs when they log in using an IP Phone 2001. When an IP Phone 2002, IP Phone

2004, or IP SoftPhone 2050 user logs in from an IP Phone 2001, the login is blocked if the user's configuration has one of the following:

- key 0 defined as ACD
- any other key (from key 1 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 IP Phone. Under the circumstances described in this section, an IP Phone 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 IP Phone's survivability in the case of network outages or equipment failure, as it allows an IP Phone to register to more than one node on a system. By configuring the IP Phone's S1 and S2 Connect Server IP addresses to the node addressees of two different nodes, and properly configuring the Node IDs, the IP Phone 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 IP Phone must match exactly
- if the Node ID on the system has 4 digits and:
  - — the Node ID from the IP Phone has fewer than 3 digits, reject the registration
  - — the Node ID from the IP Phone has 4 digits, the Node ID must match exactly
  - — if the Node ID from the IP Phone has 3 digits and they match the first 3 digits of the node's 4 digit Node ID (left to right), then allow the IP Phone 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 IP Phones are distributed among the nodes by programming different S1 and S2 IP addresses into the IP Phones. The IP Phones 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 IP Phone can register to a secondary Connect Server (the S2 IP address). This feature enables a node's registered IP Phones to spread across the spare IP Phone 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 IP Phone configured with Node ID 343 can register with either node.

If the IP Phone presented one of the following Node IDs, it would be rejected for registration

- 3
- 34
- 3433

The TN must still match before the IP 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.

# Personal Directory, Callers List, and Redial List

## Contents

This section contains information on the following topics:

# Introduction

Personal Directory, Callers List, and Redial List are supported on the IP Phone 2002, IP Phone 2004, IP Softphone 2050, and Mobile Voice Client (MVC) 2050. The IP Phone 2001 is not supported.

An IP Phone must be registered to a Signaling Server to access the Personal Directory, Callers List, and Redial List features. The IP Phone Application Server ELAN interface IP address must be configured (see "IP Phone Application Server configuration and administration" on page 152).

**IMPORTANT!**

CPND must be configured as a Class of Service on the system to enable Personal Directory, Callers List, and Redial List.

Personal Directory is controlled by the user, who can enter or copy names to their personal directory, delete entries, or delete the entire list.

Callers List and Redial List are call log features. The content of these lists is generated during call processing. CPND must be configured as a Class of Service to generate the names in the logs. Content cannot be changed; however, a user can delete or, in some cases, copy entries or lists.

***Note:*** Personal Directory is not a call log feature.

Table 35 compares the Personal Directory with the Callers List and Redial List features.

**Table 35**
**Comparison of Personal Directory with Callers List and Redial List**

| Operation | Personal Directory | Callers List and Redial List |
|---|---|---|
| Displays date and time of transaction | No | Yes |
| Modify entry | Yes | No |
| Dial from the list | Yes | Yes |
| Delete entry | Yes | Yes |
| Content view mode<br>(IP Phone 2002 and IP Phone 2004 displays name and DN simultaneously; IP Phone 2002 displays only DN) | Yes | Yes |
| Delete list | Yes | Yes |
| Edit and dial<br>(Temporarily modify an entry and dial out.<br>Does not modify record in database.) | No | Yes |
| Access through soft keys | No | No |
| Maximum number of entries | 100 | 20 (Redial List)<br>100 (Callers List) |

## Virtual Office

Personal Directory, Callers List, and Redial List are available when using Virtual Office (VO). Data is stored on the Signaling Server, not on the IP Phone. This means when a user logs on using Virtual Office or logs on in a branch office in normal mode, they can always access their stored names and numbers.

## Media Gateway 1000B

Personal Directory, Callers List, and Redial List are supported in a branch office configuration when the Media Gateway (MG) 1000B in the branch office location is in normal mode. Personal Directory, Callers List, and Redial List are not available in local mode, as the entries are stored on the main office Signaling Server.

## User key for Personal Directory, Callers List, and Redial List

An IP Phone's Private Network Identifier (PNI) + Home Location Code (HLOC) + primary DN (PDN) are used as the lookup key for the IP Phone's Personal Directory, Callers List, and Redial List data.

For the HLOC, if a CLID table entry exists (CLID = yes in LD 15) for the Primary DN (PDN) or the first non-ACD key DN, the CLID table's HLOC is used. When no CLID entry exists, the HLOC defined in LD 15's Network Data section is used (it might be 0's if HLOC is not configured).

The PNI ensures the HLOC + PDN is unique across customers on a system if the system is multi-customer.

Since the user's PDN and HLOC are used, then to identify a specific user, a user's primary DN and HLOC must be unique to the network to support their own specific Personal Directory, Callers List, and Redial List. If using Multiple Appearance DN (MADN) for a group of users and it is necessary to provide users with their own Personal Directory, Callers List, and Redial List, do not configure the Primary DN (PDN) as MADN.

If the MADN is used as the PDN for a group of users, this results in a shared Personal Directory, Callers List, and Redial List. This means that a call arriving on any IP Phone sharing the PDN MADN appears in the Callers List. Calls to a secondary DN on another IP Phone in the shared group appear in the Callers List for all IP Phones, even though the call did not ring on the other IP Phone.

## Personal Directory

Personal Directory supports the following features:

- maximum entries = 100
- maximum characters in name = 24
- maximum characters in DN = 31
- multiple actions:
  - add new entry
  - edit entry
  - delete entry
  - delete contents of directory
  - copy an entry from Personal Directory to Personal Directory
  - copy an entry from Corporate Directory to Personal Directory
  - dial DN of an entry
  - name search
- password protection to control access to Personal Directory
- one minute time-out

## Callers List

Callers List supports the following features:

- maximum entries = 100
- maximum characters in name = 24
- maximum characters in DN = 31
- multiple actions:
  - dial DN of an entry
  - edit entry
  - copy entry

- — delete entry
- sorted by the time the call is logged
- contains caller name, DN, time of last call occurrence, and how many times the caller has called this user
- Idle Display option: display and count all calls or only unanswered calls
- displays caller name (Redial List only displays caller DN)
- once 100 entry limit is reached, newest entry overwrites oldest entry
- one minute time-out

## Call log options

Call log options allows a user to configure preferences on the IP Phone for the following:

- if the Callers List logs all incoming calls or only unanswered calls
- if Idle Set Display indicates when new calls have been logged to the Callers List
- if a name stored in the Personal Directory that is associated with the incoming call's DN is displayed instead of the name transmitted by the Call Server
- what three area codes should be displayed after the DN rather than before it (for example, local area codes)

Follow the steps in Procedure 1 to access the call log options for the IP Phone.

**Procedure 1**
**Accessing the call log options**

**1** Press the IP Phone's Services key.

The **Telephone Options** menu displays.

**2** From the **Telephone Options** menu, select **Call Log Options**.

**3** Select the desired options.

**End of Procedure**

Table 36 summarizes the call log options.

**Table 36**
**Call log options**

| Call log option | Description | Default value |
|---|---|---|
| Log all/unanswered incoming calls | Configures the Callers List to log all incoming calls or only the unanswered incoming calls | Log all calls |
| New Call Indication<br>(see note) | When New Call Indication is turned on, a message is displayed on the IP Phone to inform the user of a new incoming call. If not configured, nothing is displayed. | On |
| Preferred Name Match | Configures whether the caller name displayed is the CPND from the Call Server or the name associated with the DN stored in the Personal Directory | CPND from the Call Server is displayed |
| Area code set-up | Configures how the incoming DN is displayed. If the area code of the incoming call matches a specified area code, the DN is displayed in the configured manner (for example, the area code may be displayed after the DN) | No area code |
| Name display format | Configures the format of the name display of the incoming call on the IP Phone.<br>There are two choices:<br><first name> <last name><br><last name> <first name> | <first name> <last name> |

***Note:*** The IP Phone 2002 does not display the New Call Indication on the idle screen at the same time as the date and time. Instead, the New Call Indication alternates with the date and time display.

## Redial List

Redial List supports the following features:

- maximum entries = 20
- maximum characters in name = 24
- maximum characters in DN = 31
- contains name, DN, and the time the last call to that DN occurred in each entry
- newest entry overwrites oldest entry once 20-entry limit is reached
- sort by the time the call is logged
- multiple actions:
    - dial DN of an entry
    - edit entry
    - copy entry
    - delete entry
    - delete contents of list
- one minute time-out

## IP Phone Application Server configuration and administration

The IP Phone Application Server runs on the Signaling Server. If less than 1000 users are supported, then the IP Phone Application Server can run on the same Signaling Server as Element Manager. If more than 1000 users are supported, then the IP Phone Application Server must run on a separate Signaling Server (preferably a Follower) with no co-located applications. Therefore, it is necessary to configure in Element Manager the ELAN interface IP address of the specific Signaling Server where the IP Phone Application Server is installed.

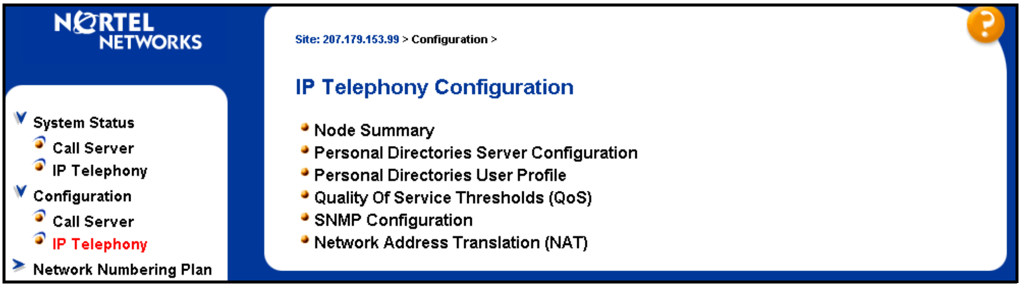
> ***Note:*** The IP Phone Application Server can be shared across multiple IP Telephony nodes on the same Call Server.

## Configure the IP Phone Application Server and remote backup

> ***Note:*** If the IP Phone Application Server must support more than 1000 users, refer to “Configure IP Phone Application Server on a separate Signaling Server” on page 156.

The IP Phone Application Server and remote backup configuration are configured in Element Manager by clicking (in the navigation tree) **Configuration > IP Telephony > Personal Directories Server Configuration**. See Figure 19.

**Figure 19**
**Personal Directory Server Configuration**

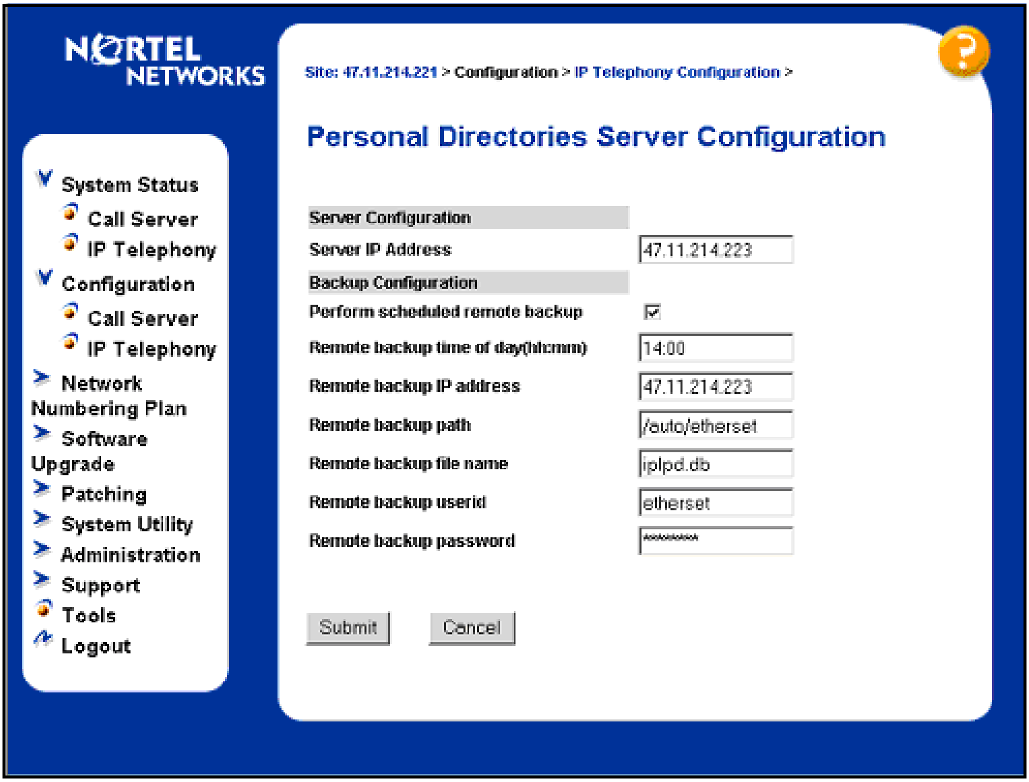

NORTEL NETWORKS
System Status
Call Server
IP Telephony
Configuration
Call Server
IP Telephony
Network Numbering Plan
Site: 207.179.153.99 > Configuration >
IP Telephony Configuration
Node Summary
Personal Directories Server Configuration
Personal Directories User Profile
Quality Of Service Thresholds (QoS)
SNMP Configuration
Network Address Translation (NAT)

Since a backup and restore of the IP Phone Application Server’s database can be performed, it is necessary to configure information to support the backup/restore functionality.

The following parameters are configured (see Figure 20 on page 154):

- ELAN interface IP address of the IP Phone Application Server where the database is located
- checkbox to turn on/off the remote backup functionality
- IP address of the server where the backup is saved
- path, filename, user ID, and password to support the backup/restore functionality

**Figure 20**
**Personal Directories Server Configuration window**



Site: 47.11.214.221 > Configuration > IP Telephony Configuration >

Personal Directories Server Configuration

| | |
|---|---|
| Server Configuration | |
| Server IP Address | 47.11.214.223 |
| Backup Configuration | |
| Perform scheduled remote backup | ☑ |
| Remote backup time of day(hh:mm) | 14:00 |
| Remote backup IP address | 47.11.214.223 |
| Remote backup path | /auto/etherset |
| Remote backup file name | iplpd.db |
| Remote backup userid | etherset |
| Remote backup password | ******** |

Table 37 provides a sample IP Phone Application Server configuration.

**Table 37**
**Sample IP Phone Application Server configuration**

| Data field name | Example | Description |
|---|---|---|
| Server Configuration | | |
| Server IP Address | 92.168.10.12 | IP address of the database server (for example, the Leader Signaling Server's ELAN network interface IP address) |
| Backup Configuration | | |
| Perform scheduled remote backup | Checkbox is selected | Select checkbox to enable scheduled remote backups. |
| Remote backup time of day (hh:mm) | 00:00 | the time of day to perform the backup (default is 00:00 midnight) |
| Remote backup IP address | 47.11.22.11 | remote backup server's IP address |
| Remote backup path | /auto/etherset | remote path where the back up file will be saved |
| Remote backup file name | ipldb.db | file name of the backup file |
| Remote backup userid | etherset | login name for the remote backup |
| Remote backup password | etherset | password for remote backup |

The Personal Directory, Callers List, and Redial List features are not available to the user if the Voice Gateway Media Cards to which the IP Phones are registered lose contact with the Signaling Server. The features become available again when contact with the Signaling Server is re-established.

*Note:* In a node composed of Voice Gateway Media Cards and Signaling Server(s), IP Phones only register to the Voice Gateway Media Cards when the Signaling Server(s) are not present due to a failure condition. Five minutes after a node election is completed, each Voice Gateway Media Card with IP Phones registered to it checks to see if a Signaling Server is present in the node. If a Signaling Server is present, any idle IP Phones that are found are reset (server-switched) back to S1 (Server 1) so they can re-register to the Signaling Server. If an IP Phone is busy, a one-minute timer is started. Every one minute, the process comes back to check for idle IP Phones and idle phones are reset. This checking continues until no IP Phones remain registered to the Voice Gateway Media Cards.

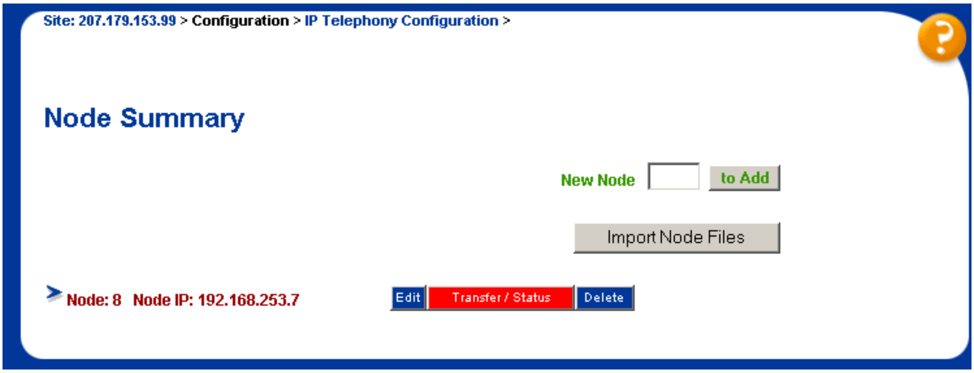
## Configure IP Phone Application Server on a separate Signaling Server

If the IP Phone Application Server must support more than 1000 users, follow the steps in Procedure 2 on page 157 to configure the IP Phone Application Server on a separate Signaling Server.

**Procedure 2**
**Configuring the IP Phone Application Server on a separate Signaling Server**

1 In Element Manager, configure a new node. Enter a unique Node ID in the **New Node** field. Click the **to Add** button. See Figure 21.

**Figure 21**
**Add a new node**



Site: 207.179.153.99 > Configuration > IP Telephony Configuration >

Node Summary

New Node

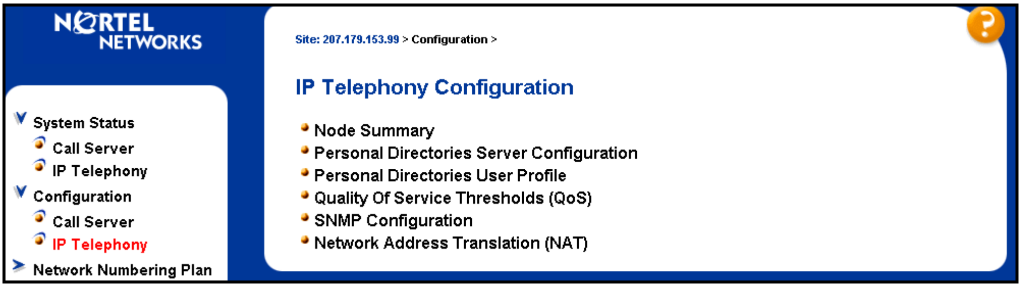
Node: 8 Node IP: 192.168.253.7

2 Configure the IP addresses and subnet masks for the Signaling Server.

3 Configure the IP Phone Application Server using the ELAN address of the new Signaling Server.

Click **Configuration** > **IP Telephony** > **Personal Directories Server Configuration**. See Figure 22 on page 158.

**Figure 22**
**Personal Directory Server Configuration**



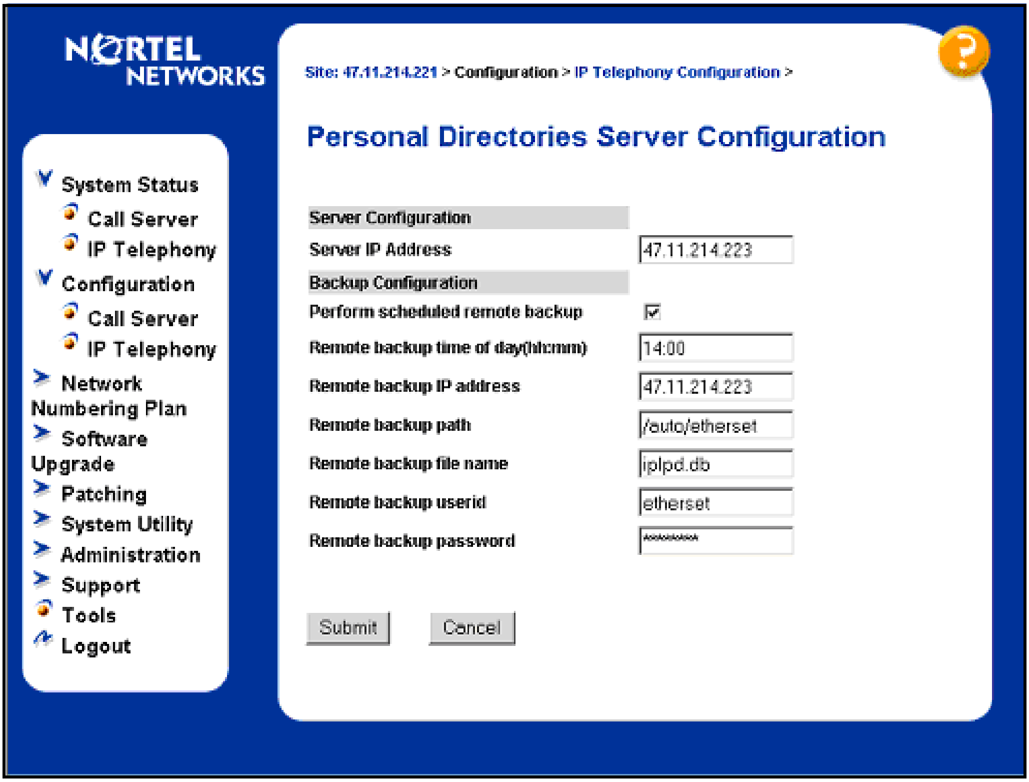
Site: 207.179.153.99 > Configuration >

IP Telephony Configuration

- Node Summary
- Personal Directories Server Configuration
- Personal Directories User Profile
- Quality Of Service Thresholds (QoS)
- SNMP Configuration
- Network Address Translation (NAT)

4 Configure the backup parameters for Personal Directory, Callers List, and Redial List and click **Submit**. See Figure 23 on page 159.
Refer to Table 37 on page 155 for more information.

**Figure 23**
**Personal Directories Server Configuration window**



Personal Directories Server Configuration

|  |  |
|---|---|
| **Server Configuration** |  |
| Server IP Address | 47.11.214.223 |
| **Backup Configuration** |  |
| Perform scheduled remote backup | ☑ |
| Remote backup time of day(hh:mm) | 14:00 |
| Remote backup IP address | 47.11.214.223 |
| Remote backup path | /auto/etherset |
| Remote backup file name | iplpd.db |
| Remote backup userid | etherset |
| Remote backup password | ********* |

5 Reboot the Signaling Server that was configured as the IP Phone Application Server.

6 When the Signaling Server comes back online, reset all the IP Phones by performing **isetResetAll** on every LTPS in the system. See Table 74 on page 595 for more information.

**End of Procedure**

## Alarms

If the IP Phone Application Server is not installed on the primary Signaling Server, and the other Signaling Server(s) cannot contact the IP Phone

Application Server, then an SNMP alarm is raised. The alarm indicates that the Personal Directory, Callers List, and Redial List are not available. If this occurs, the other Signaling Server(s) track the Signaling Server where the IP Phone Application Server resides. When contact with the IP Phone Application Server is made, Personal Directory, Callers List, and Redial List access is resumed.

# IP Phone Application Server database maintenance

All IP Phone Application Server database maintenance is performed in Element Manager.

Backup can be configured to occur daily at a scheduled time.

Database recovery can be performed for the entire database of the IP Phone Application Server or for one user's entries.

## IP Phone Application Server database backup

Follow the steps in Procedure 3 to perform a manual backup of the IP Phone Application Server's database.

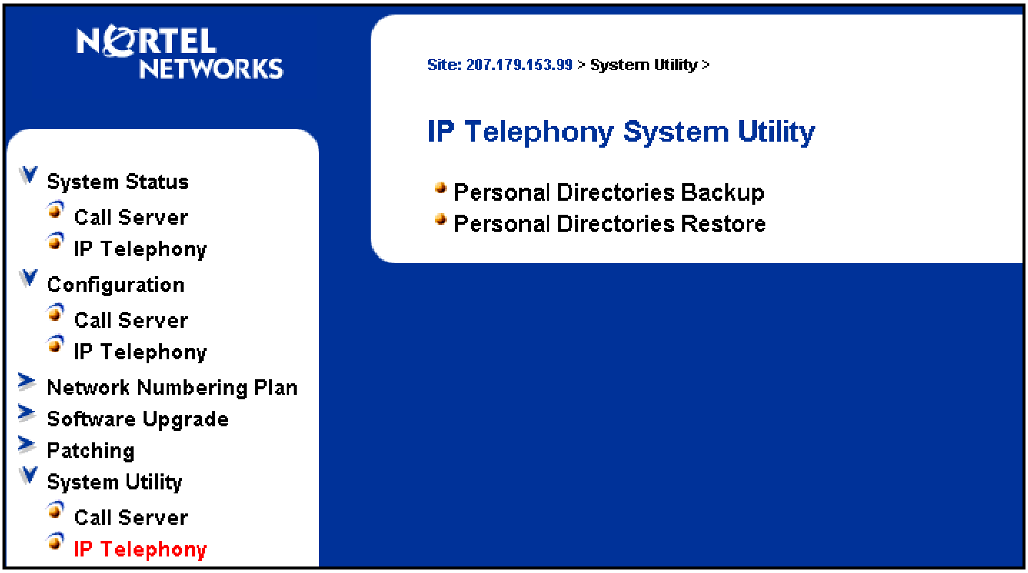
> ***Note:*** A scheduled backup of the database can also be configured. Refer to "Configure the IP Phone Application Server and remote backup" on page 153.

**Procedure 3**
**Backing up the IP Phone Application Server database Server manually**

1 Click **System Utility > IP Telephony**.

The **IP Telephony System Utility** window opens. See Figure 24 on page 161.

**Figure 24**
**IP Telephony System Utility window**



Site: 207.179.153.99 > System Utility >

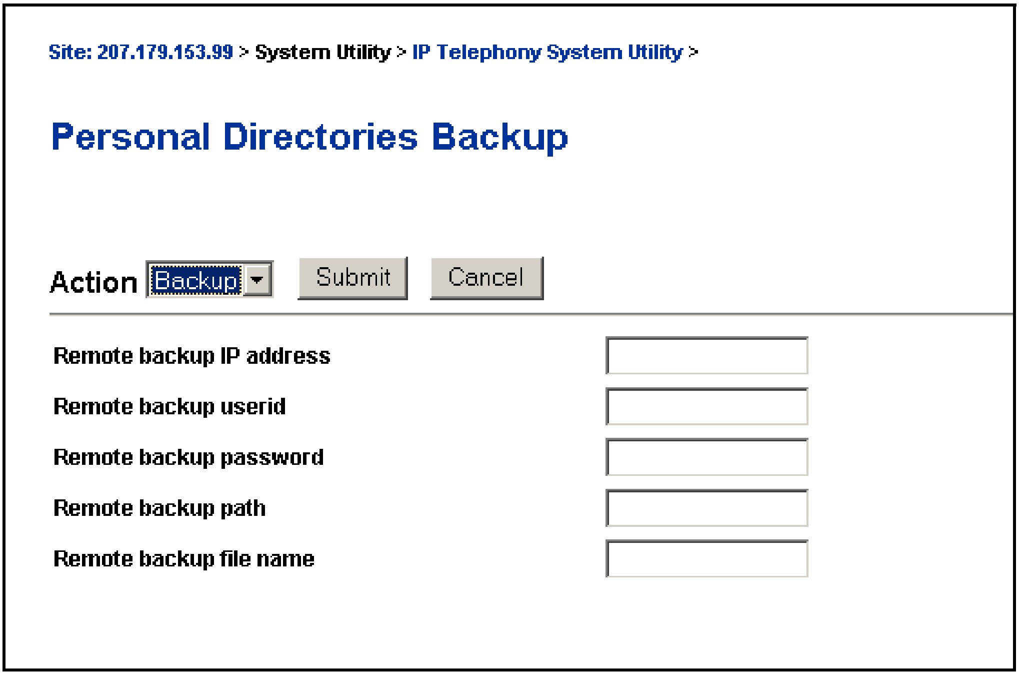
IP Telephony System Utility

- Personal Directories Backup
- Personal Directories Restore

2 Click **Personal Directories Backup.**

The **Personal Directories Backup** window opens. See Figure 25 on page 162.

**Figure 25**
**Personal Directories Backup window**



Site: 207.179.153.99 > System Utility > IP Telephony System Utility >

Personal Directories Backup

Action Backup

Remote backup IP address

Remote backup userid

Remote backup password

Remote backup path

Remote backup file name

3 Enter the data for the **Remote backup IP address**, **Remote backup userid**, **Remote backup password**, **Remote backup path**, and **Remote backup file name** fields.

4 Click **Submit**.

**End of Procedure**

## Full database recovery

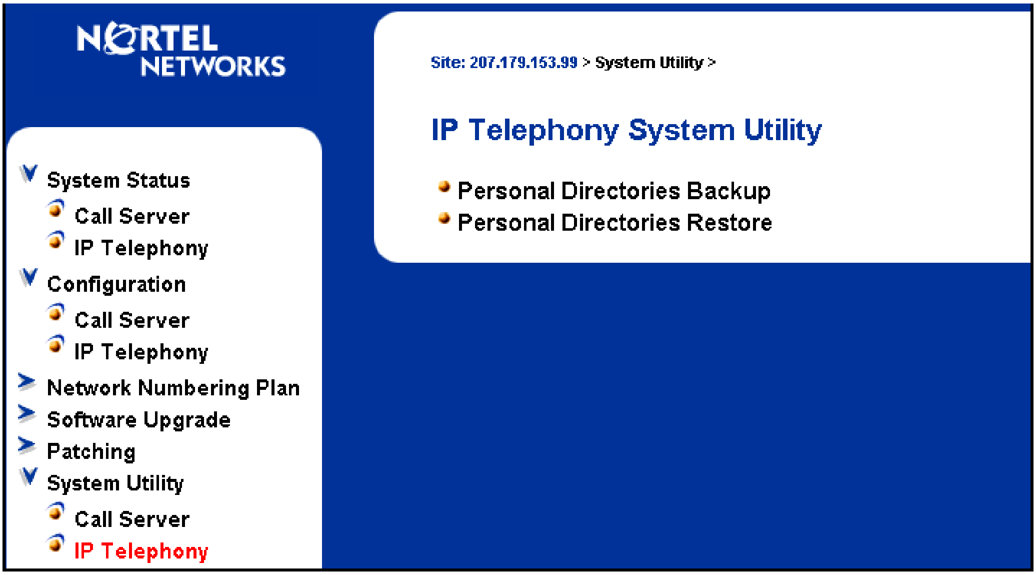
Follow the steps in Procedure 4 on page 163 to perform a full database backup for the IP Phone Application Server.

**Procedure 4**
**Performing a full database recovery**

1 Click **System Utility > IP Telephony**.

The **IP Telephony System Utility** window opens. See Figure 26.

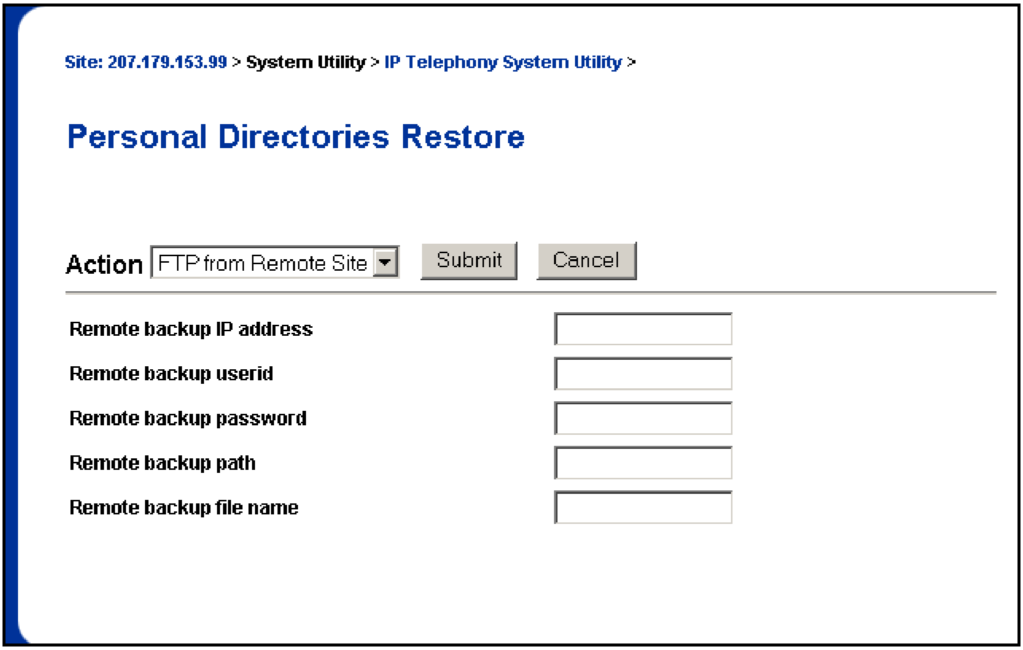
**Figure 26**
**IP Telephony System Utility window**



2 Click **Personal Directories Restore**.

The **Personal Directories Restore** window opens. See Figure 27 on page 164.

**Figure 27**
**Personal Directories Restore window**



Site: 207.179.153.99 > System Utility > IP Telephony System Utility >

Personal Directories Restore

3 From the **Action** drop-down list, select **FTP from Remote Site** if the backup is save on a remote server. If the backup is saved locally, go to Step 7.

4 Enter the data for the **Remote backup IP address**, **Remote backup userid**, **Remote backup password**, **Remote backup path**, and **Remote backup file name** fields.

5 Click **Submit**.

After the file is transferred by FTP to the local drive, a **Switch-over** button appears.

6 Click the **Switch-over** button.

7 If the backup is saved locally, select **Restore All Users** from the **Action** drop-down list and click **Submit**.

**End of Procedure**

*Note:* When switch-over occurs, the database is off-line for approximately two minutes.

## Selective database recovery for a single user

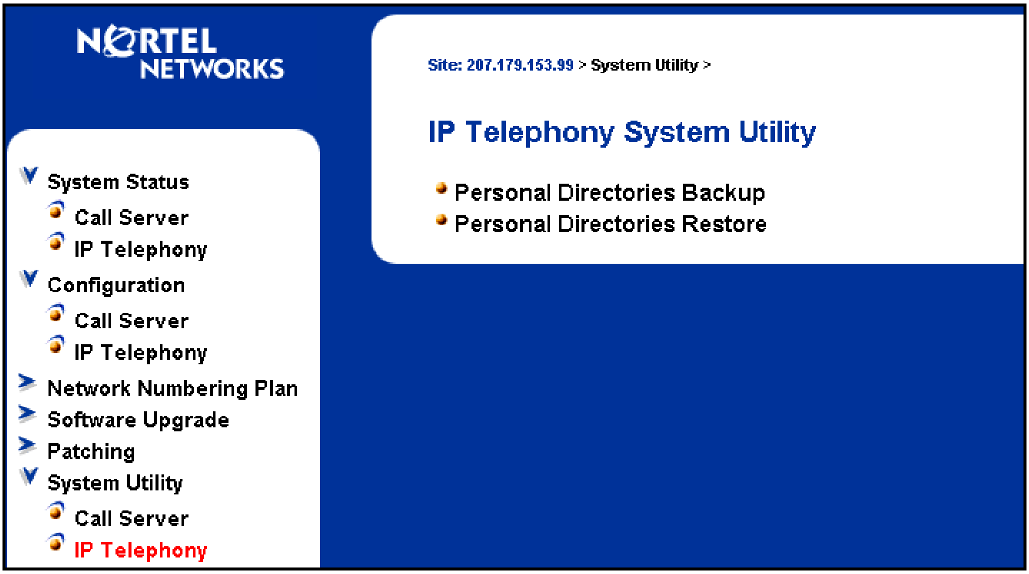
Follow the steps in Procedure 5 to perform a database recovery for a single user. The procedure cannot be performed unless there is a valid backup file.

**Procedure 5**
**Performing a selective database recovery**

1 Click **System Utility > IP Telephony**.

The **IP Telephony System Utility** window opens. See Figure 28.

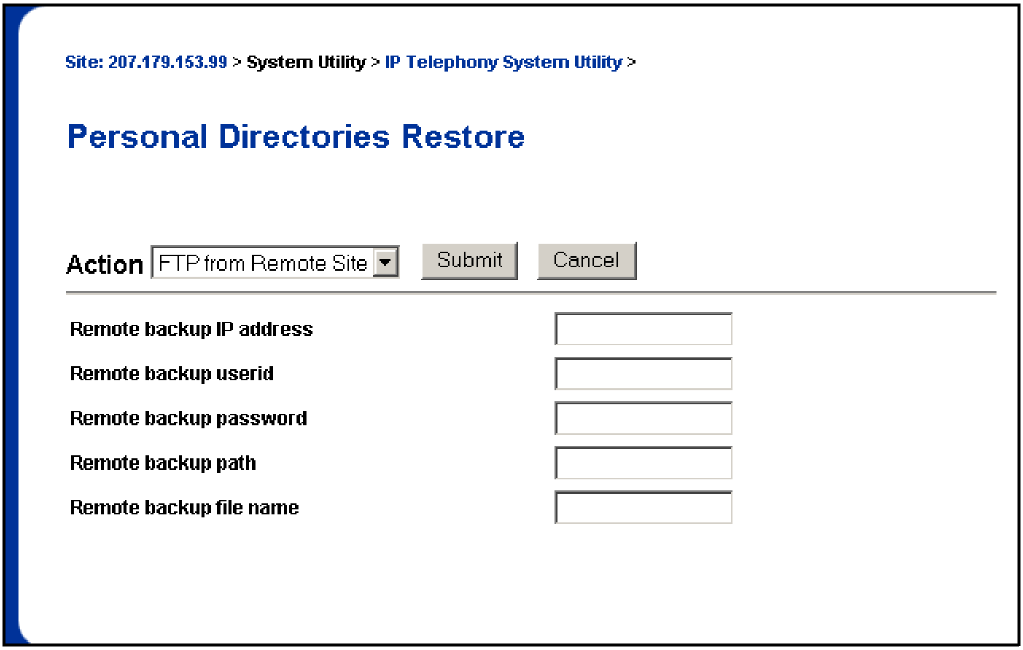
**Figure 28**
**IP Telephony System Utility window**



2 Click **Personal Directories Restore**.

The **Personal Directories Restore** window opens. See Figure 29.

**Figure 29**
**Personal Directories Restore window**



Site: 207.179.153.99 > System Utility > IP Telephony System Utility >

Personal Directories Restore

Action FTP from Remote Site

Remote backup IP address

Remote backup userid

Remote backup password

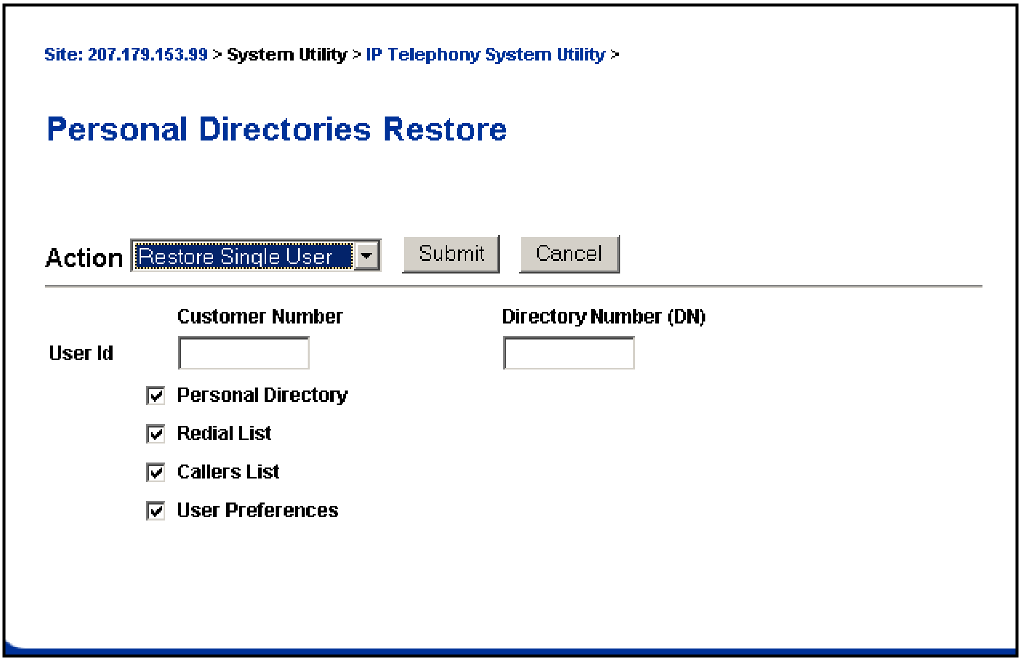
Remote backup path

Remote backup file name

3 From the **Action** drop-down list, select **Restore Single User**.

The **Personal Directories Restore** window for a single user opens. See Figure 30 on page 167.

Figure 30
Personal Directories Restore for a single user window



Site: 207.179.153.99 > System Utility > IP Telephony System Utility >

Personal Directories Restore

Action Restore Single User

User Id

Customer Number

Directory Number (DN)

☑ Personal Directory

☑ Redial List

☑ Callers List

☑ User Preferences

4 Enter the Customer Number and DN of the user.

5 Select the check box(es) of the data that is to be restored.

6 Click **Submit**.

**End of Procedure**

### Fault clearance

The recovery of the database clears any faults.

**Recommendation**

Nortel Networks recommends that the IP Phone Application Server be installed on a dedicated Signaling Server to ensure that database operations do not affect call processing.

## Call Server configuration

To provide password protection for an IP Phone user's Personal Directory, Callers List, and Redial List, Station Control Password (SCPW) must be configured on the Call Server. If SCPW is not configured, password administration on the IP Phone cannot be accessed.

In LD 15 and in Element Manager, a new prompt, DFLT_SCPW, has been added to the Flexible Feature Code (FFC) parameters for the Call Server. When DFLT_SCPW is set to YES, the system assigns a default password (the primary DN) to IP Phone users when an IP Phone is added or changed in LD 11.

**IMPORTANT!**

System administrators must ensure that users change the default password on the IP Phone to control access, as the default password is the same on all IP Phones when DFLT_SCPW is set to YES.

The new prompt DFLT_SCPW and the existing prompt Station Control Password Length (SCPL) are prompted only if FFC package 139 is enabled.

The SCPL is also defined in LD 15's Flexible Feature Code (FFC) configuration parameters and in Element Manager. If the SCPL length is changed, the change takes effect only after a data dump and then a sysload of the Call Server. The SCPL is changed to the new length during the sysload. If the length has been increased, then "0" is inserted at the beginning of the

SCPW to conform to the new length. If the password length has been reduced, then the leading digits are removed during the sysload.

# Password administration

The Station Control Password (SCPW) controls access to the user's private Personal Directory, Callers List, and Redial List information.

When the IP Phone first registers to the system after it has been created, by default the password protection is turned off. If a default password has been defined for the user, then the user can enable or disable password protection and change the password. The changed password is updated on the Call Server and can be viewed in LD 20. Other applications that use this password, such as Virtual Office and Remote Call Forward, are affected by the password change.

## Initial password

When an IP Phone first registers with the system, by default the password protection is turned off. SCPW must be initially configured for each user. If no SCPW has been defined, password protection for the IP Phone cannot be enabled. The prompt DFLT_SCPW in LD 15 specifies that a default SCPW is assigned to an IP Phone user when an IP Phone is added or changed in LD 11. See Table 38.

**Table 38**
**LD 15 – Enable a default SCPW. (Part 1 of 2)**

| Prompt | Response | Description |
|---|---|---|
| REQ: | CHG | Change existing data. |
| TYPE: | FFC | Change Flexible Feature Code parameters. |
| CUST | | Customer number |
| | 0 – 99 | Range for Large System and CS 1000E system |
| | 0 – 31 | Range for CS 1000M Small System, Meridian 1 Small System, CS 1000S system, Media Gateway 1000B, and Media Gateway 1000T |

**Table 38**
**LD 15 – Enable a default SCPW. (Part 2 of 2)**

| Prompt | Response | Description |
|---|---|---|
| ... | | |
| FFCS | (NO) YES | Change Flexible Feature Code end-of dialing indicator. |
| ADLD | (0) – 20 | Auto Dial Delay (in seconds) |
| DFLT_SCPW | (NO) YES | Default Station Control Password<br>NO = disable Default Station Control Password (default)<br>When DFLT_SCPW = YES, the system automatically assigns an SCPW when a new IP Phone 2002, IP Phone 2004, or IP Softphone 2050 is created.<br>***Note:*** An SCPW is not automatically assigned to an existing IP phone unless that IP Phone is given a service change. |

## Password guessing protection

A password retry counter tracks how many incorrect password entries are made. If the IP Phone password verification fails three times in one hour, then the user is locked out for one hour. This means that the Personal Directory, Callers List, and Redial List cannot be accessed and no password administration can be performed. A message displays on the IP Phone to indicate that access is locked.

After one hour, the retry counter is reset and access is unlocked. The retry counter also resets when the password is entered correctly.

The administrator can reset the counter and unlock the access either in Element Manager or in LD 32.

*Note:* If a user is locked out from using their SCPW to access their Personal Directory, Callers List, and Redial List, then the user is also blocked from accessing their Virtual Office login, since VO uses the same SCPW. Conversely, a user who is locked out from the VO login is also locked out from accessing their Personal Directory, Callers List, and Redial List.

## Forgotten password

If the user forgets his or her IP Phone password, the administrator can reset the retry counter and change the user's password in Element Manager. Once the administrator changes the password, the lock is released automatically.

# User profile management

The User Profile screen(s) in Element Manager are used to perform all administer-related maintenance functions for a user. These functions include:

- erasing databases for a user
- viewing a user profile
- resetting the password

Once a user profile is selected, a user identification number (ESN+DN) must be entered to retrieve a user profile from the datbase.When a user profile has been retrieved from the database, an administrator can perform the following functions:

- move/copy the following to another user:
  - — user profile
  - — Personal Directory
  - — Callers List
  - — Redial List
- delete Personal Directory
- delete Callers List
- delete Redial List

- delete user preferences
- delete all user-related databases
- reset user's SCPW to the default
- unlock the user's SCPW

***Note:*** If a user's Personal Directory, Callers List, Redial List, and User Preferences are all removed individually, this has the same effect as selecting the "Delete all user-related databases" option. Either way, all the data related to that user is deleted from the database. The user's entry must be recreated the next time the user tries to access his or her Personal Directory, Callers List, and Redial List.

## User profile management in Element Manager

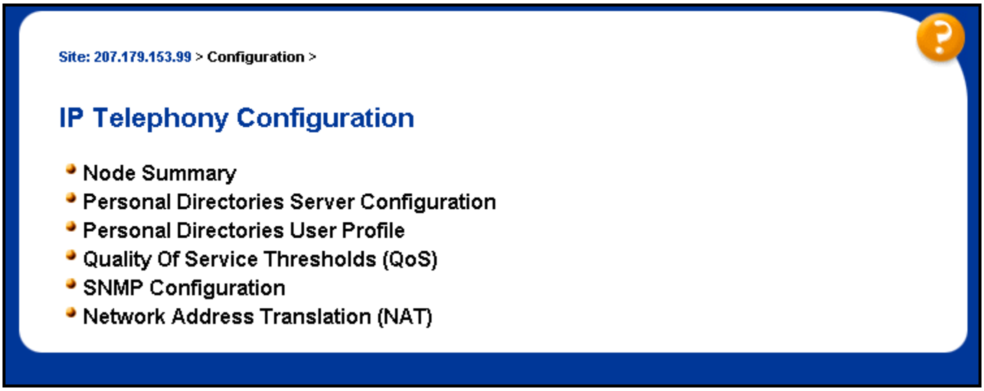
To access the user profile management functionality in Element Manager, follow the steps in Procedure 6.

**Procedure 6**
**Accessing User Profile Management in Element Manager**

1 Select **Configuration > IP Telephony** in the Element Manager navigation tree.

The IP Telephony Configuration window opens. See Figure 31.

**Figure 31**
**IP Telephony Configuration window**



Site: 207.179.153.99 > Configuration >

IP Telephony Configuration

- Node Summary
- Personal Directories Server Configuration
- Personal Directories User Profile
- Quality Of Service Thresholds (QoS)
- SNMP Configuration
- Network Address Translation (NAT)

**2** Click the **Personal Directories User Profile** link.

The **Personal Directories User Profile Configuration** window opens.

**3** From the drop-down list, select the desired action.

**End of Procedure**

## Reset the IP Phone user password

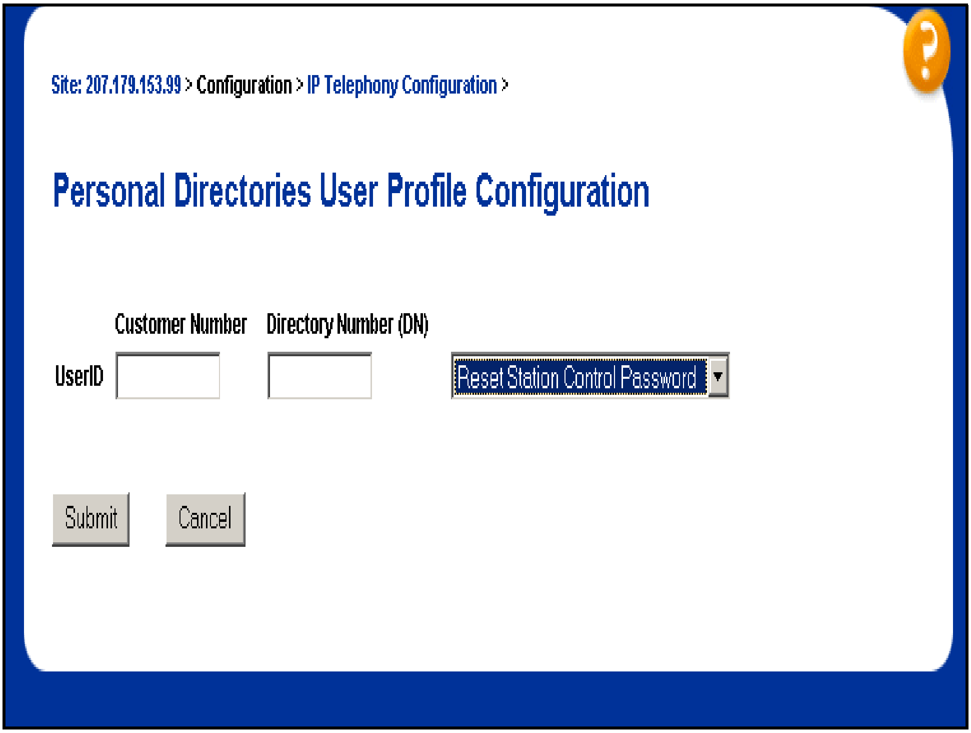
To reset the password for an IP Phone user, follow the steps in Procedure 7.

**Procedure 7**
**Resetting the IP Phone user password**

**1** Select **Reset Station Control Password** from the drop-down list from the drop-down list in the **Personal Directories User Profile Configuration** window.

The Reset Station Control Password window opens. See Figure 32 on page 174.

**Figure 32**
**Reset password window**



Site: 207.179.153.99 > Configuration > IP Telephony Configuration >

Personal Directories User Profile Configuration

| | Customer Number | Directory Number (DN) | |
|---|---|---|---|
| UserID | | | Reset Station Control Password |

2 Enter the User ID.

3 Click **Submit** or click **Cancel** to cancel the action.

**End of Procedure**

## Copy a Personal Directory to another user

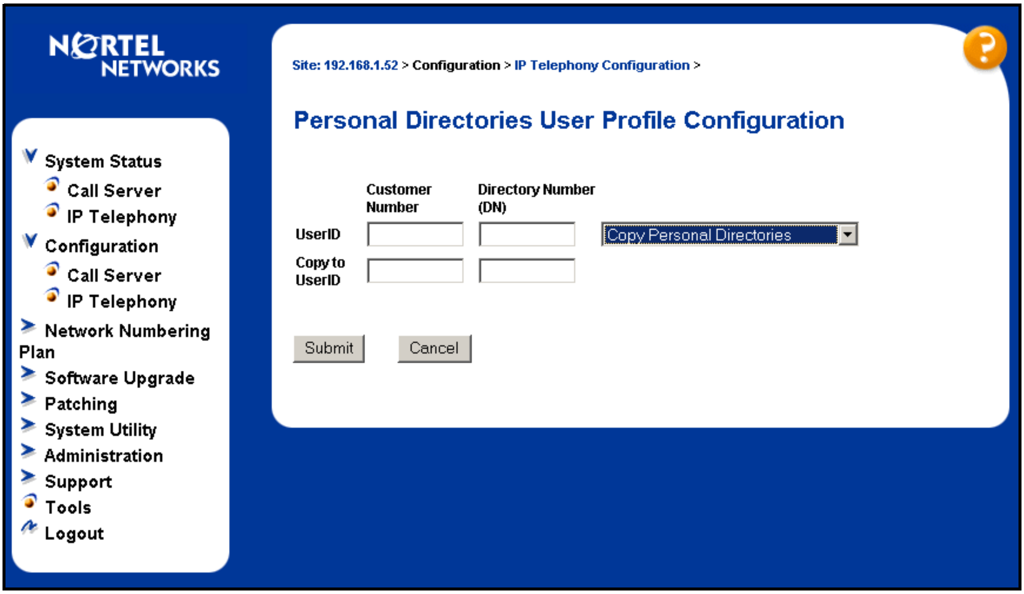
To copy a user's Personal Directory to another user, follow the steps in Procedure 8 on page 175.

### Procedure 8
### Copying a Personal Directory to another user

1 Select **Copy Personal Directories** from the drop-down list from the drop-down list in the **Personal Directories User Profile Configuration** window.

The Copy Personal Directories window opens. See Figure 33.

**Figure 33**
**Copy Personal Directories window**



Site: 192.168.1.52 > Configuration > IP Telephony Configuration >

Personal Directories User Profile Configuration

| | Customer Number | Directory Number (DN) | |
|---|---|---|---|
| UserID | | | Copy Personal Directories |
| Copy to UserID | | | |

2 Enter the User ID of the user from which the Personal Directory is being copied and the User ID of the user who will receive the Personal Directory copy.

3 Click **Submit**. Click **Cancel** to cancel the action.

**End of Procedure**

## Delete a Personal Directory, Callers List, Redial List, or user preferences

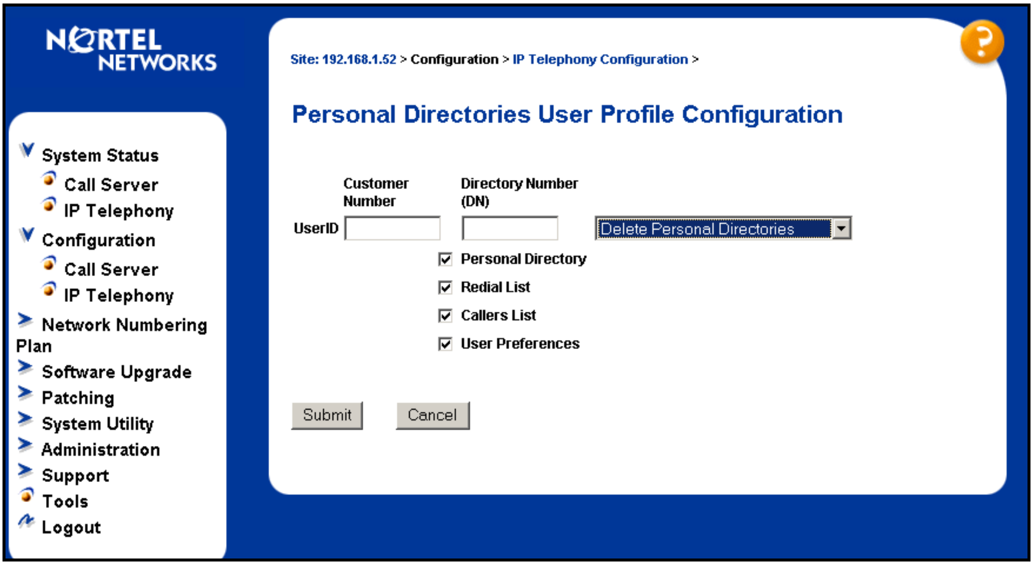
To delete a Personal Directory, Redial List, Callers List, or User Preferences, follow the steps in Procedure 9.

### Procedure 9
### Deleting a Personal Directory, Callers List, Redial List, or user preferences

1 Select **Delete Personal Directories** from the drop-down list from the drop-down list in the **Personal Directories User Profile Configuration** window.

The Delete Personal Directories window opens. See Figure 34.

**Figure 34**
**Delete Personal Directories window**



Site: 192.168.1.52 > Configuration > IP Telephony Configuration >

Personal Directories User Profile Configuration

UserID Customer Number [ ] Directory Number (DN) [ ] Delete Personal Directories ▼

☑ Personal Directory
☑ Redial List
☑ Callers List
☑ User Preferences

2 Select the item or items to be deleted.

**3** Click **Submit** or click **Cancel** to cancel the action.

**End of Procedure**

When a new user is configured on the Call Server, a user profile can be copied to create the new user profile. If a new IP Phone registers and the user is not found in the database, then the system automatically creates a user profile based on default settings and the data on the IP Phone. In this case, the Personal Directory, Callers List, and Redial List are automatically created as empty lists.

# Codecs

## Contents

This section contains information on the following topics:

## Introduction

The IP Phones and Voice Gateway Media Cards support different codecs and codec parameters with different compression rates and audio quality. The CS 1000 and Meridian 1 systems select the appropriate codecs based on user-configurable parameters.

For instance, an IP Phone-to-IP Phone call in the same zone within a LAN can be set up using G.711 at 64 Kbps. For an IP Phone-to-IP Phone 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 Line Terminal Proxy Server (LTPS) 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 IP Phone-to-IP Phone or IP Phone-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 IP Phone 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 LTPS, and on the system.

Table 39 shows which codecs are supported on the CS 1000 and Meridian 1 systems.

**Table 39**
**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 4.0, 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:* The MVC 2050 supports only the G.711 codec with 30 ms payload.

*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.

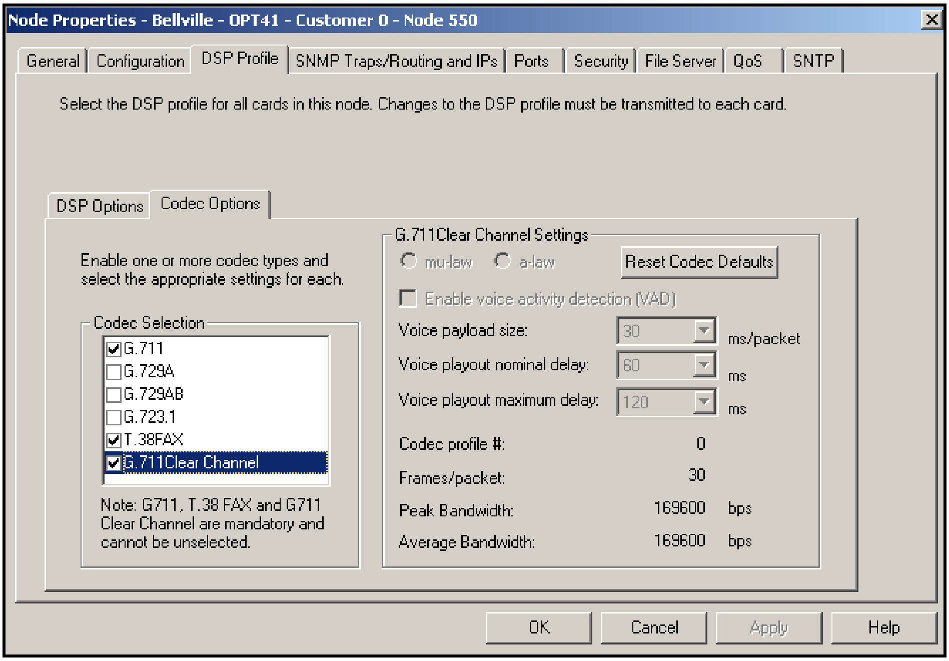
# Codec configuration

Configure the codec in the DSP Profile sections of OTM 2.2 and Element Manager.

## Codec selection in OTM 2.2

Figure 35 shows the list of codecs available on the DSP Profile tab within OTM's IP Line 4.0 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 35**
**Codec list on OTM 2.2**



Node Properties - Bellville - OPT41 - Customer 0 - Node 550

Select the DSP profile for all cards in this node. Changes to the DSP profile must be transmitted to each card.

Enable one or more codec types and select the appropriate settings for each.

Codec Selection

☑ G.711
☐ G.729A
☐ G.729AB
☐ G.723.1
☑ T.38FAX
☑ G.711Clear Channel

Note: G711, T.38 FAX and G711 Clear Channel are mandatory and cannot be unselected.

G.711Clear Channel Settings

○ mu-law ○ a-law

☐ Enable voice activity detection (VAD)

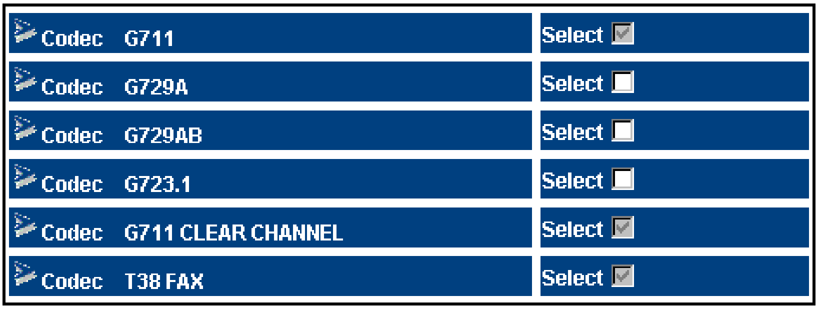
Voice payload size: 30 ms/packet
Voice playout nominal delay: 60 ms
Voice playout maximum delay: 120 ms
Codec profile #: 0
Frames/packet: 30
Peak Bandwidth: 169600 bps
Average Bandwidth: 169600 bps

For more information, see “Configure DSP profile data” on page 271.

## Codec selection in Element Manager

Figure 36 shows the list of codec types that are displayed in Element Manager.

**Figure 36**
**Codec list in Element Manager**



| | |
|---|---|
| Codec G711 | Select ☑ |
| Codec G729A | Select □ |
| Codec G729AB | Select □ |
| Codec G723.1 | Select □ |
| Codec G711 CLEAR CHANNEL | Select ☑ |
| Codec T38 FAX | Select ☑ |

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 page 349.

# Codec registration

After the configuration of codecs is complete, the IP Phones and DSPs have to register the configured codecs with the Call Server.

## Codec registration for IP Phones

The IP Phones 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 IP Phone is two: G.711 a-law and G.711 mu-law (G.711 is always configured).

The maximum number of codecs registered for an IP Phone is five: G.711 a-law, G.711 mu-law, G729A, G729AB, and G.723.1.

> ***Note:*** IP Phones 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 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 six codecs are actually registered:

1. G.711 a-law (10 msec)
2. G.711 mu-law (10 msec)
3. G.729AB (30 msec)
4. G.729A (50 msec)
5. T.38
6. 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.723.1 codec does 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 four codecs can be registered - the G.711 a-law and mu-law for BQ codec, and some BB codecs (defined by the following rules).
    - — If the G.729A codec is configured, only the G.729A codec is registered with the Call Server.
    - — If the G.729AB codec is configured, the G.729A codec and the G.729AB codec are registered with the Call Server.
    - — If the G.723 codec is configured, the G.723 codec is registered with the Call Server.

### 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, G.729A, 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 IP Phone/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 40 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 40**
**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 Slave then Master) 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 Slave node 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 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 41 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 41**
**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 IP Phones. It also includes information on what is required before beginning the installation procedures.

Read “Codecs” on page 179 before installing an IP Telephony node.

## Before you begin

Ensure that the system meets the following minimum requirements:

- CS 1000 or Meridian 1 system running CS 1000 Release 4.0 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 42 on page 199.

2 Complete the IP Phone configuration data summary sheet. See Table 43 on page 200.

3 Install the hardware components:

- **a.** Install the Voice Gateway Media Card(s). See Procedure 10 on page 208 for installing the ITG-P 24-port line cards and Procedure 12 on page 216 for installing the Media Card 8-port and 32-port line cards.

- **b.** Cable the Voice Gateway Media Cards:

  - **i.** Install the ELAN network, TLAN network, serial interface cable for the ITG-P 24-port line card. See Procedure 14 on page 224.

  - **ii.** Install the Shielded 50-pin to Serial/ELAN/TLAN Adapter for the Media Card 8-port and 32-port line card. See Procedure 15 on page 228.

4 Configure IP Line data on the system:

- **a.** Configure the IP address for the ELAN network interface. See Procedure 16 on page 229.

- **b.** Configure VoIP bandwidth management zones. See page 230.

- **c.** Configure IP Line physical TNs. See page 234.

- **d.** Configure virtual superloops. See page 240.

- **e.** Configure Small System (if applicable) mapping of virtual superloops. See page 241.

- **f.** Configure IP Phone features. See page 243.

5 Configure IP Line data using Element Manager:

a. Manually add an IP Telephony node. See page 339.

b. Configure SNMP traps and community names access for security. See page 345.

c. Configure DSP Profile data. See page 349.

d. Configure DiffServ CodePoint (DSCP) data, 802.1Q support, and NAT support. See page 355.

e. Configure Call Server ELAN network interface (Active ELNK) IP address, TLAN Voice port (RTP UDP port), and the routing tables on the Voice Gateway Media Card. See page 357.

f. Configure file server access. See page 362.

g. Configure the loss plan. See page 364.

h. Configure Voice Gateway Media Care properties. See page 365.

6 Submit and transfer the node information to the Call Server. See page 368.

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

a. Set Leader IP Address. See Procedure 51 on page 373.

b. Transmit node and card properties to the Leader. See Procedure 52 on page 375.

8 Upgrade the card software and IP Phone firmware:

a. Verify card software version. See page 386.

b. Verify card firmware release. See page 389.

c. Download software and firmware files from the Nortel Networks web site. See page 392.

d. Upload the software and firmware files to the file server. See page 393.

e. Upgrade the software on the Voice Gateway Media Card. See page 396.

f. Reboot the card. See page 400.

g. Upgrade the firmware on the card. See page 400.

**9** Configure OTM alarm notification feature to receive IP Line SNMP traps. See Procedure 38 on page 322.

**10** Assemble and install an IP Phone. Refer to *IP Phones: Description, Installation, and Operation* (553-3001-368).

**11** Change the default IP Line CLI (IPL>) Shell password. See Procedure 63 on page 435.

**12** Configure the IP Phone Installer Passwords (see page 425).

**a.** Enable and set the administrative IP Phone Installer Password. See Procedure 63 on page 435.

**b.** If needed, enable and set a temporary IP Phone Installer Password. See Procedure 64 on page 438.

## Voice Gateway Media Card installation summary sheet

Nortel Networks recommends that a Voice Gateway Media Card installation summary sheet (see Table 42 on page 199) 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:

- MAC address. This is the ELAN network interface MAC address on the Voice Gateway Media Card faceplate sticker (for example, 00:60:38:01:12:77).
- ELAN network interface IP address, used to perform management through OTM and to communicate with the system
- TLAN Node IP address for the IP Telephony node
- TLAN network interface IP address on each card
- IP address of the active ELNK Ethernet interface on the system core

Nortel Networks recommends that an IP Phone configuration data summary sheet (see Table 43 on page 200) be filled out as the IP Phones are installed and configured.

**Table 42**
**Voice Gateway Media Card installation summary sheet**

**Site________________ Meridian 1/CS 1000 system ___________________**
**Meridian 1/CS 1000 customer________________________**
**Node ID (Number)________________________**
**TLAN Node IP address________________________**
**Meridian 1/CS 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<br>(OTM: Leader1) |
| | | | | Follower |
| | | | | Follower |
| | | | | Follower |
| | | | | Follower |
| | | | | Follower |
| | | | | Follower |
| | | | | Follower |
| | | | | Follower |
| | | | | Follower |
| | | | | Follower |

**Table 43**
**IP Phone 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 |
| | | | | | | | | |
| | | | | | | | | |
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*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 Media Card line cards), and associated cables.

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

**IMPORTANT!**

The maximum number of Voice Gateway Media Cards that can be installed in each node is 30. When more than 30 Voice Gateway Media Cards are needed on a single CS 1000 system, then multiple nodes must be used. The maximum number of Signaling Servers and Voice Gateway Media Cards that can be combined within a node is 35.

### Meridian 1

If configuring IP Line 4.0 on a Meridian 1, the remainder of the configuration of IP Line data is completed using Optivity Telephony Manager (OTM) 2.2.

### CS 1000

If configuring IP Line 4.0 on a CS 1000 system, the remainder of the configuration of IP Line data is completed using Element Manager.

## Installation and configuration procedures

The following is a list of procedures in this chapter:

- “Installing the ITG-P 24-port line card” on page 208
- “Installing the CompactFlash card on the Media Card” on page 210

- “Installing the Media Card” on page 216
- “Replacing the existing I/O Panel Filter Connector” on page 218
- “Installing the NTMF94EA ELAN, TLAN, serial interface cable” on page 224 for the ITG-P Line Card
- “Installing the Shielded 50-pin to Serial/ELAN/TLAN Adapter onto the Media Card” on page 228 for the Media Card
- “Configuring the ELAN network interface IP address for the active ELNK” on page 229

# 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 IP Phone products.

## Required equipment

The required equipment includes the following:

- a PC to manage IP Line 4.0, with the following installed:
  - OTM 2.2 must be installed for a Meridian 1 system
  - Internet Explorer 6.0.2600 (or later) to run Element Manager for CS 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 network interface (optional auto-sensing) to support TLAN and 10BaseT ELAN network connections
- 10/100BaseT network interface (optional auto-sensing) in each location where an IP Phone 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 4.0 software; the Media Card 8-port and 32-port line cards and the ITG-P 24-port line card.

- See page 209 for installation instructions for the Media Card 8-port and 32-port line card.
- See page 207 for installation instructions for the ITG-P 24-port line card.

> **IMPORTANT!**
>
> The ITG-P 24-port card is not supported in the Media Gateway 1000E of the CS 1000E system.

### Voice Gateway Media Card

If a Media Card 32-port card, a Media Card 8-port card, or an ITG-P 24-port card is running IP Line 4.0 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 44**
**Installation summary (Part 1 of 2)**

| Step | ITG-P 24-port line card | Media Card line card |
|---|---|---|
| Determine card slot. | See "Identify the IPE card slots on a CS 1000M or Meridian 1" on page 206 | See "Identify the IPE card slots on a CS 1000M or Meridian 1" on page 206 |
| Unpack the card. | Remove all contents from the packaging box. | Remove all contents from the packaging box. |
| Install the CompactFlash Card. | Not applicable | Procedure 11 on page 210 |
| Install the Voice Gateway Media Cards. | Procedure 10 on page 208 | Procedure 12 on page 216 |
| Install NTCW84JA ITG-specific I/O Panel Filter Connector for Option 51C/61C/81/81C. | Procedure 13 on page 218 | Procedure 13 on page 218 |
| Install the NTMF94EA ELAN, TLAN, RS-232 Serial Maintenance I/O interface cable. | Procedure 14 on page 224 | Not applicable |
| Install the A0852632 Shielded 50-pin to Serial/ELAN/TLAN Adapter. | Not applicable | Procedure 15 on page 228 |

**Table 44**
**Installation summary (Part 2 of 2)**

| Step | ITG-P 24-port line card | Media Card line card |
|---|---|---|
| Configure card as a Leader or Follower. | In OTM 2.2:<br>Procedure 31 on page 296<br>In Element Manager:<br>Procedure 51 on page 373 (Leader)<br>Procedure 53 on page 379 (Follower) | In OTM 2.2:<br>Procedure 31 on page 296<br>In Element Manager:<br>Procedure 51 on page 373 (Leader)<br>Procedure 53 on page 379 (Follower) |
| Add the card and configure the card properties | In OTM 2.2:<br>Procedure 22 on page 269<br>In Element Manager:<br>Procedure 49 on page 365 | In OTM 2.2:<br>Procedure 22 on page 269<br>In Element Manager:<br>Procedure 49 on page 365 |
| Transmit/Transfer properties | In OTM 2.2:<br>Procedure 32 on page 298<br>Procedure 33 on page 300<br>In Element Manager:<br>Procedure 52 on page 375 | In OTM 2.2:<br>Procedure 32 on page 298<br>Procedure 33 on page 300<br>In Element Manager:<br>Procedure 52 on page 375 |

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

Depending on the module that is used, the ITG-P 24-port line card must be installed in a specific slot. Use Table 45 to identify the IPE card slots selected for the Voice Gateway Media Card.

**Table 45**
**Voice Gateway Media Card installation by module type**

| C 1000M/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 page 757.

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

Each ITG-P 24-port line card requires two slots in the CS 1000 or Meridian 1. 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 ESD DEVICES**

Wear an ElectroStatic Discharge Strap (ESDS) when handling ITG-P 24-port and 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 CAT5 Ethernet cable between the ITG-P 24-port line card TLAN network interface and the Layer 2 switch must have a length of 50 meters or less for proper operation of the TLAN network interface

To install an ITG-P 24-port line card, follow the steps in Procedure 10 on page 208.

**Procedure 10**
**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 198, and Table 42 on page 199.

**Table 46**
**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 start-up 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 64 on page 569 for a list of the ITG-P 24-port line card display codes.

**End of Procedure**

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

The 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 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 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 Media Card package contains the following items:

- Media Card
- CompactFlash card
- retaining pin

The CompactFlash card must be installed on the Media Card before installing the Media Card in the system. Follow the steps in Procedure 11 on page 210 to install the CompactFlash card.

> ***Note:*** If it is necessary to remove the CompactFlash card, follow the steps outlined in Procedure 101 on page 645.

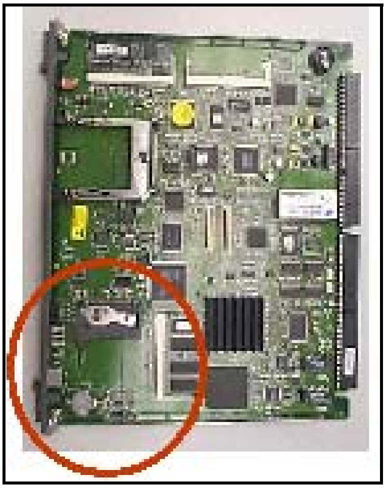
**Procedure 11**
**Installing the CompactFlash card on the Media Card**

1 Remove the Media Card and CompactFlash card 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-dissipating surface.

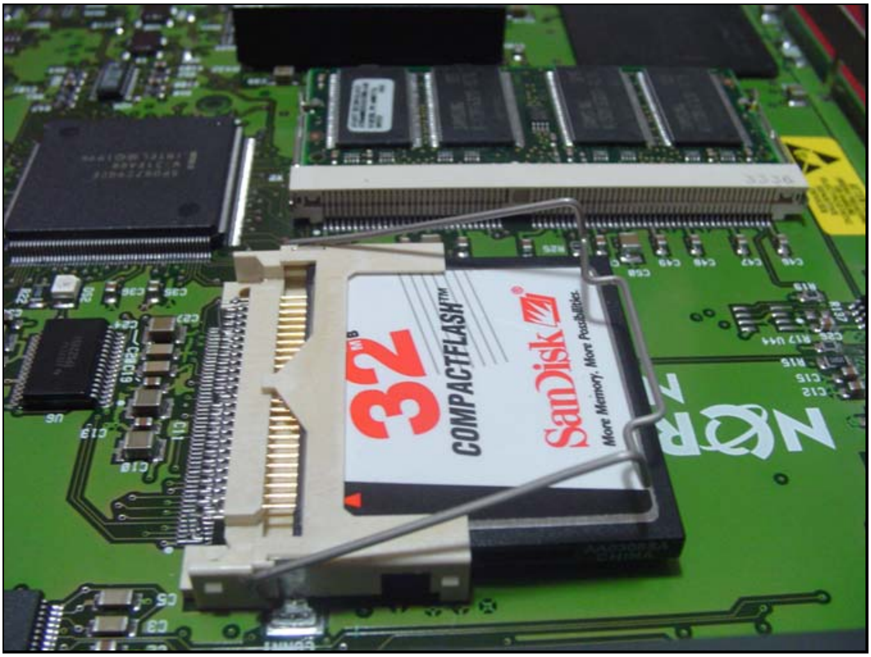
2 Locate the CompactFlash card socket in the lower left-hand corner of the Media Card. See Figure 37.

**Figure 37**
**CompactFlash card socket on Media Card**



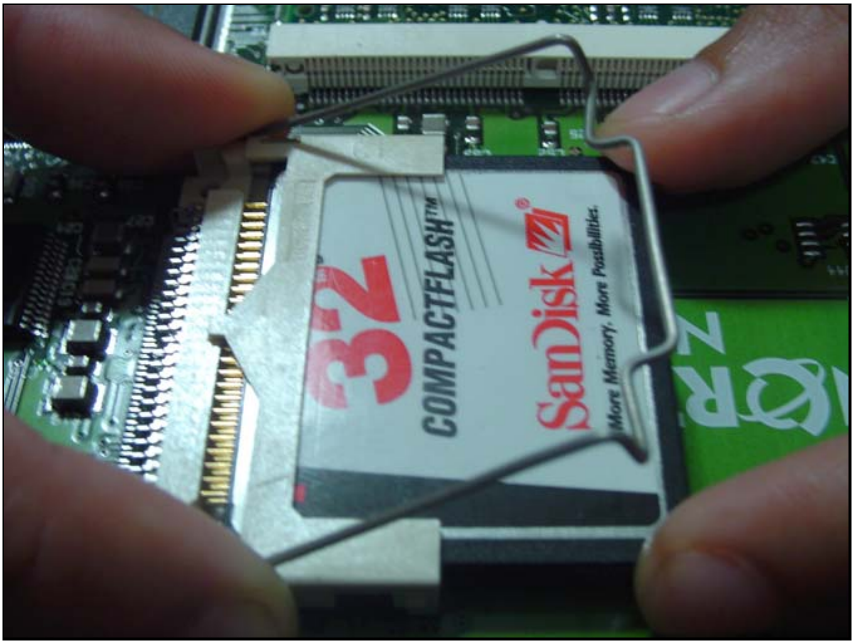
3 Position the CompactFlash card with the label facing up, the metal clip pulled up, and contact pins toward the socket as shown in Figure 38 on page 211.

**Figure 38**
**Position the CompactFlash in socket**



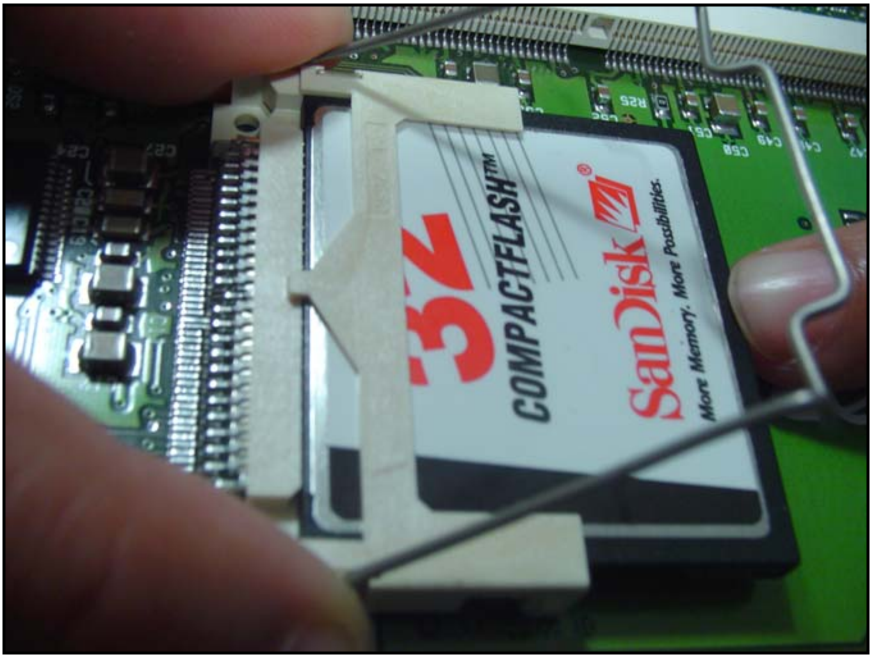
4 Insert the Compact Flash card in the socket. Ensure force is applied equally at both ends of the Compact Flash when pushing it in. See Figure 39 on page 212.

**Figure 39**
**Insert CompactFlash**



5 Gently insert the CompactFlash card, so that it is fully in contact with the connectors on the drive. See Figure 40 on page 213.

**Figure 40**
**Seat CompactFlash card**



**6** Push the metal clip down so that the CompactFlash card is locked in. See Figure 41 on page 214.

**Figure 41**
**Lock card into place**

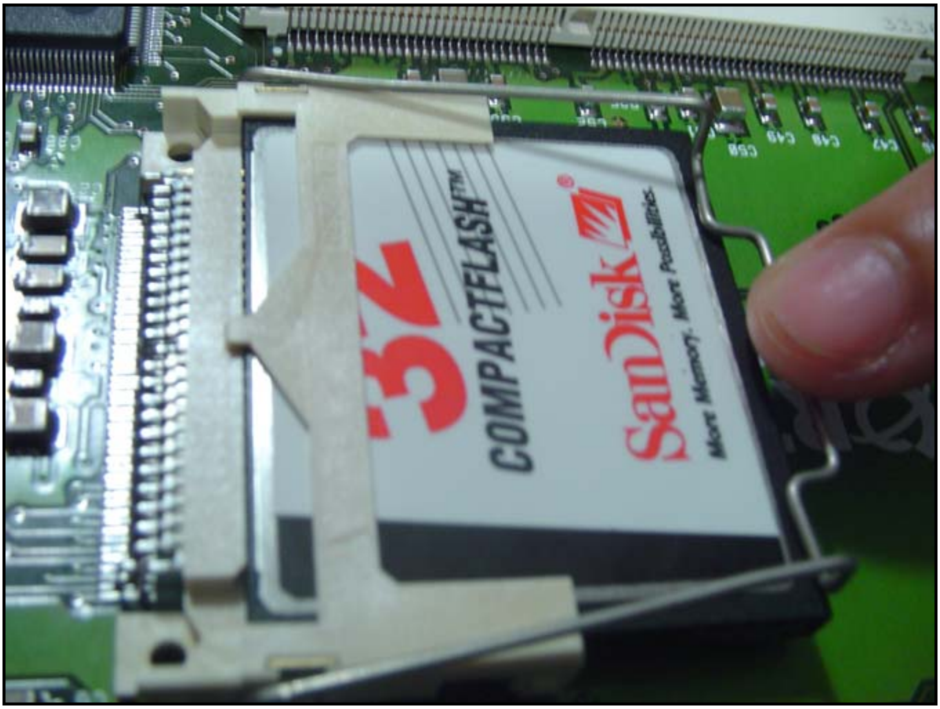
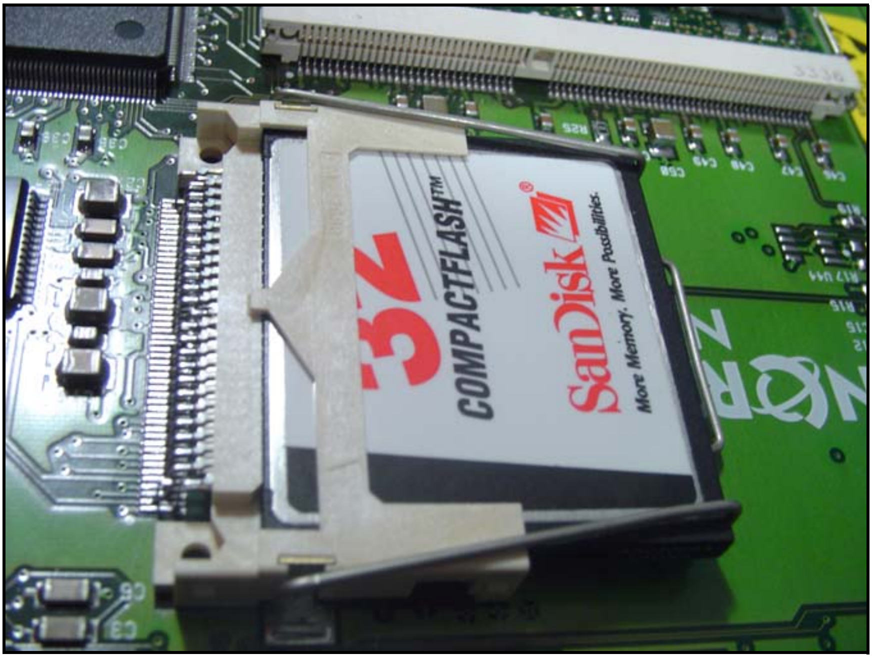


**Figure 42**
**CompactFlash card locked into position**



**End of Procedure**

## Install the Media Card

To install a Media Card, follow the steps in Procedure 12.

**Procedure 12**
**Installing the Media Card**

**1** For each Media Card in the node, identify the IPE card slot selected for the Media Card. Use the information from the "Voice Gateway Media Card installation summary sheet" on page 198, and Table 42 on page 199.

**Table 47**
**Media Card installation by module type**

| Meridian 1 Modules | 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 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 start-up 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 371.

***Note 4:*** Refer to Table 65 on page 571 for a listing of the 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 Media Card

For Small Systems, and CS 1000SS 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 13 on page 218.

> ***Note:*** This NTCW84JA ITG-specific Filter Connector is not required on Small Systems or CS 1000S 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 operation of the TLAN network interface, but if a 100BaseT operation of the TLAN network interface 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 13
### 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.

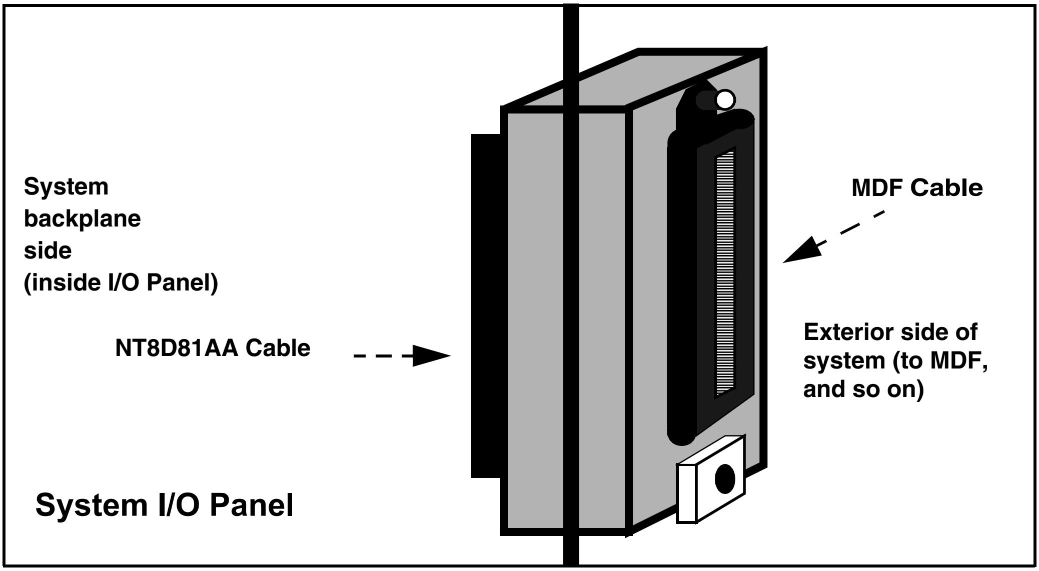
   ***Note:*** Make sure to use the I/O Panel Filter Connector which corresponds to the left slot number of the DCHIP card.

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 43 on page 219.

**Figure 43**
**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 network interface 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 48.

**Table 48**
**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 UTP cabling from the TLAN network interface to the Layer 2 switch does not meet the UTP CAT5 termination and impedance uniformity standards. | Always ensure that UTP cabling from the TLAN network interface to the Layer 2 switch is CAT5-compliant. |

## Voice Gateway Media Card ELAN and TLAN network interfaces

### CS 1000M and Meridian 1 systems

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

- NTMF94EA ELAN, TLAN, RS-232 Serial Maintenance I/O interface cable (see Figure 44 on page 223)
- A0852632 Shielded 50-pin to Serial/ELAN/TLAN Adapter (see Figure 45 on page 226)

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

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

The ELAN network interface supports 10BaseT operation and the TLAN network interface supports 10/100BaseT operation. To support the 100BaseT operation on Large Systems, the TLAN network 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 network 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, CAT5 LAN cables (<100 meters) are recommended to attach the LAN ports to the local network.

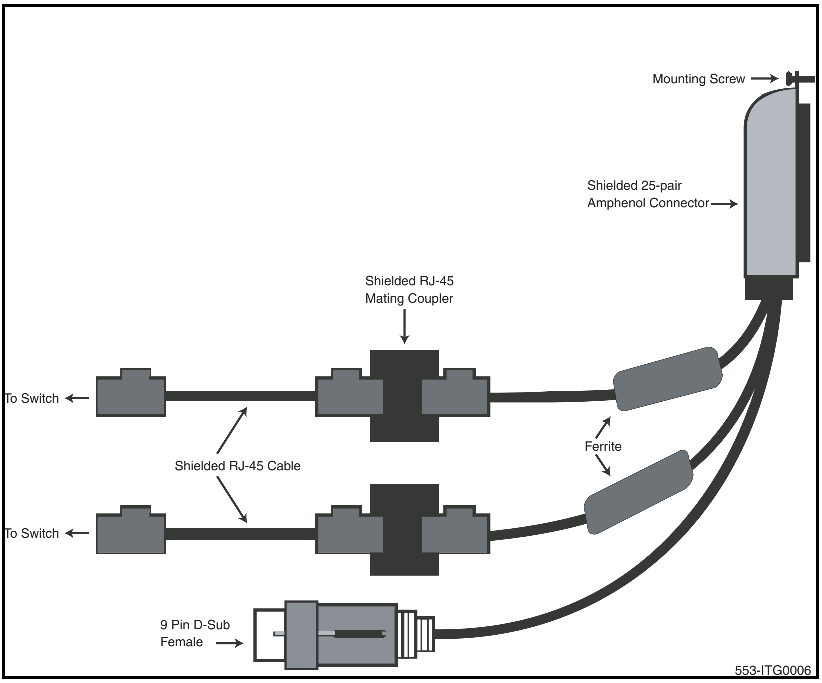
### CS 1000S systems

For information on Voice Gateway Media Card ELAN and TLAN network interfaces on a CS 1000S system, refer to *Communication Server 1000S: 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 B: "I/O, maintenance, and extender cable description" on page 717 for pinouts and technical specifications on the NTMF94EA cable.

**Figure 44**
**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 14.

**Procedure 14**
**Installing the NTMF94EA ELAN, TLAN, serial interface cable**

> **WARNING**
> Plug all Voice Gateway Media Card ELAN network 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 218 on page 719).

**2** Connect a shielded CAT5 Ethernet cable from the customer's TLAN Layer 2 or Layer 3 switch port to the RJ-45 port labeled "TLAN".

**3** Connect a shielded CAT5 Ethernet cable from the customer's ELAN Layer 2 or Layer 3 switch port to the RJ-45 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 network interface.

***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**

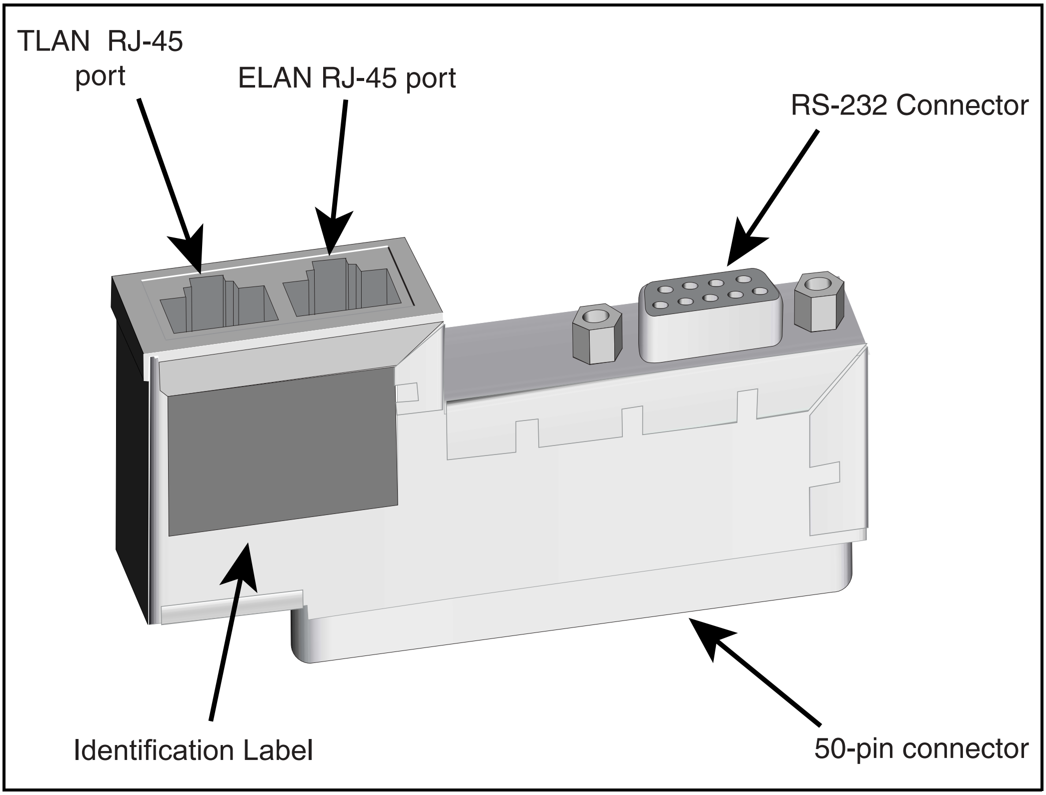
### Install the Shielded 50-pin to Serial/ELAN/TLAN Adapter

The Media Card can support a single connector solution for access to the TLAN and ELAN network interfaces. This connector (see Figure 45 on page 226) 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 network interface
- TLAN network interface
- one RS-232 (local console) port

**Figure 45**
**Shielded 50-pin to Serial/ELAN/TLAN Adapter**



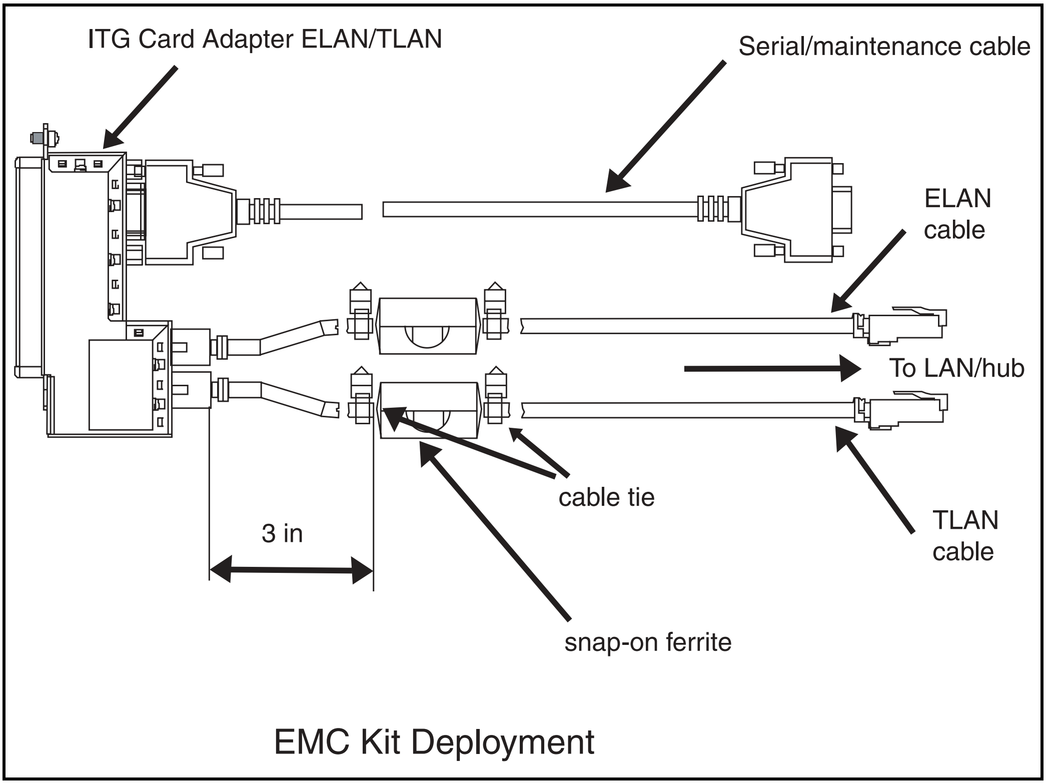
On Large Systems, the NT8D81AA cable is used to bring all 24 Tip and Ring pairs to the I/O panel. The NTCW84JA I/O panel mounting block must be installed on Large Systems before the A0852632 Shielded 50-pin to Serial/ELAN/TLAN Adapter is installed. Refer to Figure 45.

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 network interface cables to meet regulatory requirements at the installation site. As shown in Figure 46, a ferrite must be placed on both the ELAN and TLAN network interface CAT5 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 46**
**ITG EMC Shielding Kit Deployment**



Follow the steps in Procedure 15 on page 228 to install the ITG EMC shielding kit (NTVQ83AA) on the ELAN and TLAN network interface cables.

**Procedure 15**
**Installing the Shielded 50-pin to Serial/ELAN/TLAN Adapter onto the Media Card**

1. Install the Shielded 50-pin to Serial/ELAN/TLAN Adapter into the card connector (1, 2, 3, or 4) where the 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 4.0 data

Before beginning the configuration:

- Ensure the system is running CS 1000 Release 4.0 software.
- Verify the License system limit in LD 22. The License system limit must have sufficient unused units to support the number of IP Phones to be installed. For more information, refer to *Software Input/Output: Maintenance* (553-3001-511).
- Expand the License limit, if necessary, by ordering additional Licenses. See "Licenses" on page 52 for more information.

## Summary of procedures

1. Configure IP address for the system active
ELNK Ethernet interface (LD 117). See page 229.
2. Configure VoIP bandwidth management zones (LD 117). See page 230.
3. Configure physical TNs (LD 14). See page 234.
4. Configure virtual superloops for IP Phones (LD 97). See page 240.
5. Configure IP Phone features in LD 11. See page 243.

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

To configure the Call Server's ELAN network interface IP address (active ELNK), follow the steps in Procedure 16.

**Procedure 16**
**Configuring the ELAN network interface IP address for the active ELNK**

**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 49 on page 231 lists the 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 49**
**LD 117 bandwidth management zone configuration**

| Command | Description |
|---|---|
| NEW ZONE xxx p1 p2 p3 p4 p5 | Create a new zone, where:<br>xxx = zone number = (0) – 255.<br>p1 = Intrazone available bandwidth = 0 – (10000) – 100000 (Kbps)<br>p2 = Intrazone preferred strategy = (BQ – Best Quality) or BB – Best Bandwidth<br>p3 = Interzone available bandwidth = 0 – (10000) – 100000 (Kbps)<br>p4 = Interzone preferred strategy = BQ for Best Quality or BB for Best Bandwidth<br>p5 = Zone resource type = (shared) or private |
| New ZONE xxx | Create a new zone with default values for the parameters:<br>p1 = 10000 (Kbps)<br>p2 = BQ<br>p3 = 10000 (Kbps)<br>p4 = BQ<br>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<br>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 for CS 1000 systems using Element Manager instead of LD 117.

To view Element Manager for zone configuration, follow the steps in Procedure 18:

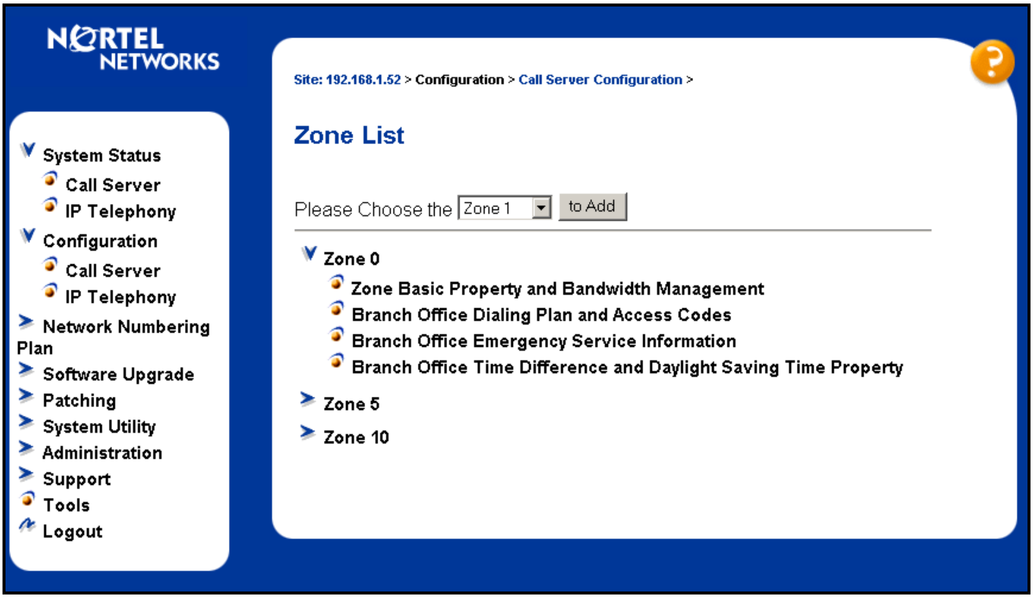
**Procedure 17**
**Viewing Element Manager for Zone Configuration**

1 Launch and log into Element Manager. See Procedure 40 on page 335.

2 In the navigation tree, click **Configuration > Call Server** and then click **Zone**.

The **Zone List** window opens. See Figure 47.

**Figure 47**
**Zone List**



Site: 192.168.1.52 > Configuration > Call Server Configuration >

Zone List

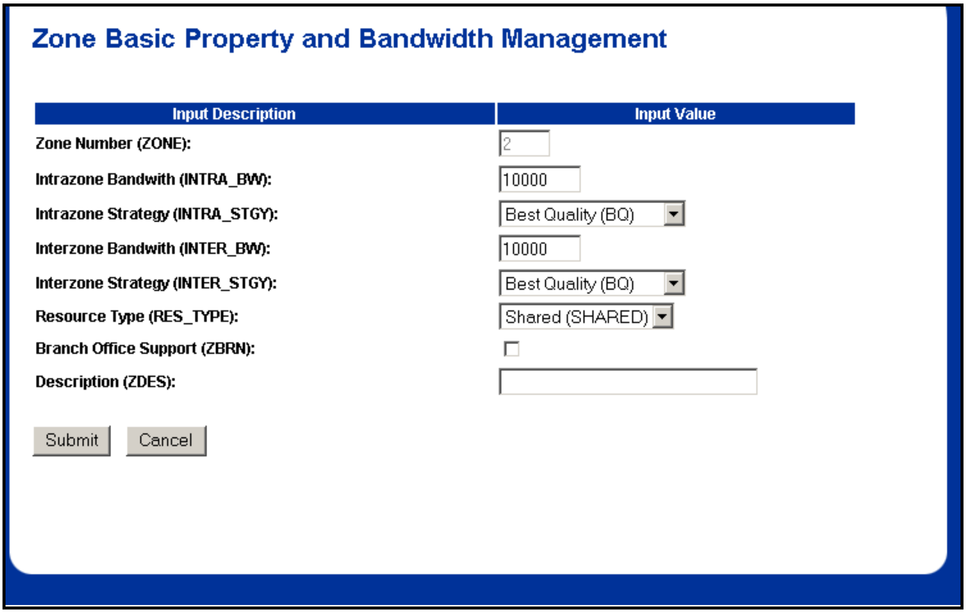
Please Choose the Zone 1 to Add

- Zone 0
  - Zone Basic Property and Bandwidth Management
  - Branch Office Dialing Plan and Access Codes
  - Branch Office Emergency Service Information
  - Branch Office Time Difference and Daylight Saving Time Property
- Zone 5
- Zone 10

3 Click the **to Add** button to add a new zone.

The **Zone Basic Property and Bandwidth Management** window opens. See Figure 48.

**Figure 48**
**Zone Basic Property and Bandwidth Management window**



Zone Basic Property and Bandwidth Management

| Input Description | Input Value |
|---|---|
| Zone Number (ZONE): | 2 |
| Intrazone Bandwith (INTRA_BW): | 10000 |
| Intrazone Strategy (INTRA_STGY): | Best Quality (BQ) |
| Interzone Bandwith (INTER_BW): | 10000 |
| Interzone Strategy (INTER_STGY): | Best Quality (BQ) |
| Resource Type (RES_TYPE): | Shared (SHARED) |
| Branch Office Support (ZBRN): | ☐ |
| Description (ZDES): | |

**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 50 for a list of the prompts and responses in LD 14.

**Table 50**
**Configure physical TNs in LD 14 (Part 1 of 2)**

| Prompt | Response | Description |
|---|---|---|
| REQ | NEW<br>CHG<br>OUT | Create the Voice Gateway channels on a line card.<br>Change configuration data for a Voice Gateway channel.<br>Delete the Voice Gateway channels on a line card. |
| TYPE | VGW | Voice Gateway |
| TN | | TN of the first ITG Physical TN |
| | l s c u | Format for Large System and CS 1000E system, where l = loop, s = shelf, c = card, u = unit. |
| | c u | Format for Small System, CS 1000S system, Media Gateway 1000B, and Media Gateway 1000T, where c = card and u = unit. |
| DES | aa.......a | Description for gateway channel.<br>Identify the channel using the card’s TLAN network interface IP address or MAC address. |
| XTRK | aaa | ITG8 – ITG 486 8-port card<br>ITGP – ITG-P 24-port card<br>MC8 – Media Card 8-port card<br>MC32 – Media Card 32-port card |

**Table 50**
**Configure physical TNs in LD 14 (Part 2 of 2)**

| Prompt | Response | Description |
|---|---|---|
| ZONE | 0 – 255 | Zone number to which this ITG Physical TN belongs.<br>Verify that the zone exists in LD 117. |
| CUST | xx | Customer number as defined in LD 15 |

## Using Element Manager for Voice Gateway channels

Alternatively, for CS 1000 systems, configure the Voice Gateway channels using Element Manager instead of using LD 14.

To use Element Manager to configure Voice Gateway channels, follow the steps in Procedure 18.

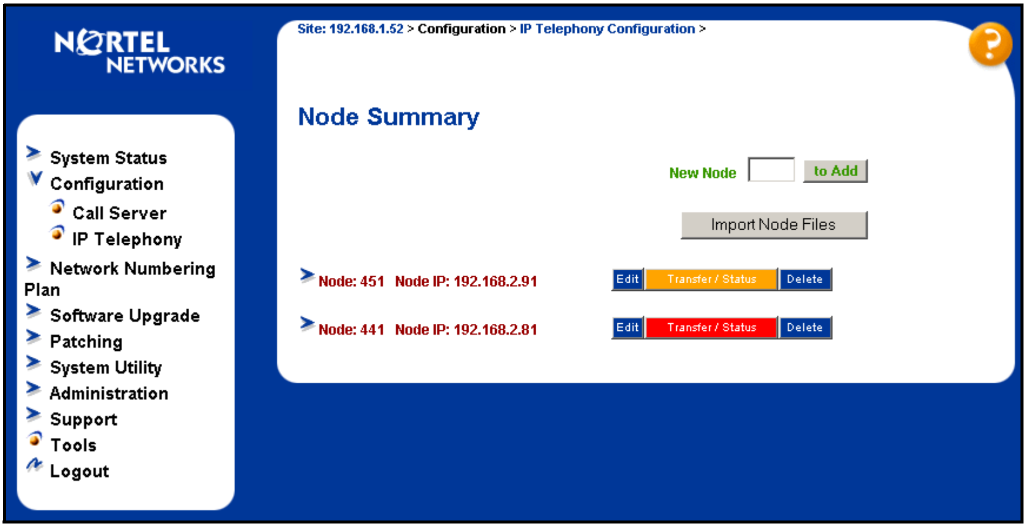
**Procedure 18**
**Using Element Manager to configure Voice Gateway channels**

1 Launch and log into Element Manager. See Procedure 40 on page 335 for details.

2 In the navigation tree, click **Configuration** > **IP Telephony**.

The **Node Summary** window opens. See Figure 49 on page 236.

**Figure 49**
**Node Summary window**



Site: 192.168.1.52 > Configuration > IP Telephony Configuration >

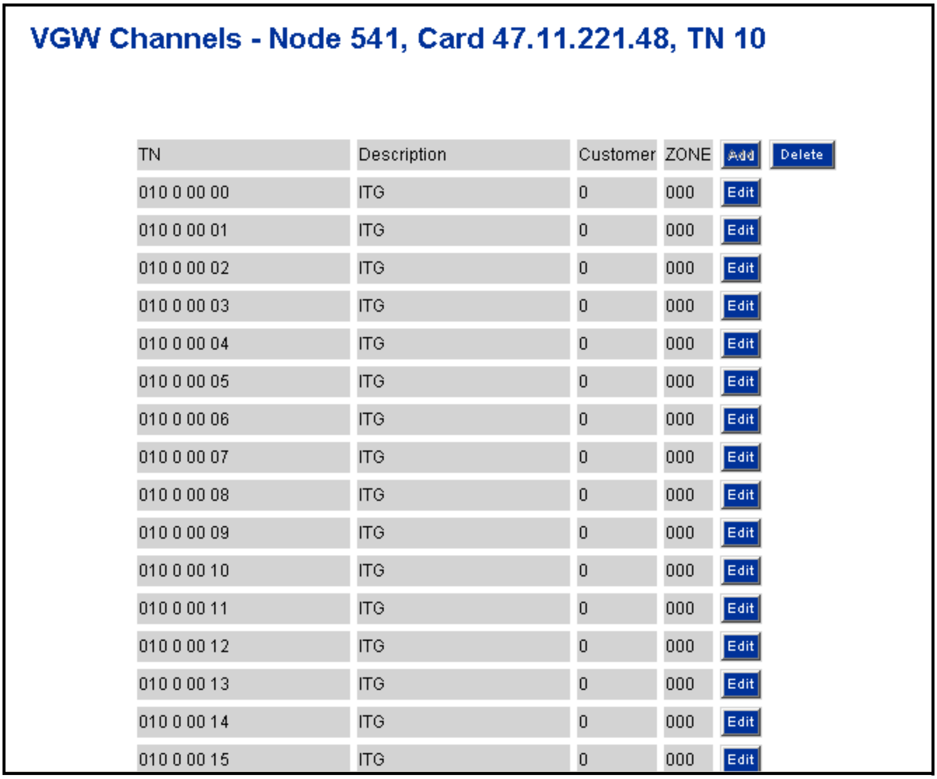
Node Summary

Node: 451 Node IP: 192.168.2.91

Node: 441 Node IP: 192.168.2.81

3 Expand a node by clicking the arrow to the left of the node. Click the **DSP Channels** button. The **VGW Channels** summary window opens. See Figure 50 on page 237.

**Figure 50**
**VGW Channels summary window**



VGW Channels - Node 541, Card 47.11.221.48, TN 10

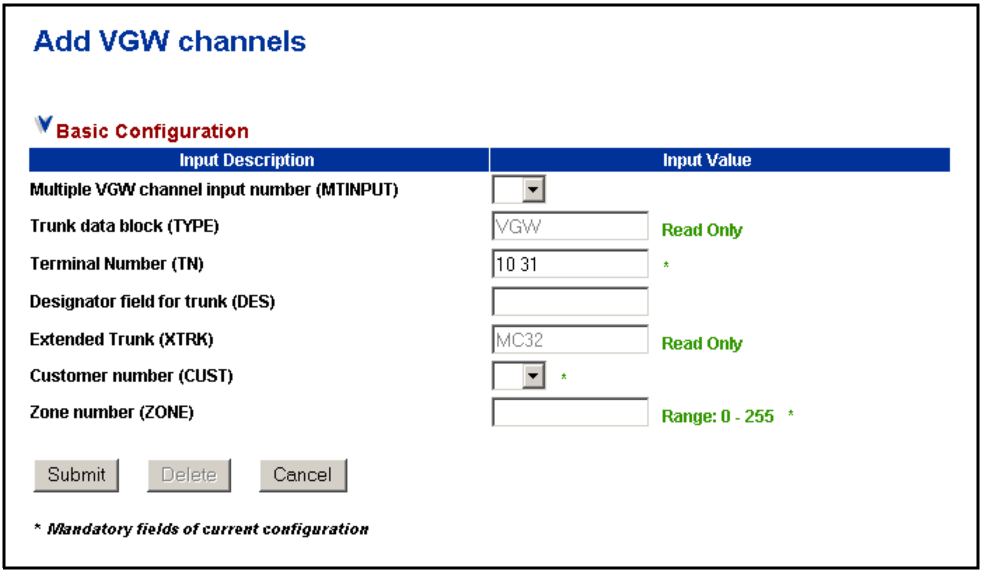
| TN | Description | Customer | ZONE | Add | Delete |
|---|---|---|---|---|---|
| 010 0 00 00 | ITG | 0 | 000 | Edit | |
| 010 0 00 01 | ITG | 0 | 000 | Edit | |
| 010 0 00 02 | ITG | 0 | 000 | Edit | |
| 010 0 00 03 | ITG | 0 | 000 | Edit | |
| 010 0 00 04 | ITG | 0 | 000 | Edit | |
| 010 0 00 05 | ITG | 0 | 000 | Edit | |
| 010 0 00 06 | ITG | 0 | 000 | Edit | |
| 010 0 00 07 | ITG | 0 | 000 | Edit | |
| 010 0 00 08 | ITG | 0 | 000 | Edit | |
| 010 0 00 09 | ITG | 0 | 000 | Edit | |
| 010 0 00 10 | ITG | 0 | 000 | Edit | |
| 010 0 00 11 | ITG | 0 | 000 | Edit | |
| 010 0 00 12 | ITG | 0 | 000 | Edit | |
| 010 0 00 13 | ITG | 0 | 000 | Edit | |
| 010 0 00 14 | ITG | 0 | 000 | Edit | |
| 010 0 00 15 | ITG | 0 | 000 | Edit | |

4 To add new gateway channels, click the **Add** button at the top in the **Gateway Channel summary** window.

The **Add VGW channels window opens. See** Figure 51 on page 238.

***Note:*** Figure 51 is the equivalent to LD 14's NEW command.

**Figure 51**
**Add VGW channels window**



Add VGW channels

Basic Configuration

| Input Description | Input Value |
|---|---|
| Multiple VGW channel input number (MTINPUT) | ▾ |
| Trunk data block (TYPE) | VGW Read Only |
| Terminal Number (TN) | 10 31 * |
| Designator field for trunk (DES) | |
| Extended Trunk (XTRK) | MC32 Read Only |
| Customer number (CUST) | ▾ * |
| Zone number (ZONE) | Range: 0 - 255 * |

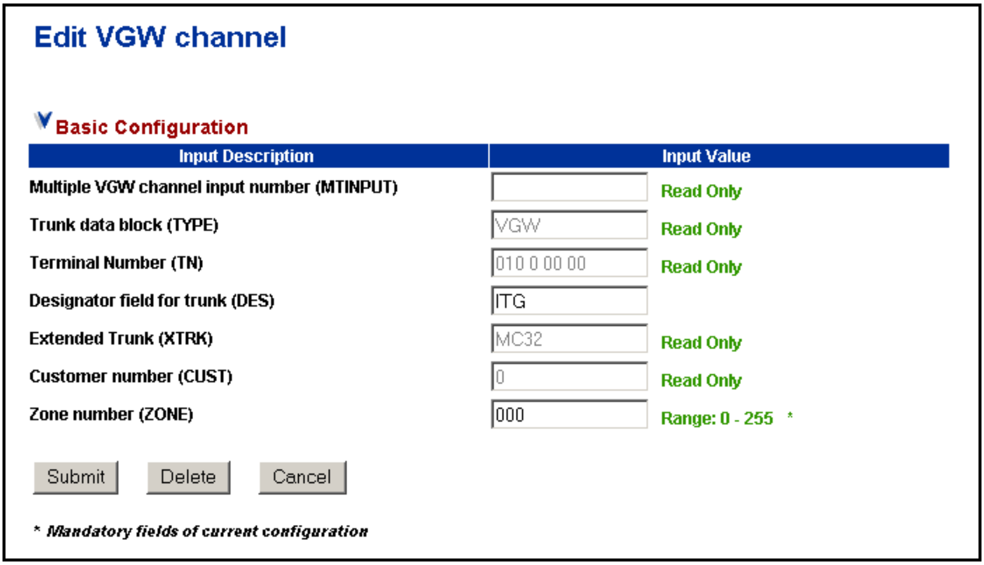
* *Mandatory fields of current configuration*

5 To edit a specific Voice Gateway channel, click the **Edit** button to the right of the channel in the VGW Channels summary window seen in Figure 50 on page 237.

The **Edit VGW channel** window opens. See Figure 52 on page 239.

The Edit VGW channel window is equivalent to LD 14’s CHG command that enables the changing of the DES and ZONE parameters of the channel.

**Figure 52**
**Edit VGW channel window**



Edit VGW channel

Basic Configuration

| Input Description | Input Value | |
|---|---|---|
| Multiple VGW channel input number (MTINPUT) | | Read Only |
| Trunk data block (TYPE) | VGW | Read Only |
| Terminal Number (TN) | 010 0 00 00 | Read Only |
| Designator field for trunk (DES) | ITG | |
| Extended Trunk (XTRK) | MC32 | Read Only |
| Customer number (CUST) | 0 | Read Only |
| Zone number (ZONE) | 000 | Range: 0 - 255 * |

* *Mandatory fields of current configuration*

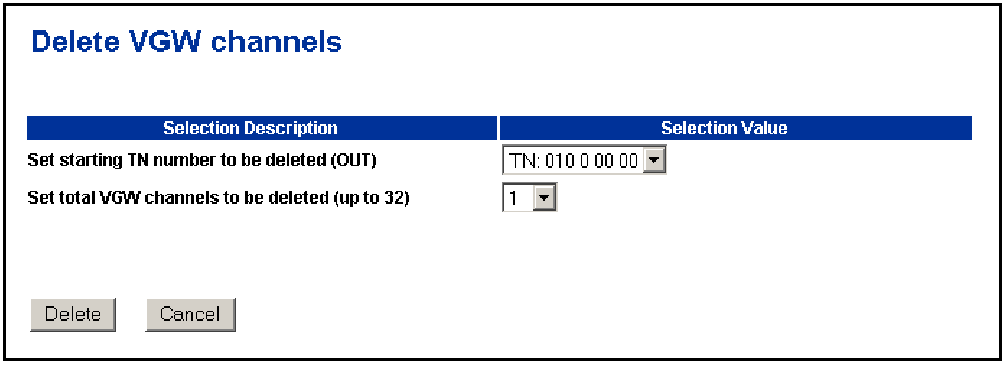
**6** To delete a Voice Gateway channel, click the **Delete** button in the Gateway Channel summary window. See Figure 50 on page 237.

The **Delete VGW channels** for the Voice Gateway channel opens. See Figure 53 on page 240.

Select a gateway channel from the drop-down list box and click **Delete**.

Figure 53, the Delete VGW channels window, is the equivalent of LD 14's OUT command.

Figure 53
Delete VGW channels window



Delete VGW channels

| Selection Description | Selection Value |
|---|---|
| Set starting TN number to be deleted (OUT) | TN: 010 0 00 00 |
| Set total VGW channels to be deleted (up to 32) | 1 |

**End of Procedure**

## Configure virtual superloops for IP Phones (LD 97)

One or more virtual superloops must be configured to support IP Phone 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 51 lists the prompts and responses required to configure virtual superloops in LD 97.

**Table 51**
**LD 97 – Virtual superloop configuration for Large Systems**

| Prompt | Response | Description |
|---|---|---|
| REQ | CHG | Change existing data. |
| TYPE | SUPL | Superloop |
| SUPL | Vxxx | V represents a virtual superloop and xxx is the number of the virtual superloop where:<br>• xxx = 0 – 156 and multiple of four for a Large System without FIBN package 365<br>• 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 system, for a maximum of 640 VTNs in each system.

A maximum of 1000 VTNs can be configured on a CS 1000M Cabinet and CS 1000M Chassis system.

In a Small System, mapping virtual superloops to virtual cards is the same as mapping phantom superloops to phantom cards. See Table 52.

**Table 52**
**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 |

### CS 1000S systems

Table 53 lists the virtual superloop and virtual card mapping for the CS 1000S system.

**Table 53**
**Virtual superloop/virtual card mapping for CS 1000S 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 TNs (for example, Virtual TNs). Similarly, LUC of a specified type (virtual, phantom, or DECT) prints a list of unused cards on configured superloops.

## Configure IP Phone features in LD 11

The existing License header that is printed at the start of LD 11 includes the new License limit for the IP Phone. Refer to Table 43 on page 200 to configure the IP Phone features in LD 11.

**Table 54**
**LD 11 – Configure an IP Phone (Part 1 of 3)**

| Prompt | Response | Description |
|---|---|---|
| REQ: | NEW<br>CHG<br>PRT<br>OUT<br>CPY<br>MOV | New<br>Change<br>Print<br>Out<br>Copy<br>Move |
| TYPE: | i2001<br>i2002<br>i2004<br>i2050 | For IP Phone 2001, IP Phone 2002, and IP Phone 2004, IP Softphone 2050, or MVC 2050. The system accepts this response if it is equipped with packages 88 and 170. The IP Phone 2001 and IP Phone 2002, IP Softphone 2050, and MVC 2050 are also restricted by the IP Phone License setting. |

**Table 54**
**LD 11 – Configure an IP Phone (Part 2 of 3)**

| Prompt | Response | Description |
|---|---|---|
| TN | l s c u<br><br><br>c u | Format for Large System and CS 1000E system, where l = loop, s = shelf, c = card, u = unit.<br>Enter loop (virtual loop), shelf, card, and unit (terminal number),<br>where unit = 0 – 31<br>Format for Small System, CS 1000S system, Media Gateway 1000B, and Media Gateway 1000T, where c = card and u = unit.<br>Enter card slot (virtual slot) and unit.<br>***Note:*** See Table 52 on page 242 for virtual superloop to virtual card slot mapping for Small Systems. |
| DES | a...z | ODAS telephone designator |
| CUST | xx | Customer number as defined in LD 15 |
| ZONE | 0 – 255 | Zone number to which this IP Phone belongs. The zone prompt is applied only when TYPE = i2001, i2002, i2004, or i2050.<br>***Note:*** Verify that the zone number exists in LD 117. |

**Table 54**
**LD 11 – Configure an IP Phone (Part 3 of 3)**

| Prompt | Response | Description |
|---|---|---|
| CLS | ADD | ADD - Automatic Digit Display, default for IP Phone.<br>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:<br>xx = keys 0 – 5 (and 6 – 11 using the Shift key) for IP Phone 2004 and xx = keys 0 – 3 for the IP Phone 2002. These are self-labeled physical keys that can be programmed with any feature. xx = 0 for the IP Phone 2001; any other key number entered returns an error message.<br>aaa = key name or function<br>yyy, zzz = additional information required for the key.<br>***Note:*** Keys 16 – 26 are reserved for dedicated IP Phone soft keys.<br>Table 55 lists the dedicated IP Phone key name values (aaa). Other key name values can be found in *Software Input/Output: Administration* (553-3001-311). |

## Configure the IP Phone KEM

Configure the optional IP Phone KEM in LD 11.

*Note:* The IP Phone KEM is not supported on the IP Phone 2001.

### LD 11 – Configure the IP Phone KEM. (Part 1 of 4)

| Prompt | Response | Description |
|---|---|---|
| REQ: | NEW | Add new data. |
| | CHG | Change existing data. |
| TYPE: | i2002 | IP Phone 2002 |
| | i2004 | IP Phone 2004 |
| ... | | |
| ZONE | 0-255 | Zone number to which the IP Phone 2002 or IP Phone 2004 belongs |
| KEM | (0)-2 | Number of attached IP Phone KEMs<br>***Note:*** Up to two IP Phone KEMs can be attached to an IP Phone. Pressing <CR> without entering a number leaves the value unchanged. |
| ... | | |

**LD 11 – Configure the IP Phone KEM. (Part 2 of 4)**

| Prompt | Response | Description |
|---|---|---|
| KEY | xx aaa yyyy (cccc ***or*** D) zz..z | |
| | | Telephone function key assignments<br>The following key assignments determine calling options and features available to a telephone. Note that KEY is prompted until just a carriage return <CR> is entered.<br>Where:<br>xx = key number<br>For IP Phone 2002, where:<br>xx = 0-31, when KEM = 0<br>xx = 0-55, when KEM = 1<br>xx = 0-79, when KEM = 2<br>For IP Phone 2004, where:<br>xx = 0-31, when KEM = 0<br>xx = 0-79, when KEM = 1<br>xx = 0-79, when KEM = 2<br>***Note:*** Type xx = NUL to remove a key function or feature.<br>aaa = key name or function<br>yyyy = additional information required for the key<br>zz..z = additional information required for the key aaa<br>The cccc or D entry deals specifically with the Calling Line Identification feature, where:<br>cccc = CLID table entry of (0)-N, where N = the value entered at the SIZE prompt in LD 15 minus 1. You can enter a CLID table entry if aaa = ACD, HOT d, HOT L, MCN, MCR, PVN, PVR, SCN, or SCR.<br>D = the character “D”. When the character “D” is entered, the system searches the DN keys from key 0 and up, to find a DN key with a CLID table entry. The CLID associated with the found DN key will then be used. |

### LD 11 – Configure the IP Phone KEM. (Part 3 of 4)

| Prompt | Response | Description |
|---|---|---|
| | | ***Note:*** The position of the (cccc or D) field varies depending on the key name or function. |
| PAGEOFST | <Page><br><KeyOffset> | Automatically calculates the IP Phone KEM key based on the entered values. This prompt enables the system administrator to enter a Page number of 0 or 1 and a Key Offset number from 0-23. Once entered, the KEY prompt is prompted with the appropriate KEY value filled in.<br>Enter <CR> to terminate data entry.<br>***Note 1:*** Applies to an IP Phone 2004 with KEM = 1, and where <CR> was entered at the KEY prompt.<br>***Note 2:*** Does not apply to an IP Phone 2002.<br>When values are entered for Page and KeyOffset, the KEY xx prompt displays, followed by PAGEOFST prompt. This loop continues until no values (<CR> only) are entered at the PAGEOFST prompt. |
| KEY xx | | Edit the IP Phone KEM key number specified by PAGEOFST, where:<br>xx = the number of the key (for example, KEY 36)<br>Enter <CR> to keep the current setting. |

**LD 11 – Configure the IP Phone KEM. (Part 4 of 4)**

| Prompt | Response | Description |
|---|---|---|
| KEMOFST | <KEM><br><KeyOffset> | Automatically calculates the IP Phone KEM key based on the entered values. This prompt enables the system administrator to enter a KEM number of 1 or 2 and a Key Offset number from 0-23. Once entered, the KEY prompt is prompted with the appropriate KEY value filled in.<br>Enter <CR> to terminate data entry.<br>When values are entered for KEM and KeyOffset, the KEY xx prompt displays, followed by KEMOFST prompt. This loop continues until no values (<CR> only) are entered at the KEMOFST prompt.<br>***Note 1:*** Applies to an IP Phone 2002 if <CR> was entered at the KEY prompt.<br>***Note 2:*** Applies to an IP Phone 2004 with KEM = 2, and where <CR> was entered at the KEY prompt. |
| KEY xx | | Edit the IP Phone KEM key number specified by KEMOFST, where:<br>xx = the number of the key (for example, KEY 36)<br>Enter <CR> to keep the current setting. |

## IP Phone dedicated soft keys

Table 55 describes the features that can be assigned to dedicated soft keys 16-26 on the IP Phone 2001, IP Phone 2002, and IP Phone 2004, IP Softphone 2050, or MVC 2050. 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 55**
**LD 11 – IP Phone dedicated soft key assignment (Part 1 of 2)**

| IP Phone key number | Response(s) Allowed |
|---|---|
| Key 16 | MWK, NUL<br>MWK – Message Waiting key |
| Key 17 | TRN, NUL<br>TRN– - Call Transfer key |
| Key 18 | A03, A06, NUL<br>AO3 – 3-party conference key<br>AO6 – 6-party conference key |
| Key 19 | CFW, NUL<br>CFW – Call Forward key |
| Key 20 | RGA, NUL<br>RGA – Ring Again key |
| Key 21 | PRK, NUL<br>PRK – Call Park key |
| Key 22 | RNP, NUL<br>RNP – Ringing Number pickup key |

**Table 55**
**LD 11 – IP Phone dedicated soft key assignment (Part 2 of 2)**

| IP Phone key number | Response(s) Allowed |
|---|---|
| Key 23 | SCU, SSU, SCC, SSC, NUL<br>SCU – Speed Call User<br>SSU – System Speed Call User<br>SCC – Speed Call Controller<br>SSC – System Speed Call Controller |
| Key 24 | PRS, NUL<br>PRS – Privacy Release key |
| Key 25 | CHG, NUL<br>CHG – Charge Account key |
| Key 26 | CPN, NUL<br>CPN – Calling Party Number key |

## Node election rules

The rules for the node election process are as follows:

1. A Signaling Server wins over any Voice Gateway Media Cards.
2. A Leader card always wins over a Follower card.
3. A 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 Media Card Follower card cannot win over an ITG-P Leader card.

# Configuration of IP telephony nodes using OTM 2.2

## 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) 2.2.

This chapter also provides instruction for transmitting data to Voice Gateway Media Cards, upgrading card software, and upgrading IP Phone 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

OTM can be used to manually add and configure IP Telephony nodes. OTM 2.2 includes an IP Line 4.0 application that is used to configure nodes on CS 1000 or Meridian 1 systems. Multiple IP Telephony nodes for IP Phones are configured and managed from the same OTM PC.

## Node definition

A node is defined as a collection of Signaling Servers and Voice Gateway Media Cards (ITG-P 24-port line cards and 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 42 on page 199 for IP addresses and information required in this procedure.

**WARNING**

OTM 2.2 does not support configuration of nodes which reside on a CS 1000 system. However, since OTM 2.2 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 19 on page 256 through Procedure 23 on page 271. In these procedures, pay special attention to any comments specific to nodes which reside on a CS 1000 system.

## Launch OTM and the IP Line 4.0 application

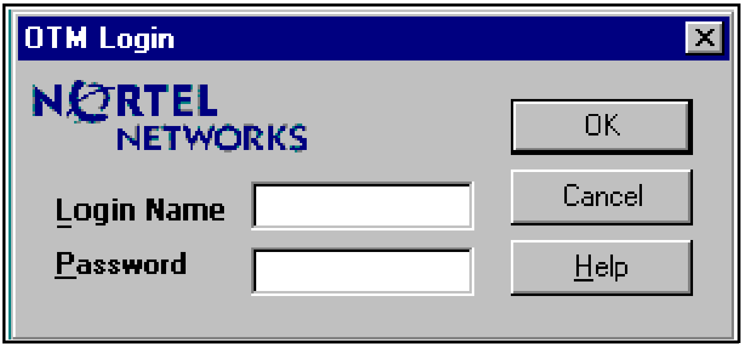
To launch OTM and start the IP Line 4.0 application, follow the steps in Procedure 19.

**Procedure 19**
**Launching OTM**

1 Select **Start** > **Programs** > **Optivity Telephony Manager** > **OTM Navigator**.

2 The **OTM Login** screen appears. See Figure 54.

**Figure 54**
**OTM Login screen**

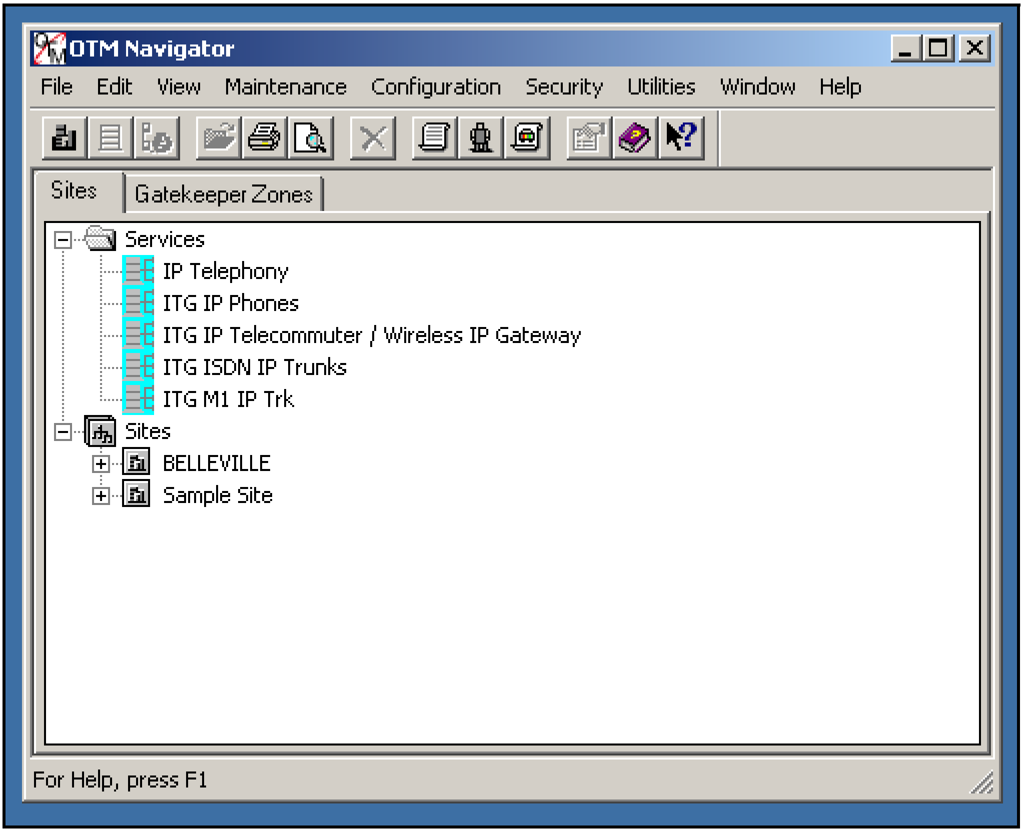


3 Enter the **Login Name** and **Password**. Click **OK.**

4 The **OTM Navigator** window opens.

OTM Navigator has two tabs: Sites and Gatekeeper Zones. The IP Line 4.0 application, called IP Telephony, that is available with OTM is located on the Sites tab. Click the **Sites** tab. See Figure 55 on page 257.

**Figure 55**
**OTM Navigator**



**5** Expand the Services folder. Double-click the **IP Telephony** icon to launch the IP Line 4.0 application. See Figure 55.

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**

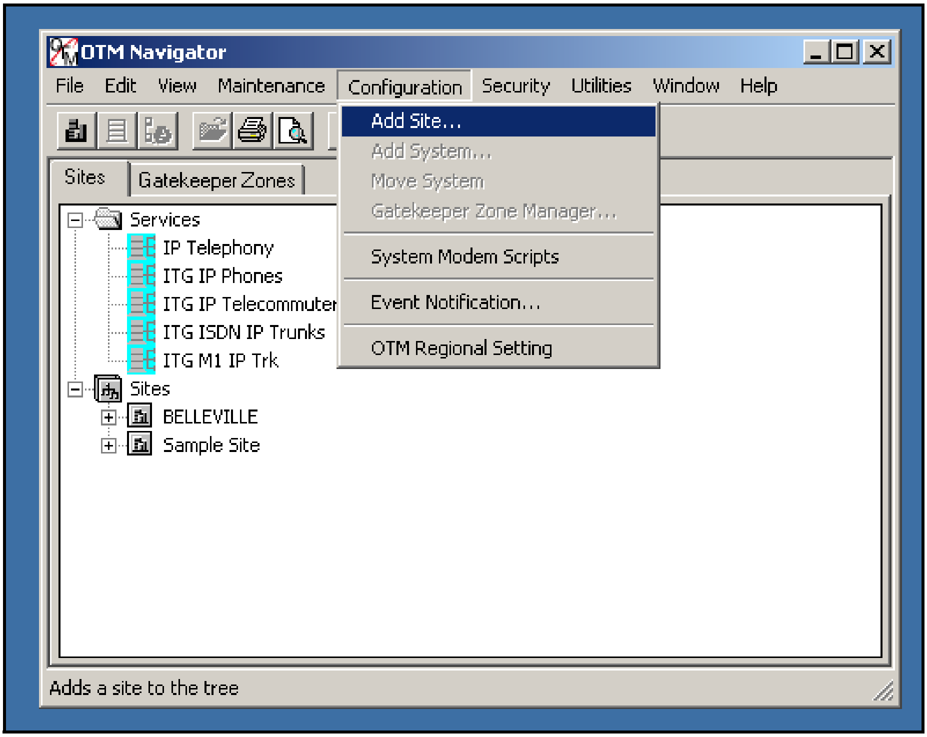
## Add a site, system, and customer

A site, system, and customer must be added before nodes and Voice Gateway Media Cards can be configured. Follow the steps in Procedure 20 to add a site, system, and customer using OTM Navigator.

**Procedure 20**
**Adding a site, system, and customer**

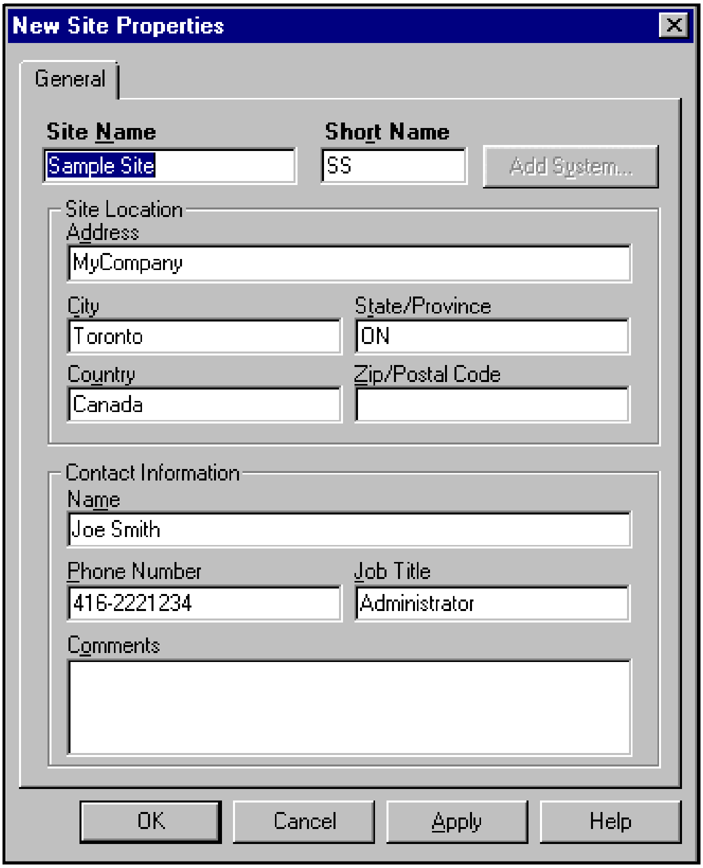
1 In the **OTM Navigator** window, click **Configuration > Add Site.** See Figure 56.

**Figure 56**
**OTM Navigator – Configuration > Add Site**



The **New Site Properties** window opens. See Figure 57 on page 259.

**Figure 57**
**New Site Properties window**



Site Name: Sample Site
Short Name: SS
Address: MyCompany
City: Toronto
State/Province: ON
Country: Canada
Zip/Postal Code:
Name: Joe Smith
Phone Number: 416-2221234
Job Title: Administrator
Comments:

2 In the **New Site Properties** window, configure the following:

a. **Site Name:** Enter the name of the site.

b. **Short Name:** Enter a short name for the site.

c. Under **Site Location**, add the **Address**, **City**, **State/Province**, **Country**, and **Zip/Postal Code** of the site.

d. Under **Contact Information**, add the **Name**, **Phone Number**, **Job Title**, and any **Comments** for the site contact person(s).

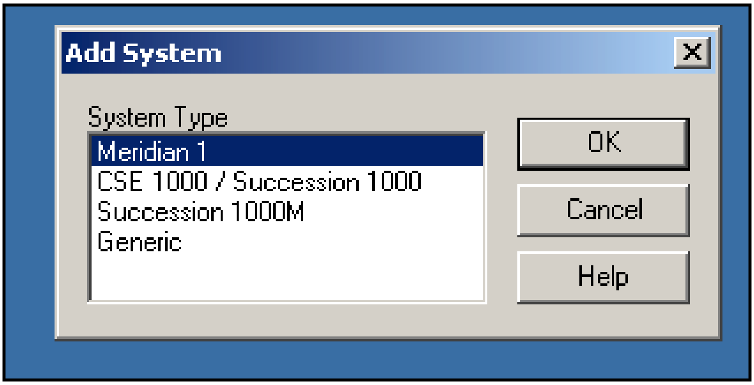
3 Click **Apply**.

The **Add System** button (located in the upper right corner of the New Site Properties window) is enabled.

4 Click the **Add System** button.

The **Add System** dialog box opens. See Figure 58.

**Figure 58**
**Add System**



Add System

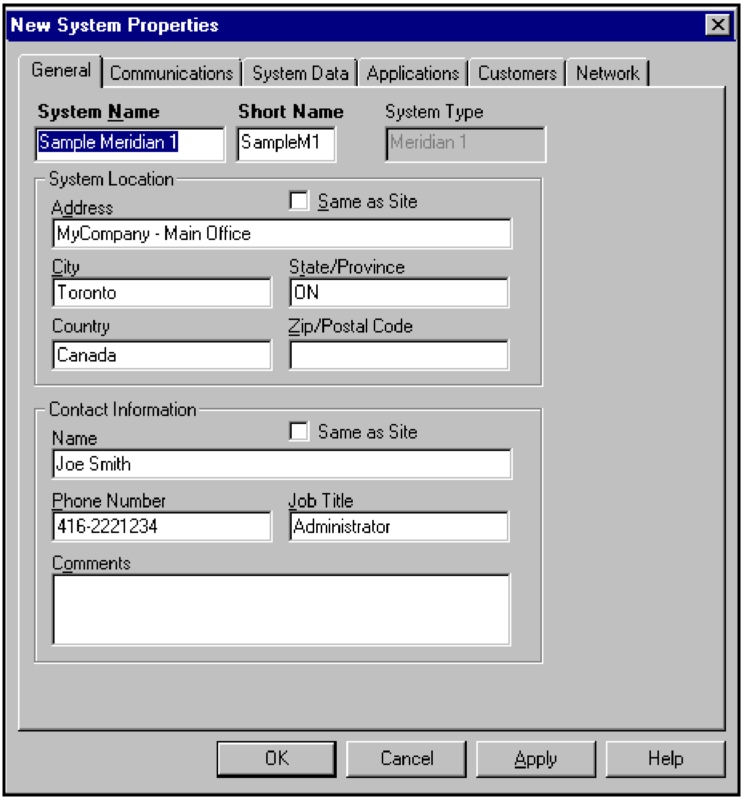
System Type

- Meridian 1
- CSE 1000 / Succession 1000
- Succession 1000M
- Generic

5 In the Add System dialog box, select the system and click **OK**.

The **New System Properties** window opens. See Figure 59 on page 261.

**Figure 59**
**New System Properties window**



System Name: Sample Meridian 1

Short Name: SampleM1

System Type: Meridian 1

System Location

Address: MyCompany - Main Office □ Same as Site

City: Toronto

State/Province: ON

Country: Canada

Zip/Postal Code:

Contact Information

Name: Joe Smith □ Same as Site

Phone Number: 416-2221234

Job Title: Administrator

Comments:

**6** In the **New System Properties** window, configure the following:

**a. System Name:** Enter the name of the system.

**b. Short Name:** Enter a short name for the system.

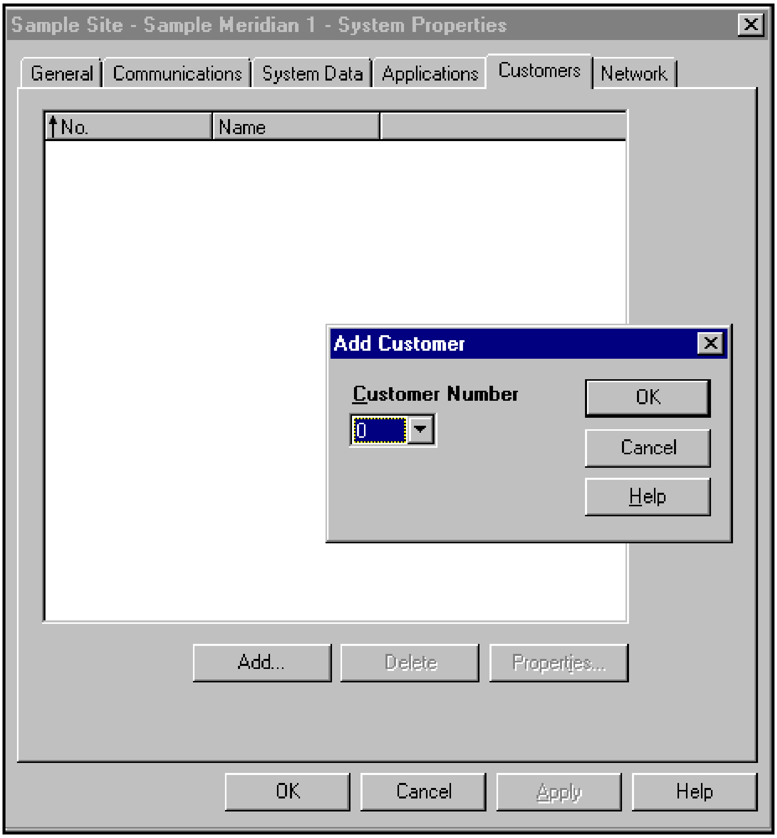
**7** Click **Apply**.

The **System Properties** window opens.

**8** Click the **Customers** tab and then click the **Add** button.

The **Add Customer** dialog window appears. See Figure 60 on page 262.

**Figure 60**
**System Properties window – Add Customer**



**9** Select the **Customer Number.** Click **OK**.

This adds a customer to the system and opens the **New - (Customer n) Properties** window.

**10** Click **OK**.

The System Properties window opens.

**11** 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 4.0 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 2.2:

1. "Manually add an IP Telephony node" on page 264.
2. "Configure the card properties of the Voice Gateway Media Card" on page 268.
3. "Configure DSP profile data" on page 271.
4. "Configure SNMP traps and ELAN gateway routing table" on page 275.
5. "Configure the Call Server ELAN IP address and the TLAN voice port" on page 282.
6. "Configure security for SNMP access" on page 284.
7. "Configure file server access" on page 290.
8. "Configure QoS" on page 292.

## Manually add an IP Telephony node

Follow the steps in Procedure 21 to manually add an IP Telephony node.

**Procedure 21**
**Adding an IP Telephony node manually**

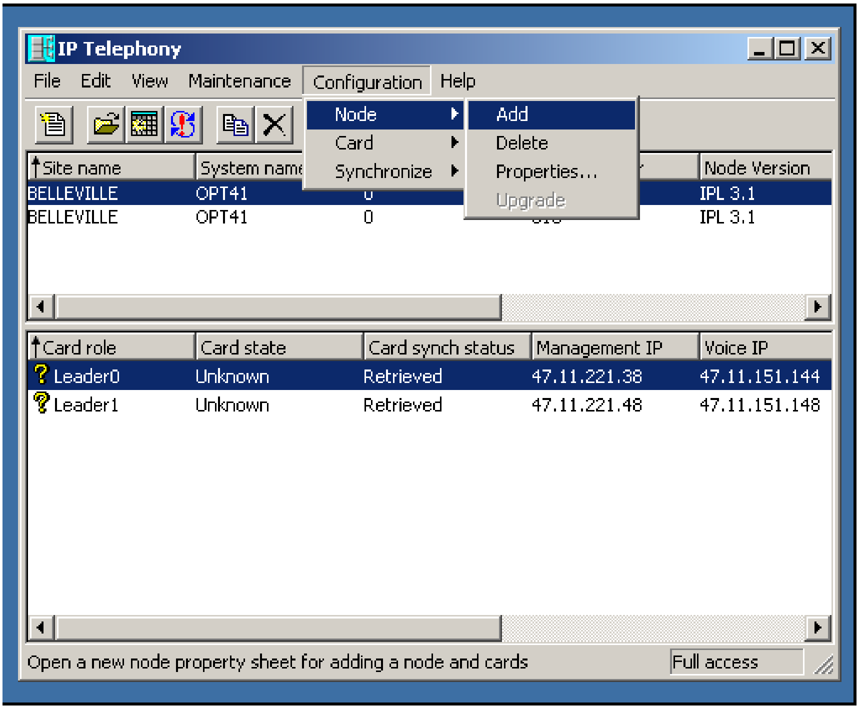
1 In the OTM Navigator window, click on the **Services** folder.

2 Double-click the **IP Telephony** icon. See Figure 55 on page 257.

The **IP Telephony** window opens.

3 Click **Configuration > Node > Add.** See Figure 61.

**Figure 61**
**IP Telephony main window**



| Site name | System name | | | Node Version |
|---|---|---|---|---|
| BELLEVILLE | OPT41 | 0 | | IPL 3.1 |
| BELLEVILLE | OPT41 | 0 | | IPL 3.1 |

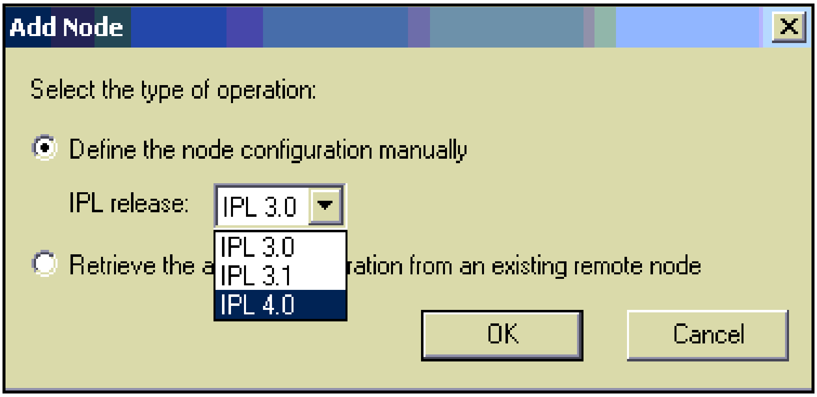
| Card role | Card state | Card synch status | Management IP | Voice IP |
|---|---|---|---|---|
| Leader0 | Unknown | Retrieved | 47.11.221.38 | 47.11.151.144 |
| Leader1 | Unknown | Retrieved | 47.11.221.48 | 47.11.151.148 |

Open a new node property sheet for adding a node and cards
Full access

The **Add Node** dialog box opens.See Figure 62 on page 265.

**4** Ensure the “Define node configuration manually” radio button is selected. Select the IP Line software release being installed. Click **OK**.

**Figure 62**
**Add Node**



Add Node

Select the type of operation:

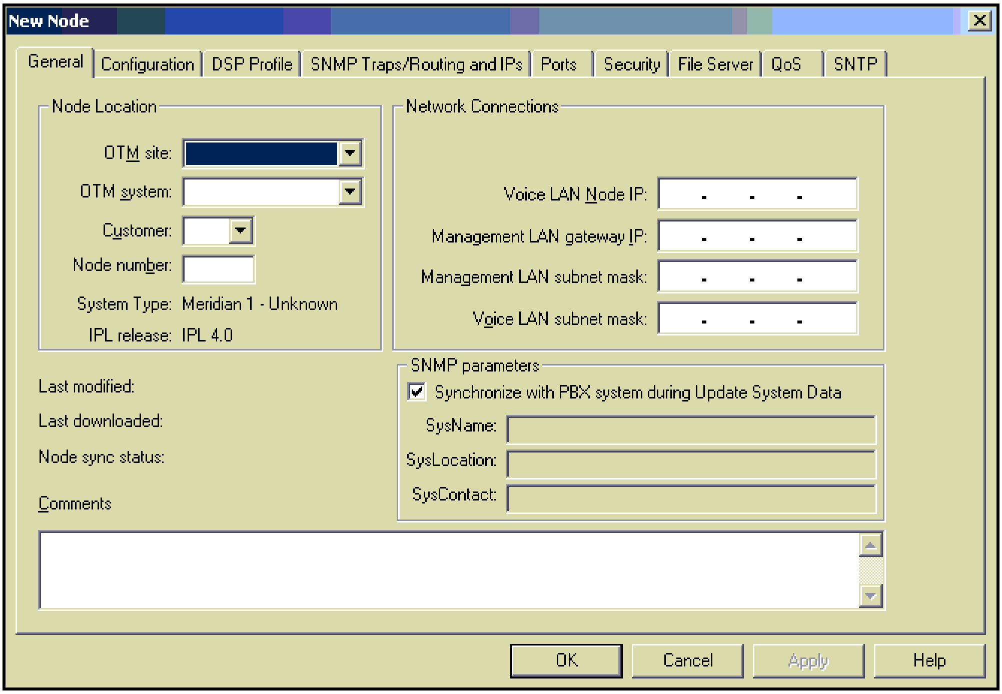
● Define the node configuration manually

IPL release: IPL 3.0

○ Retrieve the a ration from an existing remote node

The **New Node** window opens. See Figure 63 on page 266.

**Figure 63**
**New Node – General tab**



Node Location

OTM site:

OTM system:

Customer:

Node number:

System Type: Meridian 1 - Unknown

IPL release: IPL 4.0

Network Connections

Voice LAN Node IP: . . .

Management LAN gateway IP: . . .

Management LAN subnet mask: . . .

Voice LAN subnet mask: . . .

Last modified:

Last downloaded:

Node sync status:

SNMP parameters

☑ Synchronize with PBX system during Update System Data

SysName:

SysLocation:

SysContact:

Comments

5 On the **General** tab, under **Node Location**:

a. From the drop-down lists, 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 IP Phone 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 page 142). 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 IP Phone 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 IP Phones 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 network interface 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 22 on page 269.

**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 E on page 761.

> ***Note 1:*** On the Configuration tab, cards can be added, changed, or deleted in the node one at a time.

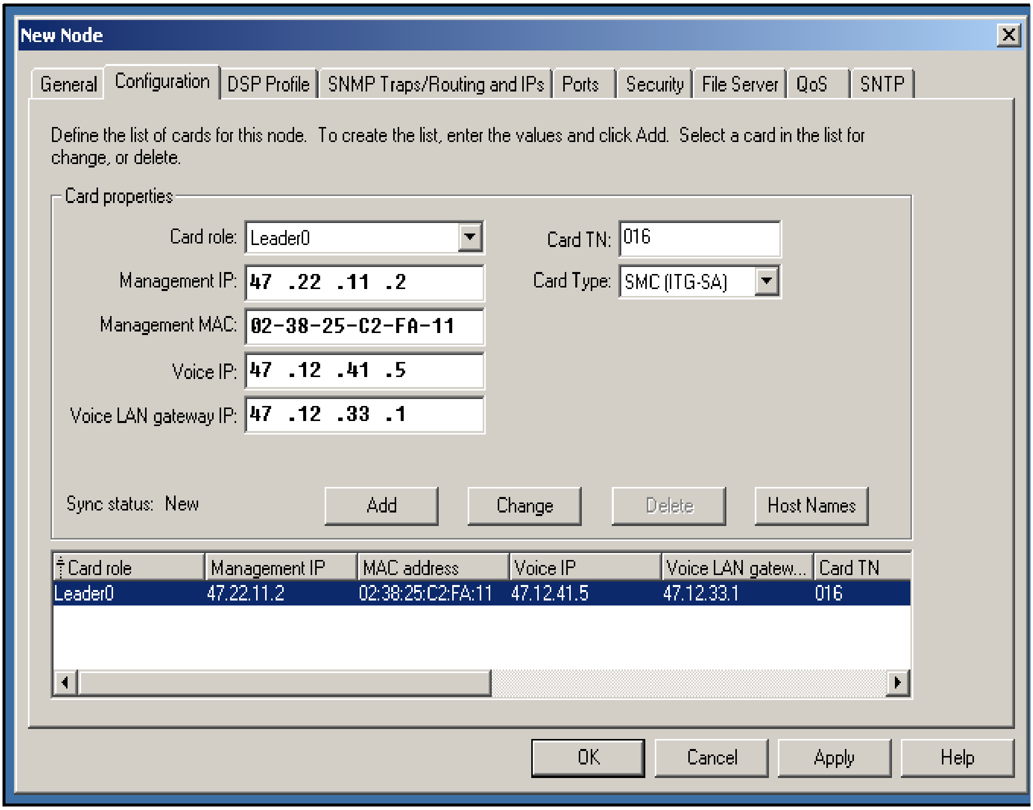
> ***Note 2:*** The Leader 0 card cannot be deleted in the Configuration tab. It is necessary to delete the node to delete Leader 0.

Follow the steps in Procedure 22 on page 269 to configure card properties for the Voice Gateway Media Card.

### Procedure 22
### Configuring card properties for the Voice Gateway Media Card

1 Click the **Configuration** tab in the New Node window. See Figure 64.

**Figure 64**
**New Node – Configuration tab**



Define the list of cards for this node. To create the list, enter the values and click Add. Select a card in the list for change, or delete.

Card properties

Card role: Leader0

Management IP: 47 .22 .11 .2

Management MAC: 02-38-25-C2-FA-11

Voice IP: 47 .12 .41 .5

Voice LAN gateway IP: 47 .12 .33 .1

Card TN: 016

Card Type: SMC (ITG-SA)

Sync status: New

| Card role | Management IP | MAC address | Voice IP | Voice LAN gatew... | Card TN |
|---|---|---|---|---|---|
| Leader0 | 47.22.11.2 | 02:38:25:C2:FA:11 | 47.12.41.5 | 47.12.33.1 | 016 |

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 CS 1000S system for the purpose of retrieving OM reports, always assign the Signaling Server to be the Leader 0 card. A backup 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 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 network interface IP address for the card. OTM 2.2 and Meridian 1/CS 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 199.

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 CS 1000S 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 a ITG-P 24-port line card (dual-slot card). Select StrongArm if using a 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 2.2, the **DSP Profile** tab and its two sub-tabs (**DSP Options** and **Codec Options**) are used to configure DSP profile data.

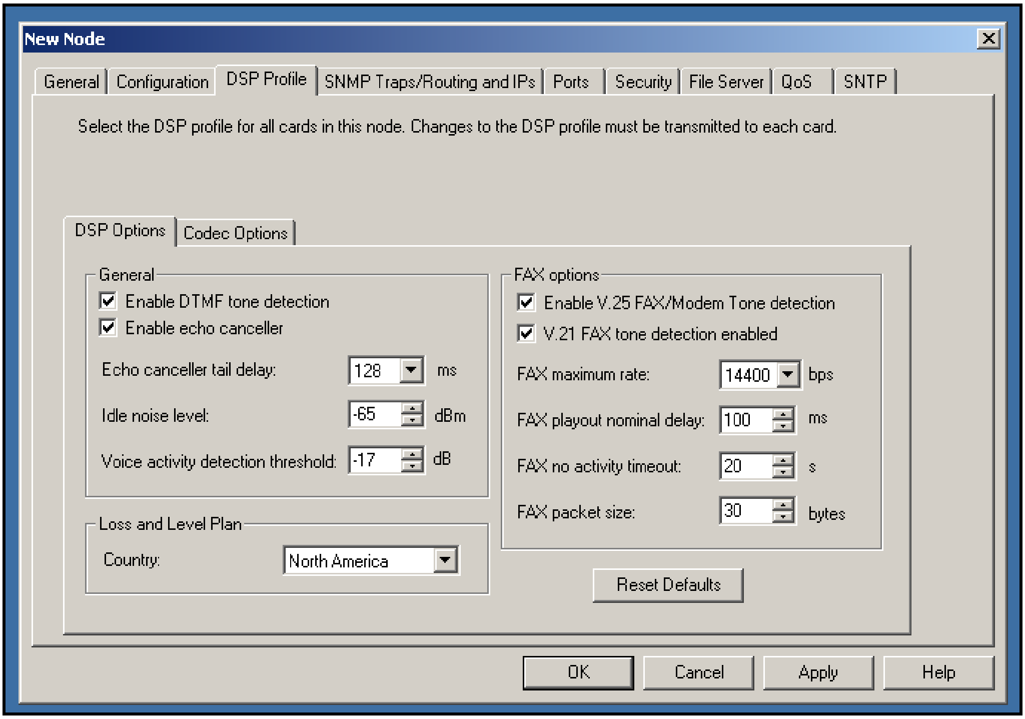
Follow the steps in Procedure 23 to configure DSP profile data.

**Procedure 23**
**Configuring DSP profile data using OTM**

**1** Click the **DSP Profile** tab.

The DSP Options sub-tab opens. See Figure 65 on page 272.

**Figure 65**
**New Node – DSP Profile tab**



Select the DSP profile for all cards in this node. Changes to the DSP profile must be transmitted to each card.

General

☑ Enable DTMF tone detection

☑ Enable echo canceller

Echo canceller tail delay: 128 ms

Idle noise level: -65 dBm

Voice activity detection threshold: -17 dB

Loss and Level Plan

Country: North America

FAX options

☑ Enable V.25 FAX/Modem Tone detection

☑ V.21 FAX tone detection enabled

FAX maximum rate: 14400 bps

FAX playout nominal delay: 100 ms

FAX no activity timeout: 20 s

FAX packet size: 30 bytes

Table 56 lists the configurable DSP parameters, the range of the values, and the default values.

**Table 56**
**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 56**
**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 |

2 Click the **Codec Options** sub-tab. See Figure 66 on page 275.

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 IP Softphone 2050 could be configured with the “I use a modem to connect to the network” check box checked. If the node does not have G.729A and/or G.723 configured, IP Softphone 2050 users with that checkbox selected will have calls blocked. (Note: This does not apply to the MVC 2050.)

For more information, refer to *IP Phones: Description, Installation, and Operation* (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

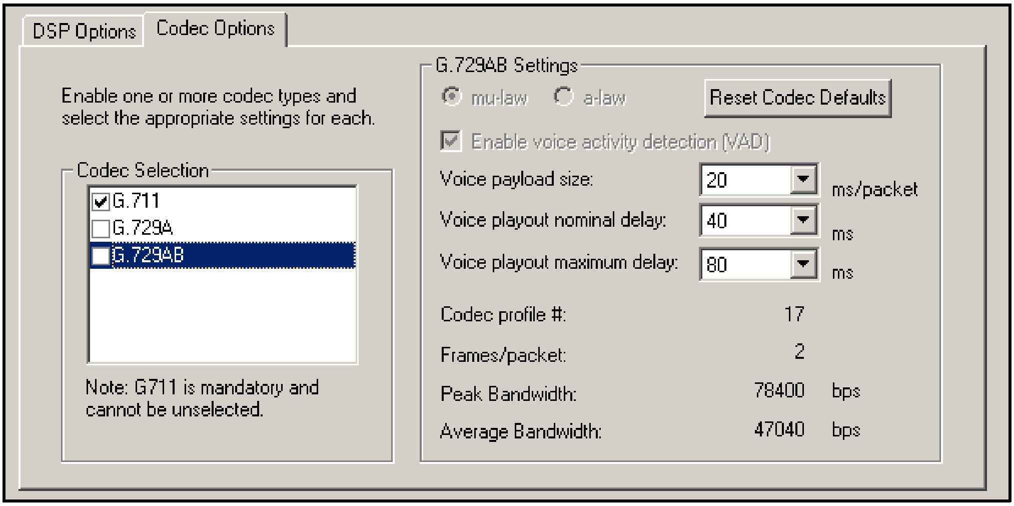
The payload size is stored in the Config.ini file under the entry **VxPayload=**

**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 drop-down lists.

**4** Click **OK**.

**Figure 66**
**New Node – DSP Profile tab - Codec Options sub-tab with G.729 AB Codec selected**



Enable one or more codec types and select the appropriate settings for each.

Codec Selection

☑ G.711
□ G.729A
□ G.729AB

Note: G711 is mandatory and cannot be unselected.

G.729AB Settings

● mu-law ○ a-law

☑ Enable voice activity detection (VAD)

| | | |
|---|---|---|
| Voice payload size: | 20 | ms/packet |
| Voice playout nominal delay: | 40 | ms |
| Voice playout maximum delay: | 80 | ms |
| Codec profile #: | 17 | |
| Frames/packet: | 2 | |
| Peak Bandwidth: | 78400 | bps |
| Average Bandwidth: | 47040 | bps |

***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

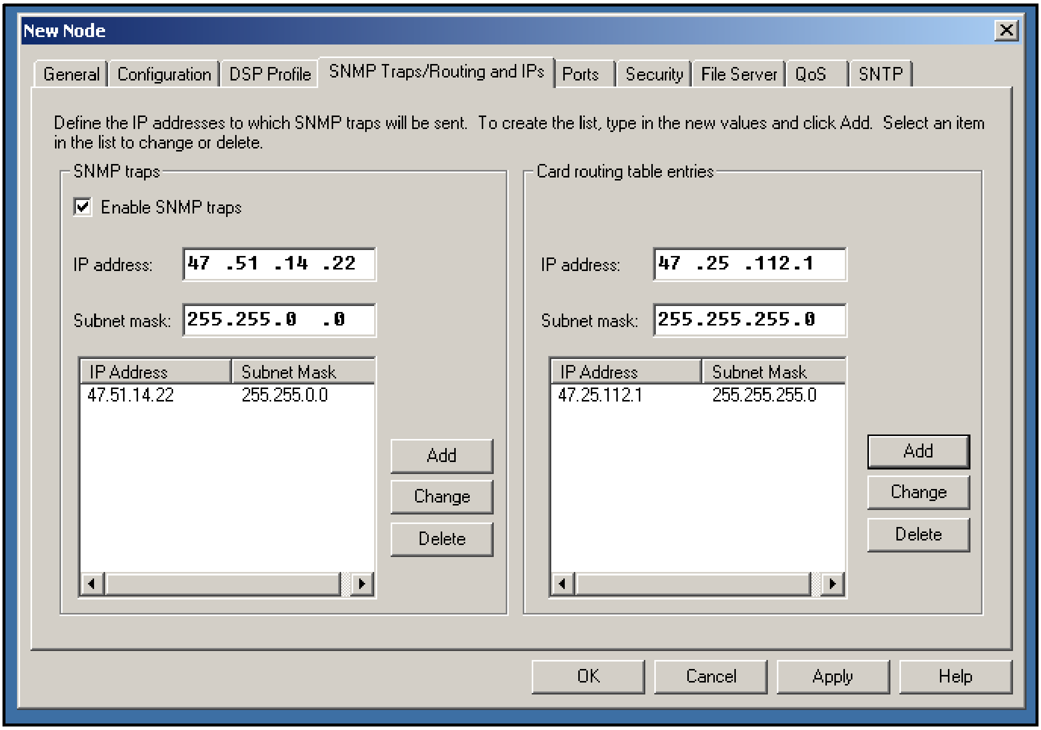
Follow the steps in Procedure 24 to configure SNMP traps and the ELAN gateway routing table.

**Procedure 24**
**Configuring SNMP traps and ELAN GW Routing table**

**1** Click the **SNMP Traps/Routing and IPs** tab in the New Node window. See Figure 67 on page 276.

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 network interface instead of the TLAN network interface.

**Figure 67**
**New Node – SNMP Traps/Routing and IPs tab**



Define the IP addresses to which SNMP traps will be sent. To create the list, type in the new values and click Add. Select an item in the list to change or delete.

SNMP traps

☑ Enable SNMP traps

IP address: 47 .51 .14 .22

Subnet mask: 255.255.0 .0

| IP Address | Subnet Mask |
|---|---|
| 47.51.14.22 | 255.255.0.0 |

Card routing table entries

IP address: 47 .25 .112.1

Subnet mask: 255.255.255.0

| IP Address | Subnet Mask |
|---|---|
| 47.25.112.1 | 255.255.255.0 |

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, this is the IP address of the destination where the SNMP traps are sent.

c. **Subnet mask:** If SNMP traps are enabled, this is the subnet mask of the destination where SNMP traps are sent.

To add a trap destination IP address, enter the IP address in the SNMP IP address fields, and click **Add**. Add SNMP Manager IP addresses for the following:

- local or remote OTM server
- PPP IP address configured in the router on the ELAN subnet for the remote support OTM PC
- SNMP manager for remote alarm monitoring

***Note 1:*** Up to six SNMP trap destinations 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** Click **Apply**.

**4** To transmit the information to the node, from the menu select **Configuration > Synchronize > Transmit**.

**5** On the **SNMP Traps/Routing and IPs** tab 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 on the TLAN network interface. Packets from an external host arrive on the ELAN network interface and responses are sent on the TLAN network interface. This can cause one-way communication if the TLAN subnet is not routed to the ELAN subnet. It is necessary to add an entry in the Route list, to correct the routing so that response packets are sent on the ELAN network interface. Each entry creates a route entry in the card's route table that directs packets to the ELAN network interface. See Figure 68 on page 279.

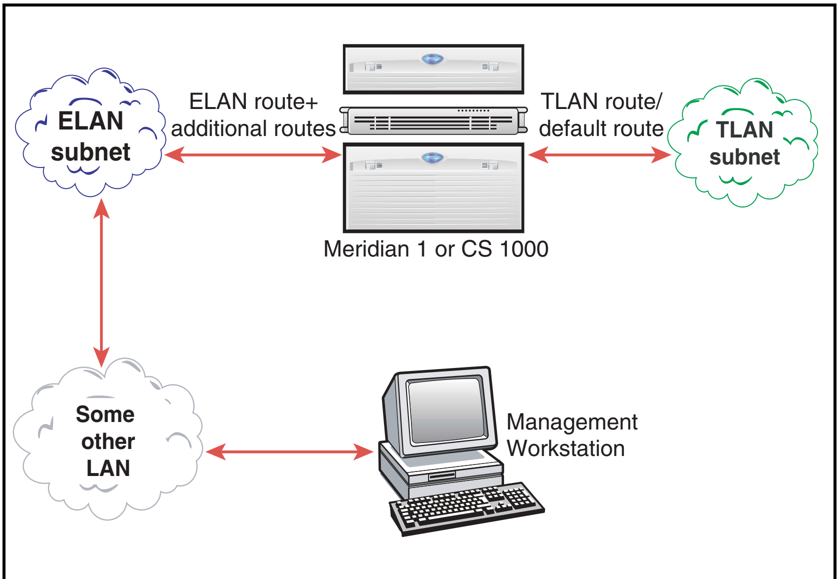
**CAUTION**

Use caution when assigning card routing table entries. Do not include the IP address of an IP Phone. Otherwise, voice traffic to this IP Phone 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.

**6** 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**.

**7** Click **Apply**.

**Figure 68**
**Specifying additional ELAN routes**



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.

**8** Click **OK** to exit the window.

**End of Procedure**

## Configure node synchronization with the Call Server

The SNMP MIB II parameters are configured as a node property in the group box “SNMP parameters” on the **New Node - General** tab. See Figure 69 on page 280.

The check box enables/disables synchronization of the SNMP parameters with the Call Server. The default value is selected. During Update System Data, the SNMP parameters are propagated to all existing IP nodes that have the “Synchronize with PBX system” option selected. Status of the node is set to changed (CHG).

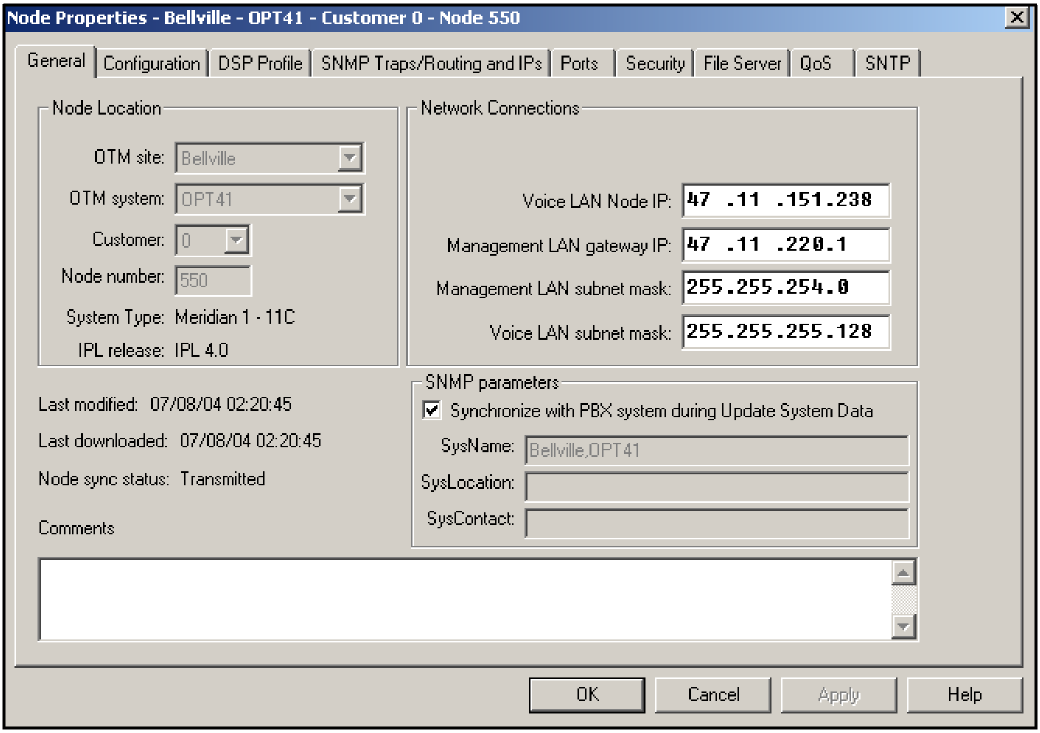
When the check box is selected, the fields are set to read-only. When the check box is not selected, the fields are set to read/write, and synchronization does not occur for that node.

Follow the steps in Procedure 25 to configure node synchronization with the Call Server.

**Procedure 25**
**Configuring node synchronization with the Call Server**

1 Click the **Node Properties - General** tab for the desired node. See Figure 69.

**Figure 69**
**SNMP parameters**



Node Properties - Bellville - OPT41 - Customer 0 - Node 550

Node Location

OTM site: Bellville

OTM system: OPT41

Customer: 0

Node number: 550

System Type: Meridian 1 - 11C

IPL release: IPL 4.0

Network Connections

Voice LAN Node IP: 47 .11 .151.238

Management LAN gateway IP: 47 .11 .220.1

Management LAN subnet mask: 255.255.254.0

Voice LAN subnet mask: 255.255.255.128

Last modified: 07/08/04 02:20:45

Last downloaded: 07/08/04 02:20:45

Node sync status: Transmitted

Comments

SNMP parameters

☑ Synchronize with PBX system during Update System Data

SysName: Bellville.OPT41

SysLocation:

SysContact:

**2** Check the **Synchronize with PBX system during Update System Data** check box.

**3** Click **Apply**.

**4** Click **OK** to exit the window.

**End of Procedure**

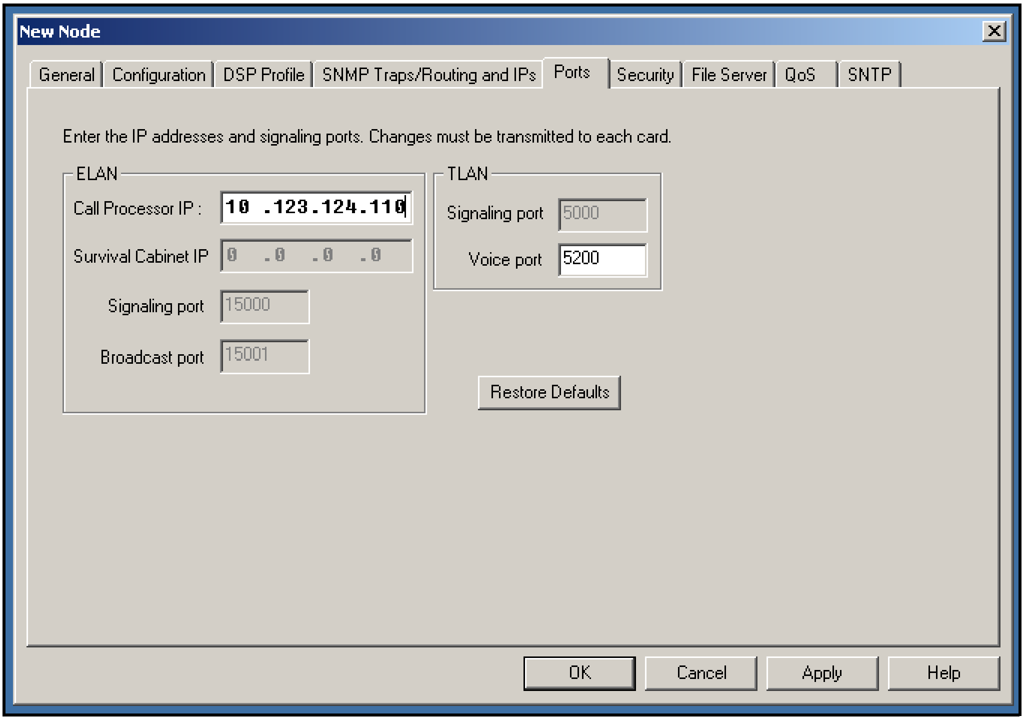
## Configure the Call Server ELAN IP address and the TLAN voice port

Follow the steps in Procedure 26 to configure the Call Server IP address (Active ELNK) and the TLAN voice port.

### Procedure 26
### Configuring the Call Server ELAN IP address (Active ELNK) and the TLAN voice port

**1** Click the **Ports** tab. See Figure 70.

**Figure 70**
**New Node – Ports tab**



Enter the IP addresses and signaling ports. Changes must be transmitted to each card.

ELAN

Call Processor IP : 10 .123.124.110

Survival Cabinet IP 0 .0 .0 .0

Signaling port 15000

Broadcast port 15001

TLAN

Signaling port 5000

Voice port 5200

**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 CS 1000S systems.

***Note:*** For Small Systems or CS 1000S, 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 IP Phone 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 IP Phones. 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:*** The TLAN Voice port range is 1024 to 65535. The default Voice ports are 5200-5295.

***Note 3:*** 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 Media Card 32-port line card
- 5200-5215 on the 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

Change the SNMP community names to control access to the IP Telephony node. OTM uses the community names to refresh the Voice Gateway Media Card status, and to control the transmitting and retrieving of configuration data files for database synchronization.

Use OTM to configure SNMP on the Meridian 1 Call Server and Voice Gateway Media Cards.

## Configure SNMP access and community name strings

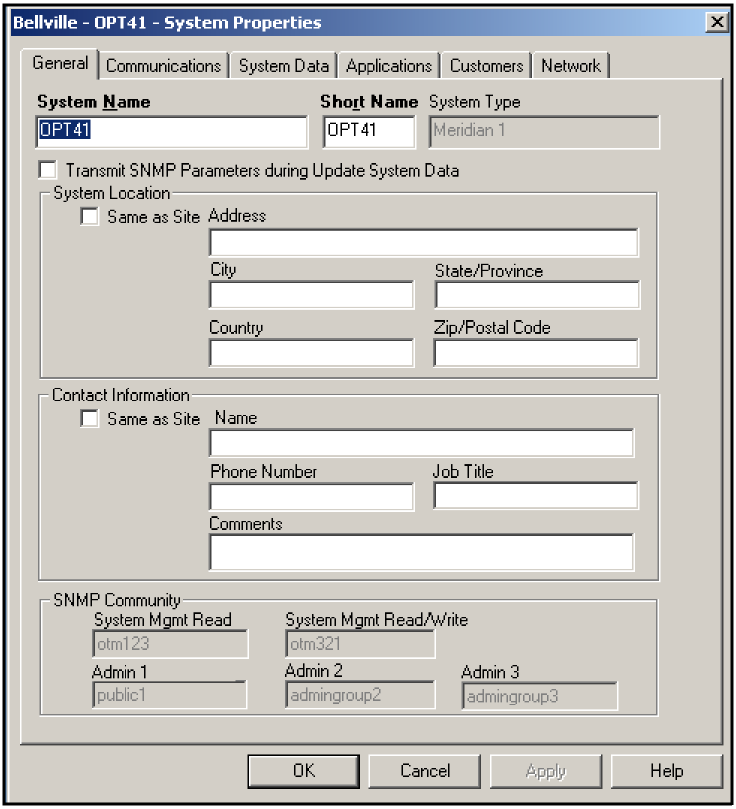
Follow the steps in Procedure 27 on page 285 to configure SNMP access for the system.

### Procedure 27
### Configuring SNMP access and community name strings

1 Click the **General** tab on System properties.

See Figure 71.

**Figure 71**
**System properties - General tab**



Bellville - OPT41 - System Properties

System Name: OPT41

Short Name: OPT41

System Type: Meridian 1

□ Transmit SNMP Parameters during Update System Data

System Location

□ Same as Site

Address:

City:

State/Province:

Country:

Zip/Postal Code:

Contact Information

□ Same as Site

Name:

Phone Number:

Job Title:

Comments:

SNMP Community

System Mgmt Read: otm123

System Mgmt Read/Write: otm321

Admin 1: public1

Admin 2: admingroup2

Admin 3: admingroup3

2 Enter the **System Name** data.

3 Select the **Configure SNMP parameters using OTM data in this tab during Update System Data** check box.

4 Change the default **System Mgmt Read, System Mgmt Read/Write, Admin 1, Admin 2, and Admin 3** community names.

5 Enter the **System Location** and **Contact Information** data.

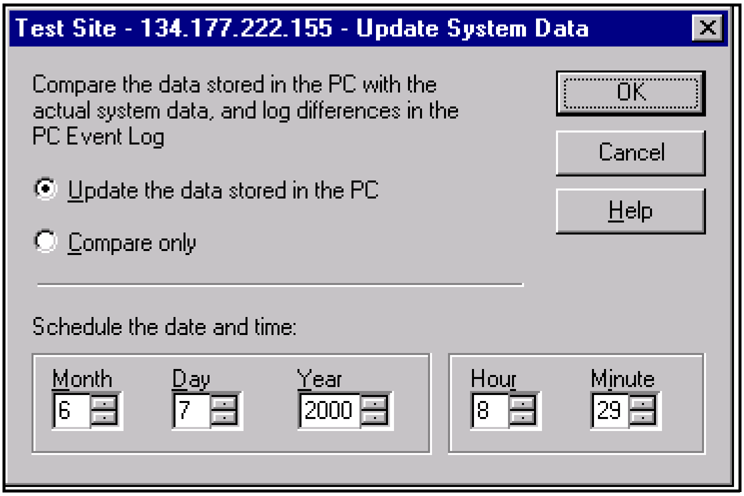
6 Click **Apply**.

7 Click **OK** to exit the window.

8 To update the system data, from the System Window menu bar, click **File > Update System Data.**

The Update System Data dialog box opens. See Figure 72.

**Figure 72**
**Update System Data dialog box**



Test Site - 134.177.222.155 - Update System Data

Compare the data stored in the PC with the actual system data, and log differences in the PC Event Log

● Update the data stored in the PC

○ Compare only

Schedule the date and time:

Month: 6
Day: 7
Year: 2000
Hour: 8
Minute: 29

9 Select **Update the data stored in the PC**.

10 Click **OK** to update the system data.

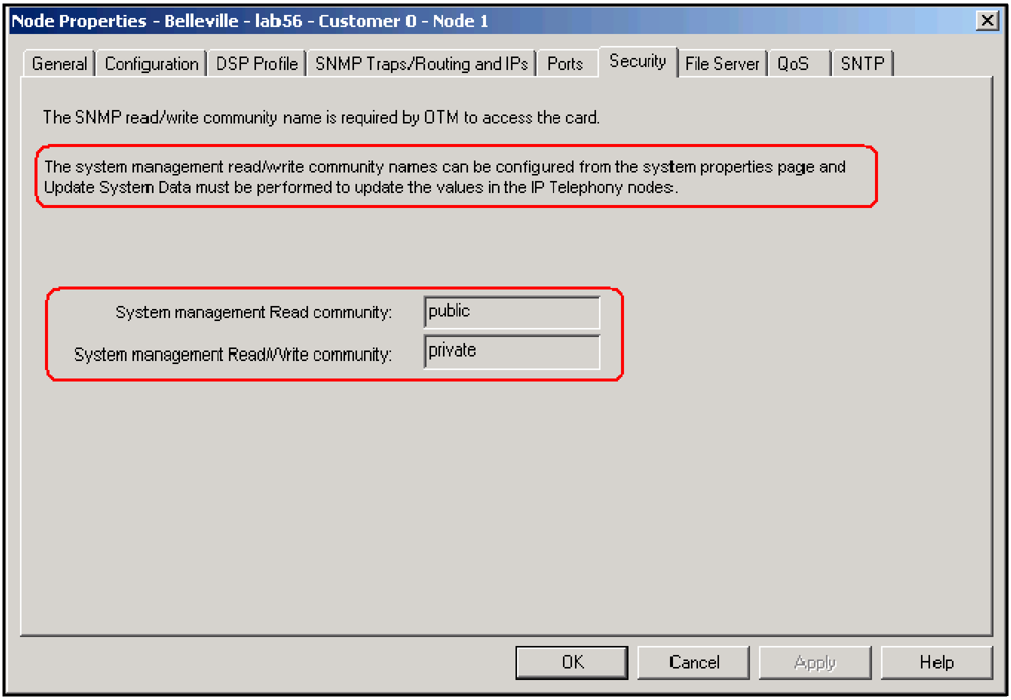
**End of Procedure**

SNMP community name strings (passwords) are required to access the Voice Gateway Media Card. The community name strings are not configured on the

Security tab. They are displayed as read-only for information purposes. See Figure 73.

Community name strings are configured on the System Properties - General tab. See Procedure 27 on page 285.

**Figure 73**
**Node Properties – Security tab**



Node Properties - Belleville - lab56 - Customer 0 - Node 1
General
Configuration
DSP Profile
SNMP Traps/Routing and IPs
Ports
Security
File Server
QoS
SNTP
OK
Cancel
Apply
Help

The SNMP read/write community name is required by OTM to access the card.

The system management read/write community names can be configured from the system properties page and Update System Data must be performed to update the values in the IP Telephony nodes.

System management Read community: public

System management Read/Write community: private

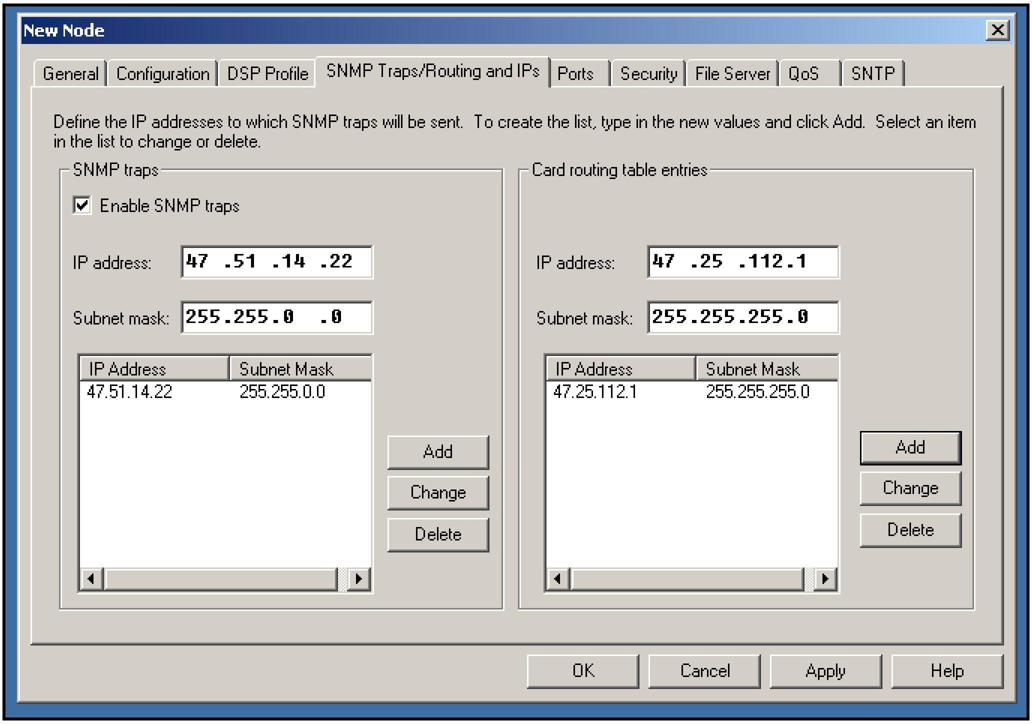
## Configure SNMP trap destinations for an IP Telephony node

Follow the steps in Procedure 28 on page 288 to use OTM to configure SNMP trap destinations for an IP Telephony node.

### Procedure 28
### Configuring SNMP trap destinations for an IP Telephony node

1 Click the **SNMP Traps/Routing and IPs** tab in the Node Properties window. See Figure 67.

**Figure 74**
**Node Properties – SNMP Traps/Routing and IPs tab**



Define the IP addresses to which SNMP traps will be sent. To create the list, type in the new values and click Add. Select an item in the list to change or delete.

SNMP traps

☑ Enable SNMP traps

IP address: 47 .51 .14 .22

Subnet mask: 255.255.0 .0

| IP Address | Subnet Mask |
|---|---|
| 47.51.14.22 | 255.255.0.0 |

Card routing table entries

IP address: 47 .25 .112.1

Subnet mask: 255.255.255.0

| IP Address | Subnet Mask |
|---|---|
| 47.25.112.1 | 255.255.255.0 |

2 On the left side of the window, under **SNMP traps**:

a. **Enable SNMP traps:** Select the **Enable SNMP traps** check box, if configuring one or more destination SNMP management IP addresses to receive SNMP traps from cards in the IP Telephony node.

b. **IP address:** If SNMP traps are enabled, this is the IP address of the destination where the SNMP traps are sent.

c. **Subnet mask:** The subnet mask for the IP address of the trap destination must **always** be configured as 255.255.25.255.

> **WARNING**
>
> Do not enter the actual value of the subnet mask on the interface of the SNMP trap destination. Doing so can cause misrouting of RTP media and signaling, leading to no speech path between the IP Phones and the Voice Gateway Media Cards or failure of the IP Phones to register with the LTPS.

d. To add a trap destination IP address, enter the IP address and subnet mask (if applicable) in the SNMP IP address field, and click **Add**.

Add trap destination IP addresses for the following:

— local or remote OTM server

— PPP IP address configured in the router on the ELAN for the remote support OTM PC

— SNMP manager for remote alarm monitoring

***Note:*** Up to six SNMP trap destinations can be defined.

3 Click **Apply**.

4 Click **OK** to exit the window.

5 To transmit the information to the node, from the menu select **Configuration > Synchronize > Transmit**.

**End of Procedure**

***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 start-up.

## Configure file server access

With the addition of new IP Phones, there are also additional firmware files for the IP Phones. The Voice Gateway Media Card has limited space to store the files for all the IP Phones on the card. Instead, a file server can be used to store the IP Phone firmware files.

The Phase I IP Phone 2002 firmware filename is 0603Bnn.BIN where Bnn = firmware version 1.nn. The Phase I IP Phone 2004 firmware filename is 0602Bnn.BIN where Bnn = F/W version 1.nn. The Phase II IP Phone 2001, IP Phone 2002, and IP Phone 2004 firmware filename is 0603Dnn.BIN where Dnn = F/W version 3.nn.

### External file server option

If the external file server option is used in OTM 2.2 for firmware distribution with a node, the following files must be renamed before being placed on the server.

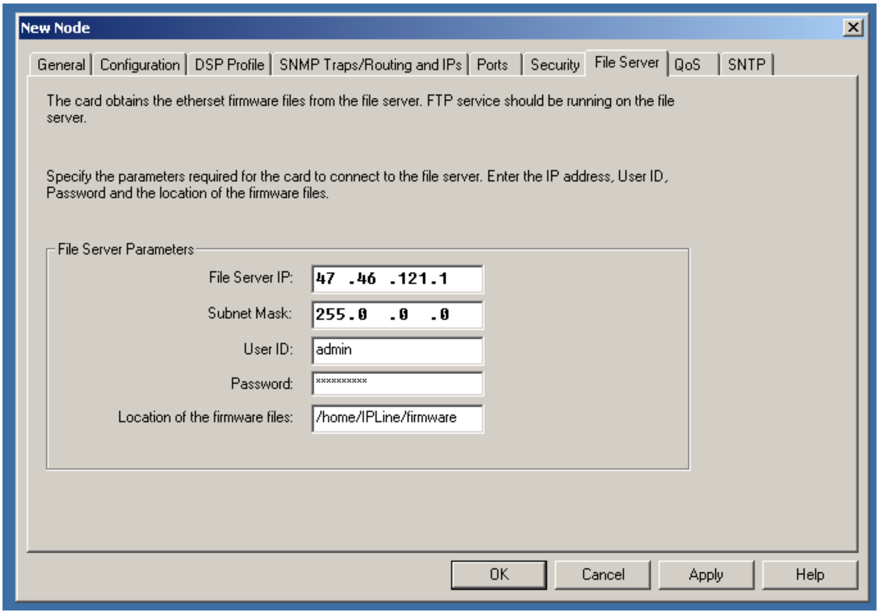
- 0602Bnn.BIN file renamed to i2004.fw
- 0603Bnn.BIN file renamed to i2002.fw
- 0604Dnn.BIN renamed to IPP2SETS.fw

To configure the file server, follow the steps in Procedure 29 on page 291.

### Procedure 29
### Configuring access to the File Server

1 Click the **File Server** tab. See Figure 75.

**Figure 75**
**New Node – File Server tab**



New Node

The card obtains the etherset firmware files from the file server. FTP service should be running on the file server.

Specify the parameters required for the card to connect to the file server. Enter the IP address, User ID, Password and the location of the firmware files.

File Server Parameters

File Server IP: 47 .46 .121.1

Subnet Mask: 255.0 .0 .0

User ID: admin

Password: **********

Location of the firmware files: /home/IPLine/firmware

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 132 for the default location of firmware files for the system.

3 Click **Apply**.

**End of Procedure**

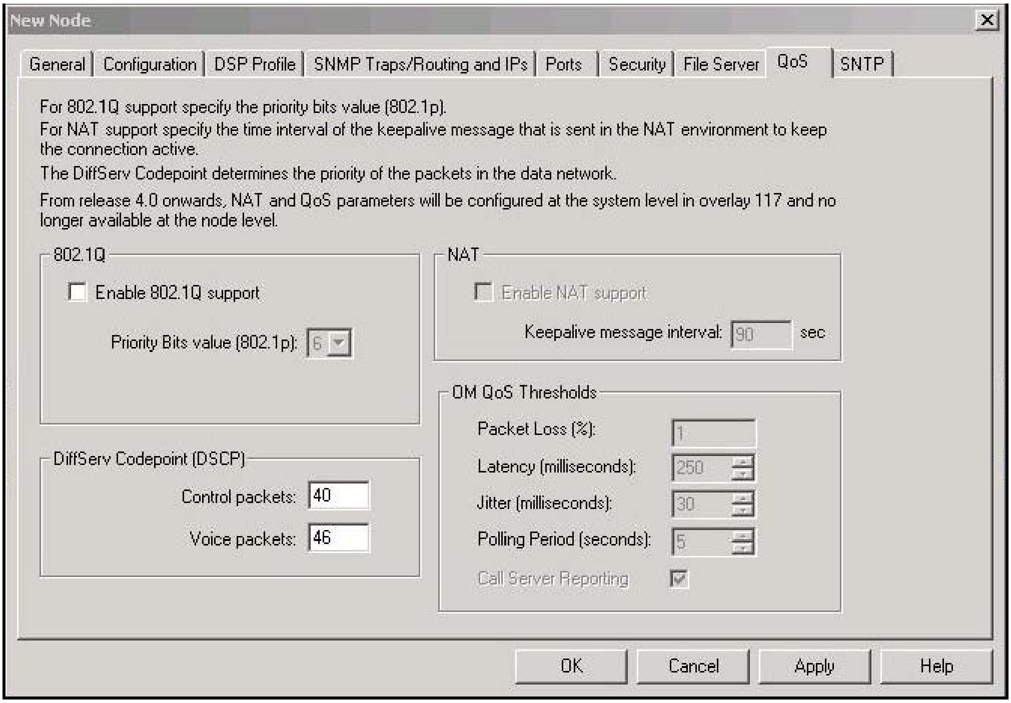
## Configure QoS

Configure QoS by enabling 802.1Q and NAT support, configuring DiffServ CodePoint (DSCP) settings, and configuring OM QoS thresholds.

**Procedure 30**
**Enabling 802.1Q and configuring DSCP settings**

1 Click the **QoS** tab. See Figure 76.

**Figure 76**
**New Node – QoS tab**



For 802.1Q support specify the priority bits value (802.1p).
For NAT support specify the time interval of the keepalive message that is sent in the NAT environment to keep the connection active.
The DiffServ Codepoint determines the priority of the packets in the data network.
From release 4.0 onwards, NAT and QoS parameters will be configured at the system level in overlay 117 and no longer available at the node level.

802.1Q
☐ Enable 802.1Q support
Priority Bits value (802.1p): 6

NAT
☐ Enable NAT support
Keepalive message interval: 90 sec

DiffServ Codepoint (DSCP)
Control packets: 40
Voice packets: 46

OM QoS Thresholds
Packet Loss (%): 1
Latency (milliseconds): 250
Jitter (milliseconds): 30
Polling Period (seconds): 5
Call Server Reporting ☑

**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:** Select 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** 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.

**4** Click **Apply** and then click **OK**.

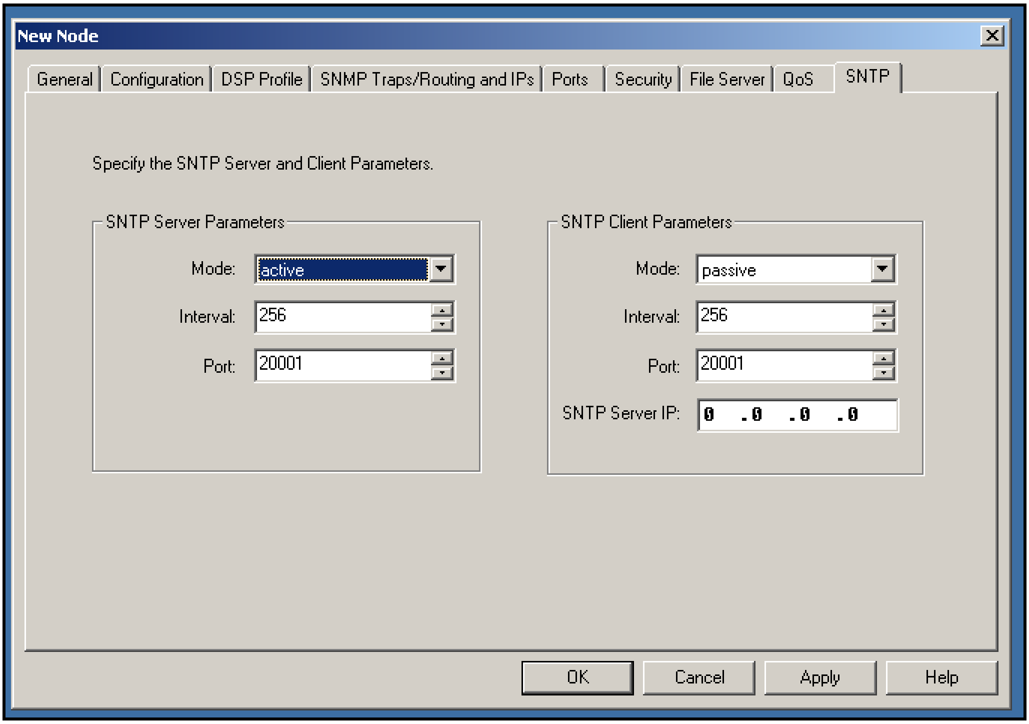
***Note:*** As described on the QoS tab, NAT and QoS parameters are no longer configured here. Therefore, those areas are grayed out.

**End of Procedure**

## Configure SNTP

Simple Network Time Protocol (SNTP) can be configured for an SNTP Server and SNTP Client. See Figure 77.

**Figure 77**
**SNTP configuration tab**



New Node

Specify the SNTP Server and Client Parameters.

SNTP Server Parameters

Mode: active
Interval: 256
Port: 20001

SNTP Client Parameters

Mode: passive
Interval: 256
Port: 20001
SNTP Server IP: 0 .0 .0 .0

### 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 2.2 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 network interfaces of all cards are connected with access to the IP network.
- IP Line 4.0 data has been configured in OTM 2.2.
- OTM 2.2 server is connected to the local ELAN subnet or to a remote subnet with IP router access to the ELAN and TLAN subnets.

The IP Telephony node and card properties are configured using OTM 2.2’s IP Line 4.0 application. The configuration data is converted to text files by OTM 2.2 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 31 on page 296.

**2** Reboot Leader 0.

3 Transmit the node and card properties from the OTM IP Line 4.0 application to Leader 0. See Procedure 32 on page 298.

4 Reboot Leader 0.

5 Transmit card properties to all cards in the node. See Procedure 33 on page 300.

## Set the Leader 0 IP address

Follow the steps in Procedure 31 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 31
### Setting the Leader 0 IP address

1 Access the IPL> CLI by connecting the COM port of an OTM 2.2 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 2.2.

**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 4.0 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 32.

> **CAUTION**
>
> OTM 2.2 does not support transmitting node and/or card properties to a node (or any of the card within the node) which resides on a CS 1000 system.

**Procedure 32**
**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.

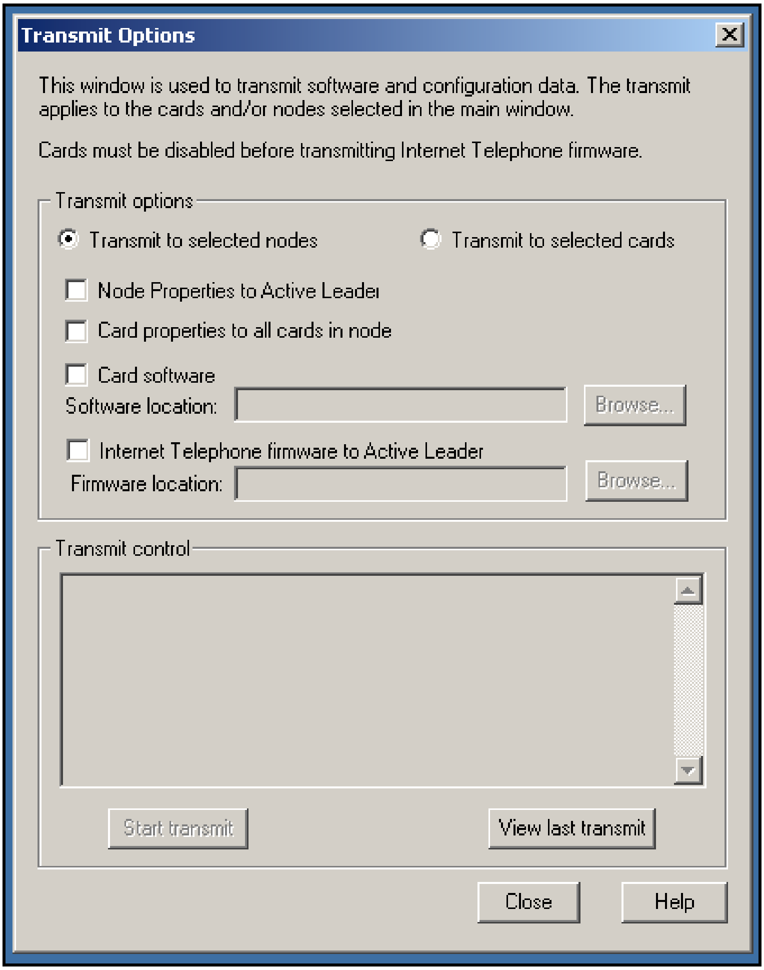
**2** Open OTM. From the **OTM Navigator** window, click on the **Services** folder to expand the menu. Double-click on **IP Line 4.0**. The **IP Telephony Gateway - IP Line 4.0** window opens.

**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 78 on page 299.

**Figure 78**
**Transmit Options dialog box**



Transmit Options

This window is used to transmit software and configuration data. The transmit applies to the cards and/or nodes selected in the main window.

Cards must be disabled before transmitting Internet Telephone firmware.

Transmit options

● Transmit to selected nodes ○ Transmit to selected cards

□ Node Properties to Active Leader

□ Card properties to all cards in node

□ Card software

Software location:

□ Internet Telephone firmware to Active Leader

Firmware location:

Transmit control

5 Use the default setting of **Transmit to selected nodes**. Select 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 33.

**CAUTION**

OTM 2.2 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 CS 1000 system.

**Procedure 33**
**Transmitting card properties to all cards in the node**

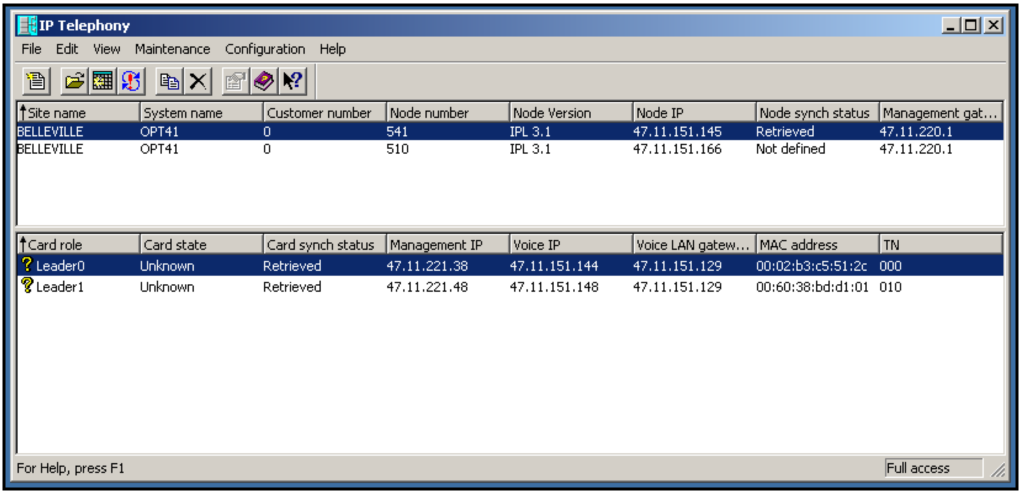
**1** To verify installation and configuration of the node properties, observe the displays on the card faceplate.

- 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 IP Phones registered with the LTPS on the Leader card. L000 means that no IP Phones 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 IP Phones registered with the LTPS on the Leader card. F000 means that no IP Phones 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 79.

**Figure 79**
**IP Telephony window**



| Site name | System name | Customer number | Node number | Node Version | Node IP | Node synch status | Management gat... |
|---|---|---|---|---|---|---|---|
| BELLEVILLE | OPT41 | 0 | 541 | IPL 3.1 | 47.11.151.145 | Retrieved | 47.11.220.1 |
| BELLEVILLE | OPT41 | 0 | 510 | IPL 3.1 | 47.11.151.166 | Not defined | 47.11.220.1 |

| Card role | Card state | Card synch status | Management IP | Voice IP | Voice LAN gatew... | MAC address | TN |
|---|---|---|---|---|---|---|---|
| Leader0 | Unknown | Retrieved | 47.11.221.38 | 47.11.151.144 | 47.11.151.129 | 00:02:b3:c5:51:2c | 000 |
| Leader1 | Unknown | Retrieved | 47.11.221.48 | 47.11.151.148 | 47.11.151.129 | 00:60:38:bd:d1:01 | 010 |

**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 2.2 cannot communicate using the TLAN router, connect to the Voice Gateway Media Card maintenance port with a TTY and use the IPL> **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. Select 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 IP Phone 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 Signaling Server.

Before upgrading the software and firmware, determine the version of card software and IP Phone firmware that is currently installed. Compare the versions to the latest available versions by accessing the Nortel Networks web site. Refer to Procedure 34 on page 306 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. See Appendix F on page 763.

## IP Phone firmware installation and upgrade

The firmware files for the IP Phones are downloaded from OTM 2.2 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, 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 IP Phones with the correct version of firmware. Except in the case where the UFTP download to the IP Phone would be blocked (such as when the IP Phone is behind a firewall that has port 5105 blocked), the IP Phone's firmware is automatically upgraded as part of the registration to the LTPS. If the firmware cannot be upgraded due to firewall restrictions, then upgrade the IP Phone with the current firmware version before distributing the telephone.

There is one firmware file each for the Phase I IP Phone 2002 and 2004. There is one firmware file for the Phase II IP Phone 2001, IP Phone 2002, and IP Phone 2004.

There is limited space on the Voice Gateway Media Card running IP Line 4.0 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 IP Phones performing a Virtual Office login or Branch Office login to a remote system. No firmware upgrade takes place during a Virtual Office Login or MG 1000B User registration with the LTPS. The registration is allowed because the IP Phone firmware version must be 1.33 or later to do a Virtual Office login or MG 1000B User registration.
>
> The **umsUpgradeAll** command has no impact on Virtual Office Login IP Phones. These IP Phones are not reset. If the Virtual Office Login is on the same Call Server, then the IP Phone firmware is upgraded after the user logs out. If the Virtual office Login is between different Call Servers, then the IP Phone just registers back to its home LTPS and follows the normal firmware rules for regular registration.
>
> When the **umsUpgradeAll** command is executed, MG 1000B User IP Phones that are on an active call are flagged. After the IP Phone becomes idle, the IP Phones are switched by the Call Server back to the MG 1000B 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 2.2 IP Line 4.0 application. If using OTM 2.2, this information is configured in the File Server tab of the Node properties. See Figure 75 on page 291.

**IMPORTANT!**

All IP Phones in a system must use the same version of firmware as is on the Voice Gateway Media Card(s).The same version of firmware for a specific IP Phone type must reside on all Voice Gateway Media Cards in a system. If retrieved from an external server, ensure all Voice Gateway Media Cards retrieve the same firmware files

The IP Phones use UNIStim File Transfer Protocol (UFTP) to transfer the firmware; therefore, if the customer's network has a firewall, port 5105 must be explicitly opened in the firewall to enable IP Phone firmware downloads to take place. For more information, refer to "Firmware download using UNIStim FTP" on page 83.

**CAUTION**
The OTM PC should not be used as the file server for the firmware download.

## IP Phone 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 4.0 software is located on the CompactFlash card. Go to the Nortel Networks web site and download the firmware for the IP Phones to the Leader card. See Appendix F on page 763.

As each IP Phone 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 IP Phones. After the new firmware has been downloaded, the IP Phone reboots and registers again with the Voice Gateway Media Card.

### CS 1000M and CS 1000S

For CS 1000M and CS 1000S systems, it is not necessary to download software and firmware files to the card. All required software and firmware files are on the Signaling Server Installation CD and are copied over at installation. The Signaling Server is the Leader, so all Voice Gateway Media Cards in the node go to the Signaling Server to obtain the IP Phone firmware files.

> *Note:* The IP Phone does not necessarily register with the same card as before the upgrade.

## Verify card software and IP Phone 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 IP Phone, follow the steps in Procedure 34.

**Procedure 34**
**Verifying card loadware and IP Phone firmware using OTM 2.2**

1 In the **OTM Navigator**, select the **Services** folder. Double-click on the **IP Line Telephony** icon.

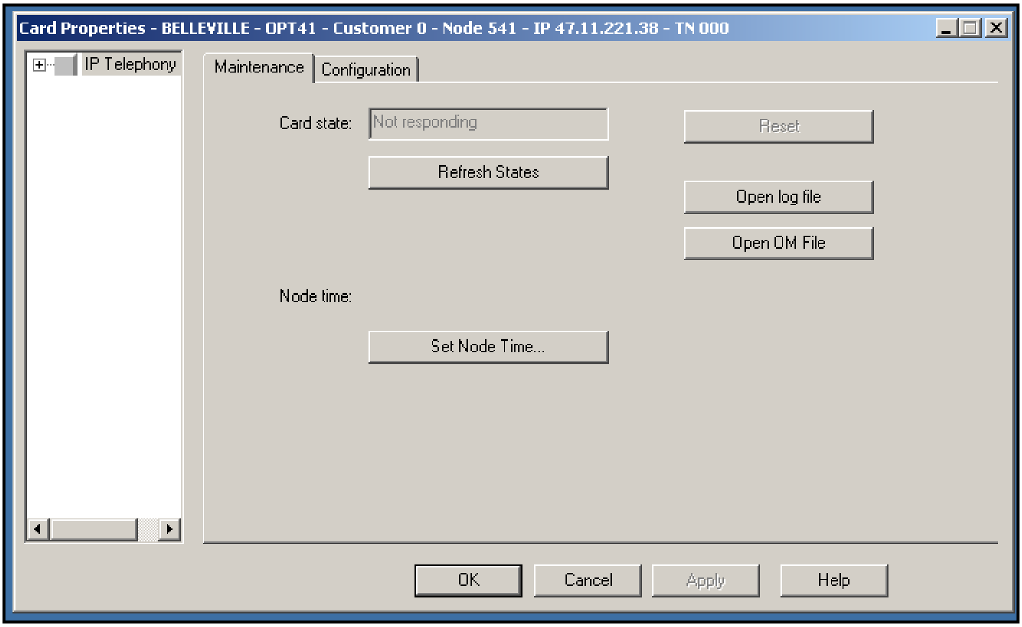
The **IP Telephony** window opens.

2 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.

3 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 80 and see Figure 81 on page 308.

**Figure 80**
**Card Properties – Maintenance tab**



Card Properties - BELLEVILLE - OPT41 - Customer 0 - Node 541 - IP 47.11.221.38 - TN 000

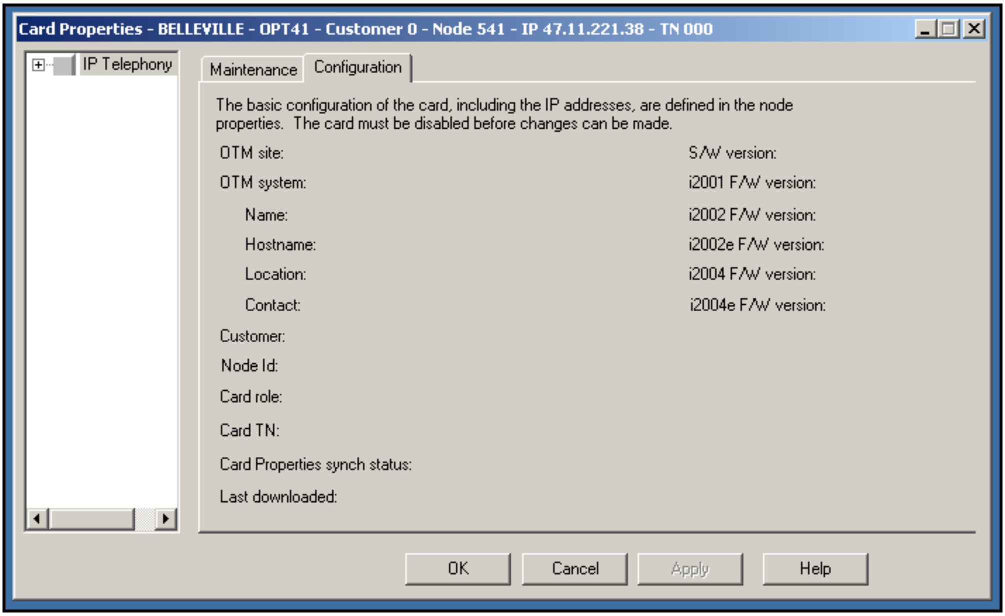
Card state: Not responding

Node time:

**4** Keep the default settings shown in the Maintenance tab. Click the **Configuration** tab.

See Figure 81 on page 308.

**Figure 81**
**Card Properties – Configuration tab**



Card Properties - BELLEVILLE - OPT41 - Customer 0 - Node 541 - IP 47.11.221.38 - TN 000

The basic configuration of the card, including the IP addresses, are defined in the node properties. The card must be disabled before changes can be made.

OTM site:

OTM system:

Name:

Hostname:

Location:

Contact:

Customer:

Node Id:

Card role:

Card TN:

Card Properties synch status:

Last downloaded:

S/W version:

i2001 F/W version:

i2002 F/W version:

i2002e F/W version:

i2004 F/W version:

i2004e F/W version:

The current Voice Gateway Media Card software and IP Phone firmware versions are displayed on the Configuration tab. The Voice Gateway Media Card software is labelled **S/W version** and the IP Phone firmware is labeled **i2001**, **i2002,** or **i2004 F/W version**.

5 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.

6 Check the Nortel Networks web site for the latest IP Line 4.0 software and IP Phone firmware releases. Download the files. See Appendix F on page 763.

***Note:*** The IP Line 4.0 software files and IP Phone firmware files are contained in the **IP Line 4.00xx. SA** file in the **Internet Telephony Gateway** product list on the Nortel Networks web site. The zipped file contains the following:

- The **IPL400xx.p2** and **IPL400xx.sa** loadware files. The IPL400xx.p2 file is the IP Line 4.0 application for the ITG-P 24-port line card. The IPL400xx.sa is the IP Line 4.0 application for the Media Card.
- The **0602Bxx.BIN** (Phase I IP Phone 2004), **0603Bxx.BIN** (Phase I IP Phone 2002), and **0604Dnn.BIN** (Phase II IP Phone 2001, IP Phone 2002, and IP Phone 2004) firmware files.

  For example, a firmware version can be labelled 0602B38. This means IP Phone firmware version 1.38.

  — The 02 represents the IP Phone 2004.

  — The letter B represents the version number.

  — 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.

7 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.

8 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.

9 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 35, “Upgrading Voice Gateway Media Card software from the OTM 2.2 PC” on page 311, and Procedure 37, “Upgrading the IP Phone firmware” on page 316 for detailed instructions on how to perform the upgrades.

***Note:*** All cards must be running the same version of the software.

**End of Procedure**

## Upgrade options

Once the Voice Gateway Media Card software and IP Phone firmware has been verified, there are three upgrade options:

**1** Upgrade the Voice Gateway Media Card software.
– In this case, perform Procedure 35 on page 311 only.

This is the most frequently-used option is used; however, verify if an IP Phone firmware upgrade is also required.

**2** Upgrade both the Voice Gateway Media Card software and IP Phone firmware.
– In this case, perform a combination of Procedure 35 on page 311 and Procedure 37 on page 316.

***Note:*** Do not restart the Voice Gateway Media Cards until the end of Procedure 37, as restarting the cards restarts all the IP Phones.

**3** Upgrade the IP Phone firmware.
– In this case, perform Procedure 37 on page 316 only.

***Note:*** In this case, restart all IP Phones instead of all Voice Gateway Media Cards. To do this, select a single test IP Phone and reset the firmware only on that test telephone before completing the procedure on all IP Phones. If the upgrade works properly, use the **umsUpgradeAll** command to complete the upgrade on all the IP Phones.

## Upgrade Voice Gateway Media Card software

To upgrade the software on the Voice Gateway Media Card, follow the steps in Procedure 35.

If Procedure 34 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 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 Media Card line card's software.

**Procedure 35**
**Upgrading Voice Gateway Media Card software from the OTM 2.2 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.

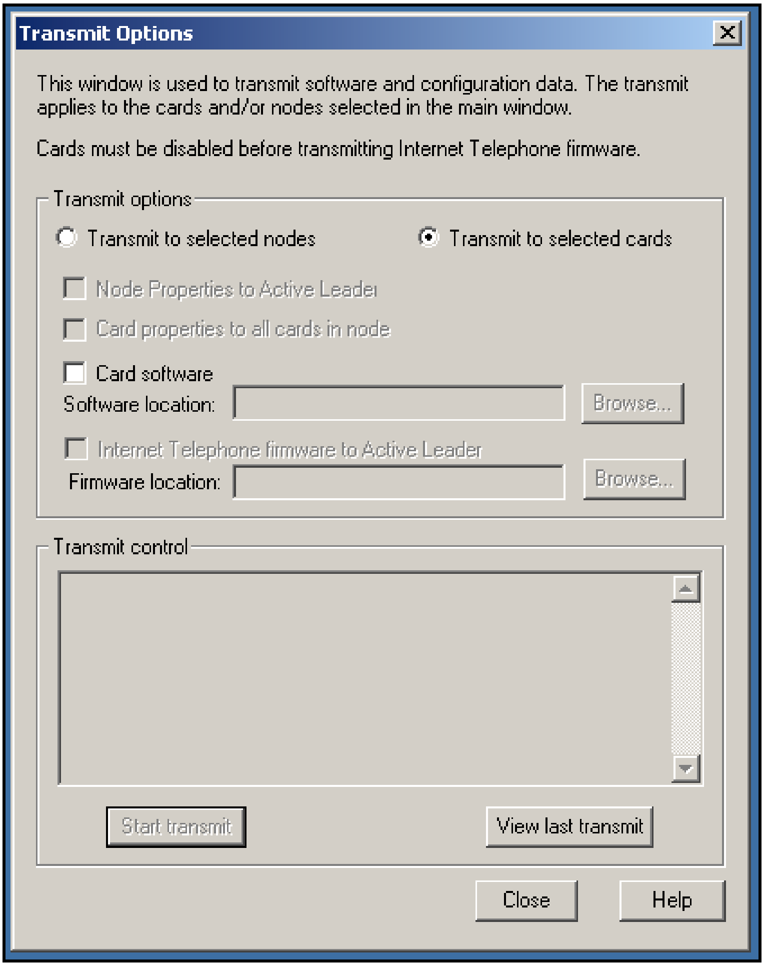
4 In the **IP Telephony Gateway - IP Line 4.0** main window, select **View > Refresh** and verify that the card status is showing "Disabled."

5 Select **Configuration > Synchronize > Transmit**.

The **Transmit Options** dialog box is displayed. See Figure 82 on page 312.

6 Under **Transmit options**, select the **Transmit to selected cards** radio button.

**Figure 82**
**Transmit Options window**



Transmit Options

This window is used to transmit software and configuration data. The transmit applies to the cards and/or nodes selected in the main window.

Cards must be disabled before transmitting Internet Telephone firmware.

Transmit options

○ Transmit to selected nodes ● Transmit to selected cards

□ Node Properties to Active Leader

□ Card properties to all cards in node

□ Card software

Software location:

□ Internet Telephone firmware to Active Leader

Firmware location:

Transmit control

7 Select 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.

**10** Locate the Voice Gateway Media Card software that was verified to be the correct version in Procedure 34 on page 306. 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.

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.

14 After all the Voice Gateway Media Cards have been reset, have successfully rebooted, and are responding again to the OTM 2.2 IP Line 4.0 application, do a **Status refresh** (disabled: active; disabled: backup; disabled).

15 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.

16 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 re-enable the Voice Gateway Media Card with one of the following commands:

- ENLC l s c (for Meridian 1 and CS 1000M Large Systems)
- ENLC c (for Meridian 1 and CS 1000M Small Systems, and CS 1000S)

17 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 4.0 software for the Voice Gateway Media Card vintages earlier than NTVQ01BB and NTVQ01AB are:

- Version 6.7 for the Media Card
- Version 5.7 for the ITG-P 24-port card

The minimum versions of IP Line 4.0 software for the Voice Gateway Media Cards NTVQ01BB and NTVQ01AB is Version 8.0. There is no need to download the Version 8.0 software for the Voice Gateway Media Cards NTVQ01BB and NTVQ01AB as the software is pre-loaded at the factory.

> ***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 36 on page 315.

**Procedure 36**
**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 Media Card line cards.

2 Once the most current version of the software has been downloaded, follow the steps in:

   - Procedure 99 on page 639 to upgrade the software on the ITG-P 24-port line card
   - Procedure 100 on page 642 to upgrade the software on the Media Card line cards

**End of Procedure**

## Upgrade the IP Phone firmware

When the IP Line 4.0 software has been upgraded on the Voice Gateway Media Card, verify if an IP Phone firmware upgrade is also required. Check the *Readme First* document for the OTM IP Line 4.0 application to determine which IP Phone firmware version is required to be compatible.

> ***Note:*** The firmware upgrade procedure does not apply to the IP Softphone 2050 and the MVC 2050.

- In Procedure 34 on page 306, 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 35 on page 311 and Procedure 37 on page 316 together, do not restart the Voice Gateway Media Card until Procedure 37 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 37 on page 316 alone (a firmware upgrade only), it is only necessary to reboot the node.

To upgrade the firmware on the IP Phone, follow the steps in Procedure 37. This procedure has two major steps:

- placing the IP Phone firmware onto each card in the node
- propagating the firmware from the card to each IP Phone registered on that card

### Procedure 37
### Upgrading the IP Phone 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 IP Phone 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.

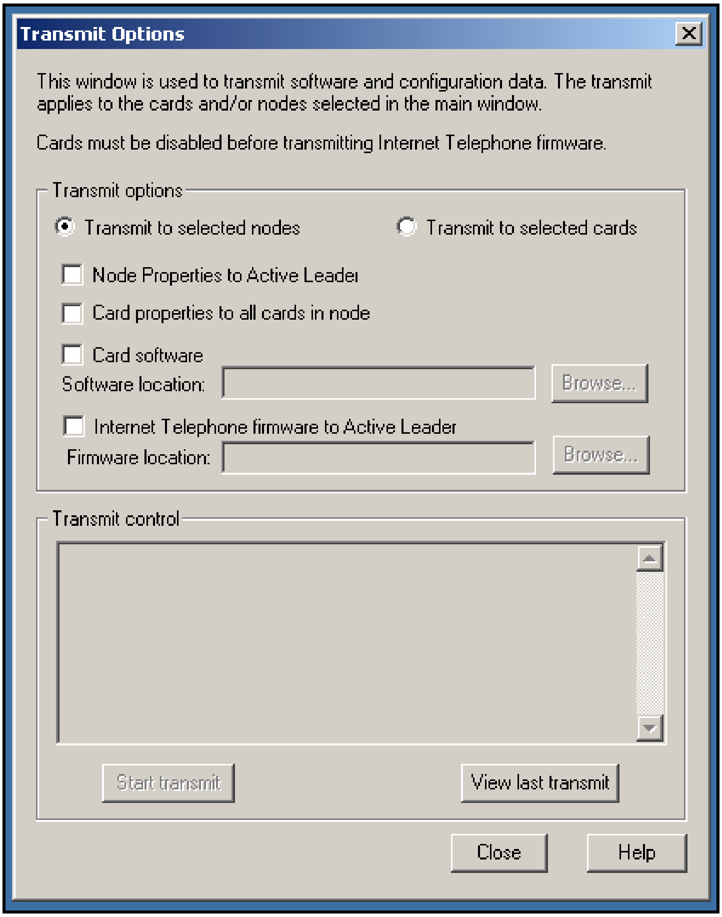
To verify that the link is available between the Call Server and Voice Gateway Media Card, Telnet to each card and log in. From the command line, type **pbxLinkShow**. The status of the Call Server link appears. If the link is active, the screen displays the following:

```
RUDPLinkState = Up
```

**4** Select **Configuration > Synchronize > Transmit**.

The **Transmit Options** dialog box is displayed. See Figure 83 on page 317.

**Figure 83**
**Transmit Options window**



Transmit Options

This window is used to transmit software and configuration data. The transmit applies to the cards and/or nodes selected in the main window.

Cards must be disabled before transmitting Internet Telephone firmware.

Transmit options

● Transmit to selected nodes ○ Transmit to selected cards

□ Node Properties to Active Leader

□ Card properties to all cards in node

□ Card software

Software location:

□ Internet Telephone firmware to Active Leader

Firmware location:

Transmit control

5 Under **Transmit options**, click the **Transmit to selected nodes** radio button.

6 Select the **IP Phone firmware to Active Leader** check box.

7 Click on the **Browse** button to the right of the **Firmware location** text box to locate the IP Phone 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 IP Phone firmware appears in the **Firmware location** text box.

The IP Line 4.0 software determines the target IP Phone type (2001, 2002, or 2004) 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 Phase I IP Phone 2004. Similarly a filename of the format **xx03xxx.BIN** represents a firmware file for the Phase I IP Phone 2002. A filename of the format **xx04xxx.BIN** represents a firmware file for the Phase II IP Phone 2001, IP Phone 2002, and IP Phone 2004. .

**CAUTION**
Downloading an incorrect version of the IP Phone firmware can result in extended service interruptions and require special recovery procedures.

**8** Click the **Start transmit** button to begin upgrading the IP Phone 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.

The IP Phones continue to run the old firmware until each telephone re-registers with a Voice Gateway Media Card that contains the new IP Phone firmware.

***Note:*** Commands are available from the IPL> command line to upgrade a single IP Phone immediately, all IP Phones immediately, or schedule all IP Phones to be upgraded at a later time. Before doing this, verify that each card has the correct firmware version and check the date and time on the node.

**10** Select an IP Phone 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 IP Phone.

**11** 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.

**12** Press the **Services** key (key with globe with arrow pointing East and West) on the IP Phone. 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 IP Phone firmware version 1.38.

- 02 represents the IP Phone 2004.
- B represents the Version number 1.
- 38 represents the Release number .38

**13** Lift the handset and make a call to verify the IP Phone works.

**14** When the IP Phone 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 IP Phones.

To verify the date and time on the node from OTM 2.2, select the node in the top of the **IP Telephony Gateway - IP Line 4.0** window.

**15** Double-click on Leader 0 in the bottom of the window.

The **Card Properties** window opens.

*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 and the IP Phone firmware version.

Double-click on each card to verify the software 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 IP Phones on the Voice Gateway Media Card go out of service. This can take several minutes.

Upon completion of the firmware upgrade, the IP Phones are brought back online in groups of ten.

**WARNING**

The **umsUpgradeAll** command (without the time parameter) causes the IP Phones 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 IP Phones 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 IP Phones, 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 IP Phones are upgraded for each Voice Gateway Media Card by entering the following command:

```
isetShow
```

Inspect the list to ensure all IP Phones have the correct firmware version.

**20** For any IP Phones that did not upgrade successfully, try one of the following (in order):

- use the **isetReset "IP Address"** command
- enter the following combination of keystrokes on the IP Phone: **release**, **mute**, **up**, **down**, **up**, **down**, **up**, **mute**, **9**, **release**
- power the IP Phone off and then on again

If the upgrade was unsuccessful on any of the IP Phones, this is probably due to one of the following reasons:

- one of the Voice Gateway Media Cards did not upgrade the software successfully
- an IP Phone is loaded with a firmware version that was unable to be upgraded by the Voice Gateway Media Card in the normal manner
- 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 IP Phones, the IP Softphone 2050, and the MVC 2050, refer to *IP Phones: Description, Installation, and Operation* (553-3001-368).

## Upgrading the MVC 2050

For information on upgrading the MVC 2050 software, refer to the *Nortel Networks Mobile Voice Client 2050 User Guide.*

# Configure OTM Alarm Management to receive IP Line SNMP traps

To configure the alarm notification feature in OTM 2.2 to receive SNMP traps, follow the steps in Procedure 38.

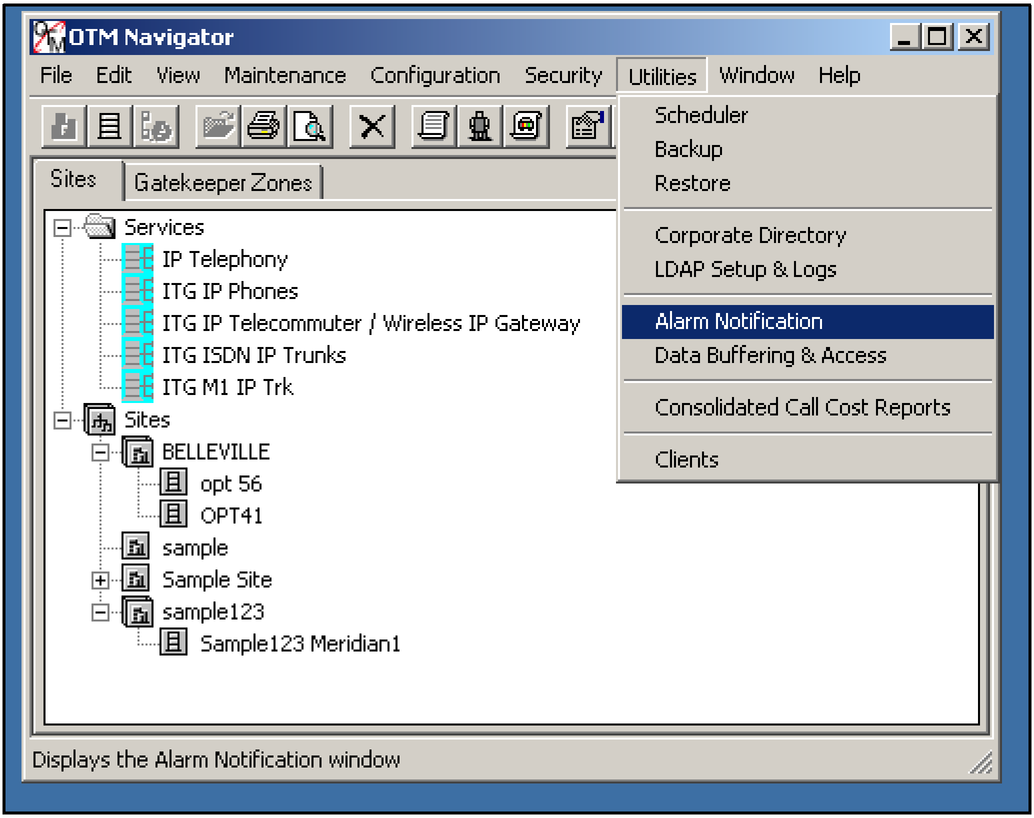
For more information about OTM Alarm Management, refer to *Optivity Telephony Manager: System Administration* (553-3001-330).

**Procedure 38**
**Configuring SNMP Traps**

1 In the **OTM Navigator** window, select the **Utilities** menu option and click on **Alarm Notification.**

See Figure 84 on page 323.

**Figure 84**
**OTM Navigator – Utilities > Alarm Notification**



The **OTM Alarm Notification** window opens.

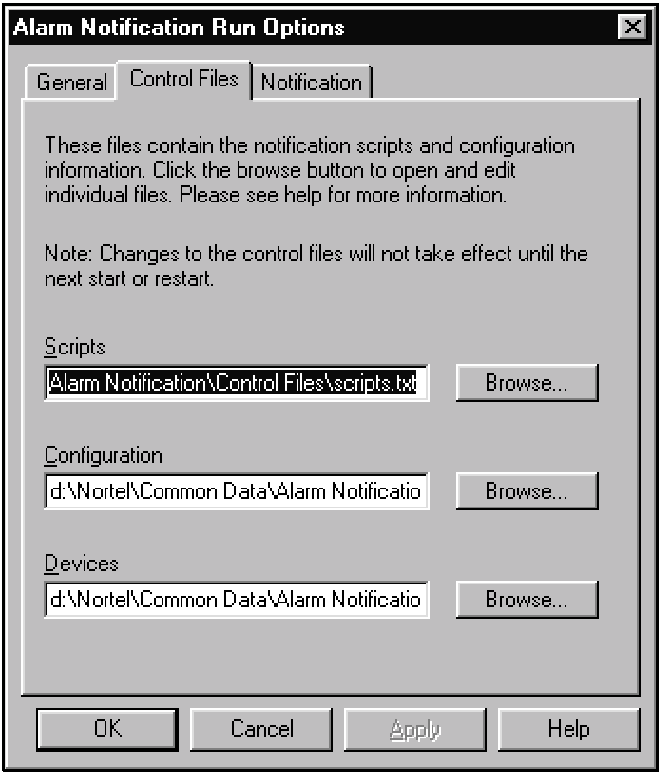
2 Select **Configuration > Run Options**.

The **Alarm Notification Run Options** dialog box opens.

3 Click the **Control Files** tab.

See Figure 85 on page 324.

**Figure 85**
**Alarm Notification Run Options – Control Files tab**



These files contain the notification scripts and configuration information. Click the browse button to open and edit individual files. Please see help for more information.

Note: Changes to the control files will not take effect until the next start or restart.

Scripts: Alarm Notification\Control Files\scripts.txt

Configuration: d:\Nortel\Common Data\Alarm Notificatio

Devices: d:\Nortel\Common Data\Alarm Notificatio

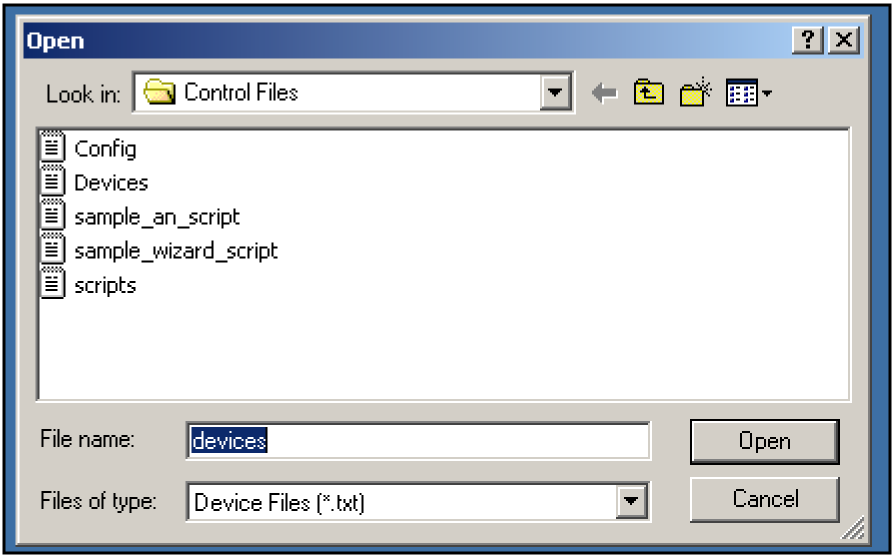
4 Click the **Browse** button located to the right of the **Devices** text box.

The **Open** dialog box opens.

5 Select the **Devices** file from the Control Files folder and click **Open.**

See Figure 86 on page 325.

**Figure 86**
**Open dialog box**

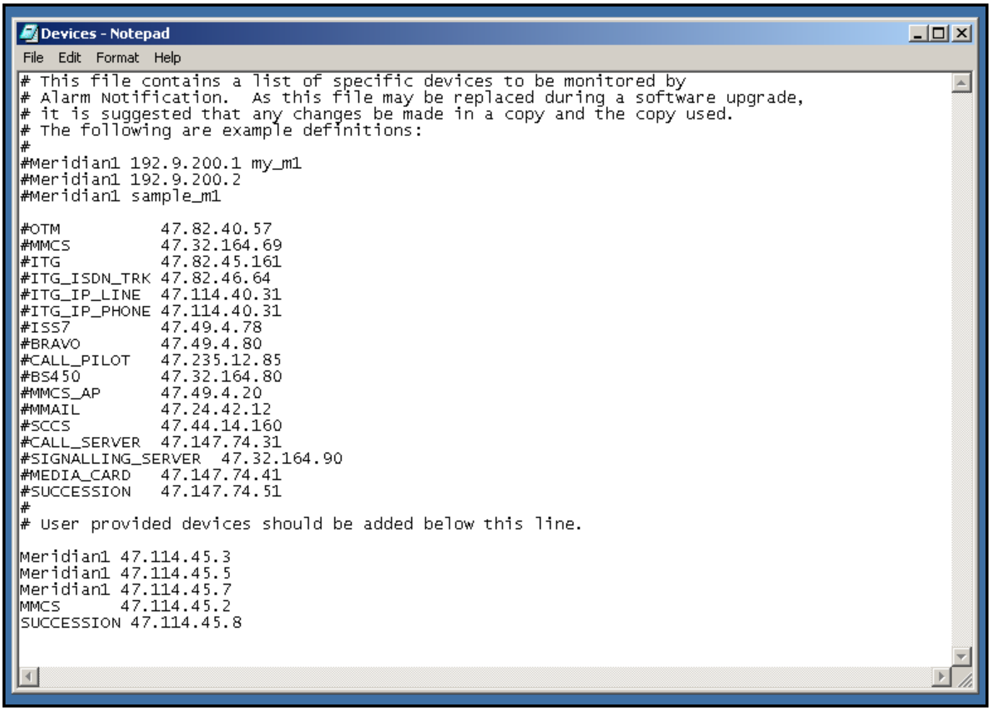


File name: devices

Files of type: Device Files (*.txt)

The Devices.txt file opens. See Figure 87 on page 326.

**Figure 87**
**Devices.txt file**



```
# This file contains a list of specific devices to be monitored by
# Alarm Notification.  As this file may be replaced during a software upgrade,
# it is suggested that any changes be made in a copy and the copy used.
# The following are example definitions:
#
#Meridian1 192.9.200.1 my_m1
#Meridian1 192.9.200.2
#Meridian1 sample_m1

#OTM          47.82.40.57
#MMCS         47.32.164.69
#ITG          47.82.45.161
#ITG_ISDN_TRK 47.82.46.64
#ITG_IP_LINE  47.114.40.31
#ITG_IP_PHONE 47.114.40.31
#ISS7         47.49.4.78
#BRAVO        47.49.4.80
#CALL_PILOT   47.235.12.85
#BS450        47.32.164.80
#MMCS_AP      47.49.4.20
#MMAIL        47.24.42.12
#SCCS         47.44.14.160
#CALL_SERVER  47.147.74.31
#SIGNALLING_SERVER  47.32.164.90
#MEDIA_CARD   47.147.74.41
#SUCCESSION   47.147.74.51
#
# User provided devices should be added below this line.

Meridian1 47.114.45.3
Meridian1 47.114.45.5
Meridian1 47.114.45.7
MMCS      47.114.45.2
SUCCESSION 47.114.45.8
```

6 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 57 on page 327. Enter the first line under the last line that begins with a "**#**".

7 Click **File > Save As**.

Save the template as a new file, for example, **ITGDevices1.txt**, to avoid overwriting the template file.

8 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.

**9** 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.

**10** 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 57**
**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** – 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 TLAN IP address.

**End of Procedure**

# Assemble and install an IP Phone

To assemble and install an IP Phone, refer to *IP Phones: Description, Installation, and Operation* (553-3001-368).

# Change the default IPL> CLI Shell password

The IPL> 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 page 421 and "Node password synchronization" on page 423 for more detailed information on the passwords.

# Configure the IP Phone Installer Passwords

The IP Phone Installer Password protection, required for changing the TN on the IP Phone, controls registration with a virtual line TN on the Call Server. See page 425 for more information about the IP Phone Install Passwords.

To enable and set the administrative IP Phone Installer Password, see Procedure 63 on page 435. If needed, enable and configure a temporary IP Phone Installer Password. See Procedure 64 on page 438.

# 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 Signaling Server's Node IP address, either directly or routed through the network.

> ***Note:*** The ELAN subnet IP address might be required, instead of the Node IP address, to access the Element Manager login window in secure environments.

This chapter also provides instruction for transmitting files to Voice Gateway Media Cards, upgrading card software, and upgrading IP Phone 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 4.0

> ***Note:*** Element Manager cannot be used with the Meridian 1 system, as a Signaling Server is required in the system configuration.

Meridian 1 and CS 1000 systems require the ITG-P 24-port line cards to be running IP Line 4.0.

**WARNING**

In CS 1000 systems, the ITG-P 24-port line card using an earlier release of the IP Line application must be upgraded to IP Line 4.0, or communication with Element Manager fails.

OTM 2.2 is required to upgrade an ITG-P 24-port line card to IP Line 4.0. Once the card's software has been upgraded to IP Line 4.0 using OTM 2.2, configuration, administration, and maintenance tasks can be performed using Element Manager.

Refer to "ITG-P 24-port card upgrades" in *Communication Server 1000S: Upgrade Procedures* (553-3031-258) for the procedure to upgrade an ITG-P 24-port line card to IP Line 4.0 software.

# Configure IP Line 4.0 data using Element Manager

Element Manager can be used to manually add and configure an IP Telephony node on CS 1000 systems. Multiple nodes can be configured and managed from Element Manager.

### Node definition

A node is defined as a collection of 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 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 page 761.

***Note 2:*** See Table 42 on page 199 for IP addresses and information required in this procedure.

***Note 3:*** The following sections discuss how to configure IP Line 4.0 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: Installation and Configuration* (553-3001-213)
- Gatekeeper (see *IP Peer Networking: Installation and Configuration* (553-3001-213)
- 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.

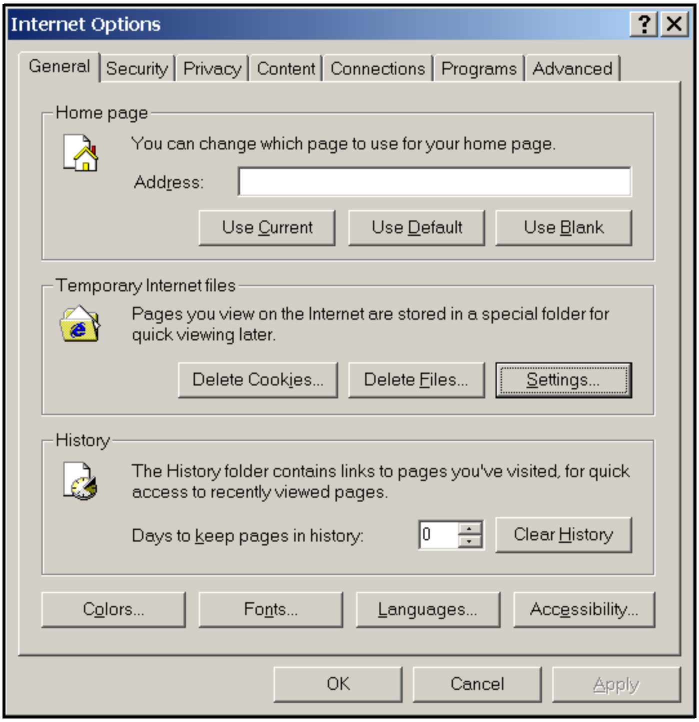
Follow the steps outlined in Procedure 39 on page 333 to prevent caching of web pages by Internet Explorer.

### Procedure 39
### Turning off browser caching in Internet Explorer

**1** Launch Internet Explorer.

**2** Click **Tools** > **Internet Options**. The Internet Options window opens. See Figure 88.

**Figure 88**
**Internet Explorer – Internet Options**



You can change which page to use for your home page.

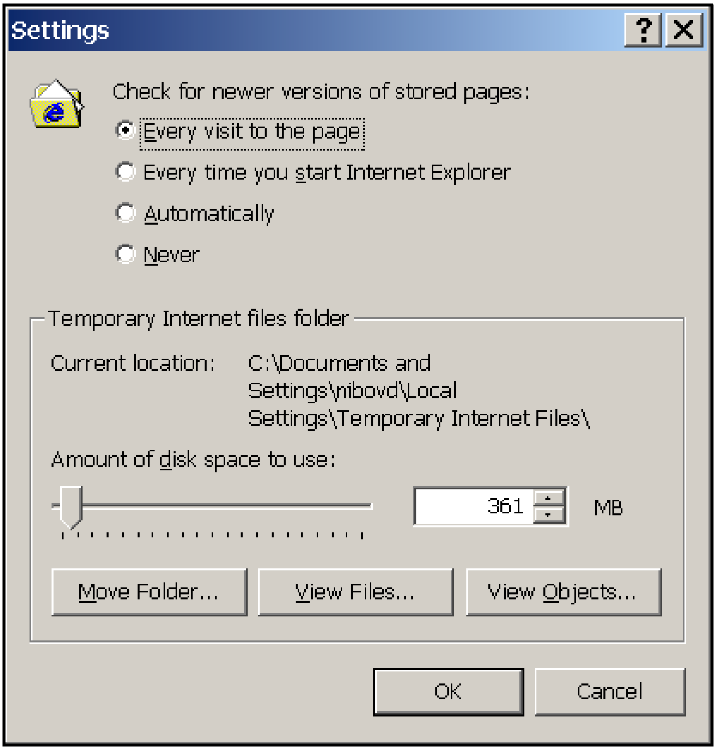
Pages you view on the Internet are stored in a special folder for quick viewing later.

The History folder contains links to pages you've visited, for quick access to recently viewed pages.

Days to keep pages in history: 0

3 On the **General** tab, under the **Temporary Internet files** section, click the **Settings** button. The Settings window opens. See Figure 89.

**Figure 89**
**Temporary Internet files Settings window**



Check for newer versions of stored pages:

● Every visit to the page
○ Every time you start Internet Explorer
○ Automatically
○ Never

Temporary Internet files folder

Current location: C:\Documents and Settings\nibovd\Local Settings\Temporary Internet Files\

Amount of disk space to use: 361 MB

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 40 to launch Element Manager.

**Procedure 40**
**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 subnet IP address might be required, instead of the Node IP address, to access the Element Manager login window in secure environments.

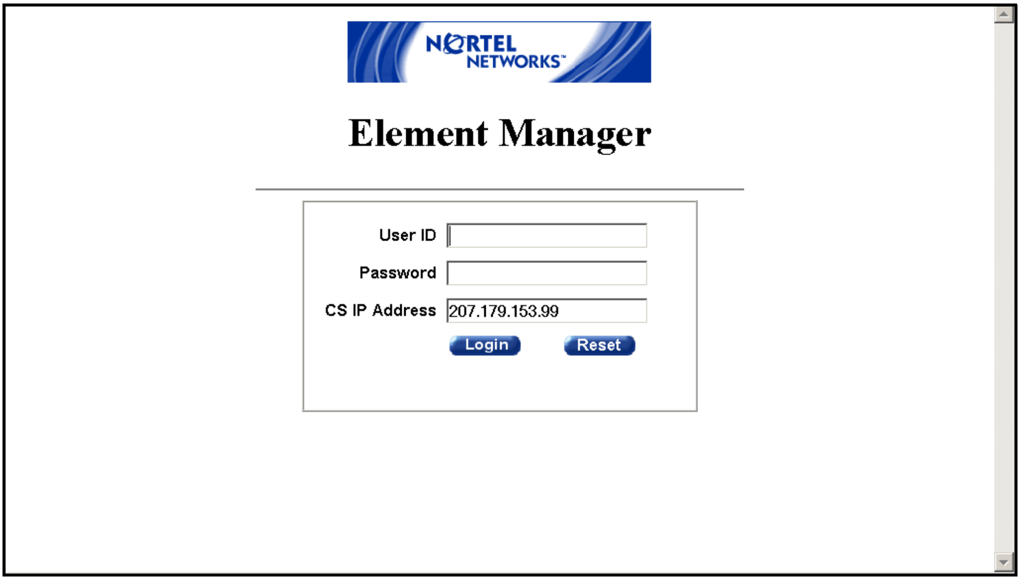
3 Element Manager opens and the **Login** window appears. See Figure 90 on page 336.

**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 90
Element Manager – Login window



Element Manager

User ID

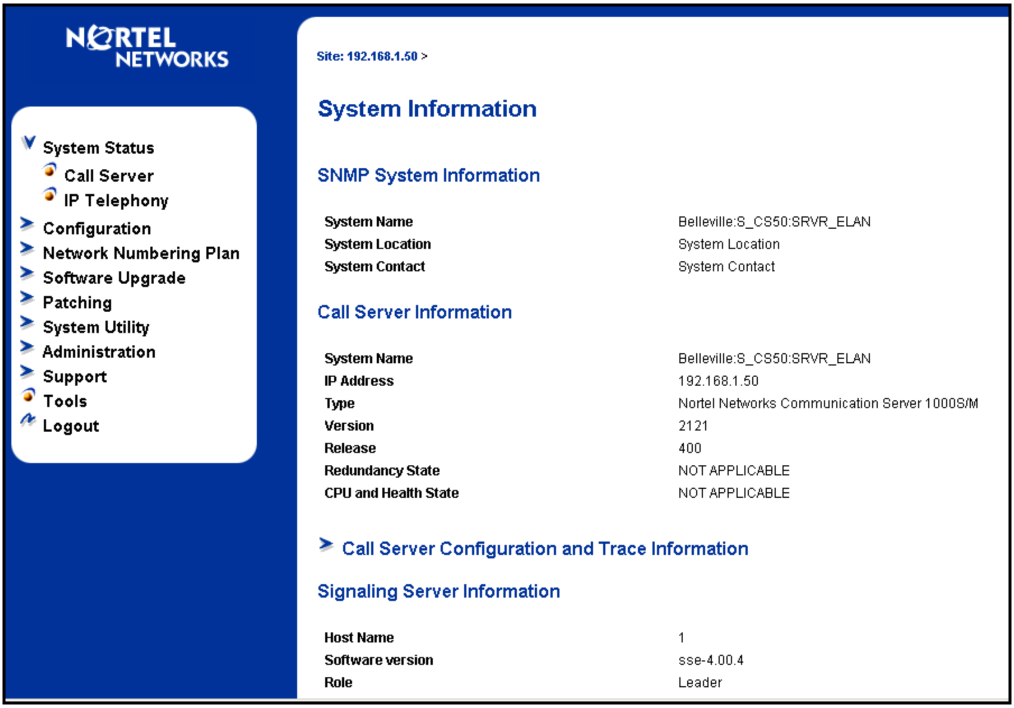
Password

CS IP Address 207.179.153.99

4 The **System Information** window opens. See Figure 91 on page 337.

The **navigation tree** is located on the left side of the browser window. The **System Status** menu is expanded in the navigation tree.

Figure 91
Element Manager – System Information



Site: 192.168.1.50 >

System Information

SNMP System Information

| | |
|---|---|
| System Name | Belleville:S_CS50:SRVR_ELAN |
| System Location | System Location |
| System Contact | System Contact |

Call Server Information

| | |
|---|---|
| System Name | Belleville:S_CS50:SRVR_ELAN |
| IP Address | 192.168.1.50 |
| Type | Nortel Networks Communication Server 1000S/M |
| Version | 2121 |
| Release | 400 |
| Redundancy State | NOT APPLICABLE |
| CPU and Health State | NOT APPLICABLE |

Call Server Configuration and Trace Information

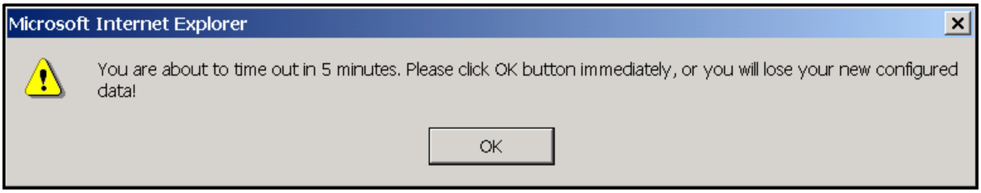
Signaling Server Information

| | |
|---|---|
| Host Name | 1 |
| Software version | sse-4.00.4 |
| Role | Leader |

***Note 1:*** To log out of Element Manager, click **Logout** at the bottom of the navigation tree.

***Note 2:*** When a user is in the Configuration -> IP Telephony -> Node ->Edit window seen in Figure 95 on page 343, 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 92**
**Timeout message**



Microsoft Internet Explorer

You are about to time out in 5 minutes. Please click OK button immediately, or you will lose your new configured data!

**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 page 339

2 “Configure SNMP trap destinations and community name string access” on page 345

3 “Configure Voice Gateway Profile data” on page 349

4 “Configure Quality of Service” on page 355

5 “Configure ELAN IP address (Active ELNK), TLAN voice port, and routes (Small Systems and CS 1000S only)” on page 357

6 “Configure file server access” on page 362

7 “Configure loss and level plan” on page 364

8 “Add card and configure the card properties of the Voice Gateway Media Card” on page 365

9 “Submit and transfer the node information” on page 368

## Manually add an IP Telephony node

Follow the steps in Procedure 41 to add an IP Telephony node using Element Manager.

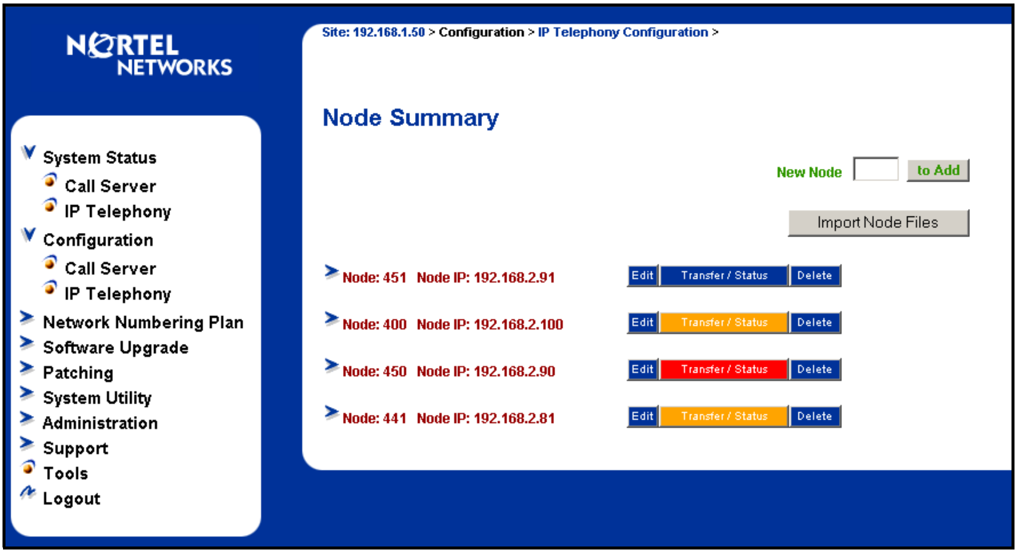
**Procedure 41**
**Adding an IP Telephony node manually**

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** window opens. See Figure 93.

**Figure 93**
**Element Manager – Node Summary - Adding a new node**



Site: 192.168.1.50 > Configuration > IP Telephony Configuration >

Node Summary

Node: 451 Node IP: 192.168.2.91

Node: 400 Node IP: 192.168.2.100

Node: 450 Node IP: 192.168.2.90

Node: 441 Node IP: 192.168.2.81

If this is the first node to be added, the “**No nodes are configured**” message is displayed. There are two options: “**New Node to Add**” or “**Import Node Files**”.

The Node Summary window 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 94 shows one expanded node.

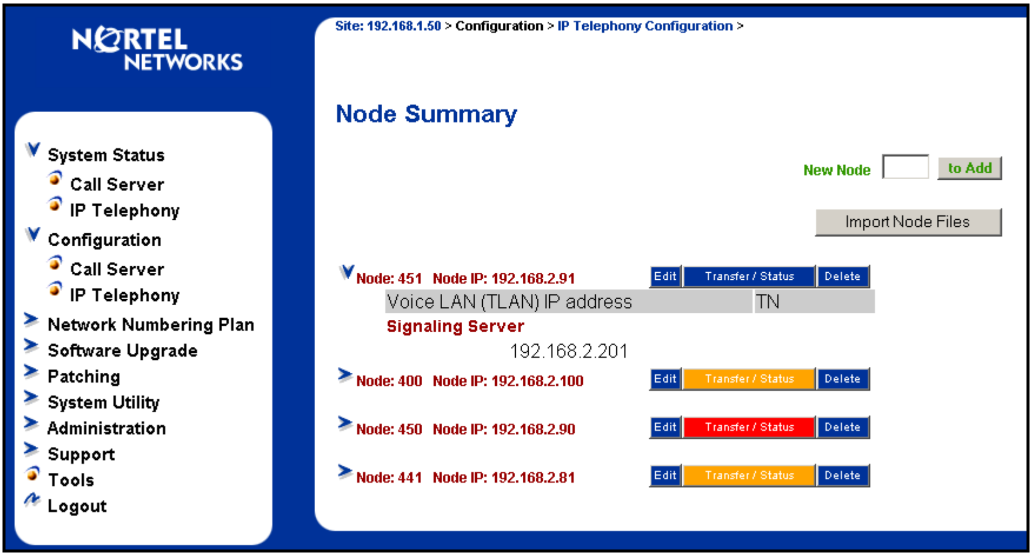
The Node Summary window includes five buttons:

- **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.

***Note:*** If any element within the Node fails to transfer either BOOTP or CONFIG files, the **Transfer/Status** button is highlighted in red. If the transfer status of the node elements is unavailable, the **Transfer/Status** button is highlighted in yellow

- **Edit** – This button retrieves the node information from the Call Server and returns the information to the Edit window. 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 94**
**Node Summary – expand a node**



Node: 451 Node IP: 192.168.2.91

| Voice LAN (TLAN) IP address | TN |
|---|---|

Signaling Server

192.168.2.201

Node: 400 Node IP: 192.168.2.100

Node: 450 Node IP: 192.168.2.90

Node: 441 Node IP: 192.168.2.81

**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 142). If it is required, factor the requirement into the node number assignment process.

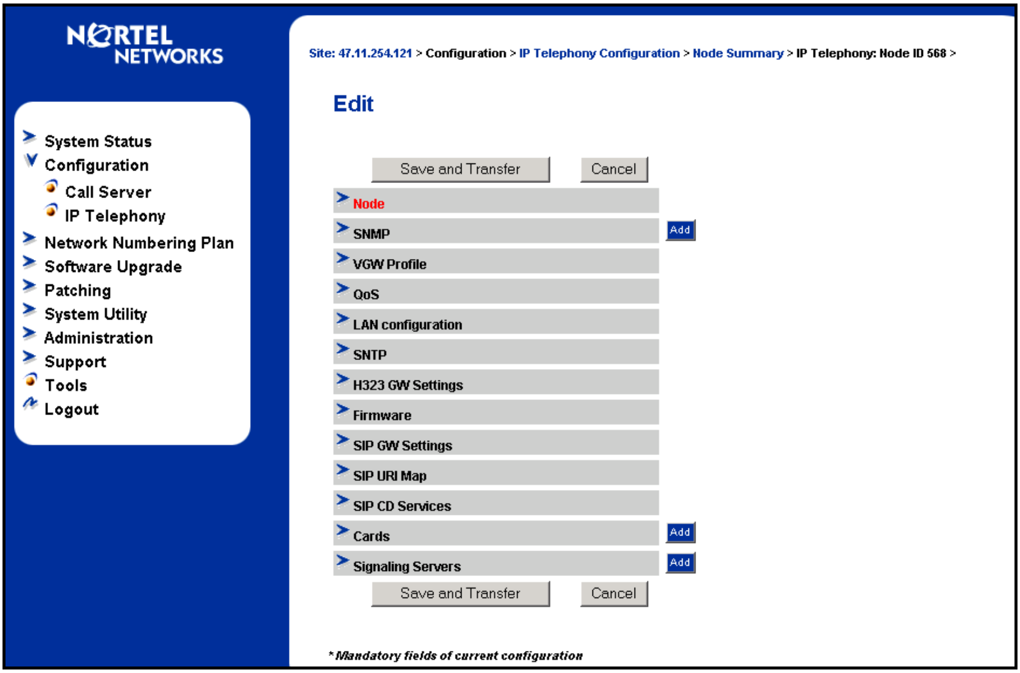
> **CAUTION**
>
> The Voice Gateway Media Cards identify themselves with a node using the node number or node ID. If there are multiple IP Telephony nodes sharing the same TLAN subnet, each node must have a unique ID. Each system on the TLAN subnet must have a unique node ID assigned to the Voice Gateway Media Cards on the system.

***Note:*** The Node ID field corresponds to the Node ID field in the IP Phone configuration. Write down the node number, which is used during the IP Phone configuration.

**4** Click the **to Add** button.

The **Edit** window opens. See Figure 95 on page 343.

**Figure 95**
**Element Manager – Edit**

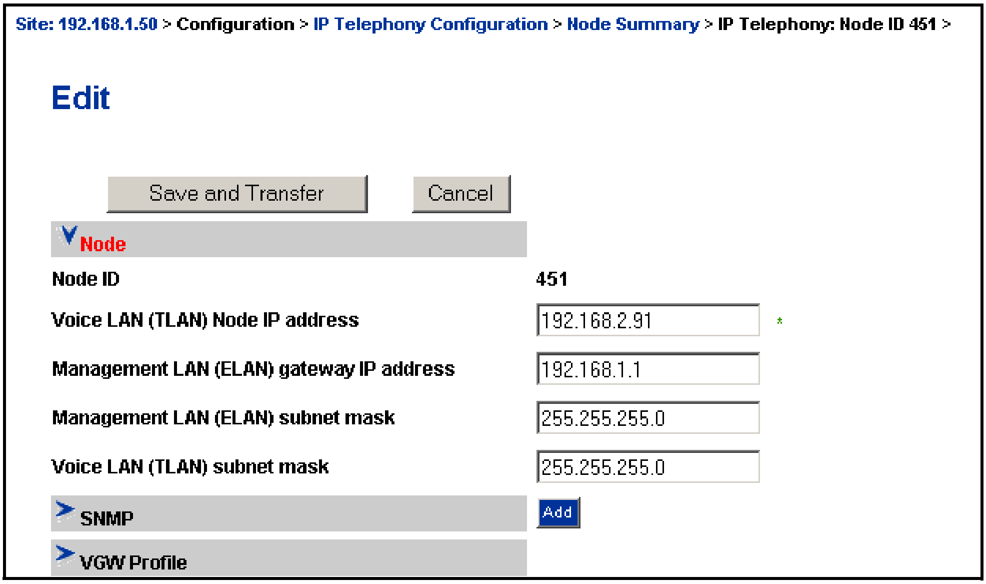


The Edit window includes three different buttons:

- **Save and Transfer** – This button saves and transfers changes to the Call Server and returns the users to the Node Summary window.
- **Cancel** – This button discards changes made to the IP Telephony node and returns the users to the Node Summary window.
- **Add** - The Add buttons are associated with specific sections of the IP Telephony node properties. The user can add new SNMP traps, cards, and Signaling Servers.

5 Click **Node** to edit the Node information, if it is not already expanded by default. See Figure 96 on page 344.

**Figure 96**
**IP Telephony Configuration > Node Summary > Edit > Node**



Site: 192.168.1.50 > Configuration > IP Telephony Configuration > Node Summary > IP Telephony: Node ID 451 >

Edit

Node

| | |
|---|---|
| Node ID | 451 |
| Voice LAN (TLAN) Node IP address | 192.168.2.91 * |
| Management LAN (ELAN) gateway IP address | 192.168.1.1 |
| Management LAN (ELAN) subnet mask | 255.255.255.0 |
| Voice LAN (TLAN) subnet mask | 255.255.255.0 |

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 subnet. The Node IP address is the IP address used by the IP Phones to communicate with the Voice Gateway Media Cards on the TLAN subnet. 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) subnet 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 subnet, if present. If there is no Management LAN subnet 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 subnet 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 window reappears. To continue the configuration, click the **Edit** button to return to the Node Edit window.

**End of Procedure**

## Configure SNMP trap destinations and community name string access

For more information on SNMP, refer to *Simple Network Management Protocol: Description and Maintenance* (553-3001-519).

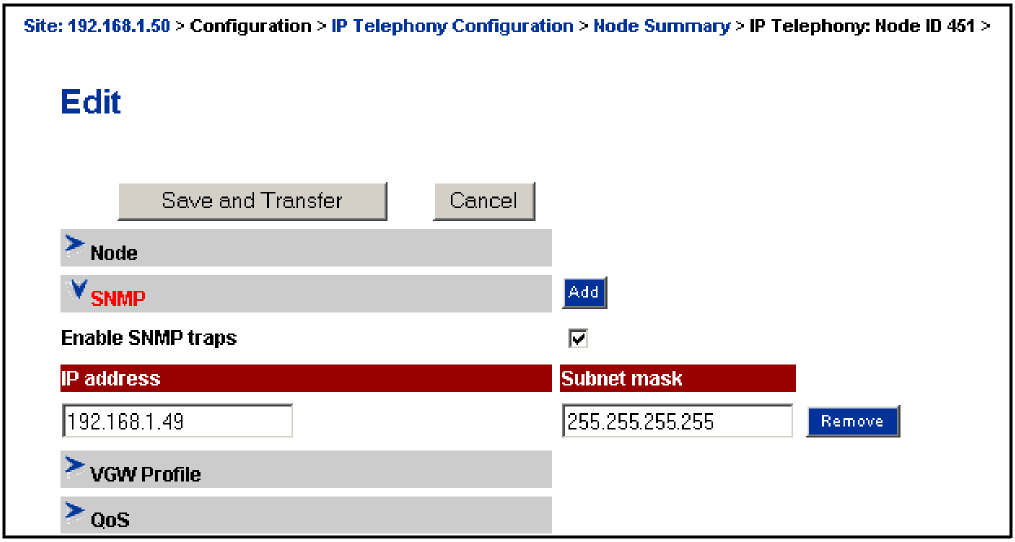
### Configuring SNMP trap destinations

To configure the SNMP trap destinations for the Signaling Server and Voice Gateway Media Cards in Element Manager, follow the steps in Procedure 42 on page 346.

### Procedure 42
### Configuring SNMP trap destinations

1 On the **Node > Edit** window, click **SNMP.** See Figure 97.

**Figure 97**
**Node > Edit > SNMP**



Site: 192.168.1.50 > Configuration > IP Telephony Configuration > Node Summary > IP Telephony: Node ID 451 >

Edit

Enable SNMP traps ☑

| IP address | Subnet mask |
|---|---|
| 192.168.1.49 | 255.255.255.255 |

2 Select the **Enable SNMP traps** check box, if configuring one or more SNMP management IP addresses to receive SNMP traps from cards in the IP Telephony node.

f. **IP address:** Enter the IP address of the trap destination. If SNMP traps are enabled, the SNMP traps are sent to the IP address entered here. More than one IP address can be configured.

g. **Subnet mask:** The subnet mask for the IP address of the trap destination must **always** be configured as 255.255.255.255.

**WARNING**

Do not enter the actual value of the subnet mask on the interface of the SNMP trap destination. Doing so can cause misrouting of RTP media and signaling, leading to no speech path between the IP Phones and the Voice Gateway Media Cards or failure of the IP Phones to register with the LTPS.

**h.** Click **ADD** to enter the IP address for another trap destination.

Add destination SNMP Manager IP addresses for the following:

- local or remote OTM server
- PPP IP address configured in the router on the ELAN for the remote-support OTM PC

- SNMP manager for remote alarm monitoring.

***Note 1:*** Up to eight SNMP trap destinations 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 destination address that is added to the SNMP traps list.

***Note 3:*** To remove an SNMP trap destination, click the corresponding **Remove** button.

**End of Procedure**

## Configuring community name strings

The SNMP community name strings control access to the IP Telephony node. Element Manager uses the community name strings to refresh the Voice Gateway Media Card status and to control the transmitting and retrieving of configuration data files for database synchronization.

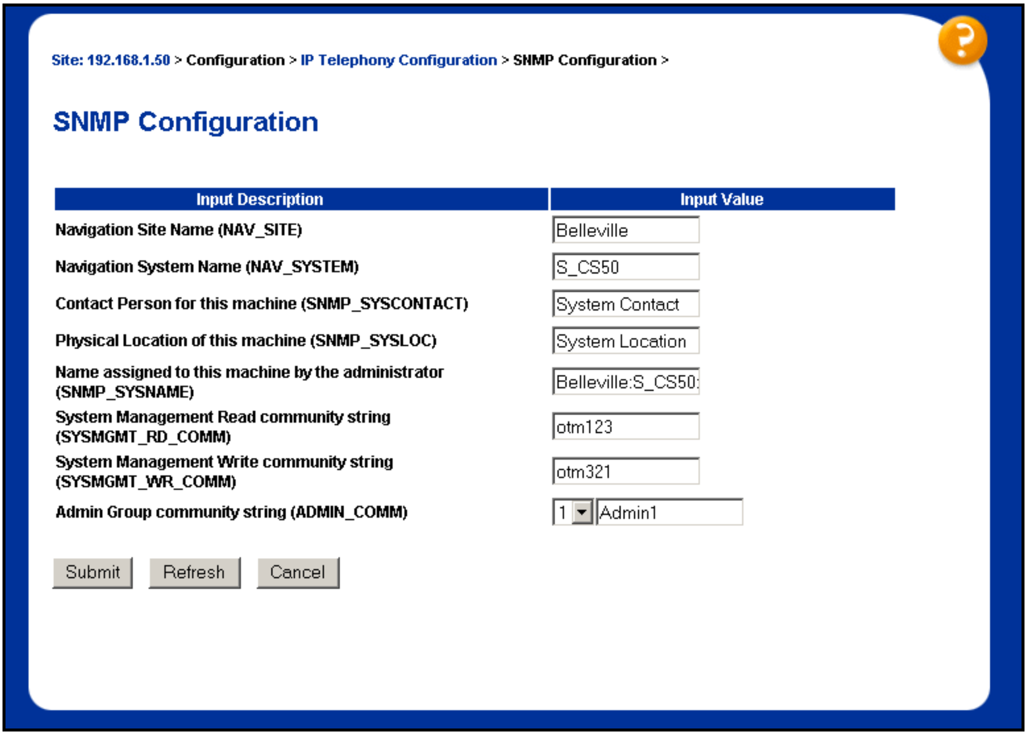
***Note:*** If the community name strings are forgotten, connect a TTY to the Voice Gateway Media Card maintenance port. Restart the card. The card displays the community name on the TTY during start-up.

To configure the community name strings in Element Manager, follow the steps in Procedure 43.

**Procedure 43**
**Configuring the community name strings**

1 Select **Configuration > IP Telephony > SNMP Configuration**. See Figure 98.

**Figure 98**
**Configuration > IP Telephony Configuration > SNMP Configuration window**



Site: 192.168.1.50 > Configuration > IP Telephony Configuration > SNMP Configuration >

SNMP Configuration

| Input Description | Input Value |
|---|---|
| Navigation Site Name (NAV_SITE) | Belleville |
| Navigation System Name (NAV_SYSTEM) | S_CS50 |
| Contact Person for this machine (SNMP_SYSCONTACT) | System Contact |
| Physical Location of this machine (SNMP_SYSLOC) | System Location |
| Name assigned to this machine by the administrator (SNMP_SYSNAME) | Belleville:S_CS50: |
| System Management Read community string (SYSMGMT_RD_COMM) | otm123 |
| System Management Write community string (SYSMGMT_WR_COMM) | otm321 |
| Admin Group community string (ADMIN_COMM) | 1 Admin1 |

**2** Obtain the following information from the system administrator and enter it in the appropriate fields:

    - Navigation Site Name (NAV_SITE)
    - Navigation System Name (NAV_SYSTEM)
    - Contact person for this machine (SNMP_SYSCONTACT)
    - Name assigned to this machine by the administrator (SNMP_SYSNAME)
    - System Management Read community string (SYSMGMT_RD_COMM)
    - System Management Write community string (SYSMGMT_WR_COMM)

- Admin Group community string (ADMIN_COMM). Select 1, 2, or 3 from the drop-down list.

**3** Click **Submit** to save the configuration or **Cancel** to cancel the entry.

***Note:*** Click **Refresh** to retrieve the current information from the system.

**End of Procedure**

### Synchronization of community name strings

After the system community name strings are configured, it is necessary to perform a data dump to synchronize these community name strings from the Call Server to the Signaling Server and Voice Gateway Media Cards. As well, when a link is established between the Signaling Server or Voice Gateway Media Cards and the Call Server, the Call Server transmits the community name strings to those devices.

## Configure Voice Gateway Profile data

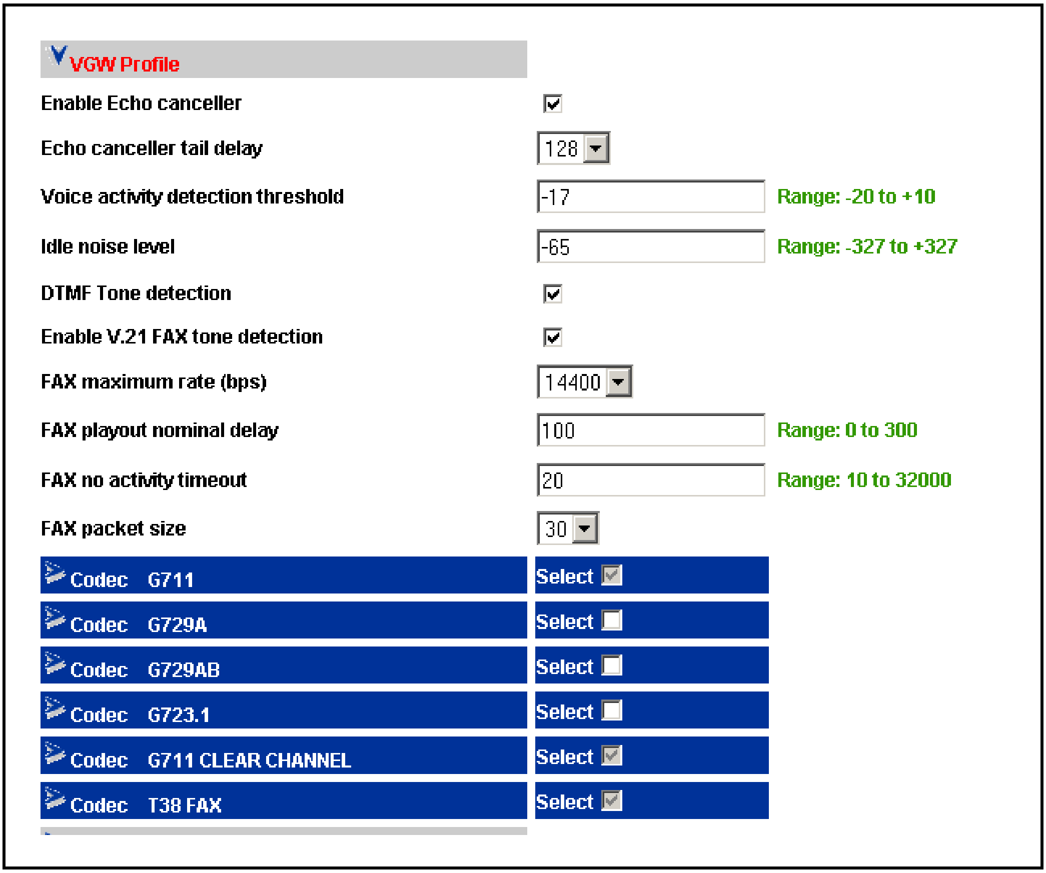
Follow the steps in Procedure 44 on page 350 to configure the Voice Gateway Profile data.

### Procedure 44
### Configuring DSP Profile data

1 On the **Edit** window, click **VGW Profile**.

The **VGW Profile** window opens. See Figure 99. The VGW Profile area includes VGW Profile information and a list of codecs.

**Figure 99**
**Configuration > Node Summary > Edit > VGW Profile**



VGW Profile

| | | |
|---|---|---|
| Enable Echo canceller | ☑ | |
| Echo canceller tail delay | 128 ▾ | |
| Voice activity detection threshold | -17 | Range: -20 to +10 |
| Idle noise level | -65 | Range: -327 to +327 |
| DTMF Tone detection | ☑ | |
| Enable V.21 FAX tone detection | ☑ | |
| FAX maximum rate (bps) | 14400 ▾ | |
| FAX playout nominal delay | 100 | Range: 0 to 300 |
| FAX no activity timeout | 20 | Range: 10 to 32000 |
| FAX packet size | 30 ▾ | |
| Codec G711 | Select ☑ | |
| Codec G729A | Select □ | |
| Codec G729AB | Select □ | |
| Codec G723.1 | Select □ | |
| Codec G711 CLEAR CHANNEL | Select ☑ | |
| Codec T38 FAX | Select ☑ | |

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.

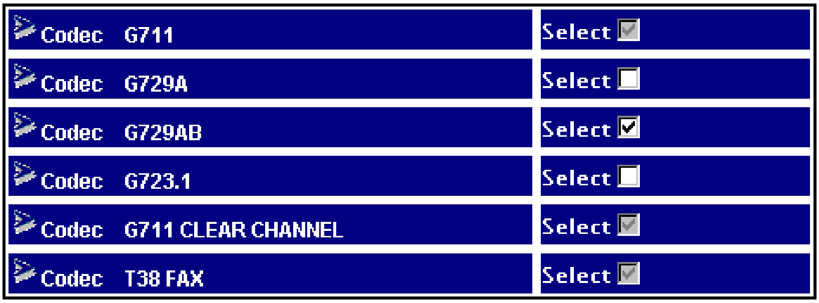
To select a codec, scroll through the list, and click the corresponding **Select** check box. See Figure 100 for codec samples. A maximum of four codecs can be selected.

### Recommendation

Nortel Networks recommends that the system be configured with both G.711 and G.729A if there is a possibility that an IP Softphone 2050 could be configured with the "I use a modem to connect to the network" check box checked. If the node does not have G.729A and/or G.723 configured, IP Softphone 2050 users with that checkbox selected will have calls blocked.
(Note: This does not apply to the MVC 2050 as it only supports G.711 capability; there is no dial-up capability.)

For more information, refer to *IP Phones: Description, Installation, and Operation* (553-3001-368) in the "Select Sound Devices tab" section.

**Figure 100**
**Codec list**



| | |
|---|---|
| Codec G711 | Select ☑ |
| Codec G729A | Select □ |
| Codec G729AB | Select ☑ |
| Codec G723.1 | Select □ |
| Codec G711 CLEAR CHANNEL | Select ☑ |
| Codec T38 FAX | Select ☑ |

***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:

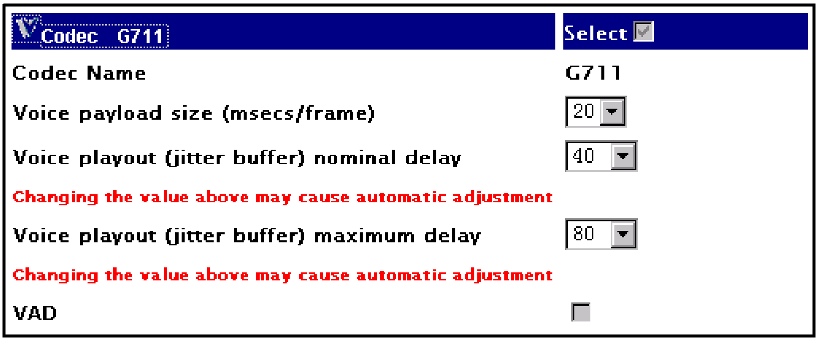
- The payload size, jitter buffer setting, and companding law for the G.711 codec can be changed. The default is G.711 mu-law.
- Only the jitter buffer can be changed for the G.711 Clear Channel codec.

  Up to three additional codecs can be optionally selected: 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 101.

**Figure 101**
**Selected Codec**



Codec G711 Select ☑

Codec Name G711

Voice payload size (msecs/frame) 20

Voice playout (jitter buffer) nominal delay 40

Changing the value above may cause automatic adjustment

Voice playout (jitter buffer) maximum delay 80

Changing the value above may cause automatic adjustment

VAD □

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. The pull-down values range from the minimum recommended value (see above) 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 a system has multiple nodes 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:** Select this 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:

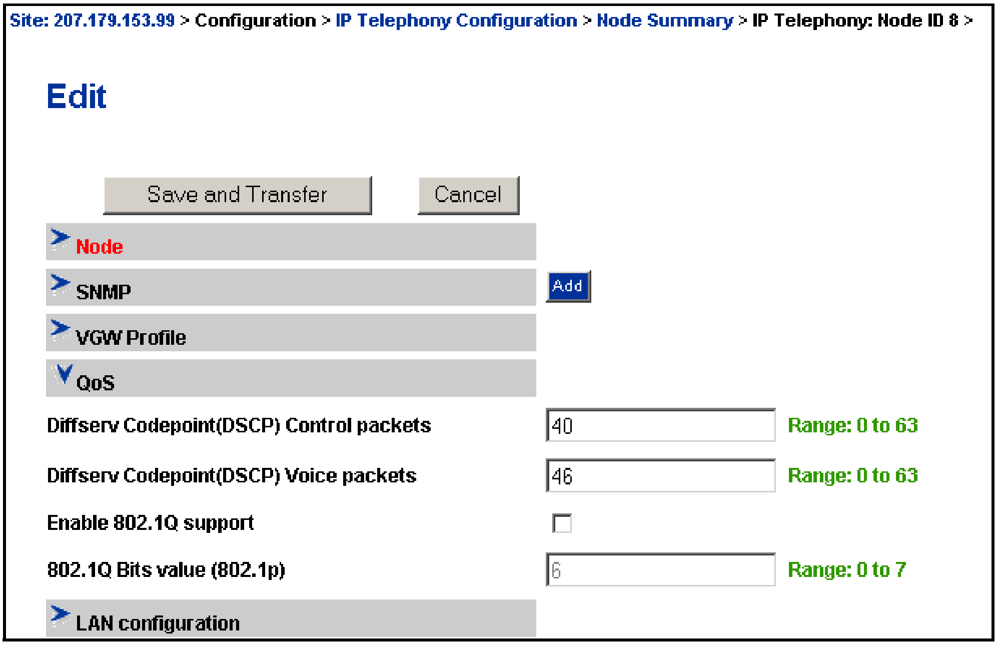
- DiffServ CodePoint (DSCP)
- 802.1Q support

Follow the steps in Procedure 45 to configure QoS.

**Procedure 45**
**Configuring QoS**

**1** Click **QoS.** See Figure 102.

**Figure 102**
**Configuration > IP Telephony > Node Summary > Edit > Qos**



Site: 207.179.153.99 > Configuration > IP Telephony Configuration > Node Summary > IP Telephony: Node ID 8 >

Edit

Diffserv Codepoint(DSCP) Control packets: 40 Range: 0 to 63

Diffserv Codepoint(DSCP) Voice packets: 46 Range: 0 to 63

Enable 802.1Q support: □

802.1Q Bits value (802.1p): 6 Range: 0 to 7

**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.

**End of Procedure**

## Configure ELAN IP address (Active ELNK), TLAN voice port, and routes (Small Systems and CS 1000S only)

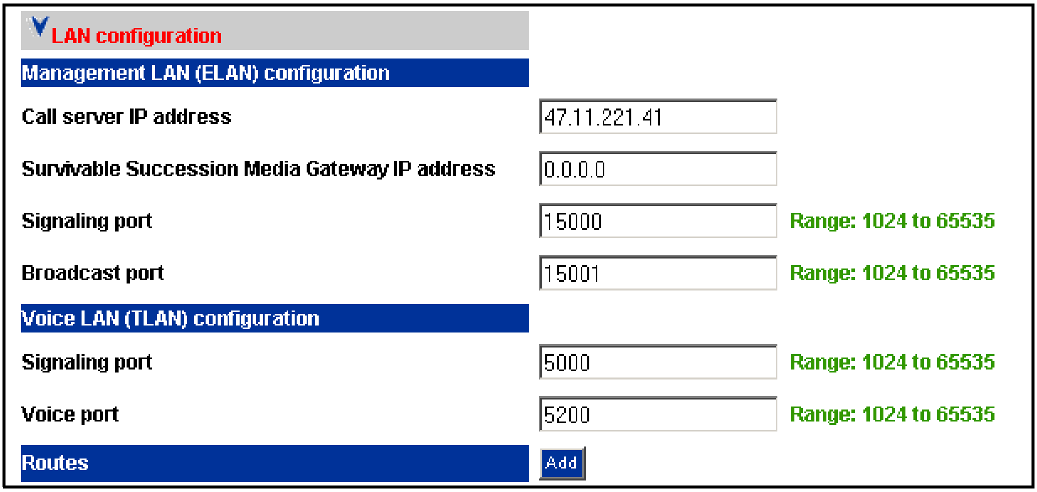
The LAN configuration section is used for configuring the Call Server ELAN IP address (Active ELNK), TLAN voice port, and routes.

This information is applicable only to Small Systems.

**Procedure 46**
**Configuring the Call Server ELAN IP address (Active ELNK), TLAN voice port, and routes on a Small System**

1 Click **LAN Configuration.** See Figure 103.

**Figure 103**
**Configuration > Node Summary > Edit > LAN configuration**



LAN configuration

| | | |
|---|---|---|
| **Management LAN (ELAN) configuration** | | |
| Call server IP address | 47.11.221.41 | |
| Survivable Succession Media Gateway IP address | 0.0.0.0 | |
| Signaling port | 15000 | Range: 1024 to 65535 |
| Broadcast port | 15001 | Range: 1024 to 65535 |
| **Voice LAN (TLAN) configuration** | | |
| Signaling port | 5000 | Range: 1024 to 65535 |
| Voice port | 5200 | Range: 1024 to 65535 |
| **Routes** | Add | |

**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 subnet. Enter the Call Server ELAN subnet IP Address (Active ELNK).

***Note:*** The Call Server ELAN subnet IP address must correspond to the Active ELNK IP address configured in LD 117. The IP address must be in the same subnet as the ELAN subnet for the IP Line node.

b. **Survivable Media Gateway IP address:** This address is configured for survivability. It is the IP address of the Survivable CS 1000S Media Gateway on the ELAN subnet.

***Note 1:*** The Survivable CS 1000S 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 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 Signaling Server; therefore, it is normally connected to the same ELAN subnet as the Call Server and the Primary Signaling Server IP Telephony node. The Alternate Call Server Media Gateway should be equipped with sufficient trunk cards, Voice Gateway Media Cards, and centralized CallPilot, so that it provides a large degree of survivability in case of Call Server equipment failure for IP Phone users who normally register through the Signaling Server.

Refer to *Communication Server 1000S: Planning and Engineering* (553-3031-120) and *Communication Server 1000S: 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 IP Phones. 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 Media Card 32-port line card
- ports 5200 – 5215 on the 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 104 on page 360. The Routes fields expand.

**Figure 104**
**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 subnet. 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.

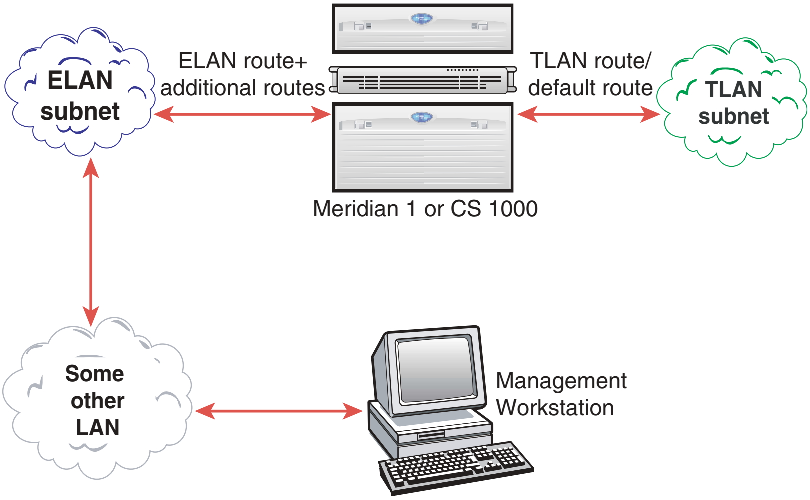
The default route on the card causes packets destined for unknown subnets to be sent out on the TLAN network interface. Packets from an external host arrive on the ELAN network interface and responses are sent on the TLAN network interface. This process can cause one-way communication if the TLAN subnet is not routed to the ELAN subnet. It is necessary to add an entry in the Route list to correct the routing so that response packets are sent on the ELAN subnet. Each entry creates a route entry in the card's route table that directs packets out the ELAN network interface. See Figure 105 on page 361.

**CAUTION**

Use caution when assigning card routing table entries. Do not include the IP address of an IP Phone. Otherwise, voice traffic to these IP Phones is incorrectly routed through the ELAN subnet and ELAN subnet 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 105**
**Specifying additional ELAN routes**



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.

**End of Procedure**

## Configure file server access

With the addition of more IP Phones, there are also additional firmware files for the IP Phones. 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 “IP Phone firmware” on page 130

The IP Phone firmware files are labeled as follows:

- 0603Bnn.BIN is the filename for the Phase I IP Phone 2002 firmware where Bnn = F/W version 1.nn.
- 0602Bnn.BIN is the filename for the Phase I IP Phone 2004 firmware where Bnn = F/W version 1.nn.
- 0603Dnn.BIN is the filename for the Phase II IP Phone 2001, IP Phone 2002, and IP Phone 2004 firmware where Dnn = F/W version 3.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:

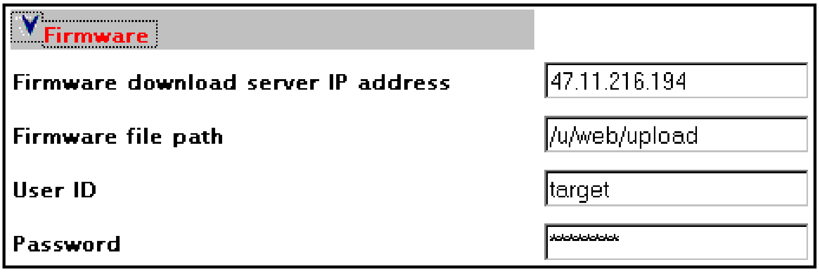
- 0602Bnn.BIN must be renamed to i2004.fw
- 0603Bnn.BIN must be renamed to i2002.fw
- 0604Dnn. BIN must be renamed to IPP2SETS.fw

To configure the file server, follow the steps in Procedure 47 on page 363.

**Procedure 47**
**Configuring access to the file server**

1 Click **Firmware.** See Figure 106.

**Figure 106**
**Configuration > Node Summary > Edit > Firmware**



Firmware

| | |
|---|---|
| Firmware download server IP address | 47.11.216.194 |
| Firmware file path | /u/web/upload |
| User ID | target |
| Password | ******** |

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 where the firmware will be downloaded.

b. **Firmware file path:** Enter the path for the location of the firmware files. See page 133 for the default location of firmware files for the CS 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 4.0 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.

Refer to *Transmission Parameters* (553-3001-182) for more information.

### 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 IP Phones to the higher transmit levels required in the UK. Follow the steps in Procedure 48 to set the loss plan for the UK.

**Procedure 48**
**Setting the loss plan for the UK**

**1** Telnet to the card, connect to the maintenance port, or use OTM 2.2 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**.

**4** Press <CR>.

**5** 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 IP Phones, and on other IP Phones as they register.

To clear the loss plan adjustment, use the command **UKLossPlanClr.**

Refer to "IP Phone Loss Plan (UK) commands" on page 615 for more information on these and other loss plan commands.

## Add card and 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 E on page 761.

> ***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.

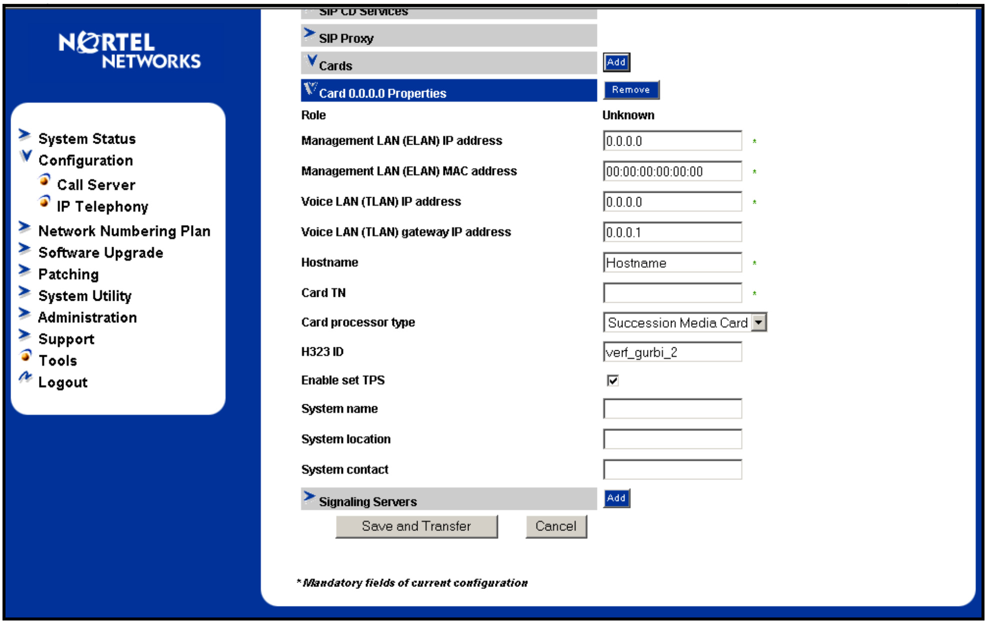
Follow the steps in Procedure 49 to configure Voice Gateway Media Card properties.

**Procedure 49**
**Adding card and configuring Voice Gateway Media Card properties**

**1** Click **Cards** and then click the **Add** button.

See Figure 107 on page 366.

**Figure 107**
**Configuration > Node Summary > Edit > Cards**



| | |
|---|---|
| Role | Unknown |
| Management LAN (ELAN) IP address | 0.0.0.0 * |
| Management LAN (ELAN) MAC address | 00:00:00:00:00:00 * |
| Voice LAN (TLAN) IP address | 0.0.0.0 * |
| Voice LAN (TLAN) gateway IP address | 0.0.0.1 |
| Hostname | Hostname * |
| Card TN | * |
| Card processor type | Succession Media Card |
| H323 ID | verf_gurbi_2 |
| Enable set TPS | ☑ |
| System name | |
| System location | |
| System contact | |

** Mandatory fields of current configuration*

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 subnet 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 199.

d. **Voice LAN (TLAN) IP address:** This is the TLAN subnet IP address for the card.

e. **Voice LAN (TLAN) gateway IP address:** This is the IP address of the router interface on the TLAN subnet.

f. **Hostname:** This is the Host name.

g. **Card TN:** Enter the card slot number between 1 – 50.

h. **Card processor type:** Choose either Pentium or Media Card. Select Pentium if using the ITG-P 24-port line card (dual-slot card). Select Media Card if using the Media Card 32-port or 8-port line card (single-slot card).

i. **H323 ID:** The H323 ID within IP Line 4.0 is for the Virtual Office/ Media Gateway 1000B feature. Keep the H323 ID the same for all the elements within one node.

j. **Enable set TPS:** Select the check box.

k. **System name:** Enter the name of the system.

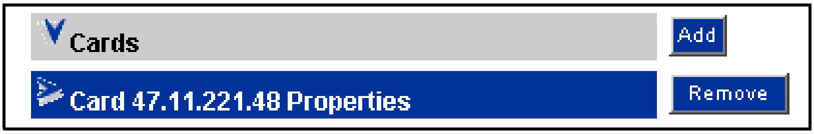
l. **System location:** Enter the location where the system resides.

m. **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.

New cards appear under the Cards menu as they are added. See Figure 108.

**Figure 108**
**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 50.

**Procedure 50**
**Submitting and transferring the node information**

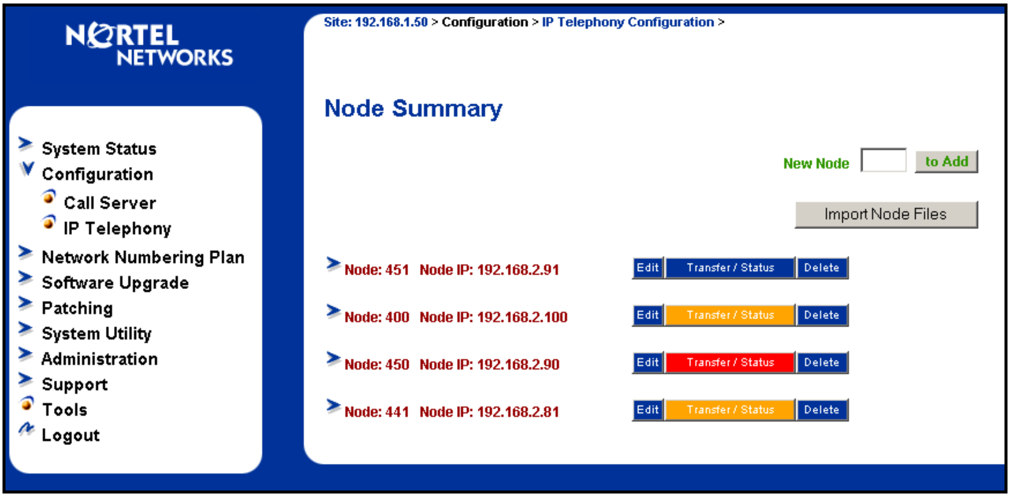
**1** Click the **Save and Transfer** button when all the node information is configured in the Edit window. Clicking the Save and Transfer button saves and transfers the data to the Call Server.

The Edit window closes, and the **Node Summary** window opens with the new node added. See Figure 109 on page 369.

***Note 1:*** The Save and Transfer button can be clicked after each section is configured in the Edit window. However, each time the Save and Transfer button is clicked, the Edit window closes and the Node Summary window is displayed. To continue the node configuration, click the **Edit** button to return to the Edit window.

***Note 2:*** If the Cancel button is clicked, all information that has been configured is discarded. The Edit window closes and the Node Summary window opens.

**Figure 109**
**Node added to Node Summary window**



Site: 192.168.1.50 > Configuration > IP Telephony Configuration >

Node Summary

Node: 451 Node IP: 192.168.2.91

Node: 400 Node IP: 192.168.2.100

Node: 450 Node IP: 192.168.2.90

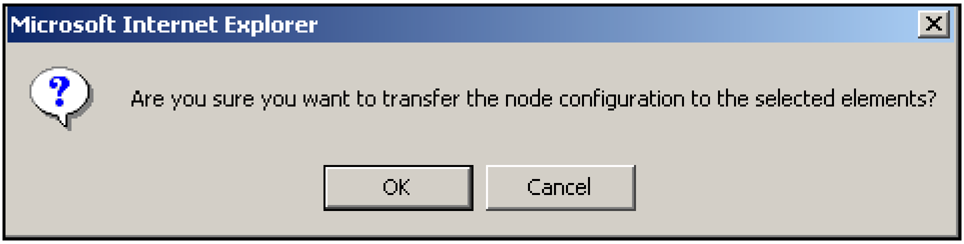
Node: 441 Node IP: 192.168.2.81

2 Click the **Transfer/Status** button for the node.

The **Transfer confirmation** dialog box opens.

3 Click **OK** to confirm the transfer. See Figure 110.

**Figure 110**
**Transfer confirmation dialog box**



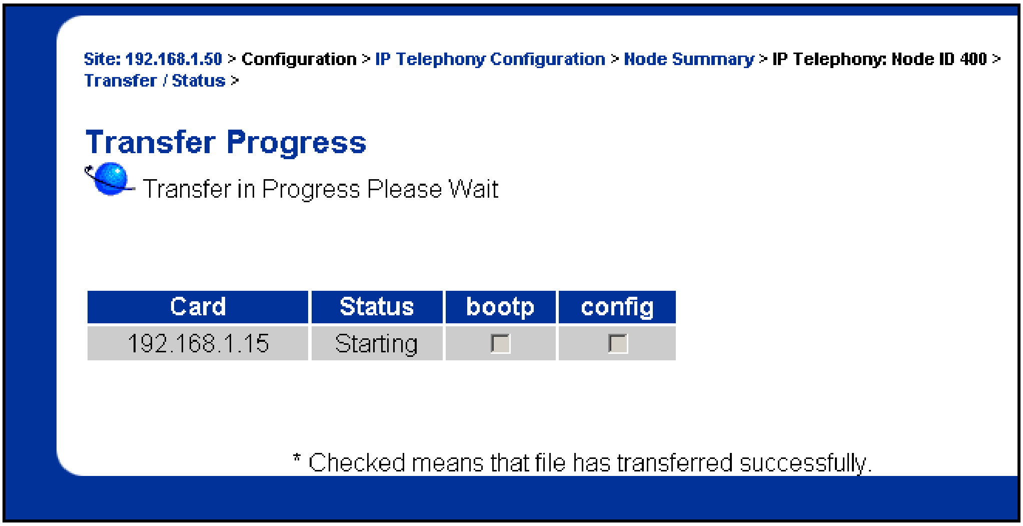
Are you sure you want to transfer the node configuration to the selected elements?

After a few seconds, the **Transfer Progress** window opens and displays each of the Voice Gateway Media Cards in the node. See Figure 111 on page 370.

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” and a check mark is displayed.
- If the transfer is unsuccessful, the Status column displays “Fail”. A failed transfer can be caused by several situations, including the following:
  - — improper cabling. Check cable connections.
  - — improper card configuration. Ensure all information is configured correctly.
  - — the card running an older version of the software than the Signaling Server. Verify the software version on the card and upgrade the software if necessary. Refer to “Upgrade the Voice Gateway Media Card software and IP Phone firmware” on page 382.

**Figure 111**
**Transfer Progress window**



Site: 192.168.1.50 > Configuration > IP Telephony Configuration > Node Summary > IP Telephony: Node ID 400 > Transfer / Status >

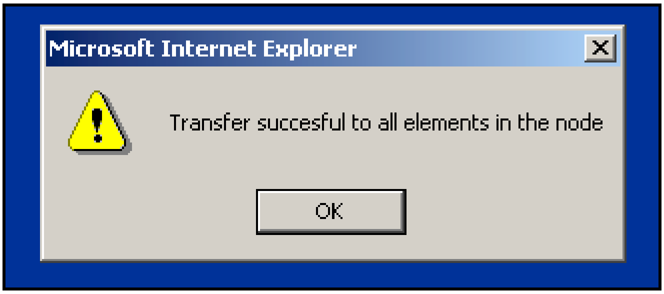
Transfer Progress

Transfer in Progress Please Wait

| Card | Status | bootp | config |
|---|---|---|---|
| 192.168.1.15 | Starting | □ | □ |

* Checked means that file has transferred successfully.

**Figure 112**
**Transfer Successful message box**


Microsoft Internet Explorer

Transfer succesful to all elements in the node

**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 network 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 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 **Save and Transfer** button on the Edit window is clicked. The files are saved to the Call Server. After the data is saved, the configuration must be transferred to the Voice Gateway Media Card. When the **Transfer/Status** button on the Node Summary window is clicked, Element Manager instructs each card 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 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 52 on page 375.

**2** Configure the Follower card. See Procedure 53 on page 379.

> ***Note:*** The following sequence of steps are applicable only to nodes that do not use the Signaling Server as the Leader card; that is, a second (or subsequent) node is being configured on the system – not the main node. The Signaling Server must be properly configured to use Element Manager, so that the steps of setting and rebooting the Leader are not needed. The Signaling Server requires a reboot only if the Signaling Server IP address information has been changed, such as the node IP address or Signaling Server TLAN subnet 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 51 on page 373.

**2** Transmit the node properties. Procedure 52 on page 375.

**3** Configure the Follower card. See Procedure 53 on page 379.

## Setting the Leader IP address

Follow the steps in Procedure 51 to set the IP address of the Leader Voice Gateway Media Card.

**Procedure 51**
**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 65 on page 439 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 (ELAN) subnet 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** window.

“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** 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 **Node** menu of the **Edit** window.

***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.

**10** Expand the node.

**11** 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

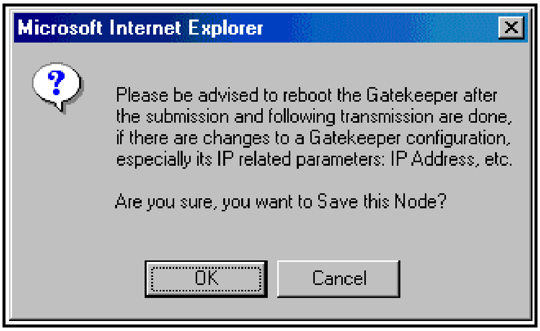
To transmit the node properties to the Leader, follow the steps in Procedure 52.

**Procedure 52**
**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 opens. See Figure 113.

**Figure 113**
**Confirm Submit**



Please be advised to reboot the Gatekeeper after the submission and following transmission are done, if there are changes to a Gatekeeper configuration, especially its IP related parameters: IP Address, etc.

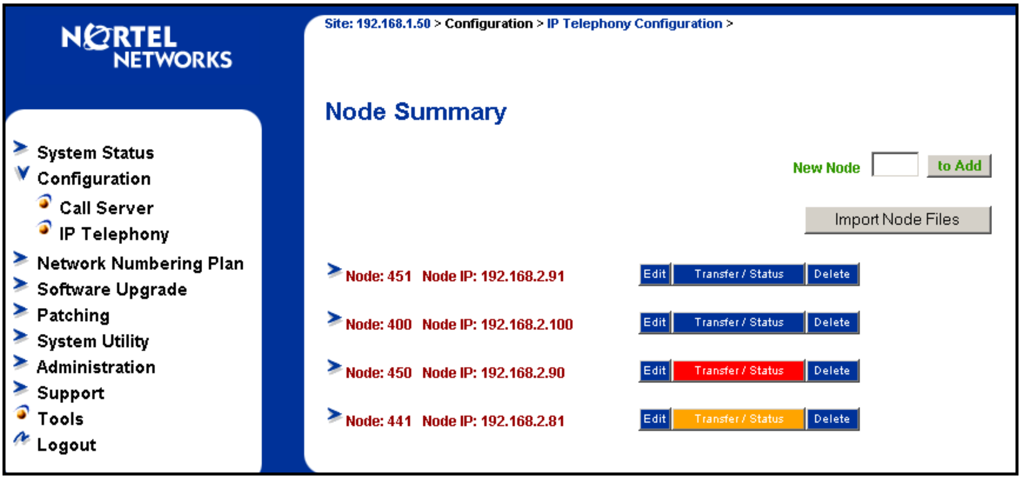
Are you sure, you want to Save this Node?

**2** Click **OK** to confirm the save of the node data.

The Edit window closes, and the Node Summary window opens.

**3** In the **Node Summary** window, click the **Transfer/Status** button associated with the node. See Figure 114 on page 376.

**Figure 114**
**Transfer Node**



Site: 192.168.1.50 > Configuration > IP Telephony Configuration >

Node Summary

Node: 451 Node IP: 192.168.2.91

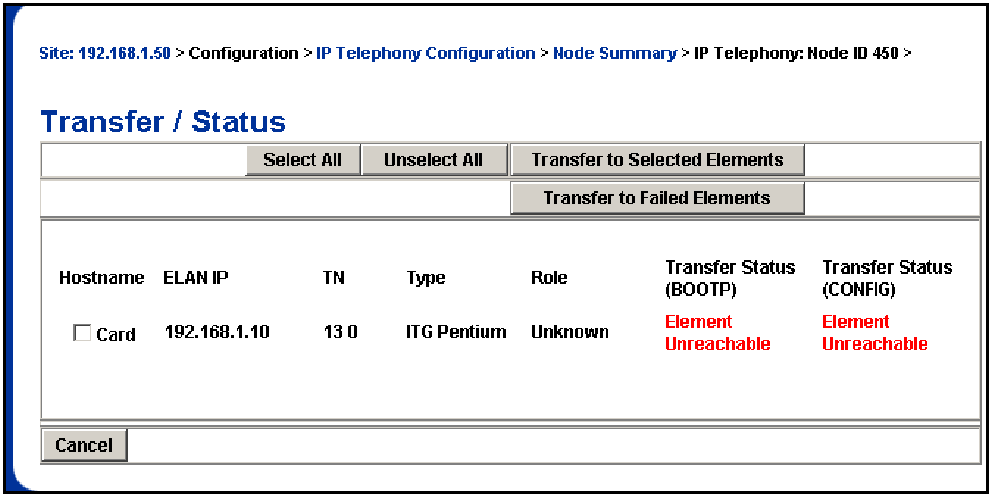
Node: 400 Node IP: 192.168.2.100

Node: 450 Node IP: 192.168.2.90

Node: 441 Node IP: 192.168.2.81

The **Transfer/Status** window opens. See Figure 115.

**Figure 115**
**Transfer/Status window**



Site: 192.168.1.50 > Configuration > IP Telephony Configuration > Node Summary > IP Telephony: Node ID 450 >

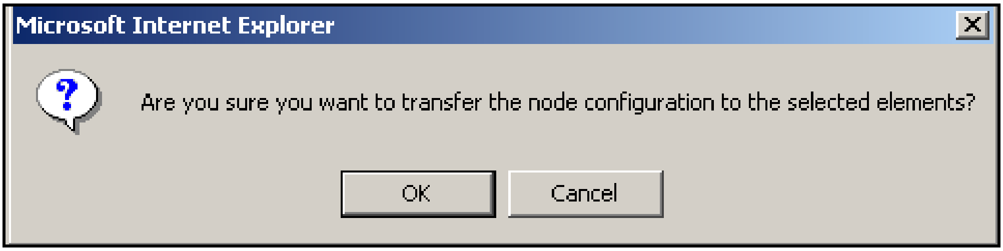
Transfer / Status

| Hostname | ELAN IP | TN | Type | Role | Transfer Status (BOOTP) | Transfer Status (CONFIG) |
|---|---|---|---|---|---|---|
| □ Card | 192.168.1.10 | 13 0 | ITG Pentium | Unknown | Element Unreachable | Element Unreachable |

4 Select the desired type of transfer.

5 Click **OK** to confirm the transfer. See Figure 116.

**Figure 116**
**Transfer confirmation dialog box**



Are you sure you want to transfer the node configuration to the selected elements?

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** window 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.

6 When the transfer is complete, click **OK** (see Figure 111 on page 370) 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.”

7 Reset the Leader card 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 Signaling Server IP address information is changed, the 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 53.

**Procedure 53**
**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 IP Phones registered with the LTPS on the Leader card.
  **L000** shows that no IP Phones 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 IP Phones registered with the Follower card's LTPS.
  **F000** shows that no IP Phones are registered.

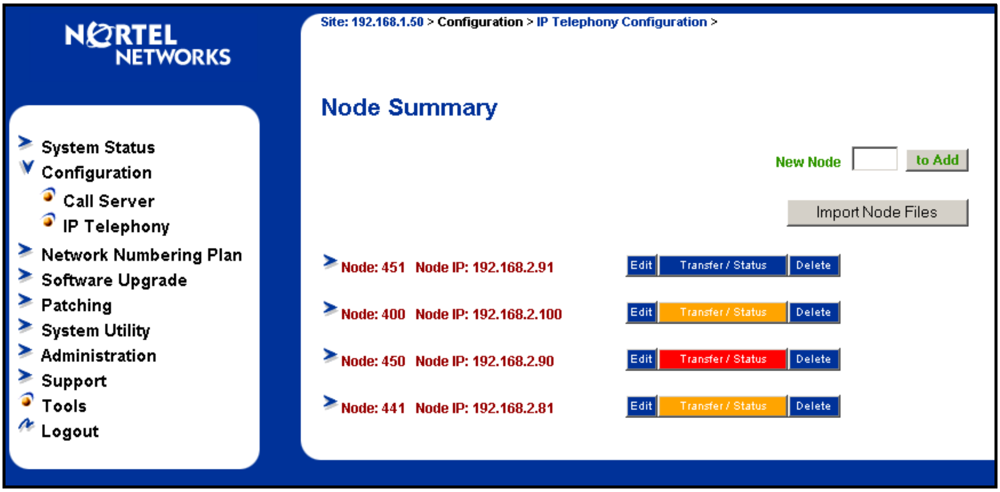
2 Reboot the Follower card if the card's faceplate does not display FXXX or F000.

3 Once all the Follower cards have the correct display on their faceplates, log into Element Manager.

4 In the **Node Summary** window, click the **Transfer/Status** button associated with the node.

See Figure 117 on page 380.

**Figure 117**
**Transfer node information to the card**



Site: 192.168.1.50 > Configuration > IP Telephony Configuration >

Node Summary

Node: 451 Node IP: 192.168.2.91

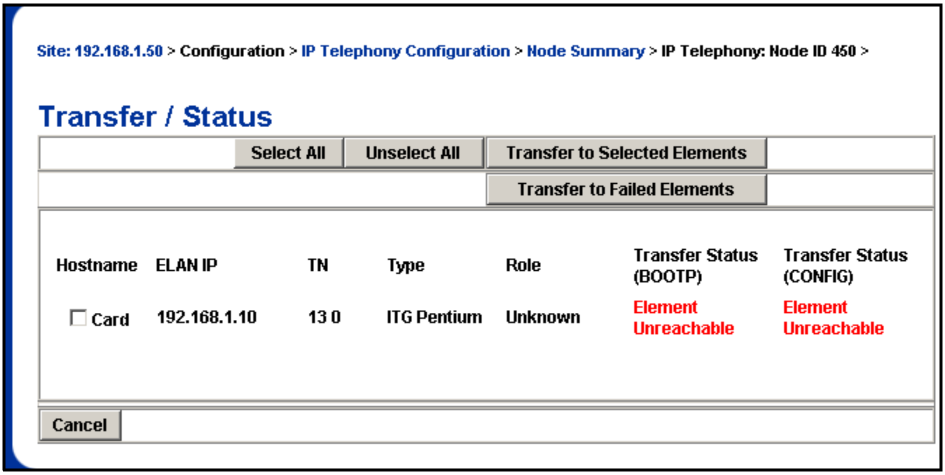
Node: 400 Node IP: 192.168.2.100

Node: 450 Node IP: 192.168.2.90

Node: 441 Node IP: 192.168.2.81

The **Transfer/Status** window opens. See Figure 118.

**Figure 118**
**Transfer/Status window**



Site: 192.168.1.50 > Configuration > IP Telephony Configuration > Node Summary > IP Telephony: Node ID 450 >

Transfer / Status

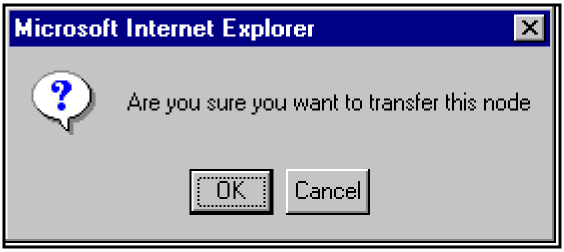
| Hostname | ELAN IP | TN | Type | Role | Transfer Status (BOOTP) | Transfer Status (CONFIG) |
|---|---|---|---|---|---|---|
| □ Card | 192.168.1.10 | 13 0 | ITG Pentium | Unknown | Element Unreachable | Element Unreachable |

**5** Select the desired type of transfer.

**6** Click **OK** to confirm the transfer.

See Figure 119.

**Figure 119**
**Transfer confirmation dialog box**



Microsoft Internet Explorer

Are you sure you want to transfer this node

The **Transfer Progress** window 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.

**7** When the transfer is complete, click **OK** in the **Progress Check Complete** dialog box. See Figure 111 on page 370.

If the transfer is successful for a card, the Status column displays "Complete." If the transfer is unsuccessful, the Status column displays "Fail."

**8** 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 IP Phone 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 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 IP Phone firmware:

1. Determine the version of the software currently installed on the Voice Gateway Media Card. See Procedure 54 on page 386.
2. Determine the version of the IP Phone firmware that is currently running on the Voice Gateway Media Card. See Procedure 55 on page 389.
3. Download the most up-to-date version of the software and firmware files from the Nortel Networks web site. See Appendix F: "Download IP Line 4.0 files from Nortel Networks web site" on page 763.
4. Upload the software and firmware files using the File Upload system utility in Element Manager. See Procedure 57 on page 394.
5. Upgrade the Voice Gateway Media Card software. See Procedure 58 on page 396.

6. Restart the Voice Gateway Media Card. See Procedure 59 on page 400.
7. Upgrade and distribute the IP Phones firmware on the Voice Gateway Media Card. See Procedure 60 on page 401.

   ***Note:*** To upgrade the Voice Gateway Media Card firmware, see Procedure 61 on page 407.

### Upgrade options

Once the Voice Gateway Media Card loadware and IP Phone 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 IP Phone firmware upgrade is also required.
2. Upgrade both the Voice Gateway Media Card software and the IP Phone firmware.

   ***Note:*** Defer restarting the cards until the end of the firmware upgrade. If the IP Phones are registered to the 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 IP Phones are registered to the Voice Gateway Media Card, resetting the card causes the IP Phone to reboot and reregister.

3. Upgrade only the IP Phone firmware.

   ***Note:*** In this case, restart all the IP Phones instead of the Voice Gateway Media Cards. To do this, select a single test IP Phone and reset the firmware only on that test IP Phone before completing the procedure on all IP Phones. If the upgrade works properly, use the **umsUpgradeAll** command to complete the upgrade on all the IP Phones.

## IP Phone 2001, IP Phone 2002, and IP Phone 2004 firmware requirements

The IP Phone 2001, IP Phone 2002, and IP Phone 2004 firmware can be upgraded in the field.

The file server can be a dedicated external file server, the 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 window. See Figure 106 on page 363.

- For a node using the Signaling Server as the Leader, no Firmware Server configuration is necessary since the files are stored on the Signaling Server and by default, the files are retrieved from the Signaling Server.
- For nodes that are not using the Signaling Server as the Leader, configure the FTP access information for the Signaling Server or some other server as the Firmware server.

### UFTP

IP Phones use UNIStim File Transfer Protocol (UFTP) to transfer the firmware; therefore, the customer's network must support UFTP. The customer's network must open port 5105.

> ***Note:*** If the firmware cannot be transferred due to firewall restrictions (such as when the IP Phone is behind a firewall that has port 5105 blocked), then upgrade the IP Phone with the current firmware version before distributing the telephone.

## 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:

- Signaling Server:
  - — The firmware file is stored on the 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 Signaling Server.
  - If the Voice Gateway Media Card is a 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.

## IP Phone Firmware upgrade from a new Voice Gateway Media Card

Use Element Manager to upgrade the IP Phone firmware files to the new Voice Gateway Media Card. See Procedure 60 on page 401.

## Determine Voice Gateway Media Card software version

To determine the version of software on the Voice Gateway Media Card, follow the steps in Procedure 54.

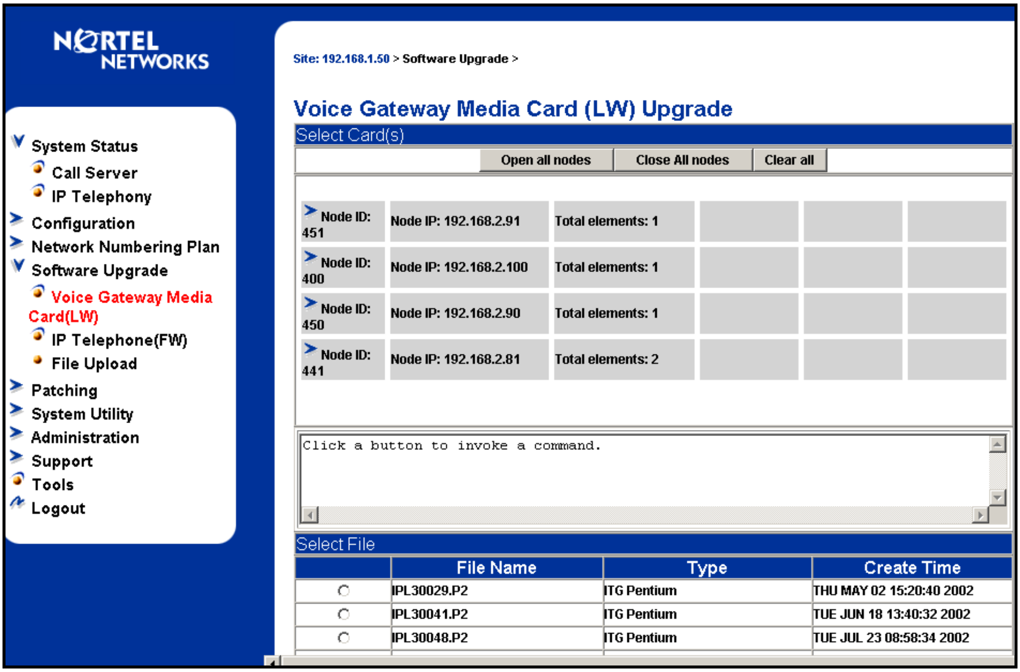
**Procedure 54**
**Determining card software version**

1 Click **Software Upgrade** from the navigation tree.

2 Click **Voice Gateway Media Card (LW)**.

The **Voice Gateway Media Card (LW) Upgrade** window opens. See Figure 120.

**Figure 120**
**IP Telephony (LW) Upgrade**



Site: 192.168.1.50 > Software Upgrade >

Voice Gateway Media Card (LW) Upgrade

Select Card(s)

| | | | | | |
|---|---|---|---|---|---|
| Node ID: 451 | Node IP: 192.168.2.91 | Total elements: 1 | | | |
| Node ID: 400 | Node IP: 192.168.2.100 | Total elements: 1 | | | |
| Node ID: 450 | Node IP: 192.168.2.90 | Total elements: 1 | | | |
| Node ID: 441 | Node IP: 192.168.2.81 | Total elements: 2 | | | |

```
Click a button to invoke a command.
```

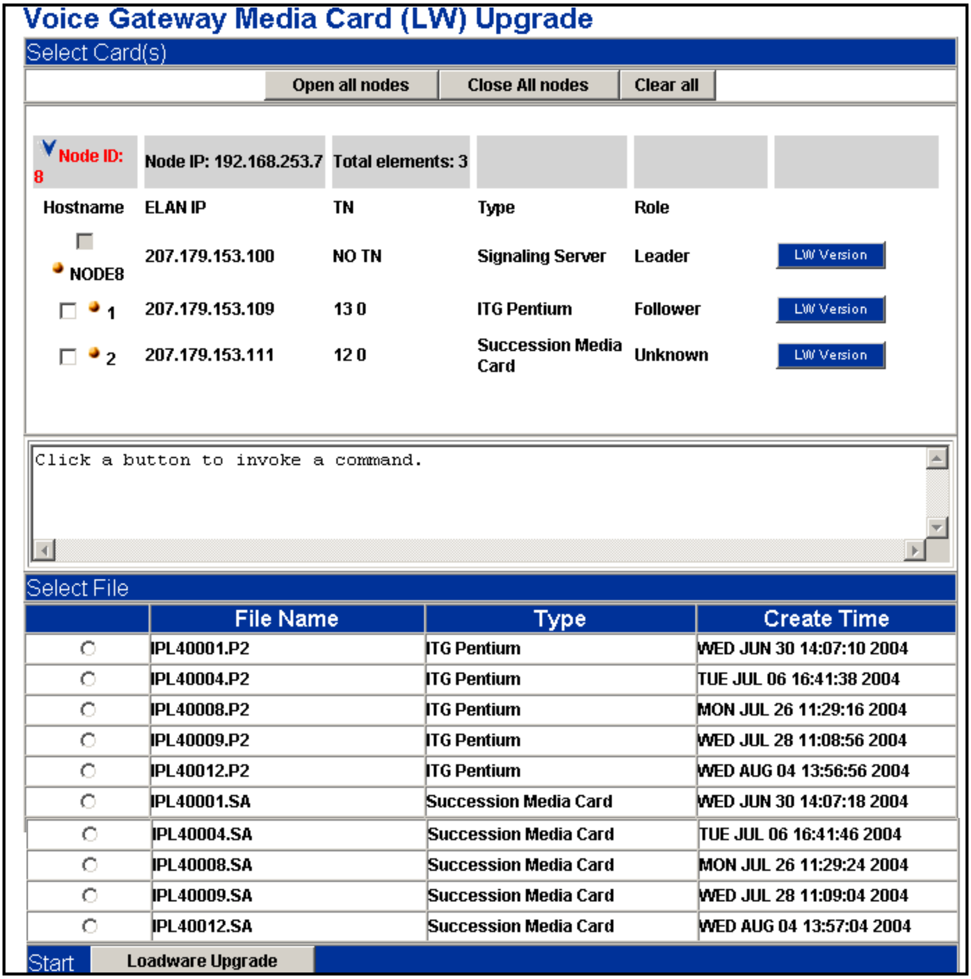
Select File

| | File Name | Type | Create Time |
|---|---|---|---|
| ○ | IPL30029.P2 | ITG Pentium | THU MAY 02 15:20:40 2002 |
| ○ | IPL30041.P2 | ITG Pentium | TUE JUN 18 13:40:32 2002 |
| ○ | IPL30048.P2 | ITG Pentium | TUE JUL 23 08:58:34 2002 |

3 Expand a node and select a card in the node.

See Figure 121 on page 387.

**Figure 121**
**LW Version window**



| Node ID: 8 | Node IP: 192.168.253.7 | Total elements: 3 | | | |
|---|---|---|---|---|---|
| Hostname | ELAN IP | TN | Type | Role | |
| □ NODE8 | 207.179.153.100 | NO TN | Signaling Server | Leader | LW Version |
| □ 1 | 207.179.153.109 | 13 0 | ITG Pentium | Follower | LW Version |
| □ 2 | 207.179.153.111 | 12 0 | Succession Media Card | Unknown | LW Version |

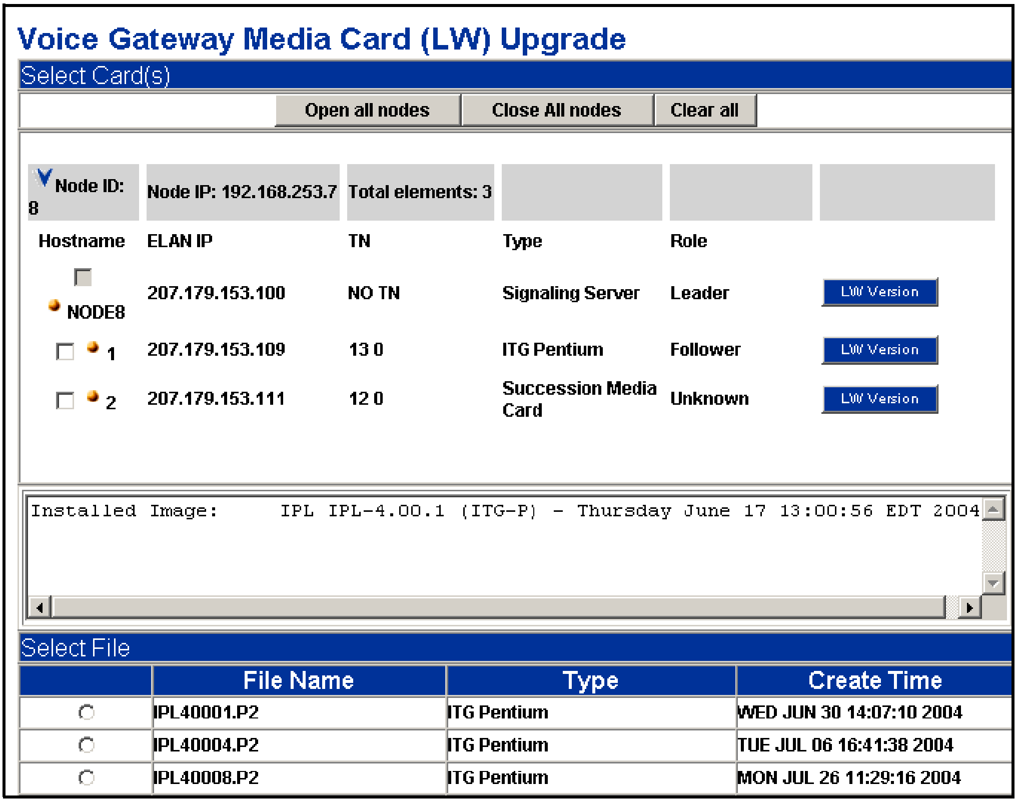
```
Click a button to invoke a command.
```

| | File Name | Type | Create Time |
|---|---|---|---|
| ○ | IPL40001.P2 | ITG Pentium | WED JUN 30 14:07:10 2004 |
| ○ | IPL40004.P2 | ITG Pentium | TUE JUL 06 16:41:38 2004 |
| ○ | IPL40008.P2 | ITG Pentium | MON JUL 26 11:29:16 2004 |
| ○ | IPL40009.P2 | ITG Pentium | WED JUL 28 11:08:56 2004 |
| ○ | IPL40012.P2 | ITG Pentium | WED AUG 04 13:56:56 2004 |
| ○ | IPL40001.SA | Succession Media Card | WED JUN 30 14:07:18 2004 |
| ○ | IPL40004.SA | Succession Media Card | TUE JUL 06 16:41:46 2004 |
| ○ | IPL40008.SA | Succession Media Card | MON JUL 26 11:29:24 2004 |
| ○ | IPL40009.SA | Succession Media Card | WED JUL 28 11:09:04 2004 |
| ○ | IPL40012.SA | Succession Media Card | WED AUG 04 13:57:04 2004 |

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 **Voice Gateway Media Card (LW) Upgrade** window under the list of cards. See Figure 122. In this example, the software version displayed is for the ITG Pentium card.

**Figure 122**
**LW version for the ITG Pentium**



Voice Gateway Media Card (LW) Upgrade

Select Card(s)

| Node ID: 8 | Node IP: 192.168.253.7 | Total elements: 3 | | | |
|---|---|---|---|---|---|
| Hostname | ELAN IP | TN | Type | Role | |
| □ NODE8 | 207.179.153.100 | NO TN | Signaling Server | Leader | LW Version |
| □ 1 | 207.179.153.109 | 13 0 | ITG Pentium | Follower | LW Version |
| □ 2 | 207.179.153.111 | 12 0 | Succession Media Card | Unknown | LW Version |

```
Installed Image:     IPL IPL-4.00.1 (ITG-P) - Thursday June 17 13:00:56 EDT 2004
```

Select File

| | File Name | Type | Create Time |
|---|---|---|---|
| ○ | IPL40001.P2 | ITG Pentium | WED JUN 30 14:07:10 2004 |
| ○ | IPL40004.P2 | ITG Pentium | TUE JUL 06 16:41:38 2004 |
| ○ | IPL40008.P2 | ITG Pentium | MON JUL 26 11:29:16 2004 |

5 Note the software version for the card.

**End of Procedure**

## Determine the IP Phone firmware version

To determine the version of firmware on the Voice Gateway Media Card, follow the steps in Procedure 55.

**Procedure 55**
**Determining the IP Phone firmware version**

1 Click **Software Upgrade** from the navigation tree.

2 Click **IP Telephone (FW)** from the expanded **Software Upgrade** menu.

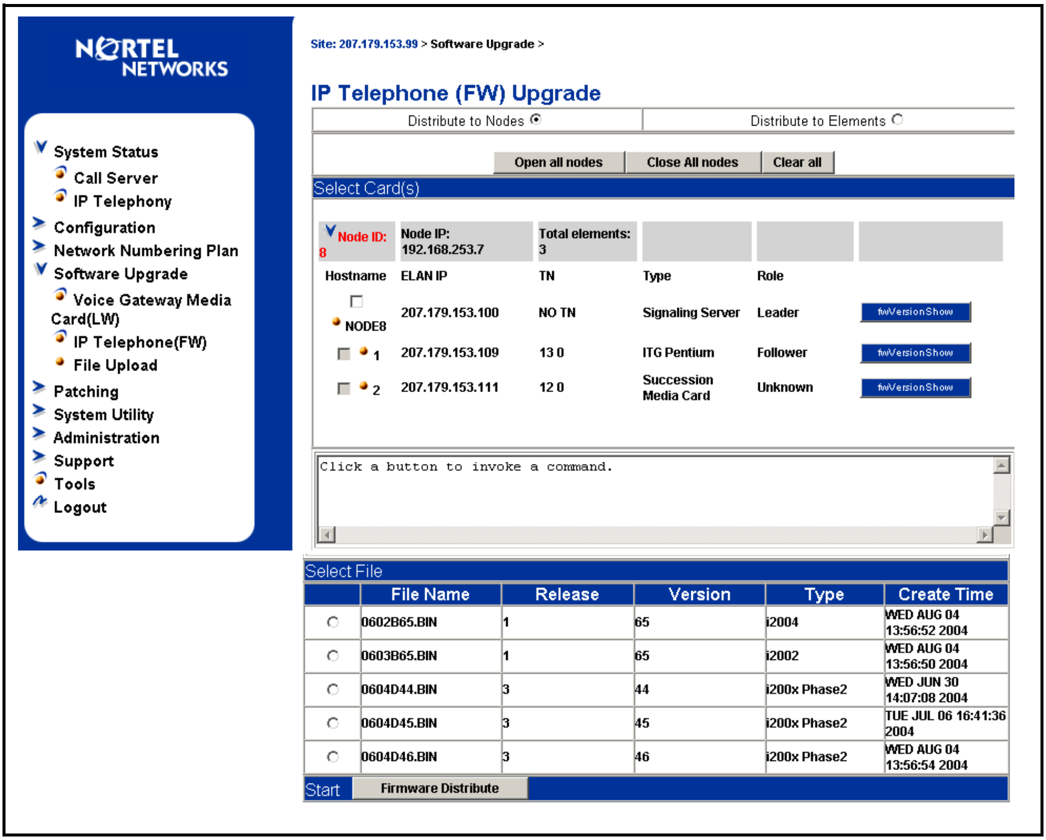
The **IP Telephone (FW) Upgrade** window opens. See Figure 123 on page 390.

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 123**
**IP Telephone (FW) Upgrade window**



Distribute to Nodes ● Distribute to Elements ○

| Node ID: 8 | Node IP: 192.168.253.7 | Total elements: 3 | | | |
|---|---|---|---|---|---|
| Hostname | ELAN IP | TN | Type | Role | |
| □ NODE8 | 207.179.153.100 | NO TN | Signaling Server | Leader | fwVersionShow |
| □ 1 | 207.179.153.109 | 13 0 | ITG Pentium | Follower | fwVersionShow |
| □ 2 | 207.179.153.111 | 12 0 | Succession Media Card | Unknown | fwVersionShow |

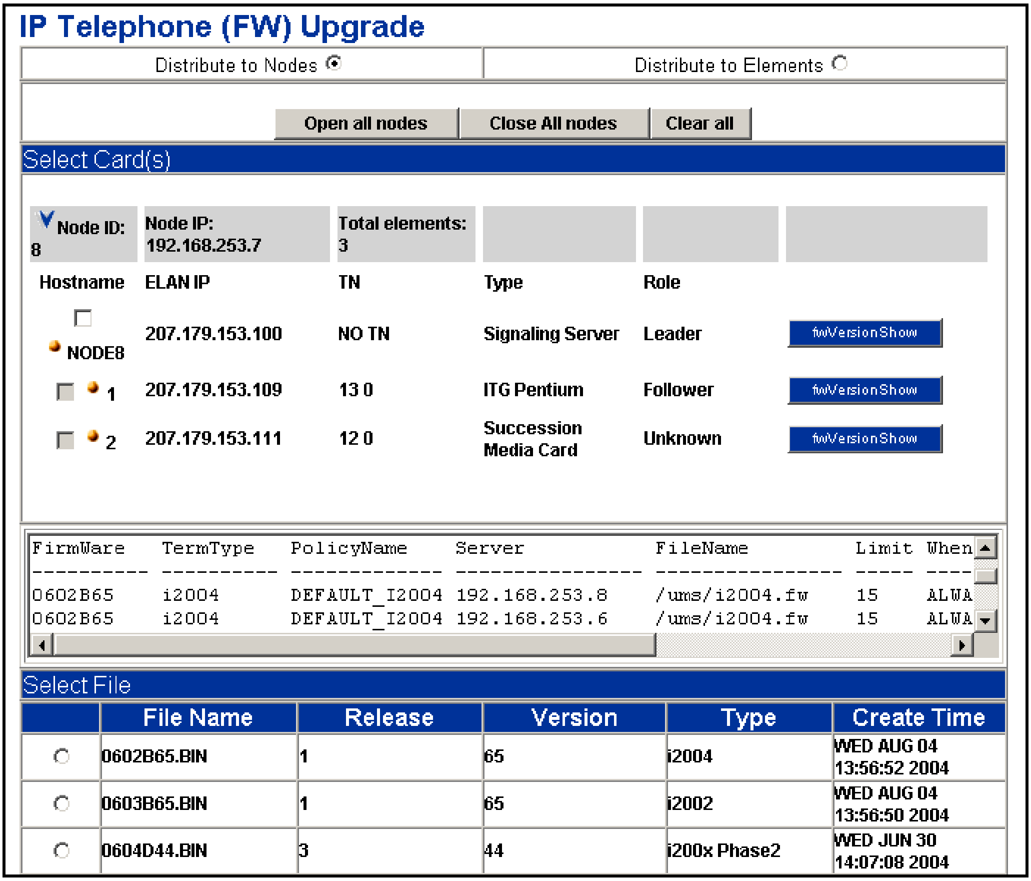
```
Click a button to invoke a command.
```

| | File Name | Release | Version | Type | Create Time |
|---|---|---|---|---|---|
| ○ | 0602B65.BIN | 1 | 65 | i2004 | WED AUG 04 13:56:52 2004 |
| ○ | 0603B65.BIN | 1 | 65 | i2002 | WED AUG 04 13:56:50 2004 |
| ○ | 0604D44.BIN | 3 | 44 | i200x Phase2 | WED JUN 30 14:07:08 2004 |
| ○ | 0604D45.BIN | 3 | 45 | i200x Phase2 | TUE JUL 06 16:41:36 2004 |
| ○ | 0604D46.BIN | 3 | 46 | i200x Phase2 | WED AUG 04 13:56:54 2004 |

3 Expand a node and select a card.

See Figure 124.

**Figure 124**
**FWVersionShow button**



## IP Telephone (FW) Upgrade

Distribute to Nodes ● Distribute to Elements ○

Open all nodes | Close All nodes | Clear all

Select Card(s)

| Node ID: 8 | Node IP: 192.168.253.7 | Total elements: 3 | | | |
|---|---|---|---|---|---|
| Hostname | ELAN IP | TN | Type | Role | |
| ☐ NODE8 | 207.179.153.100 | NO TN | Signaling Server | Leader | fwVersionShow |
| ☐ 1 | 207.179.153.109 | 13 0 | ITG Pentium | Follower | fwVersionShow |
| ☐ 2 | 207.179.153.111 | 12 0 | Succession Media Card | Unknown | fwVersionShow |

```
FirmWare    TermType   PolicyName    Server           FileName         Limit When
----------- ---------- ------------- ---------------- ---------------- ----- ----
0602B65     i2004      DEFAULT_I2004 192.168.253.8    /ums/i2004.fw    15    ALWA
0602B65     i2004      DEFAULT_I2004 192.168.253.6    /ums/i2004.fw    15    ALWA
```

Select File

| | File Name | Release | Version | Type | Create Time |
|---|---|---|---|---|---|
| ○ | 0602B65.BIN | 1 | 65 | i2004 | WED AUG 04 13:56:52 2004 |
| ○ | 0603B65.BIN | 1 | 65 | i2002 | WED AUG 04 13:56:50 2004 |
| ○ | 0604D44.BIN | 3 | 44 | i200x Phase2 | WED JUN 30 14:07:08 2004 |

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 Telephone (FW)** window. In the example displayed in Figure 124 on page 391, the firmware versions shown are for the ITG Pentium card.

**5** Note the firmware version for the card.

**End of Procedure**

## Download the current software and IP Phone firmware

To check for the latest software and IP Phone firmware releases on the Nortel Networks Customer Support web site, follow the steps in Procedure 56.

**Procedure 56**
**Downloading loadware and firmware from the Nortel Networks web site**

**1** Check the Nortel Networks Customer Support web site for the latest IP Line 4.0 software and IP Phone firmware releases. See Appendix F: “Download IP Line 4.0 files from Nortel Networks web site” on page 763.

***Note:*** The IP Line 4.0 software and IP Phone firmware files are contained in the **SSE-4.00.xx Signaling Server CD Image** file in the “**CS 1000**” product list on the Nortel Networks web site. The file contains:

- The **IPL400xx.p2** and **IPL400xx.sa** software files. The IPL400xx.p2 file is the IP Line application for the ITG-P 24-port card and the IPL400xx.sa is the IP Line application for the Media Card.
- The **0602Bxx.BIN** (Phase I IP Phone 2004), **0603Bxx.BIN** (Phase I IP Phone 2002), and **0604Dnn.BIN** (Phase II IP Phone 2001, IP Phone 2002, and IP Phone 2004) firmware files.

  For example, a firmware version can be labelled 0602B38 or 0603B38. This means IP Phone firmware version 1.38.

  — The 02 represents the IP Phone 2004 and 03 is the IP Phone 2002.

  — 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 IP Phones.

3 If more recent files are available, download the **SSE-4.00.xx Signaling Server CD Image** file.

**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" window enables software and firmware to be uploaded and stored on the Signaling Server. These files can then be downloaded to the IP Phones and the Voice Gateway Media Cards using the firmware and software upgrade functions available from the Software Upgrade menu. The 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 57 on page 394.

> ***Note:*** For patches, Element Manager does not need to upload to Signaling Server first. The Signaling Server obtains the patch file from the Element Manager PC directly.

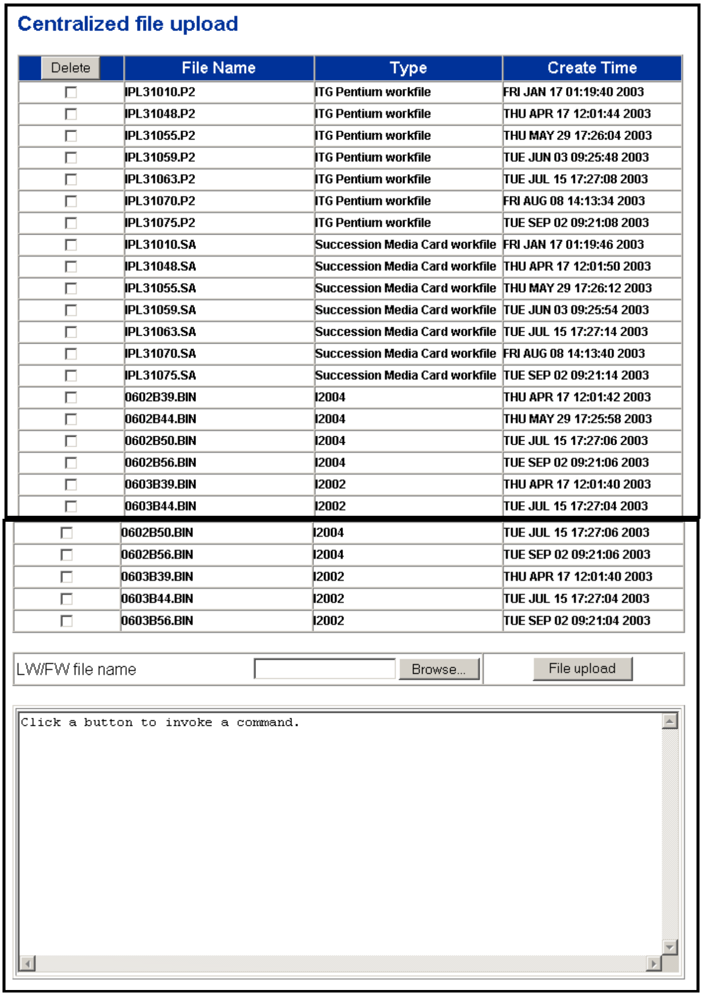
**Procedure 57**
**Uploading software and firmware files**

1 Click **Software Upgrade** in the navigation tree.

2 Click **File Upload**.

The **Centralized file upload** window opens. See Figure 125 on page 395.

**Figure 125**
**System Utility > File Upload > Centralized file upload**



Centralized file upload

| Delete | File Name | Type | Create Time |
|---|---|---|---|
| □ | IPL31010.P2 | ITG Pentium workfile | FRI JAN 17 01:19:40 2003 |
| □ | IPL31048.P2 | ITG Pentium workfile | THU APR 17 12:01:44 2003 |
| □ | IPL31055.P2 | ITG Pentium workfile | THU MAY 29 17:26:04 2003 |
| □ | IPL31059.P2 | ITG Pentium workfile | TUE JUN 03 09:25:48 2003 |
| □ | IPL31063.P2 | ITG Pentium workfile | TUE JUL 15 17:27:08 2003 |
| □ | IPL31070.P2 | ITG Pentium workfile | FRI AUG 08 14:13:34 2003 |
| □ | IPL31075.P2 | ITG Pentium workfile | TUE SEP 02 09:21:08 2003 |
| □ | IPL31010.SA | Succession Media Card workfile | FRI JAN 17 01:19:46 2003 |
| □ | IPL31048.SA | Succession Media Card workfile | THU APR 17 12:01:50 2003 |
| □ | IPL31055.SA | Succession Media Card workfile | THU MAY 29 17:26:12 2003 |
| □ | IPL31059.SA | Succession Media Card workfile | TUE JUN 03 09:25:54 2003 |
| □ | IPL31063.SA | Succession Media Card workfile | TUE JUL 15 17:27:14 2003 |
| □ | IPL31070.SA | Succession Media Card workfile | FRI AUG 08 14:13:40 2003 |
| □ | IPL31075.SA | Succession Media Card workfile | TUE SEP 02 09:21:14 2003 |
| □ | 0602B39.BIN | I2004 | THU APR 17 12:01:42 2003 |
| □ | 0602B44.BIN | I2004 | THU MAY 29 17:25:58 2003 |
| □ | 0602B50.BIN | I2004 | TUE JUL 15 17:27:06 2003 |
| □ | 0602B56.BIN | I2004 | TUE SEP 02 09:21:06 2003 |
| □ | 0603B39.BIN | I2002 | THU APR 17 12:01:40 2003 |
| □ | 0603B44.BIN | I2002 | TUE JUL 15 17:27:04 2003 |
| □ | 0603B56.BIN | I2002 | TUE SEP 02 09:21:04 2003 |

```
Click a button to invoke a command.
```

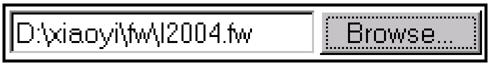
3 Click the **Browse** button. In the **Choose File** dialog box, select the path and file to upload. Alternatively, enter the path and filename for the file to be uploaded.

***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 126.

**Figure 126**
**Firmware file text box**



D:\xiaoyi\fw\I2004.fw

5 Click the **File Upload** button.

6 The firmware file appears in the list at the top of the window when it is 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 58.

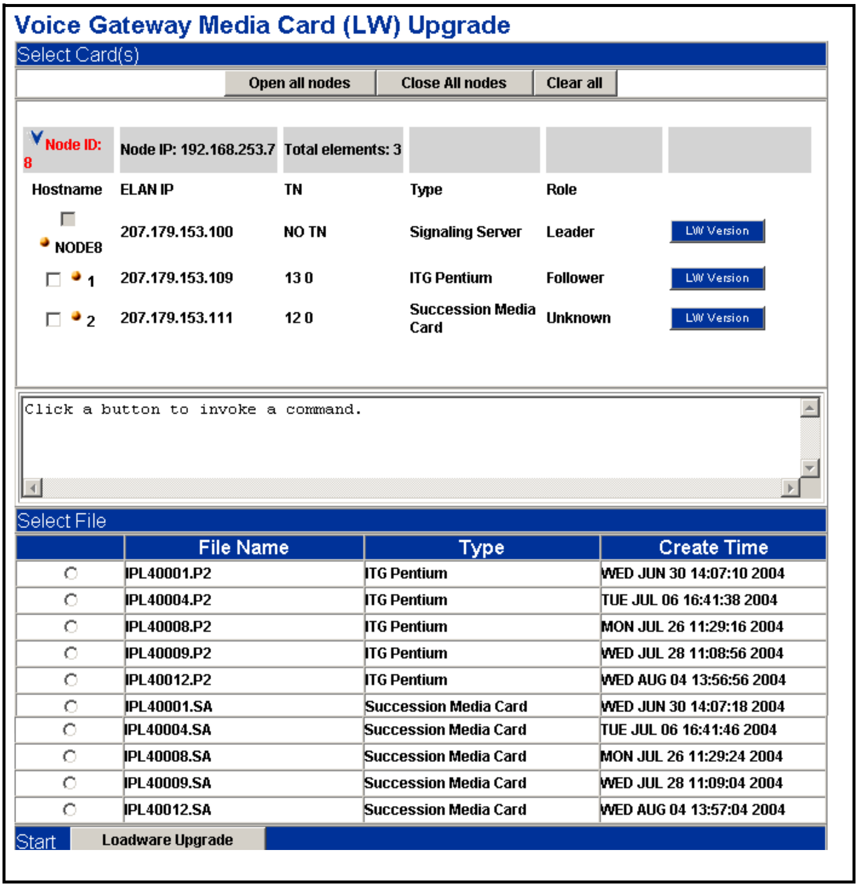
**Procedure 58**
**Upgrading the card software**

1 Click **Software Upgrade** from the navigation tree.

2 Click **Voice Gateway Media Card (LW)** from the expanded **Software Upgrade** menu.

The **Voice Gateway Media Card (LW)) Upgrade** window opens. See Figure 127 on page 397.

**Figure 127**
**IP Telephone (FW) Upgrade window**



| Node ID: 8 | Node IP: 192.168.253.7 | Total elements: 3 | | | |
|---|---|---|---|---|---|
| Hostname | ELAN IP | TN | Type | Role | |
| □ NODE8 | 207.179.153.100 | NO TN | Signaling Server | Leader | LW Version |
| □ 1 | 207.179.153.109 | 13 0 | ITG Pentium | Follower | LW Version |
| □ 2 | 207.179.153.111 | 12 0 | Succession Media Card | Unknown | LW Version |

```
Click a button to invoke a command.
```

| | File Name | Type | Create Time |
|---|---|---|---|
| ○ | IPL40001.P2 | ITG Pentium | WED JUN 30 14:07:10 2004 |
| ○ | IPL40004.P2 | ITG Pentium | TUE JUL 06 16:41:38 2004 |
| ○ | IPL40008.P2 | ITG Pentium | MON JUL 26 11:29:16 2004 |
| ○ | IPL40009.P2 | ITG Pentium | WED JUL 28 11:08:56 2004 |
| ○ | IPL40012.P2 | ITG Pentium | WED AUG 04 13:56:56 2004 |
| ○ | IPL40001.SA | Succession Media Card | WED JUN 30 14:07:18 2004 |
| ○ | IPL40004.SA | Succession Media Card | TUE JUL 06 16:41:46 2004 |
| ○ | IPL40008.SA | Succession Media Card | MON JUL 26 11:29:24 2004 |
| ○ | IPL40009.SA | Succession Media Card | WED JUL 28 11:09:04 2004 |
| ○ | IPL40012.SA | Succession Media Card | WED AUG 04 13:57:04 2004 |

3 Expand a node.

4 Select the card(s) to upgrade by selecting 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 window, click the radio button of the most current software version.

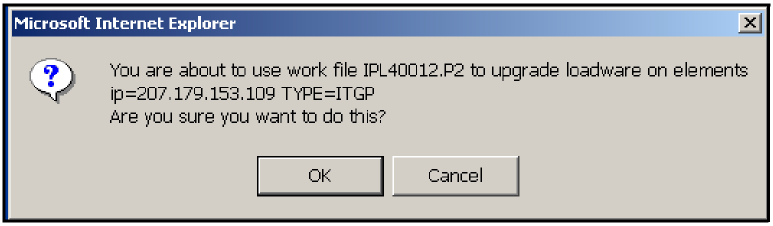
***Note:*** If the card receiving the upgrade is an ITG-P 24-port line card, select the radio button next to the most current version of the ITG-P 24-port line card software (IPL400xx.p2). If the card receiving the upgrade is a Media Card, select the radio button next to the must current version of the Media Card software (IPL400xx.sa).

6 Click the **Loadware Upgrade** button at the bottom of the window.

A confirmation dialog box appears similar to the dialog box in Figure 128.

7 Click **OK** to confirm the card upgrade. The upgrade begins.

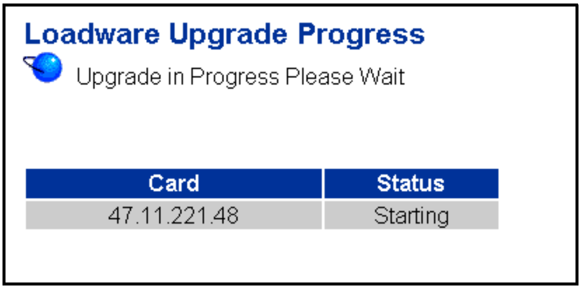
**Figure 128**
**Loadware Upgrade confirmation dialog box**



You are about to use work file IPL40012.P2 to upgrade loadware on elements
ip=207.179.153.109 TYPE=ITGP
Are you sure you want to do this?

The **Loadware Upgrade Progress** window opens. See Figure 129 on page 399. 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 129 on page 399 and Figure 130 on page 399.

**Figure 129**
**Loadware Upgrade Progress – upgrade status**

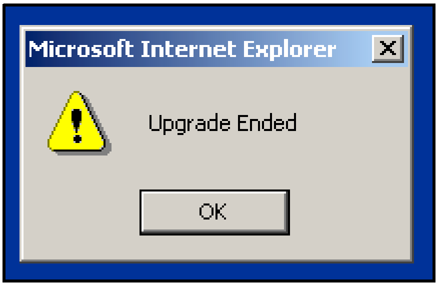


Loadware Upgrade Progress

Upgrade in Progress Please Wait

| Card | Status |
|---|---|
| 47.11.221.48 | Starting |

**Figure 130**
**Loadware Upgrade Progress – completion status**



Microsoft Internet Explorer

Upgrade Ended

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 59 to reboot a Voice Gateway Media Card.

**Procedure 59**
**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** window opens.

**3** Expand the node containing the card to be rebooted.

**4** 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 Signaling Server is not the Leader.

**5** Click the card’s **Status** button in the IP Telephony Information window to verify the status of the Voice Gateway Media Card.

**6** Use the LD 32 **ENLC** command to re-enable the Voice Gateway Media Cards.

**7** Repeat these steps for each Voice Gateway Media Card that received the software upgrade.

**End of Procedure**

## Upgrade the IP Phone firmware

When the IP Line 4.0 software has been upgraded on the Voice Gateway Media Cards, determine if an IP Phone firmware upgrade is also required. If an upgrade is required, the Voice Gateway Media Cards must be upgraded to the newest IP Phone firmware version. To upgrade the firmware required for the IP Phones, follow the steps in Procedure 60 on page 401. This procedure has two major components:

- loading the IP Phone firmware onto each Voice Gateway Media Card in the node
- propagating the firmware from the Voice Gateway Media Card to each IP Phone registered on that card

*Note:* A firmware download does not occur with IP Phones performing a Virtual Office login or Media Gateway 1000B (MG 1000B) login to a remote system. No firmware upgrade takes place during a Virtual Office Login or MG 1000B user registration with the LTPS. The registration is allowed because the IP Phone firmware version must be 1.33 or later to perform a Virtual Office login or MG 1000B user registration.

The **umsUpgradeAll** command has no impact on Virtual Office Login IP Phones. These IP Phones are not reset. If the Virtual Office Login is on the same Call Server, then the IP Phone firmware is upgraded after the user logs out. If the Virtual office Login is between different Call Servers, then the IP Phone just registers back to its home LTPS and follows the normal firmware rules for regular registration.

When the **umsUpgradeAll** command is executed, MG 1000B user IP Phones that are on active calls are flagged. After the IP Phones become idle, the IP Phones are switched by the Call Server back to the MG 1000B for the firmware upgrade.

Follow the steps in Procedure 60 to upgrade IP Phone firmware

**Procedure 60**
**Upgrading the IP Phone 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 window displays the following:

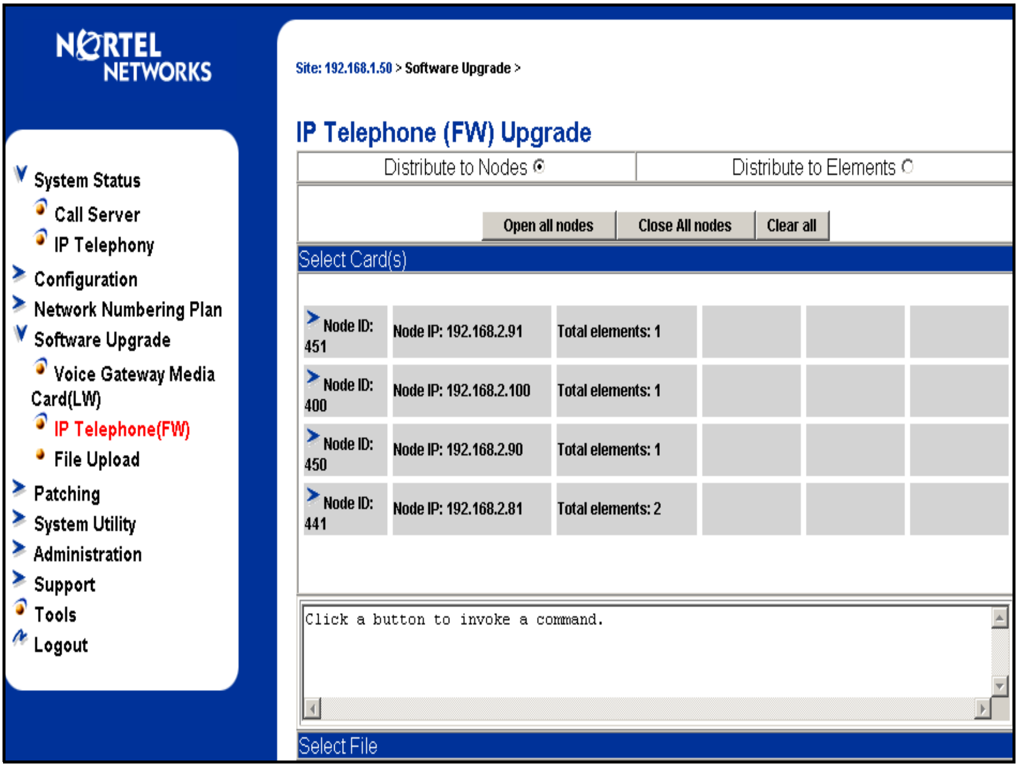
```
RUDPLinkState = Up
```

3 Click **Software Upgrade** on the navigation tree.

4 Click **IP Telephone (FW)** from the expanded **Software Upgrade** menu.

The **IP Telephone (FW) Upgrade** window opens. See Figure 131.

**Figure 131**
**IP Telephone (FW) Upgrade window**



Distribute to Nodes ● Distribute to Elements ○

| | | | | | |
|---|---|---|---|---|---|
| Node ID: 451 | Node IP: 192.168.2.91 | Total elements: 1 | | | |
| Node ID: 400 | Node IP: 192.168.2.100 | Total elements: 1 | | | |
| Node ID: 450 | Node IP: 192.168.2.90 | Total elements: 1 | | | |
| Node ID: 441 | Node IP: 192.168.2.81 | Total elements: 2 | | | |

```
Click a button to invoke a command.
```

5 Expand the node containing the cards that are to receive the IP Phone firmware upgrade.

6 Click the **Distribute to Elements** radio button in the upper right of the window.

7 Select the card(s) to upgrade by selecting the check box to the left of the card information. See Figure 127 on page 397.

***Note:*** Element Manager can upgrade the firmware on a maximum of four cards at the same time.

8 In the lower part of the window, click the radio button next to the most current version of the firmware. Click the **Firmware Distribute** button.

9 Complete this step for each version of the firmware that must be distributed.

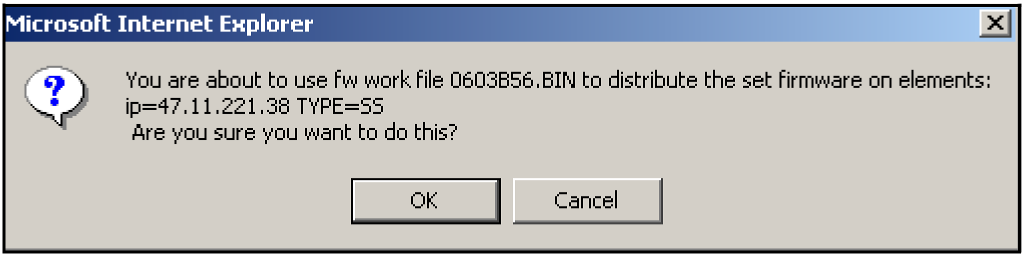
**CAUTION**

Downloading an incorrect version of the IP Phone firmware can result in extended service interruptions and can require special recovery procedures.

A confirmation dialog box appears similar to the confirmation dialog box in Figure 132.

10 Click **OK** to confirm the firmware upgrade to the card. The upgrade begins.

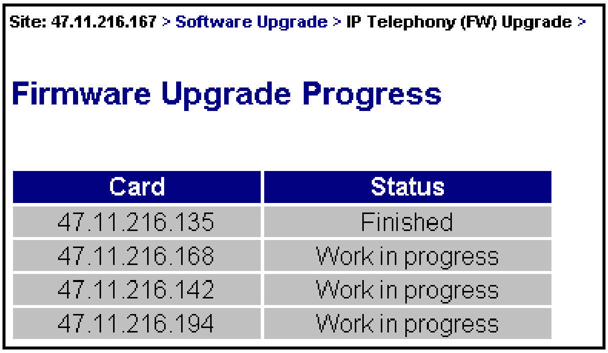
**Figure 132**
**Firmware Upgrade confirmation dialog box**



You are about to use fw work file 0603B56.BIN to distribute the set firmware on elements:
ip=47.11.221.38 TYPE=SS
Are you sure you want to do this?

The **Firmware Upgrade Progress** window opens. See Figure 133 on page 404. The status of the upgrade is shown for each of the cards selected to receive the firmware upgrade.

**Figure 133**
**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 |

**11** Repeat the preceding steps for all the card(s) that have to be upgraded.

The IP Phones continue to run the old firmware until each IP Phone re-registers with a Voice Gateway Media Card containing the new IP Phone firmware.

***Note:*** Commands are available from the IPL> command line to upgrade a single IP Phone immediately, all IP Phones immediately, or schedule all IP Phones to be upgraded at a later time. Before doing this, verify that each Voice Gateway Media Card has the correct IP Phone firmware version.

**12** Select an IP Phone for test purposes.

**13** 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.

**14** Monitor the display on the test telephone. As the IP Phone upgrades the firmware, note the IP Address of the Voice Gateway Media Card from which the telephone is receiving its upgrade.

**15** Press the **Services** key (key with globe with arrow pointing East and West on the IP Phone 2002/IP Phone 2004). 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 IP Phone firmware version 1.38.

- 02 represents the IP Phone 2004 and 03 represents the IP Phone 2002.
- B represents the version number 1.
- 38 represents the release number .38.

**16** Lift the handset of the IP Phone and make a call to verify the IP Phone works.

**17** 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 IP Phones registered to the Voice Gateway Media Card go out of service. This can take several minutes.

Upon completion of the firmware upgrade, the IP Phones are brought back online in groups of ten.

**CAUTION**

If the **umsUpgradeAll** command is used without the time parameter, all IP Phones 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 IP Phones currently registered on that line card.

To schedule a specific reset time for the IP Phones, 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.

**18** At the IPL> prompt, verify the IP Phones for each Voice Gateway Media Card are upgraded by entering the following:

```
isetShow
```

**19** Inspect the list to ensure all IP Phones have the correct firmware version.

**20** For any IP Phones 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 IP Phones, the cause is probably due to one of the following:

- One of the Voice Gateway Media Cards did not upgrade its software successfully.
- An IP Phone’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 IP Phones, refer to *IP Phones: Description, Installation, and Operation* (553-3001-368).

## Upgrade the Voice Gateway Media Card firmware

The minimum versions of IP Line 4.0 software for the Voice Gateway Media Card vintages earlier than NTVQ01BB and NTVQ01AB are:

- Version 6.7 for the Media Card
- Version 5.7 for the ITG-P 24-port card

The minimum versions of IP Line 4.0 software for the Voice Gateway Media Cards NTVQ01BB and NTVQ01AB is Version 8.0. There is no need to download the Version 8.0 software for the Voice Gateway Media Cards NTVQ01BB and NTVQ01AB as the software is pre-loaded at the factory.

To upgrade the card firmware, follow the steps in Procedure 61.

**Procedure 61**
**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 Media Cards.
2. Once the most current version of the firmware has been downloaded, follow the steps in:
   - Procedure 99 on page 639 to upgrade the firmware on the ITG-P 24-port line card
   - Procedure 100 on page 642 to upgrade the firmware on the Media Cards

**End of Procedure**

# Configure Alarm Management to receive IP Line SNMP traps

Alarm Management cannot be configured using Element Manager. OTM 2.2 must be used to configure the Alarm Management feature to receive IP Line SNMP traps. See Procedure 38 on page 322.

# Assemble and install an IP Phone

To assemble and install an IP Phone, refer to *IP Phones: Description, Installation, and Operation* (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 421 and Procedure 63 on page 435.

# Configure the IP Phone Installer Passwords

The IP Phone Installer Password, used when changing the TN on the telephone, controls registration with a virtual line TN on the Call Server. Refer to page 425 for more information about the IP Phone Installer Passwords.

To enable and set the administrative IP Phone Installer Password, see Procedure 63 on page 435.

If required, enable and set a temporary IP Phone Installer Password. See Procedure 64 on page 438.

Element Manager can also be used to configure the IP Phone Installer Passwords. See “Setting the IP Phone Installer Password” on page 558.

## 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 62**
**Importing node files**

1 In the navigation tree, click **Configuration** and then **IP Telephony**.

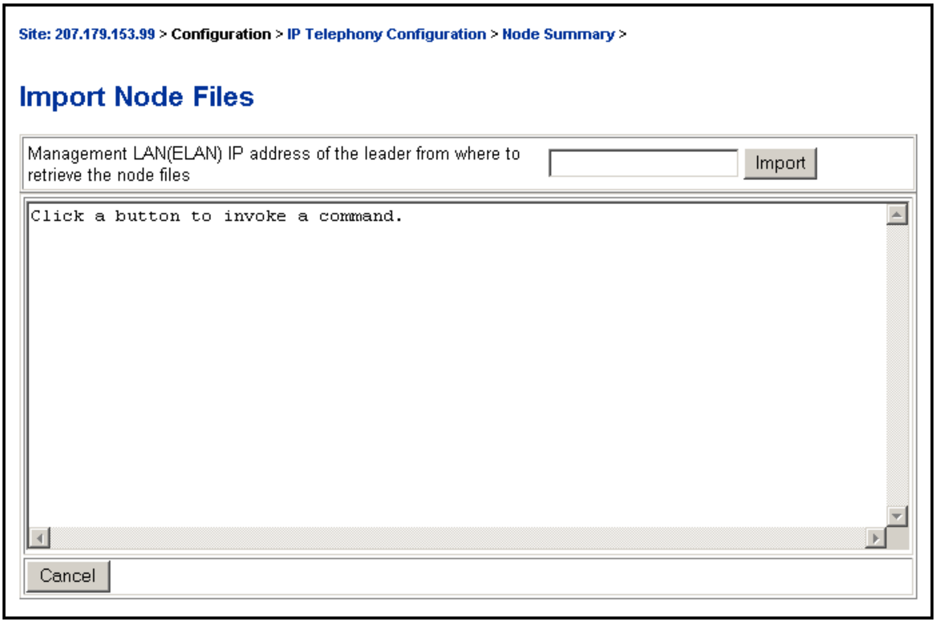
2 Click **Node Summary**.

The Node Summary window opens.

3 Click the **Import Node Files** button.

The **Import Node Files** window opens. See Figure 134 on page 410.

**Figure 134**
**Import node files**



Site: 207.179.153.99 > Configuration > IP Telephony Configuration > Node Summary >

Import Node Files

Management LAN(ELAN) IP address of the leader from where to retrieve the node files

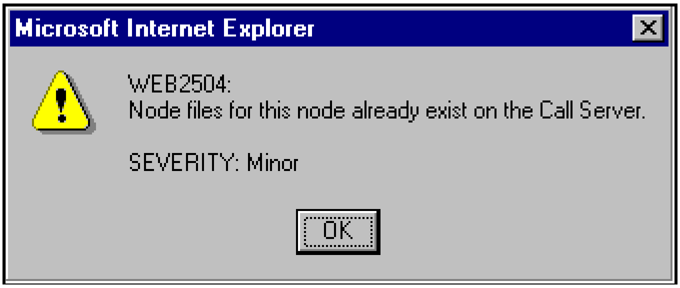
```
Click a button to invoke a command.
```

4 Enter the Management LAN (ELAN) subnet IP Address of the Leader in the text box. This address is used to retrieve the node files.

5 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 135 on page 411.

**Figure 135**
**Duplicate node information**



WEB2504:
Node files for this node already exist on the Call Server.

SEVERITY: Minor

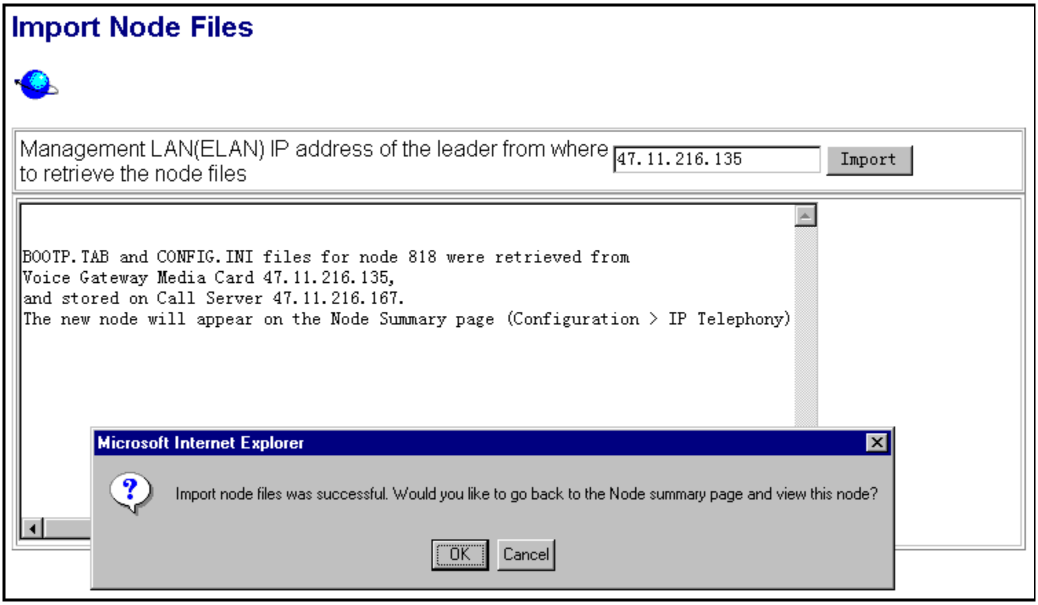
If the node does not exist, Element Manager tries to write the configuration to the Call Server. If it succeeds, a message indicating the import was successful appears. See Figure 136 on page 412. If Element Manager cannot write the configuration to the Call Server, a fail reason appears in the text area of the Import Node Files window.

If the import is successful, information appears in the text area of the Node Import Files screen. See Figure 136 on page 412.

A message box also appears. In the message box, click the **OK** button to proceed to the **Node Summary** window. 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 136**
**Import Node Files – successfully imported node**



Import Node Files

Management LAN(ELAN) IP address of the leader from where to retrieve the node files: 47.11.216.135

```
BOOTP.TAB and CONFIG.INI files for node 818 were retrieved from
Voice Gateway Media Card 47.11.216.135,
and stored on Call Server 47.11.216.167.
The new node will appear on the Node Summary page (Configuration > IP Telephony)
```

Microsoft Internet Explorer

Import node files was successful. Would you like to go back to the Node summary page and view this node?

**End of Procedure**

# IP Line 4.0 administration

## Contents

This section contains information on the following topics:

# Introduction

This chapter explains how to administer IP Line 4.0 and the Voice Gateway Media Cards on the Meridian 1 and CS 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) 2.2

  OTM's IP Line 4.0 application provides a GUI to the Voice Gateway Media Card. OTM 2.2 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 IP Phones.

**Table 58**
**Corporate Directory: LD 11 configuration**

| Prompt | Response | Description |
|---|---|---|
| REQ: | NEW CHG | Add new data or change existing data. |
| TYPE: | i2002<br>i2004<br>i2050 | Enter terminal type. |
| TN | l s | Enter IP Phone 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).

> ***Note:*** Corporate Directory is not supported on the IP Phone 2001.

## Private Zone configuration

DSP channels and IP Phones 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 IP Phone 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 IP Phone 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 IP Phone) 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 59 shows the CLS for LD 11.

**Table 59**
**LD 11 – Virtual Office Login for IP Phones**

| Prompt | Responses | Description |
|---|---|---|
| REQ: | NEW CHG | |
| TYPE: | i2001<br>i2002<br>i2004<br>i2050 | For IP Phone 2001, IP Phone 2002, and IP Phone 2004, IP Softphone 2050, or MVC 2050. The system accepts this response if it is equipped with packages 88 and 170. The IP Phone 2001 and IP Phone 2002, IP Softphone 2050, and MVC 2050 are also restricted by the IP Phone License setting. |
| CUST | xx | Customer number as defined in LD 15 |
| BUID | <user id> | Dialable DN, main office user ID<br>Enter X to delete. |
| MOTN | l s c u | Main Office Terminal Number<br>Format for Large System and CS 1000E system, where l = loop, s = shelf, c = card, u = unit.<br>Accept default for CS 1000S, Media Gateway 1000B, Media Gateway 1000T, 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 IP Phone |

## e911

If 911 is dialed while logged into Virtual Office, the LTPS re-directs the 911 call to the local area 911 service (PSAP), not the remote Call Server 911 service. Table 60 describes the process.

**Table 60**
**e911 process**

| Step | Description |
|---|---|
| 1 | The LTPS aborts the call on the remote Call Server. |
| 2 | The LTPS displays **Emergency Call** on the IP Phone. |
| 3 | The LTPS logs the IP Phone out of Virtual Office. |
| 4 | The LTPS reconnects to the local Call Server. |
| 5 | The LTPS restarts the 911 call, thus reaching the correct PSAP.<br>***Note:*** The extra processing adds 5 seconds to the call setup time. |
| 6 | After the emergency call ends, the IP Phone remains registered to the Home LTPS as a normal telephone, in case the PSAP makes a call back to the originator of the emergency call.<br>After the IP Phone 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 IP Phone were allowed to immediately resume a Virtual Office login to another site, it could not receive the call back.<br>If the local TN has another IP Phone Virtual Office logged into it when it comes back, the non-emergency IP Phone is pre-empted.<br>***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 IP Phones 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 2.2 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 IP Phone 2001/IP Phone 2002/IP Phone 2004 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 IP Phone 2001, IP Phone 2002, and IP Phone 2004 sent out in the priority field. The range is 0 – 7.

## Password security

The following password security features must be configured and administered in IP Line 4.0:

**1** SNMP community name strings

**2** IPL> CLI Shell password

**3** Call Server's Level 1 Password (PWD1)

**4** IP Phone Installer Password

The SNMP community name strings, IPL> CLI Shell password, and Call Server's Level 1 Password (PWD1) operate at the card level. The IP Phone Installer Password works at the node level.

- The SNMP community name strings are 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 IP Phone 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 strings

SNMP community names strings are required to access the Voice Gateway Media Card. There are three community names: public, admingroup2, and admingroup3.

OTM 2.2 stores the community names for Meridian 1 systems. See Figure 71 on page 285. Procedure 27 on page 285 explains how to change the SNMP community names to control access to the IP Telephony node.

Element Manager stores the community names for CS 1000 systems. See Figure 98 on page 348. Procedure 43 on page 348 is used to change the SNMP community name to control access to the IP Telephony node.

## 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 4.0 login banner information includes the IP 4.0 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 Media Card:

```
Login:
Password

Welcome to the IP Line command line.
Software Version: IPL-4.00.01
Management IP: 47.11.216.216
Host Type: Media Card
Firmware Version: ITG Firmware Rls 5.7

SysName: ITG Line
SysLocation: TN 10 0
SysContact: designer

OS Time: Date (04/03/2004) Time (09:07:43)
Use “logout” to logout.
Idle session timeout = 20 minutes.
IPL>
```

### Password Guessing Protection

IP Line 4.0 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 IP Phone 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 Media Card 8-port and 32-port line card, and the 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 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 subnet, the user ID and password that are currently stored in the card's NVRAM are 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 subnet 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 subnet connection. Nortel Networks recommends that an EED be performed when the PWD1 password is changed on the Call Server. Performing an EDD 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).

## IP Phone Installer Password

An IP Phone displays the node ID and Terminal Number (TN) of the IP Phone for five seconds as the IP Phone boots up. IP Line 4.0 password protection controls who can change the TN on the IP Phone. This feature is available on the IP Phone 2001, IP Phone 2002 and IP Phone 2004, IP Softphone 2050, and the MVC 2050. The IP Phone Installer Password protection controls registration with a virtual line TN on the Call Server.

> *Note:* The IP Phone Installer Password can also set using the CLI commands in Element Manager. See "Setting the IP Phone Installer Password" on page 558.

### Administrator IP Phone Installer Password

This feature adds basic IP Phone Installer Password protection on the IP Phones 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 IP Phones.

#### *IP Phone 2004*

When the password is configured, the IP Phone 2004 screen shows:

1. The four digit Node ID and a Password prompt (see Figure 139 on page 431), instead of the Node ID and TN fields (see Figure 137 on page 428).
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 139 on page 431).

#### *IP Phone 2002 and IP Phone 2001*

When the password is configured, the IP Phone screen shows:

1. The four digit Node ID screen is displayed first (see Figure 140 on page 432).
2. The user is then prompted with the Password screen (see Figure 140 on page 432) instead of the TN field screen (see Figure 138 on page 429).
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 140 on page 432).

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 IP Phone during the registration process. This provides the most security as it prevents any entry of passwords or TNs from the IP Phone.

### Temporary IP Phone Installer Password

A Temporary IP Phone 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 IP Phone Installer Password can be used:

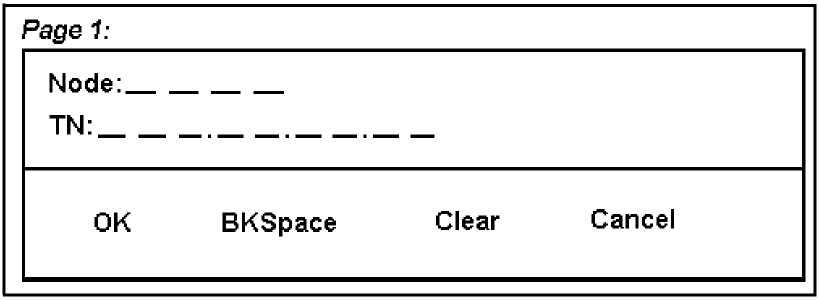
- A department is installing an IP Softphone 2050. The technician creates a temporary password, sets an appropriate number of uses (such as allowing two logins for each IP Softphone 2050 in case a problem occurs the first time) and sets the duration to expire by the end of the weekend. The password access automatically ends before Monday morning (or sooner if the number of uses expires).
- A telecommuter needs to install an IP Phone. The technician provides the temporary password that expires the next day or after two uses. When the IP Phone 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 IP Phone'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 IP Phone registers:

- Figure 137 displays the screen on the IP Phone 2004 if password protection is disabled or not configured.
- Figure 138 on page 429 displays the screen on the IP Phone 2002 and IP Phone 2001 if password protection is disabled or not configured.

**Figure 137**
**IP Phone 2004 registration with no password checking**

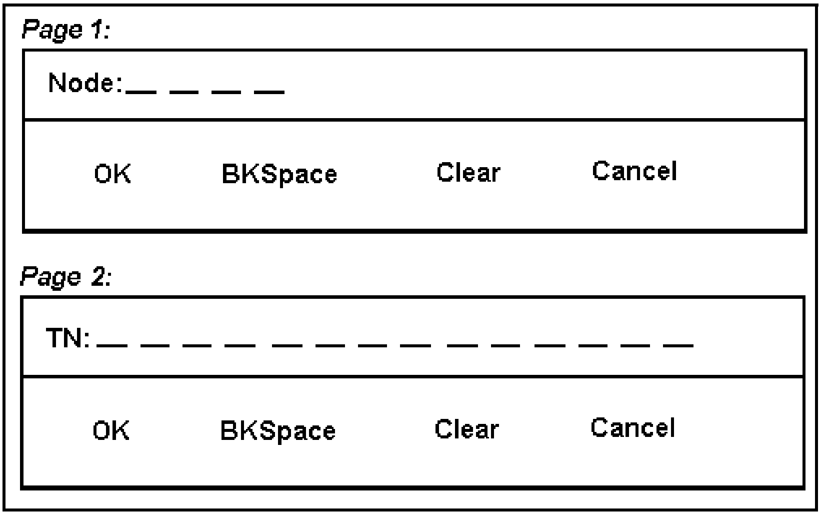


Page 1:

Node:__ __ __ __

TN:__ __ __.__ __.__ __.__ __

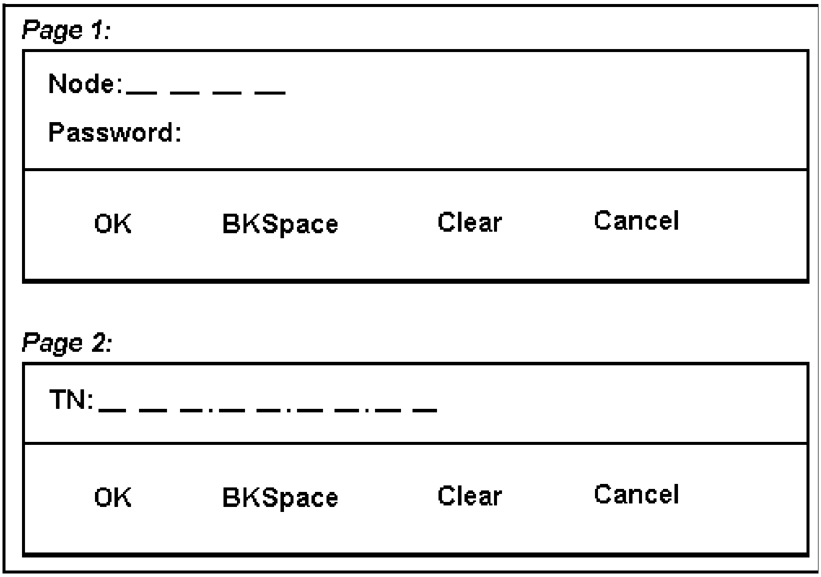
**Figure 138**
**IP Phone 2002 and IP Phone 2001 registration with no password checking**



When the TN password protection feature is configured with a non-zero length password and is enabled:

- Figure 139 on page 431 shows the IP Phone 2004 TN entry screens.
  - Figure 139 on page 431 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 140 on page 432 shows the IP Phone 2002 and IP Phone 2001 TN entry screens.
  - Figure 140 displays the Node ID. The Node ID is entered and the user presses OK.
  - Figure 140 displays the Password entry window. 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 139**
**IP Phone 2004 registration with password checking**



*Page 1:*

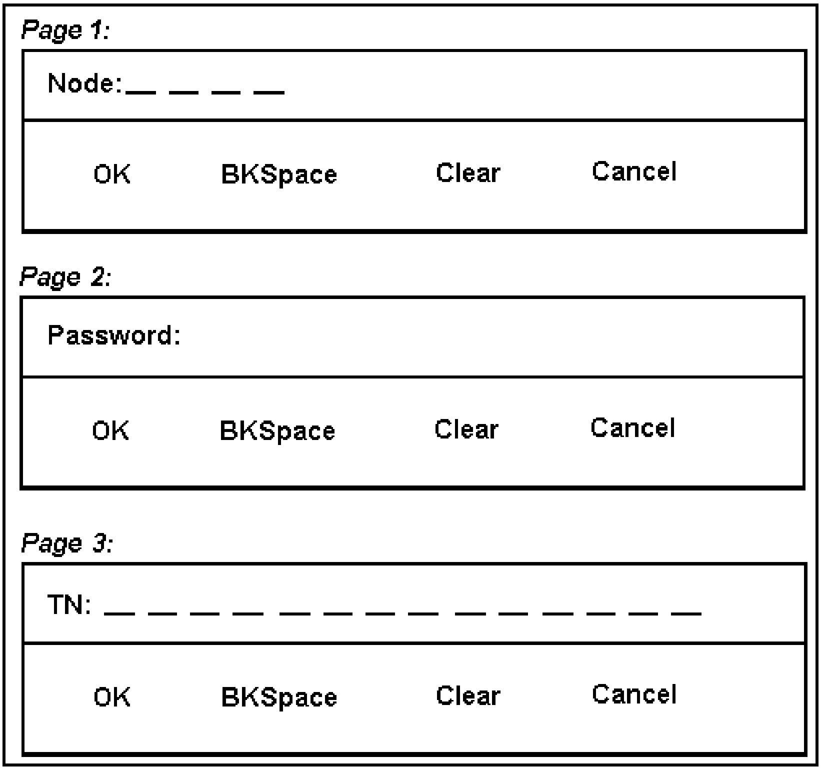
Node:__ __ __ __

Password:

*Page 2:*

TN:__ __ __.__ __.__ __.__ __

**Figure 140**
**IP Phone 2002 and IP Phone 2001 registration with password checking**



## IP Line CLI commands for password control

The IP Phone Installer Passwords are configured on any Voice Gateway Media Card in the node. The IP Phone 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 78: “IP Phone Installer Password commands” on page 598.

When an IP Telephony node is first installed, the IP Phone Installer Password is not defined or enabled by default. To prevent users from inadvertently re-configuring the Node ID and TN on their IP Phones, enable the IP Phone Installer Password after the IP Phone is initially installed and the system is in service.

Password security controls access to an IP Phone's TN for the purpose of registering to a different virtual line TN on the Call Server after the IP Phones 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 IP Phone 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 IP Phones 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 IP Phones.

The administrator normally uses the Administrative IP Phone 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 IP Phone 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 IP Phone Installer Password for experienced users who are delegated to install IP Phones. 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 IP Phone Installer Passwords

The IP Phone Installer Passwords are configured on one Voice Gateway Media Card or on the Signaling Server in the node. The passwords are then applied to all cards in the node.

### *Administrative IP Phone Installer Password*

The Administrative IP Phone Installer Password is used by the administrator to install a new IP Phone or change the configuration (node ID and TN) of an existing IP Phone.

To set the Administrative IP Phone Installer Password, follow the steps in Procedure 63.

**Procedure 63**
**Configuring the Administrative IP Phone 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 IP Phone Installer (node) password.

If in the default state, the IP Phone 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 IP Phone 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 IP Phone Installer Password.

**Pwd** – this is the Administrator IP Phone Installer Password. In the default state, the Administrator password is null (zero-length).

**TmpPwd** – this is the temporary IP Phone Installer Password. In the default state, the temporary password is null.

**Uses** – the Uses parameter applies to the temporary IP Phone 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 IP Phone 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 IP Phone 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 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 password is now enabled (PwdEna=Yes).

**Pwd** – if no "password" parameter specified, the administrator password is null. IP Phones 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.

IP Phones cannot be installed if the administrator password is enabled and set to null.

Always specify the password parameter to install IP Phones.

**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 IP Phone Installer Password, respectively.

**End of Procedure**

### *Temporary IP Phone Installer Password*

A temporary IP Phone 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 IP Phone 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 IP Phone Installer Password, follow the steps in Procedure 64.

**Procedure 64**
**Configuring the temporary IP Phone 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 65. 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 65**
**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 4.0 application. The password synchronization feature changes the password on the card automatically.

**End of Procedure**

# IP configuration commands

Table 61 describes the IP configuration commands.

**Table 61**
**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 IP Phone default to half-duplex mode when no auto-negotiation signaling occurs. The result is that the Voice Gateway Media Card and the IP Phone 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!**

Configure 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 network interface. By default, the interface auto-negotiates to the highest speed supported by the switch. If the switch is 10/100BaseT, the network 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 start-up. 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 network 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 start-up. 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 must be 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 4.0 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 network interface MAC
- TLAN network interface IP Address
- ELAN network interface IP Address
- how long it has been registered
- how many IP Phones 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 network interface MAC
- TLAN network interface IP Address
- ELAN network interface IP Address

### Example

The following is an example of the output on a 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 CLI

A number of special file transfer commands are 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 62, 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 62 at the IPL> CLI, depending on what type of file transfer is to occur.

Table 62 lists the commands can be entered at the IPL> CLI:

**Table 62**
**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 62**
**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 72: "File Transfer commands" on page 590.

***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 4.0 error log

The IP Line 4.0 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 4.0 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 2.2

## Contents

This section contains information on the following topics:

# Introduction

This chapter explains how to administer IP Line 4.0 and the Voice Gateway Media Card on the systems using OTM 2.2.

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 CS 1000 system is the retrieval of OM reports. Refer to Procedure 66 on page 456 through Procedure 70 on page 467.

# OTM administration procedures

This section describes the OTM administration procedures using the OTM IP Line 4.0 application. All references to OTM in the following procedures assume the latest OTM version.

## 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 4.0. 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 4.0 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 **ipline40_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.

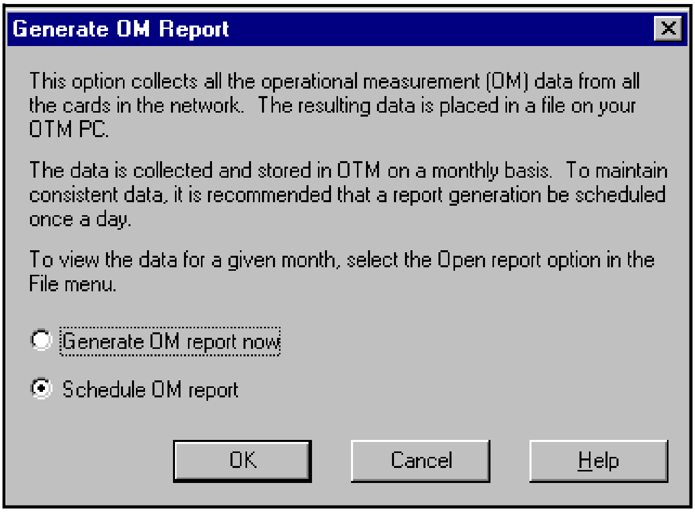
To schedule a generated OM Report, follow the steps in Procedure 66 on page 456.

### Procedure 66
### Scheduling Reports

**1** Select the node in the **IP Telephony** window. Click **File > Report > Generate**.

The **Generate OM Report** window opens. See Figure 141.

**Figure 141**
**Generate OM Report – Schedule an OM report**



Generate OM Report

This option collects all the operational measurement (OM) data from all the cards in the network. The resulting data is placed in a file on your OTM PC.

The data is collected and stored in OTM on a monthly basis. To maintain consistent data, it is recommended that a report generation be scheduled once a day.

To view the data for a given month, select the Open report option in the File menu.

○ Generate OM report now

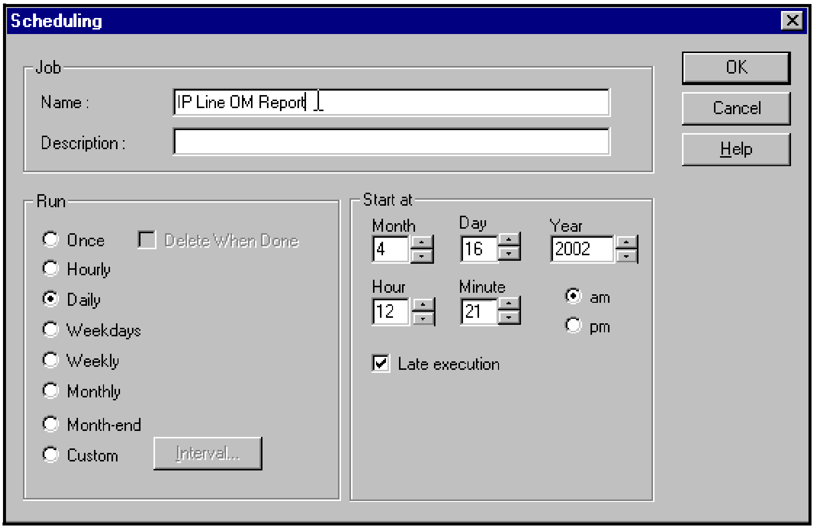
● Schedule OM report

In the Generate OM Report window there are two choices, Generate OM report now and Schedule OM report.

**2** Select the **Schedule OM report** radio button. Click **OK**.

The **Scheduling** window opens. See Figure 142 on page 457.

**Figure 142**
**Scheduling an OM Report**



Scheduling

Job

Name : IP Line OM Report

Description :

Run

○ Once □ Delete When Done
○ Hourly
● Daily
○ Weekdays
○ Weekly
○ Monthly
○ Month-end
○ Custom

Start at

Month: 4
Day: 16
Year: 2002
Hour: 12
Minute: 21
● am
○ pm

☑ Late execution

3 Under **Job**, enter the **Name** and a **Description** for the scheduled OM Report.

4 Under **Run**, select the radio button that indicates the frequency of report generation.

5 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.

6 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.

7 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.

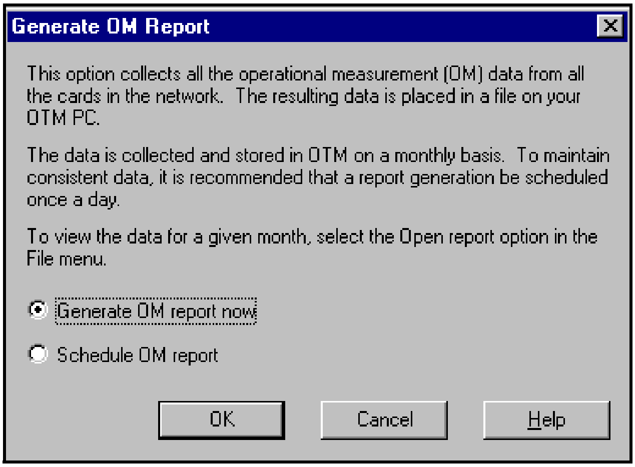
To generate an OM Report immediately, follow the steps in Procedure 67.

**Procedure 67**
**Generating reports**

1 In the **IP Telephony** window, click the node. Click **File** > **Report**.

The **Generate OM Report** window opens. See Figure 143 on page 459.

**Figure 143**
**Generate OM Report – Generate OM report now**



Generate OM Report

This option collects all the operational measurement (OM) data from all the cards in the network. The resulting data is placed in a file on your OTM PC.

The data is collected and stored in OTM on a monthly basis. To maintain consistent data, it is recommended that a report generation be scheduled once a day.

To view the data for a given month, select the Open report option in the File menu.

● Generate OM report now

○ Schedule OM report

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 68.

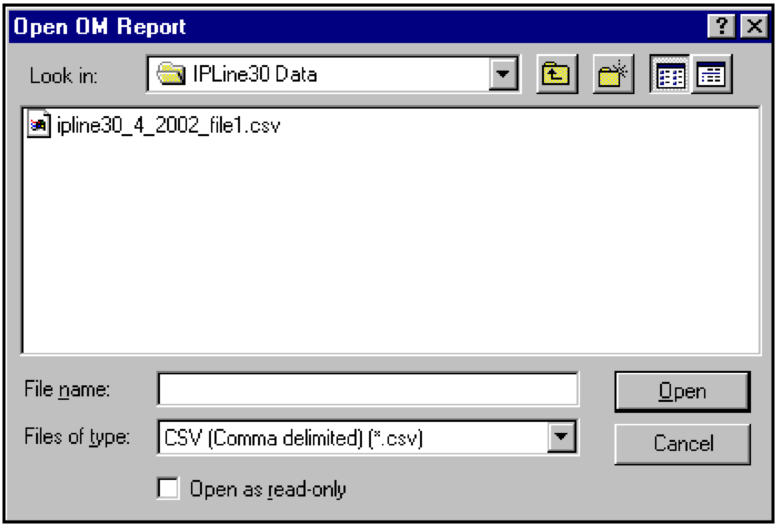
**Procedure 68**
**Opening an Operational Measurement (OM) report**

1 In the **IP Telephony** window, select the node in the top of the window.

2 Click **File > Report > Open**.

The **Open OM Report** window opens. See Figure 144 on page 460.

**Figure 144**
**Open OM Report**



Look in: IPLine30 Data

ipline30_4_2002_file1.csv

File name:

Files of type: CSV (Comma delimited) (*.csv)

□ Open as read-only

**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 LTPS and Voice Gateway channel activity for each model of IP Phone 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 IP Phone:

- 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 69.

**Procedure 69**
**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.

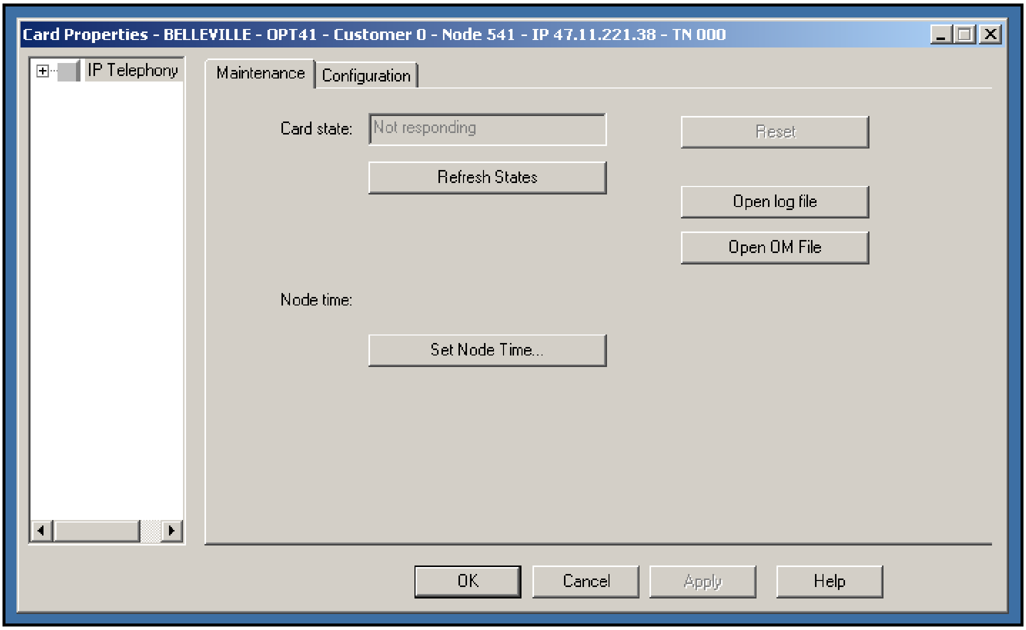
**2** Select the node in the upper portion of the window.

**3** Select the Voice Gateway Media Card from the lower portion of the window.

**4** Right-click the card and then select **Properties** from the pop-up menu.

The **Card Properties** window opens to the **Maintenance** tab. See Figure 145 on page 462.

**Figure 145**
**Card Properties – Maintenance tab**


Card Properties - BELLEVILLE - OPT41 - Customer 0 - Node 541 - IP 47.11.221.38 - TN 000

Card state: Not responding

Node time:

5 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 IP Phone.

**End of Procedure**

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 1:00 am. As each hour passes, OTM adds another collection period to the OM file; therefore, there is a maximum of 24 collection periods each day.

### Output

The OM report output tracks the statistics for each IP Phone type.

Data is first output for the Nortel Networks versions of the IP Phone 2001, IP Phone 2002, and IP Phone 2004, and IP Softphone 2050.

> ***Note:*** The i2050 set type refers to both the IP Softphone 2050 and the MVC 2050.

That output is followed by data for the 3rd-party IP Phones, labelled:

- 3Pi2001
- 3Pi2002
- 3Pi2004
- 3Pi2050

Finally, the data for the gateway channels is output.

### Output example

An example of a single hour's OM report is as follows:

```
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.
- LTPS information for IP Phones that are registered to the LTPS on the Voice Gateway Media Card during that hour. The LTPS information is prefixed by the model number (i2001, i2002, i2004, i2050). During normal operation, the LTPS values for the Voice Gateway Media Card can be zeros as the IP Phones normally register to the LTPS on the 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.

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, no relationship exists between the IP Phones registered on a card and the Voice Gateway channels on the card (if two or more cards are used) in the node. If only one card is used (with multiple IP Phones), a partial correlation might exist between the IP Phones and the card information. However, even with only one card, there still is not a 100% correlation, as an IP Phone can still call another IP Phone without involving the Voice Gateway channels.

## 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 70.

**Procedure 70**
**Viewing IP Line info and error log**

1. In the OTM Navigator window, click the **Services** folder.
2. Double-click the **IP Telephony** icon.

   The **IP Telephony** window opens.
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 145 on page 462.
4. 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 “Full OTM Backup” option is selected. 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 71.

> **CAUTION — Service Interruption**
>
> This procedure is not supported for a node that resides on a CS 1000 system.

**Procedure 71**
**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 469
- "Delete a Voice Gateway Media Card from the node" on page 476
- "Delete the Leader Voice Gateway Media Card from the node" on page 478
- "Change the IP addresses of an IP Telephony node in OTM" on page 479
- "Replacing a Leader Voice Gateway Media Card" on page 649

**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 72.

**CAUTION — Service Interruption**

This procedure is not supported for a node that resides on a CS 1000 system.

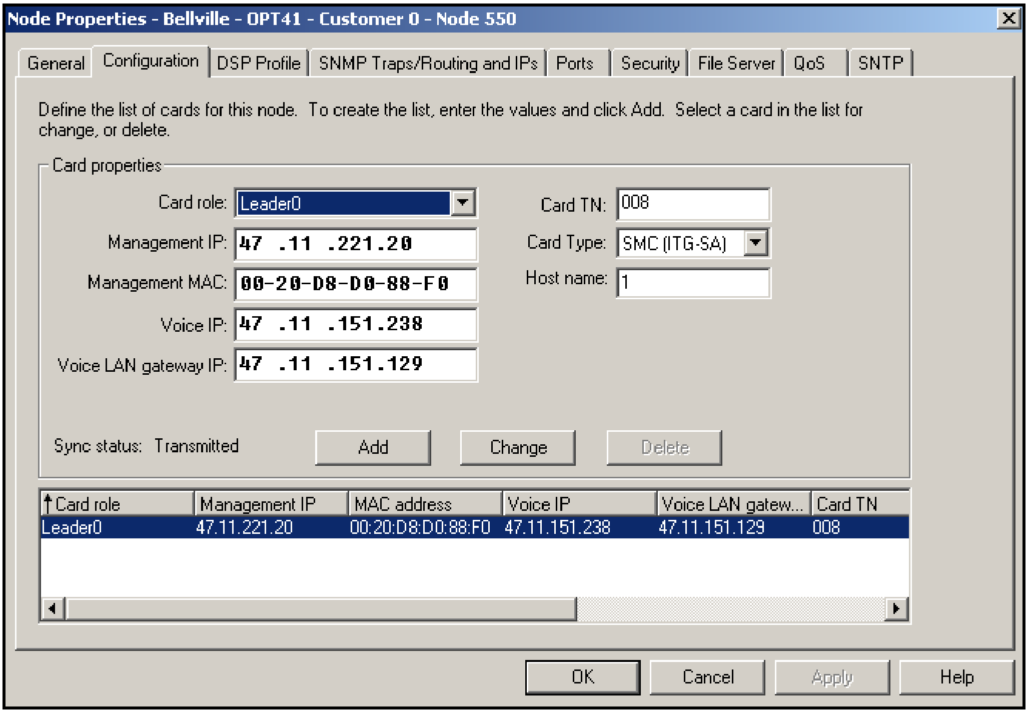
**Procedure 72**
**Adding a Voice Gateway Media Card to the node**

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 subnets on the selected card slot.
4. In the OTM Navigator window, click the **Services** folder.
5. Double-click the **IP Telephony** icon.

   The **IP Telephony** window opens.
6. Double-click the node in the upper portion of the window.

   The **Node Properties** window opens.
7. Click the **Configuration** tab. See Figure 146 on page 470.

**Figure 146**
**Node Properties – Configuration tab**



Node Properties - Bellville - OPT41 - Customer 0 - Node 550

Define the list of cards for this node. To create the list, enter the values and click Add. Select a card in the list for change, or delete.

Card properties

Card role: Leader0
Management IP: 47 .11 .221.20
Management MAC: 00-20-D8-D0-88-F0
Voice IP: 47 .11 .151.238
Voice LAN gateway IP: 47 .11 .151.129
Card TN: 008
Card Type: SMC (ITG-SA)
Host name: 1

Sync status: Transmitted

| Card role | Management IP | MAC address | Voice IP | Voice LAN gatew... | Card TN |
|---|---|---|---|---|---|
| Leader0 | 47.11.221.20 | 00:20:D8:D0:88:F0 | 47.11.151.238 | 47.11.151.129 | 008 |

8 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 subnet interface IP address for the card. OTM 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 198.

d. **Voice IP:** This is the TLAN subnet interface IP address for the card.

e. **Voice LAN gateway IP:** This is the IP address of the router interface on the TLAN subnet.

f. **Card TN:** For Large Systems, CS 1000E, and Media Gateway 1000E, enter Card TN (l s c) information. For Small Systems, CS 1000S system, Media Gateway 1000B, and Media Gateway 1000T, 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 Media Cards.

**9** Click **Add**.

The card role and address information appear in a working list at the bottom of the New Node window.

**10** Click **Apply** to add the Card Properties to the Node.

**11** If more cards are to be added, add them by repeating the previous steps. 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.

**12** In the **OTM Navigator** window, click the **Services** folder.

**13** Double-click the **IP Telephony** icon.

The **IP Telephony** window opens.

**14** From the list of IP Telephony nodes in the upper part of the window, select the IP Telephony node to which configuration data will be transmitted.

**15** Click **Configuration > Synchronize > Transmit**.

The **Transmit Options** window opens. Keep the default setting of **Transmit to selected nodes** radio button. Select only the **Node Properties to Active Leader** check box. See Figure 147 on page 473.

**16** Click the **Start transmit** button.

**17** Monitor progress under the **Transmit Control** window. Confirm that the node properties are transmitted successfully to Leader 0.

**18** When the transmission is complete, click the **Close** button.

**19** Choose a card slot for the new card. Note the TN. Configure IPTN in Meridian 1. See Table 50 on page 234.

**20** Install the I/O cables for the connection to the ELAN and TLAN subnets on the selected card slot.

Ensure that the I/O cables are connected to the ELAN and TLAN network.

**21** In the OTM Navigator window, click the **Services** folder. Double-click the **ITG Line 4.0** icon.

The **IP Telephony Gateway - IP Line 4.0** window opens.

**22** 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.

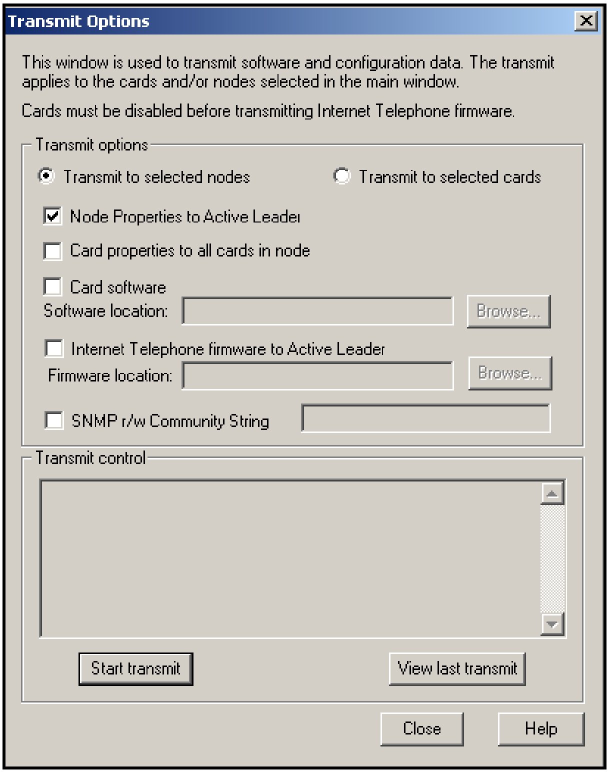
**23** Click the **Configuration** > **Synchronize** > **Transmit**.

The **Transmit Options** window opens.

**24** Keep the default setting of **Transmit to selected nodes** radio button. Check only the **Node Properties to Active Leader** check box.

See Figure 147 on page 473.

**Figure 147**
**Transmit Options**



Transmit Options

This window is used to transmit software and configuration data. The transmit applies to the cards and/or nodes selected in the main window.

Cards must be disabled before transmitting Internet Telephone firmware.

Transmit options

● Transmit to selected nodes ○ Transmit to selected cards

☑ Node Properties to Active Leader

☐ Card properties to all cards in node

☐ Card software

Software location:

☐ Internet Telephone firmware to Active Leader

Firmware location:

☐ SNMP r/w Community String

Transmit control

**25** Click the **Start transmit** button.

Monitor the progress in the **Transmit Control** window. Confirm that the node properties are transmitted successfully to Leader 0.

**26** When the transmission is complete, click the **Close** button.

**27** Insert the new card.

The card starts and obtains its IP configuration from the node master. This process 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.

**28** In the OTM IP Line 4.0 application, refresh the view of the card status in the node.

**29** 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.

**30** In the OTM Navigator window, click the **Services** folder.

**31** Double-click the **IP Telephony** icon.

The **IP Telephony** window opens.

**32** Select the IP Telephony node in the upper part of the window.

**33** Select the new card(s) in the lower part of the window.

Hold down the **Ctrl** key to select multiple cards.

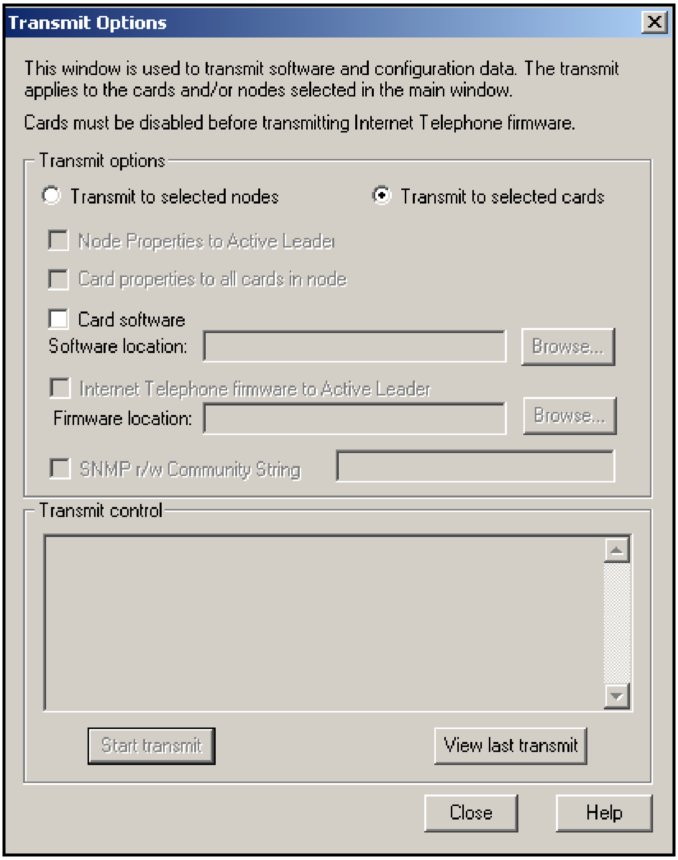
**34** Click the **Configuration** menu option and then select **Synchronize > Transmit**.

The **Transmit Options** window appears.

**35** Click the **Transmit to selected cards** radio button.

See Figure 148 on page 475.

**Figure 148**
**Transmit Options – Transmit to selected cards**



Transmit Options

This window is used to transmit software and configuration data. The transmit applies to the cards and/or nodes selected in the main window.

Cards must be disabled before transmitting Internet Telephone firmware.

Transmit options

○ Transmit to selected nodes ● Transmit to selected cards

□ Node Properties to Active Leader

□ Card properties to all cards in node

□ Card software

Software location: [ ] Browse...

□ Internet Telephone firmware to Active Leader

Firmware location: [ ] Browse...

□ SNMP r/w Community String [ ]

Transmit control

36 Click the **Start transmit** button.

Monitor the progress in the **Transmit Control** window.

37 When the transmission is complete, click the **Close** button.

38 Verify that all the new Voice Gateway Media Cards in the node have a signaling link to the Call Server.

39 Telnet to each Voice Gateway Media Card and log in.

40 At the IPL> command line, enter the **pbxLinkShow** command.

Alternatively, observe the display on the card and ensure it is displaying F000.

**41** At this point verify the card software and firmware version. Upgrade the software and the firmware, if necessary, using Procedure 34 on page 306, Procedure 35 on page 311, and Procedure 37 on page 316. 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 73.

To delete the Leader 0 Voice Gateway Media Card from the node, follow the steps in Procedure 74 on page 478.

> **CAUTION — Service Interruption**
>
> These procedures are not supported for a node that resides on a CS 1000 system.

**Procedure 73**
**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 opens.

**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**.

Next, transmit the node properties.

**8** In the **IP Telephony** window, click the **Configuration** > **Synchronize** > **Transmit**.

The **Transmit Options** window opens.

**9** Select the **Transmit to selected nodes** radio button.

**10** Select the **Node Properties to Active Leader** check box.

**11** Click the **Start transmit** button.

Monitor progress in the **Transmit Control** window. Confirm that the node properties are transmitted successfully to Leader 0.

**12** When the transmission is complete, click the **Close** button.

**13** 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.

**14** 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.

**15** At the TN prompt, enter the TN for the first unit that was equipped on the card, as determined in Step 15 in Procedure 72 on page 469. 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 using OTM. Telnet to the Leader 0 Voice Gateway Media Card and enter a command to remove the Leader 0 card. Follow the steps in Procedure 74 to delete the Leader 0 card.

> **CAUTION — Service Interruption**
>
> This procedure is not supported for a node that resides on a CS 1000 system.

**Procedure 74**
**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 179, 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 149 on page 480.
- Configuration tab – Card properties are set in this tab.
  See Figure 150 on page 482.
- SNMP Traps/Routing and IPs tab – SMNP traps and card routing table entries are configured in this tab.
  See Figure 151 on page 485.
- Ports tab – ELAN subnet settings are set in this tab.
  See Figure 152 on page 486.

To change the IP address of an IP Telephony node, follow the steps in Procedure 75.

> **CAUTION — Service Interruption**
>
> This procedure is not supported for a node that resides on a CS 1000 system.

**Procedure 75**
**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.

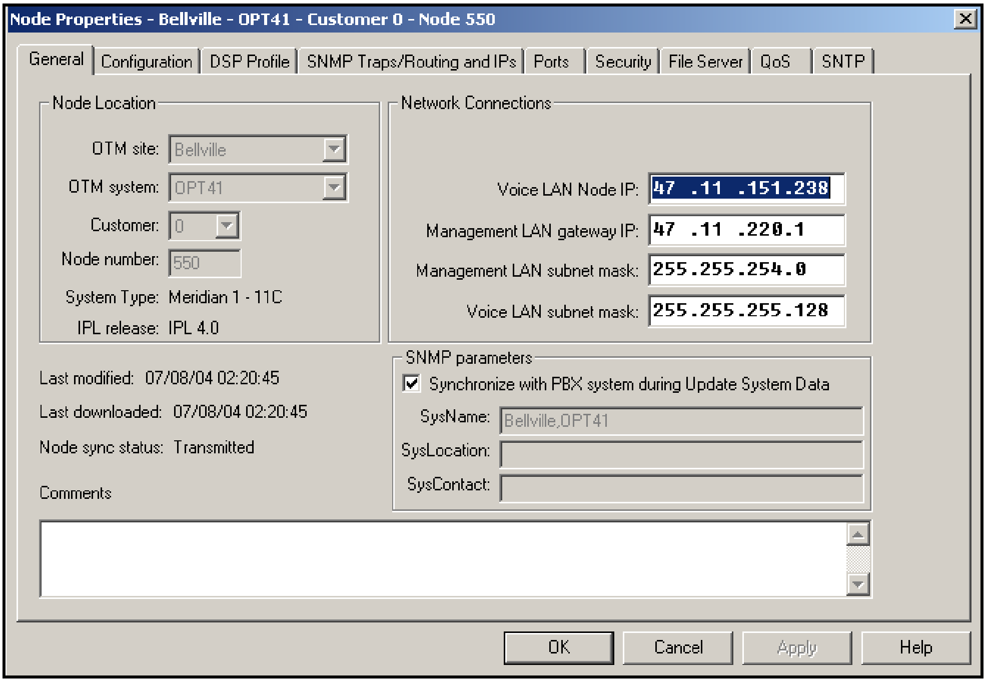
2. Select the node in the upper portion of the window.

3. Select the card in the lower portion of the window.

4. Click **Configuration > Node > Properties** to update the Voice Gateway Media Card IP addresses as required.

   The **Node Properties** window opens.

**Figure 149**
**Node Properties – General tab**



Node Properties - Bellville - OPT41 - Customer 0 - Node 550

Node Location

OTM site: Bellville

OTM system: OPT41

Customer: 0

Node number: 550

System Type: Meridian 1 - 11C

IPL release: IPL 4.0

Network Connections

Voice LAN Node IP: 47 .11 .151.238

Management LAN gateway IP: 47 .11 .220.1

Management LAN subnet mask: 255.255.254.0

Voice LAN subnet mask: 255.255.255.128

Last modified: 07/08/04 02:20:45

Last downloaded: 07/08/04 02:20:45

Node sync status: Transmitted

SNMP parameters

☑ Synchronize with PBX system during Update System Data

SysName: Bellville,OPT41

SysLocation:

SysContact:

Comments

5 Select the **General** tab. See Figure 149.

Under **Network Connections**:

a. **Voice LAN Node IP:** This is also known as the TLAN subnet IP address.

- Changing the node IP affects the configuration of the Connect Server IP address in the DHCP Server for the IP Phones.
- If the IP Phones are using partial DHCP mode, manually reconfigure the IP address in each IP Phone.

b. **Management LAN gateway IP:** This IP address is used to route to the ELAN subnet. If OTM is not connected to the local ELAN subnet, 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 subnet, the gateway must restrict access so that only authorized traffic is permitted on the ELAN subnet.
   - The router must disable the BootP relay agent for the ELAN network interface.
   - The router must block all broadcast and multicast traffic from the ELAN subnet 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 subnet IP addresses. Consult with the IP administrator before making any changes to subnets. See “Codecs” on page 179.

   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 subnet (for example, OTM if it is local)
   - any other devices on the ELAN subnet and the customer’s enterprise network that could need to communicate with IP Line
   - devices that are looking to receive SNMP traps

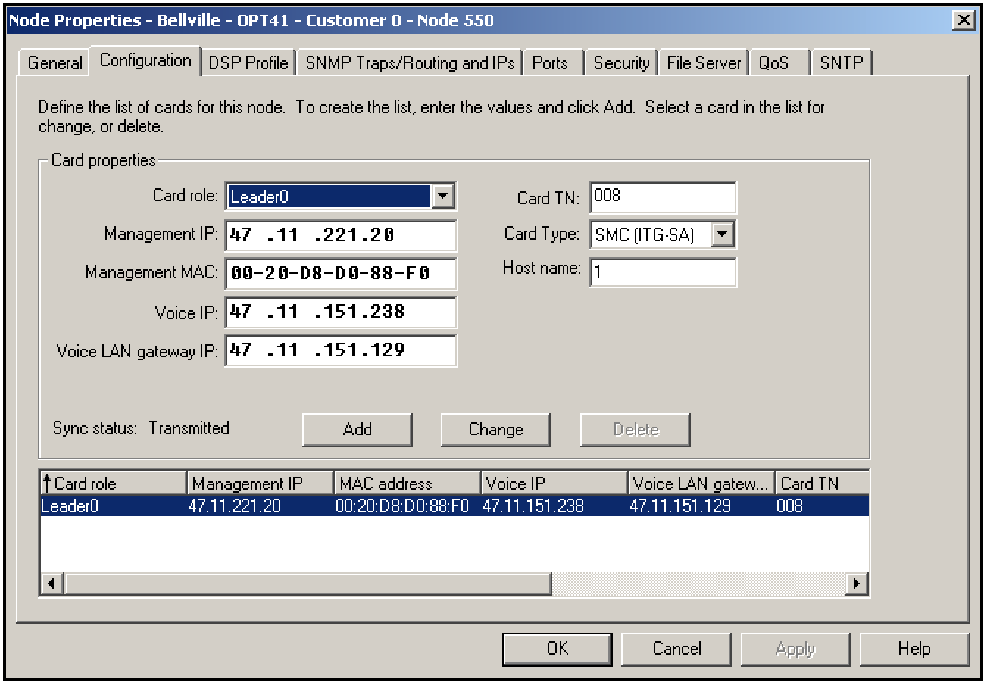
d. **Voice LAN subnet mask:** Coordinate with Voice LAN gateway (router). When changing the Voice LAN (TLAN) subnet mask, the change must be coordinated with changing the subnet mask of the Voice LAN (TLAN) gateway (router) interface.

6 Click **Apply**.

7 Select the **Configuration** tab.

See Figure 150 on page 482.

**Figure 150**
**Node Properties – Configuration tab**



Define the list of cards for this node. To create the list, enter the values and click Add. Select a card in the list for change, or delete.

Card properties

Card role: Leader0

Management IP: 47 .11 .221.20

Management MAC: 00-20-D8-D0-88-F0

Voice IP: 47 .11 .151.238

Voice LAN gateway IP: 47 .11 .151.129

Card TN: 008

Card Type: SMC (ITG-SA)

Host name: 1

Sync status: Transmitted

| Card role | Management IP | MAC address | Voice IP | Voice LAN gatew... | Card TN |
|---|---|---|---|---|---|
| Leader0 | 47.11.221.20 | 00:20:D8:D0:88:F0 | 47.11.151.238 | 47.11.151.129 | 008 |

8 Select the card to be changed from the list at the bottom of the Configuration tab.

9 Under **Card Properties**:

**a.** **Card Role:** The first card in the node must be Leader 0.

Each IP Telephony node can have only one Leader 0. 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 subnet address.

**d.** **Voice IP:** This is the card Voice IP address. This address is also known as the card TLAN subnet 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 subnet; 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 CS 1000S systems, enter only the card slot number between 1 – 50. The card TN format is determined by the CS 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 Media Cards.

**10** For each card:

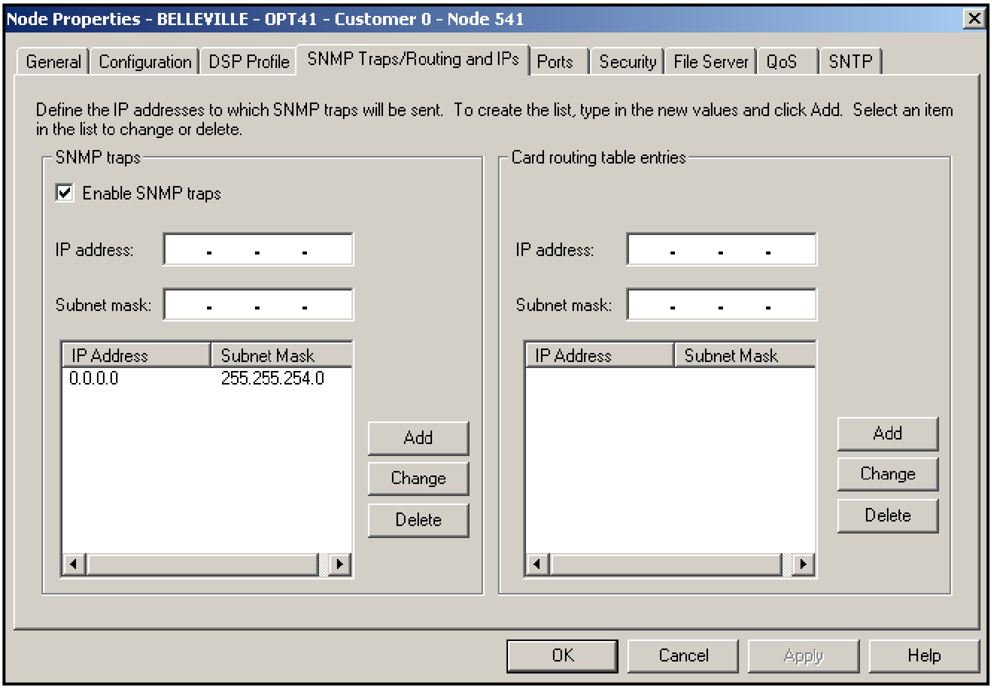
   a. Click the **Change** button. The changes are reflected in the working list at the bottom of the tab.

   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 151.

**Figure 151**
**Node Properties – SNMP Traps/Routing and IPs tab**



Node Properties - BELLEVILLE - OPT41 - Customer 0 - Node 541

Define the IP addresses to which SNMP traps will be sent. To create the list, type in the new values and click Add. Select an item in the list to change or delete.

SNMP traps

☑ Enable SNMP traps

IP address: . . .

Subnet mask: . . .

| IP Address | Subnet Mask |
|---|---|
| 0.0.0.0 | 255.255.254.0 |

Card routing table entries

IP address: . . .

Subnet mask: . . .

| IP Address | Subnet Mask |
|---|---|

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 trap destination to be reached.

IP addresses that are added in this tab create special card routing tables that direct packets out the ELAN subnet and ELAN gateway. Exercise caution when adding entries as the entry could result in one-way voice transmission, if a change results in voice packets being streamed out the ELAN network interface instead of the TLAN network interface.

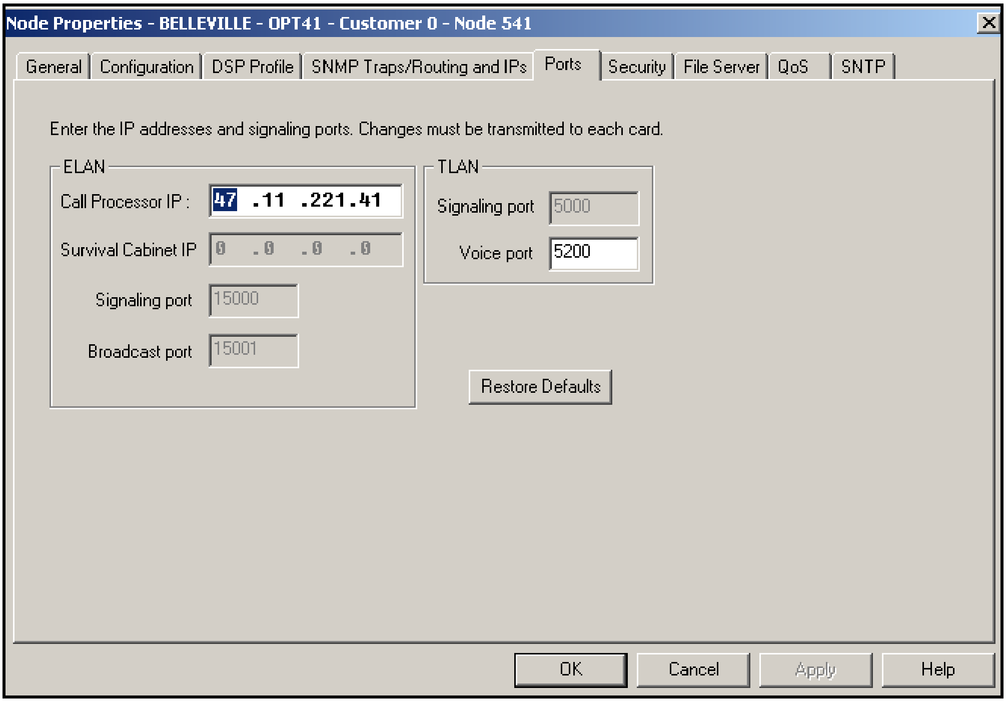
Under **SNMP Traps**, up to eight SNMP trap destinations can be defined.

Under **Card routing table entries**, use caution when assigning card routing table entries. Do not include the IP address of an IP Phone. Otherwise, voice traffic to these IP Phones 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 152.

**Figure 152**
**Node Properties – Ports tab**



Node Properties - BELLEVILLE - OPT41 - Customer 0 - Node 541

Enter the IP addresses and signaling ports. Changes must be transmitted to each card.

ELAN

Call Processor IP : 47 .11 .221.41

Survival Cabinet IP 0 .0 .0 .0

Signaling port 15000

Broadcast port 15001

TLAN

Signaling port 5000

Voice port 5200

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 CS 1000S systems.

***Note:*** For Small Systems or CS 1000S systems, this field is disabled unless at least one cabinet has been defined in OTM Navigator as a Survivable Cabinet of the main system. Each node has only one Survivable Cabinet IP address. The Survivable Cabinet is equipped with sufficient trunk cards and Voice Gateway Media Cards. In case of Call Server equipment failure, the Survivable Cabinet provides a large degree of survivability for IP Phone 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 IP Phones. In general, use the default value of 5200. If, however, numerous IP Phones are 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.

**17** Plug in all the cards.

Leader 0 forces its configuration to all the other cards.

**18** 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<br>***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 |

**19** Click the **Configuration > Synchronize > Transmit**.

**20** To transmit to the node, select the **Transmit to selected nodes** radio button. Check the **Node Properties to Active Leader** check box.

**21** 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.

**22** Log into LD 32 and disable the cards using the DISI command.

**23** Click the **Configuration > Synchronize > Transmit**.

**24** Select the **Transmit to select cards** radio button.

**25** 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.

**26** 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 page 489. 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 page 490.

## 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 76.

### Procedure 76
### 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 IP Phones 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 LTPS service on the Voice Gateway Media Card.

This Graceful TPS Disable command prevents new IP Phones from registering on the card. All IP Phones registered on the card are re-directed to another Voice Gateway Media Card when the IP Phone becomes idle.

After the command is entered, an idle IP Phone is supposed to be updated with the Watchdog reset message. However, the LTPS sends a soft reset message to the IP Phone, redirecting it to the Connect Server. The disabled LTPS does not accept new registrations, so the IP Phone must register with another LTPS in the node. Eventually, as all of the IP Phones on the LTPS become idle, they are registered with other LTPSs. 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 77 to restart all the Voice Gateway Media Cards.

**Procedure 77**
**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.

   The Leader 0 card reads the new IP address from NVRAM.
4. 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 78.

**CAUTION — Service Interruption**

This procedure is not supported for a node that resides on a CS 1000 system.

**Procedure 78**
**Updating card properties – DSP Profile tab**

**1** In the **OTM Navigator** window, click the **Services** folder. Double-click the **IP Telephony** icon.

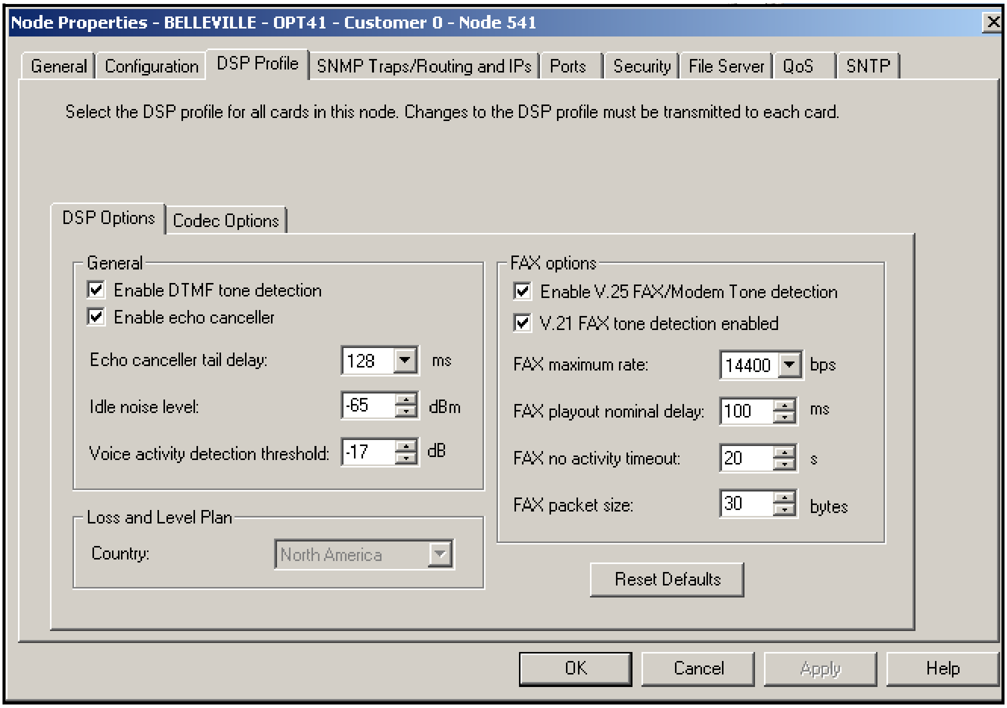
The **IP Telephony** window opens.

**2** Click **Configuration** > **Node** > **Properties**.

**3** Click the **DSP Profile** tab.

The **DSP Options** sub-tab appears. See Figure 153 on page 492.

**Figure 153**
**Node Properties – DSP Profile tab - DSP Options sub-tab**



Node Properties - BELLEVILLE - OPT41 - Customer 0 - Node 541

Select the DSP profile for all cards in this node. Changes to the DSP profile must be transmitted to each card.

General

☑ Enable DTMF tone detection
☑ Enable echo canceller

Echo canceller tail delay: 128 ms
Idle noise level: -65 dBm
Voice activity detection threshold: -17 dB

Loss and Level Plan

Country: North America

FAX options

☑ Enable V.25 FAX/Modem Tone detection
☑ V.21 FAX tone detection enabled

FAX maximum rate: 14400 bps
FAX playout nominal delay: 100 ms
FAX no activity timeout: 20 s
FAX packet size: 30 bytes

Table 63 lists the configurable DSP parameters, the range of the values, and the default values.

**Table 63**
**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 63**
**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 154 on page 495.

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:

***Note:*** 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

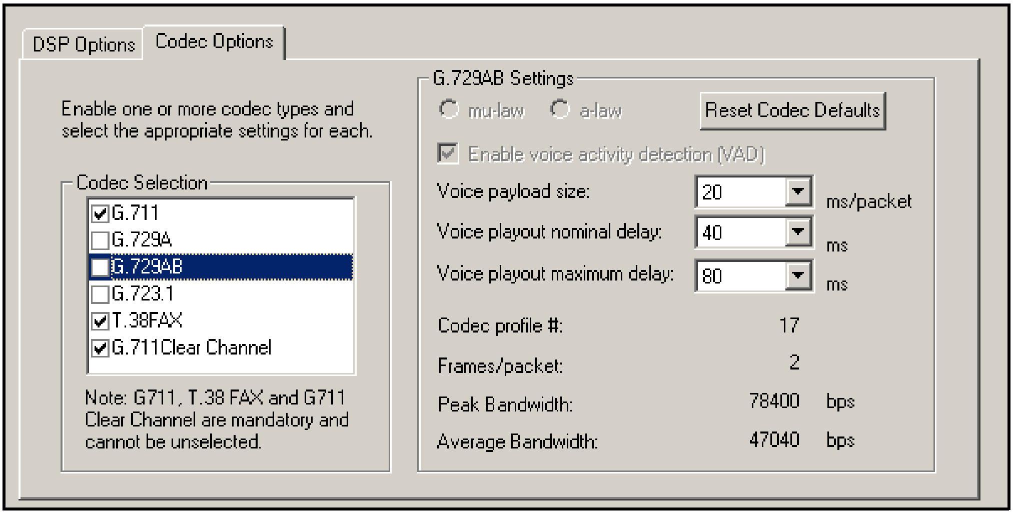
The payload size is stored in the Config.ini file under the entry *VxPayload=*

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 drop-down lists.

6 Click **OK**.

**Figure 154**
**ITG Node Properties – DSP Profile tab - Codec Options sub-tab with G.729 AB codec selected**



Enable one or more codec types and select the appropriate settings for each.

Codec Selection
- ☑ G.711
- □ G.729A
- □ G.729AB
- □ G.723.1
- ☑ T.38FAX
- ☑ G.711Clear Channel

Note: G711, T.38 FAX and G711 Clear Channel are mandatory and cannot be unselected.

G.729AB Settings

○ mu-law ○ a-law

☑ Enable voice activity detection (VAD)

| | | |
|---|---|---|
| Voice payload size: | 20 | ms/packet |
| Voice playout nominal delay: | 40 | ms |
| Voice playout maximum delay: | 80 | ms |
| Codec profile #: | 17 | |
| Frames/packet: | 2 | |
| Peak Bandwidth: | 78400 | bps |
| Average Bandwidth: | 47040 | bps |

***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 79 to disable and then enable the Voice Gateway Media Card.

**CAUTION — Service Interruption**

This procedure is not supported for a node that resides on a CS 1000 system.

Changes to the DSP Profile tab settings are applied immediately when the card properties are transmitted.

**Procedure 79**
**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.
4. 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.
5. In the **IP Telephony** window, click the **Configuration** menu option and then select **Synchronize > Transmit**.

   The **Transmit Options** window appears.
6. Select the **Transmit to selected cards** radio button.
7. Click the **Start transmit** button.

   Verify that the transmit is successful under **Transmit Control** and then click **Close**.
8. Login to the Call Server and go to LD 32.
9. Type the **ENCL** command to enable the Voice Gateway Media Card.

**End of Procedure**

## 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 that resides on a CS 1000 system.

Follow the steps in Procedure 80 to use the Retrieve command.

**Procedure 80**
**Using the Retrieve command**

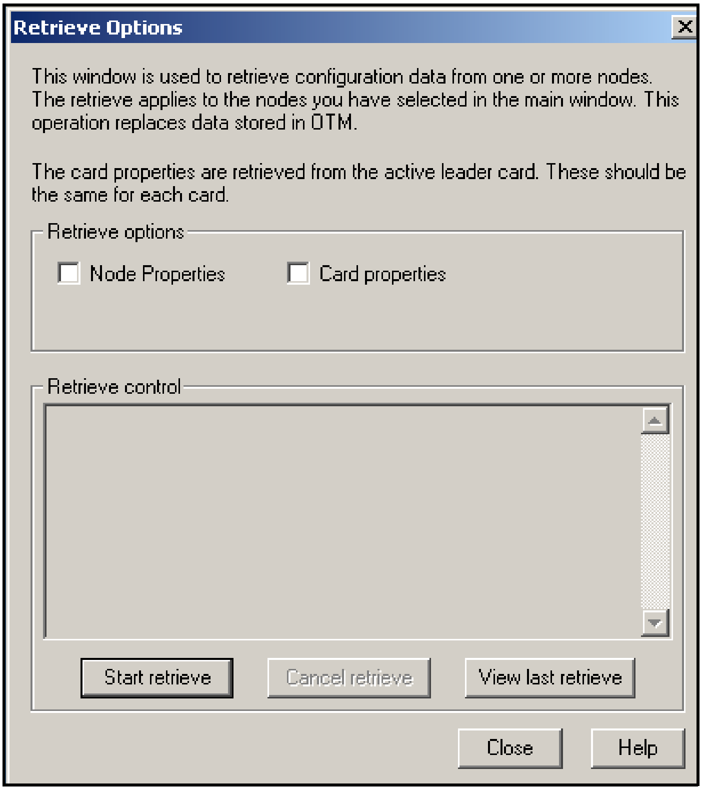
1. In the **OTM Navigator** window, click the **Services** folder. Double-click the **IP Telephony** icon.

   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 155 on page 498.

**Figure 155**
**Retrieve Options window**



Retrieve Options

This window is used to retrieve configuration data from one or more nodes. The retrieve applies to the nodes you have selected in the main window. This operation replaces data stored in OTM.

The card properties are retrieved from the active leader card. These should be the same for each card.

Retrieve options

☐ Node Properties ☐ Card properties

Retrieve control

**4** Under **Retrieve Options**, configure whether to retrieve **Node properties** or **Card properties** by selecting 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 that resides on a CS 1000 system.

Follow the steps in Procedure 81 to add an IP Telephony node by retrieving an existing node.

**Procedure 81**
**Adding a node by retrieving an existing node**

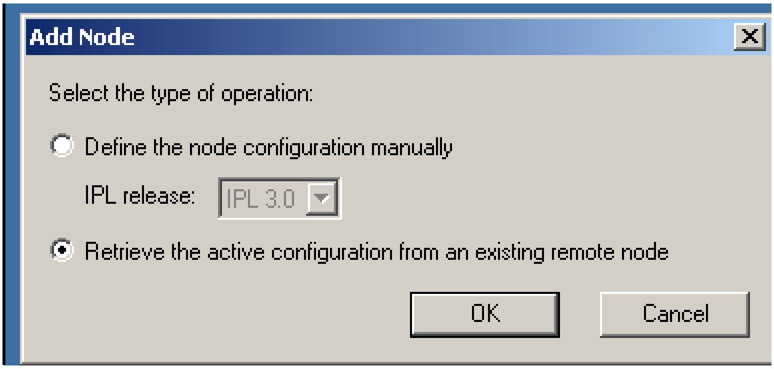
**1** In the **OTM Navigator** window, click the **Services** folder. Double-click the **IP Telephony** icon.

The **IP Telephony** window opens.

**2** Click **Configuration** > **Node** > **Add**.

The **Add Node** dialog box opens. See Figure 156.

**Figure 156**
**Add Node – Retrieve configuration from existing node**



Add Node

Select the type of operation:

○ Define the node configuration manually

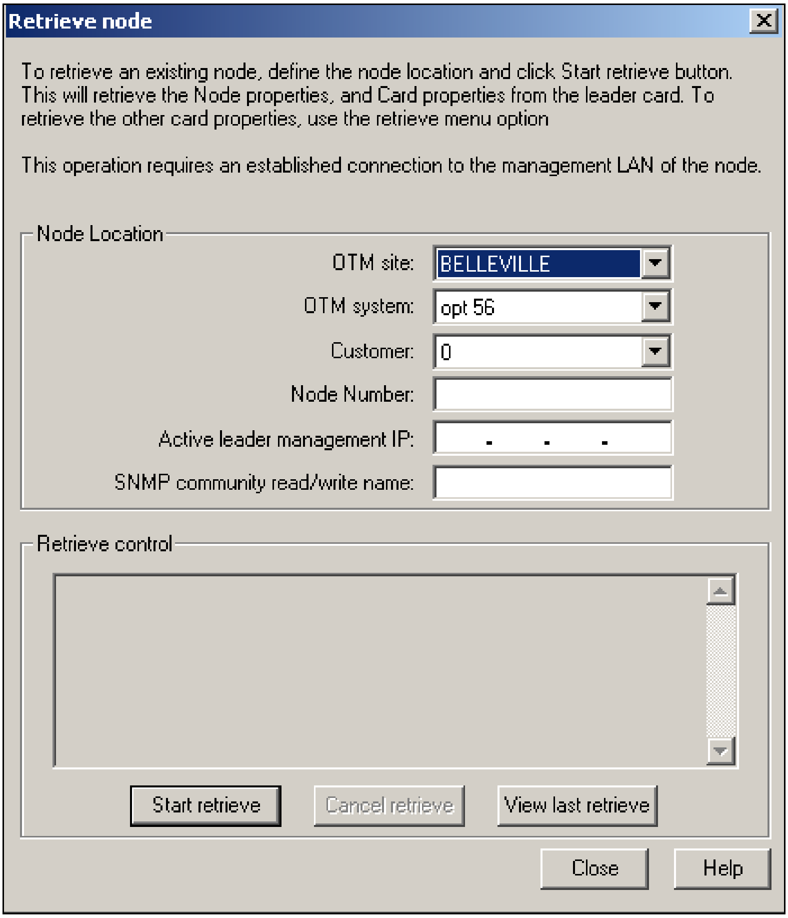
IPL release: IPL 3.0

● Retrieve the active configuration from an existing remote 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 157 on page 501.

**Figure 157**
**Retrieve node**



Retrieve node

To retrieve an existing node, define the node location and click Start retrieve button. This will retrieve the Node properties, and Card properties from the leader card. To retrieve the other card properties, use the retrieve menu option

This operation requires an established connection to the management LAN of the node.

Node Location

OTM site: BELLEVILLE

OTM system: opt 56

Customer: 0

Node Number:

Active leader management IP: . . .

SNMP community read/write name:

Retrieve control

**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.

***Note:*** The SNMP read community name cannot be used.

**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.

A new node has been created by retrieving data from another node

**9** 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.

11 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 (ELAN) IP address, Voice (TLAN) IP address, 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 82.

**Procedure 82**
**Accessing a Voice Gateway Media Card using Telnet**

1 In the  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.

**3** 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 (ELAN) IP address.

**4** Enter a user name and password to access the IPL> CLI.

Both the default user name and password are **itgadmin**. However, for security purposes, the user name and password should have been changed during installation.

The IPL> prompt appears if the login is successful.

**5** Type **?** at the prompt to display a list of available IPL> CLI commands.

See “IP Line CLI commands” on page 585 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 4.0 and the Voice Gateway Media Card on CS 1000 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 39 on page 333 to prevent caching of web windows 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 LTPS 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 83 on page 508.

### Procedure 83
### Retrieving the current OM file from the Voice Gateway Media Card using Element Manager

1 Click **System Status** in the navigation tree.

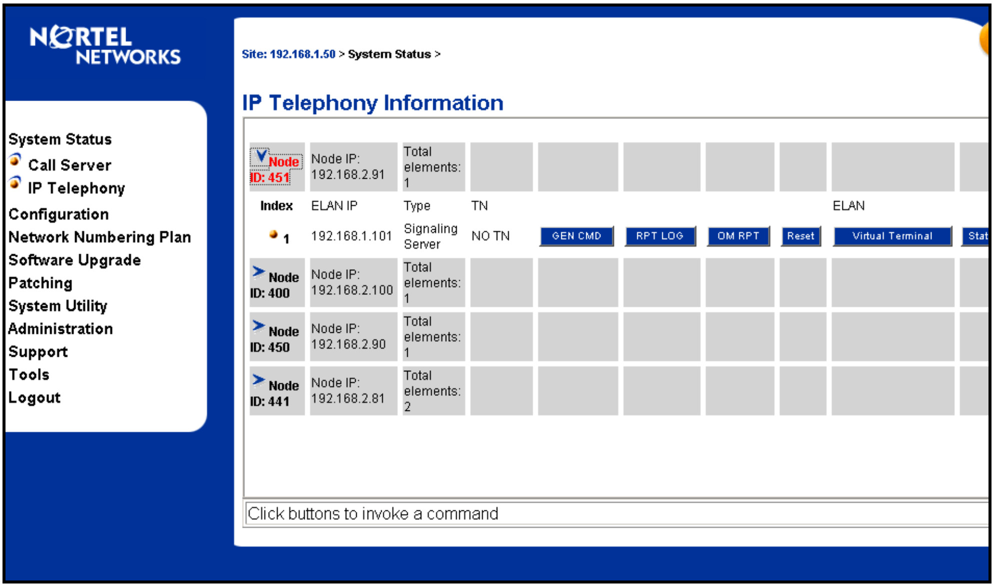
2 Click **IP Telephony**.

The **IP Telephony Information** window opens.

3 Expand the node containing the Voice Gateway Media Card.

See Figure 158.

**Figure 158**
**System Status > IP Telephony > IP Telephony Information**



Site: 192.168.1.50 > System Status >

IP Telephony Information

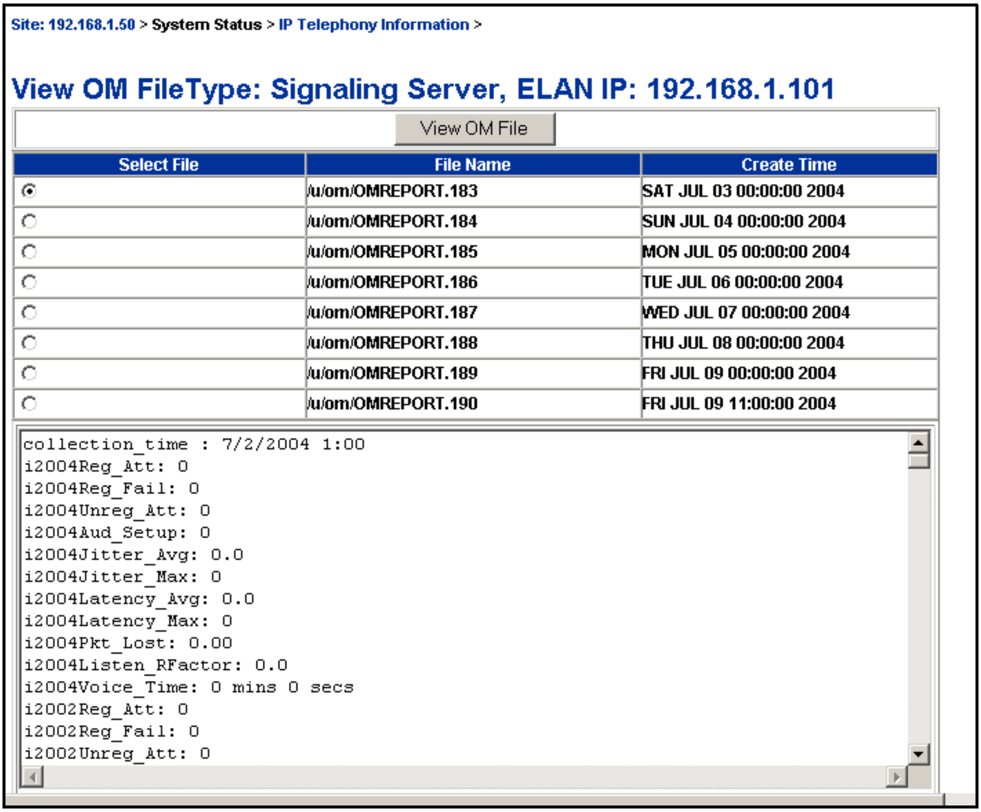
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Node ID: 451 | Node IP: 192.168.2.91 | Total elements: 1 | | | | | | | |
| Index | ELAN IP | Type | TN | | | | | ELAN | |
| ● 1 | 192.168.1.101 | Signaling Server | NO TN | GEN CMD | RPT LOG | OM RPT | Reset | Virtual Terminal | Stat |
| Node ID: 400 | Node IP: 192.168.2.100 | Total elements: 1 | | | | | | | |
| Node ID: 450 | Node IP: 192.168.2.90 | Total elements: 1 | | | | | | | |
| Node ID: 441 | Node IP: 192.168.2.81 | Total elements: 2 | | | | | | | |

Click buttons to invoke a command

4 Click the **OM RPT** button associated with the Voice Gateway Media Card.

The **View OM File** window opens. See Figure 159 on page 509.

**Figure 159**
**System Status > IP Telephony > IP Telephony Information > View OM File**



Site: 192.168.1.50 > System Status > IP Telephony Information >

View OM FileType: Signaling Server, ELAN IP: 192.168.1.101

| Select File | File Name | Create Time |
|---|---|---|
| ● | /u/om/OMREPORT.183 | SAT JUL 03 00:00:00 2004 |
| ○ | /u/om/OMREPORT.184 | SUN JUL 04 00:00:00 2004 |
| ○ | /u/om/OMREPORT.185 | MON JUL 05 00:00:00 2004 |
| ○ | /u/om/OMREPORT.186 | TUE JUL 06 00:00:00 2004 |
| ○ | /u/om/OMREPORT.187 | WED JUL 07 00:00:00 2004 |
| ○ | /u/om/OMREPORT.188 | THU JUL 08 00:00:00 2004 |
| ○ | /u/om/OMREPORT.189 | FRI JUL 09 00:00:00 2004 |
| ○ | /u/om/OMREPORT.190 | FRI JUL 09 11:00:00 2004 |

```
collection_time : 7/2/2004 1:00
i2004Reg_Att: 0
i2004Reg_Fail: 0
i2004Unreg_Att: 0
i2004Aud_Setup: 0
i2004Jitter_Avg: 0.0
i2004Jitter_Max: 0
i2004Latency_Avg: 0.0
i2004Latency_Max: 0
i2004Pkt_Lost: 0.00
i2004Listen_RFactor: 0.0
i2004Voice_Time: 0 mins 0 secs
i2002Reg_Att: 0
i2002Reg_Fail: 0
i2002Unreg_Att: 0
```

The eight most recent OM Report files are displayed in chronological order for that Voice Gateway Media Card.

5 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 window.

**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 1:00 am. 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 for each IP Phone type.

Data is first output for the Nortel Networks versions of the IP Phone 2001, IP Phone 2002, and IP Phone 2004, and IP Softphone 2050.

> ***Note:*** The i2050 set type refers to both the IP Softphone 2050 and the MVC 2050.

That output is followed by data for the 3rd-party IP Phones, labelled:

- 3Pi2001
- 3Pi2002
- 3Pi2004
- 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.
- LTPS information for IP Phones that are registered to the LTPS on the Voice Gateway Media Card during that hour. During normal operation, the LTPS values for the Voice Gateway Media Card can be zeros as the IP Phones normally register to the LTPS on the 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 Signaling Server that has been running the VTRK H.323 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, no relationship exists between the IP Phones registered on a card and the Voice Gateway channels on the card (if two or more cards are used) in the node. If only one card is used (with multiple IP Phones), a partial correlation might exist between the IP Phones and the card information. However, even with only one card, there still is not a 100% correlation, as an IP Phone can still call another IP Phone without involving the Voice Gateway channels.

> *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 "Operational Measurement report scheduling and generation" on page 454 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 84.

**Procedure 84**
**Viewing IP Line log files**

1. Click **System Status** in the navigation tree.
2. Click **IP Telephony**.

   The **IP Telephony Information** window appears.
3. Expand the node containing the Voice Gateway Media Card.

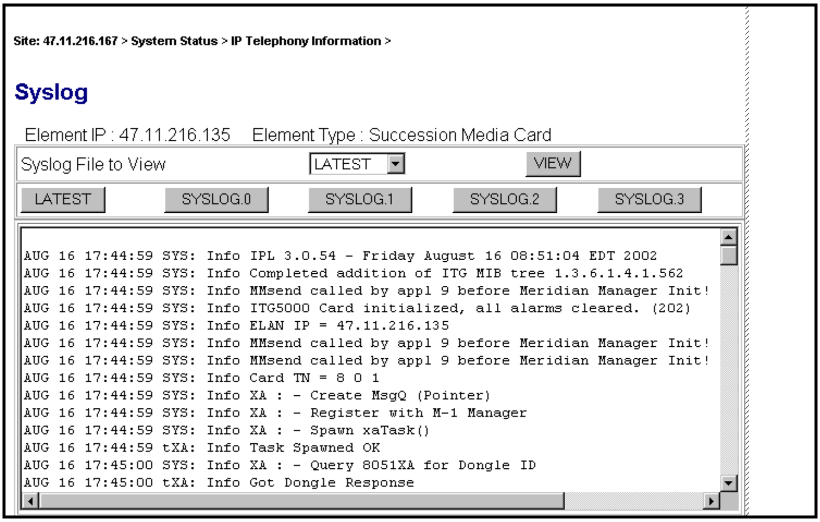
   See Figure 158 on page 508.
4. Click the **SYS LOG** button associated with the Voice Gateway Media Card.

   The **Syslog** window appears. See Figure 160 on page 515.

   The Syslog window 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 160**
**System Status > IP Telephony > Syslog**



Site: 47.11.216.167 > System Status > IP Telephony Information >

Syslog

Element IP : 47.11.216.135 Element Type : Succession Media Card

Syslog File to View: LATEST

```
AUG 16 17:44:59 SYS: Info IPL 3.0.54 - Friday August 16 08:51:04 EDT 2002
AUG 16 17:44:59 SYS: Info Completed addition of ITG MIB tree 1.3.6.1.4.1.562
AUG 16 17:44:59 SYS: Info MMsend called by appl 9 before Meridian Manager Init!
AUG 16 17:44:59 SYS: Info ITG5000 Card initialized, all alarms cleared. (202)
AUG 16 17:44:59 SYS: Info ELAN IP = 47.11.216.135
AUG 16 17:44:59 SYS: Info MMsend called by appl 9 before Meridian Manager Init!
AUG 16 17:44:59 SYS: Info MMsend called by appl 9 before Meridian Manager Init!
AUG 16 17:44:59 SYS: Info Card TN = 8 0 1
AUG 16 17:44:59 SYS: Info XA : - Create MsgQ (Pointer)
AUG 16 17:44:59 SYS: Info XA : - Register with M-1 Manager
AUG 16 17:44:59 SYS: Info XA : - Spawn xaTask()
AUG 16 17:44:59 tXA: Info Task Spawned OK
AUG 16 17:45:00 SYS: Info XA : - Query 8051XA for Dongle ID
AUG 16 17:45:00 tXA: Info Got Dongle Response
```

5 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.

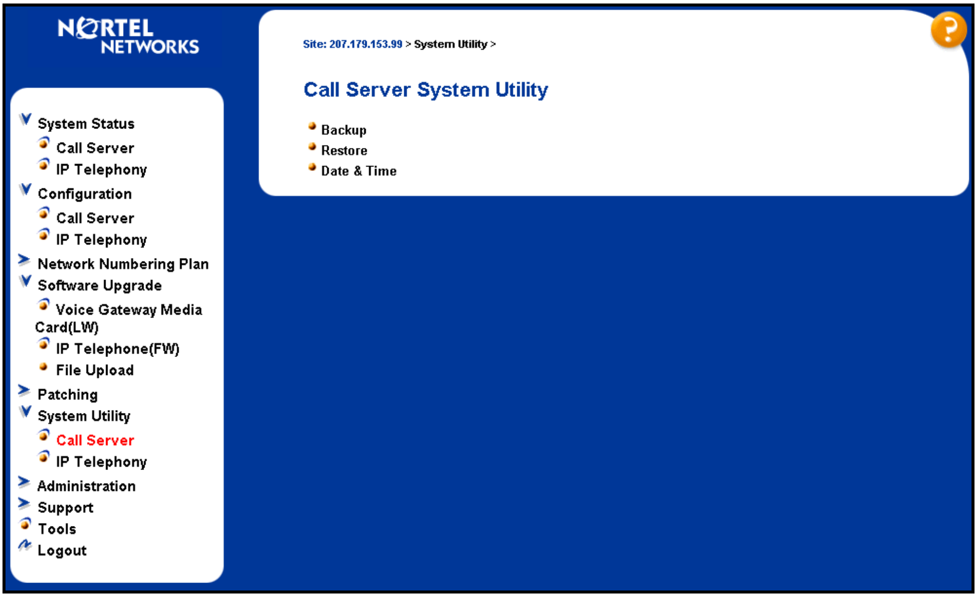
During the Backup function, the BOOTP.TAB and CONFIG.INI files of all registered nodes are copied so that they can be restored in case of system failure.

Follow the steps in Procedure 85 to back up the Call Server.

### Procedure 85
### Backing up the Call Server data

1 Click **System Utility > Call Server** in the navigation tree. See Figure 161.

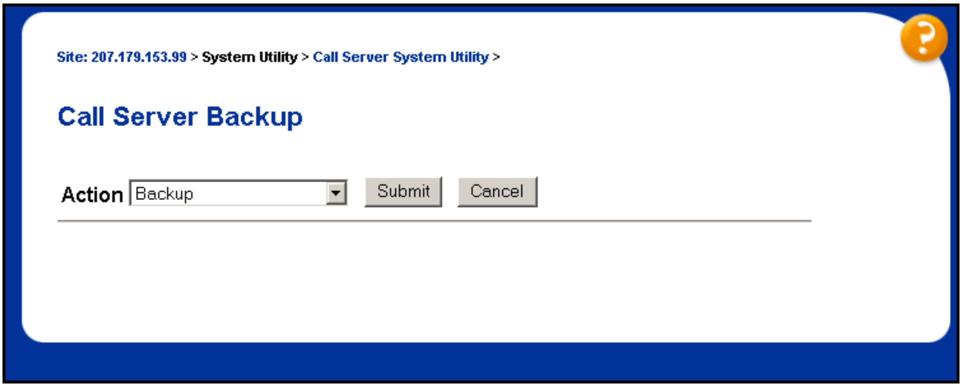
**Figure 161**
**System Utility > Call Server**



2 Click **Backup**.

The **Call Server Backup** window opens. See Figure 162 on page 518.

**Figure 162**
**System Utility > Call Server Backup**



Site: 207.179.153.99 > System Utility > Call Server System Utility >

Call Server Backup

Action: Backup

3 Select **Backup** from the **Action** drop-down list.

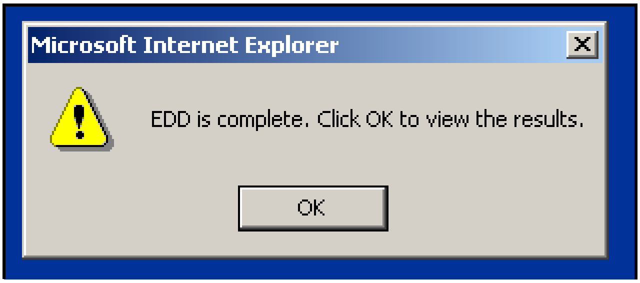
4 Click the **Submit** button or click **Cancel** to cancel the backup.

The window displays messages indicating "Backup in progress. Please wait..."

5 Click OK in the EDD complete dialog box.

See Figure 163 on page 519.

**Figure 163**
**EDD complete**



EDD is complete. Click OK to view the results.

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 86.

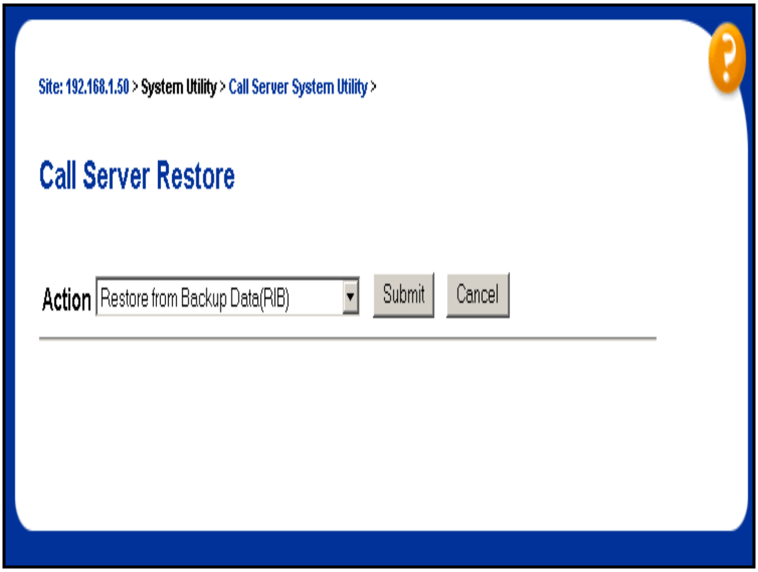
**Procedure 86**
**Restoring the Call Server data**

1 Click **System Utility** in the navigation tree.

2 Click **Restore**.

The **Call Server Restore** window opens. See Figure 164 on page 520.

**Figure 164**
**System Utility > Restore**



Site: 192.168.1.50 > System Utility > Call Server System Utility >

Call Server Restore

Action: Restore from Backup Data(RIB)

3 Select **Restore from Backup Data** from the **Action** drop-down list.

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 87.

**Procedure 87**
**Updating the IP Telephony node properties**

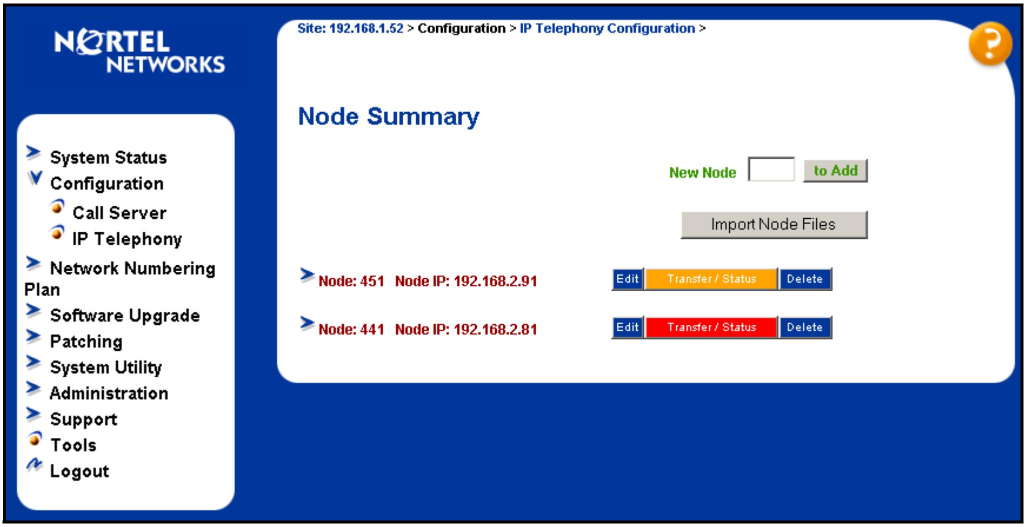
1 Click **Configuration** in the navigation tree.

2 In the **Configuration** menu, click **IP Telephony**.

The **Node Summary** window opens. See Figure 165.

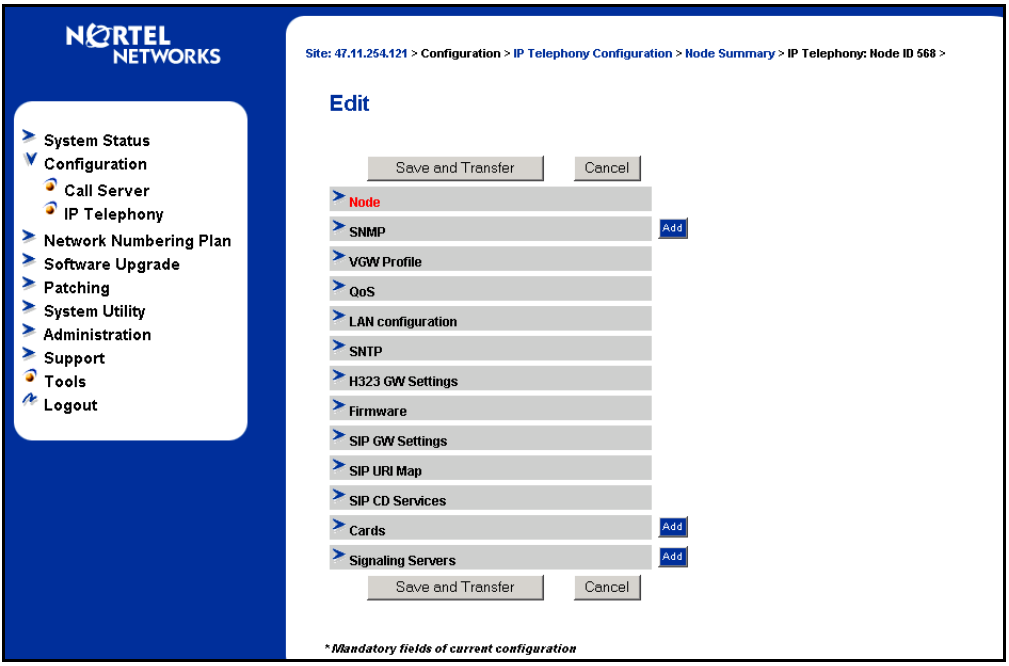
3 Click the **Edit** button associated with the node to be updated.

**Figure 165**
**Element Manager – Node Summary**



The **Edit** window opens. See Figure 166 on page 522.

**Figure 166**
**Element Manager – Edit**



4 Perform all required updates to the parameters in the appropriate sections.

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 page 523
- "Delete a Follower Voice Gateway Media Card from the node" on page 533

- “Change the IP addresses of an IP Telephony node in Element Manager” on page 537
- “Replacing a Follower Voice Gateway Media Card” on page 668
- refer to the Maintenance section for the procedure to replace a Voice Gateway Media Card – “Replace a Voice Gateway Media Card” on page 668

**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 88.

**Procedure 88**
**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 subnets on the selected card slot.

**4** Click **Configuration** in the navigation tree.

**5** In the **Configuration** menu, click **IP Telephony**.

The **Node Summary** window opens.

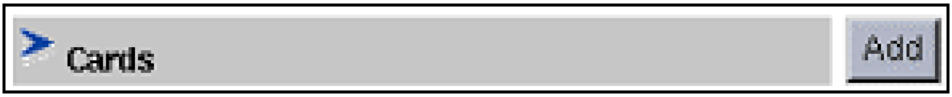
**6** Click the **Edit** button for the node that is receiving the new Voice Gateway Media Card.

The **Edit** window opens.

**7** Click the **Add** button to the right of the **Cards** section.

See Figure 167.

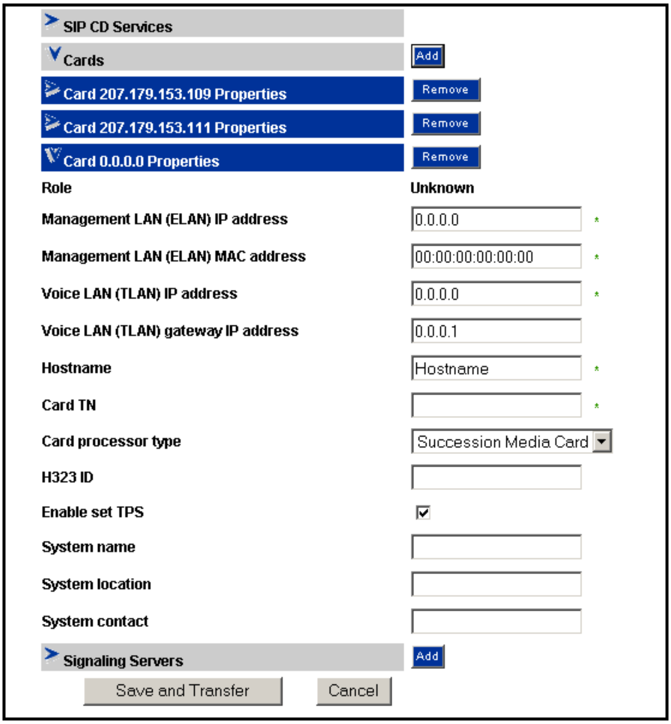
**Figure 167**
**Cards – Add button**



8 Observe that the Cards section expands.

See Figure 168.

**Figure 168**
**Configuration > Node Summary > Edit > Add Card**



| | |
|---|---|
| Role | Unknown |
| Management LAN (ELAN) IP address | 0.0.0.0 * |
| Management LAN (ELAN) MAC address | 00:00:00:00:00:00 * |
| Voice LAN (TLAN) IP address | 0.0.0.0 * |
| Voice LAN (TLAN) gateway IP address | 0.0.0.1 |
| Hostname | Hostname * |
| Card TN | * |
| Card processor type | Succession Media Card |
| H323 ID | |
| Enable set TPS | ☑ |
| System name | |
| System location | |
| System contact | |

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 199.

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 subnet.

f. **Card TN:** Enter the card slot number between 1 – 50.

g. **Card processor type:** Choose either Pentium or Media Card. Select Pentium if using the ITG-P 24-port line card (dual-slot card), or select Media Card if using the Media Card single-slot card.

h. **H323 ID:** The H323 ID in IP Line 4.0 is for the Virtual Office/ MG 1000B feature. Keep the H323 ID the same for all the elements within one node.

i. **System name:** Enter the name of the system.

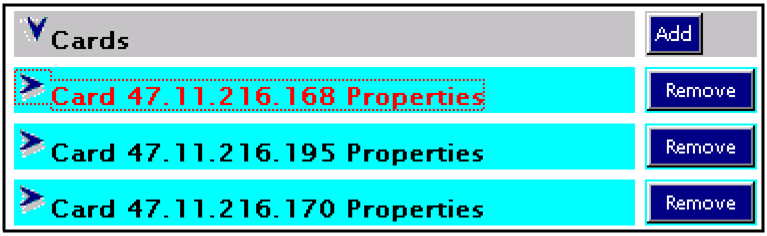
j. **System location:** Enter the location where the system resides.

k. **System contact:** Enter the system contact name and telephone 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.

Observe that new cards appear under the Cards section as they are added. See Figure 169 on page 525.

**Figure 169**
**Added cards**



Cards

Card 47.11.216.168 Properties

Card 47.11.216.195 Properties

Card 47.11.216.170 Properties

11 Click the **Save and Transfer** button after the card(s) have been added and configured.

Clicking the **Save and Transfer** button saves the data to the Call Server.

12 Click **OK** to confirm.

***Note 1:*** The **Save and Transfer** button can be clicked after each card is configured in the **Edit** window. However, each time the **Save and Transfer** button is clicked, the **Edit** window closes and the **Node Summary** window is displayed. To continue the node configuration, click the **Edit** button to return to the **Edit** window.

***Note 2:*** If the **Cancel** button is clicked, all information that has been configured is discarded. The **Edit** window closes and the **Node Summary** window opens.

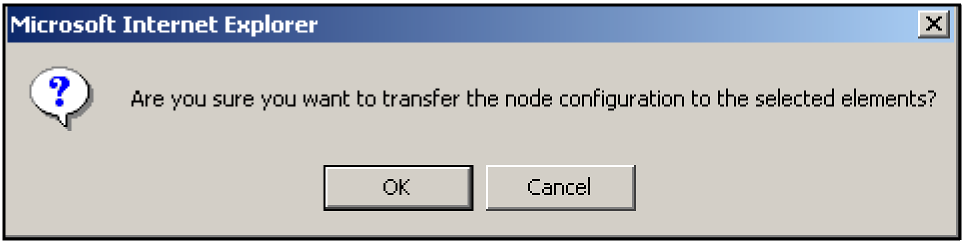
The **Edit** window closes, and the **Node Summary** window opens.

**13** Click the **Transfer/Status** button associated with the node where the new card(s) was added.

**14** Click **OK** to confirm the transfer.

See Figure 170.

**Figure 170**
**Transfer confirmation dialog box**



Microsoft Internet Explorer

Are you sure you want to transfer the node configuration to the selected elements?

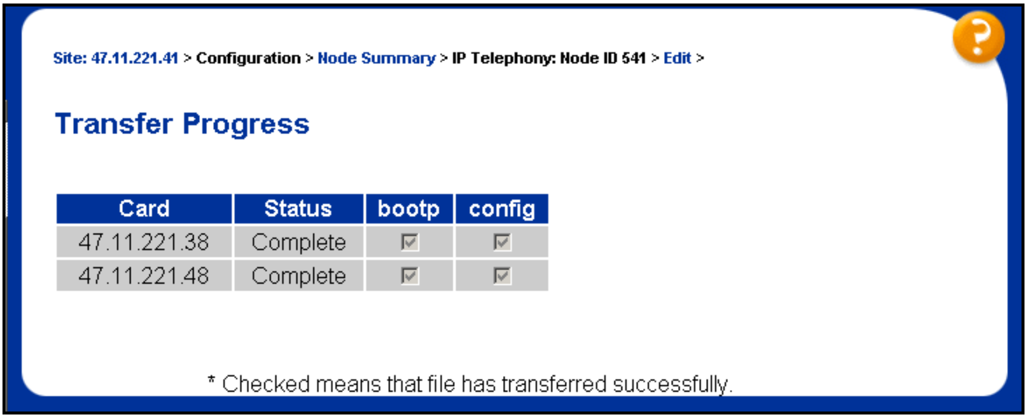
The **Transfer Progress** window opens and displays each of the Voice Gateway Media Card in the node. See Figure 171 on page 527.

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.

**15** 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 171**
**Transfer Progress window**



Site: 47.11.221.41 > Configuration > Node Summary > IP Telephony: Node ID 541 > Edit >

Transfer Progress

| Card | Status | bootp | config |
|---|---|---|---|
| 47.11.221.38 | Complete | ☑ | ☑ |
| 47.11.221.48 | Complete | ☑ | ☑ |

* Checked means that file has transferred successfully.

**16** Insert the new card.

The card starts and obtains its IP configuration from the node master. This process 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.

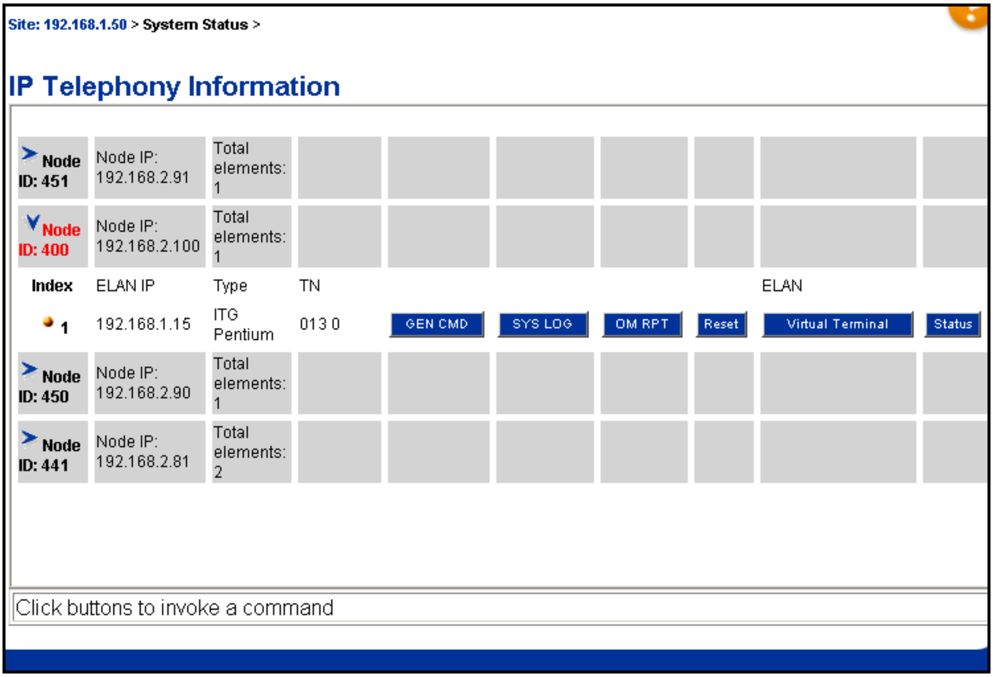
**17** Select **System Status > IP Telephony** from the navigation tree.

The **IP Telephony Information** windows opens.

**18** Expand the node containing the Voice Gateway Media Card.

19 Click the **GEN CMD** button associated with the Voice Gateway Media Card. See Figure 172.

**Figure 172**
**Voice Gateway Media Card and GEN CMD button**



Site: 192.168.1.50 > System Status >

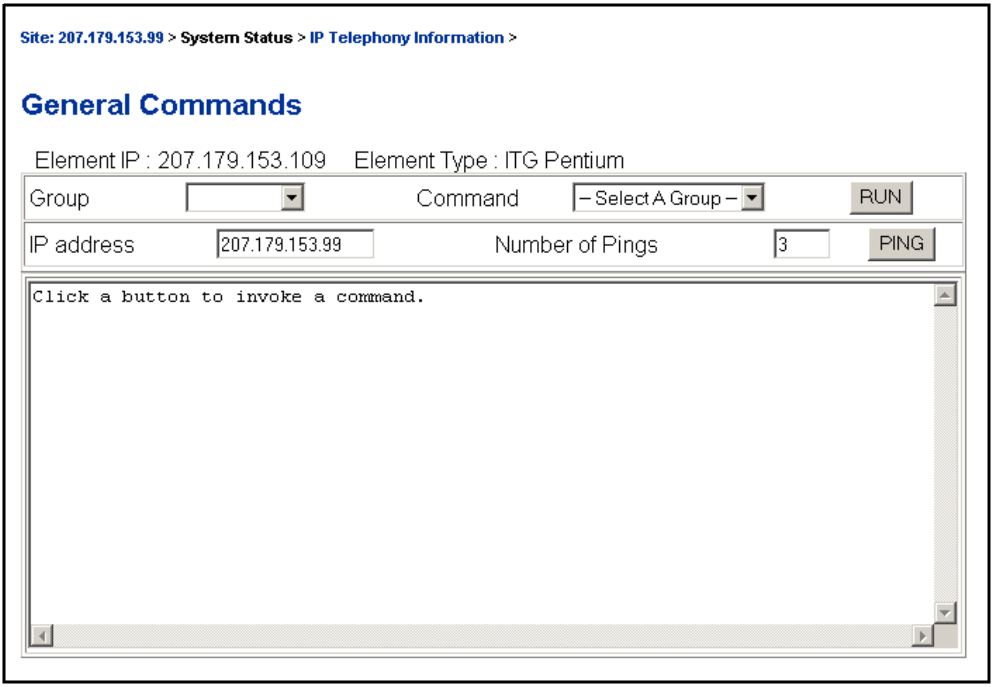
IP Telephony Information

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| ➤ Node ID: 451 | Node IP: 192.168.2.91 | Total elements: 1 | | | | | | | |
| ▼ Node ID: 400 | Node IP: 192.168.2.100 | Total elements: 1 | | | | | | | |
| Index | ELAN IP | Type | TN | | | | | ELAN | |
| ● 1 | 192.168.1.15 | ITG Pentium | 013 0 | GEN CMD | SYS LOG | OM RPT | Reset | Virtual Terminal | Status |
| ➤ Node ID: 450 | Node IP: 192.168.2.90 | Total elements: 1 | | | | | | | |
| ➤ Node ID: 441 | Node IP: 192.168.2.81 | Total elements: 2 | | | | | | | |

Click buttons to invoke a command

The **General Commands** window opens. See Figure 173 on page 529.

**Figure 173**
**General Commands window**



Site: 207.179.153.99 > System Status > IP Telephony Information >

General Commands

Element IP : 207.179.153.109 Element Type : ITG Pentium

IP address: 207.179.153.99

Number of Pings: 3

```
Click a button to invoke a command.
```

**20** From the Group drop-down list, select **Misc**.

**21** From the **Command** drop-down list, click the **cardRoleShow** command.

***Note:*** If the card role is not a Follower as expected, Telnet to the card's IPL> CLI using Virtual Terminal, and enter the **clearLeader** command to remove the clearLeader flag.

**22** In the **Node Summary** window, click the **Transfer/Status** button.

This action downloads the node information to the card.

**23** Click **System Status** in the navigation tree. Click **IP Telephony**. The IP Telephony Information window opens.

**24** Expand the node containing the new card(s) that were added.

**25** 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.

**26** Verify that all the new Voice Gateway Media Cards in the node have a signaling link to the Call Server.

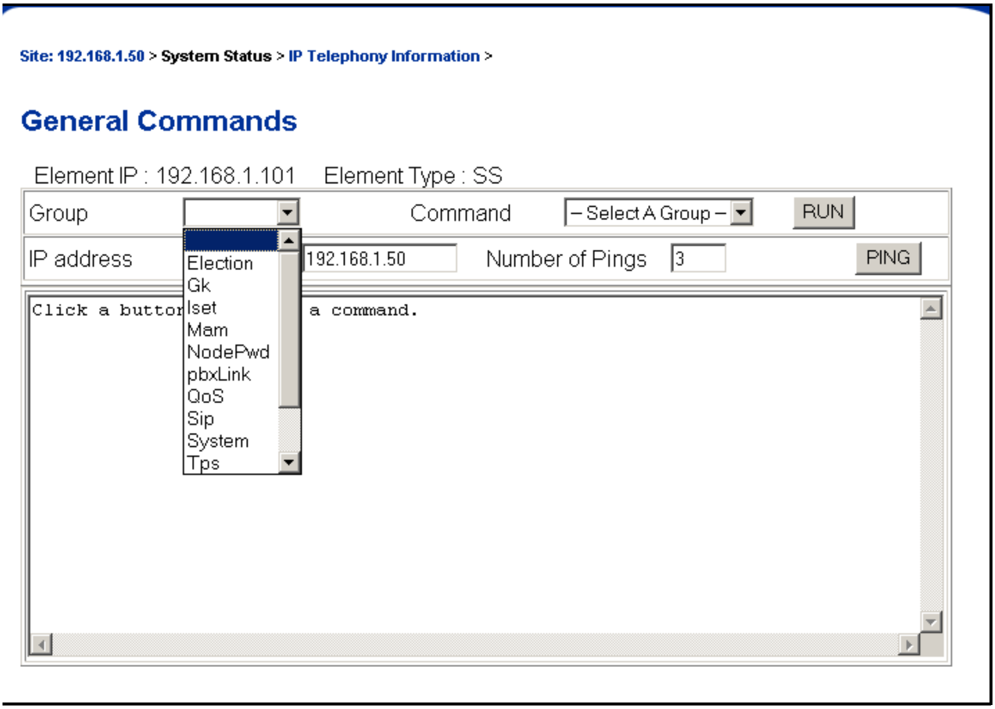
**27** Click **System Status > IP Telephony Information**.

**28** Go to the **General Command** window.

**29** In the **Group** drop-down list, click **pbxLink**.

See Figure 174.

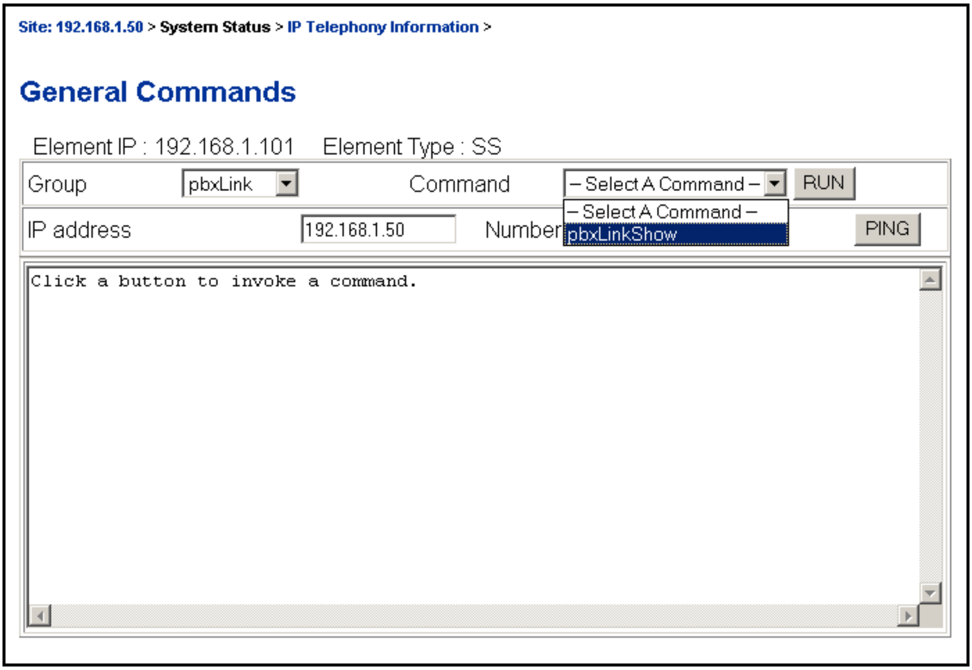
**Figure 174**
**General Commands > pbxLink group**



```
Click a button a command.
```

30 From the **Command** drop-down list, select **pbxLinkShow**. See Figure 175.

**Figure 175**
**pbxLinkShow command**



Site: 192.168.1.50 > System Status > IP Telephony Information >

General Commands

Element IP : 192.168.1.101 Element Type : SS

Group: pbxLink

Command: – Select A Command –

IP address: 192.168.1.50

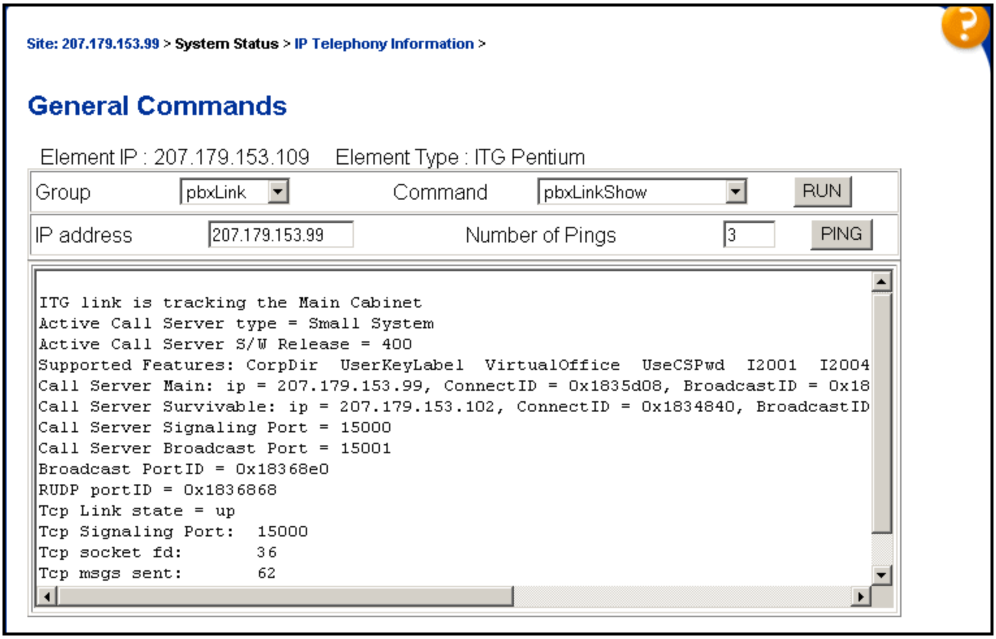
Number

```
Click a button to invoke a command.
```

31 Click the **Run** button.

The output appears in the window. See Figure 176 on page 532.

**Figure 176**
**pbxLinkShow output**



Site: 207.179.153.99 > System Status > IP Telephony Information >

General Commands

Element IP : 207.179.153.109 Element Type : ITG Pentium

Group: pbxLink Command: pbxLinkShow RUN

IP address: 207.179.153.99 Number of Pings: 3 PING

```
ITG link is tracking the Main Cabinet
Active Call Server type = Small System
Active Call Server S/W Release = 400
Supported Features: CorpDir  UserKeyLabel  VirtualOffice  UseCSPwd  I2001  I2004
Call Server Main: ip = 207.179.153.99, ConnectID = 0x1835d08, BroadcastID = 0x18
Call Server Survivable: ip = 207.179.153.102, ConnectID = 0x1834840, BroadcastID
Call Server Signaling Port = 15000
Call Server Broadcast Port = 15001
Broadcast PortID = 0x18368e0
RUDP portID = 0x1836868
Tcp Link state = up
Tcp Signaling Port:   15000
Tcp socket fd:        36
Tcp msgs sent:        62
```

*Note:* The **pbxLinkShow** command can also be entered at the IPL> command line. Telnet to each Voice Gateway Media Card and log in. Enter the **pbxLinkShow** command at the IPL> prompt. Alternatively, look at the display on the card's faceplate and ensure it is not displaying an alarm.

32 Select **System Status > IP Telephony** from the navigation tree.

The **IP Telephony Information** window opens.

33 Expand the node containing the Voice Gateway Media Card.

34 Click the **GEN CMD** button associated with the Voice Gateway Media Card.

The **General Commands** window opens.

35 In the **Group** drop-down list, click **Misc**.

36 In the Command drop-down list, click **cardRoleShow**.

*Note:* 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.

37 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 IP Phone firmware" on page 382.

**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 89.

**Procedure 89**
**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** window appears.

3 Click the **Edit** button for the node containing the Voice Gateway Media Card to be deleted.

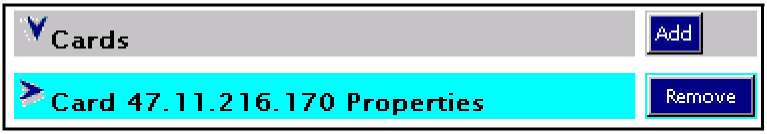
The **Edit** window appears.

4 Expand the **Cards** section.

5 Confirm the card to be deleted and then click the **Remove** button for that card.

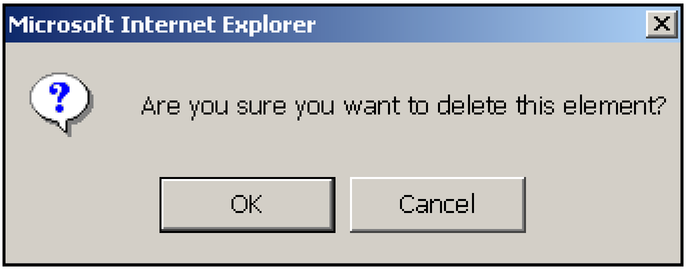
See Figure 177.

**Figure 177**
**Configuration > Node Summary > Edit > Remove Card**



6 Confirm the deletion by clicking **OK**. See Figure 178.

**Figure 178**
**Confirm the deletion**



Are you sure you want to delete this element?

7 Click **Save and Transfer** to save the node change.

The **Edit** window closes, and the **Node Summary** window opens.

8 Click the **Transfer/Status** button associated with the node containing the card that was removed.

9 Click **OK** to confirm the transfer.

The **Transfer Progress window** opens and the changes are transferred to the Call Server.

10 Click **OK** in the **Progress Check Complete** dialog box.

11 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.

**12** 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.

**13** 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 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 there. Element Manager displays the card role based on the setLeader status of the card.

Follow the steps in the Procedure 90 on page 536 to first select a new Leader card and then to delete the current Leader Voice Gateway Media Card.

### Procedure 90
### 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 window, 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 window, 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 window, click **Edit** for the node.

**13** In the **Edit** window, 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 **Save and Transfer**.

**16** In the **Node Summary** window, click the **Transfer/Status** 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

Before changing any IP address, understand "Codecs" on page 179, and consult with the IP network administrator.

IP address configuration changes are completed in four sections of the Edit window. The four sections are:

- Node – network connections are configured in this section.
  See Figure 179 on page 538.
- Card – card properties are configured in this section.
  See Figure 180 on page 540.
- SNMP – SMNP traps are enabled and configured in this section
  See Figure 181 on page 542.
- LAN Configuration – ELAN/TLAN settings and card routing table entries are configured in this section.
  See Figure 182 on page 543.

To change the IP address of an IP Telephony node, follow the steps in Procedure 91.

**Procedure 91**
**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 IP Telephony window opens.

3 Click **Node Summary.**

The **Node Summary** window opens.

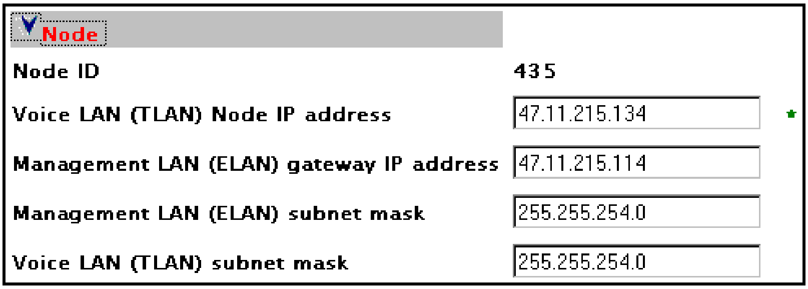
4 Click the **Edit** button for the node that is having the IP address changes.

The **Edit** window opens.

5 Expand the **Node** section, if it is not already expanded.

See Figure 179 on page 538.

**Figure 179**
**Node properties**



Node

| | | |
|---|---|---|
| Node ID | 435 | |
| Voice LAN (TLAN) Node IP address | 47.11.215.134 | * |
| Management LAN (ELAN) gateway IP address | 47.11.215.114 | |
| Management LAN (ELAN) subnet mask | 255.255.254.0 | |
| Voice LAN (TLAN) subnet mask | 255.255.254.0 | |

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 subnet. The Node IP address is the IP address used by the IP Phones to communicate with the Voice Gateway Media Cards on the TLAN subnet. 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 IP Phones.
- If the IP Phones are using partial DHCP mode, manually reconfigure the IP address of each IP Phone.

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 subnet, if present. If the subnet does not have a Management LAN gateway, enter 0.0.0.0.

- When a Management LAN gateway is added to the ELAN subnet, it must restrict access so that only authorized traffic is permitted on the ELAN subnet.
- The router must disable the BootP relay agent for the ELAN network interface.
- The router must block all broadcast and multicast traffic from the ELAN subnet and enable only proper access (that is, only authorized traffic and users coming through the ELAN 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 179.

   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:

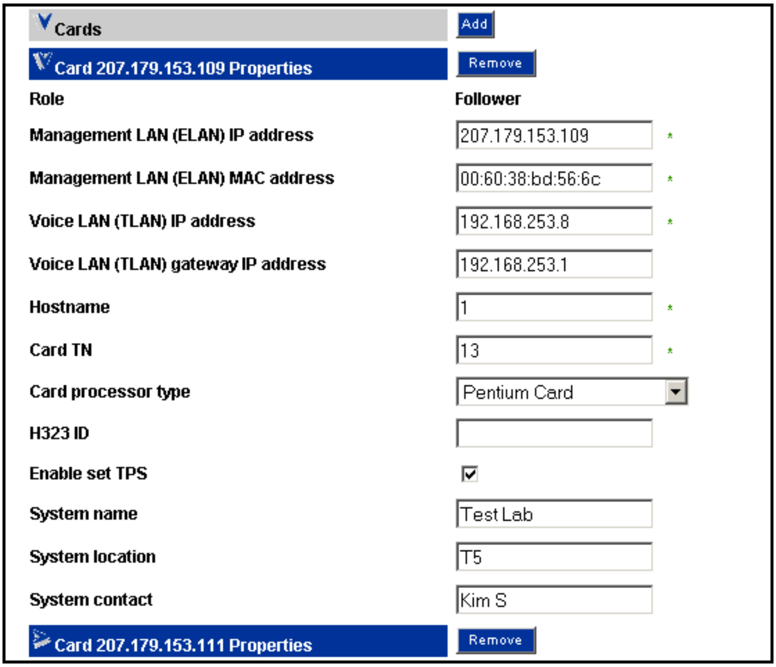
   - Management LAN gateway, and other IP devices on the ELAN subnet
   - any other devices on the ELAN subnet and customer's enterprise network subnet that need to communicate with IP Line 4.0
   - devices that are looking to receive SNMP traps

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.

6 Expand the **Cards** section and select the card to be changed.

See Figure 180 on page 540.

**Figure 180**
**Cards**



Cards
Add
Card 207.179.153.109 Properties
Remove

| | |
|---|---|
| Role | Follower |
| Management LAN (ELAN) IP address | 207.179.153.109 * |
| Management LAN (ELAN) MAC address | 00:60:38:bd:56:6c * |
| Voice LAN (TLAN) IP address | 192.168.253.8 * |
| Voice LAN (TLAN) gateway IP address | 192.168.253.1 |
| Hostname | 1 * |
| Card TN | 13 * |
| Card processor type | Pentium Card |
| H323 ID | |
| Enable set TPS | ☑ |
| System name | Test Lab |
| System location | T5 |
| System contact | Kim S |

Card 207.179.153.111 Properties
Remove

7 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 199. 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.

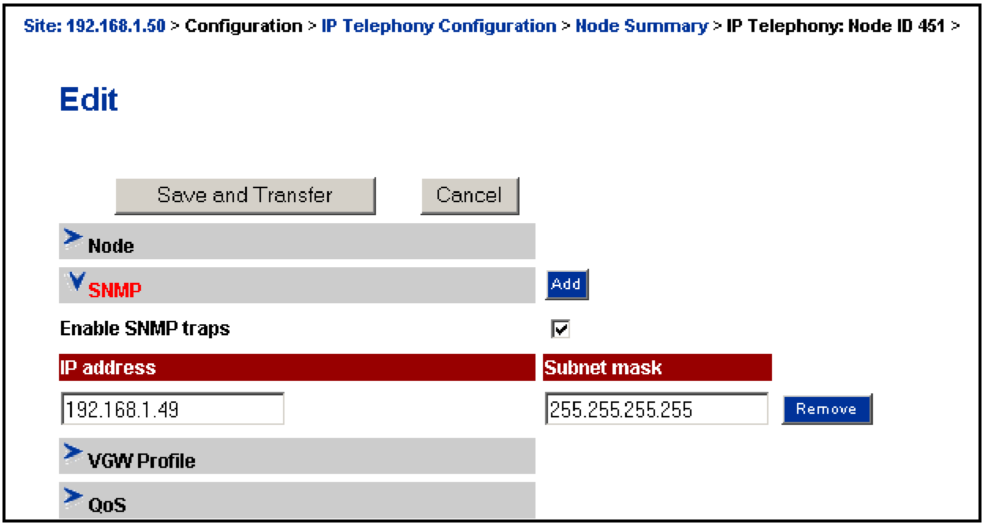
d. **Voice LAN (TLAN) IP address:** This is the card Voice IP address. This address is also known as the card TLAN IP address. In an IP Telephony node, all cards must be assigned an address on the same TLAN subnet. The card Voice IP address must be distinct from the node IP address.

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.

**8** On the **Node > Edit** window, click **SNMP.**

See Figure 181 on page 542.

**Figure 181**
**Node > Edit > SNMP**



Site: 192.168.1.50 > Configuration > IP Telephony Configuration > Node Summary > IP Telephony: Node ID 451 >

Edit

Enable SNMP traps ☑

| IP address | Subnet mask |
|---|---|
| 192.168.1.49 | 255.255.255.255 |

9 Select the **Enable SNMP traps** check box, if configuring one or more SNMP management IP addresses to receive SNMP traps from cards in the IP Telephony node.

f. **IP address:** Enter the IP address of the trap destination. If SNMP traps are enabled, the SNMP traps are sent to the IP address entered here. More than one IP address can be configured.

g. **Subnet mask:** the subnet mask for the IP address of the trap destination must **always** be configured as 255.255.255.255.

**WARNING**

Do not enter the actual value of the subnet mask on the interface of the SNMP trap destination. Doing so can cause misrouting of RTP media and signaling, leading to no speech path between the IP Phones and the Voice Gateway Media Cards or failure of the IP Phones to register with the LTPS

**h.** Click **ADD** to enter the IP address for another trap destination.

Add destination SNMP Manager IP addresses for the following:

- local or remote OTM server
- PPP IP address configured in the router on the ELAN subnet for the remote-support OTM PC
- SNMP manager for remote alarm monitoring.

***Note 1:*** Up to eight SNMP trap destinations 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.

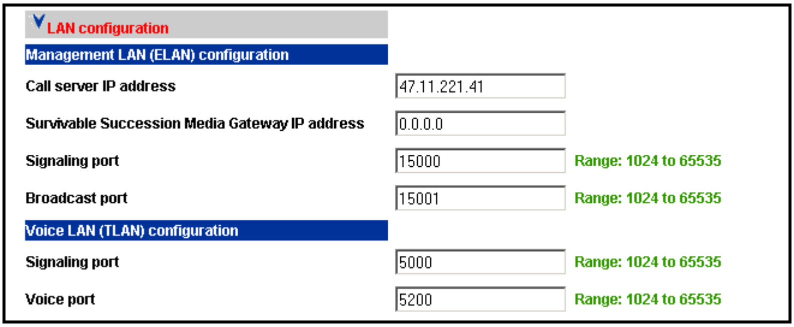
To remove an SNMP trap destination, click the corresponding **Remove** button

Changes can be made to the SNMP trap destinations without affecting other IP addresses. Change the SNMP trap destinations as required, based on the trap destination to be reached.

**10** Expand the **LAN Configuration** section.

See Figure 182.

**Figure 182**
**LAN configuration**



LAN configuration

Management LAN (ELAN) configuration

| | | |
|---|---|---|
| Call server IP address | 47.11.221.41 | |
| Survivable Succession Media Gateway IP address | 0.0.0.0 | |
| Signaling port | 15000 | Range: 1024 to 65535 |
| Broadcast port | 15001 | Range: 1024 to 65535 |

Voice LAN (TLAN) configuration

| | | |
|---|---|---|
| Signaling port | 5000 | Range: 1024 to 65535 |
| Voice port | 5200 | Range: 1024 to 65535 |

**11** 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 subnet. Enter the Call Server ELAN subnet IP Address (Active ELNK).

***Note:*** The Call Server ELAN subnet 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 Media Gateway IP address:** This is the IP address of the Survivable Media Gateway on the ELAN subnet.

***Note 1:*** The Survivable 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 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 Signaling Server. Therefore it is usually connected to the same ELAN subnet as the Call Server and the primary Signaling Server IP Telephony node. The Alternate Call Server Media Gateway is equipped with sufficient trunk cards and Voice Gateway Media Cards, and centralized CallPilot. This provides a large degree of survivability in case of Call Server equipment failure for IP Phone users who normally register through the Signaling Server.

Refer to *Communication Server 1000S: Installation and Configuration* (553-3031-210)) for more information about survivability on the CS 1000S.

Refer to *Communication Server 1000M and Meridian 1: Small System Installation and Configuration* (553-3011-210) and *Communication Server 1000M and Meridian 1: Large System Installation and Configuration* (553-3021-210) for more information about survivability on the Meridian 1 and CS 1000M.

Refer to *Communication Server 1000E: Installation and Configuration* (553-3041-210) for more information about survivability on the CS 1000E.

**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.

**12** 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 IP Phones. 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.

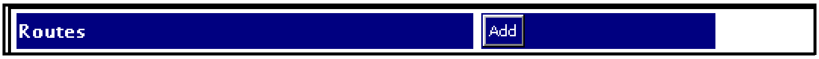
The exact range is provided by the system administrator. In general, use the default value of 5200. If, however, numerous IP Phones are working over low bandwidth WAN links using CISCO RTP header compression, then change the voice port to a number in the range of 16384 to 32767. Coordinate this value 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.

**13** 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 183.

**Figure 183**
**Routes**



**14** 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 subnet.

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 network interface. Packets from an external host arrive on the ELAN network interface. Responses are sent on the TLAN network interface. This process can cause one-way communication if the TLAN subnet is not routed to the ELAN subnet. It is necessary to add an entry in the Route list to correct the routing so that response packets are sent on the ELAN subnet. Each entry creates a route entry in the card's route table that directs packets out the ELAN network interface. See Figure 105 on page 361).

> **CAUTION**
> Use caution when assigning card routing table entries. Do not include the IP address of an IP Phone. Otherwise, voice traffic to these IP Phones is incorrectly routed through the ELAN subnet 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.

**15** Click **Save and Transfer** and then click **OK**.

**16** In the **Node Summary** window, click the **Transfer/Status** 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 page 550.

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 92 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 93 to restart the card using Element Manager.

**Procedure 92**
**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 IP Phones that are registered on that Voice Gateway Media Card. The Graceful TPS Disable command **disiTPS** removes the registered IP Phones.
3. Type **disiTPS** at the card's IPL> prompt to disable the LTPS service on the Voice Gateway Media Card.

   This Graceful TPS Disable command prevents new IP Phones from registering on the card. All IP Phones registered on the card are re-directed to another Voice Gateway Media Card when the IP Phone becomes idle.

After the command is entered, an idle IP Phone should be updated with the Watchdog reset message. However, the LTPS sends a soft reset message to the IP Phone, re-directing it to the Connect Server. The disabled LTPS does not accept new registrations, so the IP Phones must register with another LTPS in the node. Eventually, as all of the LTPS's IP Phones become idle, they are registered with other TPSs. The Voice Gateway Media Card can then be removed with no impact to any users.

**End of Procedure**

**Procedure 93**
**Restarting a Voice Gateway Media Card in Element Manager**

1 Click the **System Status** from the navigation tree.

2 Click **IP Telephony**.

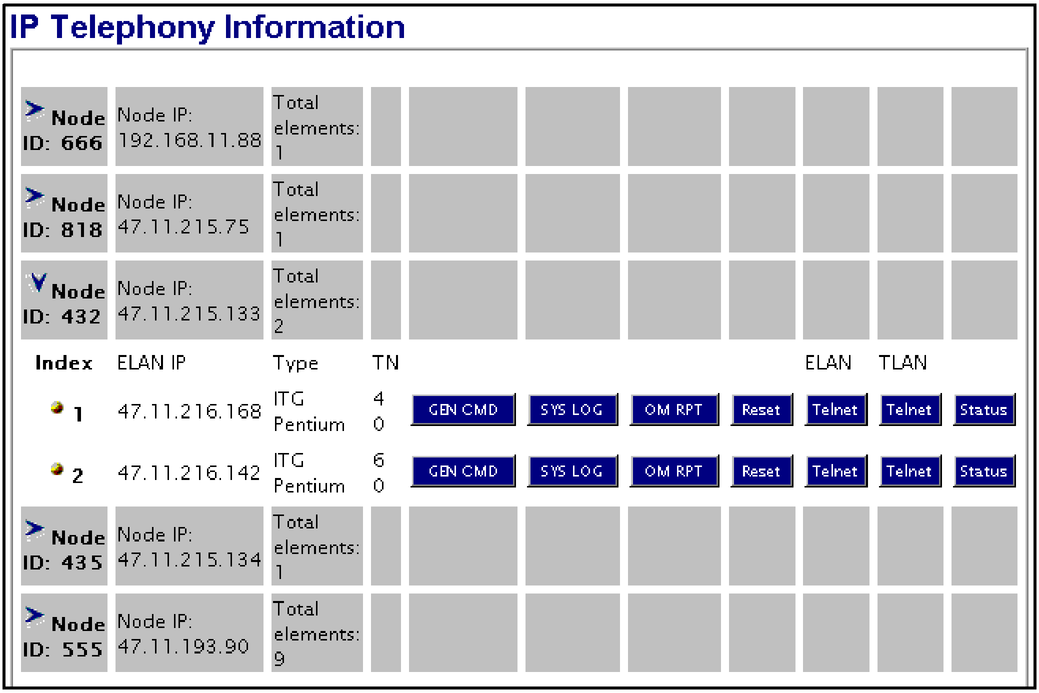
**The IP** Telephony Information window opens.

3 Expand the node containing the Voice Gateway Media Card.

4 Click the **Reset** button associated with the Voice Gateway Media Card.

See Figure 184 on page 549.

**Figure 184**
**Reset button**



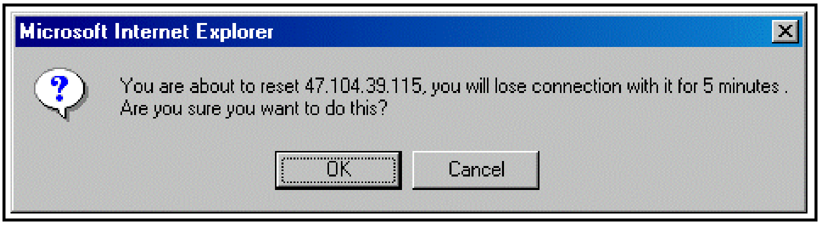
IP Telephony Information

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| ➤ **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<br>0 | GEN CMD | SYS LOG | OM RPT | Reset | Telnet | Telnet | Status |
| ● **2** | 47.11.216.142 | ITG Pentium | 6<br>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 | | | | | | | | |

5 Click **OK** to confirm the Voice Gateway Media Card reset.

See Figure 185 on page 550.

**Figure 185**
**Card Reset dialog box**



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?

**End of Procedure**

## Restart all the Voice Gateway Media Cards

All the Voice Gateway Media Cards must 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 must be restarted.

If the Management (ELAN) IP address of the Leader has changed, all the cards must 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.

Follow the steps in Procedure 94 to restart all the Voice Gateway Media Cards.

**Procedure 94**
**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** window.

To update the node properties in the following sections:

- DSP Profile section – follow the steps in Procedure 44 on page 350
- QoS section – follow the steps in Procedure 45 on page 355

## Telnet to a Voice Gateway Media Card using Virtual Terminal

To access the CLI on a Voice Gateway Media Card using Virtual Terminal from Element Manager, follow the steps in Procedure 95.

**Procedure 95**
**Accessing a Voice Gateway Media Card using Telnet**

**1** Click **System Status** from the navigation tree.

**2** Click **IP Telephony**.

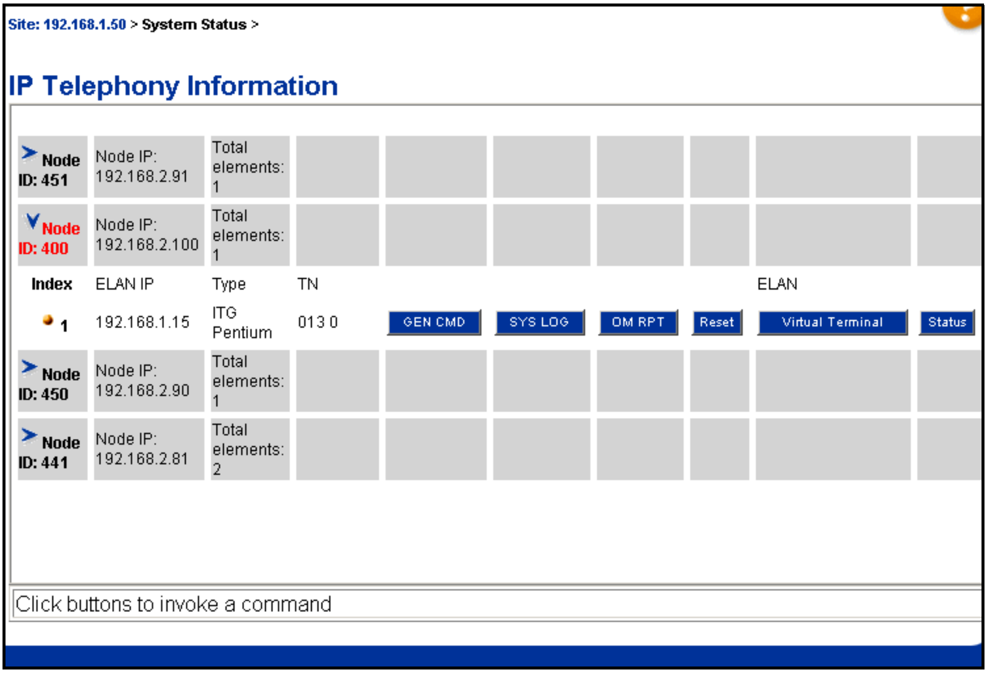
The **IP Telephony Information** window opens.

**3** Expand the node containing the Voice Gateway Media Card.

**4** Click the **Virtual Terminal** button associated with the Voice Gateway Media Card.

See Figure 186 on page 552.

**Figure 186**
**Virtual Terminal**



Site: 192.168.1.50 > System Status >

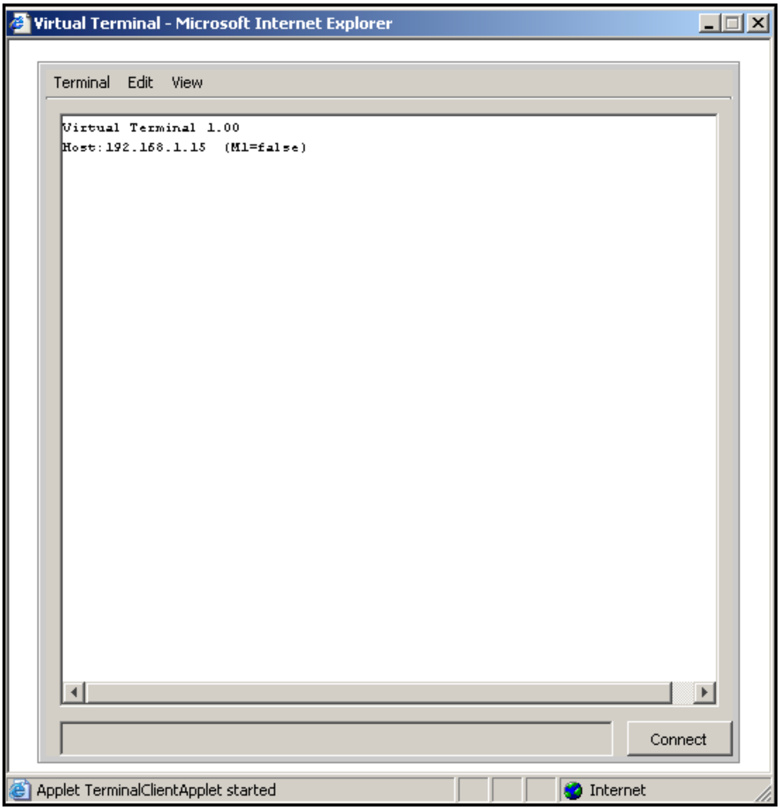
IP Telephony Information

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| > Node ID: 451 | Node IP: 192.168.2.91 | Total elements: 1 | | | | | | | |
| V Node ID: 400 | Node IP: 192.168.2.100 | Total elements: 1 | | | | | | | |
| Index | ELAN IP | Type | TN | | | | | ELAN | |
| ● 1 | 192.168.1.15 | ITG Pentium | 013 0 | GEN CMD | SYS LOG | OM RPT | Reset | Virtual Terminal | Status |
| > Node ID: 450 | Node IP: 192.168.2.90 | Total elements: 1 | | | | | | | |
| > Node ID: 441 | Node IP: 192.168.2.81 | Total elements: 2 | | | | | | | |

Click buttons to invoke a command

The Virtual Terminal window opens and automatically connects to the Voice Gateway Media Card by using the TLAN or ELAN IP Address. See Figure 187 on page 553.

**Figure 187**
**Virtual Terminal window**


Virtual Terminal - Microsoft Internet Explorer
Terminal
Edit
View
Connect
Applet TerminalClientApplet started
Internet

```
Virtual Terminal 1.00
Host:192.168.1.15  (M1=false)
```

**5** 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 CS 1000 systems, use the PWD1 user ID and password.

The IPL> prompt appears if the login is successful.

**6** Type **?** at the prompt to display a list of available IPL> CLI commands.

See "IP Line CLI commands" on page 585 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 96.

**Procedure 96**
**Checking the Voice Gateway Channels**

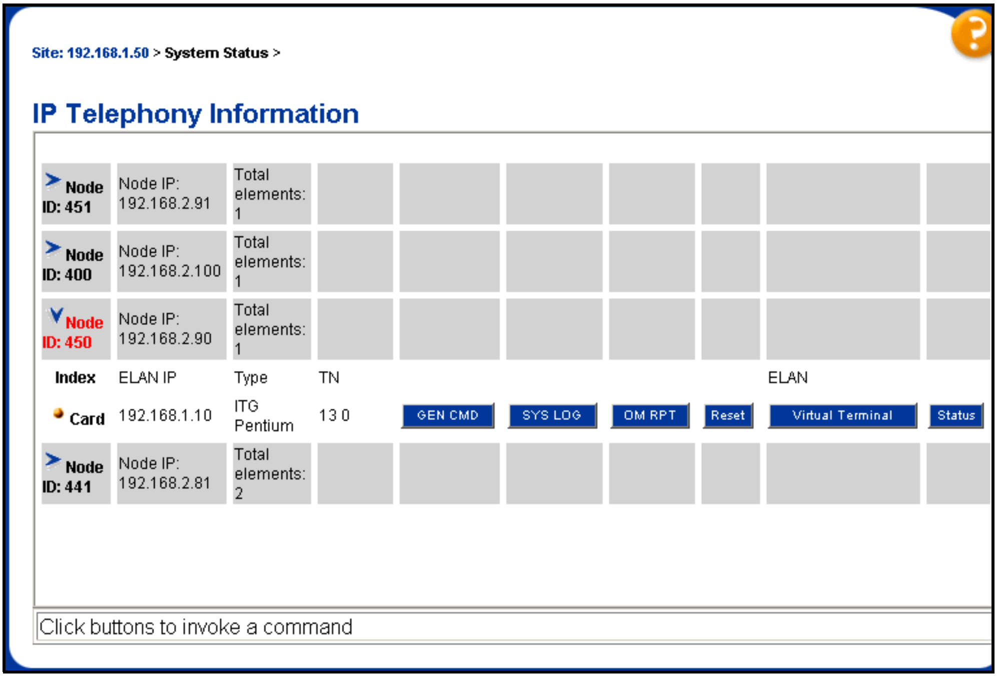
1 In the navigation tree, click **System Status > IP Telephony**.

The **IP Telephony Information** window opens.

2 Expand the node to show all its elements.

See Figure 188 on page 555.

**Figure 188**
**IP Telephony Information**



Site: 192.168.1.50 > System Status >

IP Telephony Information

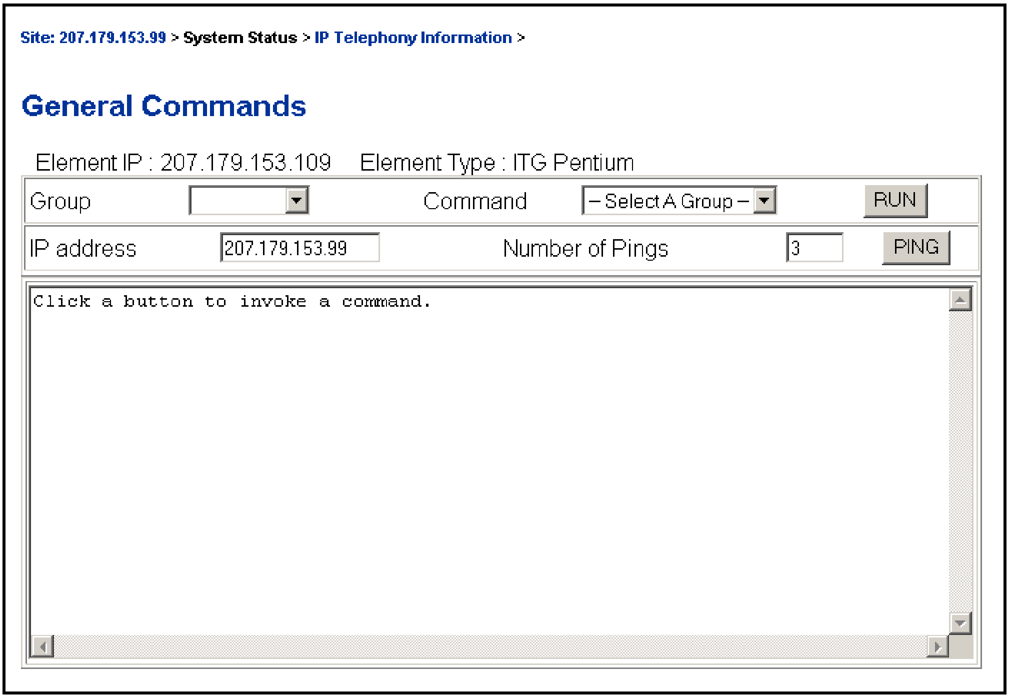
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| > Node ID: 451 | Node IP: 192.168.2.91 | Total elements: 1 | | | | | | | |
| > Node ID: 400 | Node IP: 192.168.2.100 | Total elements: 1 | | | | | | | |
| ∨ Node ID: 450 | Node IP: 192.168.2.90 | Total elements: 1 | | | | | | | |
| Index | ELAN IP | Type | TN | | | | | ELAN | |
| ● Card | 192.168.1.10 | ITG Pentium | 13 0 | GEN CMD | SYS LOG | OM RPT | Reset | Virtual Terminal | Status |
| > Node ID: 441 | Node IP: 192.168.2.81 | Total elements: 2 | | | | | | | |

Click buttons to invoke a command

3 Click the **GEN CMD** button associated with the Voice Gateway Media Card.

The **General Commands** window opens. See Figure 189 on page 556.

**Figure 189**
**General Command**



Site: 207.179.153.99 > System Status > IP Telephony Information >

General Commands

Element IP : 207.179.153.109 Element Type : ITG Pentium

Group: (blank)

Command: – Select A Group –

IP address: 207.179.153.99

Number of Pings: 3

```
Click a button to invoke a command.
```

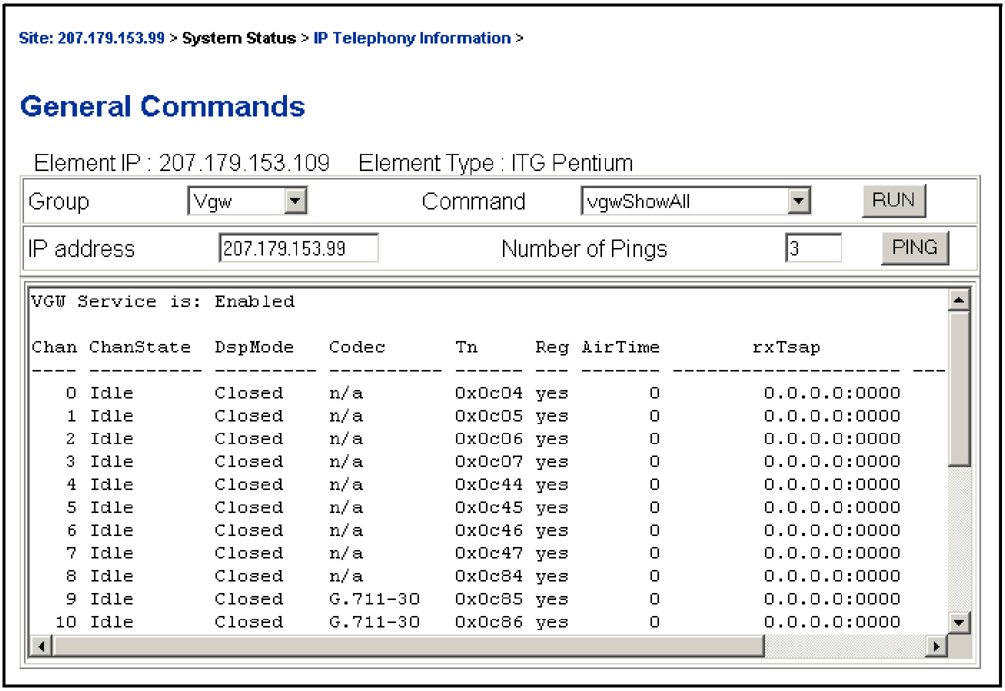
4 From the **Group** drop-down list, select **Vgw**.

5 From the **Command** drop-down list, select **vgwShowAll**.

6 Click **RUN**.

The output of the **vgwShowAll** command is displayed in the text area at the bottom of the window. See Figure 190 on page 557.

**Figure 190**
**vgwShowAll output**



Site: 207.179.153.99 > System Status > IP Telephony Information >

General Commands

Element IP : 207.179.153.109 Element Type : ITG Pentium

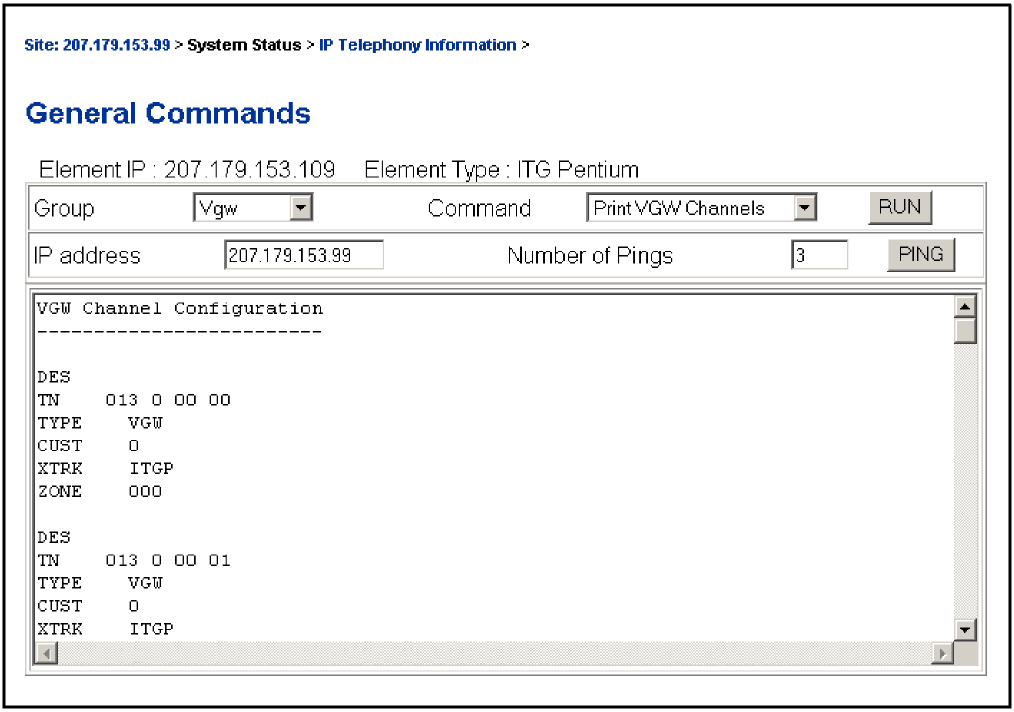
Group: Vgw
Command: vgwShowAll
IP address: 207.179.153.99
Number of Pings: 3

```
VGW Service is: Enabled

Chan ChanState  DspMode   Codec      Tn     Reg AirTime        rxTsap
---- ---------- --------- ---------- ------ --- ------- -------------------- ---
   0 Idle       Closed    n/a        0x0c04 yes       0          0.0.0.0:0000
   1 Idle       Closed    n/a        0x0c05 yes       0          0.0.0.0:0000
   2 Idle       Closed    n/a        0x0c06 yes       0          0.0.0.0:0000
   3 Idle       Closed    n/a        0x0c07 yes       0          0.0.0.0:0000
   4 Idle       Closed    n/a        0x0c44 yes       0          0.0.0.0:0000
   5 Idle       Closed    n/a        0x0c45 yes       0          0.0.0.0:0000
   6 Idle       Closed    n/a        0x0c46 yes       0          0.0.0.0:0000
   7 Idle       Closed    n/a        0x0c47 yes       0          0.0.0.0:0000
   8 Idle       Closed    n/a        0x0c84 yes       0          0.0.0.0:0000
   9 Idle       Closed    G.711-30   0x0c85 yes       0          0.0.0.0:0000
  10 Idle       Closed    G.711-30   0x0c86 yes       0          0.0.0.0:0000
```

7 To view the VGW Channel configuration, from the **Command** drop-down list, select **Print VGW Channels** and click the **RUN** button.

The output of the **Print VGW Channels** command is shown in Figure 191 on page 558.

**Figure 191**
**Output of Print VGW Channels**



Site: 207.179.153.99 > System Status > IP Telephony Information >

General Commands

Element IP : 207.179.153.109 Element Type : ITG Pentium

Group: Vgw
Command: Print VGW Channels

IP address: 207.179.153.99
Number of Pings: 3

```
VGW Channel Configuration
-------------------------

DES
TN     013  0  00  00
TYPE     VGW
CUST     0
XTRK     ITGP
ZONE     000

DES
TN     013  0  00  01
TYPE     VGW
CUST     0
XTRK     ITGP
```

**End of Procedure**

# Setting the IP Phone Installer Password

Element Manager includes the CLI commands for setting the administrative and temporary IP Phone Installer Password. For detailed information about the IP Phone Installer Password, refer to the section “IP Phone Installer Password” on page 425.

To set the IP Phone Installer Password in Element Manager, follow the steps in Procedure 97.

**Procedure 97**
**Setting the administrative and temporary IP Phone Installer Passwords**

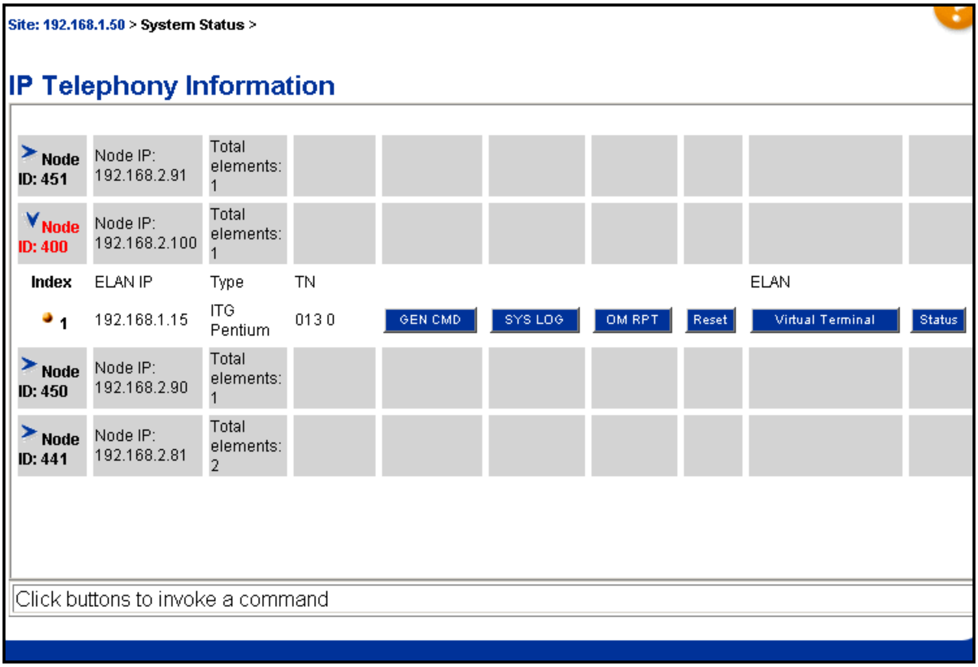
1 Click **System Status**, and then **IP Telephony**.

The **IP Telephony Information** window opens.

2 Expand the node to show all its elements.

See Figure 192.

**Figure 192**
**IP Telephony Information window**



Site: 192.168.1.50 > System Status >

IP Telephony Information

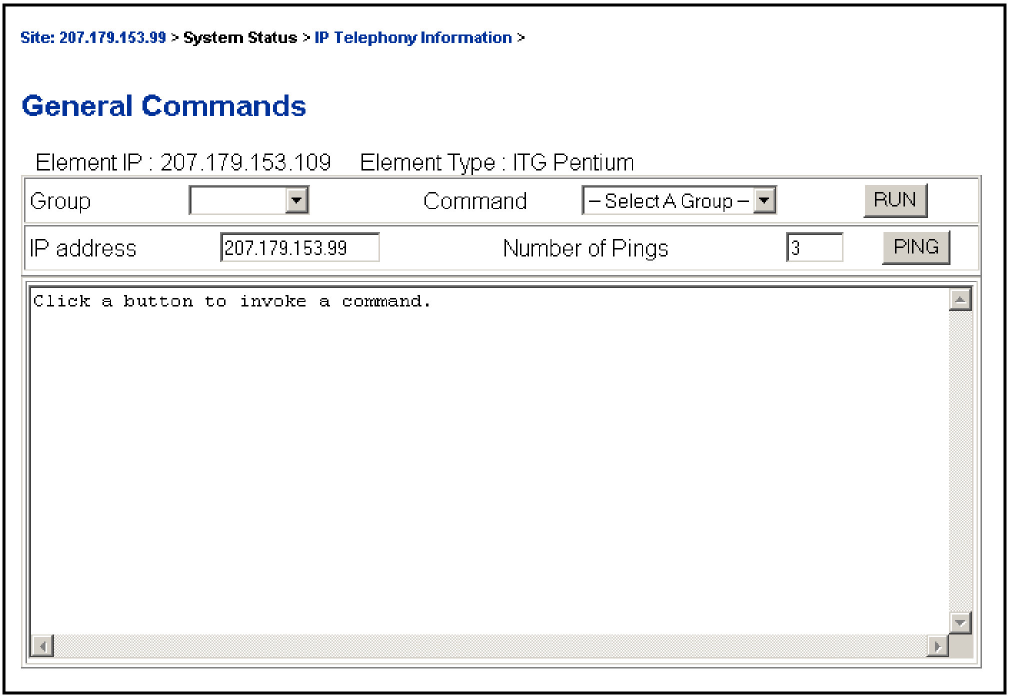
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Node ID: 451 | Node IP: 192.168.2.91 | Total elements: 1 | | | | | | | |
| Node ID: 400 | Node IP: 192.168.2.100 | Total elements: 1 | | | | | | | |
| Index | ELAN IP | Type | TN | | | | | ELAN | |
| ● 1 | 192.168.1.15 | ITG Pentium | 013 0 | GEN CMD | SYS LOG | OM RPT | Reset | Virtual Terminal | Status |
| Node ID: 450 | Node IP: 192.168.2.90 | Total elements: 1 | | | | | | | |
| Node ID: 441 | Node IP: 192.168.2.81 | Total elements: 2 | | | | | | | |

Click buttons to invoke a command

3 Click the **GEN CMD** button associated with the Voice Gateway Media Card.

The **General Commands** windows opens. See Figure 193.

**Figure 193**
**General Command**



Site: 207.179.153.99 > System Status > IP Telephony Information >

General Commands

Element IP : 207.179.153.109 Element Type : ITG Pentium

Group: (blank)

Command: -- Select A Group --

IP address: 207.179.153.99

Number of Pings: 3

```
Click a button to invoke a command.
```

4 From the **Group** drop-down list, select **nodePwd**.

5 From the **Command** drop-down list, select **nodePwdShow** and click the **RUN** button.

The output of the **nodePwdShow** command is displayed in the text area at the bottom of the window. If in the default state, the IP Phone Installer Password has never been set. The **nodePwdShow** output should display the following:

```
NodeID    PwdEna    Pwd         TmpPwd      Uses       Timeout
======    =======   ========    ========    =======    ===========
123       No                                   0       0d 0h 0m 0s
```

where:

**NodeID** – the IP Phone Installer Password configuration applies to all Voice Gateway Media Cards on the same TLAN subnet 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 IP Phone Installer Password.

**Pwd** – this is the administrator IP Phone Installer Password. In the default state, the administrator password is null.

**TmpPwd** – this is the temporary IP Phone Installer Password. In the default state, the temporary password is null.

**Uses** – the Uses parameter applies to the temporary IP Phone 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 Timeout parameter of the temporary IP Phone Installer Password. In the default state the Timeout 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 Timeout parameter is optional if the Uses parameter is non-zero. The Timeout parameter is mandatory if Uses is set to zero.

If both the Uses and Timeout parameters are entered, the password expires based on whichever happens first, that is, the number of Uses is reduced to zero or the Timeout has expired. If both the Uses and Timeout parameters are entered and are set to zero, it is the same as not setting the temporary password.

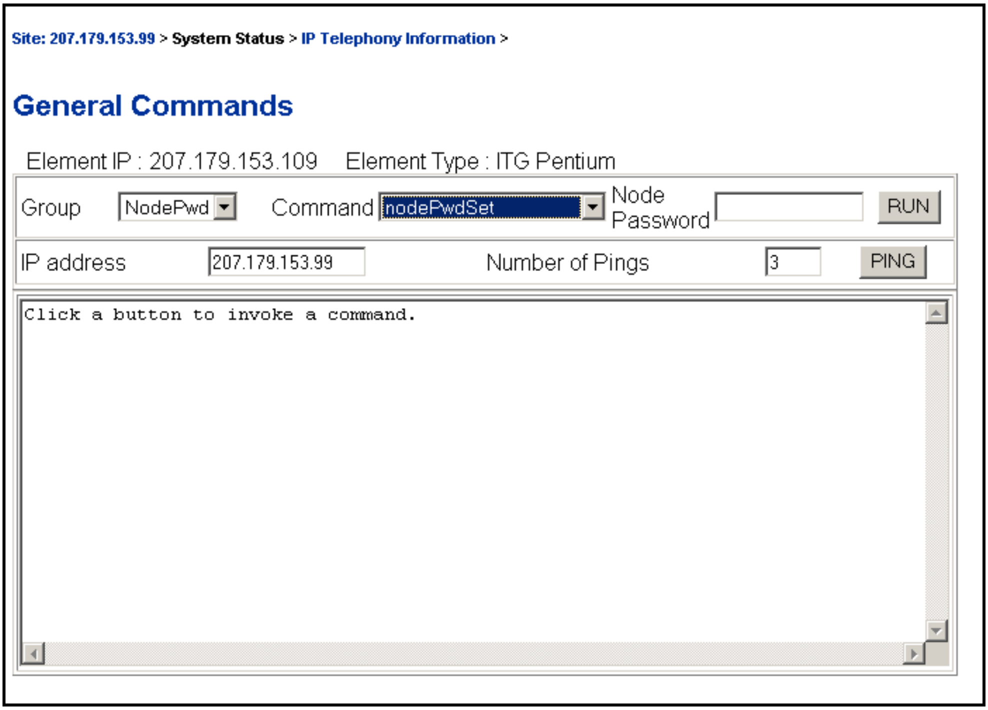
6 From the **Group** drop-down list, select **NodePwd**.

7 From the Command drop-down list, select **nodePwdSet** and click the **RUN** button.

The window refreshes and displays the blank **Node Password** field. See Figure 194.

8 Enter the administrator IP Phone Installer Password in the **Node Password** field and click the **RUN** button.

**Figure 194**
**Node Password**



Site: 207.179.153.99 > System Status > IP Telephony Information >

General Commands

Element IP : 207.179.153.109 Element Type : ITG Pentium

Group NodePwd Command nodePwdSet Node Password

IP address 207.179.153.99 Number of Pings 3

```
Click a button to invoke a command.
```

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.

The text area returns the message '**Please run nodePwdShow to verify the result.**”

**9** From the Command drop-down list, select **nodePwdShow** 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
```

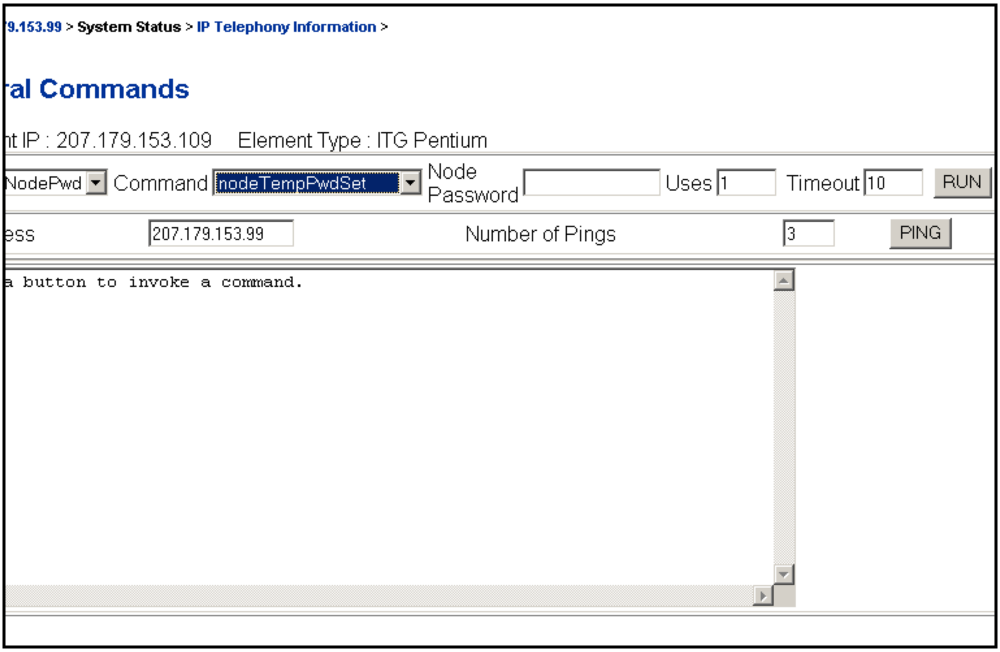
**WARNING**

If the **RUN** button in the Node Password field 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.

**10** To configure a temporary password, from the Command drop-down list, select **nodeTempPwdSet**.

The window refreshes and blank fields are displayed for the following: **Node Password**, **Uses**, and **Timeout**. See Figure 195 on page 564.

**Figure 195**
**Temporary password fields**



'9.153.99 > System Status > IP Telephony Information >

al Commands

nt IP : 207.179.153.109 Element Type : ITG Pentium

NodePwd Command nodeTempPwdSet Node Password Uses 1 Timeout 10

ess 207.179.153.99 Number of Pings 3

```
a button to invoke a command.
```

11 Enter the temporary Node Password, the number of uses, and the Timeout, and click **RUN**.

The text area returns the message '**Please run nodePwdShow to verify the result.**”

12 From the **Command** drop-down list, 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 2h 0m 0s
                                9876543     2
```

13 To clear the temporary IP Phone Installer password, select the **nodeTempPwdClear** command from the Command drop-down list and click **RUN**.

**14** Confirm that the temporary password has been cleared.

From the **Command** drop-down list, select **nodePwdShow** 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 64 on page 569 lists the normal and fault display codes for the ITG-P 24-port line card.
- Table 65 on page 571 list the normal and fault display codes for the 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 4.0 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 64**
**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 |

**Table 64**
**ITG-P 24-port line card faceplate maintenance display codes (Part 2 of 2)**

| Normal code | Fault code | Message |
|---|---|---|
| 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 |
| 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 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 Media Card faceplate. If more that one test fails, the message indicates the first failure

**Table 65**
**Media 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 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 |

**Table 65**
**Media Card faceplate maintenance display codes (Part 2 of 2)**

| Normal code | Fault code | Message |
|---|---|---|
| T:19 | F:19 | Not used at present |
| T:20 | F:20 | Waiting for application start-up message from Host processor |
| 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 66 shows the list of error codes.

**Table 66**
**List of error codes for the Media Card**

| Code | Description |
|---|---|
| H:00 | Host Processor not booting |
| H:01 | SDRAM test failure |
| H:02 | SRAM test failure |
| H:04 | PC Card 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. System error message are also written to the error log file containing error messages.

View the error log in OTM IP Line 4.0 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 Signaling Server does not have a faceplate display. Alarms appear in the Signaling Server 's report log or by way of SNMP on an Alarm browser.

Table 67 lists the critical ITG messages and Table 68 on page 577 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 Signaling Server has an “X” in the column labeled “Signaling Server.”

For a complete listing of other error messages, see *Software Input/Output: System Messages* (553-3001-411).

**Table 67**
**Critical ITG Error messages (Part 1 of 4)**

| Maintenance Display | Corresponding Critical Error Message | 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 67**
**Critical ITG Error messages (Part 2 of 4)**

| Maintenance Display | Corresponding Critical Error Message | 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 67**
**Critical ITG Error messages (Part 3 of 4)**

| Maintenance Display | Corresponding Critical Error Message | 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 67**
**Critical ITG Error messages (Part 4 of 4)**

| Maintenance Display | Corresponding Critical Error Message | Signaling Server | Description |
|---|---|---|---|
| G041 | ITG1041 | X | perceivedSeverity = alarmSeverityWarning<br>probableCause = alarmCauseRemoteTransmissionError<br>OTM displays the text “F/W file(s) not received but IP Phones have registered. May have mixed F/W versions across phones. When F/W file(s) received, IP Phones will automatically be updated.” |
| G042 | ITG1042 | | perceivedSeverity = alarmSeverityWarning<br>probableCause = alarmCauseOutOfMemory<br>OTM displays the text “Insufficient flash drive space to store F/W file.” |

**Table 68**
**Critical ITS Error messages (Part 1 of 2)**

| Maintenance Display | Corresponding Critical Error Message | 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>. |

**Table 68**
**Critical ITS Error messages (Part 2 of 2)**

| Maintenance Display | Corresponding Critical Error Message | Signaling Server | Description |
|---|---|---|---|
| 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 IP Phone: <reasonID> (<reasonString>) |
| S012 | ITS1012 | X | User entered the wrong IP Phone Installer Password three times during Branch User Config.The IP Phone is locked out from doing any User Configuration for one hour.<br>Action: Wait for the IP Phone to unlock in one hour, or use the IPL CLI command clearLockout to unlock the IP Phone. |
| S013 | ITS1013 | X | User entered the wrong Craftsperson Node Level TN Entry Password three times.The IP Phone is locked out.<br>Action: To remove the lock, use LD 32 to disable, and then enable the IP Phone. |

# IP Line and IP Phone maintenance and diagnostics – LD 32

Table 69 summarizes the system maintenance commands available in LD 32.

For more information on the ECNT commands, refer to “Counting IP Phones” on page 107.

**Table 69**
**LD 32 – Maintenance commands for the Voice Gateway Media Card (Part 1 of 3)**

| Command | Description |
|---|---|
| DISC l s c | Disable the specified card,<br>where: l = loop, s = shelf, c = card.<br>***Note 1:*** Disable the Voice Gateway Media Card before transmitting card properties from the OTM IP Line 4.0 application.<br>***Note 2:*** The card reset button is available only in the OTM IP Line 4.0 application when the card is disabled.<br>***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,<br>where: l = loop, s = shelf, c = card<br>***Note 1:*** This temporarily prevents the IP Telephony node from seizing the port from incoming calls.<br>***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,<br>where: l = loop, s = shelf, c = card, u = unit |

**Table 69**
**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 IP Phones registered for the specified card.<br>• 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.<br>• 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.<br>Example:<br>ECNT CARD 81<br><< Card 81 >><br>Number of Registered Ethersets: 5<br>Number of Unregistered Ethersets: 27 |
| ECNT ZONE zoneNum <customer> | Counts and prints the number of IP Phones registered for the specified zone.<br>• 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.<br>• If no parameters are entered, the count is printed for all zones.<br>Example:<br>ECNT ZONE 0 0<br><< Zone 0 Customer 0 >><br>Number of Registered Ethersets: 4<br>Number of Unregistered Ethersets: 17 |
| ENLC l s c | Enable the specified card,<br>where: l = loop, s = shelf, c = card |
| ENLU l s c u | Enable the specified unit,<br>where: l = loop, s = shelf, c = card, u = unit |

**Table 69**
**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,<br>where: l = loop, s = shelf, c = card<br>***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, CS 1000M, and  CS 1000 software status of the specified card,<br>where: l = loop, s = shelf, c = card |
| STAT l s c u | Print the Meridian 1, CS 1000M, and  CS 1000S software status of the specified unit,<br>where: l = loop, s = shelf, c = card, u = unit |

## TNs

For Nortel Networks IP Phones, 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 IP Phone

### 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 and CS 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 IP Phone Virtual TN. All other commands generate the NPR047 message.

## Maintenance commands for the IP Phone

Table 70 contains the maintenance commands in LD 32 for the IP Phone.

**Table 70**
**LD 32 maintenance commands for IP Phones**

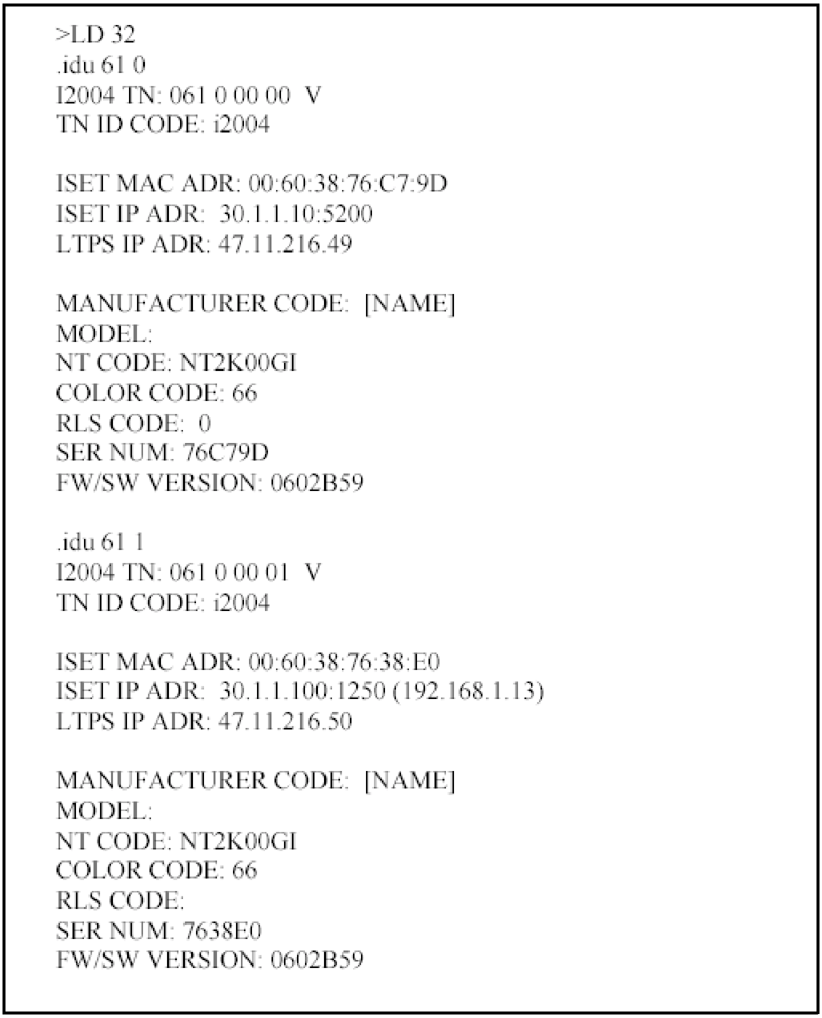
| Command | Description |
|---|---|
| STAT l s c u<br>STAT cu | Display the IP Phone state.<br>UNEQ, IDLE, BUSY, and DSBL have the usual meaning.<br>IDLE and DSBL state are precise by the following information:<br>• UNREGISTERED identifies an IP Phone that is configured in the system but that has not yet registered.<br>• REGISTERED identifies an IP Phone that has registered. |
| DISU l s c u<br>DISU cu | Change the IP Phone state to DSBL.<br>UNREGISTERED/REGISTERED state is not modified. |
| ENLU l s c u<br>ENLU cu | Change the IP Phone state to IDLE.<br>UNREGISTERED/REGISTERED state is not modified. |
| IDU l s c u<br>IDU cu | Displays selected IP Phone information.<br>Displays the TN number, MAC address, device code, NT code, color code, release code, software code, serial number, IP Phone IP address, and LTPS IP address. |
| STAT VTRM <cust#> <route#> <start_mb#> <number of members> | Displays the status of the virtual trunks for a customer's route starting from a specified starting member for the number of members specified. |

### IDU command

Since the system must request the information from the IP Phone, the IDU is effectively a PING command and can be used to test the end-to-end IP connectivity of the IP Phone.

An example of the output format of the IDU command in LD 32 is shown i n Figure 196 on page 584.

**Figure 196**
**IDU command output**



```
>LD 32
.idu 61 0
I2004 TN: 061 0 00 00  V
TN ID CODE: i2004

ISET MAC ADR: 00:60:38:76:C7:9D
ISET IP ADR:  30.1.1.10:5200
LTPS IP ADR: 47.11.216.49

MANUFACTURER CODE:  [NAME]
MODEL:
NT CODE: NT2K00GI
COLOR CODE: 66
RLS CODE:  0
SER NUM: 76C79D
FW/SW VERSION: 0602B59

.idu 61 1
I2004 TN: 061 0 00 01  V
TN ID CODE: i2004

ISET MAC ADR: 00:60:38:76:38:E0
ISET IP ADR:  30.1.1.100:1250 (192.168.1.13)
LTPS IP ADR: 47.11.216.50

MANUFACTURER CODE:  [NAME]
MODEL:
NT CODE: NT2K00GI
COLOR CODE: 66
RLS CODE:
SER NUM: 7638E0
FW/SW VERSION: 0602B59
```

Any information about attached IP Phone KEMs is also displayed.

In the example in Figure 196 on page 584, the first IP Phone is not behind a NAT device; the second IP Phone is behind a NAT device. The ISET IP ADR field displays the IP Phone's signaling IP address as seen by the LTPS. If the IP Phone is behind a NAT device, the ISET IP ADR field displays the public address (the address seen by the LTPS) followed by the private IP address (the address configured at the IP Phone) in parenthesis.

This format applies only for IP Phone Virtual TNs.

If the IP Phone is not registered with the Call Server, an NPR0048 message is generated. If the IP Phone is registered but idle, the system prints the IP Phone's IP address and Voice Gateway Media Card's IP address and generates an NPR0053 message. As well, if the IP Phone is registered, but the Call Server is not responding, an NPR0503 message is generated.

# 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, Media Cards, and Signaling Server platform.

All the CLI commands listed in Table 71 to Table 90 are supported on the ITG-P 24-port line card and Media Cards. The CLI commands are also available on the Signaling Server if an "**X**" is shown in the 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, use Telnet to access the CLI. These IP Line CLI commands are entered at the **IPL>** prompt. Instructions for connecting to the maintenance port of the Signaling Server are described in *Communication Server 1000S: Installation and Configuration* (553-3031-210). Refer to the "Signaling Server maintenance ports" section.

The commands are grouped into the following categories:

- "General purpose commands" on page 586
- "File Transfer commands" on page 590
- "IP Configuration commands" on page 594

- “Reset commands” on page 595
- “DSP commands” on page 596
- “Upgrade commands” on page 596
- “IPL> shell command” on page 597
- “IP Phone Installer Password commands” on page 598
- “Voice Gateway commands” on page 601
- “Data Path Capture Tool commands” on page 603
- “Translation IP/DN commands” on page 604
- “Graceful Disable commands” on page 614
- “IP Phone Loss Plan commands” on page 615
- “Patching Tool commands” on page 622
- “General trace tool commands” on page 623
- “Protocol trace tool CLI commands for the NCS” on page 625
- “Maintenance audit commands” on page 631
- “Audit commands” on page 632

## General purpose commands

Table 71 lists the general purpose IPL> commands.

**Table 71**
**General purpose commands (Part 1 of 4)**

| IPL> Command | Description | Signaling Server |
|---|---|---|
| **i** | Displays the current task list. | X |
| **itgHelp** | Displays the complete command list.<br>**?** also shows the command list. | |
| **logout** | Exits the IPL> Command Line Interface. | |
| **routeAdd** | Adds a route to the network routing table. | X |

**Table 71**
**General purpose commands (Part 2 of 4)**

| IPL> Command | Description | Signaling Server |
|---|---|---|
| **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:"<br>Checks the internal file system for errors.<br>chkdsk "/C:", 1<br>Repairs the file system errors and saves the damaged cluster in files.<br>chkdsk "/C:", 2<br>Repairs file system errors and returns damaged clusters to the free pool. | |
| **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> CLI).<br>Example:<br>IPL> **ping** "47.82.33.123", 10 | X |

**Table 71**
**General purpose commands (Part 3 of 4)**

| IPL> Command | Description | Signaling Server |
|---|---|---|
| **electShow** | Displays a list of cards in the node and information about each card. This includes showing all registered followers to a leader.<br>The output has two sections:<br>• cards currently registered<br>• cards that are in the BOOTP.TAB configuration but not yet registered. | X |
| **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 |
| **serialNumShow** | Displays card serial number.<br>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. | X |
| **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. | |

**Table 71**
**General purpose commands (Part 4 of 4)**

| IPL> Command | Description | Signaling Server |
|---|---|---|
| **logConsoleOff** | Turns off error logging to the console. | |
| **isetShow** | Displays general information for all registered IP Phones. For example, the command displays the IP address of the IP Phone, the VTN that the IP Phone is associated with, indicates the type of IP Phone such as IP Phone 2001, IP Phone 2002, and IP Phone 2004, or IP Softphone 2050, and provides the type of registration and the new registration status. | X |
| **isetShowByTN** | Displays general information about all registered IP Phones, sorted by TN. | X |
| **isetShowByIP** | Displays general information about all registered IP Phones, sorted by IP address. | X |
| **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. | |
| **itgPLThreshold** | Sets the IP Phone and gateway alarm packet loss threshold (units 0.1%). An alarm is generated when the threshold is reached. | |
| **elmShow** | Displays a list of supported languages. | X |
| **itgChanStateShow** | Displays the state for channels; for example, if they are idle or busy. | |

## File transfer commands

Table 72 lists the file transfer commands.

**Table 72**
**File Transfer commands (Part 1 of 4)**

| IPL> Commands | Description | 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.<br>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.<br>***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.<br>Example:<br>IPL> **swDownload** "47.82.32.346", "anonymous", "guest", "/software", "VxWorks.mms" | X |

**Table 72**
**File Transfer commands (Part 2 of 4)**

| IPL> Commands | Description | Signaling Server |
|---|---|---|
| **configFileGet**<br>“hostname”,<br>“username”,<br>“password”,<br>“directory path”,<br>“filename” | Sends an updated CONFIG.INI file from OTM to the Voice Gateway Media Card.<br>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.<br>Example:<br>IPL> **configFileGet** “ngals042”, “anonymous”, “guest”, “/configDir”, “config.ini” | X |
| **bootPFileGet**<br>“hostname”,<br>“username”,<br>“password”,<br>“directory path”,<br>“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.<br>Example:<br>IPL> **bootPFileGet** “ngals042”, “anonymous”, “guest”, “/bootpDir”, “bootptab” | X |

**Table 72**
**File Transfer commands (Part 3 of 4)**

| IPL> Commands | Description | 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.<br>***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.<br>Example:<br>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.<br>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.<br>Example:<br>IPL> **currOMFilePut** “ngals042”, “anonymous”, “guest”, “/currDir”, “omFile” | X |
| **prevOMFilePut** “hostname”, “username”, “password”, “directory path”, “filename” | Sends the previous Operational Measurements (OM) file to the specified host.<br>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.<br>Example:<br>IPL> **prevOMFilePut** “ngals042”, “anonymous”, “guest”, “/prevDir”, “omFile” | X |

**Table 72**
**File Transfer commands (Part 4 of 4)**

| IPL> Commands | Description | Signaling Server |
|---|---|---|
| **LogFilePut**<br>"hostname",<br>"username",<br>"password",<br>"directory path",<br>"filename" | Sends the syslog file from the Voice Gateway Media Card to OTM.<br>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.<br>Example:<br>IPL> **LogFilePut** "ngals042", "anonymous", "guest", "/currDir", "logFile" | |
| **bootPFilePut**<br>"hostname",<br>"username",<br>"password",<br>"directory path",<br>"filename" | Sends the BOOTPtab file from the Voice Gateway Media Card to OTM.<br>Example:<br>IPL> **bootPFilePut** "ngals042", "anonymous", "guest", "/bootpDir", "bootpFile" | X |
| **hostFilePut**<br>"hostname",<br>"username",<br>"password",<br>"directory path",<br>"filename",<br>ITGFileName | Transfers any file from the Voice Gateway Media Card to the OTM PC.<br>Example:<br>IPL> **hostFilePut** "ngals042", "anonymous", "guest", "/hostDir", "hostFile", "/C:/CONFIG/CONFIG1.INI" | X |
| **omFilePut**<br>"hostname",<br>"username",<br>"password",<br>"directory path",<br>"filename",<br>ITGFileName | Sends the current Operational Measurements (OM) file to the specified host.<br>Example:<br>IPL> **OMFilePut** "ngals042", "anonymous", "guest", "/hostDir", "omFile" | X |

## IP configuration commands

Table 73 lists the IP configuration IPL> commands.

**Table 73**
**IP Configuration commands**

| IPL> Command | Description | 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. | |

## Reset commands

Table 74 lists the Reset IPL> commands.

**Table 74**
**Reset commands**

| IPL> Command | Description | 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**<br>**isetReset "tn" c u** | Resets the IP Phone on Option 51C/61C/81/81C.<br>Resets the IP Phone on Small Systems and CS 1000 systems. | X |
| **isetResetAll** | Resets all registered IP Phones. | 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. | |

## DSP commands

Table 75 lists the DSP IPL> commands applicable to the Voice Gateway Media Card.

**Table 75**
**DSP commands**

| IPL> Command | Description | Signaling Server |
|---|---|---|
| **DSPReset** | Resets the specified DSP. | |
| **DSPNumShow** | Displays the number of DSPs on the Voice Gateway Media Card. | |

## Upgrade commands

Table 76 lists the upgrade IPL> commands.

**Table 76**
**Upgrade commands**

| IPL> Command | Description | Signaling Server |
|---|---|---|
| **umsPolicyShow** | Displays the current upgrade policy. | X |
| **umsUpgradeAll** | Upgrades all registered IP Phones according to policy and firmware file. | X |
| **umsUpgradeTimerShow** | Shows the upgrade schedule. | X |
| **umsUpgradeTimerCancel** | Cancels the scheduled upgrade. | X |

## IPL> shell commands

Table 77 lists the command to change the IPL> shell password.

**Table 77**
**IPL> shell command**

| IPL> command | Description | Signaling Server |
|---|---|---|
| **shellPasswordSet** | Changes the current user name and password of the IPL> CLI shell. | |

## IP Phone Installer Password commands

Table 78 lists the IP Phone Installer Password commands.

**Table 78**
**IP Phone Installer Password commands (Part 1 of 3)**

| IPL> command | Description | Signaling Server |
|---|---|---|
| **nodePwdSet "password"** | Sets and enables the administrative IP Phone Installer (node) Password. This is also known as the node level IP Phone Installer Password.<br>If a null password (0 characters in length) is configured, all IP Phones that attempt to register after this command has been issued display a prompt for node password before the TN can be modified.<br>The "password" parameter must be null or 6 to 14 digits in length; The valid characters are 0 – 9 * #.<br>The null password causes the Node ID and Password screen on the IP Phone 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 IP Phone 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 IP Phone Installer Password setting. After this command is entered, all IP Phones registering display the password screen. | X |

**Table 78**
**IP Phone Installer Password commands (Part 2 of 3)**

| IPL> command | Description | Signaling Server |
|---|---|---|
| **nodePwdDisable** | Disables both the administrative and the temporary IP Phone Installer Password settings. After this command is entered, all IP Phones display the original Node ID and TN screen during registration. | X |

**Table 78**
**IP Phone Installer Password commands (Part 3 of 3)**

| IPL> command | Description | Signaling Server |
|---|---|---|
| **nodeTempPwdSet** “tempPwd”, uses, <time> | Sets the temporary IP Phone Installer Password. This password is disabled by default.<br>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 * #.<br>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.<br>• If the uses parameter is set to zero, the time parameter is mandatory. As a result, the password only expires based on time.<br>• If the uses parameter is non-zero, the time parameter is optional.<br>• 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.<br>• 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.<br>This command can be entered at any time and the new parameters overwrite the existing temporary password’s parameters. | X |
| **nodeTempPwdClear** | Deletes the temporary IP Phone Installer Password. It also reset the uses and time parameters to zero. | X |

## Voice Gateway commands

Table 79 lists the Voice Gateway commands used on the Voice Gateway Media Card.

**Table 79**
**Voice Gateway commands**

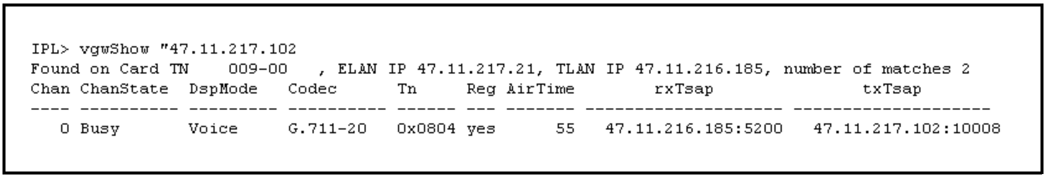
| IPL> command | Description | Signaling Server |
|---|---|---|
| **vgwPLLog** | Toggles gateway packet loss logging on and off. | |
| **vgwShow** | Displays information about the active (non-idle and equipped) gateway channels.<br>Entering this command with the IP address of an IP Phone at the Command 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 IP Phone. This information is useful when there is a need to identify from which card to collect gateway statistics (for example, packet loss). | |
| **vgwShowALL** | Displays information about all gateway channels. | |

### vgwShow

The **vgwShow** command can be issued with no parameters or with the IP address of an IP Phone using one of the Voice Channels.
**vgwShow "x.x.x.x"**
where "x.x.x.x" is the IP address of one of the IP Phones.

The IP address "x.x.x.x" is the PUBLIC IP address of the IP Phone. If there are multiple IP Phones using the same public IP address, the output will be similar to the example shown in Figure 197 on page 602.

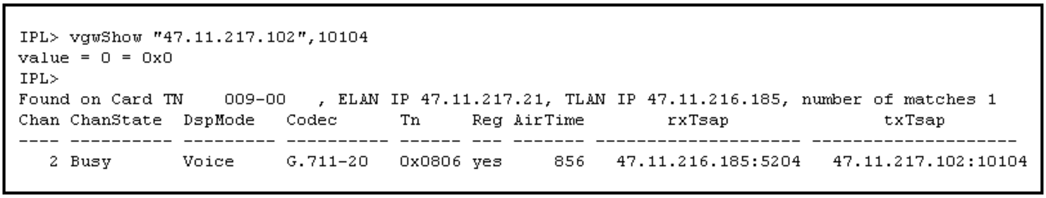
**Figure 197**
**vgwShow command sample output**



```
IPL> vgwShow "47.11.217.102
Found on Card TN    009-00   , ELAN IP 47.11.217.21, TLAN IP 47.11.216.185, number of matches 2
Chan ChanState  DspMode   Codec      Tn     Reg AirTime        rxTsap               txTsap
---- ---------- --------- ---------- ------ --- ------- -------------------- --------------------
   0 Busy       Voice     G.711-20   0x0804 yes      55   47.11.216.185:5200   47.11.217.102:10008
```

The number of IP Phones that use that public IP address is printed (**2** in this example), but only one of the IP Phones is displayed. To see the other IP Phone, determine the Public IP address and Public Media Port using the command **isetNATShow**. Then enter **vgwShow** using the Public IP address and Public Media Port. An example of the output is shown in Figure 198.

**Figure 198**
**vgwShow sample with Public information**



```
IPL> vgwShow "47.11.217.102",10104
value = 0 = 0x0
IPL>
Found on Card TN    009-00   , ELAN IP 47.11.217.21, TLAN IP 47.11.216.185, number of matches 1
Chan ChanState  DspMode   Codec      Tn     Reg AirTime        rxTsap               txTsap
---- ---------- --------- ---------- ------ --- ------- -------------------- --------------------
   2 Busy       Voice     G.711-20   0x0806 yes     856   47.11.216.185:5204   47.11.217.102:10104
```

## Data Path Capture Tool commands

Table 80 lists the commands used with the Data Path Capture Tool.

**Table 80**
**Data Path Capture Tool commands**

| IPL> command | Description | 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 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. | |

## Translation IP/DN commands

Table 81 lists the LD 117 commands to translate an IP Phone's DN to its IP address and its IP address to its DN.

**Table 81**
**Translation IP/DN commands**

| IPL> command | Description | Signaling Server |
|---|---|---|
| **PRT DNIP**<br><DN><br>[<CustomerNo>] | Prints a list of IP addresses for every IP Phone registered with the specified DN. | |
| **PRT IPDN**<br><IPAddress> | Prints a list of DNs configured for the specified IP address(es). | |

### *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 IP Phone for that customer.
  - TN
  - set type

— key number of DN appearance and type of DN

— current IP address of the IP Phone

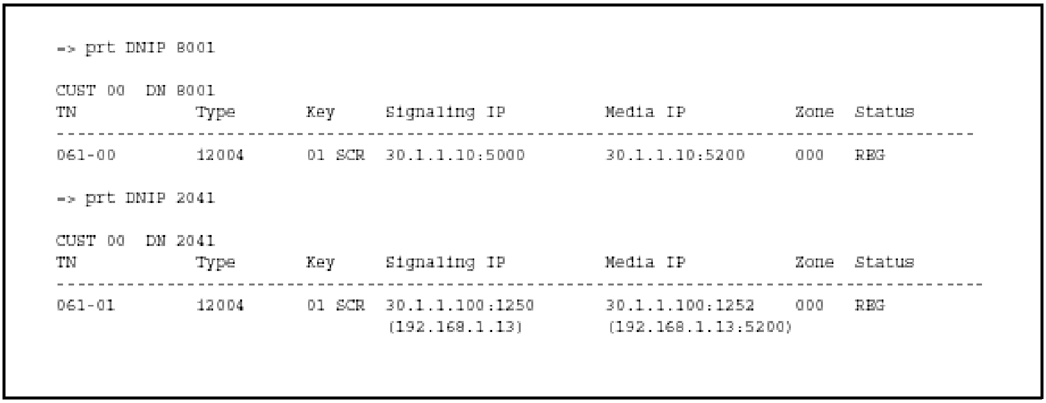
— configured zone for the IP Phone

— state of the IP Phone’s registration

If the IP Phone is behind a NAT device, the public IP address is displayed, with the private IP address underneath in parenthesis.

An example of PRT DNIP output is shown in Figure 199.

**Figure 199**
**PRT DNIP output**



```
=> prt DNIP 8001

CUST 00  DN 8001
TN            Type       Key     Signaling IP          Media IP           Zone  Status
--------------------------------------------------------------------------------------------
061-00        12004      01 SCR  30.1.1.10:5000        30.1.1.10:5200     000   REG

=> prt DNIP 2041

CUST 00  DN 2041
TN            Type       Key     Signaling IP          Media IP           Zone  Status
---------------------------------------------------------------------------------------------
061-01        12004      01 SCR  30.1.1.100:1250       30.1.1.100:1252    000   REG
                                 (192.168.1.13)        (192.168.1.13:5200)
```

### *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 IP Phone using the specified IP address
- information for all DNs configured on that IP Phone

— key number of DN appearance and type of DN

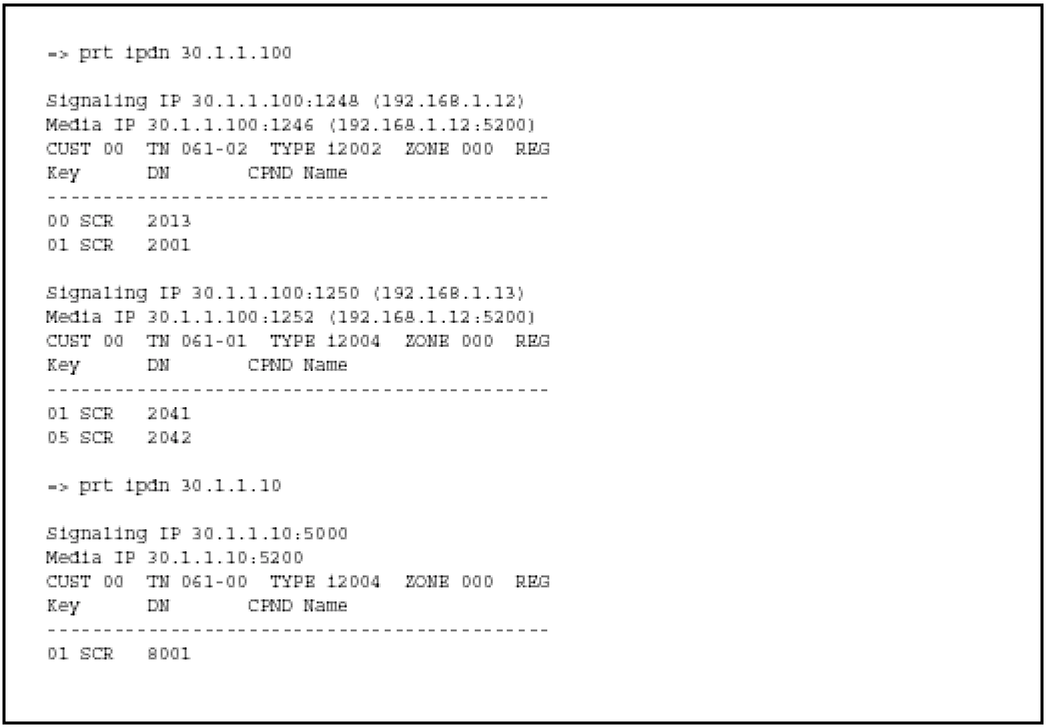
— DN

— configured CPDN for the DN

If the IP Phone is behind a NAT device, the public IP address is displayed, followed by the private IP address in parenthesis.

An example of PRT IPDN output is shown in Figure 200.

**Figure 200**
**PRT IPDN output**



```
=> prt ipdn 30.1.1.100

Signaling IP 30.1.1.100:1248 (192.168.1.12)
Media IP 30.1.1.100:1246 (192.168.1.12:5200)
CUST 00  TN 061-02  TYPE i2002  ZONE 000  REG
Key      DN       CPND Name
---------------------------------------------
00 SCR   2013
01 SCR   2001

Signaling IP 30.1.1.100:1250 (192.168.1.13)
Media IP 30.1.1.100:1252 (192.168.1.12:5200)
CUST 00  TN 061-01  TYPE i2004  ZONE 000  REG
Key      DN       CPND Name
---------------------------------------------
01 SCR   2041
05 SCR   2042

=> prt ipdn 30.1.1.10

Signaling IP 30.1.1.10:5000
Media IP 30.1.1.10:5200
CUST 00  TN 061-00  TYPE i2004  ZONE 000  REG
Key      DN       CPND Name
---------------------------------------------
01 SCR   8001
```

### *Partial IP addresses*

Partial IP addresses 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 IP Phones 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 IP Phones 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 IP Phones 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 IP Phones 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 IP Phones 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
```

## Graceful TPS commands

Table 83 and Table 84 on page 615 lists the commands used to gracefully disable the LTPS 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 82**
**Graceful TPS commands (Part 1 of 2)**

| Command | Description |
|---|---|
| **disiTPS** | Disables the LTPS service only.<br>No new IP Phones are registered on the card and all registered IP Phones are reset when they become idle.<br>This command applies to both the Voice Gateway Media Card and Signaling Server. On the 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 LTPS. |
| **disiVGW** | Disables the Voice Gateway only.<br>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 stand-alone 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.<br>On the 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 LTPS. |
| **enaTPS** | Enables the LTPS service.<br>This command is used after the disTPS command to bring the LTPS back into service.<br>This command applies to both Voice Gateway Media Cards and the Signaling Server. On the Signaling Server, this command affects the LTPS only. It does not affect the virtual trunks or gatekeeper components. |

**Table 82**
**Graceful TPS commands (Part 2 of 2)**

| Command | Description |
|---|---|
| **enaVGW** | Enables the Voice Gateway.<br>All gateway channels register with the Call Server. This command is applicable only to the Voice Gateway Media Card or the stand-alone 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.<br>On the Signaling Server, this command affects only the LTPS. It does not affect the virtual trunks or gatekeeper components. |
| **disableServices** | Causes the Voice Gateway Media Card or Signaling Server to gracefully switch the registered resources to the other Voice Gateway Media Cards or Signaling 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 Signaling Server to re-register with the other Voice Gateway Media Cards or Signaling Servers in the node. This command interrupts established calls. |
| **enableServices** | Enables all the Voice Gateway Media Cards or Signaling Servers to accept registrations of resources. |
| **levelRegistations** | Causes the Voice Gateway Media Card or Signaling Server to attempt to balance the registration load between this card/server and the rest of the node components. |

**Table 83**
**Graceful Disable commands (Part 1 of 2)**

| IPL> command | Description | Signaling Server |
|---|---|---|
| **disServices** | Causes the Voice Gateway Media Card or Signaling Server to gracefully switch the registered resources to the other Voice Gateway Media Cards or Signaling 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.<br>Gracefully disables the LTPS on the Signaling Server. | X |
| **disiTPS** | Gracefully disables the LTPS service on the Voice Gateway Media Card. Prevents new IP Phones registering on the card, and all registered IP Phones 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.<br>Enables the LTPS on the Signaling Server. | X |
| **enlServices** | Enables all the Voice Gateway Media Cards or Signaling 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 Signaling Server to re-register with the other Voice Gateway Media Cards or Signaling Servers in the node. This command will interrupt established calls | X |

**Table 83**
**Graceful Disable commands (Part 2 of 2)**

| IPL> command | Description | Signaling Server |
|---|---|---|
| **loadBalance** | Causes the Voice Gateway Media Card or Signaling Server to attempt to balance the registration load between this card/server and the rest of the node components. | X |

## IP Phone Loss Plan (UK) commands

These commands set and adjust the gains for the UK (or other places where loss plan adjustment of IP Phones is needed).

**Table 84**
**IP Phone Loss Plan commands**

| IPL> command | Description | Signaling Server |
|---|---|---|
| **UKLossPlanSet** | Increases the Tx level of the IP Phone to match the requirement for the UK. | X |
| **UKLossPlanClr** | Removes the loss plan adjustment and returns the IP Phone to the default loss plan levels. | X |
| **lossPlanPrt** | Prints the current IP Phone 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).<br>The rlrOffset adjusts the level heard at the IP Phone.<br>The slrOffset adjusts the level transmitted from the IP Phone.<br>Positive numbers reduce the level (add loss).<br>Negative numbers increase the level (add gain). | X |
| **lossPlanClr** | Removes the loss plan adjustment and returns the IP Phone 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 process ensures that the data is correctly propagated 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 IP Phones registered to that new card have the default loss plan levels.

**CAUTION**

Care must be taken when altering the IP Phone'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.

## Patch and Patching Tooling tool commands

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 Signaling Server are accessible at the IPL> prompt. These commands are summarized in Table 85 on page 618 and Table 86 on page 622.

> ***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 85 lists the patch commands.

**Table 85**
**Patch commands (Part 1 of 3)**

| 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.<br>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).<br>Syntax:<br>pload "[patch-filename]"<br>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.<br>If the pload command is issued without a parameter, enter the patch filename and other information when prompted. |
| **pins** | Puts a patch that has been loaded into memory (using the pload command) into service. This command activates a patch.<br>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.<br>Syntax:<br>pins "[handle]"<br>where [handle] is the number returned by the pload command<br>If the pins command is issued without a parameter, enter a handle when prompted. |

**Table 85**
**Patch commands (Part 2 of 3)**

| Command | Description |
|---|---|
| **poos** | Deactivates a patch (takes it out-of-service) by restoring the patched procedure to its original state.<br>Syntax:<br>poos "[handle]"<br>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.<br>Syntax:<br>pout "[handle]"<br>If the pout command is issued without a parameter, enter a handle when prompted. |
| **pstat** | Gives summary status information for one or all loaded patches.<br>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.<br>***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.<br>Syntax:<br>pstat "[handle]"<br>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. |

**Table 85**
**Patch commands (Part 3 of 3)**

| Command | Description |
|---|---|
| **plis** | Gives detailed patch status information for a loaded patch.<br>Syntax:<br>plis “[handle]”<br>If the pout command is issued without a parameter, enter a handle when prompted. |
| **pnew** | Creates memory patches for the Voice Gateway Media Card.<br>• The release of the patch is assumed to be the same as that of the current load.<br>• The address to be patched is checked to ensure that it is in range.<br>• For each address that is changed, the “old” contents are assumed to be the current contents of that memory address.<br>• 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.<br>Once a memory patch is created using the pnew command, it is loaded and activated like any other patch.<br>Syntax:<br>pnew<br>***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 86 lists the Patching Tool commands.

**Table 86**
**Patching Tool commands**

| IPL> command | Description | 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 |

## General trace tool commands

**IMPORTANT!**

A warm boot of the system causes all tracing to cease. Traces must be re-entered after the system has restarted.

Table 87 lists the general trace tool commands applicable to the Voice Gateway Media Cards. They are issued from the LTPS prompt of the Voice Gateway Media Cards.

**Table 87**
**General trace tool commands (Part 1 of 2)**

| CLI Command | Description | Signaling Server |
|---|---|---|
| traceShow | Displays the names of active traces in the system. | X |
| traceAllOff | Causes all traces that use the monitorLib server to stop their output. This is a temporary disabling function. | X |
| tracePrintOff | Blocks all logging of information received by the monitorLib service to the TTY output. This does not include traces directed through the monitorLib service to the RPT.LOG or SYSLOG.n services. | X |
| traceFileOff | Causes the monitorLib server to stop logging to the log files any and all trace information received by the service. The log files include syslog.n for the Voice Gateway Media Card and rpt.log for the Signaling Server. | X |
| traceAllOn | Clears the blocking of all trace information imposed on the monitorLib service by the traceAllOff command, the tracePrintOff command, and the traceFileOff command. By default, all tracing is on. | X |

**Table 87**
**General trace tool commands (Part 2 of 2)**

| CLI Command | Description | Signaling Server |
|---|---|---|
| tracePrintOn | Clears only the TTY output blocking that was imposed by the traceAllOff and tracePrintOff commands. | X |
| traceFileOn | Clears only the blocking of logging to files that was imposed by the traceAllOff and traceFileOff commands. | X |

***Note 1:*** If no directory path is supplied with the file name specified, then the file is written to the C:/U/trace directory on the Voice Gateway Media Cards and to the /u/trace directory on the Signaling Server.

***Note 2:*** If no file name is given, then no trace file is generated and output is directed to the TTY. If the file name does not meet the DOS 8.3 restriction, then the file name is rejected and no file is generated. If the file is deleted, cannot be found, or has a write error, then the output is directed to the TTY.

***Note 3:*** If the output for the trace cannot be determined, then the output is directed to the TTY.

## Protocol trace tool commands for the Network Connection Service

**IMPORTANT!**

A warm boot of the system causes all tracing to cease. Traces must be re-entered after the system has restarted.

Table 88 includes the protocol trace tool commands for the Network Connection Service (NCS) applicable to the Voice Gateway Media Cards. They are issued from the OAM shell.

**Table 88**
**Protocol trace tool CLI commands for the NCS (Part 1 of 3)**

| CLI Command | Description | Signaling Server |
|---|---|---|
| tpsARTrace<br>IP <IP Address><br>ID <user ID><br>ALL | Allows tracing of the tpsAR protocol, which is used to determine where an IP Phone should register.<br>Where:<br>• IP Address - a string containing the IP Phone's IP address<br>• user UID - the ID of the IP Phone to be traced (the DN used to log in) or the H323_Alias of where the IP Phone is trying to register<br>• ALL - all IP Phones are to be monitored | X |
| tpsARTraceOff<br>IP <IP Address><br>ID <user ID><br>ALL | Removes the specified endpoint from the list of endpoints to be traced. | X |

**Table 88**
**Protocol trace tool CLI commands for the NCS (Part 2 of 3)**

| CLI Command | Description | Signaling Server |
|---|---|---|
| tpsAROutput<br><Output_Destination><br><"File Pathname"> | Sets the output for all tpsAR protocol traces.<br>Where:<br>• Output_Destination specifies where all the trace messages for the tpsARTraceSet are to be directed.<br>If the command is run from the Voice Gateway Media Card or the vxshell prompt:<br>The values are:<br>1 = TTY<br>2 = RPTLOG<br>3 = File<br>4 =TTY + File<br>If the command is run from the OAM prompt or PDT prompt on the Signaling Server:<br>The values are the actual word, not a number:<br>TTY<br>RPTLOG<br>FILE<br>TTY+FILE<br>• "File Pathname" is a string encapsulated in quotes. It specifies the file to output to if option 3 or 4 was selected. | X |
| tpsARTraceSettings | Displays the trace tool settings, which endpoints are being traced, and where the trace output is being directed. | X |

**Table 88**
**Protocol trace tool CLI commands for the NCS (Part 3 of 3)**

| CLI Command | Description | Signaling Server |
|---|---|---|
| tpsARTraceHelp | Displays a list of all CLIs used for tracing tpsAR protocol messages, including usage and parameters. | X |

# Lamp Audit and Keep Alive functions

The Lamp Audit function provides a continuous source of heartbeat messages to ensure the IP Phone is powered and the IP connection is alive. Since there is a reliable UDP connection from the core through to the IP Phones, any failure of the IP Phone, 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 defined in LD 30. Fore more information, refer to *Software Input/Output: Maintenance* (553-3001-511).

### IP Phone Keep Alive

When the Voice Gateway Media Card detects that the IP Phone has been disconnected, the Voice Gateway Media Card logs the event and sends an UNREGISTER message to the system for that IP Phone.

### Card or ELAN subnet 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 IP Phones and gateway channels associated with that Voice Gateway Media Card.

## Maintenance audit

IP Line 4.0 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 4.0 application running on the ITG-P 24-port and Media Card line cards. It is not available on the 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 89.

**Table 89**
**Maintenance audit commands (Part 1 of 2)**

| Command | Description |
|---|---|
| **auditShow** | Displays the following information:<br>• whether a card reboot is enabled<br>• the time a card reboot will occur if a non-critical task is found suspended<br>• a list of all tasks being monitored and their designation (critical or non-critical)<br>Example:<br>**IPL> auditShow**<br>**Reboot when detect a suspended task --- Disabled**<br>**Critical Task: tTPS tVTM tSET tVTI tUMS tUMC tRDP tPBX tVGW tRTP tRTCP tELC baseMMintTask tA07 tShell tNetTask tExcTask tTelnetd**<br>**Non-Critical Task: tTest** |
| **auditHistoryShow** | Displays the contents of the audit.his file. |
| **auditRebootSet** 0/1 | Globally disables the card reboot from this audit task.<br>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.<br>The debug information is dumped; however, recovery requires a manual reset of the card. |

**Table 89**
**Maintenance audit commands (Part 2 of 2)**

| Command | Description |
|---|---|
| **auditRebootTimeSet** "timeString" | Sets the reset time for non-critical tasks to the value defined by the timeString parameter.<br>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.<br>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.<br>The value of 0 marks the task as non-critical, the value of 1 marks it as critical. |

Table 90 lists the Audit commands.

**Table 90**
**Audit commands**

| Command | Description | 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 4.0 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.

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 IP Phone installation

If an IP Phone cannot be installed because the prompt for the node ID or TN does not display, follow the steps in Procedure 98.

**Procedure 98**
**Troubleshooting an IP Phone installation**

**1** Log into 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 the IP Phone cannot be installed on that Voice Gateway Media Card.

```
NodeI    PwdEn    Pwd        TmpPw     Uses     Timeout
D        a        ======     d         =====    ==========
=====    =====    ==         ======    ==       0d 0h 0m 0s
=        ==                  ==
123      Yes
```

**4** Use the **nodePwdSet “password”** command to set the administrative password and to enable IP Phones to be installed. Ensure the “password” parameter is included.

**End of Procedure**

# Maintenance telephone

An IP Phone 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 IP Phone 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 IP Phones 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 for vintages earlier than NTVQ01BB and NTVQ01AB are:

- Version 6.7 for the Media Card
- Version 5.7 for the ITG-P 24-port line card

*Note:* NTVQ01BB and NTVQ01AB Voice Gateway Media Cards require Version 8.0 software, which is pre-loaded in the factory.

Check the Nortel Networks web site for the most current version of the firmware. See Appendix F on page 763.

Once the most current version of the firmware has been downloaded, follow the steps in:

- Procedure 99 on page 639 to upgrade the 8051 XAController firmware on the ITG-P 24-port line card
- Procedure 100 on page 642 to upgrade the 8051 XAController firmware on the Media Card

## Upgrade the ITG-P 24-port line card 8051 XAController firmware

Follow the steps in Procedure 99 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 99**
**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, vintages earlier than NTVQ01AB do not require the upgrade. There is no need to download the Version 8.0 software for the Voice Gateway Media Card NTVQ01AB as the software is pre-loaded at the factory.

**2** Depending on the location of the firmware file, enter one of the following commands as shown in Table 91:

The file name for the 8051 XAController firmware for the ITG-P 24-port line card is ITGPFW57.BIN

**Table 91**
**Upgrade command based on file location**

| |
|---|
| — File is located on the card's /C: drive (The file was previously FTP’d to /C:):<br>upgradeXa “127.0.0.1","userid”,"password”,"</C:/path>”,"<fw_filename>” |
| — File is located on a PC Card plugged in the card’s faceplate:<br>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:):<br>upgradeXa “<ITG ELAN IPaddr>”,"userid”,"password”,"<path>”,"<fwfilename>” |
| — File is located on the OTM PC:<br>upgradeXa “<PC’s IP addr>”,"itguser”,"itguser”,"“,”<fw_filename>” |
| — File is located on a network FTP server:<br>upgradeXa "<server’s IP addr>","<uid>","<pswd>","<path>","<fw_filename>" |

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.

**3** 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.

4 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., 1996-2004
32K External RAM detected
All FPGAs are configured
No dongle detected
8K DPRAM detected

Bank 0 Checksum - 54A9H
....
```

**End of Procedure**

## Upgrade the Media Card 8051 XAController firmware

Upgrades of the 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 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 100 to upgrade the Media Card 8051 XAController firmware.

**Procedure 100**
**Upgrading the 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.

4 While the card is booting, break into the BIOS by entering **jkl** when prompted.

5 At the prompt enter the following commands:

```
-> initMm
value = 0 = 0x0
-> spawnMm
value = 0 = 0x0
```

6 Depending on the location of the software file, enter one of the following commands as shown in Table 92.

The file name for the 8051 XAController firmware for the Media Card is SMCFW65.BIN.

**Table 92**
**Upgrade command based on file location**

| |
|---|
| — File is located on the card's /C: drive (The file was previously FTPed to /C:):<br>**upgradeXa “127.0.0.1","userid","password","</C:/path>","<fw_filename>"** |
| — File is located on a PC Card plugged in the card’s faceplate:<br>**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:):<br>**upgradeXa "<ITG ELAN IPaddr>","userid","password","<path>","<fw_filename>"** |
| — File is located on the OTM PC:<br>**upgradeXa "<PC’s IP addr>","itguser","itguser","","<Fw_filename>"** |
| — File is located on a network FTP server:<br>**upgradeXa "<server’s IP addr>","<uid>","<pswd>","<path>","<Fw_filename>"** |

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.

When the card boots up with version 8.0 software, for instance, the following messages are printed:

```
MC Firmware Rls 8.0
8051XA Firmware Version 4.11 05 November 2003
(C) Nortel Inc. 2001
EPLD Version: 1.0
64K External RAM detected
8K DPRAM detected
All FPGAs are configured
No security Device detected
Bank 0 Checksum - CAA3H
SRAM test okay
SDRAM Addr test okay
SDRAM blank over
```

**End of Procedure**

# Replace the Media Card's CompactFlash

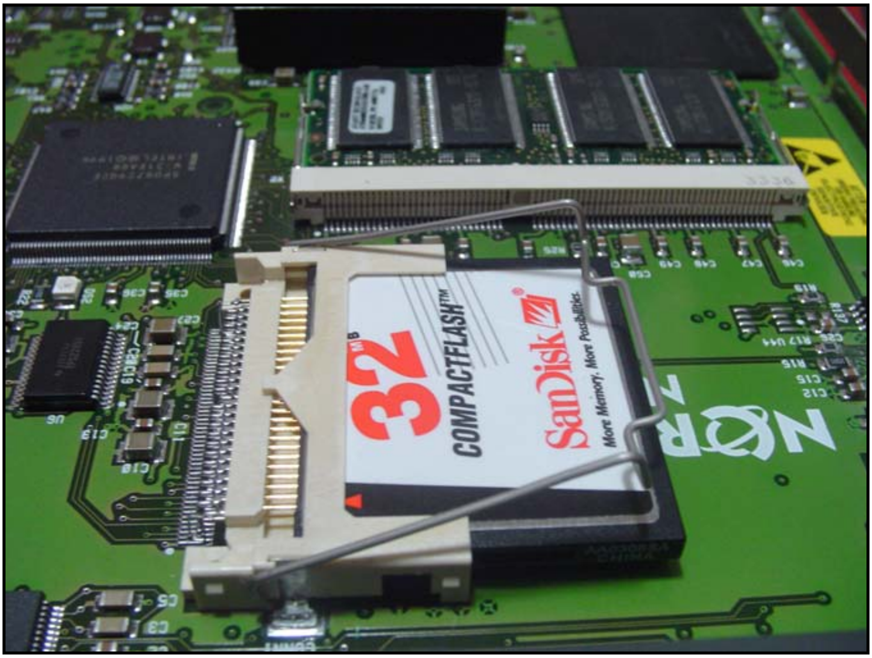
The Media Card must have the CompactFlash card installed in order to be used as a Voice Gateway Media Card. If the CompactFlash card is removed from the Media Card, another CompactFlash card must be installed before using the Media Card.

If it is necessary to remove the CompactFlash card, follow the steps in Procedure 101. To re-install a CompactFlash card, see Procedure 11 on page 210.

**Procedure 101**
**Removing the CompactFlash**

1 Lift the metal clip that holds the CompactFlash card in the socket on the Voice Gateway Media Card. See Figure 201.

**Figure 201**
**Lift the metal clip on the CompactFlash card**



**2** Slide the card out of the socket and carefully remove the CompactFlash card.

**3** Return the CompactFlash card to an anti-static package.

**End of Procedure**

# Voice Gateway Media Card maintenance using OTM 2.2

## Contents

This section contains information on the following topics:

## Introduction

This chapter provides information on using Optivity Telephony Management (OTM) 2.2 to perform maintenance functions on the Voice Gateway Media Card.

Where reference is made to OTM, the latest version, OTM 2.2, is assumed.

**CAUTION**

This procedure is not supported for a node that resides on a CS 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 102.

**CAUTION**

This procedure is not supported for a node that resides on a CS 1000 system.

**Procedure 102**
**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 LTPS 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 IP Phone. The Voice Gateway Media Card card is completely disabled when no IP Phones are 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/ CS 1000M IPE module, Option 11C/CS 1000M Cabinet, or CS 1000 Media Gateway 1000S/Media Gateway 1000S Expander. 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 start-up self-test results and status messages. A display of the type **F:xx** indicates a failure. Refer to Table 64 on page 569 for a listing of the ITG-P 24-port line card's display codes and to Table 65 on page 571 for a listing of the Media Card's display codes.

**7** Follow the steps in Procedure 31 "Setting the Leader 0 IP address" on page 296 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 103 to replace a Follower Voice Gateway Media Card.

**Procedure 103**
**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 LTPS 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 IP Phones. The Voice Gateway Media Card card is completely disabled when there are no IP Phones registered on the card.

5 Remove the faulty Voice Gateway Media Card from the system.

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/CS 1000M IPE module, Option 11C/CS 1000M Cabinet, or CS 1000 Media Gateway 1000S/Media Gateway 1000S Expander. 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 start-up self-test results and status messages. A display of the type **F:xx** indicates a failure. Refer to Table 64 on page 569 for a listing of the ITG-P 24-port line card's display codes and to Table 65 on page 571 for a listing of the 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 IP Phone, follow the steps in Procedure 104.

**CAUTION**

This procedure is not supported for a node that resides on a CS 1000 system.

**Procedure 104**
**Verifying the Voice Gateway Media Card software and firmware**

***Note:*** Refer also to Procedure 34, “Verifying card loadware and IP Phone firmware using OTM 2.2” on page 306.

**1** Check the Nortel Networks Customer Support web site for the latest IP Line software and IP Phone firmware releases. Download the appropriate IP Line 4.0 file. See Appendix F on page 763.

- Download the **IP Line 4.0xx.sa.zip** for the Media Card. This zipped file contains the IP Line 4.0 loadware for the Media Card, the IP Phone firmware, and a readme.txt file.
- Download the **IP Line 4.0xx.p2.zip** for the ITG-P card. This zipped file contains the IP Line 4.0 loadware for the ITG-P card, the IP Phone firmware, and a readme.txt file.

See Appendix F on page 763 for information on downloading files from the Nortel Networks web site.

***Note:*** The IP Line software and IP Phone firmware files are contained in the **IP Line 4.0.xx SA** file in the **Internet Telephony Gateway** product list on the Nortel Networks web site.

The zipped file contains:

- the **IPL400xx.p2** and **IPL400xx.sa** software files. The IPL400xx.p2 file is the IP Line application for the ITG-P 24-port line card and the IPL400xx.sa is the IP Line 4.0 application for the Media Card.
- the **0602Bxx.BIN** (Phase I IP Phone 2004), **0603Bxx.BIN** (Phase I IP Phone 2002), and **0603Dnn. BIN** (Phase II IP Phone 2001, IP Phone 2002, and IP Phone 2004) firmware files.
- For example, a firmware version labelled 0602B38 means IP Phone firmware version 1.38 where:
  - The 02 represents the IP Phone 2004.
  - 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 **IP Phone 2002 or IP Phone 2004 F/W version** is the latest recommended release of the IP Phone 2002 or IP Phone 2004 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 2.2 PC" on page 311 and "Upgrading the IP Phone firmware" on page 316.

**End of Procedure**

## Transmit card properties to the cards

To transmit cards properties to the Voice Gateway Media Cards, follow the steps in Procedure 105.

**CAUTION**

This procedure is not supported for a node that resides on a CS 1000 system.

**Procedure 105**
**Transmitting card properties**

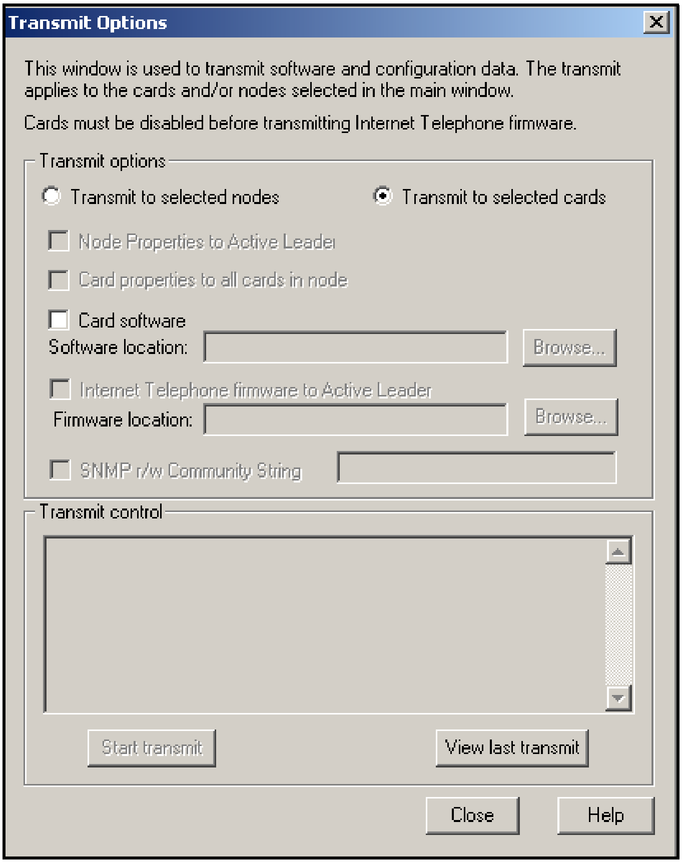
1 In the **OTM Navigator**, select the **Services** folder. Double-click on the **IP telephony** icon. The **IP Telephony** window opens.

2 Select the replacement Voice Gateway Media Card.

3 Click **Configuration** > **Synchronize** > **Transmit**.

4 The **Transmit Options** window opens. See Figure 202 on page 657.

**Figure 202**
**Transmit Options dialog box**



Transmit Options

This window is used to transmit software and configuration data. The transmit applies to the cards and/or nodes selected in the main window.

Cards must be disabled before transmitting Internet Telephone firmware.

Transmit options

○ Transmit to selected nodes ● Transmit to selected cards

□ Node Properties to Active Leader

□ Card properties to all cards in node

□ Card software

Software location:

□ Internet Telephone firmware to Active Leader

Firmware location:

□ SNMP r/w Community String

Transmit control

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 page 198.
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 82, “Accessing a Voice Gateway Media Card using Telnet” on page 503.

## Add a “dummy” node for retrieving and viewing IP Telephony node configuration

Follow the steps in Procedure 106 on page 660 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 106 to create the “dummy” IP Telephony node.

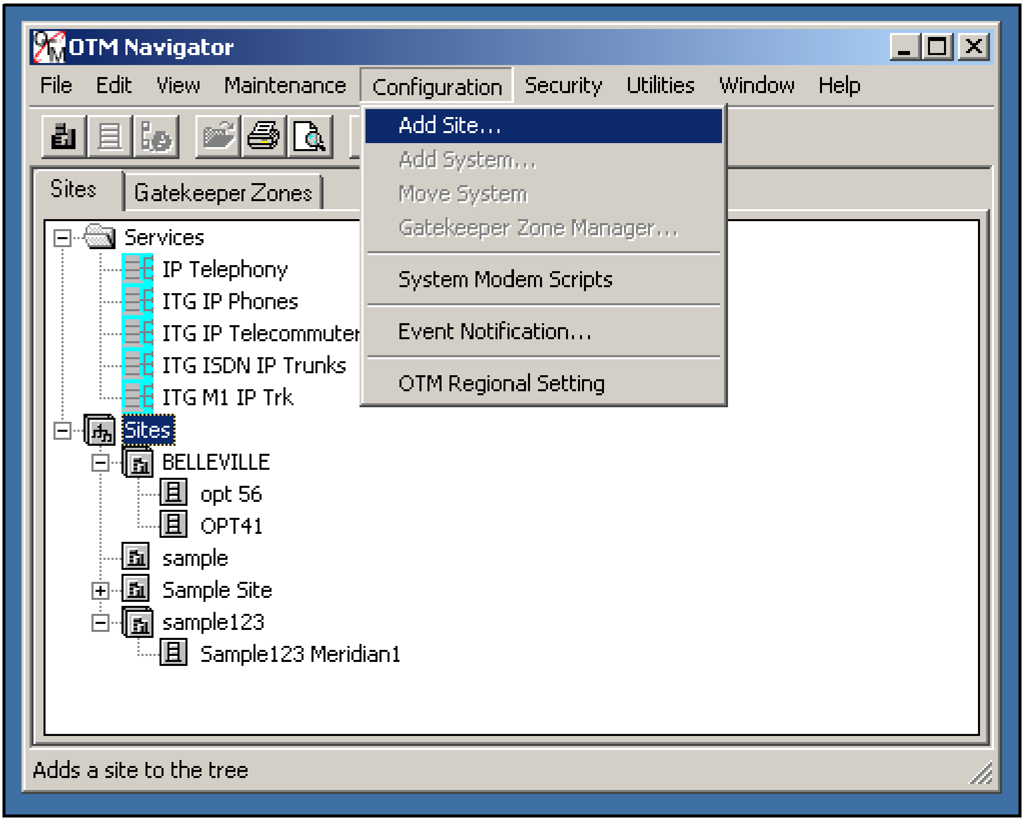
**CAUTION**

This procedure in is not supported for a node that resides on a CS 1000 system.

**Procedure 106**
**Creating the “dummy” IP Telephony node to retrieve configuration**

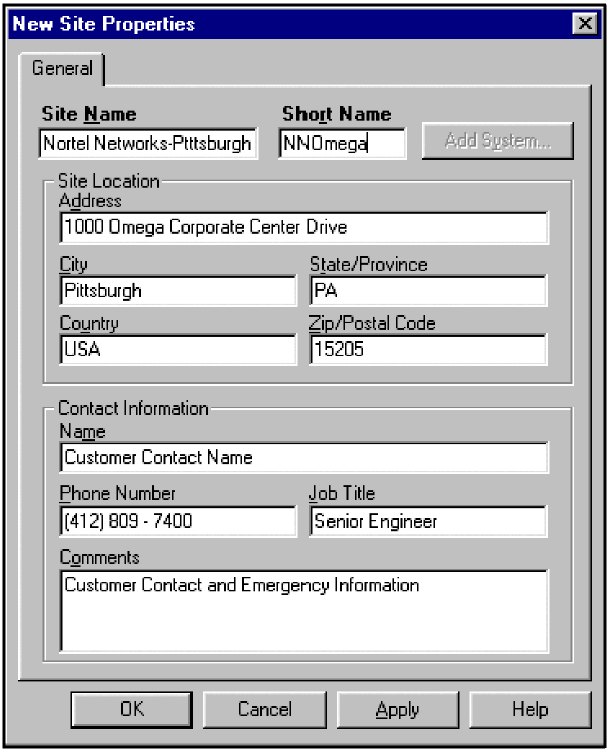
1 In **OTM Navigator**, click **Sites > Configuration > Add Site.** See Figure 203.

**Figure 203**
**OTM Navigator – Configuration > Add Site**



**2** The **New Site Properties** window opens. See Figure 204.

**Figure 204**
**New Site Properties**



New Site Properties

General

Site Name: Nortel Networks-Pttsburgh

Short Name: NNOmega

Site Location

Address: 1000 Omega Corporate Center Drive

City: Pittsburgh

State/Province: PA

Country: USA

Zip/Postal Code: 15205

Contact Information

Name: Customer Contact Name

Phone Number: (412) 809 - 7400

Job Title: Senior Engineer

Comments: Customer Contact and Emergency Information

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**.

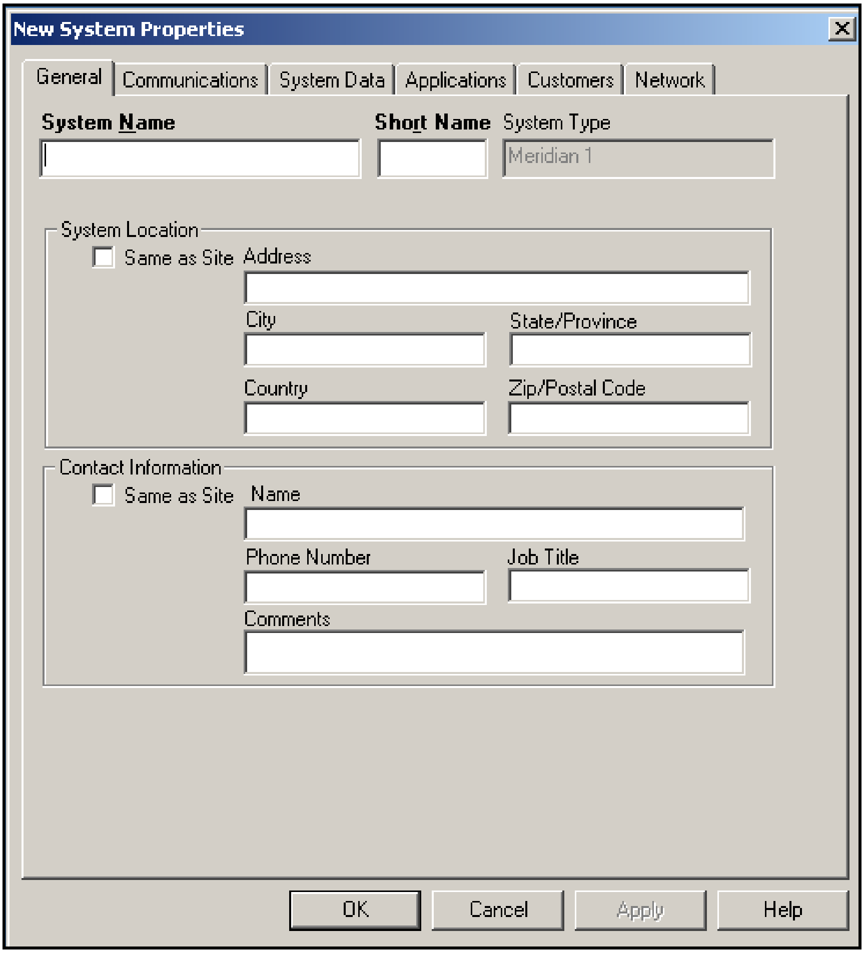
4 In **OTM Navigator**, click **Configuration** > **Add System**.

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 205.

**Figure 205**
**System Properties – General Tab**



New System Properties

General | Communications | System Data | Applications | Customers | Network

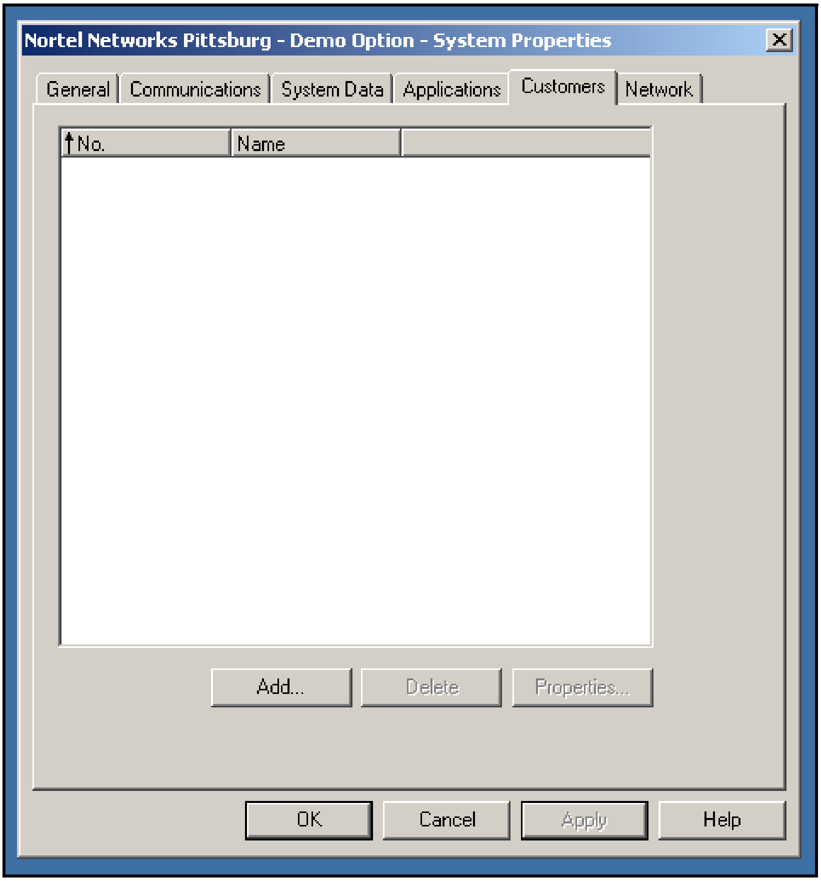
System Name: 
Short Name: 
System Type: Meridian 1

System Location
□ Same as Site
Address:
City:
State/Province:
Country:
Zip/Postal Code:

Contact Information
□ Same as Site
Name:
Phone Number:
Job Title:
Comments:

**6** Click the **Customers** tab. See Figure 206 on page 664.

**Figure 206**
**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 107 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)

**CAUTION**

This procedure is not supported for a node that resides on a CS 1000 system.

**Procedure 107**
**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 108.

**Procedure 108**
**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 LTPS on the faulty Voice Gateway Media Card.

   ***Note:*** This forces all IP Phones 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, IP Phones can remain unregistered indefinitely.

**4** Use the **isetShow** command to monitor the status of the card and the re-registration of the IP Phones.

The Voice Gateway Media Card is completely disabled when there are no IP Phones 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 start-up self-test results and status messages. A display of the type F:xx indicates a failure. See Table 64 on page 569 for a listing of the ITG-P 24-port line card's display codes and to Table 65 on page 571 for a list of the Media Card's display codes.

**7** In Element Manager, click **Configuration** in the navigation tree.

**8** In the **Configuration** menu, click **IP Telephony**.

The **IP Telephony** window opens.

**9** Click **Node Summary**.

The **Node Summary** window opens.

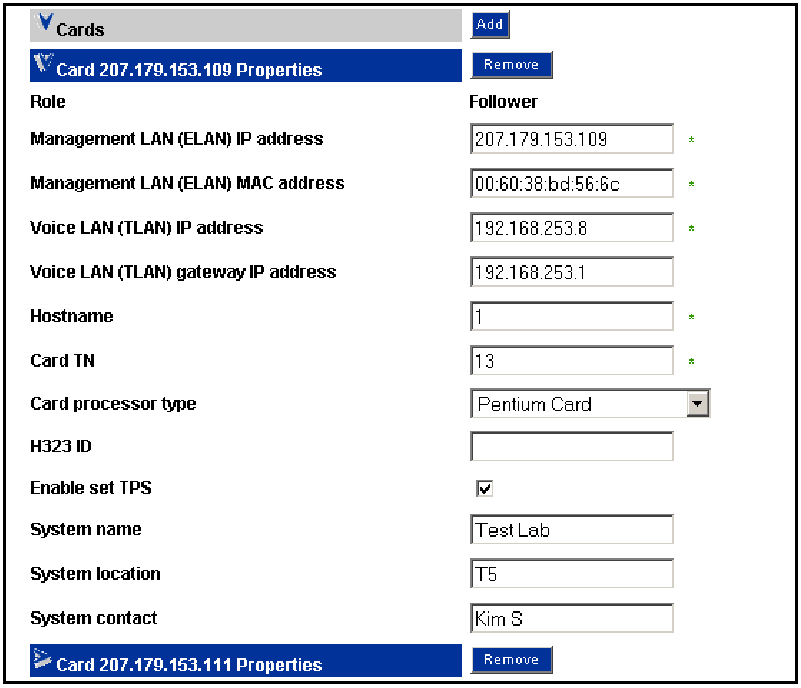
**10** Click the **Edit** button associated with the node containing the card to be replaced. The **Edit** window appears.

**11** Expand the **Cards** section.

**12** Select the Voice Gateway Media Card from the list of cards in the node.

See Figure 207 on page 670.

**Figure 207**
**Cards**



Cards

Card 207.179.153.109 Properties

| | |
|---|---|
| Role | Follower |
| Management LAN (ELAN) IP address | 207.179.153.109 * |
| Management LAN (ELAN) MAC address | 00:60:38:bd:56:6c * |
| Voice LAN (TLAN) IP address | 192.168.253.8 * |
| Voice LAN (TLAN) gateway IP address | 192.168.253.1 |
| Hostname | 1 * |
| Card TN | 13 * |
| Card processor type | Pentium Card |
| H323 ID | |
| Enable set TPS | ☑ |
| System name | Test Lab |
| System location | T5 |
| System contact | Kim S |

Card 207.179.153.111 Properties

13 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.

14 Click **Save and Transfer**.

The **Node Summary** window opens.

15 Click the **Transfer/Status** button associated with the node containing the Voice Gateway Media Card.

16 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.

17 Follow the steps in Procedure 53 on page 379 to load the CONFIG.INI file onto the card.

18 Follow the steps in Procedure 58 on page 396 to download the latest software to the Voice Gateway Media Card.

19 Follow the steps in Procedure 59 on page 400 to reboot the card and run the new software.

20 Follow the steps in Procedure 60 on page 401 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 109.

**Procedure 109**
**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 LTPS on the faulty Voice Gateway Media Card.

This forces all IP Phones 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, IP Phones can remain unregistered indefinitely.

4 Use the **isetShow** command to monitor the status of the card and the re-registration of the IP Phones.

The Voice Gateway Media Card is completely disabled when no IP Phones are 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 start-up self-test results and status messages. A display of the type F:xx indicates a failure. Refer to Table 64 on page 569 for a listing of the ITG-P 24-port line card's display codes and to Table 65 on page 571 for a listing of the 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 **IP Telephony** window opens.

**11** Click **Node Summary**.

The **Node Summary** window opens.

**12** Click the **Edit** button associated with the node containing the card to be replaced.

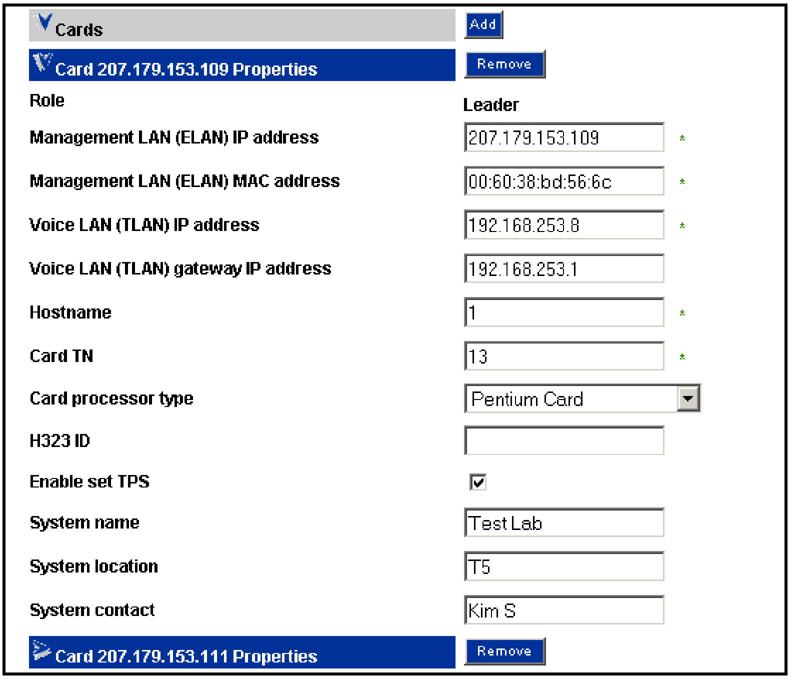
The **Edit** window opens.

**13** Expand the **Cards** section.

**14** Select the Voice Gateway Media Card from the list of cards in the node.

See Figure 207 on page 670.

**Figure 208**
**Cards**



Cards

Card 207.179.153.109 Properties

| | |
|---|---|
| Role | Leader |
| Management LAN (ELAN) IP address | 207.179.153.109 * |
| Management LAN (ELAN) MAC address | 00:60:38:bd:56:6c * |
| Voice LAN (TLAN) IP address | 192.168.253.8 * |
| Voice LAN (TLAN) gateway IP address | 192.168.253.1 |
| Hostname | 1 * |
| Card TN | 13 * |
| Card processor type | Pentium Card |
| H323 ID | |
| Enable set TPS | ☑ |
| System name | Test Lab |
| System location | T5 |
| System contact | Kim S |

Card 207.179.153.111 Properties

**15** 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.

**16** Follow the steps in Procedure 58 on page 396 to download the latest software to the Voice Gateway Media Card.

**17** Follow the steps in Procedure 59 on page 400 to reboot the card and run the new software.

**18** Follow the steps in Procedure 60 on page 401 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 IP Phone firmware:

1 Check the version of the software currently installed on the Voice Gateway Media Card. Refer to Procedure 54 on page 386.

2 Check the version of the firmware that is currently running on the Voice Gateway Media Card. Refer to Procedure 55 on page 389.

3 Download the most up-to-date version of the software and firmware files from the Nortel Networks web site. Refer to Procedure 56 on page 392.

4 Upload the software and firmware files using the File Upload system utility in Element Manager. Refer to Procedure 57 on page 394.

5 Upgrade the Voice Gateway Media Card software. Refer to Procedure 58 on page 396.

6 Restart the Voice Gateway Media Card. Refer to Procedure 59 on page 400.

7 Upgrade and distribute the firmware to the IP Phones on the Voice Gateway Media Card. Refer to Procedure 60 on page 401.

## Add another Voice Gateway Media Card

Follow the steps in Procedure 110 to add another Voice Gateway Media Card to the system.

**Procedure 110**
**Add another Voice Gateway Media Card to the system**

1 Install and cable the Voice Gateway Media Card, as described in “Install the hardware components” on page 204.

2 Go to the VxWorks shell. Set the Voice Gateway Media Card as a Follower using the ELAN IP address and subnet mask. Restart the card.

The card obtains the ELAN IP address and subnet mask.

3 In Element Manager, click **Configuration** in the navigation tree.

4 In the **Configuration** menu, click **IP Telephony**.

The **IP Telephony** window opens.

5 Click **Node Summary**.

The **Node Summary** window opens.

6 Click the **Edit** button associated with the node containing the card to be replaced.

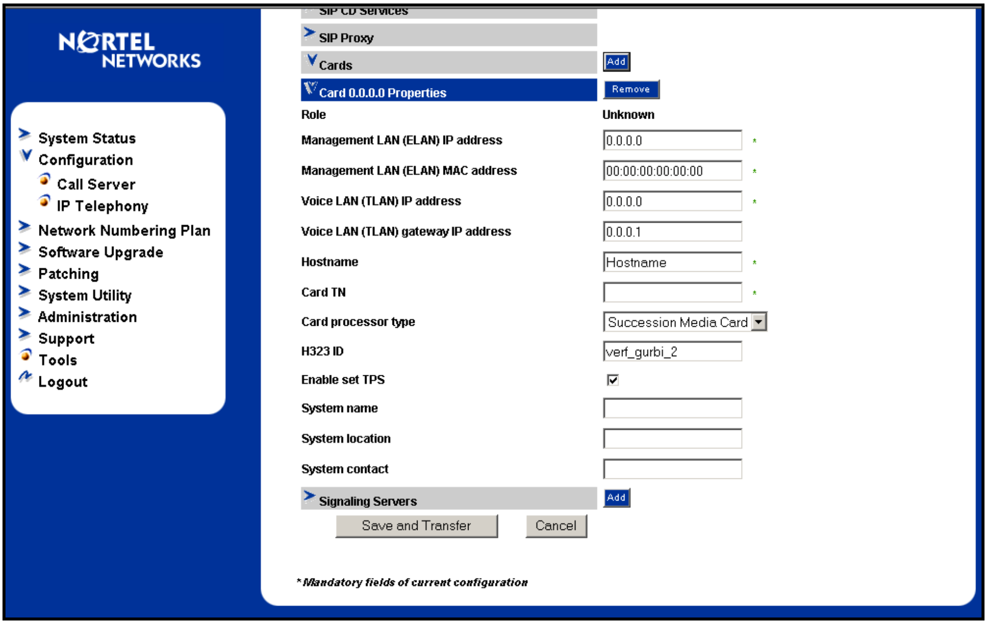
The **Edit** window opens.

7 Expand the **Cards** section.

8 Click **Cards** and then click the **Add** button.

See Figure 209.

**Figure 209**
**Configuration > Node Summary > Edit > Cards**



| | |
|---|---|
| Role | Unknown |
| Management LAN (ELAN) IP address | 0.0.0.0 * |
| Management LAN (ELAN) MAC address | 00:00:00:00:00:00 * |
| Voice LAN (TLAN) IP address | 0.0.0.0 * |
| Voice LAN (TLAN) gateway IP address | 0.0.0.1 |
| Hostname | Hostname * |
| Card TN | * |
| Card processor type | Succession Media Card |
| H323 ID | verf_gurbi_2 |
| Enable set TPS | ☑ |
| System name | |
| System location | |
| System contact | |

**Mandatory fields of current configuration*

9 Enter the **Card Properties** data.

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 subnet IP address for the card. Element Manager and the system use this address to communicate with the card.

c. **Management LAN (ELAN) MAC address:** The MAC address is the Motherboard Ethernet address labeled on the faceplate of the Voice Gateway Media Card.

d. **Voice LAN (TLAN) IP address:** This is the TLAN subnet IP address for the card.

e. **Voice LAN (TLAN) gateway IP address:** This is the IP address of the router interface on the TLAN subnet.

f. **Hostname:** This is the Host name.

g. **Card TN:** Enter the card slot number between 1 – 50.

h. **Card processor type:** Choose either Pentium or Media Card. Select Pentium if using the ITG-P 24-port line card (dual-slot card). Select Media Card if using the Media Card 32-port or 8-port line card (single-slot card).

i. **H323 ID:** The H323 ID within IP Line 4.0 is for the Virtual Office/ Media Gateway 1000B feature. Keep the H323 ID the same for all the elements within one node.

j. **Enable set TPS:** Select the check box.

k. **System name:** Enter the name of the system.

l. **System location:** Enter the location where the system resides.

m. **System contact:** Enter a contact name and telephone number.

10 Click **Save and Transfer**.

The **Node Summary** window opens.

11 Click the **Transfer/Status** button associated with the node containing the Voice Gateway Media Card.

12 After the transfer is complete, restart the new card.

Restarting the card causes the follower card to obtain its BOOTP parameters from the Leader, and also establishes ELAN and TLAN connectivity.

13. Follow the steps in Procedure 53 on page 379 to load the CONFIG.INI file onto the card.
14. Follow the steps in Procedure 58 on page 396 to download the latest software to the Voice Gateway Media Card.
15. Follow the steps in Procedure 59 on page 400 to reboot the card and run the new software.
16. Follow the steps in Procedure 60 on page 401 to update the card's firmware.

**End of Procedure**

# Access CLI commands from Element Manager

The following list of informational CLI commands are available from Element Manager:

**Voice Gateway Media Card CLI Commands**

- cardRoleShow
- disiAll
- disiTPS
- dspSWVersionShow
- DSPNumShow
- electShow
- i
- ifShow
- IPInfoShow
- ipstatShow
- isetShow
- itgCardShow
- nodePwdDisable
- nodePwdEnable
- nodePwdShow
- nodeTempPwdClear
- pbxLinkShow
- routeShow

**Signaling Server CLI Commands**

- cardRoleShow
- DCHstatus
- disiAll
- disiTPS
- disServices
- disTPS
- disVTRK
- electShow
- enlServices
- enlTPS
- enlVTRK
- forceDisServices
- forceDisTPS
- forceDisVTRK
- help
- i
- ifShow
- IPinfoShow

- rudpShow
- umsPolicyShow
- ping
- nodePwdSet
- nodeTempPwdSet
- isetResetAll
- umsUpgradeAll
- vgwShowAll

- IPstatShow
- isetInfoShow
- isetResetAll
- isetReset
- isetShow
- itgCardShow
- loadBalance
- nodePwdDisable
- nodePwdEnable
- nodePwdSet
- nodePwdShow
- nodeTempPwdClear
- nodeTempPwdSet
- pbxLinkShow
- ping
- routeShow
- rping
- RTPStatShow
- rTraceRoute
- rudpShow
- servicesStatusShow
- SIPgwShow
- SIPgwShowch
- SIPgwShownum
- umsPolicyShow
- umsUpgradeAll
- vtrkShow

Refer to “IP Line CLI commands” on page 585 for descriptions of these commands.

To access these commands in Element Manager, follow the steps in Procedure 111.

**Procedure 111**
**Accessing the CLI commands from Element Manager**

1. Select **System Status** and then **IP Telephony** from the navigation tree.

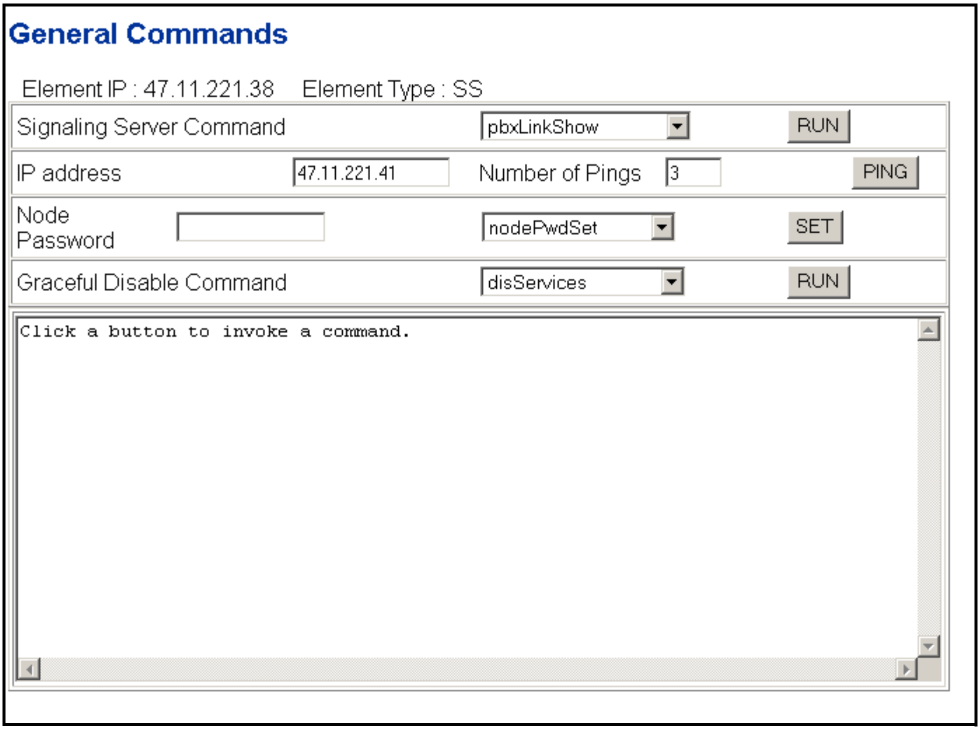
   The **IP Telephony Information** window opens.

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** window opens. See Figure 210 on page 680.

**Figure 210**
**System Status > IP Telephony > GEN CMD button > General Commands**



General Commands

Element IP : 47.11.221.38 Element Type : SS

Signaling Server Command: pbxLinkShow

IP address: 47.11.221.41 Number of Pings: 3

Node Password: nodePwdSet

Graceful Disable Command: disServices

```
Click a button to invoke a command.
```

*Note:* The first section shown on the top of the General Commands window, under Element IP, is **ITGL Commands** or **Signaling Server Command**. The section display depends on whether a card or Signaling Server was selected in the IP Telephony Information window.

**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 window.

**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 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 = CS 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
```

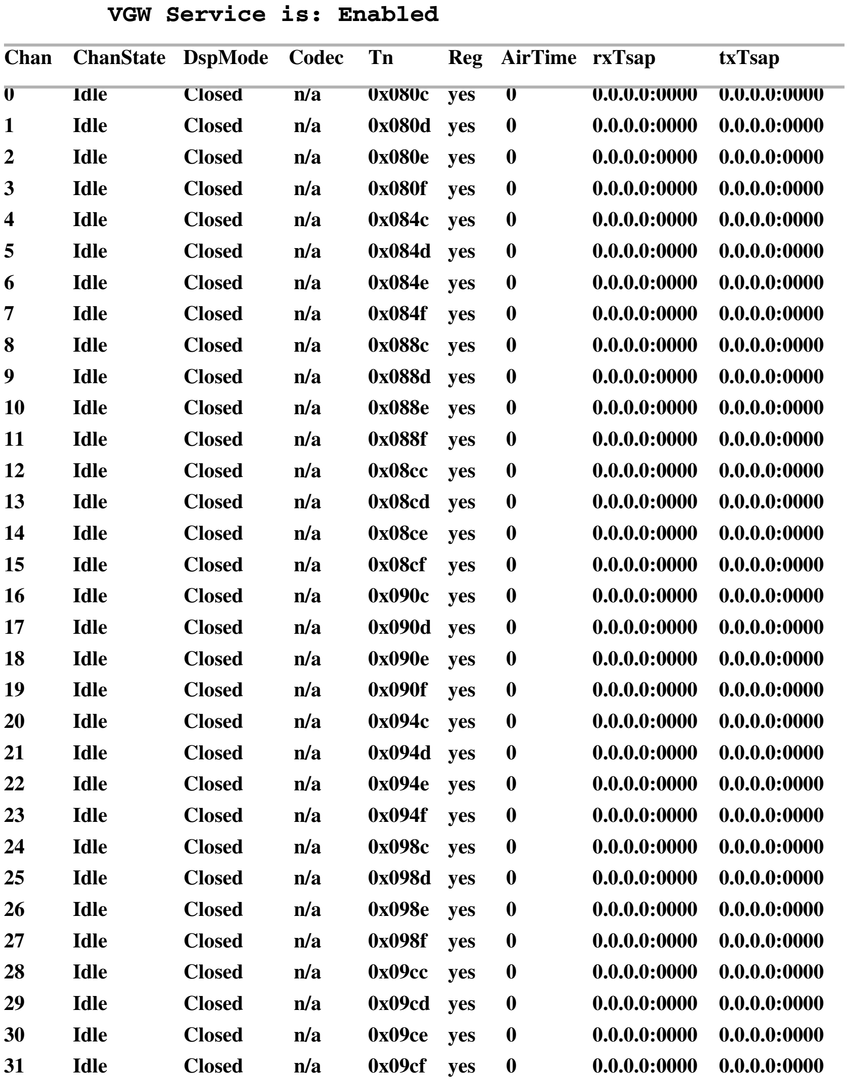
```
RUDP Connection Summary

    Src IP      Src Port  Connect ID    Dst IP      Dst    Status     Msg rcv  Msg sent  Retries
                                                    Port

    0.0.0.0      15001    0x02bcb77c  47.11.221.41  15000   DUDP         1        0         0
                 15000    0x02bcad18  47.11.221.41  15000  Established   2      44305     3075
47.11.221.48
```

### 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 with Element Manager, follow the steps in Procedure 95, “Accessing a Voice Gateway Media Card using Telnet” on page 551.

# Convert IP Trunk Cards to Voice Gateway Media Cards

## Contents

This section contains information on the following topics:

## Introduction

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 4.0 application.

**Recommendation**

Nortel Networks recommends using the OTM 2.2 ITG ISDN trunk service, used to manage the trunk node, to download the IP Line 4.0 application loadware to the existing trunk cards.

### Post-conversion

After the trunk cards have been converted to run the IP Line 4.0 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 Call Server

To perform these actions using OTM 2.2, refer to "Add a Voice Gateway Media Card to the node" on page 469.

To perform these actions using Element Manager, refer to "Add a Voice Gateway Media Card to the node" on page 523.

> ***Note:*** ITG Trunk 2.x nodes that contain Media Cards must be upgraded to IP Trunk 3.0 and rebooted. This is necessary to enable OTM 2.2 to transmit the IP Line 4.0 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 112 on page 695 to convert the IP Trunk cards to Voice Gateway Media Cards.

### Procedure 112
### Converting IP Trunk card to Voice Gateway Media Cards

**1** Download the CS 1000 Release 4.0 IP Line 4.0 software (IPL400xx.p2 and IPL400xx.sa) from the Nortel Networks Software Download web page to the OTM Server. Alternatively, place the Signaling Server Installation CD in the drive of the OTM Server, or use FTP to obtain the IP Line 4.0 software from the Signaling Server.

**2** Use the OTM 2.2 ITG ISDN Trunk service to select the node, or to select all cards in the node of the same host type (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 4.0 loadware file for the appropriate card type (Media Card or ITG-P).

**5** Click **Open** > **Start Transmit**.

Monitor the progress in the **Transmit Control** window to ensure that the IP Line 4.0 loadware is transmitted successfully to all selected cards.

**6** At the Call Server CLI, use the LD 32 **DISI** command to disable each IP Trunk card that is being converted.

**7** In the OTM 2.2 ITG ISDN Trunk service, double-click on each disabled card that is being converted. Click the **Reset** button for each card.

**8** Verify the 8051XA firmware version of each SMC and ITG-P card.

In OTM 2.2 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 93 on page 696.

**Table 93**
**File download locations**

| If | Then |
|---|---|
| Media Card firmware version is less than 6.7 | 1. Access the www.nortelnetworks.com website.<br>2. Select **Support** > **Software Downloads** > **Product Family** > **CS 1000** > **IP Line**.<br>3. Download the "Media Card Release 6.7 Firmware Upgrade and Instruction" document.<br>4. Download "Media Card Release 6.7 firmware". Follow the procedures in the "Media Card Release 6.7 Firmware Upgrade and Instruction" document to upgrade the 8051XA firmware and reboot the Media Card card.<br>***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.<br>2. Select **Support** > **Software Downloads** > **Product Family** > **CS 1000** > **IP Line**.<br>3. Download the "ITG-Pentium Rel. 5.7 Firmware Upgrade and Instruction" document.<br>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.<br>***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. |

**9** 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 2.2.

**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 Signaling Server is functioning properly
- the ELAN and TLAN connections are properly configured
- the Signaling Server is configured as the Leader in the node
- the Call Server software is upgraded to CS 1000 Release 4.0 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 4.0 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 page 698.

**2** "Import all converted Voice Gateway Media Cards into a new IP Telephony node" on page 702. 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 113 to add the converted Voice Gateway Media Cards to an existing IP Telephony node using Element Manager.

**Procedure 113**
**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 Signaling Server.
2. Enter the User ID and password (usually the same as the 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 Media Card)
   - enable the IP Phone LTPS

The following is an example of the card properties data:

**Table 94**
**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 | Media Card |
| H.323 ID | |
| Enable set TPS | check mark |
| 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 action saves the configuration changes to the Call Server and transfers the changes to the Signaling Servers and Voice Gateway Media Cards in the node. The BOOTP and CONFIG.INI files are saved on the Call Server and transferred to the 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 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 **IP Telephony Configuration** window opens.

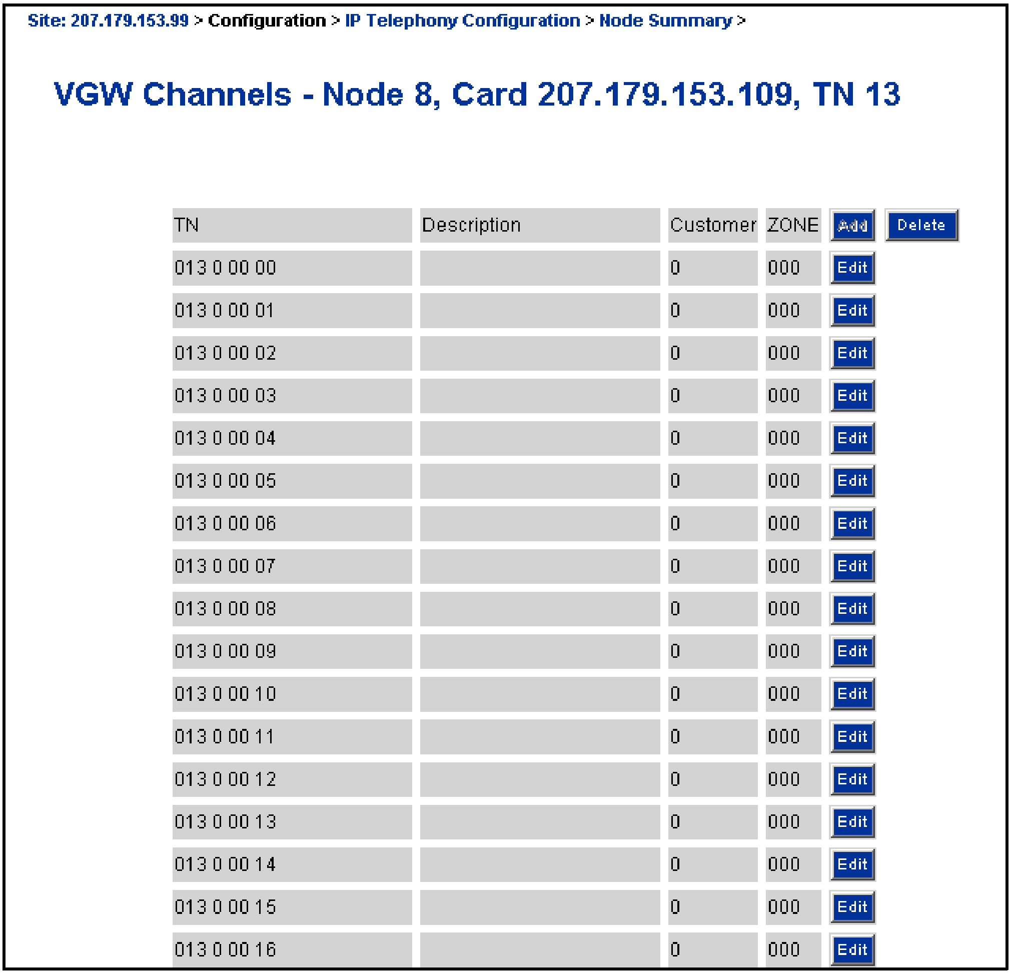
— Click **Node Summary**. The **Node Summary** window opens.

— Expand the desired node by clicking on the arrowhead.

— Click **VGW CHANNELS** next to the appropriate Voice Gateway Media Card.

The VGW Channels window opens. See Figure 211 on page 701.

Figure 211
VGW Channels window



Site: 207.179.153.99 > Configuration > IP Telephony Configuration > Node Summary >

VGW Channels - Node 8, Card 207.179.153.109, TN 13

| TN | Description | Customer | ZONE | Add | Delete |
|---|---|---|---|---|---|
| 013 0 00 00 | | 0 | 000 | Edit | |
| 013 0 00 01 | | 0 | 000 | Edit | |
| 013 0 00 02 | | 0 | 000 | Edit | |
| 013 0 00 03 | | 0 | 000 | Edit | |
| 013 0 00 04 | | 0 | 000 | Edit | |
| 013 0 00 05 | | 0 | 000 | Edit | |
| 013 0 00 06 | | 0 | 000 | Edit | |
| 013 0 00 07 | | 0 | 000 | Edit | |
| 013 0 00 08 | | 0 | 000 | Edit | |
| 013 0 00 09 | | 0 | 000 | Edit | |
| 013 0 00 10 | | 0 | 000 | Edit | |
| 013 0 00 11 | | 0 | 000 | Edit | |
| 013 0 00 12 | | 0 | 000 | Edit | |
| 013 0 00 13 | | 0 | 000 | Edit | |
| 013 0 00 14 | | 0 | 000 | Edit | |
| 013 0 00 15 | | 0 | 000 | Edit | |
| 013 0 00 16 | | 0 | 000 | Edit | |

c. Click **Add**.

if an Alert Box appears, log into the CLI of the Call Server. Use LD 22 to determine if Package 167 is enabled or restricted by entering 167 as a response to the TYPE prompt..

If Package 167 is restricted, obtain a new keycode to enable GPRI Package 167.

In LD 73, enter DDB at the TYPE prompt and 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 114 to import all newly-converted Voice Gateway Media Cards into a new IP Telephony node using Element Manager.

**Procedure 114**
**Importing all converted Voice Gateway Media Cards into a new IP Telephony node**

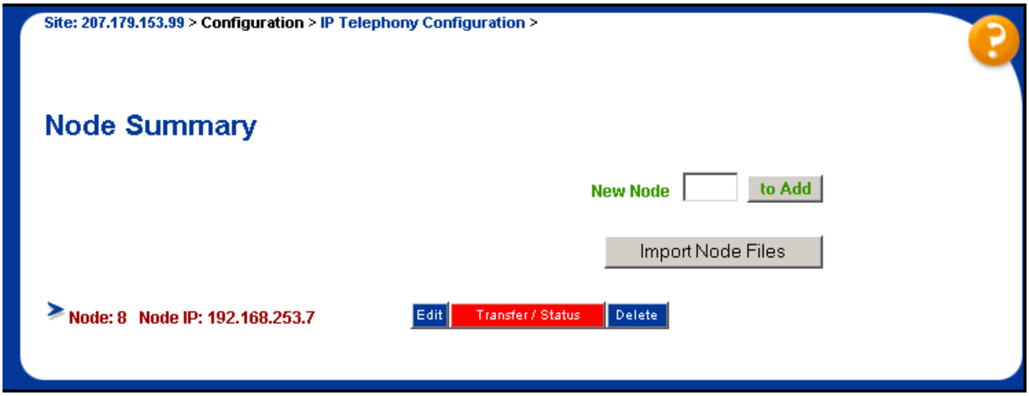
1 Log in to Element Manager from the web browser by entering the IP address of the Signaling Server.

2 Enter the User ID and password (usually the same as the Call Server User ID and password).

3 When logged into Element Manager, click **Configuration > IP Telephony > Node Summary.**

The **Node Summary** window opens. See Figure 212.

**Figure 212**
**Node Summary window**



Site: 207.179.153.99 > Configuration > IP Telephony Configuration >

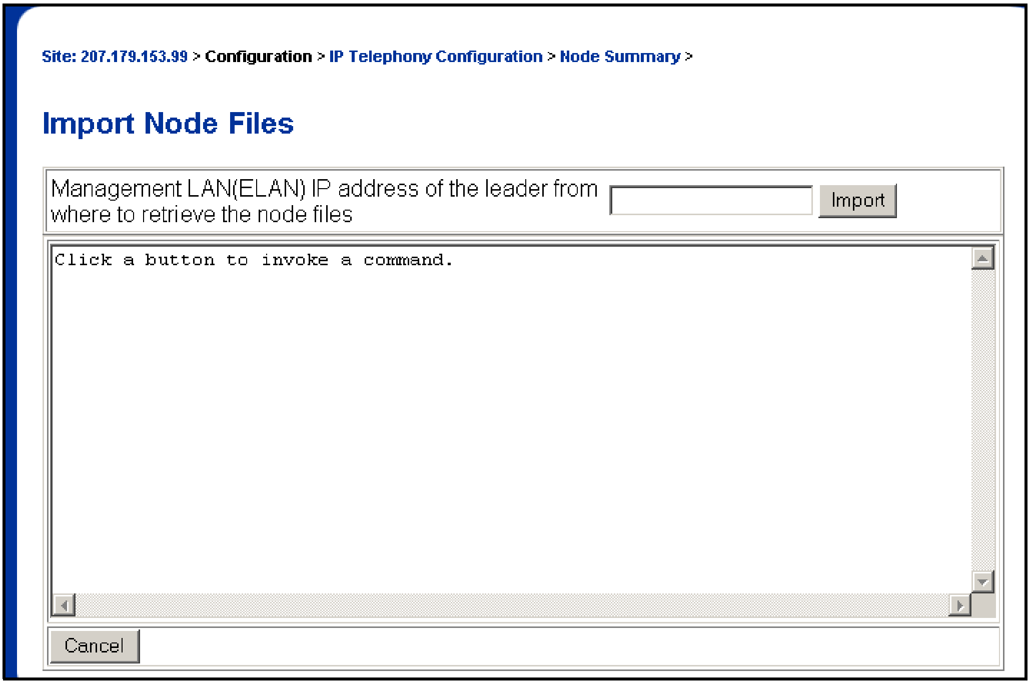
Node Summary

Node: 8 Node IP: 192.168.253.7

4 Click the **Import Node Files** button**.**

The **Import Node Files** window opens. See Figure 213 on page 704.

**Figure 213**
**Import Node Files window**



Site: 207.179.153.99 > Configuration > IP Telephony Configuration > Node Summary >

Import Node Files

Management LAN(ELAN) IP address of the leader from where to retrieve the node files

```
Click a button to invoke a command.
```

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.

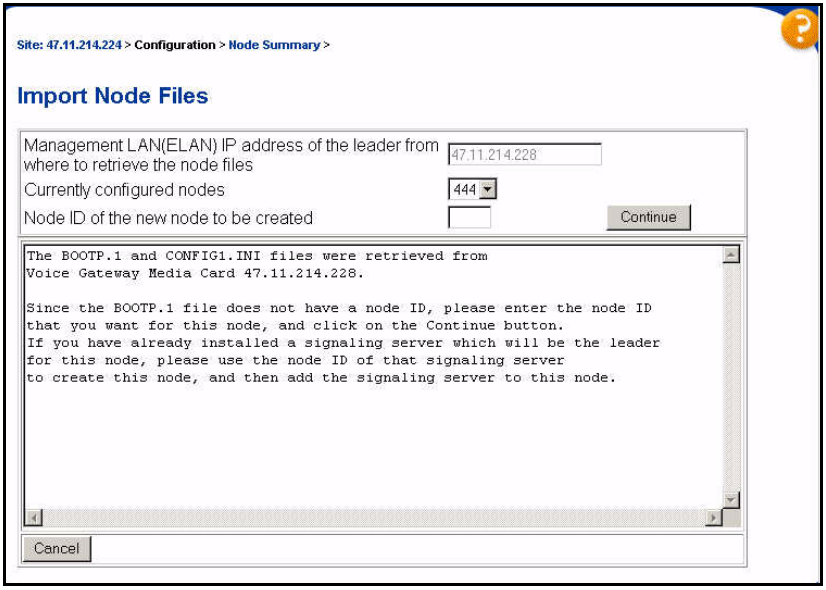
```
The BOOTP.1 and CONFIG1.INI files were retrieved from
Voice Gateway Media Card x.x.x.x.
```

6 As the BOOTP.1 file does not have a node ID, enter the node ID for this node.

If a Signaling Server has already been installed, the Signaling Server will be the leader for this node, and if IP Phones have been configured to point to the Signaling Server node ID, use the node ID of that Signaling Server to create this node. Add the Signaling Server to this node in Step 8.

See Figure 214 on page 705.

**Figure 214**
**BootP.1 information window**



Management LAN(ELAN) IP address of the leader from where to retrieve the node files: 47.11.214.228

Currently configured nodes: 444

Node ID of the new node to be created:

```
The BOOTP.1 and CONFIG1.INI files were retrieved from
Voice Gateway Media Card 47.11.214.228.

Since the BOOTP.1 file does not have a node ID, please enter the node ID
that you want for this node, and click on the Continue button.
If you have already installed a signaling server which will be the leader
for this node, please use the node ID of that signaling server
to create this node, and then add the signaling server to this node.
```

7 Enter the node ID.

8 Click **Continue**.

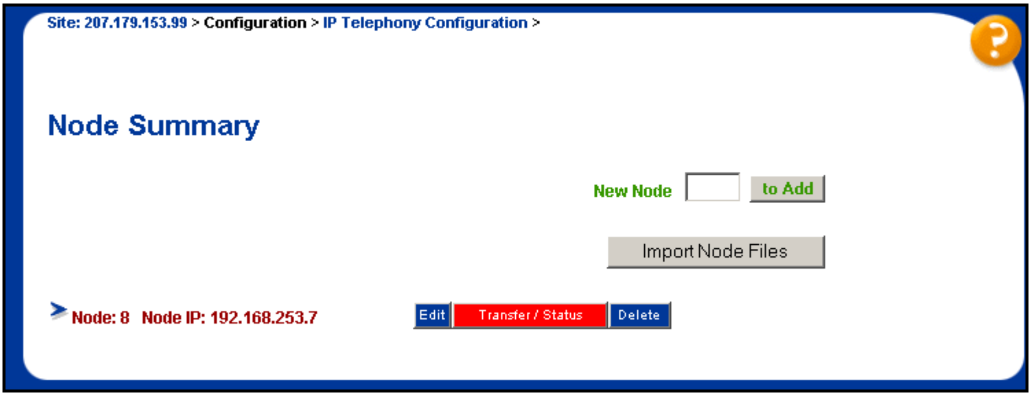
When the new node has been created with the imported data, the following warning is displayed.

```
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).
```

9 In the **Node Summary** window, click the **Edit** button for the new node.

See Figure 215 on page 706.

**Figure 215**
**Edit and transfer new node information**


Site: 207.179.153.99 > Configuration > IP Telephony Configuration >
Node Summary
New Node
to Add
Import Node Files
Node: 8 Node IP: 192.168.253.7
Edit
Transfer / Status
Delete

Perform the following actions:

**a.** Enter the correct IP address of the Call Server.

**b.** Add the Signaling Server (if it exists and is not already part of a larger IP Telephony node).

**c.** Add any additional Voice Gateway Media Cards.

**10** After all required fields for the card properties have been entered, click **Submit and Transfer**.

This action saves the configuration changes to the Call Server and transfers the changes to the 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 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.

**11** 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 > Node Summary.**

The Node Summary window opens.

**i.** Click on the arrowhead.

**ii.** Click the appropriate Voice Gateway Media Card.

**iii.** Click **VGW CHANNELS** next to the appropriate Voice Gateway Media Card.

The **VGW Channels** window opens. See Figure 211 on page 701

**iv.** if an Alert Box appears, log into the CLI of the Call Server. In LD 22, enter 167 as a response to the TYPE prompt to determine if Package 167 is enabled or restricted.

If it is restricted, obtain a new keycode to enable GPRI Package 167.

In LD 73, enter DDB at the TYPE prompt.:

Press <CR> through the overlay, accepting all the defaults.

**12** If no 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: NAT router requirements for NAT Traversal feature

## Contents

This section contains information on the following topics:

## Description

This appendix describes the requirements of a Network Address Translation (NAT) router to enable it to support the CS 1000 Release 4.0 NAT Traversal feature.

For a NAT device to work correctly between an IP Phone and the CS 1000 system, the following requirements must be met:

**1** A cone NAT must be used.

**2** The Private-to-Public mapping should have a long time-out configured.

**3** If multiple IP Phones will be supported behind the same NAT router, hairpinning must be supported.

4. The Private-to-Public mapping created by a NAT router must be kept alive by packets in only one direction (standard in most NAT routers).
5. The IP Phone must be running the correct minimum firmware version (not a NAT device requirement, but still important).

Most of the issues encountered can be confirmed using either an IP Phone behind the NAT device or a PC running the third-party tool “natcheck”.

> ***Note:*** Nortel Networks is not affiliated in any manner with the natcheck tool, and therefore is not liable or responsible for any problems that may be encountered with this tool.

The natcheck tool can be downloaded at no cost from the Internet at: http://midcom-p2p.sourceforge.net/. The natcheck tool runs in Windows on a PC connected to the internet through a NAT router.

# Requirements

## Cone NAT

The NAT Traversal feature cannot work unless the NAT device has a cone NAT implemented.

### Confirm using natcheck

Run the natcheck program. Look for the following message:

```
UDP consistent translation:          YES (GOOD for peer-to-peer)
```

If YES is displayed, then the NAT router uses a cone NAT.

### Confirm using IP Phone

The NAT router uses a cone NAT if no error message is displayed when the IP Phone registers to the system. The NAT device does not use a cone NAT if the IP Phone behind it displays the following error message:

```
NAT Error!  ITG3053
Please try upgrading firmware on the NAT device or
replacing it with a different NAT device that has a cone
NAT implemented.
```

## Time-out configuration

### Confirm using natcheck

Time-out configuration cannot be performed using natcheck.

### Confirm using IP Phone

If the IP Phone connection times out and the IP Phone reboots, use LD 117 to lower the NAT Keep Alive Timer value on the Call Server. The reboots could indicate that the NAT device's address/port mapping is being cleared because there is no message traffic from the IP Phone. By lowering the NAT Keep Alive Timer value in the Call Server, keep-alive messages are sent more frequently to keep the mapping "alive".

```
>ld 117
->chg nkt 20
```

If lowering the NAT Keep Alive Timer value to the minimum value of 20 seconds doesn't stop the time-outs, try replacing the NAT device.

## Hairpinning

Hairpinning occurs when an IP Phone behind a NAT router can send packets to the Public IP address and Port of another IP Phone connected to the same NAT router. Determine if hairpinning is supported on the NAT router.

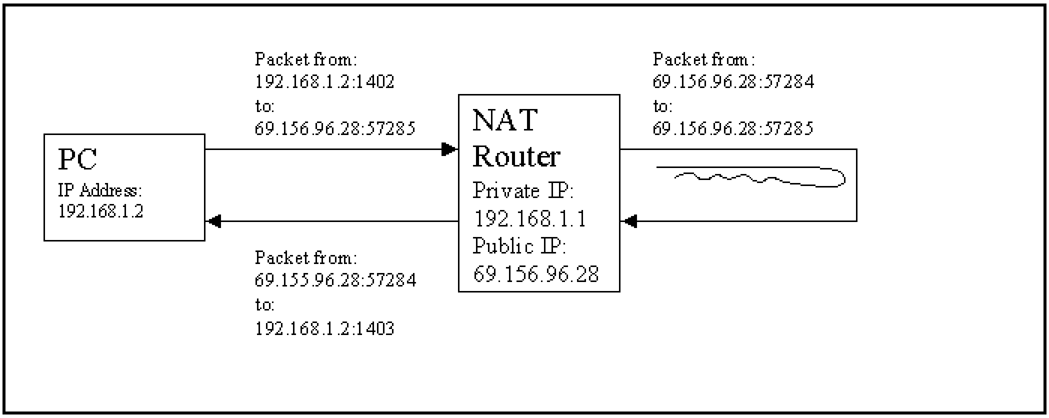
### Confirm using natcheck

Run the natcheck program. Look for the message:

```
UDP loopback translation: YES (GOOD for peer-to-peer)
```

If this messages prints, then a two-way speech path should be available between two IP Phones behind the NAT device. See Figure 216.

**Figure 216**
**Speech path**



### Confirm using IP Phone

Connect two IP Phones to the same NAT device and call from one phone to the other. Confirm that a two-way speech path is achieved during the call.

## Unidirectional packet flow

### Confirm using natcheck

The natcheck tool cannot be used to determine if the private-to-public mapping created by the NAT device is being kept alive by a unidirectional packet flow.

### Confirm using IP Phone

If an IP Phone behind a NAT device has a two-way speech path immediately after being registered, and continues to have a two-way speech path 2 – 30 minutes later, then the NAT device's address/port mapping is being kept alive by the packets. If a one-way speech path occurs after this time period, ensure that the IP Phone has the latest CS 1000 Release 4.0 firmware version. If the IP Phone has the latest firmware, then the problem lies with the NAT device. Try replacing the NAT device with a different model.

If the one-way speech path problem is fixed after rebooting the IP Phone, it is likely that the NAT device does not meet the requirement of unidirectional packet flow. As well, ensure that the firmware on the IP Phone has the latest CS 1000 Release 4.0 firmware version (older firmware versions can be a possible source of the one-way speech path problem).

## Firmware versions

The IP Phone must have the correct minimum firmware version loaded.

### Confirm using natcheck

The natcheck tool cannot be used to determine the IP Phone firmware version.

### Confirm using IP Phone

On the IP Phone, go to the **Services > Telephone Options > Set Info** menu and scroll down to the **FW Version** menu item. The minimum firmware versions (based on the vintage of the IP Phone) that support the NAT Traversal feature are:

- Nortel Networks IP Phone 2002 and IP Phone 2004: xxxxB64
- Nortel Networks Phase II IP Phone 2002 and IP Phone 2004: xxxxD41
- Nortel Networks IP Softphone 2050: xxxx375

Earlier firmware versions do not correctly support the NAT Traversal feature.

# Natcheck output

A NAT router using CONE NAT will have output similar to the following.

```
D:\natcheck>natcheck -v
server 1: pdos.lcs.mit.edu at 18.26.4.9:9856
server 2: tears.lcs.mit.edu at 18.26.4.77:9856
server 3: sure.lcs.mit.edu at 18.26.4.29:9856
Local TCP port: 1400
Local UDP port: 1401
Request 1 of 20...
Connection to server 2 complete
Server 1 reports my UDP address as 69.156.96.28:57283
Server 2 reports my UDP address as 69.156.96.28:57283
Server 3 reports my UDP address as 69.156.96.28:57283
Connection to server 1 complete
Server 1 reports my TCP address as 69.156.96.28:57281
Connection from 18.26.4.29:9856
Server 3 reports my TCP address as 69.156.96.28:57281
Request 2 of 20...
Loopback packet from 69.156.96.28 port 57285
Request 3 of 20...
Loopback packet from 69.156.96.28 port 57285
Request 4 of 20...
Loopback packet from 69.156.96.28 port 57285
Request 5 of 20...
Loopback packet from 69.156.96.28 port 57285
Server 2 reports my TCP address as 69.156.96.28:57281
Initiated TCP server 3 connection
Initiated TCP loopback connection
Connection from 69.156.96.28:57289
Loopback received
Request 6 of 20...
Loopback packet from 69.156.96.28 port 57285
Request 7 of 20...
Loopback packet from 69.156.96.28 port 57285
Request 8 of 20...
Loopback packet from 69.156.96.28 port 57285
Request 9 of 20...
Loopback packet from 69.156.96.28 port 57285
Request 10 of 20...
Loopback packet from 69.156.96.28 port 57285
Request 11 of 20...
Loopback packet from 69.156.96.28 port 57285
Request 12 of 20...
Loopback packet from 69.156.96.28 port 57285
Request 13 of 20...
Loopback packet from 69.156.96.28 port 57285
```

```
Request 14 of 20...
Loopback packet from 69.156.96.28 port 57285
Request 15 of 20...
Loopback packet from 69.156.96.28 port 57285
Request 16 of 20...
Loopback packet from 69.156.96.28 port 57285
Request 17 of 20...
Loopback packet from 69.156.96.28 port 57285
Request 18 of 20...
Loopback packet from 69.156.96.28 port 57285
Request 19 of 20...
Loopback packet from 69.156.96.28 port 57285
Request 20 of 20...
Loopback packet from 69.156.96.28 port 57285


TCP RESULTS:
TCP consistent translation:          YES (GOOD for peer-to-peer)
TCP simultaneous open:               YES (GOOD for peer-to-peer)
TCP loopback translation:            YES (GOOD for peer-to-peer)
TCP unsolicited connections filtered: NO  (BAD for security)

UDP RESULTS:
UDP consistent translation:          YES (GOOD for peer-to-peer)
UDP loopback translation:            YES (GOOD for peer-to-peer)
UDP unsolicited messages filtered:    NO  (BAD for security)
```

The important information is highlighted in red.

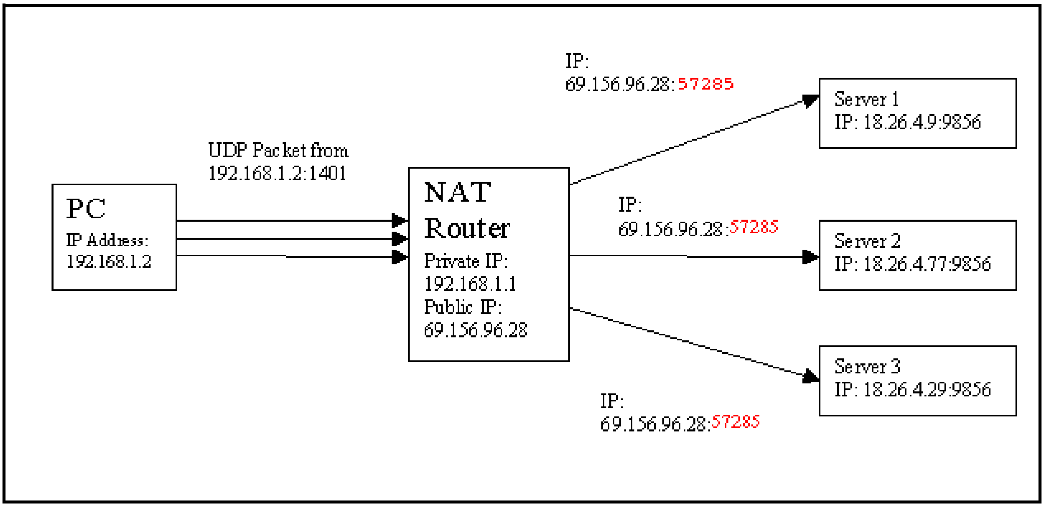
In order for the NAT router to support the NAT Traversal feature, natcheck must print the following to the screen:

```
UDP consistent translation:          YES (GOOD for peer-to-peer)
```

YES indicates that Cone NAT is being used. NO indicates that Symmetric NAT is present. Symmetric NAT is not supported.

> ***Note:*** Near the beginning of the printout, the PUBLIC port seen by various servers is printed out. In this case, all three servers receive the packets from the same PUBLIC port of 57283. This Private-to-Public port mapping is seen in Figure 217 on page 716.

**Figure 217**
**Private-to-Public port mapping**



Since all three servers see the same PUBLIC port, the NAT router is using Cone NAT.

# Appendix B: 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 NTMF94EA cable provides the ELAN and TLAN network interfaces 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 218 on page 719.

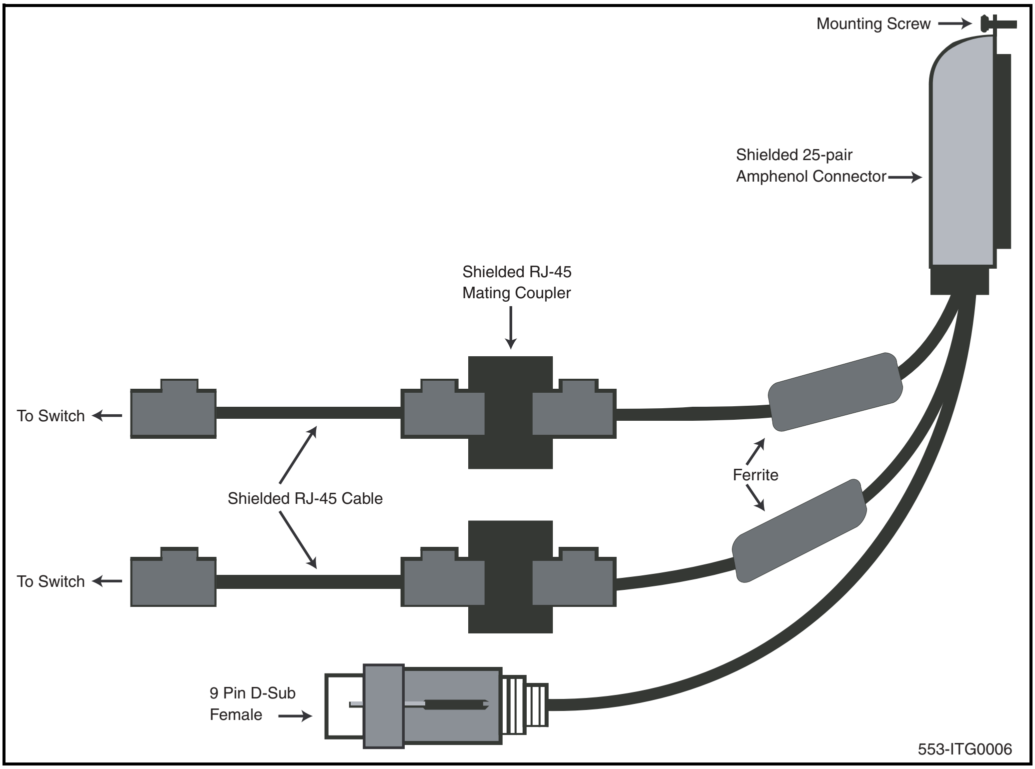
It is important to use the mounting screw provided to secure the top of the NTMF94EA cable 25-pair Amphenol connector to the system. The screw ties the LAN cable shield to the Meridian 1, CS 1000M, and CS 1000S frame ground for EMC compliance.

The NTMF94EA cable provides a factory-installed, shielded, RJ-45-to-RJ-45 coupler at the end of both the ELAN and the TLAN network interfaces. 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 723, 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 CAT5 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 CAT5 cable, do not overtighten cable ties.

**Figure 218**
**NTMF94EA ELAN, TLAN and RS-232 serial maintenance I/O cable**



# Connector pin assignments

Table 95 shows the I/O connector pin designations for the Voice Gateway Media Card.

**Table 95**
**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 95**
**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 96**
**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 CAT5 LAN cable to the hub, switch, or router supporting the TLAN and ELAN subnets. Use shielded CAT5 RJ-45 cable to connect to the customer's TLAN/ELAN equipment. Follow the steps in Procedure 115 to prevent ground loops when connecting to external customer LAN equipment.

Follow the steps in Procedure 115 to prevent ground loops.

**Procedure 115**
**Preventing ground loops**

1. Connect the customer-provided shielded CAT5 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.

   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.

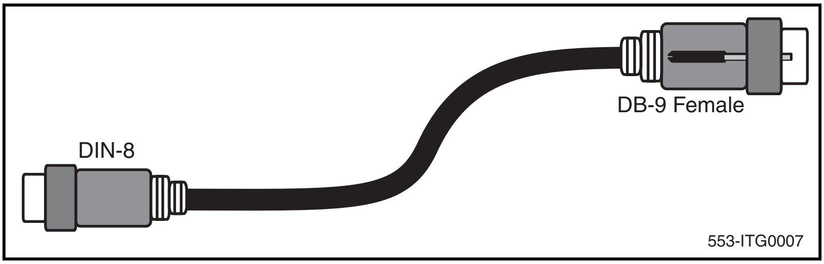
**WARNING**
The serial maintenance ports on the faceplate connector and the DB-9 female connector of the NTMF9DA cable assembly are identical. Do not connect a serial device to both access points simultaneously. This results in incorrect and unpredictable operation of the Voice Gateway Media Card.

**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 219.

**Figure 219**
**NTAG81CA Maintenance cable**



The NTAG91CA maintenance cable pin description is outlined in Table 97.

**Table 97**
**NTAG81CA maintenance cable pin description**

| Signals<br>(MIX Side) | 8-pin Mini-DIN<br>(MIX Side)<br>Male | 9-pin D-Sub<br>(PC Side)<br>Female | Signals<br>(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 98. 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 220.

**Table 98**
**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 220**
**NTAG81BA Maintenance Extender cable**

DB-9 male
DB-9 female
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.

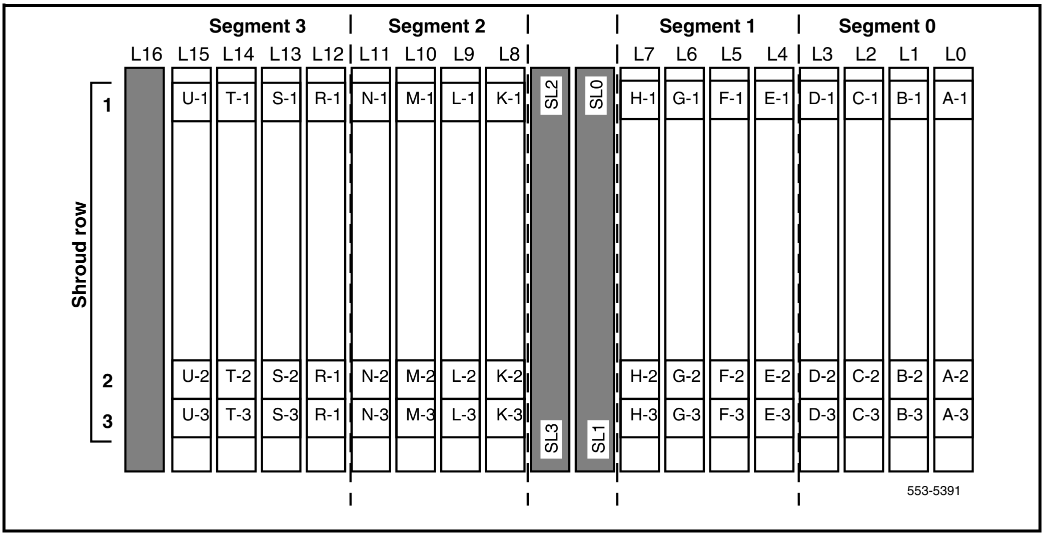
In NT8D37BA and NT8D37EC (and later vintage) IPE Modules, all 16 IPE card slots support 24-pair cable connections. Table 99: “NT8D37 cable connections” on page 727 shows the cable connections from the backplane to the inside of the I/O panel.

**Table 99**
**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 221 on page 728 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 221**
**Backplane slot designations**



## 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 116 on page 729 to remove the NT8D81BA cable.

**Procedure 116**
**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 the NT8D81BA cable.

**End of Procedure**

## Install the NTCW84JA filter and NT8D81AA cable

Follow the steps in Procedure 117 to install the NTCW84JA filter and NT8D81AA cable.

**Procedure 117**
**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 C: 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/CS 1000 site LAN subnet (called the Embedded LAN or ELAN subnet as opposed to the customer's data network subnet) 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 subnet 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.

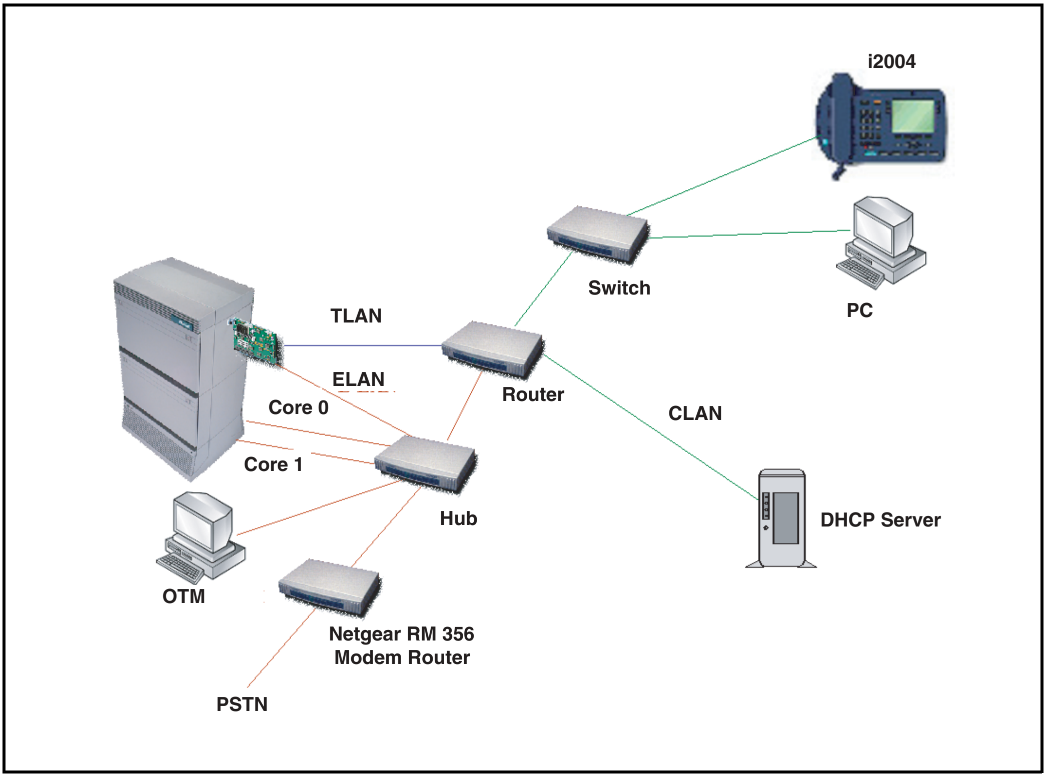
Figure 222 on page 733 shows an example of a remote network.

## 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 222**
**Remote support using Netgear RM356 Modem Router**



# Install the RM356 Modem Router

Follow the steps in Procedure 118 to install the RM356 Modem Router.

**Procedure 118**
**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, CS 1000M, CS 1000, a local Optivity Telephone Manager (OTM) 2.2 PC, Symposium Call Center Server, and CallPilot.

   ***Note:*** The up-link connection to an additional ELAN hub or optional gateway on the customer's enterprise network 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 119 to configure the RM356 Modem Router.

**Procedure 119**
**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 page 743 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 system 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.

**11** Under TCP/IP Setup, type in the **IP Address** and the **IP Subnet Mask** for the Modem Router's Ethernet interface on the ELAN.

**12** Toggle **RIP Direction = None**.

**13** Press **Enter** to confirm and save data to ROM, then press **Esc** to return to the RM356 Main Menu.

**14** 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 customer's enterprise network to other IP Telephony nodes on remote ELAN subnets, define a default network route pointing to the Management GW IP address on the local ELAN subnet. 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 customer's enterprise network.

***Note 2:*** To prevent access from the Modem Router to the TLAN subnet through the Management GW router on the ELAN subnet, disable RIP by setting **RIP Direction = None**, and remove all static routes or disable a particular static route by setting **Active = No**.

**15** 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:
```

**16** 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.

**17** Press **Enter** to confirm and save data to ROM, then press **Esc** to return from the sub-menu to the RM356 Main Menu.

**18** 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.
```

**19** 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.

**20** 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.

**21** Toggle **Compression= No**.

Windows 9x DUN is not compatible with software compression on the Modem Router. Calls are randomly disconnected.

**22** Toggle **Mutual Authen= No**.

**23** Under IP Address Supplied By, toggle **Dial-in User= No** and **IP Pool = Yes**.

**24** 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 2.2 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.

**25** 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.

**26** Set **Idle Timeout = 1200**.

1200 seconds provides 20 minutes idle timeout disconnect for remote support purposes.

**27** Press **Enter** to confirm and save data to ROM and then press **Esc** to return from the sub-menu to the main menu.

**28** 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.

**29** 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:
```

**30** Type in the **User Name**, such as itgadmin.

**31** Toggle **Active = Yes/No** for security purposes.

**32** Type in a **Password** for PAP.

The DUN client on the remote OTM 2.2 PC must provide the user name and password defined here when dialing up the Modem Router.

**33** 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.

**34** Set **Rem CLID =** to the **PSTN Calling Number** that is displayed when the remote OTM 2.2 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.

**35** Set **Idle Timeout = 1200**, where 1200 seconds provides 20 minutes idle timeout disconnect for Nortel Networks remote support purposes.

**36** Press **Enter** to confirm and save data to ROM, then press **Esc** to return from the sub-menu to the RM356 Main Menu.

**37** 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:
```

**38** Type in the **Old Password**.

**39** Navigate down and type a **New Password**.

**40** Navigate down to **Retype to confirm** and then retype the new password.

**41** 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 D: 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 100 on page 754:

**Table 100**
**Voice Gateway Media Card power consumption**

| Card Type | Power Consumption |
|---|---|
| ITG-Pentium 24-port line card | ± 15 volt = 19.3 watts => 0.640 amps<br>+5 volt = 10.5 watts => 2.1 amps |
| Media Card | + 15 volt = 6 watts => 0.2 amps<br>+5 volt = 7.25 watts => 1.45amps |

# Environmental specifications

Table 101 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 101**
**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 102 on page 755.

## Temperature-related conditions

Refer to Table 102 for a display of acceptable temperature and humidity ranges for the Voice Gateway Media Card.

**Table 102**
**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 103, Table 104 on page 758, and Table 105 on page 758 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 103 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 103**
**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 or CS 1000 system 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 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.
- Media Card
  - — For Small Systems, there is no limit to the number of 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 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 Media Card EMC requirements.
  - — For Large Systems, there is no limit to the number of 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 Media Cards that can be installed on one shelf. If the 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 Media Card’s EMC requirements.

Table 104 lists Electro-magnetic emissions regulations met by the Voice Gateway Media Card, along with the country's standard that lists each regulation.

**Table 104**
**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 105 lists Electro-magnetic immunity regulations met by the Voice Gateway Media Card, along with the country's standard that lists each regulation.

**Table 105**
**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 105**
**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 E: 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 120 on page 762 to convert a subnet mask from CIDR format to dotted decimal format.

**Procedure 120**
**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 106 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 106, 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 106**
**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 F: Download IP Line 4.0 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 121 to download IP Line 4.0-related software and firmware files from the Nortel Networks web site.

**Procedure 121**
**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 window opens and displays the list **Product Family**.

3 Select **Meridian** or **CS 1000**.

**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 4.0 for Media Cards (this *.zip file contains the IP Line 4.0 loadware for the Media Cards, the IP Phone firmware, and a readme.txt file)

— IP Line 4.0 for ITG-P cards (this *.zip file contains the IP Line 4.0 loadware for the ITG-P cards, the IP Phone firmware, and a readme.txt file)

— Media Card firmware

— ITG-P 24-port line card firmware

— IP Line 4.0 Readmefirst document

**b.** If **CS 1000** was selected, click **CS 1000E**, **CS 1000M,** or **CS 1000S**, and select **Software**.

This product list includes the following:

— Signaling Server SSE-4.00.xx CD-ROM Image (this image contains the IP Line 4.0 loadware for the Media Card and the ITG-P 24-port card, the IP Phone firmware, and other key components)

— Media Card 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** window and then click **Sign In**.

**6** If not registered to access this web site, refer to the Meridian 1 or CS 1000 product bulletin for directions on how to register.

**7** Once logged in, ignore the security alert.

**8** The **Software Downloads: Software Details Information** window 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**

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## Description, Installation, and Operation

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Publication number: 553-3001-365
Document release: Standard 3.00
Date: September 2004
Produced in Canada