
Nortel Communication Server 1000

Nortel Communication Server 1000 Release 4.5

IP Phones

Description, Installation, and Operation

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Standard 6.00. This document is up-issued to support the addition of the IP Phone 2007.

April 2005

Standard 5.00. This document is up-issued to support the addition of the IP Audio Conference Phone 2033.

February 2005

Standard 4.00. This document is up-issued to support the 8.x Firmware Upgrade for IP Phones.

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Standard 3.00. This document is up-issued to support Communication Server 1000 Release 4.0.

June 2004

Standard 2.00. This document is up-issued to include the Nortel Networks Mobile Voice Client 2050.

October 2003

Standard 1.00. This document is a new NTP for Succession 3.0 Software. It was created to support a restructuring of the Documentation Library. This document contains information previously contained in the following legacy document, now retired: *Internet Terminals Description (553-3001-217)*.

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How to get Help

This chapter explains how to get help for Nortel products and services.

Getting help from the Nortel web site

The best way to get technical support for Nortel products is from the Nortel Technical Support web site:

www.nortel.com/support

This site provides quick access to software, documentation, bulletins, and tools to address issues with Nortel products. From this site, you can:

- download software, documentation, and product bulletins
- search the Technical Support Web site and the Nortel Knowledge Base for answers to technical issues
- sign up for automatic notification of new software and documentation for Nortel equipment
- open and manage technical support cases

Getting help over the phone from a Nortel Solutions Center

If you do not find the information you require on the Nortel Technical Support web site, and you have a Nortel support contract, you can also get help over the telephone from a Nortel Solutions Center.

In North America, call 1-800-4NORTEL (1-800-466-7835).

Outside North America, go to the following web site to obtain the telephone number for your region:

www.nortel.com/callus

Getting help from a specialist by using an Express Routing Code

To access some Nortel Technical Solutions Centers, you can use an Express Routing Code (ERC) to quickly route your call to a specialist in your Nortel product or service. To locate the ERC for your product or service, go to:

www.nortel.com/erc

Getting help through a Nortel distributor or reseller

If you purchased a service contract for your Nortel product from a distributor or authorized reseller, contact the technical support staff for that distributor or reseller.

About this document

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

Subject

This document contains description, installation, and administration information for the following:

- Nortel IP Audio Conference Phone 2033
- Nortel IP Phone 2001, IP Phone 2002, IP Phone 2004, and IP Phone 2007
- Nortel IP Phone Key Expansion Module (KEM)
- Nortel IP Softphone 2050
- Nortel Mobile Voice Client 2050 for Personal Digital Assistants (PDAs)
- Nortel IP Phone 1120E
- Nortel IP Phone 1140E

Note on legacy products and releases

This NTP contains information about systems, components, and features that are compatible with Nortel Communication Server 1000 Release 4.5 software. For more information on legacy products and releases, click the **Technical Documentation** link under **Support** on the Nortel home page:

<http://www.nortel.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 Cabinet
- Meridian 1 PBX 51C
- Meridian 1 PBX 61C
- Meridian 1 PBX 81
- Meridian 1 PBX 81C

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 4.5 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 (Part 1 of 2)

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

Table 1
Meridian 1 systems to CS 1000M systems (Part 2 of 2)

This Meridian 1 system...	Maps to this CS 1000M system
Meridian 1 PBX 51C	CS 1000M Half Group
Meridian 1 PBX 61C	CS 1000M Single Group
Meridian 1 PBX 81	CS 1000M Multi Group
Meridian 1 PBX 81C	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)

Intended audience

This document is intended for individuals responsible for maintaining Internet Enabled systems.

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 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 81
- Meridian 1 PBX 81C

Related information

This section lists information sources that relate to this document.

NTPs

The following NTPs and documents are referenced in this document:

- *IP Phone 2001 User Guide*
- *IP Phone 2002 User Guide*
- *IP Phone 2004 User Guide*
- *IP Phone 2007 User Guide*
- *IP Audio Conference Phone 2033 User Guide*
- *IP Phone 1120E User Guide*
- *IP Phone 1140E User Guide*
- *IP Phone Key Expansion Module User Guide*

- *WLAN IP Telephony: Installation and Configuration* (553-3001-304)
- *Mobile Voice Client 2050 User Guide*
- *Converging the Data Network with VoIP* (553-3001-160)
- *IP Peer Networking: Installation and Configuration* (553-3001-213)
- *Features and Services* (553-3001-306)
- *Software Input/Output: Administration* (553-3001-311)
- *IP Line: Description, Installation, and Operation* (553-3001-365)
- *Software Input/Output: Maintenance* (553-3001-511)

Online

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

<http://www.nortel.com>

CD-ROM

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

Nortel IP Phone 2001

Contents

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Introduction

This section explains how to install and maintain the IP Phone 2001. For information on using the IP Phone 2001, see the *IP Phone 2001 User Guide*.

This section contains the following procedures:

- Procedure 1, “Pre-installation checklist” on [page 47](#).
- Procedure 2, “Installing an IP Phone 2001 for the first time using manual configuration” on [page 49](#).
- Procedure 3, “Installing an IP Phone 2001 for the first time using DHCP” on [page 55](#).
- Procedure 4, “Disabling Auto Negotiate and enabling Full Duplex mode” on [page 62](#).
- Procedure 5, “Checking Ethernet Statistics” on [page 62](#).
- Procedure 6, “Changing the TN of an existing IP Phone 2001” on [page 64](#).
- Procedure 7, “Replacing an IP Phone 2001” on [page 65](#).
- Procedure 8, “Removing an IP Phone 2001 from service” on [page 65](#).

Note: After an IP Phone has been installed and configured, if power to the phone is interrupted, re-entry of the IP parameters, Node Number, TN, or re-acquisition of firmware is not required.

Description

The IP Phone 2001 brings voice and data to the desktop environment. It connects directly to the LAN through the Ethernet connection.

The IP Phone 2001 components are shown in Figure 1 on [page 37](#) and described in Table 2 on [page 37](#).

Figure 1
IP Phone 2001



Table 2
IP Phone 2001 components and functions (Part 1 of 3)

Component	Function
Speaker	Press the Dial/Line key to activate the speaker for on-hook dialing and listening.
Message Waiting/ Incoming Call Indicator	The Message Waiting lamp turns ON to indicate that a message has been left for the user. This lamp also flashes when the set ringer is ON.



Table 2
IP Phone 2001 components and functions (Part 2 of 3)









Component		Function
Volume control bar		<p>Use the volume control bar to adjust the volume of the Handset, Ringer, and On-hook Dialing/Listen tones.</p> <p>Press the right side of the rocker bar to increase volume; press the left side to decrease volume.</p>
Navigation keys		<p>Use the navigation keys to scroll through menus and lists in the display area.</p>
Dial/Line key		<p>Use the Dial/Line key to access the single line and activate on-hook dialing. No status icon or LED is provided.</p>
Hold key		<p>Press the Hold key to put an active call on hold. Press the Dial/Line key to return to the caller on hold.</p>
Soft keys (self-labeled)		<p>Soft keys (self-labeled) are located below the display area. The LCD label above the key changes, based on the active feature.</p> <p>Note: A triangle before a key label indicates that the key is active.</p>
Message key		<p>Press the Message key to access your voicemail box.</p>

Table 2
IP Phone 2001 components and functions (Part 3 of 3)

Component	Function
Goodbye key 	Press the Goodbye key to terminate an active call.
Services key 	Press the Services key to access the following items: <ul style="list-style-type: none"> • Telephone Options (see Notes 1 and 2): <ul style="list-style-type: none"> — Volume adjustment — Contrast adjustment — Language — Date/Time — Local DialPad Tone — Set Information — Ring type • Password Admin: <ul style="list-style-type: none"> — Station Control Password • Virtual Office Login and Virtual Office Logout (if Virtual Office is configured) Press the Services key to exit from any menu or menu item.
<p>Note 1: If a call is presented while the user is manipulating information, the phone rings. However, the screen display is not updated with Caller ID and the programming text is not disturbed.</p> <p>Note 2: The user can originate a call using Autodial or Last Number Redial while manipulating an option. However, the display is not updated with the dialed digits or Caller ID, and Autodial and Last Number Redial intercept the dialpad.</p>	

Supported features

The IP Phone 2001 supports the following additional features:

- 802.1Q VLAN and 802.1P priority support, industry standards for managing bandwidth usage
- 802.1x Port-based network access control, industry standard for passing Extensible Authentication Protocol (EAP) over a LAN
- 802.1ab Link Layer Discovery
- Extensible Authentication Protocol (EAP)
- Gratuitous Address Resolution Protocol Protection (GARP)
- VLAN filtering
- Virtual office
- Branch Office
- Both the registered and configured TNs are displayed in the Set Info menu.
- Basic IP User License — for more information, see *IP Line: Description, Installation, and Operation* (553-3001-365)
- language support: English, French, Swedish, Danish, Norwegian, German, Dutch, Portuguese, Czech, Finnish, Hungarian, Italian, Polish, Spanish, Japanese, Russian, Latvian, Turkish

Features not currently supported

The following features are not supported on the IP Phone 2001:

- External three-port switch to support sharing LAN access with a PC or other data device is not provided. However, the IP Phone 2001 does provide 100 Mbps full-duplex support.
- Integrated switch
- Personal Directory, Call Log and Redial List are not supported. However, if the primary DN on an IP Phone 2001 is an MADN of an IP Phone 2002, IP Phone 2004, or IP Softphone 2050, Preferred Name Match and Idle Set Display (new call indication) are supported.

- Corporate Directory
- Automatic Call Distribution
- IP Key Expansion Modules
- Support of accessory modules
- Live Dialpad
- Group Listening
- Set-to-Set messaging
- Context-sensitive soft keys
- Handsfree operation
- Headset support
- External Applications Server

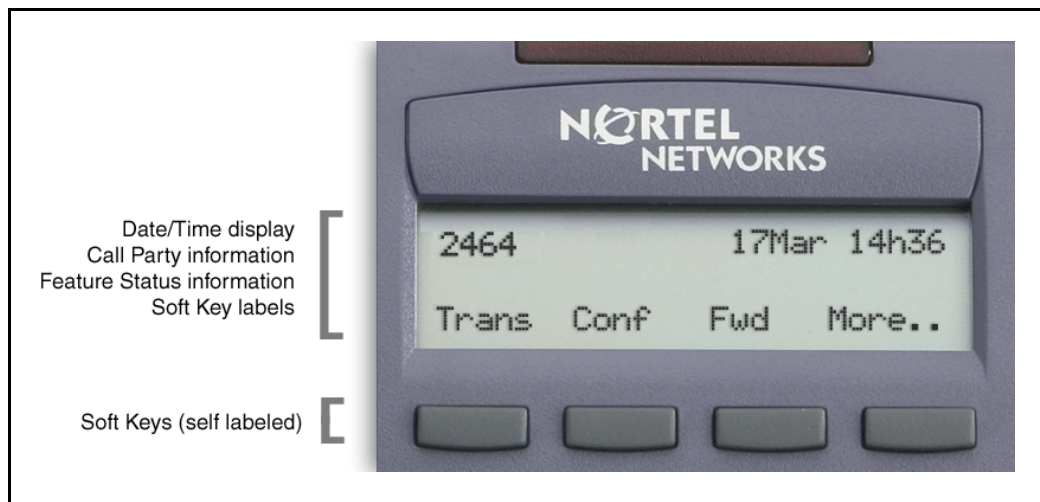
Display characteristics

An IP Phone 2001 has two display areas:

- information line display
- soft key label display

Figure 2 on [page 42](#) shows these two display areas.

Figure 2
IP Phone 2001 display areas



Cleaning the IP Phone display screen

Gently wipe the IP Phone display screen with a soft, dry cloth.



CAUTION

Do not use any liquids or powders on the IP Phone 2001. Using anything other than a soft, dry cloth can contaminate IP Phone components and cause premature failure.

Information Line display

An IP Phone 2001 has a one-line information display area with the following information:

- Caller Number
- Caller Name
- Feature prompt strings

- User-entered digits
- Date and time information (if the IP Phone is in an idle state)
- Set information

The information area changes, according to call processing state and active features.

Soft key label display

A maximum of ten functions can be assigned to the soft keys. Your system administrator assigns functions to the soft keys in layers.

Use the **More..** soft key to navigate through the layers of functions. If there are only four functions assigned to the soft keys, the **More..** key does not appear and all four functions are displayed.

The soft key label has a maximum six characters. Each soft key includes the soft key label and an icon. When a soft key is in use, a flashing icon displays at the beginning of the soft key label, and the label shifts one character to the right. (If the label is six characters long, the last or rightmost character is truncated.) If a feature is enabled, the icon state turns to On. It remains in the on state until the feature key is pressed again. This cancels the enabled feature and turns the icon off, returning the soft key label to its original state.

Key number assignments

The IP Phone 2001 has four soft-labeled, predefined soft keys that are used to provide up to ten features. Because they are predefined, the user cannot change the key number assignment.

The Message key is numbered 16. Key numbers 17 to 31 are the four soft key labels below the display area. See Figure 1 on [page 37](#).

Key numbers 17 to 31 support the features A03, A06, CFW, CHG, CPN, PRK, PRS, RGA, RNP, SCC, SCU, SSC, SSU and TRN, as listed in Table 3 on [page 44](#).

Key number assignments at the Call Server are aligned with that of the IP Phone 2002. The mappings between IP Phone 2001 soft key numbers and PBX CPU key numbers are the same as on the IP Phone 2002 and IP Phone 2004.

Table 3 describes the IP Phone assignment functions for each of the soft keys. Use LD 11 to program keys 16 to 26 on the IP Phone 2001.

Note: If you attempt to configure anything other than the permitted response, the system generates an error code.

Table 3
IP Phone 2001 soft keys

Key Number	Response	Description
Key 16	MWK	Message Waiting key
Key 17	TRN	Call Transfer key
Key 18	A06	Six-party conference key Alternate: A03 (3-party conference)
Key 19	CFW	Call Forward key
Key 20	RGA	Ring Again key
Key 21	PRK	Call Park key
Key 22	RNP	Ringing Number Pickup key
Key 23	Reserved for speed dial	Speed dial includes SCU, SCC, SSU, SSC
Key 24	PRS	Privacy Release key
Key 25	CHG	Charge Account key
Key 26	CPN	Calling Party Number key
Keys 27 - 31		Reserved

Package components

The following information applies to Phase II IP Phones. Product codes for Phase II IP Phones are different from previous sets.

See the product code on the back of the phone to confirm whether it is a Phase II IP Phone. The product code for Phase II IP Phones appears as “IP Phone 200x”. The product code for previous versions of the IP Phones appears with an “i” in front of the model number; example, “i200x”.

The AC power adapter must be ordered separately if local power using the AC adapter is required, because Phase II IP Phones include integrated support for a number of power over LAN options, including support for IEEE 802.3af standard power.

Table 4 lists the IP Phone 2001 package components and product codes.

Table 4
IP Phone 2001 components list (Part 1 of 2)

IP Phone 2001 package contents include:	
<ul style="list-style-type: none"> • IP Phone 2001 • Handset • Handset cord • Footstand • 7 ft. Cat5 Ethernet cable • Getting Started card 	
IP Phone 2001(Ethergray) with Icon keycaps	NTDU90AA16/A0533387
IP Phone 2001 (Ethergray) with English text label keycaps	NTDU90BA16/A0533388
IP Phone 2001 (Charcoal) with Icon keycaps	NTDU90AA70/A0053389
IP Phone 2001 (Charcoal) with English text label keycaps	NTDU90BA70/A0533390
Replacement parts	
7 ft. Cat5 Ethernet Cable	A0648375

Table 4
IP Phone 2001 components list (Part 2 of 2)

Handset, Ethergray	A0788874
Handset, Charcoal	A0758634
Handset cord, Ethergray; for IP Phone 2004 and IP Phone 2001	A088682
Handset cord, Charcoal; for IP Phone 2004 and IP Phone 2001	N0000764
IP Phone 2001/2002/2004 Power Adapters	
Power transformer (117/120 VAC 50/60 Hz) (North America)	A0619627
Power transformer 3 prong AC to AC, direct plug-in, 8W, 240 VAC, 50Hz to 16 VAC at 500 mA (Ireland and UK)	A0656598
Power transformer AC to AC, direct plug-in, 8W, 230 VAC, 50/60 Hz, to 16 VAC at 500 mA (Europe)	A0619635
Power transformer 2 prong wall plug direct plug-in AC to AC, 8W, 240 VAC, 50 Hz, to 16 VAC at 500 mA (Australia and New Zealand)	A0647042
Power transformer AC to AC, direct plug-in, 8W, 100 VAC, 50 Hz, to 16 VAC at 500 mA	A0828858

For more information, and for information about previous versions of the IP Phone, contact your Nortel representative.

Before you begin

The following section provides a step-by-step guide through the IP Phone 2001 installation process. Before installing the IP Phone 2001, complete the following pre-installation checklist.

Procedure 1
Pre-installation checklist

- 1** Ensure there is one IP Phone 2001 boxed package for each IP Phone 2001 being installed. The package contains:
 - IP Phone 2001
 - Handset
 - Handset cord
 - Footstand
 - 2.3 m (7 foot) Cat5 Ethernet cable
 - Getting Started card
- 2** To install and configure an IP Phone 2001, the host system must be installed with the Voice Gateway Media Card.
- 3** If an AC power adapter is required, ensure the correct AC power transformer is used. The voltage rating of the transformer must match the wall outlet voltage. Refer to Table 4 on page 45.
- 4** Understand the three configuration modes that you can choose as you proceed through the installation of the IP Phone 2001. The three configuration modes are:
 - Static IP address – see “Static IP address assignment” on [page 48](#).
 - Dynamic Partial DHCP – see “Dynamic IP address assignment — Partial DHCP” on [page 48](#).
 - Dynamic Full DHCP – see “Dynamic IP address assignment — Full DHCP” on [page 49](#).
- 5** Make sure that a DHCP server and DHCP relay agents, if required, are installed, configured, and running.

End of Procedure

First-time installation



CAUTION — Damage to Equipment

Do not plug your IP Phone 2001 into an ISDN connection. Severe damage can result. Consult your system administrator to ensure that you are plugging your IP Phone into a 10/100BaseT Ethernet jack.

IP address assignments

During the first-time installation, there are IP address parameters that are entered either manually or automatically depending on the installation configuration. As well, you are prompted to enable or disable 802.1Q. For more information, see “802.1Q VLAN description” on [page 407](#).

There are three configuration modes you can choose from to obtain the IP parameters. Review the following sections for more information on the configuration mode that you are using.

Static IP address assignment

During the installation, the IP Phone 2001 parameters are entered manually using the key pad.

Your system administrator provides the following information: IP address, subnet mask, and default Media Gateway.

You must also enter the Connect Server parameters including: IP address, port number, action, and retry count.

Go to Procedure 2, “Installing an IP Phone 2001 for the first time using manual configuration” on [page 49](#).

Dynamic IP address assignment — Partial DHCP

For a partial DHCP installation, you must provide, through the IP Phone 2001 key pad, the Connect Server parameters including: IP address, port number, action, and retry count. Other parameters (IP Phone IP address, subnet mask, and default Gateway) are retrieved from the DHCP server.

The IP Phone 2001 password, node ID and TN must be entered manually from the key pad.

For more information about DHCP servers, see *Converging the Data Network with VoIP* (553-3001-160).

Go to Procedure 3, “Installing an IP Phone 2001 for the first time using DHCP” on [page 55](#).

Dynamic IP address assignment — Full DHCP

For a full DHCP installation, all parameters (IP Phone IP address, subnet mask, default Gateway, Connect Server IP address, port number, action, and retry count) are retrieved from the DHCP server to recognize the IP Phone 2001.

The IP Phone 2001 password, node ID, and TN must be entered manually from the key pad.

For more information on how to set up DHCP servers for use with the IP Phones, refer to *Converging the Data Network with VoIP* (553-3001-160).

Go to Procedure 3, “Installing an IP Phone 2001 for the first time using DHCP” on [page 55](#).

Procedure 2 Installing an IP Phone 2001 for the first time using manual configuration

- 1** Configure a virtual loop on the system using LD 97.

For more information, see *Software Input/Output: Administration* (553-3001-311).

- 2** Configure the IP Phone 2001 on the system using LD 11.

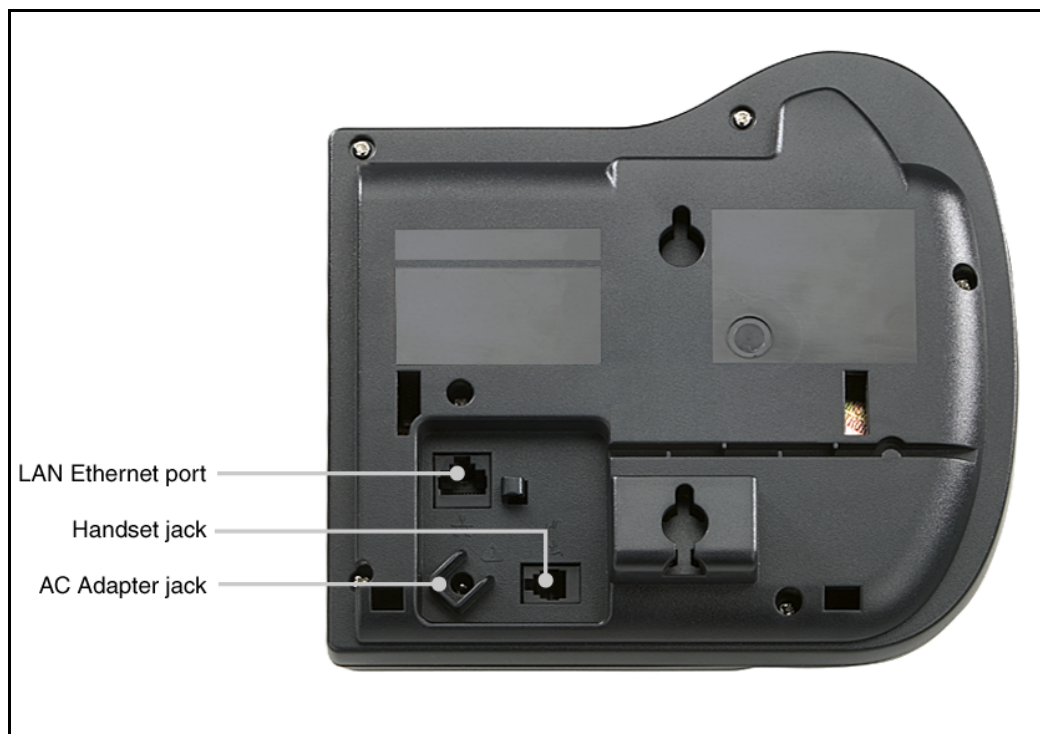
For more information, see *Software Input/Output: Administration* (553-3001-311).

- 3** Connect the IP Phone 2001 components:

- a.** Connect one end of the handset cord to the handset jack on the back of the IP Phone identified with a handset icon.
- b.** Connect the other end of the handset cord to the handset.

- 4 Connect one end of the CAT5 Ethernet cable to the network interface located on the back of the IP Phone (identified with a LAN icon, see Figure 3). The other end of the CAT5 Ethernet cable plugs into the IP network.

Figure 3
IP Phone 2001 rear view



- 5 Power the IP Phone 2001 using either the Power over Ethernet or an AC power transformer (local power).

If local power is used, plug the AC power transformer into the nearest power outlet. Make sure you use the correct AC power transformer is used. The voltage rating of the transformer must match the wall outlet voltage. Refer to Table 4 on [page 45](#). Connect the transformer to the AC power jack shown in Figure 3 on [page 50](#). Be sure to thread the cord around the retaining hook to provide strain relief for a secure power connection.

IMPORTANT!

Timing information

There are only four seconds between plugging in the IP Phone 2001 power transformer and the appearance of the Nortel logo in the middle of the display. When you see the logo, you have one second to respond by pressing the four feature keys at the bottom of the display in sequence from left to right. If you miss the one-second response time, the IP Phone 2001 attempts to locate the connect server. Wait until it is finished, and then begin the power-up sequence again.

- 6 When the Nortel logo appears in the middle of the display, immediately press the four feature keys at the bottom of the display in sequence from left to right.
- 7 At the prompt EAP enable?, select **Yes**. Enter DeviceID and Password. For more information on EAP, refer to Appendix C: “802.1x Port-based network access control” on [page 415](#).
Note: If you select **No**, you will not be prompted to enter Device ID and Password.
- 8 At the prompt DHCP Yes/No?, select **No**.
- 9 Enter the following information provided by your system administrator:

Screen prompt	Description
set IP	A valid IP Phone 2001 IP address
net msk	A subnet mask
def gw	The default Gateway for the IP Phone 2001 on the LAN segment to which it is connected

- 10 Enter the information for the primary Connect Server (S1) and the secondary Connect Server (S2):

Screen prompt	Description
S1 IP	The node IP address of the IP line node
S1 Port	This is a fixed value: 4100
S1 action	This is a fixed value: 1
S1 retry	The number of times the IP Phone 2001 attempts to connect to the server. Enter 10.
S2 IP	Same as S1 in most cases (see note below)
S2 Port	Same as S1
S2 action	Same as S1
S2 retry	Same as S1
Cfg XAS? (0-No,1-Yes)	Enter 0 (for No) External Application Server (XAS) is not supported on the IP Phone 2001. This prompt exists to support future implementation of XAS.
VLAN? (0-No, 1-Ma, 2-Au)	Default 0 (for No) 802.1Q VLAN remains off and initialization continues. For more information about VLAN configuration, refer to <i>Converging the Data Network with VoIP</i> (553-3001-160).

1-Ma

Enter a Voice VLAN ID, then press **OK**.

The following Voice VLAN ID displays:

Manual Cfg

VOICE VLAN ID: 1234

Note: The Voice VLAN ID is entered as an integer. The Voice VLAN ID is a 12-bit value between 1 and 4095.

The IP Phone 2001 is configured with 802.1Q enabled, the VOICE VLAN ID is configured to the entered value, and the VOICE VLAN priority = 6.

2-Au

Automatically enter VLAN ID using DHCP. DHCP auto discovers the VLAN ID.

)

VLANFILTER (0-No, 1-Yes)
Default 0 (for No)

You will not be prompted for VLANFILTER if VLAN? is not enabled.

Data VLAN? (0-No, 1-Yes)

After the value is entered, the DATA VLAN configuration option appears on the display.

Select **0-No**, since DATA VLAN is not supported on the IP Phone 2001.

Duplex (0-Auto, 1-Full)

Default 0 (for Auto)

GARP Ignore? (0-No,1-Yes)

Default 0 (for No)

- 11** The IP Phone 2001 can support primary (S1) and secondary (S2) connect server. If you require IP Phones to register on multiple nodes, refer to “Enhanced Redundancy for IP Line Nodes” in *IP Line: Description, Installation, and Operation* (553-3001-365).

The IP Phone 2001 searches for the connect server. When the connection is complete, proceed with step 12.

- 12** Enter the following information provided by your system administrator:

Screen prompt	Description
Password	IP Phone Installer Password
	You are not prompted to enter the IP Phone Installer Password if it has not been configured in your system.
Node	The node ID.
TN	The TN or VTN.

The IP Phone 2001 registers with the Terminal Proxy Server (TPS) and, if needed, begins the firmware download. This takes several minutes. When the download is complete, the IP Phone 2001 resets.

Note: The Enhanced UNISTim Firmware Download feature for IP Phones provides an improved method of delivering new firmware to IP Phones. For further information on Enhanced UNISTim Firmware Download, refer to *IP Line: Description, Installation, and Operation* (553-3001-365).

The current system date and time appear on the top line of the display when the configuration is complete. Self-labeling keys also appear.

- 13** Check for dial tone and the correct DN above the display.
- 14** Secure the IP Phone footstand to the base of the IP Phone. Use the angle adjustment grip on the top back of the IP Phone to adjust the position.
- 15** (Optional) Customize the feature keys as required. For more information, see *IP Phone 2001 User Guide*.

End of Procedure

Procedure 3
Installing an IP Phone 2001 for the first time
using DHCP

- 1** Configure a virtual loop on the system using LD 97.
For more information, see *Software Input/Output: Administration* (553-3001-311).
- 2** Configure the IP Phone 2001 on the system using LD 11.
For more information, see *Software Input/Output: Administration* (553-3001-311).
- 3** Connect the IP Phone 2001 components:
 - a.** Connect one end of the handset cord to the handset jack on the back of the IP Phone identified with a handset icon.
 - b.** Connect the other end of the handset cord to the handset.
- 4** Connect one end of the CAT5 Ethernet cable to the network interface located on the back of the IP Phone (identified with a LAN icon, see Figure 3 on [page 50](#)). The other end of the CAT5 Ethernet cable plugs into the IP network.

- 5 Power the IP Phone 2001 using either the Power over Ethernet or an AC power transformer (local power).

To use local power, plug the AC power transformer into the nearest power outlet. Ensure the correct AC power transformer is used. The voltage rating of the transformer must match the wall outlet voltage. Refer to Table 4 on page 45. Connect the transformer to the AC power jack shown in Figure 3 on [page 50](#). Be sure to thread the cord around the retaining hook to provide strain relief for a secure power connection.

IMPORTANT!

Timing information

There are only four seconds between plugging in the IP Phone 2001 power transformer and the appearance of the Nortel logo in the middle of the display area. When you see the logo, you have one second to respond by pressing the four feature keys at the bottom of the display in sequence from left to right. If you miss the one-second response time, the IP Phone 2001 attempts to locate the connect server. Wait until it is finished, and then begin the power-up sequence again.

- 6 When the Nortel logo appears in the middle of the display area, immediately press the four feature keys at the bottom of the display in sequence from left to right.
- 7 At the prompt EAP enable?, select **Yes**. Enter DeviceID and Password. For more information on EAP, refer to Appendix C: "802.1x Port-based network access control" on [page 415](#).

Note: If you select **No**, you will not be prompted to enter Device ID and Password.
- 8 At the prompt DHCP Yes/No?, select **Yes**.
- 9 Select Partial or Full DHCP.
 - a. If you select Full DHCP, then the following parameters are retrieved from the DHCP server:
 - a valid IP Phone 2001 IP address
 - a subnet mask

- the default Media Gateway for the IP Phone 2001 on the LAN segment to which it is connected
- the S1 node IP address of the IP line node
- the S1 action
- the S1 retry count. This is the number of times the IP Phone 2001 attempts to connect to the server
- the S2 node IP address of the IP line node
- the S2 action
- the S2 retry count

b. If you select Partial DHCP, then you must enter the following parameters:

Screen prompt	Description
S1 IP	the node IP address of the IP line node
S1 Port	this is a fixed value: 4100
S1 action	this is a fixed value: 1
S1 retry	the number of times the IP Phone 2001 attempts to connect to the server; enter 10
S2 IP	same as S1 in most cases (see note below)
S2 Port	same as S1
S2 action	same as S1
S2 retry	same as S1
Cfg XAS? (0-No,1-Yes)	Enter 0 (for No), since External Application Server is not supported on the IP Phone 2001. This prompt exists to support future implementation of External Application Server.

VLAN? (0-No, 1-Ma, 2-Au)

Default 0 (for No)
802.1Q remains off and initialization continues.

For more information about VLAN configuration, refer to *Converging the Data Network with VoIP* (553-3001-160).

1-Ma
Enter a VLAN ID manually, then press OK.
The following VLAN ID displays:

Manual Cfg

VOICE VLAN ID: 1234

Note: The VOICE VLAN ID is entered as a decimal. The VOICE VLAN ID is a 12-bit value between 0 and 4095.

The IP Phone 2001 is configured with 802.1Q enabled, VOICE VLAN priority = 6, and the VOICE VLAN ID set to the entered value.

	2-Au Automatically enter a VLAN ID using DHCP. DHCP auto discovers the VLAN ID.
	VLANFILTER (0-No, 1-Yes) Default 0 (for No) You will not be prompted for VLANFILTER if VLAN? is not enabled.
Data VLAN? (0-No, 1-Yes)	After the value is entered, the DATA VLAN configuration option appears on the display. Select 0 (for No), since DATA VLAN is not supported on the IP Phone 2001.
Duplex (0-Auto, 1-Full)	Default 0 (for Auto).
GARP Ignore? (0-No,1-Yes)	Default 0 (for No)

Note: The IP Phone 2001 can support a primary (S1) and secondary (S2) connect server. If you require IP Phones to register on multiple nodes, refer to “Enhanced Redundancy for IP Line Nodes” in *IP Line: Description, Installation, and Operation* (553-3001-365).

The IP Phone 2001 searches for the connect server. When the connection is complete, proceed to step 10.

10 Enter the following information provided by your system administrator.

Screen prompt	Description
Password	IP Phone Installer Password You are not prompted to enter the IP Phone Installer Password if it has not been configured in your system.

Node	The node ID
TN	The TN or VTN

The IP Phone 2001 registers with the TPS and, if needed, begins the firmware download. This takes several minutes. When the download is complete, the IP Phone 2001 resets.

Note: The Enhanced UNISlim Firmware Download feature for IP Phones provides an improved method of delivering new firmware to IP Phones. For further information on Enhanced UNISlim Firmware Download, refer to *IP Line: Description, Installation, and Operation* (553-3001-365).

The current system date and time appear on the top line of the display when the configuration is complete. Self-labeling keys also appear.

- 11 Check for dial tone and the correct DN above the display.
- 12 Secure the IP Phone footstand to the base of the IP Phone. Use the angle adjustment grip on the top back of the IP Phone to adjust the position.
- 13 (Optional) Customize the feature keys as required. For more information, see *IP Phone 2001 User Guide*.

End of Procedure

Start-up sequence

When an IP Phone 2001 is connected to the network, it must perform a startup sequence. The elements of the startup sequence include:

- obtaining the IP parameters
- finding a default Gateway server
- authenticating the user

See Table 5 on [page 61](#) for a summary of the IP parameters and how they are obtained.

Note: For all static IP address assignments, your system administrator provides the network information.

Table 5
IP Phone 2001 IP parameters

Parameter	Method of Acquisition
IP Address	Manually entered or automatically retrieved through Partial or Full DHCP.
Net Mask	Manually entered or automatically retrieved through Partial or Full DHCP.
Default Address	Manually entered or automatically retrieved through Partial or Full DHCP.
Connect Server (IP address, port, action and retry count — primary and secondary)	Manually entered or automatically retrieved through Full DHCP.
User ID (Node ID, Node Password and TN)	Manually entered for first-time configuration. Retrieved from local storage on subsequent power cycles. Provided by your system administrator.

Full Duplex mode

In the **Configuration** menu, Auto Negotiate mode is the default setting for initial startup. Typically, the IP Phone 2001 is connected to a network that supports Auto Negotiate, and it selects the best speed and duplex mode available. There is no intervention required under normal operation.

If the IP Phone is connected to a network configured for Full Duplex mode only, it is not able to automatically negotiate the proper configuration. Therefore, in this instance, to allow the IP Phone to work at the optimum speed and duplex mode, Auto Negotiate must be disabled. Use the following procedure to disable Auto Negotiate and enable Full Duplex mode.

Procedure 4
Disabling Auto Negotiate and enabling Full Duplex mode

- 1 Reset the phone by disconnecting and re-connecting power.
- 2 When the Nortel logo appears, press each of the soft keys in sequence. See Procedure 3 on [page 55](#).
- 3 If no other configuration changes are required, press **OK** repeatedly until the Duplex network option appears.
- 4 Select 1 to enable Full Duplex mode.
- 5 When the Speed option appears, select one of the following:
 - 0 for 10 Mbps
 - 1 for 100 Mbps (default)
- 6 Select **OK** to confirm the change.
- 7 Restart the IP Phone 2001. The firmware reads the new setting, and the IP Phone operates in Full Duplex mode.

End of Procedure

When the IP Phone is restarted, the firmware reads the setting for Full Duplex mode and sets port 0, the network interface port, accordingly.

Use the following procedure to confirm activation of Full Duplex mode.

Procedure 5
Checking Ethernet Statistics

- 1 Double-click the **Services** key. The Network Diagnostics menu appears.
- 2 Select **Ethernet Statistics**.
 - If Full Duplex mode is active, the following is displayed:
 - Link: UP
 - Duplex: Full
 - Speed: 10 (Mb) or 100(Mb)

- Auto-Nego Capability: N
- Auto-Nego Completed: N

End of Procedure

Gratuitous Address Resolution Protocol Protection

Gratuitous Address Resolution Protocol Protection (GARP) prevents the IP Phone 2001 from GARP Spoof attacks on the network. In a GARP Spoof attack, a malicious device on the network takes over an IP address (usually the default gateway) by sending unsolicited (or Gratuitous) ARP messages, thus manipulating the ARP table of the victim's machine. This allows the malicious device to launch a variety of attacks on the network, resulting in undesired traffic routing. For example, a GARP attack can convince the victim machine that the malicious device is the default gateway. In this scenario, all traffic from the victim's machine flows through the malicious device.

To enable GARP Protection during configuration, refer to Procedure 2, "Installing an IP Phone 2001 for the first time using manual configuration" on [page 49](#) or Procedure 2, "Installing an IP Phone 2001 for the first time using DHCP" on [page 55](#).

Extensible Authentication Protocol

Extensible Authentication Protocol (EAP) is a general protocol that fulfills the protocol requirements defined by 802.1x. For further information on 802.1x, refer to Appendix C: "802.1x Port-based network access control" on [page 415](#).

Reinstalling an IP Phone 2001

You can reinstall an existing previously configured IP Phone 2001 on the same system. For example, the IP Phone 2001 can be assigned to a new user (new TN) or to an existing user who moved to a new subnet by changing the TN of the IP Phone 2001.

Procedure 6
Changing the TN of an existing IP Phone 2001

- 1 Repower the IP Phone 2001.
- Note:** During the reboot sequence of a previously configured Internet Telephone, the IP Phone 2001 displays the existing node number for approximately five seconds.
- 2 If node password is enabled and NULL, choose one of the following:
- a. Disable password.
 - b. Set password as non-NULL.
- 3 Press **OK** when the node number displays.
- | If | Then |
|--|---|
| node password is enabled and is not NULL | a password screen displays. Go to step 4. |
| node password is disabled | a TN screen displays. Go to step 5. |
- 4 Enter password at the password screen, and press **OK**.
A TN screen displays.
- 5 Select the **Clear** soft key to clear the existing TN.

End of Procedure

Replacing an IP Phone 2001

IMPORTANT!

Two IP Phones cannot share the same TN. You must remove the IP Phone 2001 that is currently using the TN.

Procedure 7 Replacing an IP Phone 2001

- 1 Disconnect the IP Phone 2001 that you want to replace.
- 2 Follow either Procedure 2 on [page 49](#) (static IP assignment) or Procedure 3 on [page 55](#) (dynamic IP assignment) to install and configure the IP Phone 2001.
- 3 Enter the same TN and Node Number as the IP Phone 2001 you replaced. The system associates the new IP Phone 2001 with the existing TN.

End of Procedure

Removing an IP Phone 2001 from service

Procedure 8 Removing an IP Phone 2001 from service

- 1 Disconnect the IP Phone 2001 from the network or turn off the power.

Note: The service to the PC is disconnected as well if the PC is connected to the IP Phone 2001.

If the IP Phone 2001 was automatically configured, the DHCP lease expires and the IP address returns to the available pool.

- 2 In LD 11, OUT the TN.

End of Procedure

Nortel IP Phone 2002

Contents

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Introduction

This section explains how to install and maintain the IP Phone 2002. For information on using the IP Phone 2002, see the *IP Phone 2002 User Guide*.

This section contains the following procedures:

- Procedure 9, “Pre-installation checklist” on [page 80](#).
- Procedure 10, “Installing an IP Phone 2002 for the first time using manual configuration” on [page 83](#).
- Procedure 11, “Installing an IP Phone 2002 for the first time using DHCP” on [page 88](#).
- Procedure 12, “Disabling Auto Negotiate and enabling Full Duplex mode” on [page 97](#).
- Procedure 13, “Checking Ethernet Statistics” on [page 97](#).
- Procedure 14, “Changing the TN of an existing IP Phone 2002” on [page 98](#).
- Procedure 15, “Replacing an IP Phone 2002” on [page 99](#).
- Procedure 16, “Removing an IP Phone 2002 from service” on [page 100](#).

Note: After an IP Phone has been installed and configured, if power is to the phone is interrupted, re-entry of the IP parameters, Node Number, TN, or re-acquisition of firmware is not required.

Description

The IP Phone 2002 brings voice and data to the desktop environment. It connects directly to the LAN through the Ethernet connection.

The IP Phone 2002 components are shown in Figure 4 on [page 69](#).

Figure 4
IP Phone 2002

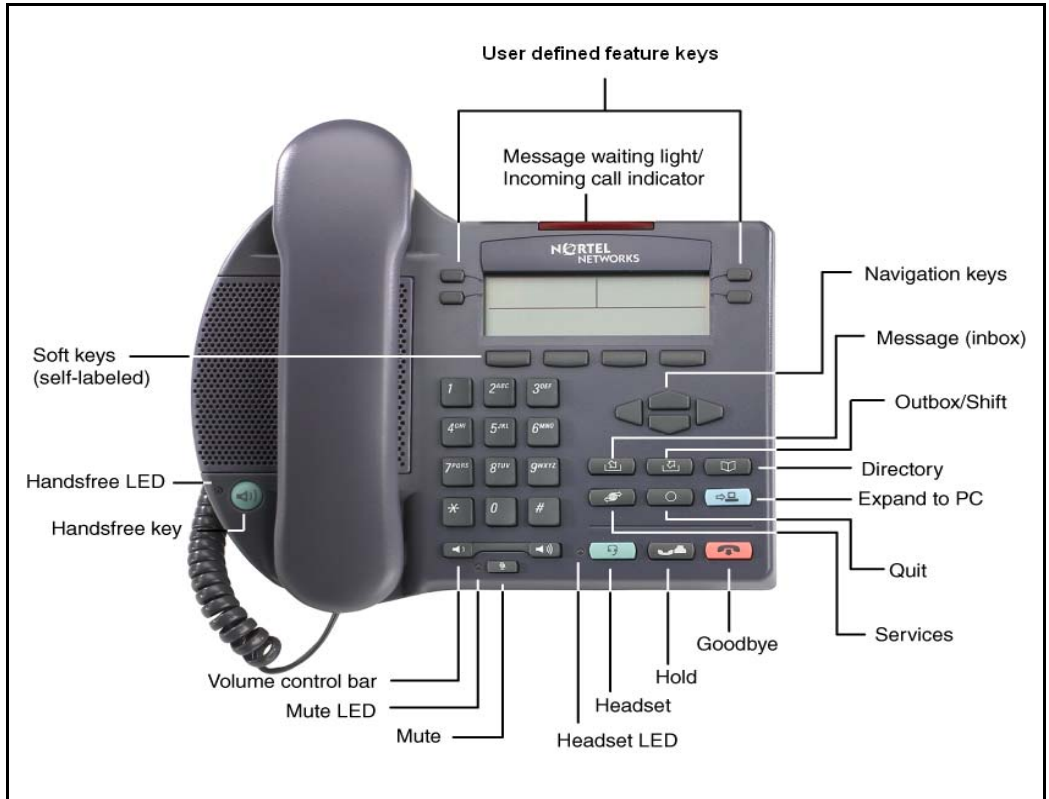


Table 6
IP Phone 2002 components and functions (Part 1 of 4)

Component	Function
Speaker	Press the Handsfree key to activate the speaker.
Programmable Line DN/ feature keys (self-labeled)	<p>Four programmable line (DN)/feature keys (self-labeled) are configured for various features on the IP Phone. One must be the prime DN key.</p> <p>A steady LCD light beside a line (DN) key indicates the feature or line is active. A flashing LCD indicates the line is on hold or the feature is being programmed.</p>
Message Waiting light/ Incoming Call Indicator	The Message Waiting light turns ON to indicate that a message has been left for the user. This light also flashes when the set ringer is ON.
Soft keys (self-labeled)	<p>Soft keys (self-labeled) are located below the display area. The LCD label above the key changes, based on the active feature.</p> <p>Note: A triangle before a key label indicates that the key is active.</p>
Navigation keys	Use the navigation keys to scroll through menus and lists in the display area.
Inbox (Message)	Press the Inbox (Message) key to access your voicemail box.
Outbox/Shift	The Outbox/Shift key is a fixed key that is reserved for future feature development.
Directory	Press the Directory key to access Directory services.

Table 6
IP Phone 2002 components and functions (Part 2 of 4)

Component	Function
Services	<p>Press the Services key to access the following items:</p> <ul style="list-style-type: none">• Telephone Options (see Notes 1 and 2):<ul style="list-style-type: none">— Volume Adjustment— Contrast Adjustment— Language— Date/Time Format— Display diagnostics— Local Dialpad Tone— Ring type— OnHook Default Path— Change Feature key label— Set Information• Virtual Office Login and Virtual Office Logout (if Virtual Office is configured)• Test Local Mode and Resume Local Mode (if Branch Office is configured)
Quit	<p>Press the Quit key to end an active application.</p> <p>Pressing the Quit key does not affect the status of the calls currently on your IP Phone.</p>
Expand to PC	<p>The Expand to PC key is used to access external server applications such as External Application Server (XAS).</p>
Goodbye	<p>Press the Goodbye key to terminate an active call.</p>

Table 6
IP Phone 2002 components and functions (Part 3 of 4)

Component	Function
Hold	Press the Hold key to put an active call on hold. Press the line (DN) key beside the flashing LCD to return to the caller on hold.
Headset	Press the Headset key to answer a call using the headset or to switch a call from the handset or Handsfree to the headset.
Mute	<p>Press the Mute key to listen to the receiving party without transmitting.</p> <p>Press the Mute key again to return to a two-way conversation.</p> <p>The Mute key applies to Handsfree, Handset, and Headset microphones.</p> <p>The Mute LED flashes when the Mute option is in use.</p>
Volume control bar	<p>Use the volume control bar to adjust the volume of the handset, headset, speaker, ringer, and, Handsfree feature.</p> <p>Press the right side of the rocker bar to increase volume; press the left side to decrease volume.</p>

Table 6
IP Phone 2002 components and functions (Part 4 of 4)

Component	Function
Handsfree key	<p>Press the Handsfree key to activate the Handsfree feature.</p> <p>The LED lights to indicate when handsfree is active.</p>
<p>Note 1: If a call is presented while the user is manipulating an option, the IP Phone 2002 rings and the DN key flashes. However, the screen display is not updated with Caller ID information and programming text is not disturbed.</p> <p>Note 2: The user can originate a call using Autodial or Last Number Redial while manipulating an option. However, the display is not updated with the dialed digits or the Caller ID information, and Autodial and Last Number Redial intercept the dialpad.</p>	

Supported features

The IP Phone 2002 supports the following additional features:

- 802.1Q VLAN and 802.1P priority support, industry standards for managing bandwidth usage — full VLAN capability, including a manageable integrated switch in the IP Phone for VLAN and priority tagging for PC and IP Phone traffic
- 802.1x Port-based network access control, industry standard for passing Extensible Authentication Protocol (EAP) over a LAN
- integrated hardware to support power over Ethernet, for IEEE 802.3af standard power; also including support for PowerDsine Power over LAN Hub powering, and Cisco proprietary powering as tested with specific Cisco Ethernet switch equipment
- Extensible Authentication Protocol (EAP)
- Gratuitous Address Resolution Protocol Protection (GARP)
- VLAN filtering
- ability to change the feature key labels

- Corporate Directory
- Personal Directory
- Redial List
- Callers List
- Password Administration
- Virtual office
- Branch Office
- switch to support sharing LAN access with a PC or other data device
- 10/100 Mbps Full Duplex mode
- Both the registered and configured TNs are displayed in the Set Info menu.
- language support: English, French, Swedish, Danish, Norwegian, German, Dutch, Portuguese, Czech, Finnish, Hungarian, Italian, Polish, Spanish, Japanese, Russian, Latvian, Turkish
- IP Key Expansion modules
- External Application Server (XAS)

Features not currently supported

The following features are not supported on the IP Phone 2002:

- Live Dialpad
- Group Listening
- Set-to-Set messaging
- Context-sensitive soft keys

The three-port switch that is internal to the IP Phone 2002 is an unmanaged switch. It passes the packets (unmodified) and does not interpret the 802.1Q header. The three-port switch provides priority based on the port. The IP Phone port traffic takes priority over the Ethernet.

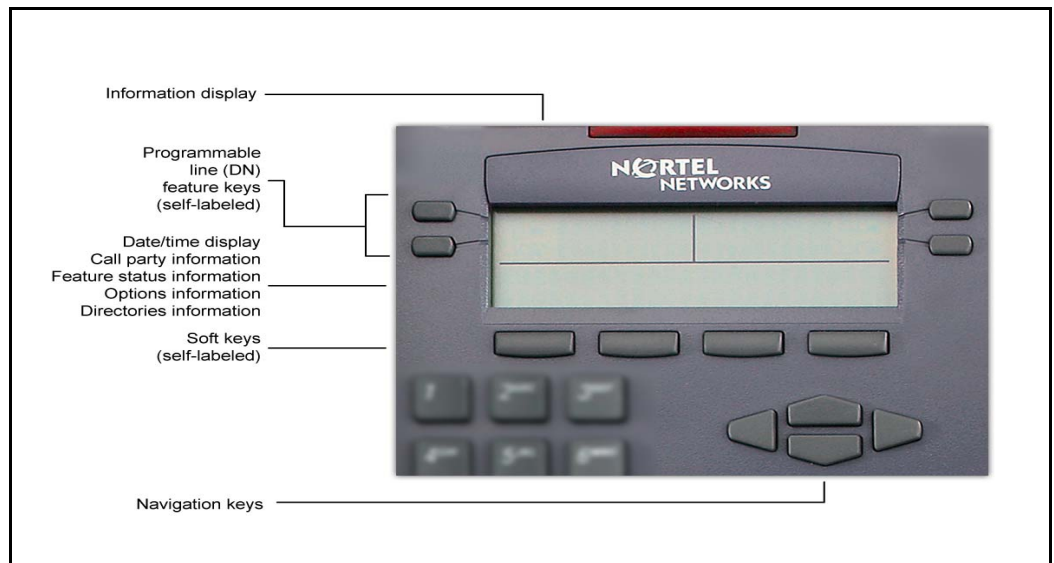
Display characteristics

An IP Phone 2002 has three major display areas:

- programmable line (DN) feature key label
- soft key label
- information line

Figure 5 on [page 75](#) shows these three display areas.

Figure 5
IP Phone 2002 display areas



Cleaning the IP Phone display screen

Gently wipe the IP Phone display screen with a soft, dry cloth.



CAUTION

Do not use any liquids or powders on the IP Phone. Using anything other than a soft, dry cloth can contaminate IP Phone components and cause premature failure.

Programmable line (DN)/feature key label display

The feature key label area displays a ten-character string for each of the four feature keys. Each feature key includes the key label and an icon. The icon state can be on, off, or flashing. Key labels are left-aligned for keys on the left side of the screen, and right-aligned for keys on the right side of the screen.

Note: If a label is longer than ten characters, the last ten characters are displayed and the excess characters are deleted from the beginning of the string.

Soft key label display

A maximum of ten functions can be assigned to the soft keys. Your system administrator assigns functions to the soft keys in layers.

Use the **More..** soft key to navigate through the layers of functions. If there are only four functions assigned to the soft keys, the **More..** key does not appear and all four functions are displayed.

The soft key label has a maximum six characters. Each soft key includes the soft key label and an icon. When a soft key is in use, a flashing icon displays at the beginning of the soft key label, and the label shifts one character to the right. (If the label is six characters long, the last or rightmost character is truncated.) If a feature is enabled, the icon state turns to On. It remains in the on state until the feature key is pressed again. This cancels the enabled feature and turns the icon off, returning the soft key label to its original state.

Information line display

An IP Phone 2002 has a one-line information display area with the following information:

- Caller number
- Caller name
- Feature prompt strings
- User-entered digits
- Date and time information (if the IP Phone is in an idle state)

The information in the display area changes, according to the call processing state and active features.

Key number assignments

The IP Phone 2002 has four soft-labeled, predefined soft keys that are used to provide up to ten features. Because they are pre-defined, the user cannot change the key number assignment.

The Message key is numbered 16. Key numbers 17 to 31 are the four soft key labels below the display area. See Figure 4 on [page 69](#).

Key numbers 17 to 31 support the features A03, A06, CFW, CHG, CPN, PRK, PRS, RGA, RNP, SCC, SCU, SSC, SSU and TRN, as listed in Table 7 on [page 78](#).

Key number assignments at the Call Server are aligned with that of the IP Phone 2004. The mappings between IP Phone 2002 soft key numbers and PBX CPU key numbers are the same as on the IP Phone 2004.

Table 7 describes the IP Phone assignment functions for each of the dedicated keys. Use LD 11 to program keys 16 to 26 on the IP Phone 2002.

Note: If you attempt to configure anything other than the permitted response, the system generates an error code.

Table 7
IP Phone 2002 soft keys

Key Number	Response	Description
Key 16	MWK	Message Waiting key
Key 17	TRN	Call Transfer key
Key 18	A06	Six-party conference key Alternate: A03 (3-party conference)
Key 19	CFW	Call Forward key
Key 20	RGA	Ring Again key
Key 21	PRK	Call Park key
Key 22	RNP	Ringing Number Pickup key
Key 23	Reserved for speed dial	Speed dial includes SCU, SCC, SSU, SSC
Key 24	PRS	Privacy Release key
Key 25	CHG	Charge Account key
Key 26	CPN	Calling Party Number key
Keys 27 - 31		Reserved

Package components

The following information applies to Phase II IP Phones. Product codes for Phase II IP Phones are different from previous sets.

See the product code on the back of the phone to confirm whether it is a Phase II IP Phone. The product code for Phase II IP Phones appears as

“IP Phone 200x”. The product code for previous versions of the IP Phone appears with an “i” in front of the model number (for example, “i200x”).

The AC power adapter must be ordered separately if local power using the AC adapter is required, because Phase II IP Phones include integrated support for a number of power over LAN options, including support for IEEE 802.3af standard power.

Table 8 lists the IP Phone 2002 package components and product codes.

Table 8
IP Phone 2002 components list (Part 1 of 2)

IP Phone 2002 package contents include:	
<ul style="list-style-type: none"> • IP Phone 2002 • Handset • Handset cord • Footstand • 7ft Cat5 Ethernet cable • Getting Started card 	
IP Phone 2002 (Ethergray) with Icon keycaps	NTDU91AA16/A0533404
IP Phone 2002 (Ethergray) with English text label keycaps	NTDU91BA16/A0533405
IP Phone 2002 (Charcoal) with Icon keycaps	NTDU91AA70/A0533406
IP Phone 2002 (Charcoal) with English text label keycaps	NTDU91BA70/A0533407
Replacement parts	
7 ft. Cat5 Ethernet cable	A0648375
Handset, Ethergray	A0788874
Handset, Charcoal	A0758634
Handset cord, Ethergray	A0897725
Handset cord, Charcoal	N0000763
Footstand, Charcoal (used for Ethergray and Charcoal models)	A0891619

Table 8
IP Phone 2002 components list (Part 2 of 2)

IP Phone 2001/2002/2004 Power Adaptors	
Power transformer (117/120 VAC 50/60 Hz) (North America)	A0619627
Power transformer 3 prong AC to AC, direct plug-in, 8W, 240 VAC, 50Hz to 16 VAC at 500 mA (Ireland and UK)	A0656598
Power transformer AC to AC, direct plug-in, 8W, 230 VAC, 50/60 Hz, to 16 VAC at 500 mA (Europe)	A0619635
Power transformer 2 prong wall plug direct plug-in AC to AC, 8W, 240 VAC, 50 Hz, to 16 VAC at 500 mA (Australia and New Zealand)	A0647042
Power transformer AC to AC, direct plug-in, 8W, 100 VAC, 50 Hz, to 16 VAC at 500 mA	A0828858

For more information, and for information about previous versions of the IP Phone, contact Nortel.

Before you begin

The following section provides a step-by-step guide through the IP Phone 2002 installation process. Before installing the IP Phone 2002, complete the following pre-installation checklist.

Procedure 9 **Pre-installation checklist**

- 1 Ensure there is one IP Phone 2002 boxed package for each IP Phone 2002 being installed. The package contains:
 - IP Phone 2002
 - Handset
 - Handset cord
 - Footstand
 - 2.3 m (7') Cat5 Ethernet cable
 - Getting Started card

- 2 To install and configure an IP Phone 2002, the host system must be installed with the Voice Gateway Media Card.
- 3 If an AC power adapter is required, ensure the correct AC power transformer is used. The voltage rating of the transformer must match the wall outlet voltage. Refer to Table 8 on [page 79](#).
- 4 Understand the three configuration modes that you can choose as you proceed through the installation of the IP Phone 2002. The three configuration modes are:
 - Static IP address (see “Static IP address assignment” on [page 81](#))
 - Dynamic Partial DHCP (see “Dynamic IP address assignment — Partial DHCP” on [page 82](#))
 - Dynamic Full DHCP (see “Dynamic IP address assignment — Full DHCP” on [page 82](#))
- 5 A DHCP server and DHCP relay agents, if required, must also be installed, configured, and running.

End of Procedure

First-time installation

IP address assignments

During the first-time installation, there are IP address parameters that are entered either manually or automatically depending on the installation configuration. As well, you are prompted to enable or disable 802.1Q. For more information, see “802.1Q VLAN description” on [page 407](#).

There are three configuration modes you can choose from to obtain the IP parameters. Review the following sections for more information on the configuration mode that you are using.

Static IP address assignment

During the installation, the IP Phone 2002 parameters are entered manually using the key pad.

Your system administrator provides the following information: IP address, subnet mask, and the default Gateway.

You must also enter the Connect Server parameters including: IP address, port number, action, and retry count.

Go to Procedure 10, “Installing an IP Phone 2002 for the first time using manual configuration” on [page 83](#).

Dynamic IP address assignment — Partial DHCP

For a partial DHCP installation, you must provide, through the IP Phone 2002 key pad, the Connect Server parameters including: IP address, port number, action, and retry count. Other parameters (IP Phone IP address, subnet mask and default Gateway) are retrieved from the DHCP server.

The IP Phone 2002 password, node ID and TN must be entered manually from the key pad.

For more information about DHCP servers, see *Converging the Data Network with VoIP* (553-3001-160).

Go to Procedure 11, “Installing an IP Phone 2002 for the first time using DHCP” on [page 88](#).

Dynamic IP address assignment — Full DHCP

For a full DHCP installation, all parameters (IP Phone IP address, subnet mask, default Gateway, Connect Server IP address, port number, action, and retry count) are retrieved from the DHCP server to recognize the IP Phone 2002.

The IP Phone 2002 password, node ID, and TN must be entered manually from the key pad.

For more information on how to set up DHCP servers for use with the IP Phones, refer to *Converging the Data Network with VoIP* (553-3001-160).

Go to Procedure 11, “Installing an IP Phone 2002 for the first time using DHCP” on [page 88](#).

Procedure 10**Installing an IP Phone 2002 for the first time using manual configuration**

- 1 Configure a virtual loop on the system using LD 97.

For more information, see *Software Input/Output: Administration* (553-3001-311).

- 2 Configure the IP Phone 2002 on the system using LD 11.

For more information, see *Software Input/Output: Administration* (553-3001-311).

- 3 Connect the IP Phone 2002 components:

- a. Connect one end of the handset cord to the handset jack on the back of the IP Phone (identified with a handset icon).
- b. Connect the other end of the handset cord to the handset.

- 4 Choose one of the following connections:

- For an IP Phone not sharing LAN access with a PC:

Connect one end of the CAT5 Ethernet cable to the network interface located on the back of the IP Phone (identified with a LAN icon, see Figure 6). The other end of the CAT5 Ethernet cable plugs into the IP network.

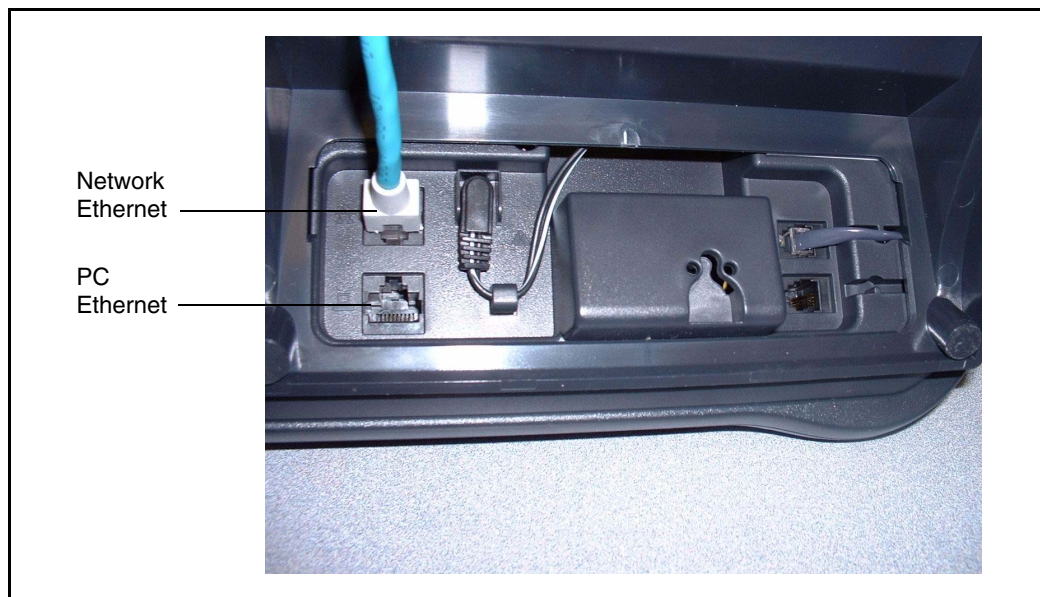
- For an IP Phone sharing LAN access with a PC:

Connect one end of the CAT5 Ethernet cable to the network interface located on the back of the IP Phone (identified with a LAN icon, see Figure 6) and the other end to the IP network. Insert one end of a second CAT5 Ethernet cable into the PC network interface located on the back of the IP Phone (identified with a PC icon, see Figure 6) and the other end into the computer.

**CAUTION****Damage to Equipment**

Do not plug your IP Phone 2002 into any other port but the PC Ethernet port. Severe damage can result. Consult your system administrator to ensure that you plug your IP Phone into the PC Ethernet port.

Figure 6
IP Phone 2002 Ethernet network interface connections



- 5 Power the IP Phone 2002 using either the Power over Ethernet or an AC power transformer (local power).

IMPORTANT!

Timing information

There are only four seconds between plugging in the IP Phone 2002 power transformer and the appearance of the Nortel logo in the middle of the display. When you see the logo, you have one second to respond by pressing the four feature keys at the bottom of the display in sequence from left to right. If you miss the one-second response time, the IP Phone 2002 attempts to locate the connect server. Wait until it is finished, and then begin the power-up sequence again.

To use local power, plug the AC power transformer into the nearest power outlet.

Ensure the correct AC power transformer is used. The voltage rating of the transformer must match the wall outlet voltage. Refer to Table 8 on page 79. Connect the power jack as shown in Figure 6 on [page 84](#). Be sure to thread the cord around the retaining hook to provide strain relief for a secure power connection.

- 6 When the Nortel logo appears in the middle of the display, immediately press the four feature keys at the bottom of the display in sequence from left to right.
- 7 At the prompt EAP enable?, select **Yes**. Enter DeviceID and Password. For more information on EAP, refer to Appendix C: "802.1x Port-based network access control" on [page 415](#).

Note: If you select **No**, you will not be prompted to enter Device ID and Password.

- 8 At the prompt DHCP Yes/No?, select **No**.
- 9 Enter the following information provided by your system administrator:

Screen prompt	Description
set IP	A valid IP Phone 2002 IP address.
net msk	A subnet mask.
def gw	The default Gateway for the IP Phone 2002 on the LAN segment to which it is connected.

- 10 Enter the information for the primary Connect Server (S1) and the secondary Connect Server (S2):

Screen prompt	Description
S1 IP	The node IP address of the IP line node.
S1 Port	This is a fixed value: 4100
S1 action	This is a fixed value: 1
S1 retry	The number of times the IP Phone 2002 attempts to connect to the server. Enter 10.
S2 IP	Same as S1 in most cases (see note below).
S2 Port	Same as S1
S2 action	Same as S1
S2 retry	Same as S1

Cfg XAS? (0-No,1-Yes)	<p>Default 1 (for Yes).</p> <p>Note: If there is no External Application Server (XAS), enter 0 (for No). You will not be prompted to enter the XAS IP address.</p>
XAS IP:	<p>Enter the IP address of the XAS server.</p>
VLAN? (0-No, 1-Ma, 2-Au)	<p>Default 0 (for No) 802.1Q VLAN remains off until initialization continues.</p> <p>For more information about VLAN configuration, refer to <i>Converging the Data Network with VoIP</i> (553-3001-160).</p> <p>1-Ma Enter a Voice VLAN ID, then press OK.</p> <p>The following Voice VLAN ID displays: Manual Cfg VOICE VLAN ID: 1234</p> <p>Note: The Voice VLAN ID is entered as an integer. The Voice VLAN ID is a 12-bit value between 1 and 4095.</p> <p>The IP Phone 2002 is configured with 802.1Q enabled, the VOICE VLAN ID is configured to the entered value, and the VOICE VLAN priority = 6.</p> <p>2-Au Automatically enter a VLAN ID using DHCP. DHCP auto discovers the VLAN ID.</p>

	<p>VLANFILTER (0-No, 1-Yes) Default 0 (for No)</p> <p>You will not be prompted for VLANFILTER if VLAN? is not enabled. After the value is entered, the DATA VLAN configuration option appears on the display.</p> <p>Enter 0 (for No) Data VLAN is not present.</p> <p>Enter 1 (for Yes) Enter DATA VLAN to set the DATA VLAN ID, then press OK. The following DATA VLAN ID displays: DATA VLAN ID: 1234</p> <p>Note: The DATA VLAN ID is entered as an integer. The DATA VLAN ID is a 12-bit value between 0 and 4095, and should be different from the VOICE VLAN ID.</p> <p>The IP Phone 2002 is configured with 802.1Q enabled, the DATA VLAN ID is configured to the entered value, and the DATA VLAN priority = 0.</p>
Data VLAN? (0 for No, 1 for Yes)	
Duplex (0-Auto, 1-Full)	Default 0 (for Auto)
GARP Ignore? (0-No,1-Yes)	Default 0 (for No)

Note 1: The IP Phone 2002 can support a primary (S1) and secondary (S2) connect server. If you require IP Phones to register on multiple nodes, refer to “Enhanced Redundancy for IP Line Nodes” in *IP Line: Description, Installation, and Operation* (553-3001-365).

The IP Phone 2002 searches for the connect server. When the connection is complete, proceed with step 11.

- 11 Enter the following information provided by your system administrator:

Screen prompt	Description
Password	IP Phone Installer Password You are not prompted to enter the IP Phone Installer Password if it has not been configured in your system.
Node	The node ID.
TN	The TN or VTN.

The IP Phone 2002 registers with the Terminal Proxy Server (TPS) and, if needed, begins the firmware download. This takes several minutes. When download is complete, the IP Phone 2002 resets.

Note: The Enhanced UNISlim Firmware Download feature for IP Phones provides an improved method of delivering new firmware to IP Phones. For further information on Enhanced UNISlim Firmware Download, refer to *IP Line: Description, Installation, and Operation* (553-3001-365).

The current system date and time appear on the top line of the display when the configuration is complete. Self-labeling keys also appear.

- 12 Check for dial tone and the correct DN above the display.
- 13 Secure the IP Phone footstand to the base of the IP Phone. Use the angle adjustment grip on the top back of the IP Phone to adjust the position.
- 14 (Optional) Customize the feature keys as required. For more information, see *IP Phone 2002 User Guide*.

End of Procedure

Procedure 11
Installing an IP Phone 2002 for the first time
using DHCP

- 1 Configure a virtual loop on the system using LD 97.
 For more information, see *Software Input/Output: Administration* (553-3001-311).
- 2 Configure the IP Phone 2002 on the system using LD 11.
 For more information, see *Software Input/Output: Administration* (553-3001-311).

- 3** Connect the IP Phone 2002 components:
 - a.** Connect one end of the handset cord to the handset jack on the back of the IP Phone (identified with a handset icon).
 - b.** Connect the other end of the handset cord to the handset.

4 Choose one of the following connections:

- For an IP Phone not sharing LAN access with a PC:

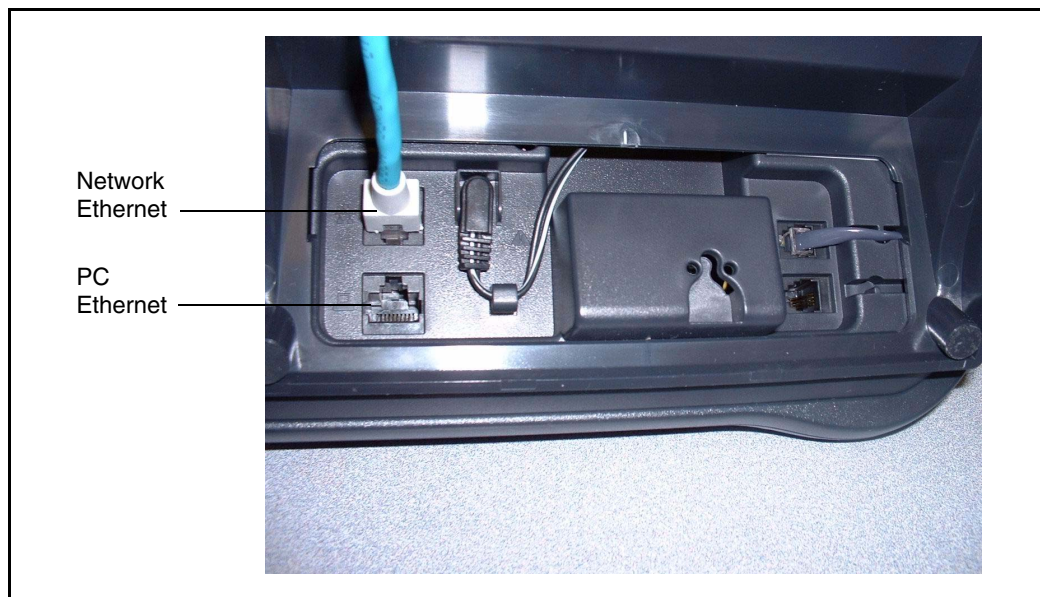
Connect one end of the CAT5 Ethernet cable to the network interface located on the back of the IP Phone (identified with a LAN icon, see Figure 7 on [page 90](#)). The other end of the CAT5 Ethernet cable plugs into the IP network.

- For an IP Phone sharing LAN access with a PC:

Connect one end of the CAT5 Ethernet cable to the network interface located on the back of the IP Phone (identified with a LAN icon, see Figure 7 on [page 90](#)) and the other end to the IP network.

Insert one end of a second CAT5 Ethernet cable into the PC network interface located on the back of the IP Phone (identified with a PC icon, see Figure 7 on [page 90](#)) and the other end into the computer.

Figure 7
IP Phone 2002 Ethernet network interface connections



- 5 Power the IP Phone 2002 using either the Power over Ethernet or an AC power transformer (local power).

IMPORTANT!

Timing information

There are only four seconds between plugging in the IP Phone 2002 power transformer and the appearance of the Nortel logo in the middle of the display. When you see the logo, you have one second to respond by pressing the four feature keys at the bottom of the display in sequence from left to right. If you miss the one-second response time, the IP Phone 2002 attempts to locate the connect server. Wait until it is finished, and then begin the power-up sequence again.

- a. To use local power, plug the AC power transformer into the nearest power outlet.
 - b. Ensure the correct AC power transformer is used. The voltage rating of the transformer must match the wall outlet voltage. Refer to Table 8 on page 79. Connect the power jack as shown in Figure 6 on [page 84](#). Be sure to thread the cord around the retaining hook to provide strain relief for a secure power connection.
- 6 When the Nortel logo appears in the middle of the display, immediately press the four feature keys at the bottom of the display in sequence from left to right.
- 7 At the prompt EAP enable?, select **Yes**. Enter DeviceID and Password. For more information on EAP, refer to Appendix C: "802.1x Port-based network access control" on [page 415](#).

Note: If you select **No**, you will not be prompted to enter Device ID and Password.

- 8 At the prompt DHCP Yes/No?, select **Yes**.
- 9 Select Partial or Full DHCP.
 - a. If you select Full DHCP, then the following parameters are retrieved from the DHCP server:
 - a valid IP Phone 2002 IP address
 - a subnet mask
 - the default Gateway for the IP Phone 2002 on the LAN segment to which it is connected
 - the S1 node IP address of the IP line node
 - the S1 action
 - the S1 retry count (This is the number of times the IP Phone attempts to connect to the server.)
 - the S2 node IP address of the IP line node
 - the S2 action
 - the S2 retry count
 - the External Application Server (XAS) IP address

b. If you select Partial DHCP, then you must enter the following parameters:

Screen prompt	Description
S1 IP	the node IP address of the IP line node
S1 Port	this is a fixed value: 4100
S1 action	this is a fixed value: 1
S1 retry	the number of times the IP Phone 2002 attempts to connect to the server; enter 10
S2 IP	same as S1 in most cases (see note below)
S2 Port	same as S1
S2 action	same as S1
S2 retry	same as S1
Cfg XAS? (0-No,1-Yes)	Default 1 (for Yes).

Note: If there is no External Application Server (XAS), enter 0 (for No). You will not be prompted to enter the XAS IP address.

XAS IP: Enter the IP address of the XAS server.

VLAN? (0-No, 1-Ma, 2-Au)	Default 0 (for No) 802.1Q VLAN remains off until initialization continues.
--------------------------	--

For more information about VLAN configuration, refer to *Converging the Data Network with VoIP* (553-3001-160).

1-Ma

Enter a Voice VLAN ID, then press OK.

The following Voice VLAN ID displays:

Manual Cfg

VOICE VLAN ID: 1234

Note: The Voice VLAN ID is entered as an integer. The Voice VLAN ID is a 12-bit value between 1 and 4095.

The IP Phone 2002 is configured with 802.1Q enabled, the VOICE VLAN ID is configured to the entered value, and the VOICE VLAN priority = 6.

2-Au

Automatically enter a VLAN ID using DHCP. DHCP auto discovers the VLAN ID.

VLANFILTER (0-No, 1-Yes)

Default 0 (for No)

You will not be prompted for VLANFILTER if VLAN? is not enabled.

Data VLAN?
(0 for No, 1 for Yes)

After the value is entered, the DATA VLAN configuration option appears on the display.

Enter 0 (for No)
Data VLAN is not present.

Enter 1 (for Yes)
Enter DATA VLAN to set the DATA VLAN ID, then press OK.
The following DATA VLAN ID displays:
DATA VLAN ID: 1234

Note: The DATA VLAN ID is entered as an integer. The DATA VLAN ID is a 12-bit value between 0 and 4095, and should be different from the VOICE VLAN ID.

The IP Phone 2002 is configured with 802.1Q enabled, the DATA VLAN ID is configured to the entered value, and the DATA VLAN priority = 0.

Duplex (0-Auto, 1-Full) Default 0 (for Auto)

GARP Ignore?(0-No,1-Yes) Default 0 (for No)

Note 1: The IP Phone 2002 can support a primary (S1) and secondary (S2) connect server. If you require IP Phones to register on multiple nodes, refer to “Enhanced Redundancy for IP Line Nodes” in *IP Line: Description, Installation, and Operation* (553-3001-365).

The IP Phone 2002 searches for the connect server. When the connection is complete, proceed to step 10.

- 10** Enter the following information provided by your system administrator.

Screen prompt	Description
Password	IP Phone Installer Password
	You are not prompted to enter the IP Phone Installer Password if it has not been configured in your system.

Node	the node ID
TN	the TN or VTN

The IP Phone 2002 registers with the TPS and, if needed, begins the firmware download. This takes several minutes. When complete, the IP Phone 2002 resets.

Note: The Enhanced UNISTim Firmware Download feature for IP Phones provides an improved method of delivering new firmware to IP Phones. For further information on Enhanced UNISTim Firmware Download, refer to *IP Line: Description, Installation, and Operation* (553-3001-365).

The current system date and time appear on the top line of the display when the configuration is complete. Self-labeling keys also appear.

- 11 Check for dial tone and the correct DN above the display.
- 12 Secure the IP Phone footstand to the base of the IP Phone. Use the angle adjustment grip on the top back of the IP Phone to adjust the position.
- 13 (Optional) Customize the feature keys as required. For more information, see *IP Phone 2002 User Guide*.

End of Procedure

Startup sequence

When an IP Phone 2002 is connected to the network, it must perform a startup sequence. The elements of the startup sequence include:

- obtaining the IP parameters
- finding a default Gateway server
- authenticating the user

See Table 9 for a summary of the IP parameters and how they are obtained.

Note: Your system administrator provides the network information for all static IP address assignments,.

Table 9
IP Phone 2002 IP parameters

Parameter	Method of acquisition
IP Address	Manually entered or automatically retrieved through Partial or Full DHCP.
Net Mask	Manually entered or automatically retrieved through Partial or Full DHCP.
Default Address	Manually entered or automatically retrieved through Partial or Full DHCP.
Connect Server (IP address, port, action and retry count — primary and secondary)	Manually entered or automatically retrieved through Full DHCP.
User ID (Node ID, Node Password and TN)	Manually entered for first-time configuration. Retrieved from local storage on subsequent power cycles. Provided by your system administrator.

Full Duplex mode

In the **Configuration** menu, Auto Negotiate mode is the default setting for initial startup. Typically, the IP Phone is connected to a network that supports Auto Negotiate, and it selects the best speed and duplex mode available. There is no intervention required under normal operation.

If the IP Phone is connected to a network configured for Full Duplex mode only, it is not able to automatically negotiate the proper configuration. Therefore, in this instance, to allow the IP Phone to work at the optimum speed and duplex mode, Auto Negotiate must be disabled. Use the following procedure to disable Auto Negotiate and enable Full Duplex mode.

Procedure 12**Disabling Auto Negotiate and enabling Full Duplex mode**

- 1 Reset the phone by disconnecting and reconnecting power.
- 2 When the Nortel logo appears in the middle of the display, press each of the soft keys in sequence. See Procedure 10 on [page 83](#).
- 3 If no other configuration changes are required, press the **OK** soft key repeatedly until the Duplex network option appears.
- 4 Select 1 to enable Full Duplex mode.
- 5 When the Speed option appears, select one of the following:
 - 0 for 10 Mbps
 - 1 for 100 Mbps (default)
- 6 Select **OK** to confirm the change.
- 7 Restart the IP Phone. The firmware reads the new setting, and the IP Phone operates in Full Duplex mode.

When the IP Phone is restarted, the firmware reads the setting for Full Duplex mode and sets both port 0, network interface port, and port 1, PC interface port, accordingly.

Use the following procedure to confirm activation of Full Duplex mode.

Procedure 13**Checking Ethernet Statistics**

- 1 Double-click the **Services** key. The Network Diagnostics menu appears.
- 2 Select **Ethernet Statistics**.
 - If Full Duplex mode is active, the following is displayed:
 - Link: UP
 - Duplex: Full
 - Speed: 10 (Mb) or 100(Mb)
 - Auto-Nego Capability: N
 - Auto-Nego Completed: N

End of Procedure

Gratuitous Address Resolution Protocol Protection

Gratuitous Address Resolution Protocol Protection (GARP) prevents the IP Phone 2002 from GARP Spoof attacks on the network. In a GARP Spoof attack, a malicious device on the network takes over an IP address (usually the default gateway) by sending unsolicited (or Gratuitous) ARP messages, thus manipulating the ARP table of the victim's machine. This allows the malicious device to launch a variety of attacks on the network, resulting in undesired traffic routing. For example, a GARP attack can convince the victim machine that the malicious device is the default gateway. In this scenario, all traffic from the victim's machine flows through the malicious device.

To enable GARP Protection during configuration, refer to Procedure 10, "Installing an IP Phone 2002 for the first time using manual configuration" on [page 83](#) or Procedure 10, "Installing an IP Phone 2002 for the first time using DHCP" on [page 88](#).

Extensible Authentication Protocol

Extensible Authentication Protocol (EAP) is a general protocol that fulfills the protocol requirements defined by 802.1x. For further information on 802.1x, refer to Appendix C: "802.1x Port-based network access control" on [page 415](#).

Reinstalling an IP Phone 2002

You can reinstall an existing previously configured IP Phone 2002 on the same system. For example, the IP Phone 2002 can be assigned to a new user (new TN) or to an existing user who moved to a new subnet by changing the TN of the IP Phone 2002.

Procedure 14 **Changing the TN of an existing IP Phone 2002**

- 1 Repower the IP Phone 2002.

Note: During the reboot sequence of a previously configured IP Phone, the IP Phone 2002 displays the existing node number for approximately 5 seconds.

2 If node password is enabled and NULL, choose one of the following:

- a. Disable password.
- b. Set password as non-NULL.

3 Press **OK** when the node number displays.

If

Then

node password is enabled and is not NULL

a password screen displays. Go to step 4.

node password is disabled

a TN screen displays. Go to step 5.

4 Enter password at the password screen and press **OK**.

A TN screen displays.

5 Select the **Clear** soft key to clear the existing TN.

End of Procedure

Replacing an IP Phone 2002

IMPORTANT!

Two IP Phones cannot share the same TN. You must remove the IP Phone 2002 that is currently using the TN.

Procedure 15

Replacing an IP Phone 2002

- 1 Disconnect the IP Phone 2002 that you want to replace.
- 2 Follow either Procedure 10 on [page 83](#) (static IP assignment) or Procedure 11 on [page 88](#) (dynamic IP assignment) to install and configure the IP Phone 2002.

- 3 Enter the same TN and Node Number as the IP Phone 2002 you replaced. The system associates the new IP Phone 2002 with the existing TN.

End of Procedure

Removing an IP Phone 2002 from service

Procedure 16

Removing an IP Phone 2002 from service

- 1 Disconnect the IP Phone 2002 from the network or turn off the power.

Note: The service to the PC is disconnected as well if the PC is connected to the IP Phone 2002.

If the IP Phone 2002 was automatically configured, the DHCP lease expires and the IP address returns to the available pool.

- 2 In LD 11, OUT the TN.

End of Procedure

Nortel IP Phone 2004

Contents

This section contains information on the following topics:

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Introduction

This section explains how to install and maintain the IP Phone 2004. For information on using the IP Phone 2004, see the *IP Phone 2004 User Guide*.

This section contains the following procedures:

- Procedure 17, “Pre-installation checklist” on [page 115](#).
- Procedure 18, “Installing an IP Phone 2004 for the first time using manual configuration” on [page 118](#).
- Procedure 19, “Installing an IP Phone 2004 for the first time using DHCP” on [page 124](#).
- Table 20, “Disabling Auto Negotiate and enabling Full Duplex mode” on [page 132](#).
- Table 21, “Checking Ethernet Statistics” on [page 132](#).
- Procedure 22, “Changing the TN of an existing IP Phone 2004” on [page 133](#).
- Procedure 23, “Replacing an IP Phone 2004” on [page 134](#).
- Procedure 24, “Removing an IP Phone 2004 from service” on [page 135](#).

Note: After an IP Phone has been installed and configured, if power is to the phone is interrupted, re-entry of the IP parameters, Node Number, TN, or re-acquisition of firmware is not required.

Description

The IP Phone 2004 brings voice and data to the desktop environment. It connects directly to the LAN through the Ethernet connection.

The IP Phone 2004 translates voice into data packets for transport using Internet Protocol. A Dynamic Host Configuration Protocol (DHCP) server can be used to provide information that enables the IP Phone 2004 network connection, and connection to the Voice Gateway Media Card. The IP Phone 2004 uses the customer’s IP network to communicate with the Call Server. The IP Phone 2004 components are shown in Figure 8 and described in Table 10 on [page 103](#).

Figure 8
IP Phone 2004

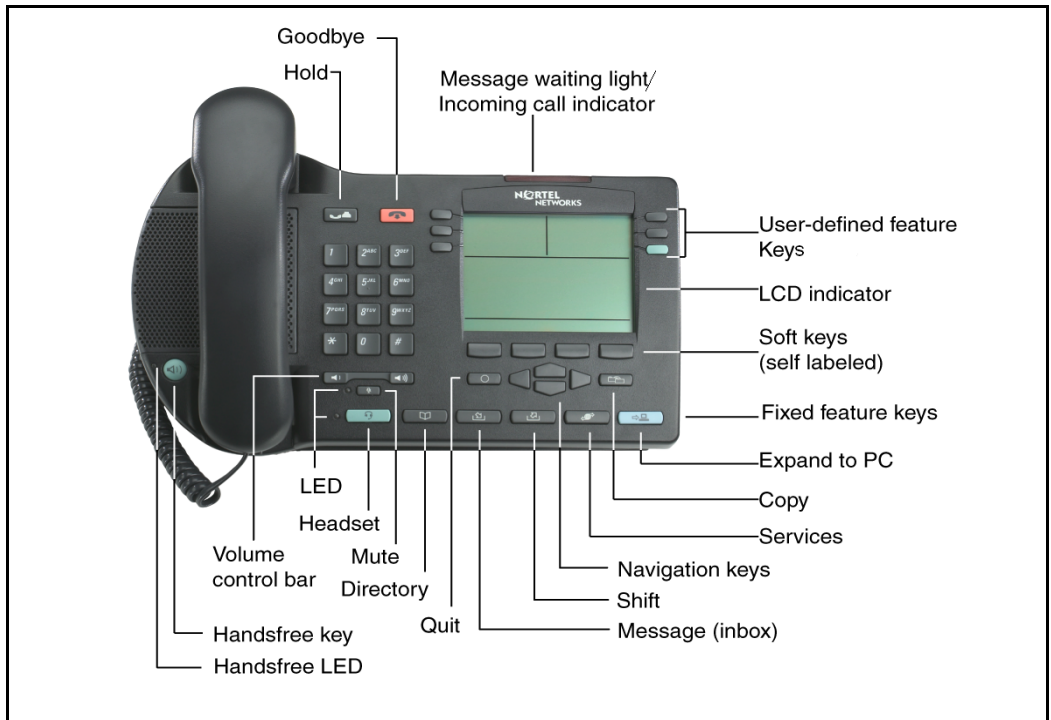


Table 10
IP Phone 2004 components and functions (Part 1 of 5)

Component	Function
Hold	Press the Hold key to put an active call on hold. Press the line (DN) key beside the flashing LCD to return to the caller on hold.
Goodbye	Press the Goodbye key to terminate an active call.

Table 10
IP Phone 2004 components and functions (Part 2 of 5)

Component	Function
Message Waiting Light/ Incoming Call Indicator	The Message Waiting Indicator turns ON to indicate that a message has been left for the user. This indicator also flashes when the set ringer is ON.
Programmable line DN/ feature keys (self-labeled)	<p>Programmable line (DN)/feature keys (self-labeled) are configured for various features on the IP Phones.</p> <p>A steady LCD light beside a line (DN) key indicates the feature or line is active. A flashing LCD indicates the line is on hold or the feature is being programmed.</p>
Soft keys (self-labeled)	<p>Soft keys (self-labeled) are located below the display area. The LCD label above the key changes, based on the active feature.</p> <p>Note: A triangle before a key label indicates that the key is active.</p>
Fixed feature keys	Use these keys to access non-programmable standard features.
Expand to PC	The Expand to PC key is used to access external server applications such as External Application Server.
Copy	A fixed key reserved for future feature development. An audible non-working tone is generated along with a display message.

Table 10
IP Phone 2004 components and functions (Part 3 of 5)

Component	Function
Services	<p>Press the Services key to access the following items:</p> <ul style="list-style-type: none">• Telephone Options (see Notes 1 and 2):<ul style="list-style-type: none">— Volume Adjustment— Contrast Adjustment— Language— Date/Time Format— Display diagnostics— Local Dialpad Tone— Ring type— Call timer— OnHook Default Path— Change Feature key Label— Set Information• Virtual Office Login and Virtual Office Logout (if Virtual Office is configured)• Test Local Mode and Resume Local Mode (if Branch Office is configured)
Navigation keys	<p>Use the navigation keys to scroll through menus and lists in the display area.</p>
Shift	<p>Press the Shift key to toggle between two feature key pages and access an additional six lines/features.</p>
Inbox (Message)	<p>Press the Inbox (Message) key to access your voice mailbox.</p>

Table 10
IP Phone 2004 components and functions (Part 4 of 5)

Component	Function
Quit	<p>Press the Quit key to end an active application.</p> <p>Pressing the Quit key does not affect the status of the calls currently on your IP Phone.</p>
Directory	<p>Press the Directory key to access Directory services.</p>
Mute	<p>Press the Mute key to listen to the receiving party without transmitting.</p> <p>Press the Mute key again to return to a two way conversation.</p> <p>The Mute key applies to Handsfree, Handset, and Headset microphones.</p> <p>The Mute LED flashes when the Mute option is in use.</p>
Headset	<p>Press the Headset key to answer a call using the headset or to switch a call from the handset or Handsfree to the headset.</p>
Volume control bar	<p>Use the Volume control bar to adjust the volume of the handset, headset, speaker, ringer, and Handsfree feature.</p> <p>Press the right side of the rocker bar to increase volume, the left side to decrease volume.</p>

Table 10
IP Phone 2004 components and functions (Part 5 of 5)

Component	Function
Handsfree key	<p>Press the Handsfree key to activate handsfree.</p> <p>The LED lights to indicate when the handsfree feature is active.</p>
<p>Note 1: If a call is presented while the user is manipulating an option, the IP Phone 2004 rings and the DN key flashes. However, the screen display is not updated with Caller ID information. The programming text is not disturbed.</p> <p>Note 2: The user can originate a call using Autodial or Last Number Redial while manipulating an option. However, the display is not updated with the dialed digits or the Caller ID, and Autodial and Last Number Redial intercept the dialpad.</p>	

Supported features

The IP Phone 2004 supports the following additional features:

- 802.1Q VLAN and 802.1P priority support, industry standards for managing bandwidth usage — full VLAN capability, including a manageable integrated switch in the IP Phone for VLAN and priority tagging for PC and IP Phone traffic
- 802.1x Port-based network access control, industry standard for passing Extensible Authentication Protocol (EAP) over a LAN
- integrated hardware to support power over Ethernet, for IEEE 802.3af standard power; also including support for PowerDsine Power over LAN Hub powering, and Cisco proprietary powering as tested with specific Cisco Ethernet switch equipment
- Extensible Authentication Protocol (EAP)
- Gratuitous Address Resolution Protocol Protection (GARP)
- VLAN filtering
- ability to change the feature key labels

- Corporate Directory
- Personal Directory
- Redial List
- Callers List
- Password Administration
- Virtual office
- Branch Office
- switch to support sharing LAN access with a PC or other data device
- 10/100 Mbps Full Duplex mode
- External Application Server (XAS)
- Both the registered and configured TNs are displayed in the Set Info menu.
- language support: English, French, Swedish, Danish, Norwegian, German, Dutch, Portuguese, Czech, Finnish, Hungarian, Italian, Polish, Spanish, Japanese, Russian, Latvian, and Turkish
- IP Key Expansion modules

Features not currently supported

The following features are not supported on the IP Phone 2004 :

- Live Dialpad
- Group Listening
- Set-to-Set messaging
- Context-sensitive soft keys

The three-port switch that is internal/external to the IP Phone 2004 is an unmanaged switch. It passes the packets (unmodified) and does not interpret the 802.1Q header. The three-port switch provides priority based on the port (that is, the IP Phone port traffic takes priority over the Ethernet).

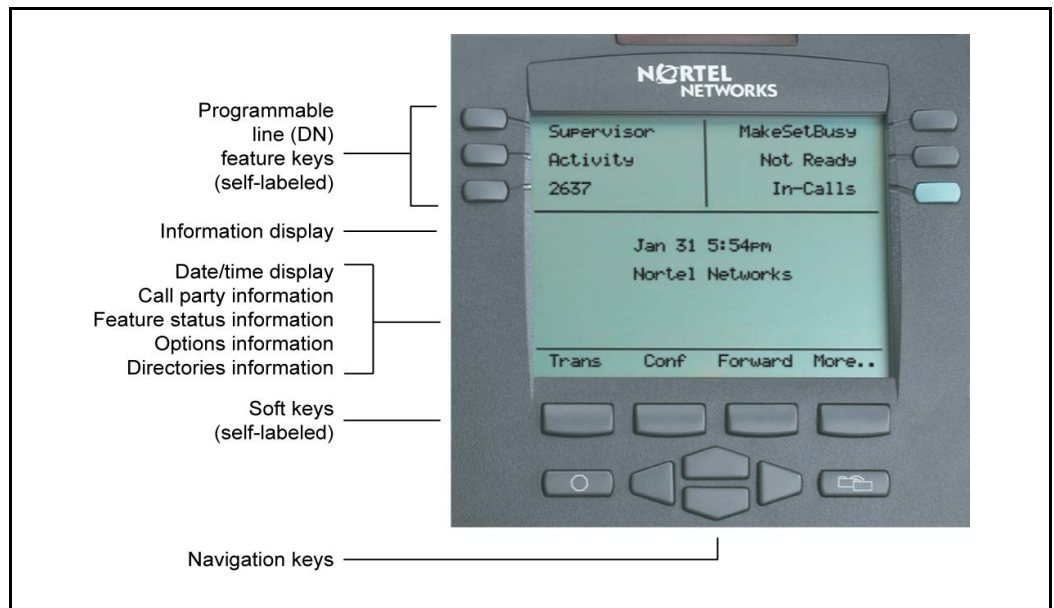
Display characteristics

An IP Phone 2004 has three major display areas:

- programmable line (DN)/feature key label
- soft key label
- information line

Figure 9 on page 109 shows these three display areas.

Figure 9
IP Phone 2004 display areas



Cleaning the IP Phone display screen

Gently wipe the IP Phone display screen with a soft, dry cloth.



CAUTION

Do not use any liquids or powders on the IP Phone. Using anything other than a soft, dry cloth can contaminate IP Phone components and cause premature failure.

Programmable line (DN)/feature key label display

The feature key label area displays a ten-character string for each of the four feature keys. Each feature key includes the key label and an icon. The icon state can be on, off, or flashing. Key labels are left-aligned for keys on the left side of the screen, and right-aligned for keys on the right side of the screen.

Note: If a label is longer than ten characters, the last ten characters are displayed, and the excess characters are deleted from the beginning of the string.

Soft key label display

A maximum of ten functions can be assigned to the soft keys. Your system administrator assigns functions to the soft keys in layers.

Use the **More..** soft key to navigate through the layers of functions. If there are only four functions assigned to the soft keys, the **More..** key does not appear and all four functions are displayed.

The soft key label has a maximum six characters. Each soft key includes the soft key label and an icon. When a soft key is in use, a flashing icon displays at the beginning of the soft key label, and the label shifts one character to the right. (If the label is six characters long, the last or rightmost character is truncated.) If a feature is enabled, the icon state turns to On. It remains in the on state until the feature key is pressed again. This cancels the enabled feature and turns the icon off, returning the soft key label to its original state.

Information line display

An IP Phone 2004 has a three-line information display area with the following information:

- caller number
- caller name
- feature prompt strings
- user-entered digits
- date and time information (if the IP Phone is in an idle state)

The information in the display area changes, according to the call processing state and active features.

Key number assignments

The IP Phone 2004 has four soft-labeled, predefined soft keys that are used to provide up to 10 features. Because they are predefined, the user cannot change the key number assignment.

The Message key is numbered 16. Key numbers 17 to 31 are the four soft-key labels below the display area. See Figure 8 on [page 103](#).

Key numbers 17 to 31 support the features A03, A06, CFW, CHG, CPN, PRK, PRS, RGA, RNP, SCC, SCU, SSC, SSU and TRN, as listed in Table 11 on [page 112](#).

Table 11 describes the IP Phone assignment functions for each of the dedicated keys. Use LD 11 to program keys 16 to 26 on the IP Phone 2004 .

Note: If you attempt to configure anything other than the permitted response, the system generates an error code.

Table 11
IP Phone 2004 soft keys (Part 1 of 2)

Key number	Response	Description
Key 16	MWK	Message Waiting key
	NUL	Removes function or feature from key
Key 17	TRN	Call Transfer key
	NUL	Removes function or feature from key
Key 18	A03	Three-party conference key
	A06	Six-party conference key
	NUL	Removes function or feature from key
Key 19	CFW	Call Forward key
	NUL	Removes function or feature from key
Key 20	RG A	Ring Again key
	NUL	Removes function or feature from key
Key 21	PRK	Call Park key
	NUL	Removes function or feature from key
Key 22	RNP	Ringing Number Pickup key
	NUL	Removes function or feature from key
Key 23	SCU	Speed Call User
	SSU	System Speed Call User
	SCC	Speed Call Controller
	SSC	System Speed Call Controller
	NUL	Removes function or feature from key

Table 11
IP Phone 2004 soft keys (Part 2 of 2)

Key number	Response	Description
Key 24	PRS	Privacy Release key
	NUL	Removes function or feature from key
Key 25	CHG	Charge Account key
	NUL	Removes function or feature from key
Key 26	CPN	Calling Party Number key
	NUL	Removes function or feature from key

Package components

The following information applies to Phase II IP Phones. Product codes for Phase II IP Phones are different from previous sets.

See the product code on the back of the phone to confirm whether it is a Phase II IP Phone. The product code for Phase II IP Phones appears as “IP Phone 200x”. The product code for previous versions of the IP Phone appears with an “i” in front of the model number (for example, “i200x”).

The AC power adapter must be ordered separately if local power using the AC adapter is required, because Phase II IP Phones include integrated support for a number of power over LAN options, including support for IEEE 802.3af standard power.

Table 12 lists the IP Phone 2004 package components and product codes.

Table 12
IP Phone 2004 component list (Part 1 of 2)

IP Phone 2004 package contents includes	
<ul style="list-style-type: none"> • IP Phone 2004 • Handset • Handset cord • Footstand • 7 ft. Ethernet cable • Getting Started card 	
IP Phone 2004 (Ethergray) with Icon keycaps	NTDU92AA16/ A0533408
IP Phone 2004 (Ethergray) with English text label keycaps	NTDU92BA16/ A0533409
IP Phone 2004 (Charcoal) with Icon keycaps	NTDU92AA70/ A0533410
IP Phone 2004 (Charcoal) with English text label keycaps	NTDU92BA70/ A0533411
IP Phone 2004 wall mount kit (Charcoal), used with Ethergray and Charcoal models	NTMN15BA70/ A0503076
Replacement parts	
7 ft. Ethernet Cat5 cable	A0648375
Handset (Ethergray)	A0788874
Handset (Charcoal)	A0758634
Handset cord (Ethergray)	A0788682
Handset cord (Charcoal)	N0000764
Footstand (Charcoal), used for Ethergray and Charcoal models	A0538587
IP Phone 2004 Power Adaptors	

Table 12
IP Phone 2004 component list (Part 2 of 2)

Power transformer (117/120 VAC 50/60 Hz) (North America)	A0619627
Power transformer 3 prong AC to AC, direct plug-in, 8W, 240 VAC, 50Hz to 16 VAC at 500 mA (Ireland and UK)	A0656598
Power transformer AC to AC, direct plug-in, 8W, 230 VAC, 50/60 Hz, to 16 VAC at 500 mA (Europe)	A0619635
Power transformer 2 prong wall plug direct plug-in AC to AC, 8W, 240 VAC, 50 Hz, to 16 VAC at 500 mA (Australia and New Zealand)	A0647042
Power transformer AC to AC, direct plug-in, 8W, 100 VAC, 50 Hz, to 16 VAC at 500 mA	A0828858

For more information, and for information about previous versions of the IP Phone, contact Nortel.

Before you begin

The following section provides a step-by-step guide through the IP Phone 2004 installation process. Before installing the IP Phone 2004, complete the following pre-installation checklist.

Procedure 17

Pre-installation checklist

- 1** Ensure there is one IP Phone 2004 boxed package for each IP Phone 2004 being installed. The package contains:
 - IP Phone 2004
 - Handset
 - Handset cord
 - Footstand
 - 2.3 m (7 foot) Ethernet cable, Category 5
 - Getting Started card
- 2** To install and configure an IP Phone 2004, the host system must be installed with the Voice Gateway Media Card.

- 3 If an AC power adapter is required, make sure you use the correct AC power transformer. The voltage rating of the transformer must match the wall outlet voltage. Refer to Table 12 on page 114.
- 4 Understand the three configuration modes that you can choose from as you proceed through the installation of the IP Phone 2004 . The three configuration modes are:
 - Static IP address – see “Static IP address assignment” on [page 117](#).
 - Dynamic Partial DHCP – see “Dynamic IP address assignment — Partial DHCP” on [page 117](#).
 - Dynamic Full DHCP – see “Dynamic IP address assignment — Full DHCP” on [page 117](#).
- 5 A DHCP server and DHCP relay agents, if required, must also be installed, configured, and running.

End of Procedure

First-time installation

To install and configure an IP Phone 2004 , you must first install a Voice Gateway Media Card in the system.



CAUTION

Damage to Equipment

Do not plug your IP Phone 2004 into an ISDN connection. Severe damage can result. Consult your system administrator to ensure that you are plugging your IP Phone into a 10/100BaseT Ethernet jack.

IP address assignments

During the first-time installation, there are IP address parameters that are entered either manually or automatically depending on the installation configuration. As well, you are prompted to enable or disable 802.1Q. For more information, see “802.1Q VLAN description” on [page 407](#).

The three configuration modes for the IP Phone 2004 are described below.

Static IP address assignment

During the installation, the IP Phone 2004 parameters are entered manually using the key pad.

Your system administrator provides the following information: IP address, subnet mask, and default Gateway.

You must also enter the Connect Server parameters including: IP address, port number, action, and retry count.

Go to Procedure 18, “Installing an IP Phone 2004 for the first time using manual configuration” on [page 118](#).

Dynamic IP address assignment — Partial DHCP

For a partial DHCP installation, you must provide, through the IP Phone’s key pad, the Connect Server parameters including: IP address, port number, action, and retry count. Other parameters (IP Phone IP address, subnet mask, and default Gateway) are retrieved from the DHCP server.

The IP Phone password, node ID and TN must be entered manually from the key pad.

For more information about DHCP servers, see *Converging the Data Network with VoIP* (553-3001-160).

Go to Procedure 19, “Installing an IP Phone 2004 for the first time using DHCP” on [page 124](#).

Dynamic IP address assignment — Full DHCP

For a full DHCP installation, all parameters (IP Phone IP address, subnet mask, default Gateway, Connect Server IP address, port number, action, and retry count) are retrieved from the DHCP server to recognize the IP Phone 2004.

The IP Phone 2004 password, node ID and TN must be entered manually from the key pad.

Go to Procedure 19, “Installing an IP Phone 2004 for the first time using DHCP” on [page 124](#).

Procedure 18
Installing an IP Phone 2004 for the first time using manual configuration

- 1 Configure a virtual loop on the system using LD 97.

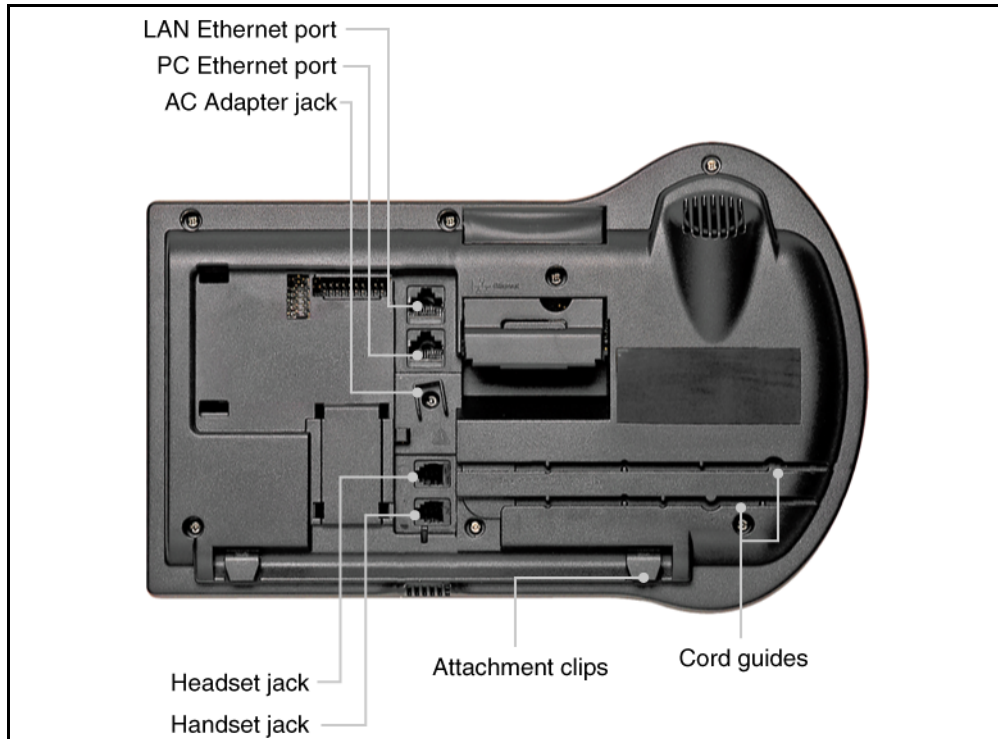
For more information, see *Software Input/Output: Administration* (553-3001-311).
- 2 Configure the IP Phone 2004 on the system using LD 11.

For more information, see *Software Input/Output: Administration* (553-3001-311).
- 3 Connect the IP Phone 2004 components:
 - a. Connect one end of the handset cord to the handset jack on the back of the IP Phone (identified with a handset icon).
 - b. Connect the other end of the handset cord to the handset.
- 4 Choose one of the following connections:
 - For an IP Phone not sharing a LAN access with a PC:

Connect one end of the CAT5 Ethernet cable to the LAN Ethernet port located on the back of the IP Phone 2004 (identified with a LAN icon). The other end of the CAT5 Ethernet cable plugs into the IP network.
 - For an IP Phone sharing a LAN access with a PC:

Connect one end of the CAT5 Ethernet cable to the LAN Ethernet port located on the back of the IP Phone (identified with a LAN icon, see Figure 10 on [page 119](#)) and the other end to the IP network. Insert one end of a second CAT5 Ethernet cable into the PC Ethernet port located on the back of the IP Phone (identified with a PC icon, see Figure 10 on [page 119](#)) and the other end into the computer.

Figure 10
IP Phone 2004 Ethernet network connections



CAUTION

Damage to Equipment

Do not plug your IP Phone 2004 into any port but the PC Ethernet port. Severe damage can result. Consult your system administrator to ensure that you are plugging your IP Phone into the PC Ethernet port.

IMPORTANT!

Timing information

There are only four seconds between plugging in the IP Phone 2004 power transformer and the appearance of the Nortel logo in the middle of the display. When you see the logo, you have one second to respond by pressing the four feature keys at the bottom of the display in sequence from left to right. If you miss the one-second response time, the IP Phone 2004 attempts to locate the connect server. Wait until it is finished, and then begin the power-up sequence again.

- 5
- Power the IP Phone 2004 using either the Power over Ethernet or an AC power transformer (local power).
- a.

To use local power, plug the AC power transformer into the nearest power outlet.
- b.

Ensure the correct AC power transformer is used. The voltage rating of the transformer must match the wall outlet voltage. Refer to Table 12 on page 114. Connect the AC power transformer to the power adapter jack (see Figure 10 on [page 119](#)).
- 6
- When the Nortel logo appears in the middle of the display, immediately press the four feature keys at the bottom of the display in sequence from left to right.
- 7
- At the prompt EAP enable?, select **Yes**. Enter DeviceID and Password. For more information on EAP, refer to Appendix C: “802.1x Port-based network access control” on [page 415](#).
- Note:

If you select **No**, you will not be prompted to enter Device ID and Password.
- 8
- At the prompt DHCP Yes/No?, select **No**.
- 9
- Enter the following information provided by your system administrator:

Screen prompt	Description
set IP	a valid IP Phone 2004 IP address
net msk	a subnet mask
def gw	the default Gateway for the IP Phone 2004 on the LAN segment to which it is connected

- 10** Enter the information for the primary Connect Server (S1) and the secondary Connect Server (S2):

Screen prompt	Description
S1 IP	the node IP address of the IP line node
S1 Port	this is a fixed value: 4100
S1 action	this is a fixed value: 1
S1 retry	the number of times the IP Phone 2004 attempts to connect to the server (Enter 10)
S2 IP	same as S1 in most cases (see note below)
S2 Port	same as S1
S2 action	same as S1
S2 retry	same as S1
Cfg XAS? (0-No,1-Yes)	Default 1 (for Yes). Note: If there is no External Application Server (XAS), enter 0 (for No). You will not be prompted to enter the XAS IP address.
XAS IP:	Enter the IP address of the XAS server.
VLAN? (0-No, 1-Ma, 2-Au)	Default 0 (for No) 802.1Q VLAN remains off until initialization continues. For more information about VLAN configuration, refer to <i>Converging the Data Network with VoIP</i> (553-3001-160).

1-Ma

Enter a Voice VLAN ID, then press OK.

The following Voice VLAN ID displays:

Manual Cfg

VOICE VLAN ID: 1234

Note: The Voice VLAN ID is entered as an integer. The Voice VLAN ID is a 12-bit value between 1 and 4095.

The IP Phone 2004 is configured with 802.1Q enabled, the VOICE VLAN ID is configured to the entered value, and the VOICE VLAN priority = 6.

2-Au

Automatically enter a VLAN ID using DHCP. DHCP auto discovers the VLAN ID.

VLANFILTER (0-No, 1-Yes)
Default 0 (for No)

You will not be prompted for
VLANFILTER if VLAN? is not enabled.

Data VLAN? (0-No, 1-Yes)	<p>After the value is entered, the DATA VLAN configuration option appears on the display.</p> <p>Enter 0 (for No) Data VLAN is not present.</p> <p>Enter 1 (for Yes) Enter DATA VLAN to set the DATA VLAN ID, then press OK. The following DATA VLAN ID displays: DATA VLAN ID: 1234</p> <p>Note: The DATA VLAN ID is entered as an integer. The DATA VLAN ID is a 12-bit value between 0 and 4095, and should be different from the VOICE VLAN ID.</p> <p>The IP Phone 2004 is configured with 802.1Q enabled, the DATA VLAN ID is configured to the entered value, and the DATA VLAN priority = 0.</p>
Duplex (0-Auto, 1-Full)	Default 0 (for Auto)
GARP Ignore? (0-No,1-Yes)	Default 0 (for No)

Note 1: The IP Phone 2004 can support a primary (S1) and secondary (S2) connect server. If you require IP Phones to register on multiple nodes, refer to “Enhanced Redundancy for IP Line Nodes” in *IP Line: Description, Installation, and Operation* (553-3001-365).

The IP Phone 2004 searches for the connect server. When the connection is complete, proceed with step 11.

- 11 Enter the following information provided by your system administrator:

Screen prompt	Description
Password	IP Phone Installer Password You are not prompted to enter the IP Phone Installer Password if it has not been configured in your system.
Node	The node ID.
TN	The TN or VTN.

- 12 The IP Phone 2004 registers with the TPS and, if needed, begins the firmware download. This takes several minutes. When registration is complete, the IP Phone 2004 resets.

Note: The Enhanced UNISTim Firmware Download feature for IP Phones provides an improved method of delivering new firmware to IP Phones. For further information on Enhanced UNISTim Firmware Download, refer to *IP Line: Description, Installation, and Operation* (553-3001-365).

The current system date and time appear on the top line of the display when the configuration is complete. Self-labeling keys also appear.

- 13 Check for dial tone and the correct DN above the display.
- 14 Secure the IP Phone footstand to the base of the IP Phone. Use the angle adjustment grip on the top back of the IP Phone to adjust the position.
- 15 (Optional) Customize the feature keys as required. For more information, see *IP Phone 2004 User Guide*.

End of Procedure

Procedure 19

Installing an IP Phone 2004 for the first time using DHCP

- 1 Configure a virtual loop on the system using LD 97.
For more information, see *Software Input/Output: Administration* (553-3001-311).
- 2 Configure the IP Phone 2004 on the system using LD 11.
For more information, see *Software Input/Output: Administration* (553-3001-311).

- 3 Connect the IP Phone 2004 components:
 - a. Connect one end of the handset cord to the handset jack on the back of the IP Phone (identified with a handset icon).
 - b. Connect the other end of the handset cord to the handset.
- 4 Choose one of the following connections:
 - a. For an IP Phone not sharing a LAN access with a PC:

Connect one end of the CAT5 Ethernet cable to the LAN ethernet port located on the back of the IP Phone (identified with a LAN icon). The other end of the CAT5 Ethernet cable plugs into the IP network.
 - b. For an IP Phone sharing a LAN access with a PC:

Connect one end of the CAT5 Ethernet cable to the LAN Ethernet port located on the back of the IP Phone (identified with a LAN icon, see Figure 10 on [page 119](#)) and the other end to the IP network. Insert one end of a second CAT5 Ethernet cable into the PC Ethernet port located on the back of the IP Phone (identified with a PC icon, see Figure 10 on [page 119](#)) and the other end into the computer.

**CAUTION****Damage to Equipment**

Do not plug your IP Phone 2004 into any port but the PC Ethernet port. Severe damage can result. Consult your system administrator to ensure that you are plugging your IP Phone into the PC Ethernet port.

IMPORTANT!**Timing information**

There are only four seconds between plugging in the IP Phone 2004 power transformer and the appearance of the Nortel logo in the middle of the display. When you see the logo, you have one-second to respond by pressing the four feature keys at the bottom of the display in sequence from left to right. If you miss the one second response time, the IP Phone 2004 attempts to locate the connect server. Wait until it is finished, and then begin the power-up sequence again.

- 5 Power the IP Phone 2004 using either the Power over Ethernet or an AC power transformer (local power).
 - a. To use local power, plug the AC power transformer into the nearest power outlet.
 - b. Ensure the correct AC power transformer is used. The voltage rating of the transformer must match the wall outlet voltage. Refer to Table 12 on [page 114](#). Connect the AC power transformer to the power adapter jack (see Figure 10 on [page 119](#)).
- 6 When the Nortel logo appears in the middle of the display, immediately press the four feature keys at the bottom of the display in sequence from left to right.
- 7 At the prompt EAP enable?, select **Yes**. Enter DeviceID and Password. For more information on EAP, refer to Appendix C: "802.1x Port-based network access control" on [page 415](#).

Note: If you select **No**, you will not be prompted to enter Device ID and Password.
- 8 At the prompt DHCP Yes/No?, select **Yes**.
- 9 Select Partial or Full DHCP.
 - a. If you select Full DHCP, then the following parameters are retrieved from the DHCP server:
 - a valid IP Phone 2004 IP address
 - a subnet mask
 - the default Gateway for the IP Phone 2004 on the LAN segment to which it is connected
 - the S1 node IP address of the IP line node
 - the S1 Action
 - the S1 retry count. This is the number of times the IP Phone attempts to connect to the server
 - the S2 node IP address of the IP line node
 - the S2 Action
 - the S2 retry count
 - the External Application Server (XAS) IP address

- b. If you select Partial DHCP, then you must enter the following parameters:

Screen prompt	Description
S1 IP	The node IP address of the IP line node.
S1 Port	This is a fixed value: 4100
S1 action	This is a fixed value: 1
S1 retry	The number of times the IP Phone 2004 attempts to connect to the server. Enter 10.
S2 IP	Same as S1 in most cases (see note below)
S2 Port	Same as S1
S2 action	Same as S1
S2 retry	Same as S1
Cfg XAS? (0-No,1-Yes)	Default 1 (for Yes).
	Note: If there is no External Application Server (XAS), enter 0 (for No). You will not be prompted to enter the XAS IP address.
XAS IP:	Enter the IP address of the XAS server.
VLAN? (0-No, 1-Ma, 2-Au)	Default 0 (for No) 802.1Q VLAN remains off until initialization continues. For more information about VLAN configuration, refer to <i>Converging the Data Network with VoIP</i> (553-3001-160).

1-Ma

Enter a Voice VLAN ID, then press OK.

The following Voice VLAN ID displays:

Manual Cfg

VOICE VLAN ID: 1234

Note: The Voice VLAN ID is entered as an integer. The Voice VLAN ID is a 12-bit value between 1 and 4095.

The IP Phone 2004 is configured with 802.1Q enabled, the VOICE VLAN ID is configured to the entered value, and the VOICE VLAN priority = 6.

2-Au

Automatically enter a VLAN ID using DHCP. DHCP auto discovers the VLAN ID.

VLANFILTER (0-No, 1-Yes)

Default 0 (for No)

You will not be prompted for VLANFILTER if VLAN? is not enabled.

Data VLAN? (0 for No, 1 for Yes)	<p>After the value is entered, the DATA VLAN configuration option appears on the display.</p> <p>Enter 0 (for No) Data VLAN is not present.</p> <p>Enter 1 (for Yes) Enter DATA VLAN to set the DATA VLAN ID, then press OK. The following DATA VLAN ID displays: DATA VLAN ID: 1234</p> <p>Note: The DATA VLAN ID is entered as an integer. The DATA VLAN ID is a 12-bit value between 0 and 4095, and should be different from the VOICE VLAN ID.</p> <p>The IP Phone 2004 is configured with 802.1Q enabled, the DATA VLAN ID is configured to the entered value, and the DATA VLAN priority = 0.</p>
Duplex (0-Auto, 1-Full)	Default 0 (for Auto)
GARP Ignore? (0-No,1-Yes)	Default 0 (for No)

Note 1: The IP Phone 2004 can support a primary (S1) and secondary (S2) connect server. If you require IP Phones to register on multiple nodes, refer to “Enhanced Redundancy for IP Line Nodes” in *IP Line: Description, Installation, and Operation* (553-3001-365).

The IP Phone 2004 searches for the connect server. When the connection is complete, proceed to step 10.

- 10 Enter the following information provided by your system administrator.

Screen prompt	Description
Password	IP Phone Installer Password You are not prompted to enter the IP Phone Installer Password if it has not been configured in your system.
Node	The node ID
TN	The TN or VTN

The IP Phone 2004 registers with the TPS and, if needed, will begin the firmware download. This takes several minutes. When the download is complete, the IP Phone 2004 resets.

Note: The Enhanced UNISlim Firmware Download feature for IP Phones provides an improved method of delivering new firmware to IP Phones. For further information on Enhanced UNISlim Firmware Download, refer to *IP Line: Description, Installation, and Operation* (553-3001-365).

The current system date and time appear on the top line of the display when the configuration is complete. Self-labeling keys also appear.

- 11 Check for dial tone and the correct DN above the display.
- 12 Secure the IP Phone footstand to the base of the IP Phone. Use the angle adjustment grip on the top back of the IP Phone to adjust the position.
- 13 (Optional) Customize the feature keys as required. For more information, see *IP Phone 2004 User Guide*.

End of Procedure

Startup sequence

When an IP Phone 2004 is connected to the network, it must perform a startup sequence. The elements of the startup sequence include:

- obtaining the IP parameters
- finding a default Gateway server
- authenticating the user

See Table 13 on [page 131](#) for a summary of the IP parameters and how they are obtained.

Note: For all IP static assignments, your system administrator provides the network information.

Table 13
IP Phone 2004 IP parameters

Parameter	Method of Acquisition
IP Address	Manually entered or automatically retrieved through Partial or Full DHCP.
Net Mask	Manually entered or automatically retrieved through Partial or Full DHCP.
Default Address	Manually entered or automatically retrieved through Partial or Full DHCP.
Connect Server (IP address, port, action and retry count — primary and secondary)	Manually entered or automatically retrieved through Full DHCP.
User ID (Node ID, Node Password and TN)	Manually entered for first-time configuration. Retrieved from local storage on subsequent power cycles. Provided by your system administrator.

Full Duplex mode

In the **Configuration** menu, Auto Negotiate mode is the default setting for initial startup. Typically, the IP Phone is connected to a network that supports Auto Negotiate, and it selects the best speed and duplex mode available. There is no intervention required under normal operation.

If the IP Phone 2004 is connected to a network configured for Full Duplex mode only, it is not able to automatically negotiate the proper configuration. Therefore, in this instance, to allow the IP Phone 2004 to work at the optimum speed and duplex mode, Auto Negotiate must be disabled. Use the following procedure to disable Auto Negotiate and enable Full Duplex mode.

Procedure 20

Disabling Auto Negotiate and enabling Full Duplex mode

- 1 Reset the IP Phone 2004 by disconnecting and reconnecting power.
- 2 When the Nortel logo appears in the middle of the display, press each of the soft keys in sequence. See Procedure 19 on [page 124](#).
- 3 If no other configuration changes are required, press **OK** repeatedly until the Duplex network option appears.
- 4 Select 1 to enable Full Duplex mode.
- 5 When the Speed option appears, select one of the following:
 - 0 for 10 Mbps
 - 1 for 100 Mbps (default)
- 6 Select **OK** to confirm the change.
- 7 Restart the IP Phone 2004. The firmware reads the new setting, and the IP Phone operates in Full Duplex mode.

When the IP Phone 2004 is restarted, the firmware reads the setting for Full Duplex mode and sets both port 0, network interface port, and port 1, PC interface port, accordingly.

Use the following procedure to confirm activation of Full Duplex mode.

Procedure 21

Checking Ethernet Statistics

- 1 Double-click the **Services** key. The Network Diagnostics menu appears.
- 2 Select **Ethernet Statistics**.
 - If Full Duplex mode is active, the following is displayed:
 - Link: UP
 - Duplex: Full
 - Speed: 10 (Mb) or 100(Mb)
 - Auto-Nego Capability: N
 - Auto-Nego Completed: N

End of Procedure

Gratuitous Address Resolution Protocol Protection

Gratuitous Address Resolution Protocol Protection (GARP) prevents the IP Phone 2004 from GARP Spoof attacks on the network. In a GARP Spoof attack, a malicious device on the network takes over an IP address (usually the default gateway) by sending unsolicited (or Gratuitous) ARP messages, thus manipulating the ARP table of the victim's machine. This allows the malicious device to launch a variety of attacks on the network, resulting in undesired traffic routing. For example, a GARP attack can convince the victim machine that the malicious device is the default gateway. In this scenario, all traffic from the victim's machine flows through the malicious device.

To enable GARP Protection during configuration, refer to Procedure 18, "Installing an IP Phone 2004 for the first time using manual configuration" on [page 118](#) or Procedure 18, "Installing an IP Phone 2004 for the first time using DHCP" on [page 124](#).

Extensible Authentication Protocol

Extensible Authentication Protocol (EAP) is a general protocol that fulfills the protocol requirements defined by 802.1x. For further information on 802.1x, refer to Appendix C: "802.1x Port-based network access control" on [page 415](#).

Reinstalling an IP Phone 2004

You can reinstall an existing previously configured IP Phone 2004 on the same system. For example, the IP Phone 2004 can be assigned to a new user (new TN) or to an existing user who moved to a new subnet by changing the TN of the IP Phone 2004.

Procedure 22

Changing the TN of an existing IP Phone 2004

- 1 Repower the IP Phone 2004.

Note: During the reboot sequence of a previously configured IP Phone, the IP Phone 2004 displays the existing node number for approximately five seconds.

- 2 If node password is enabled and NULL, choose one of the following:
 - a. Disable password.
 - b. Set password as non-NULL.
- 3 Press **OK** when the node number displays.

If	Then
node password is enabled and is not NULL	a password screen displays. Go to step 4.
node password is disabled	a TN screen displays. Go to step 5.

- 4 Enter password at the password screen, and press **OK**.
A TN screen displays.
- 5 Select the **Clear** soft key to clear the existing TN.

End of Procedure

Replacing an IP Phone 2004

IMPORTANT!

Two IP Phones cannot share the same TN. You must remove the IP Phone 2004 that is currently using the TN.

Procedure 23 **Replacing an IP Phone 2004**

- 1 Disconnect the IP Phone 2004 that you want to replace.
- 2 Follow Procedure 18 on [page 118](#) (static IP assignment) or Procedure 19 on [page 124](#) (dynamic IP assignment) to install and configure the IP Phone 2004.

- 3 Enter the same TN and Node Number as the IP Phone 2004 you replaced. The system associates the new IP Phone 2004 with the existing TN.

End of Procedure

Removing an IP Phone 2004 from service

Procedure 24

Removing an IP Phone 2004 from service

- 1 Disconnect the IP Phone 2004 from the network or turn the power off.

Note: The service to the PC is disconnected as well if the PC is connected to the IP Phone 2004.

If the IP Phone 2004 was automatically configured, the DHCP lease expires and the IP address returns to the available pool.

- 2 In LD 11, OUT the TN.

End of Procedure

Nortel IP Phone 2007

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Introduction

This section explains how to install and maintain the IP Phone 2007. For information on using the IP Phone 2007, see the *IP Phone 2007 User Guide*.

This section contains the following procedures:

- Procedure 25, “Pre-installation checklist” on [page 157](#).
- Procedure 26, “Installing an IP Phone 2007 for the first time using manual configuration” on [page 159](#).
- Procedure 27, “Installing an IP Phone 2007 for the first time using DHCP” on [page 166](#).
- Table 28, “Disabling Auto Negotiate and enabling Full Duplex mode” on [page 175](#).
- Table 29, “Checking Ethernet Statistics” on [page 175](#).
- Procedure 30, “Changing the TN of an existing IP Phone 2007” on [page 177](#).
- Procedure 31, “Replacing an IP Phone 2007” on [page 178](#).
- Procedure 32, “Removing an IP Phone 2007 from service” on [page 178](#).

Note: After an IP Phone has been installed and configured, if power to the phone is interrupted, re-entry of the IP parameters, Node Number, TN, or re-acquisition of firmware is not required.

Description

The IP Phone 2007 brings voice and data to the desktop environment. It connects directly to the LAN through the Ethernet connection.

The IP Phone 2007 translates voice into data packets for transport using Internet Protocol. A Dynamic Host Configuration Protocol (DHCP) server can be used to provide information that enables the IP Phone 2007 network connection, and connection to the Voice Gateway Media Card. The IP Phone 2007 uses the customer’s IP network to communicate with the Call Server.

The IP Phone 2007 supports the following features:

- 12 programmable feature soft keys
- four soft keys (self-labeled) providing access to a maximum of ten features
- speaker for on-hook dialing or on-hook listening
- volume control bar for adjusting ringer, speaker, handset, and headset volume
- four call processing fixed keys:
 - Hold
 - Goodbye
 - Handsfree
 - Mute
- shared LAN access with a PC
- headset jack with On/Off key
- automatic network configuration
- hearing-aid compatibility
- remote firmware download
- TFTP Server based firmware upgrades
- Enhanced UNISTim firmware upgrades
- USB mouse and keyboard support
- USB port support
- large, color touch panel display screen
- web-based applications support
- Password protection

The IP Phone 2007 supports the following additional features:

- 802.1Q VLAN and Layer 2 priority bit support, an industry standard for managing bandwidth usage — full VLAN capability, including a manageable integrated switch in the IP Phone for VLAN and priority tagging for PC and IP Phone traffic
- integrated hardware to support power over Ethernet, for IEEE 802.3af standard power; also including support for PowerDsine Power over LAN Hub powering, and Cisco proprietary powering as tested with specific Cisco Ethernet switch equipment
- Gratuitous Address Resolution Protocol Protection (GARP)
- ability to change the feature key labels

Note: Feature keys will support English characters only.

- language support: English, French, Swedish, Danish, Norwegian, German, Dutch, Portuguese, Czech, Finnish, Hungarian, Italian, Polish, Spanish, Japanese, Russian, Latvian, and Turkish

The IP Phone 2007 provides a large, color touch panel display that supports color XML/HTML content through an external application server.

Touch panel

You perform point and click operations on your IP Phone 2007 using the touch panel. The touch panel is used with the graphical user interface (GUI) to present soft keys directly on the display. You can activate all Line/DN keys and feature soft keys by using the touch panel.

Calibrate the touch panel

Calibrate the touch panel through the **Tools** menu, which enables you to fine-tune the touch panel. You are prompted to use the stylus to tap three targets. For further information, see Procedure 26, “Installing an IP Phone 2007 for the first time using manual configuration” on [page 159](#) or Procedure 27, “Installing an IP Phone 2007 for the first time using DHCP” on [page 166](#).

Stylus

Operate the touch panel using a stylus or your finger. However, use of a stylus is recommended to avoid damage to the touch panel.

Figure 11
IP Phone 2007

Cleaning the IP Phone display screen

Press the **Goodbye** key and the gently wipe the IP Phone display screen with a soft, dry cloth.



CAUTION

Do not use any liquids or powders on the IP Phone. Using anything other than a soft, dry cloth can contaminate IP Phone components and cause premature failure.

Table 14
IP Phone 2007 components and functions (Part 1 of 3)

Component	Function
Hold	Press the Hold key to put an active call on hold. Tap the flashing line (DN) soft key to return to the caller on hold.
Goodbye	Press the Goodbye key to terminate an active call.
Handsfree	Press the Handsfree key to activate handsfree. The LED lights to indicate when the handsfree feature is active.
Headset	Press the Headset key to answer a call using the headset or to switch a call from the handset or handsfree to the headset.
Mute	Press the Mute key to listen to the receiving party without transmitting. Press the Mute key again to return to a two way conversation. The Mute key applies to handsfree, handset, and headset microphones. The Mute LED flashes when the Mute option is in use.
Volume control bar	Use the Volume control bar to adjust the volume of the ringer, handset, headset, speaker, and the Handsfree feature. Press the right side of the rocker bar to increase volume, the left side to decrease volume.
Message waiting light/ incoming call indicator	The Message waiting indicator turns ON to indicate that a message has been left for the user. This indicator also flashes when the set ringer is ON.
Programmable line DN/ feature keys (self-labeled)	Programmable line (DN)/feature keys (self-labeled) are located on the touch panel display. Line (DN)/feature keys are configured for various features on the IP Phones. A steady LCD light beside a line (DN)/feature key indicates the feature or line is active. A flashing LCD indicates the line is on hold or the feature is being programmed.

Table 14
IP Phone 2007 components and functions (Part 2 of 3)

Component	Function
Soft keys (self-labeled)	<p>Soft keys (self-labeled) are located on the touch panel display. The soft key label changes, based on the active feature.</p> <p>Tap the More.. soft key to access the next layer of soft key functions.</p>
Navigation keys	<p>Use the navigation keys to scroll through menus and lists on the LCD display screen. The key rocks for up, down, left, and right movement.</p>
Context-sensitive keys	<p>The soft key labels are enabled for the keys on either side of the navigation cluster. The labels are context sensitive. When in an edit box, the soft key labels will show as Clear and Backspace. This allows numeric editing without using the soft keyboard. In normal use the soft key labels show Quit and Copy.</p>

Table 14
IP Phone 2007 components and functions (Part 3 of 3)

Component	Function
Services	<p>Tap the Services key to access the following items:</p> <ul style="list-style-type: none">• Telephone Option menu<ul style="list-style-type: none">— Volume adjustment...— Contrast adjustment— Language...— Date/Time— Display diagnostics— Local DialPad Tone— Set Info— Diagnostics— Call Log Options— Ring type...— Call timer— On hook default path— Change Feature key label— Name Display Format• Virtual Office Login and Virtual Office Logout (if Virtual Office is configured)• Test Local Mode and Resume Local Mode (if Branch Office is configured)• Password Admin (if configured) <p>Note 1: When an option has a sublist, an ellipsis (...) appears after the option.</p> <p>Note 2: For ease of use, Nortel recommends the use of the external USB keyboard.</p>

Features not currently supported

The following features are not supported on the IP Phone 2007:

- Live Dialpad
- Group Listening
- Set-to-Set messaging

The three-port switch that is internal to the IP Phone 2007 is an unmanaged switch. It passes the packets (unmodified) and does not interpret the 802.1Q VLAN header. The three-port switch provides priority based on the port (that is, the IP Phone port traffic takes priority over the Ethernet).

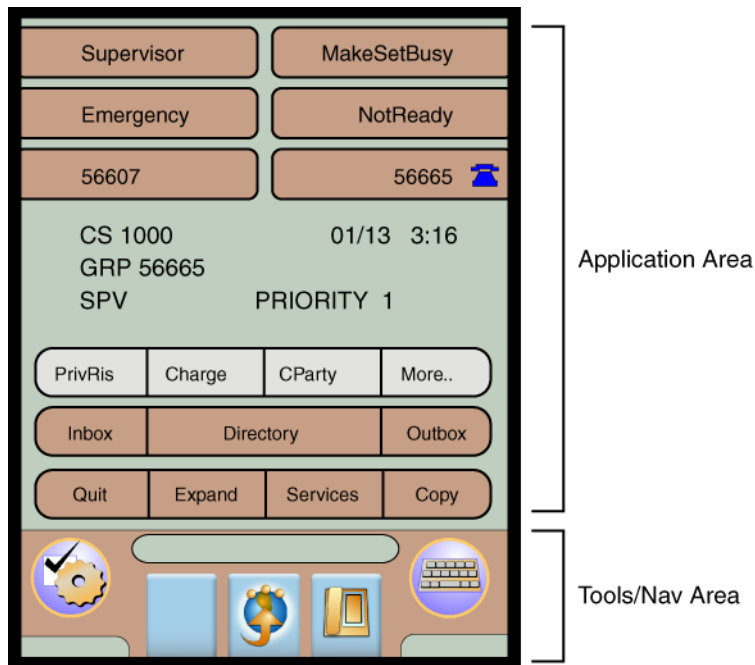
Display characteristics

The IP Phone 2007 window-based user interface has two display areas:

- Application area
- Tools/Navigation area

Figure 12 on [page 146](#) shows these two display areas.

Figure 12
IP Phone 2007 display areas



Note: The display may differ from the above example.

To extend the life of the LCD panel, the panel will go dark (“sleep”) after a configured period of time. For further information, refer to the *IP Phone 2007 User Guide*.

Application area

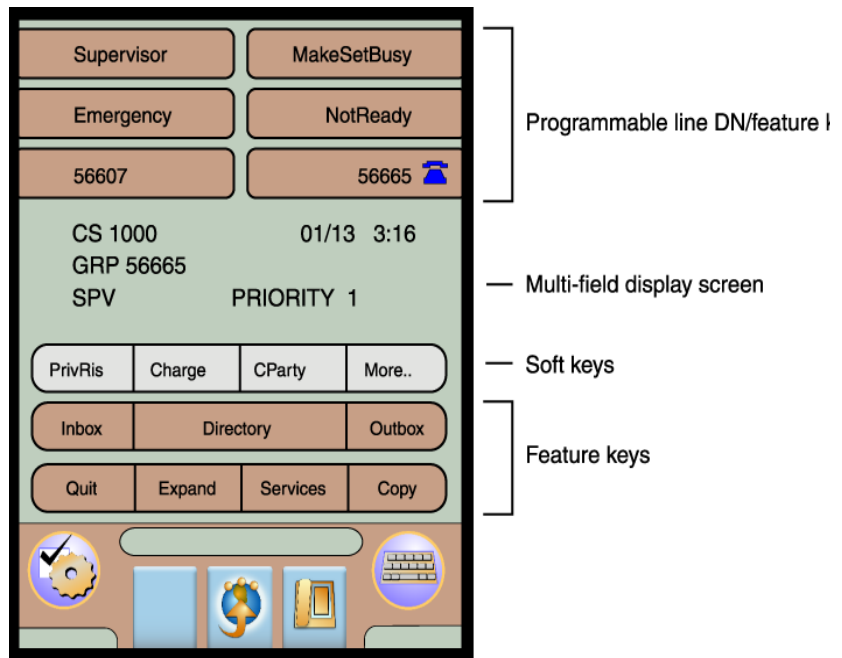
The Application area provides:

- line and feature key status
- information line display
 - caller number
 - caller name

- feature prompt strings
- user-entered digits
- date and time information
- set information
- feature keys
- soft keys

Figure 13 shows the Application area.

Figure 13
IP Phone 2007 Application area



Programmable line (DN)/feature key label display

The feature key label area displays a ten-character string for each of the twelve programmable line (DN)/feature keys. Each key includes the key label and an icon. The icon state can be on, off, or flashing. Key labels are

left-aligned for keys on the left side of the screen, and right-aligned for keys on the right side of the screen.

If a label is longer than ten characters, the last ten characters are displayed, and the excess characters are deleted from the beginning of the string.

Soft key label display

A maximum of ten functions can be assigned to the soft keys. Your system administrator assigns functions to the soft keys in layers.

Note: Soft key labels support different languages.

Use the **More..** key to navigate through the layers of functions. If there are only four functions assigned to the soft keys, the **More..** key does not appear and all four functions are displayed.

The soft key label has a maximum of six characters. Each soft key includes the soft key label and an icon. When a soft key is in use, a flashing icon displays at the beginning of the soft key label, and the label shifts one character to the right. (If the label is six characters long, the last or rightmost character is truncated.) If a soft key is enabled, the icon state changes to on. It remains in the on state until the soft key is pressed again. This cancels the enabled soft key and turns the icon off, returning the soft key label to its original state.

Feature key label display

The soft key labels may show either text or icons. The text labels are displayed by default and are changed using the **Tools** menu. For further information about the soft keys and their icon equivalents, refer to the *IP Phone 2007 User Guide*.

Tools/Navigation area

The Tools/Navigation area provides controls for navigating between features and selecting tools.

The following five main elements are presented as touchable keys:

- Tools
- Primary application
- Applications
- Telephone
- Keyboard

Password Protection

Password protection is enabled during Full DHCP configuration through SECUREMENU parameter. The Full DHCP configuration mode is required to enable the password protection. If the SECUREMENU item is not present at the end of the S4 part of the Full DHCP string, password protection is not enabled. You can still enable password protection by setting the S4 IP address to 0.0.0.0 and the other fields, such as ActionByte and RetryCount, to another setting. Nortel recommends you use 0 as the setting for ActionByte and RetryCount.

The following examples show how to configure password protection through the DHCP string:

- Menu protection on, GraphicalXAS configured:

```
Nortel-i2004-A,xxx.xxx.xxx.xxx:pppppp,aaa,rrr;  
xxx.xxx.xxx.xxx:pppppp,aaa,rrr;xxx.xxx.xxx.xxx:  
pppppp,aaa,rrr,SECUREMENU
```

```
Nortel-i2004-A,147.19.11.70:4100,1,10;  
147.19.11.70:4100,1,5;37.165.238.90:44443,1,5,  
SECUREMENU
```

- Menu protection off, GraphicalXAS configured:

```
Nortel-i2004-A,xxx.xxx.xxx.xxx:pppppp,aaa.rrr;  
xxx.xxx.xxx.xxx:pppppp,aaa,rrr;xxx.xxx.xxx.xxx:  
pppppp,aaa
```

```
Nortel-i2004-A,147.19.11.70:4100,1,10;147.19.11.7:  
4100,1,5;37.165.238.90:4443,1
```

- Menu protection off, no XAS configured:

```
Nortel-i2004-A,147.19.11.70:4100,1,10;147.19.11.7:  
4100,1,5;0.0.0.0:0,0,0,SECUREMENU
```

IMPORTANT!

In Full DHCP mode, the server must be configured to respond to the request for vendor-specific encapsulated options.

For further information on configuring Full DHCP, refer to *Converging the Data Network with VoIP* (553-3001-160).

When Password protection is enabled, a password is required to access the **Tools** menu. When the **Tools** icon is pressed, a password prompt window appears. Use the dialpad and enter the password 26567*738 (color*set) to access the Tools menu.

The Tools menu remains active for five minutes. You can freely navigate, exit and reenter the Tools menu without being prompted to reenter the password. To reset the timer before the five minute time expires, press the Tools icon.

When time expires, the Tools menu and any open submenus are closed. Alternatively, you can select **Lock Menu** item from the Tools menu. The Lock Menu item immediately closes and locks the Tools menu. You must reenter your password to reaccess the Tools menu.

If you enter an incorrect password, press the Tools icon to reopen the password prompt window. Only three incorrect password entries are allowed. Any entry after the three attempts is ignored for five minutes. The password prompt window is visible and you can reenter the password, but the password is not processed until the five minute time expires.

For further information about the Tools/Navigation area, refer to the *IP Phone 2007 User Guide*.

Figure 14 shows the Tools/Navigation area.

Figure 14: IP Phone 2007 Tools/Navigation area

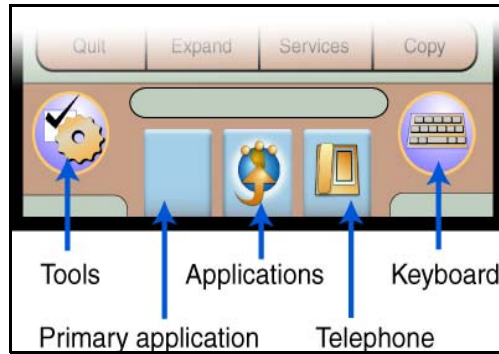


Table 15: IP Phone 2007 Tools Menu (Part 1 of 2)

Component	Description
Network Configuration	<p>Displays the information that was configured when the IP Phone 2007 was installed:</p> <ul style="list-style-type: none"> — DHCP status — Telephone Set IP mask — Network Mask — Gateway IP address — Server 1 and Server 2 IP address, Port, Action, Retry, and PK numbers — Voice VLAN and Data VLAN — Duplex setting — XAS (S4) IP address, Port, Action, Retry — GraphicalXAS IP address
Local Diagnostics	<p>Displays the Local Diagnostics menu containing the following items:</p> <ul style="list-style-type: none"> — Network Diagnostic Tools — Ethernet Statistics — IP Network Statistics — IP Set&DHCP Information
Touch Panel Setup	Use the Touch Panel Setup tool to calibrate the touch panel and stylus.
Contrast and Brightness	Use Contrast Brightness tools to alter the display's physical settings.
USB Devices	Use USB Devices menu to control the Universal Serial Bus (USB) device plugged into the USB port in the back of the IP Phone.

Table 15: IP Phone 2007 Tools Menu (Part 2 of 2)

Component	Description
TFTP Upgrade	Use TFTP Upgrade menu to upgrade the firmware in the IP Phone.
Preferences	Use the Preferences menu to configure individual user preferences.

For further information on configuring Local Options on the IP Phone 2007, refer to “IP Phone diagnostic utilities” on [page 421](#).

Key number assignments

The IP Phone 2007 has four soft-labeled, predefined keys that are used to provide up to ten features. Because they are predefined, the user cannot change the key number assignment.

The Message key is numbered 16. Key numbers 17 to 31 are the four soft key labels below the display area. See Figure 11 on [page 141](#).

Key numbers 17 to 31 support the features A03, A06, CFW, CHG, CPN, PRK, PRS, RGA, RNP, SCC, SCU, SSC, SSU and TRN, as listed in Table 16 on [page 154](#).

Table 16 describes the IP Phone assignment functions for each of the soft keys. Use LD 11 to program keys 16 to 26 on the IP Phone 2007.

Note: If you attempt to configure anything other than the permitted response, the system generates an error code.

Table 16
IP Phone 2007 soft keys (Part 1 of 2)

Key number	Response	Description
Key 16	MWK	Message waiting key
	NUL	Removes function or feature from key
Key 17	TRN	Call Transfer key
	NUL	Removes function or feature from key
Key 18	A03	Three-party conference key
	A06	Six-party conference key
	NUL	Removes function or feature from key
Key 19	CFW	Call Forward key
	NUL	Removes function or feature from key
Key 20	RG A	Ring Again key
	NUL	Removes function or feature from key
Key 21	PRK	Call Park key
	NUL	Removes function or feature from key
Key 22	RNP	Ringing Number Pickup key
	NUL	Removes function or feature from key
Key 23	SCU	Speed Call User
	SSU	System Speed Call User
	SCC	Speed Call Controller
	SSC	System Speed Call Controller
	NUL	Removes function or feature from key

Table 16
IP Phone 2007 soft keys (Part 2 of 2)

Key number	Response	Description
Key 24	PRS	Privacy Release key
	NUL	Removes function or feature from key
Key 25	CHG	Charge Account key
	NUL	Removes function or feature from key
Key 26	CPN	Calling Party Number key
	NUL	Removes function or feature from key

Package components

The IP Phone 2007 includes integrated support for a number of LAN options, including support for IEEE 802.3af standard power. The Global power adapter must be ordered separately if local power is required.

Table 17 lists the IP Phone 2007 package components and product codes. Contact Nortel for further information.

Table 17
IP Phone 2007 component list (Part 1 of 2)

IP Phone 2007 package contents includes <ul style="list-style-type: none"> • IP Phone 2007 (charcoal with metallic bezel) • Handset • Handset cord • Footstand • 7 ft. (2.3 m) CAT5 Ethernet cable • Getting Started card 	NTDU96AB70
Replacement parts	
7 ft. CAT5 Ethernet cable	A0648375

Table 17
IP Phone 2007 component list (Part 2 of 2)

Handset (charcoal)	A0758634
Handset cord (charcoal)	N0000764
Footstand (charcoal)	A0538587
IP Phone 2007 power adapter	
Global power adapter	N0014020
IP Phone 2007 power cords	
Cord 9.9 ft. NA Power, NEMA, 125Vac 13 ^a NA, M.East, Taiwan, Indonesia, Philippines, Korea, Thailand, Vietnam, Japan	NTTK14AB
Cord 8 ft., ANA Power AS-3, 240Vac 10A Australia, New Zealand, PRC	NTTK15AA
Option 11C Standard European Power Cord 250Vac Other EMEA, Kenya	NTTK16AB
Option 11C Swiss Power Cord, 9.9 ft. 125Vac Switzerland	NTTK17AB
Option 11C UK Power Cord 240Vac Hong Kong, Ireland, UK, Singapore, Malaysia, India, Bangladesh, Pakistan, Brunei, Sri Lanka	NTTK18AB
Option 11C Denmark Power Cord Kit, 9.9 ft. 125Vac Denmark	NTTK22AB

Before you begin

The following section provides a step-by-step guide through the IP Phone 2007 installation process. Before installing the IP Phone 2007, complete the following pre-installation checklist.

Procedure 25
Pre-installation checklist

- 1 Ensure there is one IP Phone 2007 boxed package for each IP Phone 2007 being installed. The package contains:
 - IP Phone 2007
 - Handset
 - Handset cord
 - Footstand
 - 7 ft. (2.3 m) CAT5 Ethernet cable
 - Getting Started card
- 2 To install and configure an IP Phone 2007, the host system must be installed with the Voice Gateway Media Card.
- 3 If you are not using Power over Ethernet (PoE) you must use the Global power adapter or your phone will fail to operate. Refer to Table 17 on [page 155](#).

**WARNING**

If you are using local power, you must use the Global power adapter or your phone will fail to operate.

- 4 Understand the three configuration modes that you can choose from as you proceed through the installation of the IP Phone 2007. The three configuration modes are:
 - Static IP address – see “Static IP address assignment” on [page 158](#).
 - Dynamic Partial DHCP – see “Dynamic IP address assignment — Partial DHCP” on [page 159](#).
 - Dynamic Full DHCP – see “Dynamic IP address assignment — Full DHCP” on [page 159](#).
- 5 A DHCP server and DHCP relay agents, if required, must also be installed, configured, and running.

End of Procedure

First-time installation

To install and configure an IP Phone 2007, you must first install a Voice Gateway Media Card in the system.



CAUTION

Damage to Equipment

Do not plug your IP Phone 2007 into an ISDN connection. Severe damage can result. Consult your system administrator to ensure that you are plugging your IP Phone into a 10/100BaseT Ethernet jack.

IP address assignments

During the first-time installation, there are IP address parameters that are entered either manually or automatically depending on the installation configuration. As well, you are prompted to enable or disable 802.1Q VLAN. For more information, see “802.1Q VLAN description” on [page 407](#).

There are three configuration modes which you can choose from to obtain the IP parameters. Review the following sections for more information on the configuration mode you are using.

Static IP address assignment

During the installation, the IP Phone 2007 parameters are entered manually using the dialpad.

Your system administrator provides the following information: IP address, subnet mask, and default Gateway.

You must also enter the Connect Server parameters including: IP address, port number, action, and retry count.

Go to Procedure 26, “Installing an IP Phone 2007 for the first time using manual configuration” on [page 159](#).

Dynamic IP address assignment — Partial DHCP

For a partial DHCP installation, you must provide, through the IP Phone 2007 dialpad, the Connect Server parameters including: IP address, port number, action, and retry count. Other parameters (IP Phone IP address, subnet mask, and default Gateway) are retrieved from the DHCP server.

The IP Phone 2007 password, node ID and TN must be entered manually from the dialpad.

For more information about DHCP servers, see *Converging the Data Network with VoIP* (553-3001-160).

Go to Procedure 27, “Installing an IP Phone 2007 for the first time using DHCP” on [page 166](#).

Dynamic IP address assignment — Full DHCP

For a full DHCP installation, all parameters (IP Phone IP address, subnet mask, default Gateway, Connect Server IP address, port number, action, and retry count) are retrieved from the DHCP server to recognize the IP Phone 2007.

The IP Phone 2007 password, node ID and TN must be entered manually from the dialpad.

For more information on how to set up DHCP servers for use with the IP Phone 2007, refer to *Converging the Data Network with VoIP* (553-3001-160).

Go to Procedure 27, “Installing an IP Phone 2007 for the first time using DHCP” on [page 166](#).

Procedure 26

Installing an IP Phone 2007 for the first time using manual configuration

- 1 Configure a virtual loop on the system using LD 97.

For more information, see *Software Input/Output: Administration* (553-3001-311).

- 2 Configure the IP Phone 2007 on the system using LD 11.

For more information, see *Software Input/Output: Administration* (553-3001-311).

- 3 Connect the IP Phone 2007 components:
 - a. Connect one end of the handset cord to the handset jack on the back of the IP Phone (identified with a handset icon).
 - b. Connect the other end of the handset cord to the handset.
- 4 Choose one of the following connections:
 - For an IP Phone not sharing a LAN access with a PC:

Connect one end of the CAT5 Ethernet cable to the LAN Ethernet port located on the back of the IP Phone (identified with a LAN icon). Plug the other end of the CAT5 Ethernet cable into the IP network.

- For an IP Phone sharing a LAN access with a PC:

Connect one end of the CAT5 Ethernet cable to the LAN Ethernet port located on the back of the IP Phone (identified with a LAN icon, see Figure 15 on [page 161](#)) and the other end to the IP network. Insert one end of a second CAT5 Ethernet cable into the PC Ethernet port located on the back of the IP Phone (identified with a PC icon, see Figure 15 on [page 161](#)) and the other end into the computer's Ethernet port.



CAUTION

Damage to Equipment

Do not plug your IP Phone 2007 into any port but the PC Ethernet port. Severe damage can result. Consult your system administrator to ensure that you are plugging your IP Phone into the PC Ethernet port.

Figure 15
IP Phone 2007 connections



- 5** Power the IP Phone 2007 using either the Power over Ethernet or the Global power adapter (local power).



WARNING

If you are using local power, you must use the Global power adapter or your phone will fail to operate.

IMPORTANT!

Timing information

There are only four seconds between plugging in the IP Phone 2007 power adapter and the appearance of Nortel on the display. When Nortel appears in the middle of the screen, you have one second to respond by pressing 0, 0, 7, *. If you miss the one-second response time, the IP Phone 2007 attempts to locate the connect server. Wait until it is finished, and then begin the power-up sequence again.

- a. To use local power, plug the Global power adapter into the nearest power outlet. Refer to Table 17 on [page 155](#).
- b. Connect the power jack as shown in Figure 15 on [page 161](#).

You will hear a tone shortly before the IP Phone is ready to start the Nortel IP telephone application.

- 6 Once the application has loaded and started, Nortel will appear in the middle of the screen. Immediately press the following keys in sequence:
 - a. 0
 - b. 0
 - c. 7
 - d. star (*)

Note: If you miss part of the configuration, unplug the phone from the power for a few seconds and redo this step.

- 7 At the prompt DHCP Yes/No?, select **No**.
- 8 Enter the following information provided by your system administrator:

Note: When entering the IP addresses and subnet mask, use the star (*) key on the dialpad to represent the dot (.).

Screen prompt	Description
set IP	a valid IP Phone 2007 IP address
net msk	a subnet mask
def gw	the default Gateway for the IP Phone 2007 on the LAN segment to which it is connected

- 9 Enter the information for the primary Connect Server (S1) and the secondary Connect Server (S2):

Screen prompt	Description
S1 IP	the node IP address of the IP line node
S1 Port	this is a fixed value: 4100
S1 action	this is a fixed value: 1
S1 retry	the number of times the IP Phone 2007 attempts to connect to the server (Enter 10)
S2 IP	same as S1 in most cases (see Note 1)
S2 Port	same as S1
S2 action	same as S1
S2 retry	same as S1
Cfg XAS? (0-No,1-Yes)	Default 0 (for No).

Note: If there is no XAS or GraphicalXAS server, enter 0 (for No). You are not prompted for the XAS IP address or the GraphicalXAS IP address if they are not configured on your system.

When prompted, enter the following:

- XAS IP:
- GXAS
Default 1 (for Yes)

Note: You will only be prompted for XAS Port if GXAS is 1 (for Yes).

- XAS Port

Voice VLAN? (0-No, 1-Yes)	<p>Default 0 (for No) 802.1Q VLAN remains off and initialization continues.</p> <p>For more information about VLAN configuration, refer to <i>Converging the Data Network with VoIP</i> (553-3001-160).</p> <p>When prompted, enter the following:</p> <ul style="list-style-type: none">• Voice VLAN ID: <p>Note: The Voice VLAN ID is entered as an integer. The Voice VLAN ID is a 12-bit value between 1 and 4095.</p> <p>The IP Phone 2007 is configured with 802.1Q enabled, the VOICE VLAN ID is configured to the entered value, and the VOICE VLAN priority = 6.</p>
Data VLAN? (0-No, 1-Yes)	<p>Default 0 (for No) Data VLAN is not present.</p> <p>When prompted, enter the following:</p> <ul style="list-style-type: none">• DATA VLAN ID: <p>Note: The DATA VLAN ID is entered as an integer. The DATA VLAN ID is a 12-bit value between 0 and 4095, and should be different from the VOICE VLAN ID.</p> <p>The IP Phone 2007 is configured with 802.1Q enabled, the DATA VLAN ID is configured to the entered value, and the DATA VLAN priority = 0.</p>
Duplex (0-Auto, 1-Full)	<p>Default 0 (for Auto)</p>
GARP Ignore? (0-No, 1-Yes)	<p>Default 0 (for No)</p>

Note 1: The IP Phone 2007 can support a primary (S1) and secondary (S2) connect server. If you require IP Phones to register on multiple nodes, refer to “Enhanced Redundancy for IP Line Nodes” in *IP Line: Description, Installation, and Operation* (553-3001-365).

The IP Phone 2007 searches for the connect server. When the connection is complete, proceed with Step 10.

- 10** Enter the following information provided by your system administrator:

Screen prompt	Description
Password	IP Phone Installer Password You are not prompted to enter the IP Phone Installer Password if it has not been configured in your system.
Node	the node ID
TN	the TN or VTN

The IP Phone 2007 registers with the TPS and, if needed, begins the firmware download. This takes several minutes. When the download is complete, the IP Phone 2007 resets.

Note: The Enhanced UNISim Firmware Download feature for IP Phones provides an improved method of delivering new firmware to IP Phones. For further information on Enhanced UNISim Firmware Download, refer to *IP Line: Description, Installation, and Operation* (553-3001-365).

- 11** Check for dial tone and the correct DN above the display.
- 12** Secure the IP Phone footstand to the base of the IP Phone. Use the angle adjustment grip on the top back of the IP Phone to adjust the position.
- 13** (Optional) Customize the feature keys as required. For more information, see the *IP Phone 2007 User Guide*.
- 14** Tap the **Tools** icon to calibrate the touch panel and stylus.
- 15** Tap the **Touch Panel Setup** soft key.

The screen displays a calibration map, the **Cancel** soft key is displayed, and the following system prompt is displayed:

Touch the center of the red ball.

- 16** Use the stylus and tap each of the red dots, in order, starting with the lower left portion of the screen, and following the sequence as prompted.

After the third dot is tapped, the display changes to indicate the result of calibration.

- If the calibration is successful, the telephone displays the following report:

Data calibration is CORRECT.
Save Data calibration?

YES and **NO** soft keys and calibration statistics are displayed on the screen.

Tap the **YES** soft key to save the calibration settings and exit to the main display or tap the **NO** soft key to abandon the calibration settings and exit to the main display.

- If the calibration is unsuccessful, the telephone displays the following report:

Data calibration is WRONG.
Repeat calibration?

YES and **NO** soft keys and calibration statistics are displayed on the screen.

Tap the **YES** soft key to retry the calibration. Return to step 15 on [page 173](#) to follow the calibration procedure or tap the **NO** soft key to abandon the calibration and return to the main display.

End of Procedure

Procedure 27 Installing an IP Phone 2007 for the first time using DHCP

- 1 Configure a virtual loop on the system using LD 97.

For more information, see *Software Input/Output: Administration* (553-3001-311).

- 2 Configure the IP Phone 2007 on the system using LD 11.

For more information, see *Software Input/Output: Administration* (553-3001-311).

- 3 Connect the IP Phone 2007 components:

- a. Connect one end of the handset cord to the handset jack on the back of the IP Phone (identified with a handset icon).
 - b. Connect the other end of the handset cord to the handset.
- 4 Choose one of the following connections:
 - For an IP Phone not sharing a LAN access with a PC:

Connect one end of the CAT5 Ethernet cable to the LAN Ethernet port located on the back of the IP Phone (identified with a LAN icon). Plug the other end of the CAT5 Ethernet cable into the IP network.
 - For an IP Phone sharing a LAN access with a PC:

Connect one end of the CAT5 Ethernet cable to the LAN Ethernet port located on the back of the IP Phone (identified with a LAN icon, see Figure 15 on [page 161](#)) and the other end to the IP network. Insert one end of a second CAT5 Ethernet cable into the PC Ethernet port located on the back of the IP Phone (identified with a PC icon, see Figure 15 on [page 161](#)) and the other end into the PC Ethernet port.

**CAUTION****Damage to Equipment**

Do not plug your IP Phone 2007 into any port but the PC Ethernet port. Severe damage can result. Consult your system administrator to ensure that you plug your IP Phone into the PC Ethernet port.

IMPORTANT!**Timing information**

There are only four seconds between plugging in the IP Phone 2007's power adapter and the appearance of Nortel on the display. When Nortel appears in the middle of the screen, you have one second to respond by pressing 0, 0, 7, *. If you miss the one-second response time, the IP Phone 2007 attempts to locate the connect server. Wait until it is finished, and then begin the power-up sequence again.

- 5 Power the IP Phone 2007 using either the Power over Ethernet or the Global power adapter (local power).

- a. To use local power, plug the Global power adapter into the nearest power outlet.



WARNING

If you are using local power, you must use the Global power adapter or your phone will fail to operate.

- b. Connect the power jack as shown in Figure 15 on [page 161](#).

You will hear a tone shortly before the IP Phone is ready to start the Nortel IP telephone application.

- 6 Once the application has loaded and started, Nortel will appear on the screen. Immediately press the following keys in sequence:

- a. 0
- b. 0
- c. 7
- d. star (*)

Note: If you miss part of the configuration, unplug the phone from the power for a few seconds and redo this step.

- 7 At the prompt DHCP Yes/No?, select **Yes**.

- 8 Select Partial or Full DHCP.

- a. If you select Full DHCP, then the following parameters are retrieved from the DHCP server:
 - a valid IP Phone 2007 IP address
 - a subnet mask
 - the default Gateway for the IP Phone 2007 on the LAN segment to which it is connected
 - the S1 node IP address of the IP line node
 - the S1 Action
 - the S1 Retry Count (This is the number of times the IP Phone attempts to connect to the server.)

- S1 Port
- the S2 node IP address of the IP line node
- the S2 Action
- the S2 Retry Count
- S2 Port
- the External Application Server (XAS) IP address (S4 IP address)
- XAS Port (S4 Port)
- XAS Action (S4 Action)
- XAS Retry Count (S4 Retry Count)
- Duplex

- b.** If you select Partial DHCP, then you must enter the following parameters:

Screen prompt	Description
S1 IP	The node IP address of the IP line node.
S1 Port	This is a fixed value: 4100
S1 action	This is a fixed value: 1
S1 retry	The number of times the IP Phone 2007 attempts to connect to the server. Enter 10.
S2 IP	Same as S1 in most cases (see note below)
S2 Port	Same as S1
S2 action	Same as S1
S2 retry	Same as S1

Cfg XAS? (0-No,1-Yes)

Default 0 (for No).

Note: If there is no XAS or GraphicalXAS server, enter 0 (for No). You are not prompted for the XAS IP address or the GraphicalXAS IP address if they are not configured on your system.

When prompted, enter the following:

- XAS IP:
- GXAS
Default 1 (for Yes)

Note: You will only be prompted for XAS Port if GXAS is 1 (for Yes).

- XAS Port

Voice VLAN? (0-No, 1-Yes)

Default 0 (for No)
802.1Q VLAN remains off and initialization continues.

For more information about VLAN configuration, refer to *Converging the Data Network with VoIP* (553-3001-160).

When prompted, enter the following:

- VLAN Cfg? (0-Auto, 1-Man):
Default 1 (for Man)

Note: You are only prompted for VLAN Cfg? if Full DHCP is selected.

- Voice VLAN ID:

Note: The Voice VLAN ID is entered as an integer. The Voice VLAN ID is a 12-bit value between 1 and 4095.

The IP Phone 2007 is configured with 802.1Q enabled, the VOICE VLAN ID is configured to the entered value, and the VOICE VLAN priority = 6.

Data VLAN? (0-No, 1-Yes)

Default 0 (for No)

Data VLAN is not present.

When prompted, enter the following:

- DATA VLAN ID:

Note: The DATA VLAN ID is entered as an integer. The DATA VLAN ID is a 12-bit value between 0 and 4095, and should be different from the VOICE VLAN ID.

The IP Phone 2007 is configured with 802.1Q enabled, the DATA VLAN ID is configured to the entered value, and the DATA VLAN priority = 0.

Duplex (0-Auto, 1-Full):0 Default 0 (for Auto)

GARP Ignore? (0-No,1-Yes) Default 0 (for No)

Note: The IP Phone 2007 can support a primary (S1) and secondary (S2) connect server. If you require IP Phones to register on multiple nodes, refer to “Enhanced Redundancy for IP Line Nodes” in *IP Line: Description, Installation, and Operation* (553-3001-365).

The IP Phone 2007 searches for the connect server. When the connection is complete, proceed to step 9.

- 9** Enter the following information provided by your system administrator.

Note: When entering the IP addresses and subnet mask, use the star (*) key on the dialpad to represent the dot (.).

Screen prompt	Description
Password	IP Phone Installer Password You are not prompted to enter the IP Phone Installer Password if it has not been configured in your system.
Node	the node ID
TN	the TN or VTN

The IP Phone 2007 registers with the TPS and, if needed, begins the firmware download. This takes several minutes. When the download is complete, the IP Phone 2007 resets.

Note: The Enhanced UNISTim Firmware Download feature for IP Phones provides an improved method of delivering new firmware to IP Phones. For further information on Enhanced UNISTim Firmware Download, refer to *IP Line: Description, Installation, and Operation* (553-3001-365).

- 10** Check for dial tone and the correct DN above the display.
- 11** Secure the IP Phone footstand to the base of the IP Phone. Use the angle adjustment grip on the top back of the IP Phone to adjust the position.
- 12** (Optional) Customize the feature keys as required. For more information, see *IP Phone 2007 User Guide*.
- 13** Tap the **Tools** icon to calibrate the touch panel and stylus.
- 14** Tap the **Touch Panel Setup** soft key.

The screen displays a calibration map, the **Cancel** soft key is displayed, and the following system prompt is displayed:

Touch the center of the red ball.

- 15** Use the stylus and tap each of the red dots, in order, starting with the lower left portion of the screen, and following the sequence as prompted.

After the third dot is tapped, the display changes to indicate the result of calibration.

- If the calibration is successful, the telephone displays the following report:

Data calibration is CORRECT.
Save Data calibration?

YES and **NO** soft keys and calibration statistics are displayed on the screen.

Tap the **YES** soft key to save the calibration settings and exit to the main display or tap the **NO** soft key to abandon the calibration settings and exit to the main display.

- If the calibration is unsuccessful, the telephone displays the following report:

Data calibration is WRONG.
Repeat calibration?

YES and **NO** soft keys and calibration statistics are displayed on the screen.

Tap the **YES** soft key to retry the calibration. Return to step 15 on [page 173](#) to follow the calibration procedure or tap the **NO** soft key to abandon the calibration and return to the main display.

End of Procedure

Startup sequence

When an IP Phone 2007 is connected to the network, it must perform a startup sequence. The elements of the startup sequence include:

- obtaining the IP parameters

- finding a default Gateway server
- authenticating the user

Table 18 on [page 174](#) lists a summary of the IP parameters and how they are obtained.

Note: Your system administrator provides the network information for all static IP address assignments.

Table 18
IP Phone 2007 IP parameters

Parameter	Method of Acquisition
IP Address	Manually entered or automatically retrieved through Partial or Full DHCP.
Net Mask	Manually entered or automatically retrieved through Partial or Full DHCP.
Default Gateway	Manually entered or automatically retrieved through Partial or Full DHCP.
Connect Server (IP address, port, action and retry count — primary and secondary)	Manually entered or automatically retrieved through Full DHCP.
User ID (Node ID, Node Password and TN)	Manually entered for first-time configuration. Retrieved from local storage on subsequent power cycles. Note: Your system administrator provides the information to enter.

Full Duplex mode

In the **Configuration** menu, Auto Negotiate mode is the default setting for initial startup. Typically, the IP Phone is connected to a network that supports Auto Negotiate, and it selects the best speed and duplex mode available. There is no intervention required under normal operation.

If the IP Phone 2007 is connected to a network configured for Full Duplex mode only, it is not able to automatically negotiate the proper configuration. Therefore, in this instance, to allow the IP Phone to work at the optimum speed and duplex mode, Auto Negotiate must be disabled. Use Procedure 28 on [page 175](#) to disable Auto Negotiate and enable Full Duplex mode.

Procedure 28
Disabling Auto Negotiate and enabling Full Duplex mode

- 1 Reset the IP Phone by disconnecting and reconnecting power.
- 2 When Nortel appears on the screen, press 0, 0, 7, star (*). See Procedure 27 on [page 166](#).
- 3 If no other configuration changes are required, press the **OK** soft key repeatedly until the Duplex network option appears.
- 4 Select 1 to enable Full Duplex mode.
- 5 When the Speed option appears, select one of the following:
 - 0 for 10 Mbps
 - 1 for 100 Mbps (default)
- 6 Select **OK** to confirm the change.
- 7 Restart the IP Phone 2007. The firmware reads the new setting, and the IP Phone operates in Full Duplex mode.

When the IP Phone is restarted, the firmware reads the setting for Full Duplex mode and sets both port 0, network interface port, and port 1, PC interface port, accordingly.

***Note:** Refer to the *IP Phone 2007 User Guide* for further information.*

Use Procedure 29 to confirm activation of Full Duplex mode.

Procedure 29
Checking Ethernet Statistics

- 1 Tap the **Tools** icon.
- 2 Tap the **Local Diagnostics** soft key.
- 3 Tap the **Ethernet Statistics** soft key.

The following statistics are displayed:

- Link: Up
- Duplex: Full
- Speed: 10 (Mb) or 100 (Mb)
- Auto-Nego Capability: N
- Auto-Nego Completed: N

End of Procedure

Gratuitous Address Resolution Protocol Protection

Gratuitous Address Resolution Protocol Protection (GARP) prevents the IP Phone 2007 from GARP Spoof attacks on the network. In a GARP Spoof attack, a malicious device on the network takes over an IP address (usually the default gateway) by sending unsolicited (or Gratuitous) ARP messages, thus manipulating the ARP table of the victim's machine. This allows the malicious device to launch a variety of attacks on the network, resulting in undesired traffic routing. For example, a GARP attack can convince the victim machine that the malicious device is the default gateway. In this scenario, all traffic from the victim's machine flows through the malicious device.

To enable GARP Protection during configuration, refer to Procedure 26, "Installing an IP Phone 2007 for the first time using manual configuration" on [page 159](#) or Procedure 26, "Installing an IP Phone 2007 for the first time using DHCP" on [page 166](#).

Reinstalling an IP Phone 2007

You can reinstall an existing, previously-configured IP Phone 2007 on the same system. For example, the IP Phone 2007 can be assigned to a new user (new TN) or to an existing user who moved to a new subnet by changing the TN of the IP Phone 2007.

Procedure 30**Changing the TN of an existing IP Phone 2007**

- 1 Repower the IP Phone 2007.

Note: During the reboot sequence of a previously configured IP Phone, the IP Phone 2007 displays the existing node number for approximately five seconds.

- 2 If node password is enabled and NULL, choose one of the following:

- a. Disable password.
- b. Set password as non-NULL.

- 3 Press **OK** when the node number displays.

If	Then
node password is enabled and is not NULL	a password screen displays. Go to step 4.
node password is disabled	a TN screen displays. Go to step 5.

- 4 Enter password at the password screen, and press **OK**.

A TN screen displays.

- 5 Select the **Clear** soft key to clear the existing TN.

Replacing an IP Phone 2007

IMPORTANT!

Two IP Phones cannot share the same TN. You must remove the IP Phone 2007 that is currently using the TN.

Procedure 31 Replacing an IP Phone 2007

- 1 Disconnect the IP Phone 2007 that you want to replace.
- 2 Follow Procedure 26 on [page 159](#) (static IP assignment) or Procedure 27 on [page 166](#) (dynamic IP assignment) to install and configure the IP Phone 2007.

Enter the same TN and Node Number as the IP Phone 2007 you replaced. The system associates the new IP Phone 2007 with the existing TN.

End of Procedure

Removing an IP Phone 2007 from service

Procedure 32 Removing an IP Phone 2007 from service

- 1 Disconnect the IP Phone 2007 from the network or turn the power off.

Note: The service to the PC is disconnected as well if the PC is connected to the IP Phone 2007.

If the IP Phone 2007 was automatically configured, the DHCP lease expires and the IP address returns to the available pool.

- 2 In LD 11, OUT the TN.

End of Procedure

IP Phone Key Expansion Module (KEM)

Contents

This section contains information on the following topics.

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Key number assignments	181
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Installation	186
IP Phone KEM startup initialization	188
Operating parameters	189

Description

The Nortel IP Phone Key Expansion Module (KEM) is a hardware component that connects to IP Phone 2002 and IP Phone 2004 and provides additional line appearances and feature keys (see Figure 16 on [page 180](#)).

Up to two IP Phone KEMs can be connected to an IP Phone 2002 or IP Phone 2004. With two IP Phone KEMs connected, the IP Phone can have up to 48 additional line/feature keys.

Note: The IP Phone 2004 can also have up to 48 additional line/feature keys using the **Shift** key functionality and one IP Phone KEM. With two IP Phone KEMs connected, the **Shift** key functionality does not affect the IP Phone KEMs since the maximum number of line/feature keys is already available. The IP Phone 2002 does not support **Shift** key functionality.

Figure 16
IP Phone 2002 with one IP Phone KEM attached



Features

The IP Phone KEM has the following features:

- 12 keys on each side of an LCD provide up to 24 additional self-labeled line/feature keys. Using the **Shift** key functionality, an IP Phone 2004 can have up to 48 additional logical line/feature keys.

- A desk-mount bracket and structural baseplate connect the IP Phone KEM to an IP Phone 2002 or IP Phone 2004, or to another IP Phone KEM.
- A wall-mount bracket installs the IP Phone KEM alongside a wall-mounted IP Phone 2002 or IP Phone 2004.

Display characteristics

The IP Phone KEM has one LCD between the two rows of 12 Line/feature keys (see Figure 16 on [page 180](#)). Each of the 24 physical keys on the IP Phone KEM has a 10-character display label. This label is set automatically, however, the user can edit the label using the controls on the IP Phone.

To alter the display and contrast on the IP Phone KEM, use the **Contrast Adjustment** option under the **Telephone Options** menu on the IP Phone. Any contrast changes you make on the IP Phone affect the IP Phone KEM. The IP Phone KEM and IP Phone do not have separate contrast adjustments.

Key number assignments

Since the IP Phone 2002 and IP Phone 2004 have key number assignments from 0 to 31, the IP Phone KEM key number assignments begin at 32. Therefore, the first IP Phone KEM has key number assignments from 32 to 55, and the second IP Phone KEM has key number assignments from 56 to 79.

Package components

Table 19 lists the IP Phone KEM package components.

Table 19
IP Phone KEM components list (Part 1 of 2)

Components	Order code
IP Phone KEM - Ethergray	A0540989

Table 19
IP Phone KEM components list (Part 2 of 2)

IP Phone KEM - Charcoal	A0540990
IP Phone KEM wall mount kit - Charcoal	A0555218

Configuration

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

LD 11 – Configure the IP Phone KEM. (Part 1 of 5)

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
		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 5)

Prompt	Response	Description
KEY	xx aaa yyyy (cccc or D) zz.z	<p>Telephone function key assignments</p> <p>The following key assignments determine calling options and features available to an IP Phone. Note that KEY is prompted until a carriage return <CR> is entered.</p> <p>Where:</p> <p>xx = key number aaa = key name or function yyy = additional information required for the key zz.z = additional information required for the key aaa.</p> <p>The cccc or D entry deals specifically with the Calling Line Identification feature, where:</p> <p>cccc = CLID table entry of (0)-N, where N = the value entered at the SIZE prompt in LD 15 minus 1.</p> <p>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.</p> <p>Note: The position of the (cccc or D) field varies depending on the key name or function.</p> <p>You may enter a CLID table entry if aaa = ACD, HOT d, HOT L, MCN, MCR, PVN, PVR, SCN, or SCR.</p> <p>Type xx NUL to remove a key function or feature.</p> <p>Some data ports require specific key assignments. Refer to the <i>Meridian Data Services</i> NTPs for information regarding these requirements.</p>

LD 11 – Configure the IP Phone KEM. (Part 3 of 5)

Prompt	Response	Description
		<p>Key number limits that can be assigned are as follows:</p> <ul style="list-style-type: none"> 0-7 for Meridian Communications Adapter (MCA) 0-5 for M2006 0-7 for M2008 0-59 for M2616, varies with number of add-on modules 0-79 for I2002, varies with value of KEM 0-79 for I2004, varies with value of KEM <p>Note: The first IP Phone KEM is assigned keys 32-55, and the second IP Phone KEM is assigned keys 56-79.</p> <p>If either the Meridian Programmable Data Adapter (MPDA) or the Display Module is equipped, then key 7 on sets M2008, M2216, and M2616 and key 5 on set M2006 will become Program keys which cannot be used as function keys.</p> <p>Any printout of the TN block will not show key 7 because it is a local function key.</p> <p>On the M2616, if CLS = HFA, key 15 on the voice TN defaults to the Handsfree key. No other feature assignment is accepted.</p> <p>Primary and secondary data DNs must be unique.</p> <p>A station SCR, SCN, MCR, or MCN DN must be removed as a member from all Group Hunt lists before the DN can be modified.</p>

LD 11 – Configure the IP Phone KEM. (Part 4 of 5)

Prompt	Response	Description
PAGEOFST	<Page> <KeyOffset>	<p>On the M3903, keys 4-15 are blocked. No feature assignment is accepted for keys 2-15.</p> <p>On the M3903, M3904, and M3905, keys 29-31 are reserved. No feature assignment is accepted for keys 29-31 other than NUL.</p> <p>On M3904, no feature assignment is accepted for keys 12-15.</p> <p>On M3905, the craftsman can assign NUL or a server application on key 5. On key 6, the craftsman can assign NUL or a local application.</p> <p>On M3905, the craftsman can assign NUL or the program key on key 7.</p> <p>On M3905, the craftsman can assign AAG, AMG, ASP, DWC, EMR, MSB, or NRD on keys 8-11. Other features are blocked.</p> <p>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.</p> <p>Enter <CR> to terminate data entry.</p> <p>Note 1: Applies to an IP Phone 2004 with KEM = 1, and where <CR> was entered at the KEY prompt.</p> <p>Note 2: Does not apply to an IP Phone 2002.</p> <p>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.</p>

LD 11 – Configure the IP Phone KEM. (Part 5 of 5)

Prompt	Response	Description
KEY xx		<p>Edit the IP Phone KEM key number specified by PAGEOFST, where: xx = the number of the key (for example, KEY 36)</p> <p>Enter <CR> to keep the current setting.</p>
KEMOFST	<KEM> <KeyOffset>	<p>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.</p> <p>Enter <CR> to terminate data entry.</p> <p>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.</p> <p>Note 1: Applies to an IP Phone 2002 if <CR> was entered at the KEY prompt.</p> <p>Note 2: Applies to an IP Phone 2004 with KEM = 2, and where <CR> was entered at the KEY prompt.</p>
KEY xx		<p>Edit the IP Phone KEM key number specified by KEMOFST, where: xx = the number of the key (for example, KEY 36)</p> <p>Enter <CR> to keep the current setting.</p>

Installation

The IP Phone KEM mounts on the right side of an IP Phone 2002 or IP Phone 2004. The IP Phone KEM snaps into the receptacle on the back of the IP Phone using the desk-mount bracket and structural baseplate supplied with the IP Phone KEM (see Figure 17).

The IP Phone KEM connects to the IP Phone 2002 or IP Phone 2004 using the Accessory Expansion Module (AEM) port on the IP Phone.

Figure 17
IP Phone KEM attached to an IP Phone 2002



Procedure 33
Connecting the IP Phone KEM to an IP Phone 2002 or IP Phone 2004

Use the following instructions to install an IP Phone KEM:

- 1 Remove the IP Phone from the stand by pressing the IP Phone tilt handle, and pulling the IP Phone away from the stand.

Note: For the IP Phone 2004, you can also adjust the stand angle to maximum, instead of removing the stand.

- 2 Place the connecting arm of the IP Phone KEM behind the IP Phone and align the IP Phone KEM connection plug to the AEM port on the back of the IP Phone.

Note: The IP Phones 2002 with the product codes: NTDU76AB34, NTDU76BB34, NTDU76AB70, and NTDU76BB70 have shorter connector pins than the other IP Phone 2002. Therefore, the ribbon cable connector of the IP Phone KEM must be detached from the retaining clip and pressed manually into the header connector before attaching the IP Phone KEM.

- 3 Press the IP Phone KEM and IP Phone firmly together until the IP Phone KEM locks into place.
- 4 If connecting a second IP Phone KEM, repeat steps 1-3.
Note: The second IP Phone KEM is attached to the right side of the first IP Phone KEM.
- 5 Attach the IP Phone stand and the IP Phone KEM stand, if removed. Adjust each IP Phone KEM stand to the same angle as the IP Phone.

The IP Phone KEM powers up.

Note: The IP Phone KEM uses the electrical connection of the IP Phone 2002 or IP Phone 2004 for power. It does not have its own power source.

End of Procedure

IP Phone KEM startup initialization

Once the IP Phone KEM has been installed and powered up on your IP Phone 2002 or IP Phone 2004, the IP Phone KEM initializes (see Table 20).

Table 20
Startup initialization process for the IP Phone KEM

Phase	Description
1. IP Phone KEM performs self-test	<p>The self-test confirms the operation of the IP Phone KEM's local memory, CPU, and other circuitry. While undergoing this self-test, the IP Phone KEM display lights up.</p> <p>Note: If the IP Phone KEM display does not light up, or lights up and then goes blank, or fails to begin flashing, check that the IP Phone KEM is correctly installed and configured.</p>

Table 20
Startup initialization process for the IP Phone KEM

Phase	Description
2. IP Phone KEM establishes communication with the IP Phone	The IP Phone KEM display flashes until it establishes communication with the IP Phone. If the IP Phone KEM display does not stop flashing, communication has not been established with the IP Phone. Check that the IP Phone KEM is correctly installed and configured.
3. IP Phone KEM downloads keymaps	The key labels download to the IP Phone KEM. During the download, the display is blank.

When the three phases complete successfully, you are ready to use the additional line/feature keys on your IP Phone KEM.

Note: If you have a second IP Phone KEM installed on your IP Phone, the one to the immediate right of the IP Phone must be functional for the subsequent IP Phone KEM to work. This is because the second IP Phone KEM receives its power, and communicates with the IP Phone, through the first IP Phone KEM.

Operating parameters

General

If an IP Phone KEM is not responding, and lines or features are configured on keys 32–79, calls can be directed to those keys which the user cannot access. This means the IP Phone 2002 or IP Phone 2004 rings but the call cannot be answered. In such cases, the incoming call receives Call Forward No Answer (CFNA) treatment.

IP Phone 2002

If only one IP Phone KEM is configured in LD 11, but two IP Phone KEMs are detected on an IP Phone 2002, the second IP Phone KEM is ignored. An

error message displays to alert the administrator that the hardware configuration does not match the administered configuration.

If two IP Phone KEMs are configured in LD 11, but only one IP Phone KEM is responding, the keys on the second IP Phone KEM are available for call processing but are not accessible to the user. This means that lines and features on keys 56-79 can cause the IP Phone 2002 to ring, but there is no way to answer it. An error message displays to alert the administrator that the hardware configuration does not match the administered configuration.

IP Phone 2004

If only one IP Phone KEM is configured in LD 11, but two IP Phone KEMs are detected on an IP Phone 2004, the Terminal Proxy Server (TPS) assigns keys 56–79 to the second IP Phone KEM. An error message displays to alert the administrator that the hardware configuration does not match the administered configuration.

If two IP Phone KEMs are configured in LD 11 but only one IP Phone KEM is responding, the TPS assigns keys 32–79 to the single IP Phone KEM (using the **Shift** key functionality). An error message displays to alert the administrator that the hardware configuration does not match the administered configuration. When a second IP Phone KEM is detected, the TPS changes the key assignments to display across both IP Phone KEMs, as expected.

Virtual Office

When a Virtual Office (VO) login occurs from an IP Phone 2002 or IP Phone 2004 that does not have the same number of IP Phone KEMs responding as configured on the IP Phone used to log in, call processing may terminate on a key that is not physically available. In other words, the IP Phone rings but the call cannot be answered.

During the VO login process, the existence of any IP Phone KEM is verified. If a mismatch is detected, the login proceeds normally; however, an error message is generated to alert the administrator of the mismatch.

Firmware

The IP Phone KEM firmware is not downloadable. In the event that the IP Phone KEM firmware must be upgraded or changed, the IP Phone KEM must be replaced with a new IP Phone KEM containing the updated firmware.

Nortel IP Softphone 2050

Contents

This section contains information on the following topics:

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Introduction

This section explains how to install and maintain the IP Softphone 2050. For information about using the IP Softphone, see the CS 1000 *IP Softphone 2050 User Guide*.

This section contains the following procedures:

- Procedure 35, “Installing an IP Softphone 2050 for the first time” on [page 213](#).
- Procedure 36, “Installing the IP Softphone 2050 on the PC (new installation)” on [page 215](#).
- Procedure 37, “Upgrading the IP Softphone 2050 on your PC” on [page 215](#).
- Procedure 38, “Uninstalling the IP Softphone 2050 (Version 1)” on [page 216](#).
- Procedure 39, “Uninstalling the IP Softphone 2050 (Version 2)” on [page 216](#).
- Procedure 42, “Changing the TN of an existing IP Softphone 2050” on [page 219](#).
- Procedure 43, “Removing an IP Softphone 2050 from service” on [page 219](#).

Description

The IP Softphone 2050 is a Windows-based application that provides voice services for Personal Computers (PC). The IP Softphone 2050 operates on PCs that run Windows 2000 Professional, Windows XP Pro, and Windows XP Home.

Designed to work with IP-based phone systems, the IP Softphone 2050 provides Voice Over IP (VoIP) services using a telephony server and an enterprise Local Area Network (LAN). The VoIP application is comprised of the following components:

- Settings—used to configure the IP Softphone
- IP Softphone 2050—the IP Softphone user interface
- IP Softphone 2050 QoS

The IP Softphone 2050 supports the following features:

- 12 user-defined feature keys: six programmable line (DN)/feature keys and six lines/features accessed by pressing the Shift key

- four soft keys providing access to a maximum of 10 features
- four-line display
- directory capabilities stored locally on the PC or linked to external directories, such as LDAP, Microsoft Outlook, and Windows Address Book Directory
- one-click direct dialing from various windows and applications
- five specialized feature keys:
 - Directory
 - Inbox/Message
 - Shift/Outbox
 - Services
 - Quit
 - Copy
 - Expand
- dedicated call processing keys
 - Hold
 - Goodbye
 - Answer
 - Mute
 - Navigation
 - Message Waiting
- user-selected ringer lets the PC speakers or the headset ring for incoming calls
- choice of two window skins, as well as an Accessibility Interface option for the visually-impaired

The Accessibility Interface operates with screen reading software, such as JAWS® for Windows from Freedom Scientific, which enables visually-impaired users to access the full range of IP Softphone 2050 features. Visually-impaired users can follow Procedure 40 on [page 216](#)

to install the Accessibility Interface from the IP Softphone 2050 CD ROM.

- programmable hot keys allow single-key access to user-definable features
- three input modes: Digit, Alpha, and Native
- macro functions available for programming long dialing patterns
- support for G.711, G.729A, and G.729AB codecs for operation at a variety of network connection speeds

Supported features

The IP Softphone 2050 supports the following additional features:

- 802.1Q VLAN support, industry standards for managing bandwidth usage—full VLAN capability, including a manageable integrated switch in the IP Phone for VLAN and priority tagging for PC and IP Phone traffic
- Call Duration Timer
- ability to change the feature key labels
- Corporate Directory
- Personal Directory
- Redial List
- Callers List
- Password Administration
- Virtual office
- Branch Office
- Call Recording
- language support: English, French, Swedish, Danish, Norwegian, German, Dutch, Portuguese, Czech, Finnish, Hungarian, Italian, Polish, Spanish, Japanese, Russian, Latvian, and Turkish

Language support

The IP Softphone 2050 is affected by the following three language controls:

- Operating system language
- IP Softphone 2050 language selection—sets the language displayed in the help screens and in the menus (select the IP Softphone 2050 language from the Application menu or during installation)
- TPS language selection—sets the language in the display area (the language in the display areas is selected from the Language menu)

Note: In normal operation, the language chosen from the IP Softphone 2050 language setup matches the language chosen from the Language menu. Otherwise, the soft key labels and feature prompts will appear in a different language than the help text and menu items on the IP Softphone 2050 application. The user must ensure that the appropriate language is chosen.

Components

The IP Softphone 2050 supports the following main components:

- Call Control window
- Local Directory window
- Settings window
- System tray icon and menu
- third-party supported applications
- i2050.exe application

Call Control window

You can use the 1140 Call Control Window (see Figure 18 on [page 198](#)), or the Compact skin Call Control window (see Figure 19 on [page 198](#)) to make and manage telephone calls.

Figure 18
1140 Call Control window

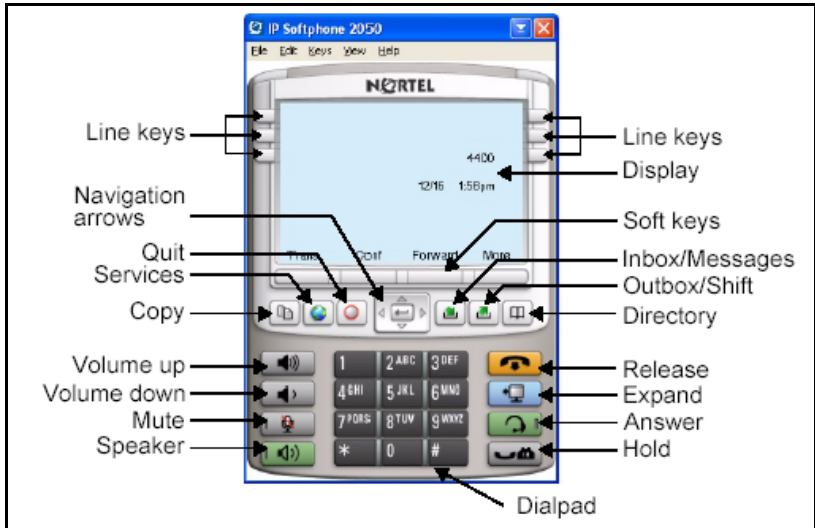


Figure 19
Compact skin Call Control window

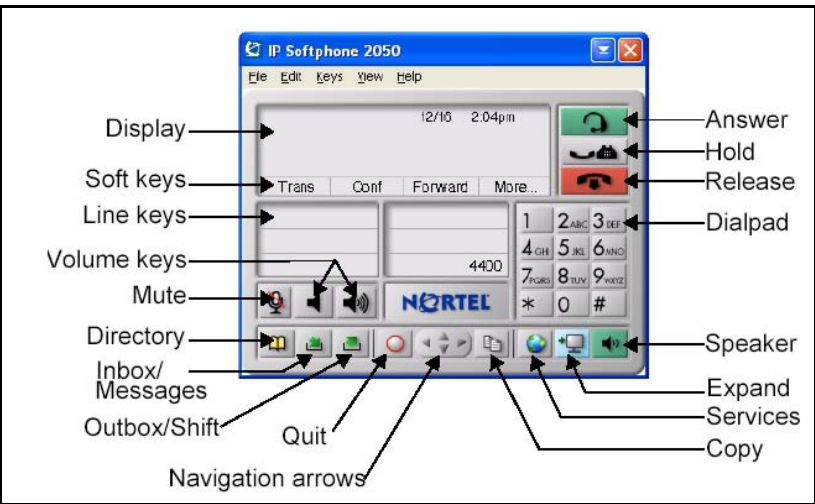


Table 21 lists the elements and functions of the Call Control window.

Table 21
Call Control window elements and functions (Part 1 of 3)

Element	Function
Primary display	The primary display area provides call information (for example, Caller ID) and instructions for using certain soft key features. In the idle state, only the date and time are displayed.
Soft keys	Four additional soft-labeled keys on the IP Softphone 2050 support a specific subset of the key features.
Answer	Click the Answer key to answer and make calls.
Hold	Click the Hold key to place an active call on hold. The feature key label for the line placed on hold displays a flashing icon. Click the Line key to return to the call.
Release	Click the Release key to end an active call.
Line keys	Six programmable line keys represent line appearances, DNIs, or features.
Volume	Use the volume keys to increase or decrease the headset volume.
Mute	Click the Mute key to listen to the receiving party without transmitting. Click the Mute key to return to a two-way conversation. The Mute key mutes the headset microphone.

Table 21
Call Control window elements and functions (Part 2 of 3)











Element		Function
Directory		Click the Directory key to access the Network Directory.
Inbox/Message		Click the Inbox/Message key to access messages or return a call.
Shift/Outbox		Press the Shift key to shift between two feature key pages when a second feature key page exists.
Copy		Click the Copy key to copy a network service, feature, or folder.
Quit		Click the Quit key to quit a network service or feature.
Navigation arrows		Use the navigation arrows to scroll through menus and lists in the display area.
Send/Enter		Press the Send/Enter key, at the center of the Navigation key cluster, to confirm menu selections. Note: The Send/Enter key is only available on the 1140E Call Control window.
Dialpad		Click numbers on the dialpad to dial a number.

Table 21
Call Control window elements and functions (Part 3 of 3)

Element	Function
Speaker 	Click the Speaker key to answer and make calls using the handsfree speaker.
Expand 	The Expand key is reserved for future implementation.
Services 	Press the Services key access the following items: <ul style="list-style-type: none"> • Language • Date/Time • Set Info • Call Log Options • Ring type • Call Timer • Change Feature Key Label • Name Display Format • Virtual Office Login and Virtual Office Logout (if Virtual Office is configured) • Test Local Mode and Resume Local Mode (if Branch Office is configured) • Password Admin: <ul style="list-style-type: none"> — Station Control Password

Operation

Display characteristics

The IP Softphone 2050 has the following display areas:

- information display
- soft key label display
- keypad dialing keys display
- feature keys display

Information display area

The information display area can contain four lines of text, up to a maximum of twenty four characters for each line. The display area consists of 2 areas: Info line and Info window.

Info line

The Info Line is the first (top) line of display text. The left ten-character area shows the Call Server type. The right part of the Info Line shows the current time and date.

Info window

The Info Window display area that shows prompts and information about calls. During a call the information area is used to display dialed digits, calling line ID, called party name, application-specific information, and various messages such as “Release and Try Again”.

When the information exceeds 3 x 24 characters, a scroll icon tells the user to press the scroll keys to view the second line of the display.

Soft key label display

A maximum of ten functions can be assigned to the soft keys. Functions are assigned to the soft keys in layers in LD 11.

Use the **More** soft key to navigate through the layers of functions. If only 4 functions are assigned to the soft keys, the **More** key does not appear and all four functions are displayed.

The soft key label has a maximum of 7 characters. Each soft key includes the soft key label and an icon. When a soft key is in use, a flashing icon displays at the beginning of the soft key label, and the label shifts one character to the right. (If the label is six characters long, the last, or rightmost, character is truncated.) If a feature is enabled, the icon state turns to ON. It remains in the ON state until the feature key is pressed again. This cancels the enabled feature and turns the icon off, returning the soft key label to its original state.

System Tray

The System Tray provides fast access to most of the IP Softphone 2050 functionality. The user can make, answer, and manage a call, as well as access macros and features from the System Tray without opening the Call Control window.

Nortel USB Audio Kit

The USB Audio Kit enables the user to speak and hear callers. To ensure proper IP Softphone 2050 operation, use only Nortel-supported USB audio kits. The USB Audio Kit includes the following:

- USB Headset Adapter (desktop or mobile)
- Installation Guide
- USB cord

The following USB adapters are supported on the IP Softphone 2050:

- Nortel Enhanced USB Adapter (desktop)
- Nortel Mobile USB Adapter (mobile)

The Algo Analog Terminal Adapter (ATA) is a USB adapter that lets you use analog terminals instead of headsets. With an Algo ATA users can, for example, use a cordless headset with their IP Softphone 2050.

The IP Softphone 2050 is compatible with the Algo ATA. For support, see www.algosolutions.com.

USB Headset Adapter

The USB Headset Adapter provides a controlled high-quality audio environment, including:

- absolute and predictable loss and level plan implementation that is necessary to meet TIA-810, FCC part 68 and its international equivalents, as well as the ADA requirements for the hearing impaired
- compliance with version 1.1 of the USB Device Specification and Windows Plug & Play specifications
- simple installation using standard Windows drivers (requires no additional software or drivers)
- support on Windows 2000 Professional, Windows XP Pro, and Windows XP Home

Refer to the *IP Softphone 2050 User Guide* for specific operation system information.

- in-use lamp connector with in-use control provided by polarity insensitive isolated contact closure
- red Message Waiting light, located at the top of the USB Headset Adapter, that flashes when you have voicemail messages
- IP Softphone 2050 Smart Functions button enables the IP Softphone 2050 Smart Functions menu that provides quick access to IP Softphone 2050 features
- Mute light that indicates a call is on mute

The USB Headset Adapter auto-configures in the supported Windows operating system. No additional software is required.

Registration

When you add an IP Softphone 2050 to the network, depending on configuration, the IP Softphone 2050 can connect to a predefined IP address or can request an IP address from a DHCP server. The IP Softphone 2050 then contacts the Connect Server, which instructs the IP Softphone 2050 to display a message on its display screen requesting the customer's node number and TN.

After the customer enters this information, the IP Softphone 2050 contacts the Node Master, which selects a TPS with sufficient capacity to register the IP Softphone 2050. The IP Softphone 2050 contacts the chosen TPS and, if the IP Softphone 2050 is valid, registers it with the system. The registration information is then saved to the IP Softphone 2050.

Loss plan

The USB Headset Adapter provides the IP Softphone 2050 with a fixed loss plan compliant with the TIA-810A specification. If other headsets or audio devices are used, the loss plan is unknown and undefined. Nortel supports the resolution of audio problems only for the USB Headset Adapter.

Echo cancellation

Echo can be generated electrically when there is an impedance mismatch, or generated acoustically by feedback from a speaker or ear piece to a microphone. Any echo that is ultimately returned to the IP Phone is more noticeable to the listener because of the additional delay introduced by the IP connection.

The Voice Gateway Media Card has echo cancelers included as part of its function that cancels echo generated on the TDM side of the Media Gateway. When audio goes through the Voice Gateway Media Card, the echo cancellers are enabled.

The IP Softphone 2050 has no echo canceller, so a slight echo from acoustic coupling on the headset can occur in some call situations.

Clock synchronization

Buffer underruns and overruns can occur since there is no sample clock at the receiving end of an IP audio stream synchronized to the transmitting clock. The buffer overruns and underruns are corrected by two mechanisms, both of which apply to the IP Phones and the DSPs on the Voice Gateway Media Card.

Jitter buffer

Use the default value sent from the TPS (the value configured in TM– [Nortel recommends that you use the default value]) to configure the IP Softphone 2050 jitter buffer.

The jitter buffer has a desired size and a maximum allowable size. If the jitter buffer exceeds its maximum allowable size, sufficient frames are discarded to reduce the contents of the jitter buffer to the desired setting. If the jitter buffer underruns, frames are held in the jitter buffer until it fills to the desired level. Both underrun and overrun result in a discontinuity in the audio.

For codecs that support silence suppression, the jitter buffer is resynchronized at the beginning of each talk spurt.

QoS

A combination of codec selection, jitter buffer and packet time, and the use of the DiffServ code point of the network contributes to the end-to-end QoS.

However, the IP Softphone 2050 is an application within the context of the PC operating system, so the operating system has an effect on the end-to-end QoS for the IP Softphone 2050. The DSP functionality (such as codec packetization) implemented in DSP hardware on the IP Softphone 2050 and Voice Gateway Media Card runs as part of the application code on the PC CPU. If the CPU is busy with other tasks, voice quality can be negatively affected.

The number of buffers used to buffer audio data between the application and PC audio hardware device driver is adjustable from the **Settings > Sound Devices** window. Using fewer buffers reduces the audio path delay but increases the chances of dropouts and choppy speech, depending on the speed and utilization of the PC CPU.

DiffSERV (DSCP)

The IP Softphone 2050 uses DSCP settings assigned by the TPS. The IP Softphone 2050 supports DSCP on Windows 2000 Professional, Windows XP Pro, and Windows XP Home.

802.1Q

The IP Softphone 2050 uses 802.1p (priority) settings assigned by the TPS. The IP Softphone 2050 supports 802.1p on Windows 2000 Professional, Windows XP Pro, and Windows XP Home.

The service can be installed from the CD-ROM. If you install the IP Softphone 2050 with Administrators access, then this service is installed automatically.

Codec

The IP Softphone 2050 provides the following codecs:

- G.711 provides the highest quality (if the network facilities can handle the packet flow) because there is no compression.
- G.729A is ranked best; it has 8:1 compression but no voice activity detection.
- G.729AB is the same as G.729A but includes voice activity detection; while this provides the lowest average network bandwidth utilization, in some call environments the speech quality suffers due to clipping of the beginning of words.

Frame size

The IP Softphone 2050 supports the following range of frame sizes:

- G.711-64 A-law and μ law: 10-960—10 ms increments
- G.729A: 10-960—10 ms frames
- G.729AB: 10-960—10 ms frames

Key number assignments

The IP Softphone 2050 has 6 keys that present 12 feature keys, with 6 on each feature key page. The keys are numbered from 0 to 11. The **Shift** key is used to change between two feature pages, 0 to 5 and 6 to 11.

Note: If a feature requires a feature package that is not present for the Call Server installation, that feature does not appear within the default configuration for the IP Softphone 2050.

The Message key is numbered 16. If Message Waiting is not configured, then key16 must be NUL.

Key numbers between 17–31 are assigned to the four soft label keys immediately below the display area. The supported features are: A03, A06, CFW, CHG, CPN, PRK, PRS, RGA, RPN, SCU, SCC, SSU, SSC, and TRN.

Table 22 describes the IP Phone feature assignment for each of the soft keys. Use LD 11 to program keys 16 to 26 on the IP Softphone 2050.

Note: If you attempt to configure anything other than the permitted response, the system generates an error code.

Table 22
IP Softphone 2050 soft keys (Part 1 of 2)

Prompt	Response	Description
Key 16	MWK	Message Waiting key
	NUL	Removes function or feature from key
Key 17	TRN	Call Transfer key
	NUL	Removes function or feature from key
Key 18	A03	three-party conference key
	A06	six-party conference key
	NUL	Removes function or feature from key
Key 19	CFW	Call Forward key
	NUL	Removes function or feature from key
Key 20	RGA	Ring Again key
	NUL	Removes function or feature from key

Table 22
IP Softphone 2050 soft keys (Part 2 of 2)

Prompt	Response	Description
Key 21	PRK	Call Park key
	NUL	Removes function or feature from key
Key 22	RNP	Ringing Number pickup key
	NUL	Removes function or feature from key
Key 23	SCU	Speed Call User
	SSU	System Speed Call User
	SCC	Speed Call Controller
	SSC	System Speed Call Controller
	NUL	Removes function or feature from key
Key 24	PRS	Privacy Release key
	NUL	Removes function or feature from key
Key 25	CHG	Charge Account key
	NUL	Removes function or feature from key
Key 26	CPN	Calling Party Number key
	NUL	Removes function or feature from key
Keys 27 - 31		Reserved

Operating parameters

The operating parameters for the IP Softphone 2050 are as follows:

- The minimum recommended system hardware for the IP Softphone 2050 application is:
 - Pentium-compatible CPU (200 megahertz [MHz] or higher)
 - 128 megabytes (MB) RAM or higher for Microsoft Windows 2000

- 256 MB RAM or higher for Windows XP
- 55 MB free hard drive space (all languages)
- 800 by 600 resolution monitor (16-bit color)
- Universal Serial Bus (USB) port (version 1.1 or 2.0)
- USB Audio Kit

For information about supported operating systems, refer to the *IP Softphone 2050 User Guide*.

- Perform the software version upgrade for IP Softphone 2050 manually. The technician must do this at the PC. The Voice Gateway Media Card does not download any software to the IP Softphone 2050. The `isetShow` command on the Voice Gateway Media Card displays the current version of any registered IP Softphone 2050.
- The IP Softphone 2050 does not have an ACD Supervisor headset jack. Agent walkaway is supported with the Enhanced USB Keypad Adapter.
- An IP Softphone 2050 does not register against a TN configured for any other type of IP Phone.
- Soundcard audio is supported only for incoming call notification. Nortel supports USB Headset Adapter for the speech path.
- 5 menu options available on the IP Phone 2004, not required on the IP Softphone 2050, are:
 - Volume adjustment
 - Contrast adjustment
 - Display diagnostics
 - Key click
 - On-hook default path

System components

The IP Softphone 2050 is comprised of an external Universal Serial Bus headset adapter (Nortel Enhanced USB Adapter [desktop]) and a software

application installed on the user's PC. The IP Softphone 2050 also supports a mobile adapter (Nortel Mobile USB Adapter).

IMPORTANT!

Use your IP Softphone 2050 with the approved Nortel Enhanced USB adapter (desktop) or Nortel Mobile USB Adapter *only*.

Table 23 lists the IP Softphone 2050 package components.

Table 23
IP Softphone 2050 package components

Component	Code
Nortel Mobile USB Adapter Monaural Headset IP Softphone 2050 Kit includes:	NTEX14MD
• IP Softphone 2050 application software CD/ROM	NTDW82EA
• Nortel Mobile USB headset adapter with monaural headset	NTEX14MB
IP Softphone 2050 application software CD/ROM	NTDW83BA
Replacement parts:	
Mobility USB Audio Adapter (no headset)	NTEX14MA
Mobility USB Audio Adapter kit with headset	NTEX14MB

Before you begin

The following section provides a step-by-step guide through the IP Softphone 2050 installation process. Before installing the IP Phone, complete the following pre-installation checklist.

Procedure 34

Preinstallation checklist

- 1 Ensure you have the IP Softphone 2050 application software CD.
- 2 To install and configure an IP Softphone 2050, the host system must be equipped with the Voice Gateway Media Card.
- 3 Understand the three configuration modes from which you can choose from as you proceed through the installation of the IP Softphone 2050. The 2 configuration modes are:
 - Static IP address—see “Static IP address assignment”
 - Partial DHCP—see “Dynamic IP address assignment—Partial DHCP”
- 4 A DHCP server and DHCP relay agents, if required, must also be installed, configured, and running.

First-time installation

During the first-time installation, the two IP address parameters entered either manually- or automatically, depending on the installation configuration. They are as follows:

- Static IP address assignment
- Partial DHCP

Static IP address assignment

During the installation, enter the IP Softphone 2050 parameters manually using the dialpad.

Enter the IP address, subnet mask, and default Gateway address. You must also enter the Connect Server parameters including IP address, port number, action, and retry count.

Dynamic IP address assignment—Partial DHCP

For a partial DHCP installation, you must provide, through the IP Phone dialpad, the Connect Server parameters including: IP address, port number, action, and retry count. Other parameters (IP Phone IP address, subnet mask, and default Gateway) are obtained from the DHCP server.

Enter the IP Phone password, node ID, and TN manually, using the dialpad.

For more information about DHCP servers, see *Converging the Data Network with VoIP* (553-3001-160).

Use Procedure 35 to install an IP Softphone 2050 for the first time.

Procedure 35

Installing an IP Softphone 2050 for the first time

- 1** Install the Voice Gateway Media Card. For more information, see *IP Line: Description, Installation, and Operation* (553-3001-365)

- 2** Configure a virtual loop on the Call Server, using LD 97.

For more information, see *Software Input/Output: Administration* (553-3001-311).

- 3** Configure the IP Softphone 2050 in LD 11. At the prompt, enter the following:

```
REQ: chg  
TYPE: i2050
```

- 4** Install the USB Headset Adapter. If you are using the mobile adapter, connect the headset to the adapter. If you are using the desktop adapter, you must:

- a.** Connect the coiled lower cord to the headset cord with the Quick Disconnect connector. Ensure the Quick Disconnect connector is securely fastened.
- b.** Connect the headset cord to the RJ9 jack on the adapter.

- 5** Connect the USB cable to the headset adapter and to one of the USB jacks on the back of your PC or USB hub.

The first time the headset adapter is plugged in, a delay occurs while Windows configures the device and locates the appropriate driver software. During the installation, you are prompted to supply the original Windows CD-ROM so Windows can locate the required drivers.

- 6** Install the IP Softphone 2050.

7 Configure the IP Softphone 2050 parameters. Click the **Server** tab in the Settings window and choose one of the following:

- To manually configure the IP Softphone 2050 parameters, enter the IP address of the Call Server, Server type, port number, and retries.
- For DHCP, select the check box beside Automatic (DHCP). The IP address, Server type, port number, and retries are automatically retrieved from the DHCP Server.

Note: For more information about using partial DHCP, refer to Procedure 19, “Installing an IP Phone 2004 for the first time using DHCP” on [page 124](#).

8 Click **Apply**.

End of Procedure

Installing or upgrading the IP Softphone 2050

Use the following options to obtain the latest version of the IP Softphone 2050:

- new installation—installing the IP Softphone 2050 for the first time
- upgrade—upgrading the IP Softphone 2050 to the latest version

IP Softphone (Version 1) and IP Softphone (Version 2) can coexist on a PC, although both versions cannot run at the same time.

Note: Before performing a new installation or an upgrade, check the version of IP Softphone 2050 software.

IMPORTANT!

Before you upgrade an IP Softphone 2050, record the information found in the **Server** window. This information may required in the future.

Use Procedure 36 on [page 215](#) for a new installation of the IP Softphone 2050.

Procedure 36
Installing the IP Softphone 2050 on the PC
(new installation)

- 1 Insert the CD-ROM disk into the CD-ROM drive of your PC.
Note: Installation should proceed automatically. If it does not, then continue with step 2, otherwise go to step 5.
- 2 Double-click the **My Computer** icon.
- 3 Double-click the **CD** icon.
- 4 Double-click the **Setup** icon.
- 5 Follow the instructions on-screen to complete the installation.
- 6 Select **Start > Programs > Nortel > IP Softphone 2050** to start the IP Softphone 2050 application.
- 7 Select **Settings** to assign a server address, select sound devices, and select a server type.

Note: If you are installing the IP Softphone 2050 on a Windows XP or Windows 2000 platform, you must install the Windows QoS Packet Scheduler. Refer to Procedure 41 on [page 217](#).

End of Procedure

Use Procedure 37 on [page 215](#) to upgrade the IP Softphone 2050 on the PC.

Procedure 37
Upgrading the IP Softphone 2050 on your PC

- 1 Download the IP Softphone 2050 upgrade file from the Nortel web site and extract all files to a working directory.
Note: Refer to either the *CS 1000 Release 4.5 Product Bulletin* or the *IP Line 4.5 Read Me First* about download instructions.
- 2 Double-click the **My Computer** icon and navigate to the working directory.
- 3 Double-click the **Setup** icon.
- 4 Follow the instructions on-screen to complete the installation.

Note: Compare the values currently in the configuration utility to the values recorded prior to the upgrade. These should be identical.

- 5 Select **Start > Programs > Nortel > IP Softphone 2050** to start the IP Softphone 2050 application.
- 6 Select **Settings** to assign a server address, select sound devices, and select a server type.

End of Procedure

Use Procedure 38 to uninstall IP Softphone 2050 (Version 1).

Procedure 38

Uninstalling the IP Softphone 2050 (Version 1)

- 1 Select **Start > Settings > Control Panel > Add/Remove Programs**.
- 2 Choose **Nortel Networks i2050 Software Phone**.
- 3 Select **Remove**.
- 4 Select **Yes** to confirm.

End of Procedure

Procedure 39

Uninstalling the IP Softphone 2050 (Version 2)

- 1 Select **Start > Settings > Control Panel > Add/Remove Programs**.
- 2 Choose **Nortel Sofphone 2050**.
- 3 Select **Remove**.
- 4 Select **Yes** to confirm.

End of Procedure

Visually impaired users can follow Procedure 40 to install the Accessibility Interface from the IP Softphone 2050 CD-ROM.

Procedure 40

Installing the Accessibility Interface

- 1 Press and hold **Shift**.
- 2 Insert the IP Softphone 2050 installation CD into your CD-ROM drive.

- 3 Press and hold **Shift** for several seconds to prevent Autorun from starting.
- 4 If the Installation Wizard starts:
 - a. Wait until the **Welcome to the Install Shield Wizard for the Nortel IP Softphone 2050** screen appears.
 - b. Press **Tab** to select **Cancel**.
 - c. Press **Return**.
 - d. Click **Yes** to confirm that you want to cancel the installation.
 - e. Click **Finish**.
- 5 From Windows Explorer, select your CD-ROM.
- 6 Select **Accessibility.bat**.

The file Accessibility.bat executes the command line “setup /s /vqb/vUI508=1”. This installs the application and sets the user interface to the Accessibility Interface.

End of Procedure

Procedure 41 **Installing the Windows QoS Packet Scheduler**

- 1 Select **Start > Control Panel**.
- 2 Select **Network Connections** (Classic View or Windows XP), or **Network and Dialup Connections** (Windows 2000).
- 3 Right-click **Local Area Connection**.
- 4 Select **Properties**.
- 5 Click **Install**.

The **Select Network Component Type** window opens.
- 6 Click **Add**.

The **Select Network Service** window opens.
- 7 Select **QoS Packet Scheduler**.
- 8 Click **OK**.

End of Procedure

Running the IP Softphone 2050 for the first time

Start the IP Softphone 2050 in one of the following ways:

- Select **Start > Programs > Nortel > IP Softphone 2050**.
- Click the desktop shortcut (if one was created during the installation).
- Click **Automatic startup sequence**.

Note: If you want the IP Softphone 2050 to start automatically when the PC starts, create a shortcut to the application in the Startup folder.

When an IP Softphone 2050 is started for the first time and connects to the network, the IP Softphone executes the following start-up sequence:

- 1 Obtain the IP parameters.
- 2 Find a Media Gateway server and authenticate the user.

As the IP Softphone 2050 registers with the Voice Gateway Media Card, one of the following occurs:

- If a non-null node password is enabled, you are prompted to enter the node number and password. Use the keyboard or numeric keypad to enter the prompts for a node number and password. After the password is verified, enter the TN of the IP Softphone 2050. Refer to *IP Line: Description, Installation, and Operation* (553-3001-365) for further information about the password feature.
- If the null node password is configured and enabled, these screens are skipped and no option is provided to change the password.
- If the node password is disabled or not configured, it prompts for a node number and TN. Enter the node number and TN using the keyboard or numeric keypad.

The IP Softphone 2050 is now configured and can be used.

Changing the TN of an existing IP Softphone 2050

This procedure is required for a new user of the IP Softphone 2050 application.

Procedure 42**Changing the TN of an existing IP Softphone 2050**

- 1 Exit the IP Softphone 2050 application.
- 2 Restart the IP Softphone 2050 application.

If the node password is not configured, or is configured but disabled, go to step 3.

If the node password is configured and enabled for the node, go to step 4.
- 3 During startup, the IP Softphone 2050 registers again with the TPS, and the IP Softphone 2050 displays the existing node number and TN for approximately five seconds.
- 4 If the password is configured and enabled for the node, the node number and password prompt displays for approximately 5 seconds; enter the correct password within this 5-second period.

If the user activates the **Clear** soft key during the 5-second period, the existing node and TN are cleared and the user is prompted for new parameters.

End of Procedure

Removing an IP Softphone 2050 from service

Procedure 43**Removing an IP Softphone 2050 from service**

- 1 Exit the IP Softphone 2050 application.
- 2 Uninstall the IP Softphone 2050 application from the PC using the Windows Add/Remove Programs.
- 3 In LD 11, OUT the TN.

End of Procedure

Nortel Mobile Voice Client 2050

Contents

This section contains information on the following topics:

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Introduction

This section describes how to install, configure, and remove the Nortel Mobile Voice Client 2050. For information on using the MVC 2050, see the *Mobile Voice Client 2050 User Guide*.

This section contains the following procedures:

- Procedure 44, “ Starting MVC 2050” on [page 246](#).

- Procedure 45, “ Synchronizing a PDA with a desktop PC using ActiveSync” on [page 247](#).
- Procedure 46, “ Installing MVC 2050” on [page 248](#).
- Procedure 47, “ Removing MVC 2050 from your PDA” on [page 249](#).
- Procedure 48, “ Enable Auto-Create” on [page 255](#).
- Procedure 49, “ Disabling Automatic Gain Control” on [page 261](#).

Description

Mobile Voice Client (MVC) 2050 adds wireless IP Phone services to the convenience of Personal Digital Assistants (PDAs). MVC 2050 functions like an IP Softphone 2050. However, MVC 2050 cannot be used as an Agent or Supervisor in Call Center Portal applications.

MVC 2050 is UNISTim-based software providing real-time voice communication, over a WLAN, to PDAs.

MVC 2050 operates on PDAs running the Windows Mobile 2003 operating system and can use WLAN 802.11b, interworking with various enterprise communication servers. MVC 2050 can also interwork with WLAN Access Points (WAP) and can use the WSS 2250 WLAN Security Switch. MVC 2050 can coexist with a secure Virtual Private Network (VPN) client on the same PDA. MVC 2050 requires access to an enterprise or public WLAN Access Point (WAP).

MVC 2050 is compatible with the following communication servers:

- CS 1000S
- CS 1000M
- CS 1000E
- Meridian 1

MVC 2050 supports the following:

- IP telephony features such as Messages, Directory, Shift, Services, Expand, Copy, and Quit
- audible notification of connection or disconnection to the server

- **Hold, Goodbye, Answer, Volume Up, Volume Down, Mute, Navigation** keys
- macro functions for programming lengthy dialing patterns

Note: Pause is available to build into the macro to introduce a delay which may be required to access some Interactive Voice Response (IVR) applications and voicemail systems.
- contacts application: locally stored in the PDA Contacts application or linked to an external application, such as Microsoft Outlook, on a desktop
- network access and DHCP-configurable services (automatic configuration of communication server location using DHCP)
- connection to end user-supplied headsets for the speech path
- online help
- six programmable line/feature keys
- four soft keys (self-labeled)
- 12-button dialpad
- multi-field display
- end user-selectable skins

System components

MVC 2050 is comprised of:

- MVC 2050 application software, including Global IP Sound NetEQ™ software
- end user-supplied compatible PDA
- end user-supplied headset

Compatible PDAs

MVC 2050 is compatible with the following PDAs:

- Dell® Axim® X5

- Dell Axim X3/X3i
- Hewlett Packard® iPAQ® h5550/h5555
- Toshiba e750/e755
- Toshiba e800/e805

Note: The Dell Axim X3, 300 MHz model, is not supported for use with MVC 2050. Since the PDA industry evolves at a rapid pace, contact Nortel technical support to determine the latest PDA models tested and supported, and for information about any known issues.

Headsets

Headsets are end user-supplied and are an important component of audio quality. The iPAQ and Toshiba PDAs support stereo headphones and microphones like the iPAQ certified Plantronics M130 Adjustable Fit Headset. The Dell Axim X5 supports stereo headphones, but not a microphone. The Jensen JM-11 Behind-the-Neck Headphone has been tested with the MVC 2050. Consult the PDA manufacturer for headphone recommendations.



CAUTION

MVC 2050 does not support the use of Bluetooth wireless technology headsets and accessories. Bluetooth wireless technology and the 802.11b WLAN interface operate on the same frequency band and use the same WLAN hardware on the PDA. Therefore, using Bluetooth wireless technology with MVC 2050 decreases audio quality.

Automatic Gain Control and feedback

Since MVC 2050 requires a headset to operate properly, disable **Automatic Gain Control**. See “Automatic Gain Control and feedback” on [page 260](#).

Note: When the PDA is used in handsfree mode, without a headset, the PDA microphone picks up sounds from the speaker, creating a feedback loop. **Automatic Gain Control** is used in this instance to avoid feedback.

Audio quality

MVC 2050 provides a high-quality audio environment, including:

- NetEQ software (included with the software package)
- interworking with G.711 codec providing high audio quality without compression; MVC 2050 supports G.711-64 A-law and U-law.
- **Audio** selection tab providing a user-selectable quality slider
- **Advanced Audio** tab for expert users

Application software

MVC 2050 is a software application that enables voice communications over a WLAN from a PDA.

The MVC 2050 software application is comprised of the following components:

- MVC 2050 software
- NetEQ software (included in MVC 2050 software)

MVC 2050 supports use of the following:

- flexible interface including:
 - end user-selectable skins to provide a variety of screen appearances
 - retractable Toolbar
 - six programmable line/feature keys (number of features available is call-server dependent)
 - four soft keys (self-labeled)
 - 12-button dialpad
 - profiles the user can customize

- contacts list the user can customize
- programmable macro functions for lengthy dialing patterns
- run-in-background application that allows the user to close the MVC 2050 interface but leave it running to allow incoming calls
- 802.11b WLAN interface
- automatic configuration of communication server location using Dynamic Host Configuration Protocol (DHCP)
- features and services provided by the network (such as call features and voicemail)
- online Help
- G.711 codec for operation without compression

ClearType

MVC 2050 uses a special screen font which requires that Microsoft ClearType® be enabled on your PDA. ClearType software improves the appearance and readability of text on liquid crystal display (LCD), pocket PC screens, and flat panel monitors.

MVC 2050 Call Handling screen

From the Call Handling screen, the end user can access and operate most features available on MVC 2050 (see Figure 20 on [page 227](#)). Calls can be answered or dial tone obtained by selecting **Answer** from the **Keys** menu or using the **Headset/Answer** icon. (see Figure 21 on [page 228](#)).

The Call Handling screen contains the telephone dialpad. The appearance of the Call Handling screen differs with each available skin. See “MVC 2050 graphical interface (skins) components” on [page 236](#). The current skin can be determined using the **Settings > Skin** dialog box. All skins share common components.

Note: You can use the up, down, left, and right cursor control arrow keys on your PDA as navigation buttons to navigate around the skin and move through the menu items.

Figure 20
Starting the MVC 2050 from the Main Application screen

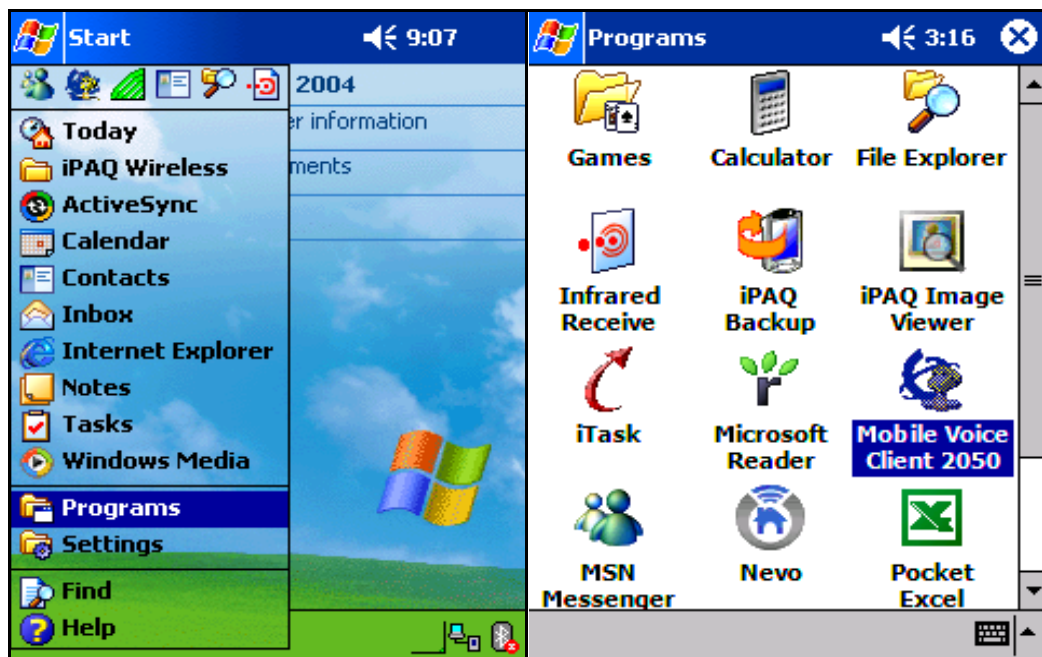
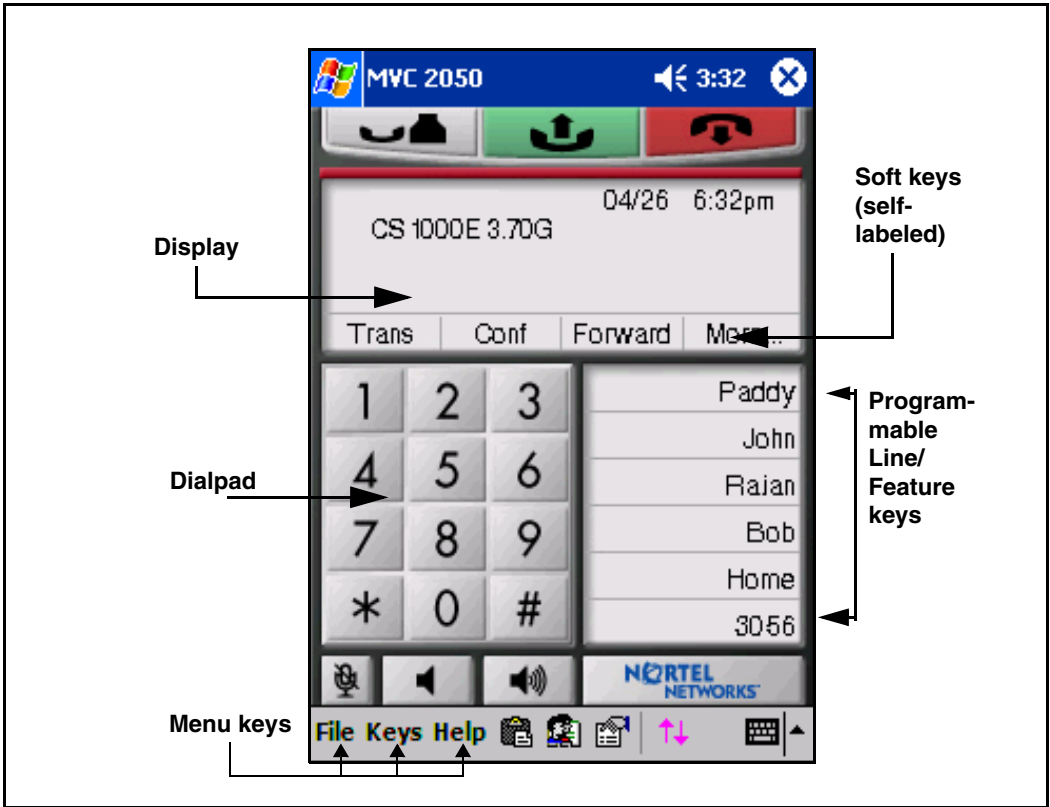


Figure 21
Call Handling screen



Display

The display is located in the central area of the skin. Messages and text are viewed on the display. See Figure 21.

Dialpad

The twelve-button dialpad is located on the left side of the skin. See Figure 21.

Soft keys (self-labeled)

There are four soft keys (self-labeled) located in the bottom row of the display. The labels on these keys depend on the call server. See Figure 21 on [page 228](#).

Programmable line/feature keys

There are six programmable line/feature keys located on the right side of the skin. They are aligned vertically and are the same color as the display. The number of features available depends on the call server. See Figure 21 on [page 228](#).

Menus

MVC 2050 provides the following menus:

- File
- Keys
- Help

File

The **File** menu provides the following items:

- Run in background
- Paste
- Contacts
- Settings
- Exit

See Figure 22 on [page 230](#).

Figure 22
File Menu screen



Run-in-background

Select **Run-in-background** to close MVC 2050 but allow it to keep running in the background so that incoming calls can ring on your PDA.

After you have completed your call, press the **X** in the upper right-hand corner of the PDA display to close the **MVC 2050** application and return it to the background.

Paste

Select **Paste** to paste a telephone number into your PDA from another application to place a call rather than entering an existing telephone number through your Call Handling screen dialpad.

Contacts

Select **Contacts** to launch the **Contacts** dialog box. The Contacts application reads a list of contacts from the PDA Contacts list or from a list which you have synchronized onto your PDA from Outlook.

Settings

Select **Settings** to provide access to the **Settings** submenu. The **Settings** menu provides windows for **Personal** settings, **System** settings, and **Connections** settings. See “Settings” on [page 251](#).

The **System** settings window provides access to settings for **memory**, **power**, **remove programs**, **screen** and **regional** settings, **iTask** settings, and **self test**.

Note: A reboot of MVC 2050 is required for settings changes to **Profiles**, **Hardware ID**, **Sounds**, **Servers**, and **Listener IP** to take effect.

Exit

Select **Exit** to close MVC 2050. Once **Exit** has been activated, calls cannot be received until the application is re-started.

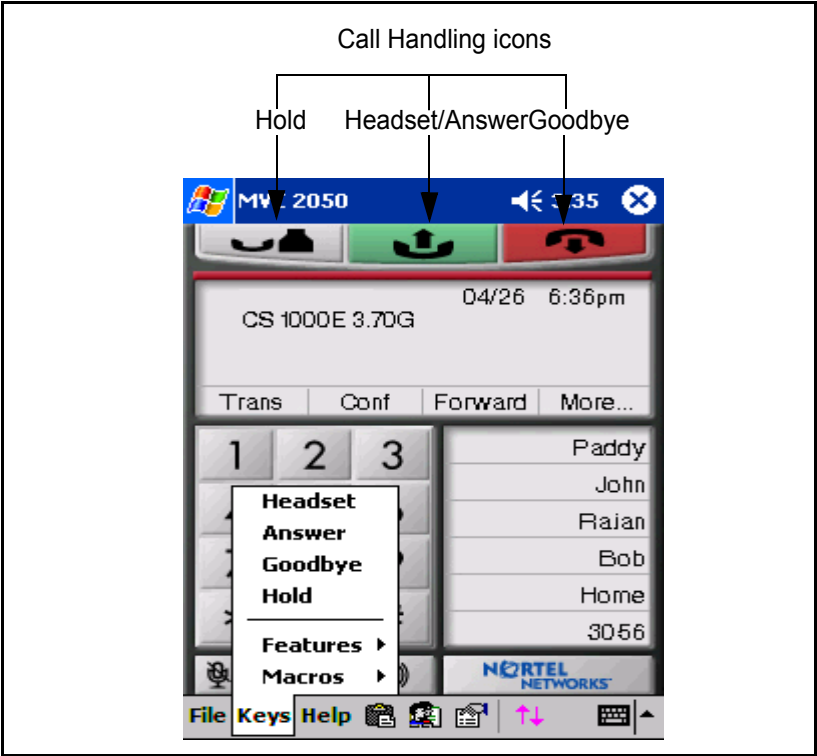
Note: Selecting **Exit** frees up PDA-processing resources.

Keys

The **Keys** menu provides the following items: See Figure 23 on [page 232](#).

- Headset
- Answer
- Goodbye
- Hold
- Features
- Macros

Figure 23
Keys menu



Headset

Select **Headset** to answer an incoming call or to obtain dial tone to place a call (see Figure 23, "Keys menu"). You can also use the **Headset/Answer** icon located at the top, center of the screen.

Answer

Select **Answer** to answer an incoming call or to obtain dial tone to place a call. You can also use the **Headset/Answer** icon on the Call Handling screen to answer an incoming call or obtain dial tone (see the **Headset/Answer** icon, located at the top, center of the screen. See Figure 23, "Keys menu").

Goodbye

Select **Goodbye** to end a call. You can also use the **Goodbye** icon located at the top right of the screen. See Figure 23 on [page 232](#).

Hold

Select **Hold** to place a call on hold. You can also use the **Hold** icon located at the top left of the screen. See Figure 23 on [page 232](#).

Features

Select **Features** from the **Keys** menu to access a menu of interface keys. See Figure 24 on [page 234](#).

Meridian 1, CS 1000S, CS 1000M, and CS 1000E communication servers provide the following default **Features** menu:

- Messages
- Shift
- Directory
- Services
- Expand
- Copy
- Quit
- Redial List
- Callers List

To re-arrange items on this list, open the **Settings** menu and select the **Features** tab. Items on this list cannot be added or removed.

Figure 24
Keys > Features screen



Macros

Select **Macros** from the **Keys > Features** submenu to access macros (also available through the **Settings > Macros** dialog box). Macros can be used to make speed-dials, access voicemail, and other routine functions faster and easier. For more information about macros see “Macros” on [page 265](#).

Help

Select **Help** to access the MVC 2050 PDA-specific version of **Help**. See Figure 25.

Figure 25
Help menu



The **Help** menu provides the following items:

- Contents
- Diagnostics
- About MVC 2050

Contents

Select the **Contents** menu item to access the **Help** system.

Diagnostics

Diagnostics provides access to a list of methods to determine server connection state.

Following are the diagnostic methods provided:

- Ping
- TraceRoute
- RUDP Ping

Also see “Profiles” on [page 257](#) for information on importing and exporting profiles to assist in troubleshooting.

About MVC 2050

About MVC 2050 identifies the MVC 2050 application. Select **About MVC 2050** to view configuration information for your MVC 2050 (such as system product name, version number, copyright indication, manufacturer’s name and logo, and Global IP Sound name and logo). MVC 2050 uses packet loss concealment provided by Global IP Sound NetEQ software.

MVC 2050 graphical interface (skins) components

MVC 2050 provides alternative graphical images known as skins. The dialpad, menu, and icon buttons are located on the skin. Skins come in several colors and arrangements. See Figures 26 to 30, starting on page 237.

All skins share the following common components. See Figure 26 on [page 237](#).

- programmable line/feature keys
- soft keys (self-labeled)
- dialpad
- display
- Call Handling icons
- Toolbar icons
- Menu Bar icons

- retractable toolbar
- Message Waiting light
- System Input Panel icon

Figure 26
Graphical image (skin), common components

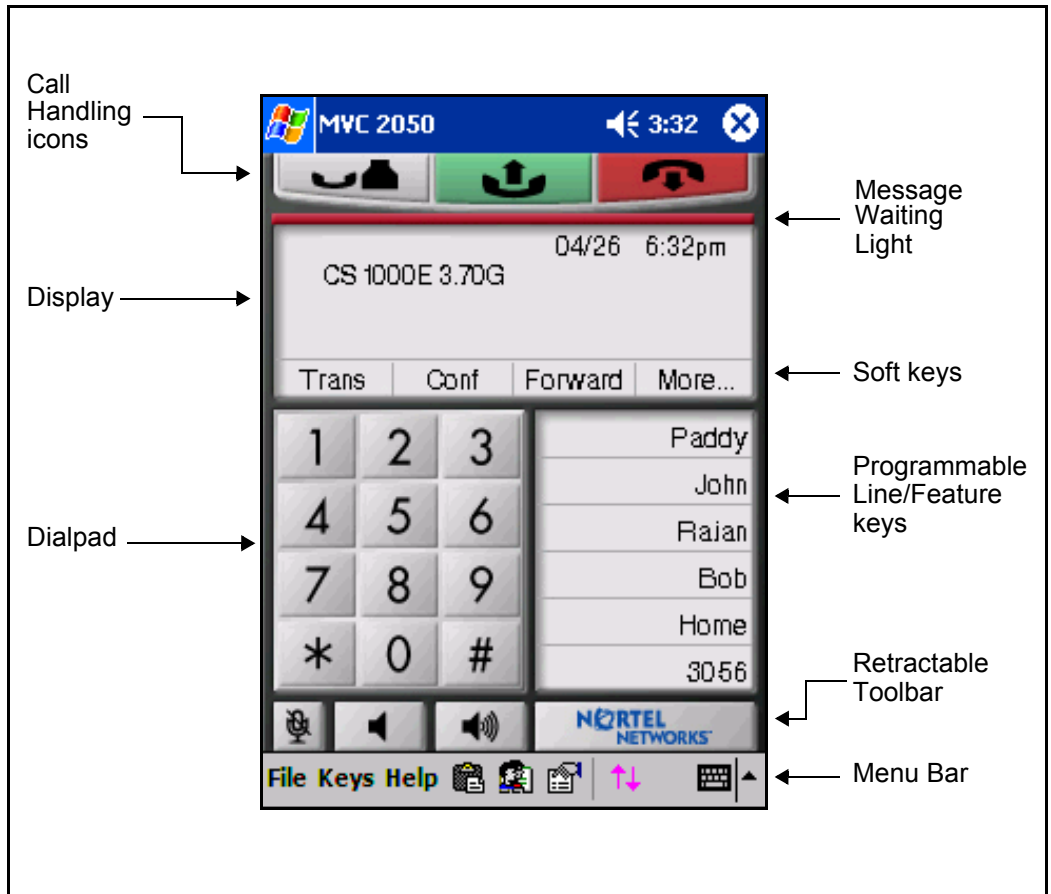


Figure 27
Black skin



Figure 28
Blue skin



Figure 29
Lime skin

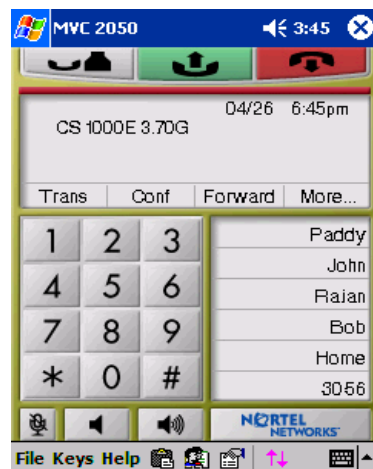
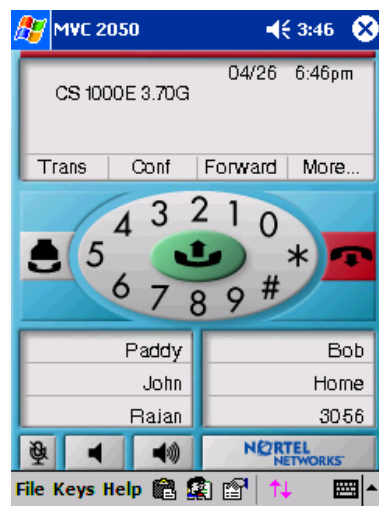


Figure 30
Round skin



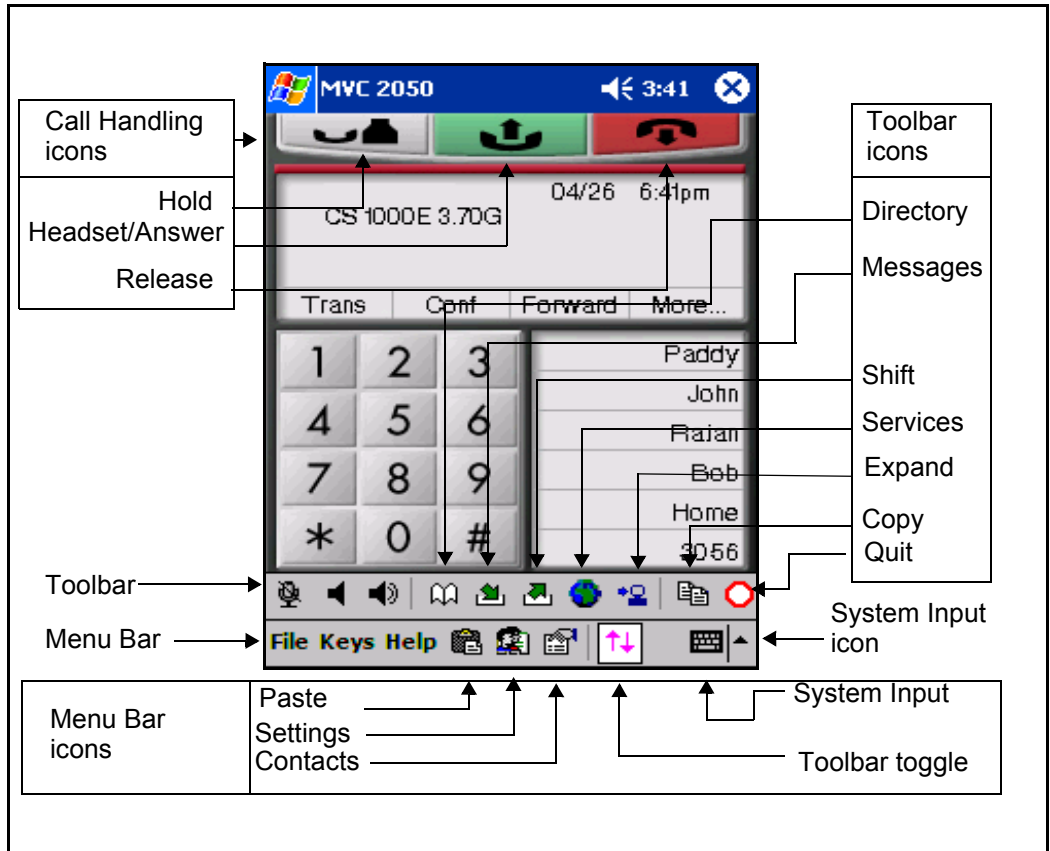
Icons

The MVC 2050 Call Handling screen presents icon equivalents for menu items. See Figure 31: “ Call Handling screen icons (with Toolbar retracted)” on [page 241](#).

Icons can be divided into three types:

- Call Handling icons
- Toolbar icons
- Menu Bar icons

Figure 31
Call Handling screen icons (with Toolbar retracted)



Call Handling icons

There are three Call Handling icons across the top of the Call Handling screen. See Figure 31.

The following are the Call Handling icons:

- Hold
- Headset/Answer
- Release

Menu Bar icons

MVC 2050 provides icons which can be used instead of text menu equivalents. See Figure 31 on [page 241](#).

The following are the Menu Bar icons:

- Paste
- Contacts
- Settings
- Toolbar toggle
- System Input icon

Toolbar icons

The retractable toolbar contains icons which are not present on the remainder of the display. The icons are located at the bottom of the skin and are visible when the Toolbar is retracted. You can retract the **Toolbar** using the **Toolbar Toggle** icon at the bottom of the screen. See Figure 31 on [page 241](#).

The following are the icons visible on the Toolbar:

- Mute
- Volume Down
- Volume Up

The following are the icons visible when the Toolbar is retracted:

- Mute
- Volume Down
- Volume Up
- Directory
- Messages
- Shift
- Services
- Expand

- Copy
- Quit

System Input Panel

To access the **System Input Panel** from MVC 2050, tap the **System Input Panel** icon on the Menu Bar in the bottom right-hand corner of the PDA. See Figure 31 on [page 241](#). Consult the PDA documentation for a description of the System Input Panel.

You can use the System Input Panel to enter data for MVC 2050 and other applications. To enter data, use the keyboard or the transcriber. See Figure 32 on [page 244](#) for an example of transcriber use.

The following are the default System Input Panels:

- Block Recognizer
- Keyboard
- Letter Recognizer
- Transcriber

Figure 32
System Input using a transcriber



Using the MVC 2050 application, the keyboard can act like a dialpad, interpreting the alphabetical keys as numbers. For instance, if you type a J, K, or L, it is interpreted as a number five (5). Keys which are not alphanumeric are ignored.

Operating parameters

The operating parameters for MVC 2050 are as follows:

- MVC 2050 application supports English language only.
- MVC 2050 is supported on PDAs running Windows Mobile 2003.

The following are the minimum recommended PDA hardware specifications:

- CPU type Intel XScale® PXA 255, speed 400 MHz
- Memory 48 Mb ROM, 64 Mb RAM

Software requirements

MVC 2050 requires Windows Mobile 2003.

For secure Virtual Private Network (VPN) access to a network, a VPN client is required. The certicom™ movianVPN™ client and the Apani™ Networks VPN client have been tested with MVC 2050. The VPN client runs on the PDA and is similar to the Contivity client that runs on a PC. The VPN client can establish the necessary IPsec tunnel through a Contivity server.

Operation

Use Procedure 48 to start MVC 2050.

Procedure 44 **Starting MVC 2050**

- 1** From the **Main Application** screen, select **Programs**.
- 2** Select **Start**.
- 3** Select **Mobile Voice Client 2050**. The Call Handling screen appears.
(See "MVC 2050 Call Handling screen" on [page 226](#)).

End of Procedure



CAUTION

PDA processor models, speed, and amount of memory vary. To maintain audio quality, do not overload the processor with intensive tasks while using MVC 2050. For example, Nortel does not recommend using your PDA's version of Internet Explorer while using MVC 2050.

PDA processor speed can have adverse effects on MVC 2050 performance.

IMPORTANT!

Set the PDA processor speed to the highest setting or to auto, which changes the processor speed according to system status. To set the PDA processor speed, select:

Start > Setting > System > Power > Processor or **CPU speed**, depending on the type of PDA.

PDA battery life can affect the MVC 2050 call duration and the call volume.

IMPORTANT!

PDA vendors offer two types of rechargeable battery: standard and extended-life. The extended-life battery is recommended. It provides longer call duration and increased call volume than the standard-life battery.

MVC 2050 installation

If an older version of MVC 2050 is installed on the PDA, remove it prior to installing a newer version. See “MVC 2050 removal” on [page 249](#).

To install MVC 2050 on the PDA:

- 1 Place the PDA in its cradle.
- 2 Synchronize the PDA with a desktop PC running Microsoft® ActiveSync® using Procedure 45.
- 3 Install the MVC 2050 from a Desktop using Procedure 46 on [page 248](#).

MVC 2050 installation method

MVC 2050 supports installation from a docked PDA with a Microsoft ActiveSync connection to a desktop PC.

Synchronizing a PDA with a desktop PC

Use Procedure 45 to synchronize your PDA with your desktop PC.

Procedure 45

Synchronizing a PDA with a desktop PC using ActiveSync

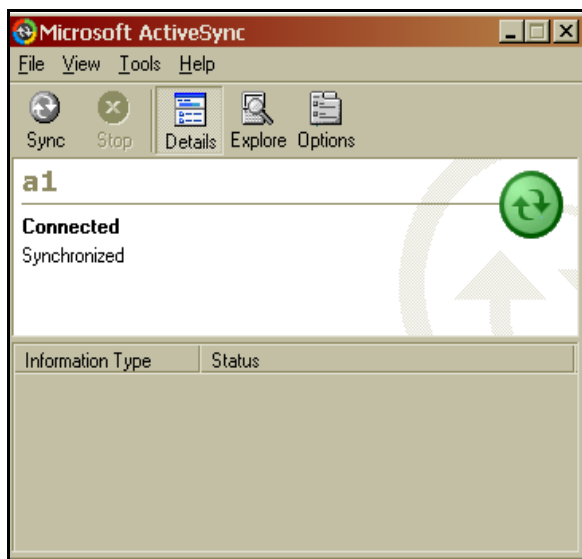
- 1 Place the PDA in its cradle.
- 2 Ensure that ActiveSync is running.

- 3 Wait for the PDA and the PC to synchronize. See Figure 33 on [page 248](#).

End of Procedure

For details about synchronizing a PDA with a desktop PC, refer to the PDA Users Manual.

Figure 33
ActiveSync connected screen



Installing MVC 2050 from a Desktop PC using ActiveSync

Use the following procedure to install MVC 2050 using the product CD.

Procedure 46
Installing MVC 2050

- 1 Synchronize the PC and PDA. See Procedure 45 on [page 247](#).
- 2 Insert the MVC 2050 CD into the CD-ROM drive of your desktop PC.
- 3 Go to your desktop and double-click **My Computer**. The PC files and folders menu appears.

- 4 Select the **CD Drive**.
- 5 Select **Setup**.
- 6 Follow the instructions on the screen until the Install Wizard asks you if you want to modify, install, or remove MVC 2050.
- 7 Select **Install**. The Install Wizard installs MVC 2050. When installation finishes, a message displays on the PC:
 - “attend to your device (PDA)”.
 - The PDA displays a message; “do you want to perform a soft restart?”.
- 8 Select **Yes**. Your PDA restarts.

End of Procedure

MVC 2050 removal

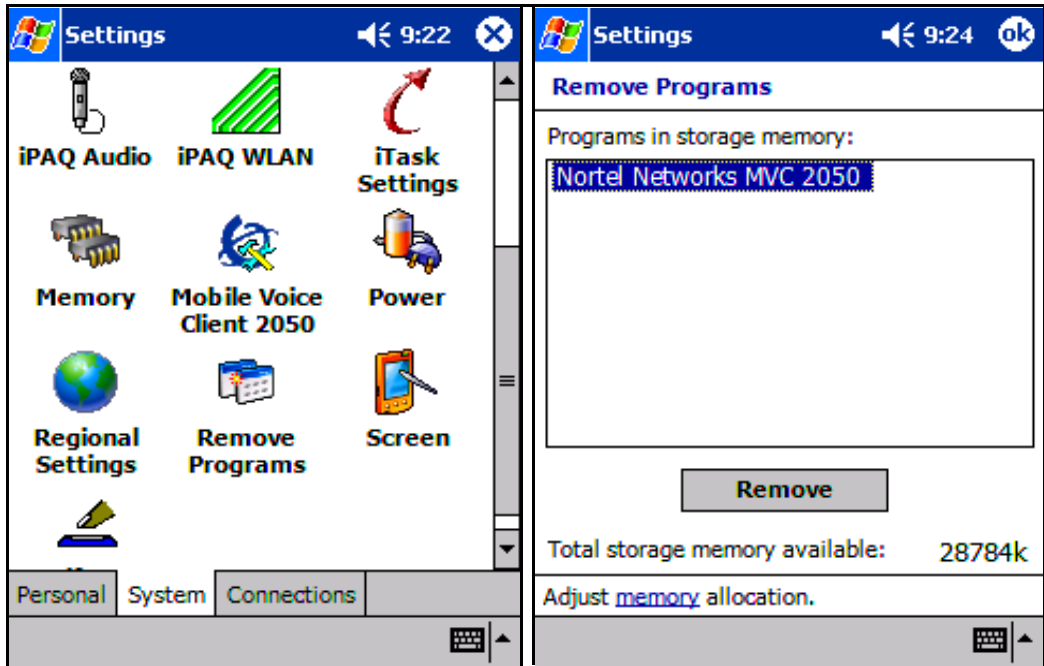
Use the following procedure to remove MVC 2050 from your PDA. See Figure 34 on [page 250](#).

Procedure 47 **Removing MVC 2050 from your PDA**

- 1 Select **Start**. A drop-down menu appears.
- 2 Select **Settings**. A Windows folder with a number of programs, usually shown as icons with names and a row of tabs across the bottom, appears.
- 3 Select the **System** tab. Another Windows program folder appears.
- 4 Select **Remove Programs**. A list of programs appears.
- 5 Select **Nortel MVC 2050**.
- 6 Select **Remove**. A dialog box appears, asking you to confirm this decision.
- 7 Select **Yes**. There is a brief pause during removal of MVC 2050. After the pause, a dialog box appears asking if you want to perform a soft reset.
- 8 Select **Yes**. Your PDA restarts and MVC 2050 has been removed.

End of Procedure

Figure 34
Removing MVC 2050



Configuration

MVC 2050 has a flexible interface which enables end users to customize configurations for a variety of connections.

About MVC 2050

About MVC 2050 identifies the application. Select **About MVC 2050** from the **Help** menu to view configuration information for your system such as the MVC 2050 system product name, version number, copyright indication, manufacturer's name and logo, and the Global IP Sound® name and logo. MVC 2050 uses packet loss concealment provided by Global IP Sound NetEQ software.

Settings

Select **Settings** from the **File** menu to access the **Settings** submenu. Settings provides windows for **Personal** settings, **System** settings, and **Connections** settings to control the behavior, appearance, and connection status of your MVC 2050.

The **System** settings window provides access to settings for **memory**, **power**, **remove programs**, **screen** and **regional** settings, **iTask** settings, and **self test**.

Note: A reboot of MVC 2050 is required for settings changes to **Profiles**, **Hardware ID**, **Sounds**, **Servers**, and **Listener IP** to take effect.

Server

The **Server** tab, accessible from the **Settings** screen, contains all the settings necessary for MVC 2050 to contact a server. See Figure 35, "DHCP Setting on Server screen" and Figure 36 on [page 253](#). **Settings** on the **Server** tab can be changed to access a different server or you can implement the profile containing the desired server (see "Profiles" on [page 257](#)).

Figure 35
DHCP Setting on Server screen

The screenshot displays the 'MVC 2050 Settings' window. The title bar includes a Windows logo, the text 'MVC 2050 Settings', a speaker icon, the time '9:46', and an 'ok' button. The main content area contains the following settings:

- ☒ Automatic (DHCP)
- Server: Primary (dropdown menu)
- ☐ IP: 0.0.0.0 (text field)
- ☐ Name: (text field)
- Port: 4100 (text field) Retries: 10 (text field)
- Type: Meridian 1 (dropdown menu)

Below these settings are two buttons: 'Restore Defaults' and 'Reset'.

At the bottom right of the settings area is the text 'My Server'.

The bottom of the window features a tabbed interface with the following tabs: 'Profiles', 'Server' (which is currently selected), 'Skin', 'Features', and 'Macro'. To the right of the 'Macro' tab are left and right arrow buttons. Below the tabs is a status bar containing a red prohibition sign on the left and a keyboard icon on the right.

Figure 36
Assigning Server values

Connection history

Connection history writes connection and disconnection indication messages to the registry key “HKCU\Software\Nortel\MVC2050\Log”. This is a circular queue of 29 entries. Each time a connection or disconnection event occurs, a log entry is written. The entries contain a date and time and a description of the connection or disconnection event. Following are the descriptions of the connection and disconnection events.

Soft reset, server n

Server n indicates that the server has instructed MVC 2050 to reset and connect to a server ‘n’ where ‘n’ and its value is determined, and possibly written, by the server. This message maps directly to a UNISTim message.

Server connected

Server connected indicates that MVC 2050 has successfully connected to the server. It means that MVC 2050 received the “Assign TerminalID” UNISTim

message, which is the last message received by MVC 2050 before a normal session is started.

Recovering: Server unreachable

The **Recovering: Server unreachable** message is generated when MVC 2050 loses connection with the server. It indicates that the UNISim “watchdog timer” has expired and indicates loss of network connection.

Hard Reset

The **Hard Reset** message indicates that the server has instructed MVC 2050 to reset and clear its UNISim-related memory. This message maps directly to a UNISim message.

Hardware ID

The **Hardware ID** screen is used to select the MAC address that MVC 2050 reports to the communication server. The MAC address can be reset.

The **Hardware ID** being used by MVC 2050 can be viewed in the MVC 2050 **Settings** on the **Hardware ID** tab. See Figure 37 on [page 255](#).

Hardware IDs are generated by reading MAC addresses from the PDA Network Interface Card (NIC). When MVC 2050 is used with most server types, the **Hardware ID** it uses must be unique. Some software, such as VPN client software, creates artificial network interfaces with MAC addresses which are not unique. These may be addresses which will be common to all installations of a particular VPN client.

Without a unique MAC address, an MVC 2050 may not be able to connect to a server, or may connect to a server and cause another device with the same hardware ID to be disconnected from the server. If MVC 2050 is disconnected from the server it automatically attempts to reconnect. The resulting conflicts prevent a stable connection from being made.

You can enable **Auto-Create** to prevent conflict with another device. **Auto-Create** fabricates a MAC address with a random value which is unlikely to be repeated by another device.

Use Procedure 48 to enable **Auto-Create**.

Procedure 48
Enable Auto-Create

- 1 Select **Settings**.
- 2 Select **Hardware ID**.
- 3 Select **Auto-Create**.

End of Procedure

Figure 37
Hardware ID screen



For more information about the **Hardware ID** screen, see Table 24.

Table 24
Hardware ID screen

Selection	Description
Hardware ID	This box contains the MAC address for the Ethernet hardware installed in your device. MVC 2050 uses the MAC address of the Ethernet hardware as its hardware ID. You may have to change this value if there is more than one MAC address, or if the device is using an extranet client that hides the true MAC address. For example, the Nortel Contivity Extranet Switch uses a single MAC address for all clients. This might cause connection problems with your communication server.
Auto-create	This changes the MAC address that appears in the Hardware ID box. If your device has more than one MAC address, tap the Auto-Create button to cycle through the set of MAC addresses on your computer. Auto-Create also makes up random hardware IDs in case the Ethernet hardware addresses are not unique to the communication server.
Firmware Version	Shows the build number of MVC 2050 installed on your device. This value is the version number of the application last reported by the server.

Dialing formats

Dialing Locations settings set the dialing rules to be applied to properly route a call when an end user dials a number. The dialing rules establish prefixes to access local and long-distance numbers using the location of the end user's

server. To establish the dialing rules and dialing patterns, see *Mobile Voice Client 2050 User Guide*.

Profiles

Each profile is a named file that contains a combination of servers and other attributes that control connection, behavior, and appearance of the MVC 2050.

A number of profiles can be created and saved to allow easy switching among different servers, feature programming, and audio programming.

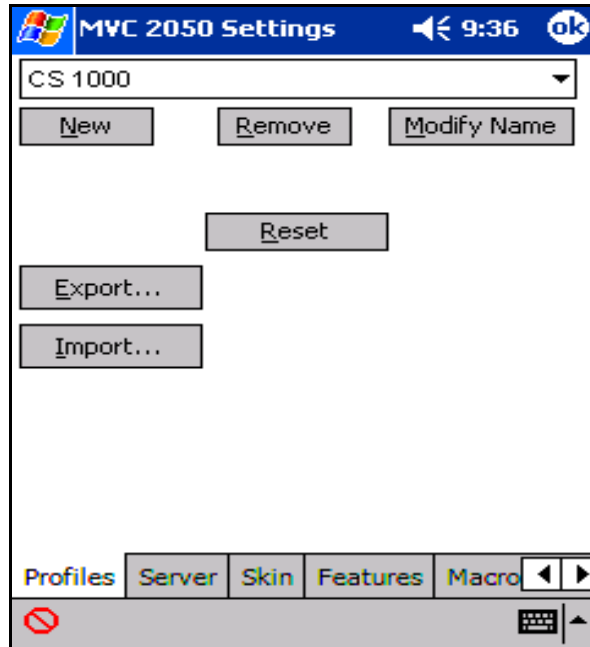
Profiles can be created, selected, modified, or deleted. When you select a profile you can change the name, modify it or delete it.

When a profile is selected, all other Settings tabs refer to the selected profile. The name of the selected profile is shown in the lower right corner on each tab. See Figure 38 on page 258.

From the **Profiles** screen you can:

- create profiles
- delete profiles
- modify a profile's name
- change the profile used by the application
- export profiles
- import profiles

Figure 38
Profiles screen



When a new profile has been created and selected, the values on all of the other tabs have been set to the defaults for this profile. Any value modified on any of the other tabs will be associated with this profile until another profile is selected. To change settings on other tabs for this profile, select the tab you wish to change. For example, go to the **Server** tab to modify the server settings.

Sounds

MVC 2050 can make sounds to indicate server connection or disconnection.

Sound files and sound settings are not saved when Profiles are saved, so the sounds must be programmed by the end user. Up to three sounds can be programmed for use with audible notification of server connection or disconnection.

Following are descriptions of the events for which the sounds are used. See Figure 39 on [page 259](#).

Server unreachable

The sound you select for this event plays when MVC 2050 loses contact with the server. The message “Server unreachable” displays on the PDA screen.

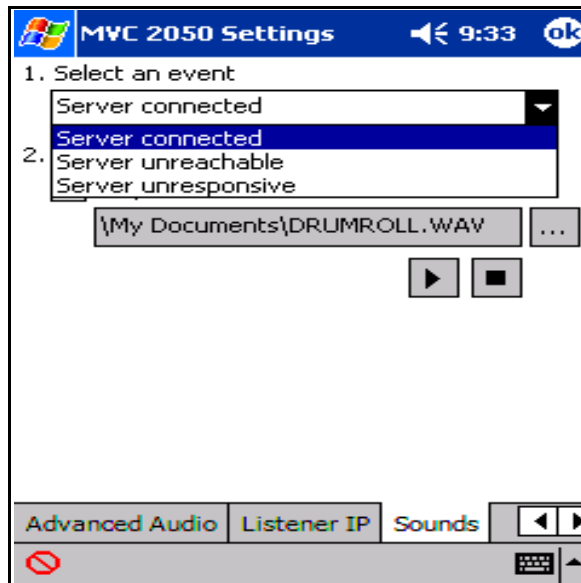
Server unresponsive

The sound you select for this event plays if MVC 2050 fails to connect to the server. The message “Server unresponsive” displays on the PDA screen.

Server connected

The sound you select for this event plays when MVC 2050 connects to a server.

Figure 39
Events List



Audio Quality

Audio quality is controlled from two screens:

- **Audio**, the quality slider tab
- **Advanced Audio**

Audio quality slider tab

You can control audio quality using the slider tab to reduce audio delay and increase audio clarity. This slider controls the number of audio buffers the PDA uses to smooth out incoming audio streams.

If you experience audio delay, you can decrease the number of buffers and reduce the delay by using the slider on the **Audio** screen.

If you experience broken or choppy speech at either end of the call, or the dial tone sounds choppy, the PDA's volume control may be the cause. To prevent this problem, use the volume controls on the MVC 2050 toolbar to adjust volume while using the MVC 2050.

If you experience reduced audio clarity in the receive audio stream, try increasing this setting. Increasing the **Audio clarity** setting increases the number of audio buffers used to process incoming audio. If the delay is too large, you can decrease this setting.

Automatic Gain Control and feedback

Since MVC 2050 requires a headset to operate properly, disable the **Automatic Gain Control**.

Note: When the PDA is used in handsfree mode, without a headset, the PDA microphone picks up sounds from the speaker, creating a feedback loop. **Automatic Gain Control** is used in this instance to avoid feedback.

Use the following procedure to disable the Automatic Gain Control.

Procedure 49**Disabling Automatic Gain Control**

- 1** Select **Start**.
- 2** Select **Settings**.
- 3** Select **System**.
- 4** Select **iPAQ Audio**.
- 5** Select **Automatic Gain Control**.
- 6** Select **Disable**.
- 7** Select **Yes**.

End of Procedure

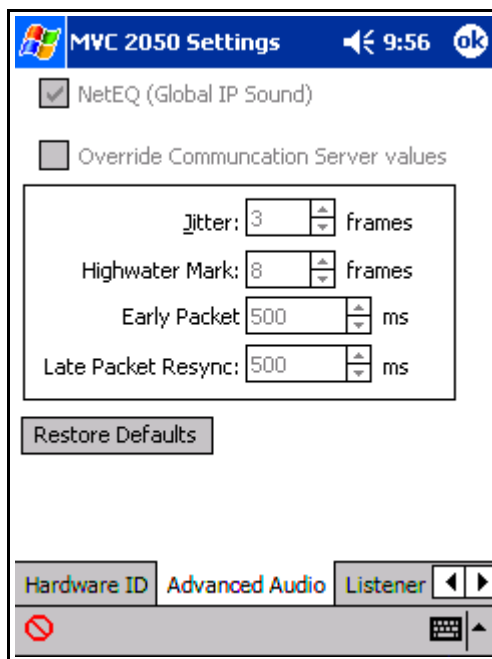
Advanced Audio

Global IP Sound NetEQ software provides loss concealment and compensation.

NetEQ is the default setting and MVC 2050 **Advanced Audio** settings cannot be adjusted.

Figure 40 on [page 262](#) shows the Advanced Audio screen.

Figure 40
Advanced Audio screen



See Table 25 for more information about the **Advanced Audio** screen.

Table 25
Advanced Audio screen

Selection	Description
NetEQ (Global IP Sound)	NetEQ packet loss concealment software is the default mode of operation.
Jitter Buffer	A Jitter Buffer is used to minimize a change in rate for arriving voice frames. The Jitter Buffer sends voice frames to your PDA sound system at a fixed rate. The rate of arrival of voice frames is variable. The value of "jitter" is the normal number of voice frames the application should have in its jitter buffer.
Highwater Mark	Highwater Mark indicates the maximum number of voice frames the application should have in its jitter buffer before it starts discarding packets. This value should be at least 2.5 times the value of jitter. If a smaller value is assigned, MVC 2050 regards it as an error and corrects it.
Early Packet and Late Packet Resync	Early Packet Resync and Late Packet Resync indicate the points at which MVC 2050 discards and restarts the jitter buffer contents. This value should be at least five times the Highwater Mark.

Echo cancellation

MVC 2050 can use the Voice Gateway Media Card for echo cancellation.

Jitter Buffer

Global IP Sound NetEQ, bundled with MVC 2050 software, provides loss concealment and compensation for up to 30% packet loss.

NetEQ is an advanced jitter buffer and packet loss concealment unit that delivers improvements in sound quality, while minimizing latency, for IP telephone systems. It is a one-sided, embedded solution that enables high-quality voice over networks. NetEQ reduces jitter buffer delay 30-80 ms and automatically provides a solution to clock drift present in VoIP hardware. NetEQ is codec independent.

The jitter buffer is used to minimize a change in rate for arriving voice frames. The jitter buffer sends voice frames to the PDA sound system at a fixed rate. The rate of arrival of voice frames is variable. The value of “jitter” is the normal number of voice frames the application should have in its jitter buffer.

Codec

MVC 2050 supports G.711 which provides higher audio quality with no compression.

Frame Size

MVC 2050 supports G.711-64 A-law and U-law with 10 ms to 960 ms frame sizes in 10 ms increments. Optimum and recommended payload is established as 30 ms frame size.

Listener IP

Use the Listener IP screen to override the port assignments when there is a conflicting application on the PDA.

See Table 26 for information about selections available on the **Listener IP** screen.

Table 26
Listener IP screen

Selection	Description
Use a specific address	MVC 2050 normally listens to all IP addresses on the device for communication server-to-terminal (UNISim) messaging on all the network interface cards on the device. This is the default mode of operation. To override this behavior, select the check box and enter a specific IP address.
Use a specific port	MVC 2050 listens to IP port 5000 on the device for communication server-to-terminal (UNISim) messaging.

Macros

The Mobile Voice Client (MVC) 2050 **Macros** tab enables you to record and use macros. A macro is a recorded sequence of steps that saves you keystrokes.

For example, you can create a macro that selects a particular line and then dials that telephone number automatically. Another example of macro use is programming voicemail access numbers and codes for faster access.

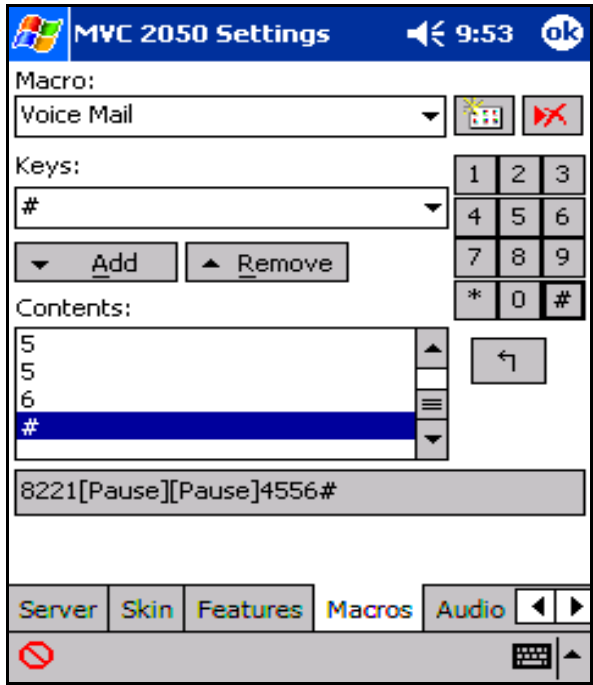
Macro screen

To enter a new macro name, or to select an existing macro to modify or delete, select the **New** icon to the right of the list box. See Figure 41 on [page 266](#).

To select an existing macro, tap the down arrow in the **Macro** list box and make your selection.

To delete a selected macro, tap the **Delete** icon (the button to the right of the list box).

Figure 41
Macro screen



Keys

Once you have selected a macro name, tap the down arrow in the **Keys** drop-down list to select a key to add to the macro. Press the **Add** button to add the key.

The **Pause** key is used to insert a short pause in the macro. A pause introduces a delay which may be required to access some Interactive Voice Response (IVR) applications and the voicemail systems.

Contents

A list of the macro's contents appears in the **Contents** list box. Once there are two or more entries in this box, the keystrokes can be moved around by using the up and down buttons which appear to the right of the box.

You can remove keystrokes from the **Contents** box by selecting a keystroke and pressing the **Remove** button.

Preview

You can preview your macro in a single view by viewing the read-only field under the **Contents** box.

Dialpad

You can select the **Keys** list box and press the **Add** button, or you can use the numbers on the dialpad to enter numbers into your macro.

MVC 2050 and WLAN

802.11b wireless ethernet networking

MVC 2050 uses an 802.11b WLAN interface.

Audio quality is affected by the distance from the AP and enclosed spaces. Audio quality is also affected by the use of Bluetooth accessories while on a voice call due to interference and contention.



CAUTION

MVC 2050 does not support use of Bluetooth accessories.

QoS

Due to device constraints, 802.11 p/q is not supported.

WiFi

ActiveSync of a PDA with a PC can be accomplished using Wireless Fidelity (WiFi).



CAUTION

When you return the PDA to its cradle, if you want to maintain the MVC 2050 connection to the server, deactivate ActiveSync. Otherwise the connection is lost because ActiveSync uses Point-to-Point Protocol (PPP). This will cause the PDA connection to the voice network to be dropped and connected to the PC.

Roaming and handover

If you experience slight gaps and pauses in transmission and reception during calls, MVC 2050 may be experiencing roaming/handover difficulties attributable to the wireless network.

Nortel WLAN Handset 2210, WLAN Handset 2211, and WLAN Handset 2212

For information about WLAN Handset 2210, WLAN Handset 2211, and WLAN Handset 2212, refer to *WLAN IP Telephony: Installation and Configuration* (553-3001-304).

Nortel IP Audio Conference Phone 2033

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Introduction

This section explains how to install and maintain the IP Audio Conference Phone 2033. For information on using the IP Audio Conference Phone 2033, see the *Nortel IP Audio Conference 2033 User Guide*.

This section contains the following procedures:

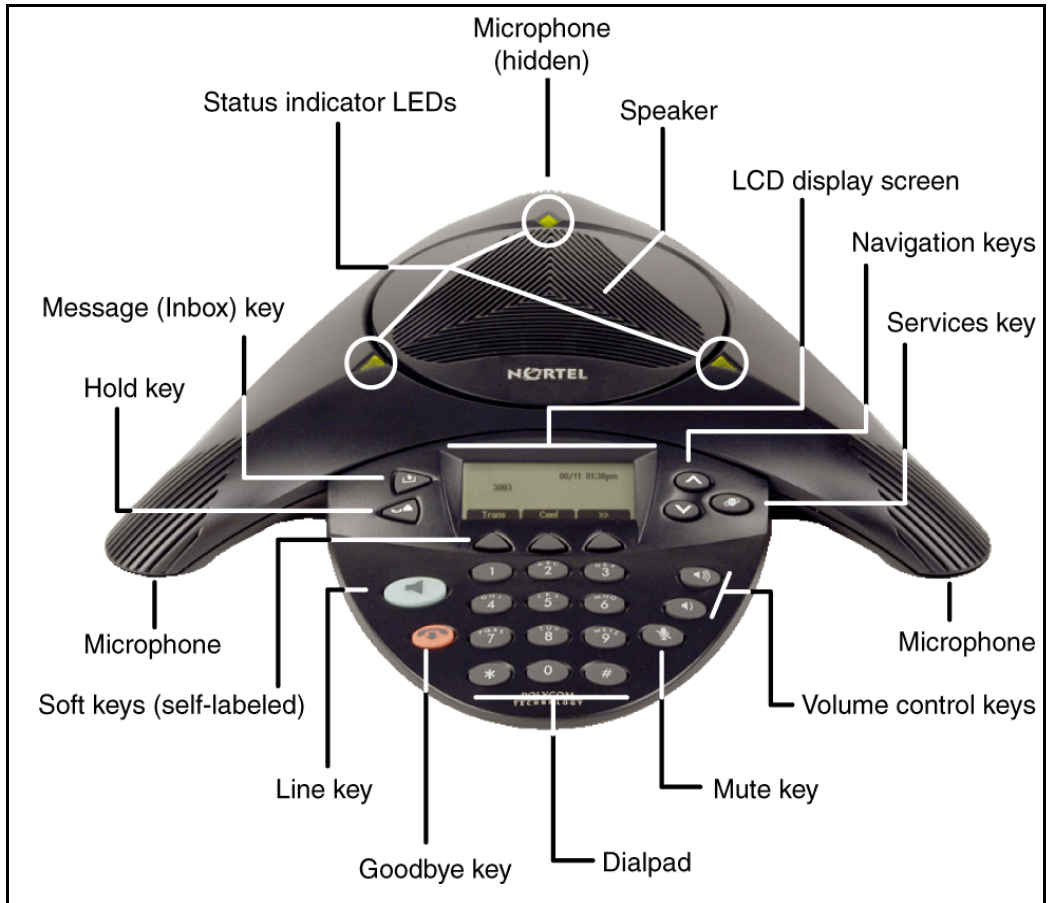
- Procedure 50, “Pre-installation checklist” on [page 283](#)
- Procedure 51, “Installing an IP Audio Conference Phone 2033 for the first time using manual configuration” on [page 285](#)
- Procedure 52, “Installing an IP Audio Conference Phone 2033 for the first time using DHCP” on [page 293](#)
- Procedure 53, “Disabling Auto Negotiate and enabling Full Duplex mode” on [page 299](#)
- Procedure 54, “Changing the TN of an existing IP Audio Conference Phone 2033” on [page 300](#)
- Procedure 55, “Replacing an IP Audio Conference Phone 2033” on [page 301](#)
- Procedure 56, “Removing an IP Audio Conference Phone 2033 from service” on [page 302](#)

Description

The IP Audio Conference Phone 2033 brings voice to the audio conference environment by connecting directly to a Local Area Network (LAN) through an Ethernet connection.

The IP Audio Conference Phone 2033 components are shown in Figure 42 on [page 273](#) and described in Table 27 on [page 274](#).

Figure 42
IP Audio Conference Phone 2033



Extension microphones

The IP Audio Conference Phone 2033 supports up to two extension microphones that extend the microphone range in large rooms. Each extension microphone has a **Mute** button and an LED indicator to indicate the current mute state.

Figure 43 on [page 274](#) shows an extension microphone.

Figure 43
Extension microphone

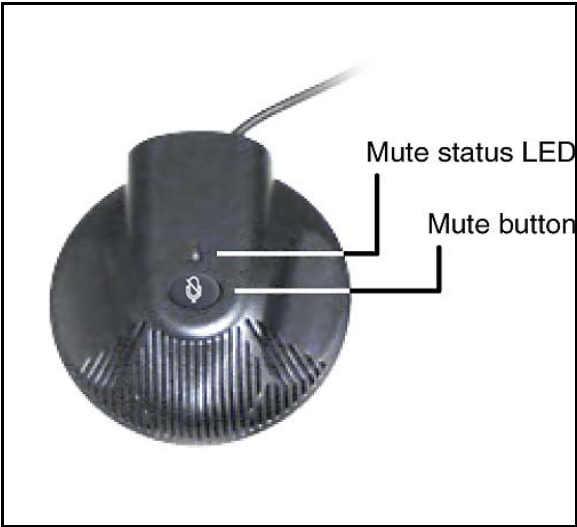


Table 27 lists the components and functions of the IP Audio Conference Phone 2033.

Table 27
Nortel IP Audio Conference Phone 2033 components and functions (Part 1 of 3)

Component	Function
Line (DN) key	Use the Line (DN) key to access the single line and activate on-hook dialing.
Volume control buttons	Use the Volume control buttons to adjust the volume of the ringer and speaker.
Mute button	Use the Mute button on the main unit or any extension microphone to mute the ringer and the speaker. Note: Pressing the Mute button on the extension microphone toggles the mute state of the entire IP Phone, not just the microphone.
Goodbye key	Use the Goodbye key to terminate an active call.

Table 27
Nortel IP Audio Conference Phone 2033 components and functions (Part 2 of 3)

Component	Function
Hold key	Press the Hold key to put an active call on hold. Press the Line (DN) key to return to the caller on hold.
Message (Inbox) key	Press the Message (Inbox) key to access your voice mailbox.
Navigation keys	Use the Navigation keys to scroll through menus and lists appearing on the LCD display screen. Arrows appear on the left side of display screen to indicate there is more information to be displayed.
Soft keys	Soft keys (self-labeled) are located below the LCD screen display. The LCD screen display above the key changes, based on the active feature. Refer to “Soft key label display” on page 279 for further information. Press the Shift soft key labelled >> to access the second row of soft keys. Note: When a triangle appears before a key label, the feature is active.

Table 27
Nortel IP Audio Conference Phone 2033 components and functions (Part 3 of 3)

Component	Function
Services key	<p>Press the Services key to access the following items:</p> <ul style="list-style-type: none"> • Telephone Options (see Notes 1 and 2): <ul style="list-style-type: none"> — Volume adjustment — Contrast adjustment — Language — Date/Time — Local DialPad Tone — Set Information — Ring type • Password Admin: <ul style="list-style-type: none"> — Station Control Password • Virtual Office Login and Virtual Office Logout (if Virtual Office is configured) • Test Local Mode and Resume Local Mode (if Media Gateway 1000B is configured) <p>Note 1: Press the Services key to exit from any menu or menu item.</p> <p>Note 2: The Password Admin menu may not be available on your IP Audio Conference Phone 2033. Consult your system administrator.</p> <p>Note 1: If a call is presented while the user is manipulating information, the phone rings. However, the screen display is not updated with Caller ID and the programming text is not disturbed.</p> <p>Note 2: The user can originate a call using Last Number Redial while manipulating an option.</p>

Diagnostic Utilities

For further information on Diagnostic Utilities, refer to Appendix D:“IP Phone diagnostic utilities” on [page 421](#).

Supported features

The Nortel IP Audio Conference Phone 2033 supports the following additional features:

- 802.1Q VLAN and Layer 2 priority bit support, an industry standard for managing bandwidth usage
- Gratuitous Address Resolution Protocol Protection (GARP)
- VLAN filtering
- Virtual Office
- language support: English, French, Swedish, Danish, Norwegian, German, Dutch, Portuguese, Czech, Finnish, Hungarian, Italian, Polish, Spanish, Japanese, Russian, Latvian, Turkish

Display characteristics

The IP Audio Conference Phone 2033 has two display areas:

- information line display
- soft key label display

Figure 44 on [page 278](#) shows the two display areas.

Figure 44
IP Audio Conference Phone 2033 display areas



Cleaning the IP Phone display screen

Press the **Goodbye** key and gently wipe the IP Phone display screen with a soft, dry cloth.



CAUTION

Do not use any liquids or powders on the IP Phone. Using anything other than a soft, dry cloth can contaminate IP Phone components and cause premature failure.

Information line display

The IP Audio Conference Phone 2033 has a one-line information display area with the following information:

- Caller number
- Caller name
- Feature prompt strings
- User-entered digits

- Date and time information (if the IP Phone is in an idle state)
- Set information

The information in the display area changes, according to the call processing state and active features.

Soft key label display

The IP Audio Conference Phone 2033 has three soft keys. A maximum of ten functions can be assigned to these soft keys. Your system administrator assigns functions to the soft keys in layers.

Use the **Shift (>>)** key to navigate through the layers of functions. If there are only three functions assigned to the soft keys, the **Shift (>>)** key does not appear and all three functions are displayed.

Figure 45 shows the soft keys on the display area.

Figure 45
Soft keys



The soft key label has a maximum of six characters. Each soft key includes the soft key label and an icon. When a soft key is in use, a flashing icon displays at the beginning of the soft key label, and the label shifts one

character to the right. (If the label is six characters long, the last or rightmost character is truncated.) If a soft key is enabled, the icon state changes to on. It remains in the on state until the soft key is pressed again. This cancels the enabled soft key and turns the icon off, returning the soft key label to its original state.

Key number assignments

The IP Audio Conference Phone 2033 has three soft-labeled, predefined soft keys that are used to provide up to ten features. The user cannot change the key number assignments.

The Message Indication key is assigned to key 16. Keys numbered 17 to 31 are the soft keys below the display area. See Table 28 on page 280.

Key numbers 17 to 31 support A03, A06, CFW, CHG, CPN, PRK, PRS, RGA, RNP, SCC, SCU, SSC, SSU and TRN, as listed in Table 28.

Table 28 describes the IP Phone assignment functions for each of the dedicated keys. Use LD 11 to program keys 16 to 26 on the IP Audio Conference Phone 2033.

Table 28
IP Audio Conference Phone 2033 soft keys (Part 1 of 2)

Key number	Response	Description
Key 16	MSI	Message waiting indication
Key 17	TRN	Call Transfer key
Key 18	A06	Six-party conference key Alternate: A03 (3-party conference)
Key 19	CFW	Call Forward key
Key 20	RGA	Ring Again key
Key 21	PRK	Call Park key
Key 22	RNP	Ringing Number Pickup key

Table 28
IP Audio Conference Phone 2033 soft keys (Part 2 of 2)

Key number	Response	Description
Key 23	Reserved for speed dial	Speed dial includes SCU, SCC, SSU, SSC
Key 24	PRS	Privacy Release key
Key 25	CHG	Charge Account key
Key 26	CPN	Calling Party Number key
Keys 27 - 31		Reserved

Package components

Table 29 on page 282 lists the components for the IP Audio Conference Phone 2033.

Table 29
IP Audio Conference Phone 2033 components list

IP Audio Conference Phone 2033 package contents include: <ul style="list-style-type: none"> • IP Audio Conference Phone 2033 (charcoal) • 7 ft. CAT5 Ethernet cable • Power Interface Module (PIM) with 25 ft. console cable • IP Audio Conference Phone 2033 Quick Reference Card • Universal power supply 	NTEX11AA70
IP Audio Conference Phone 2033 package contents include: <ul style="list-style-type: none"> • IP Audio Conference Phone 2033 (charcoal) • 7 ft. CAT5 Ethernet cable • Power Interface Module (PIM) with 25 ft. console cable • IP Audio Conference Phone 2033 Quick Reference Card • 2 Extension microphones (charcoal) • Universal power supply 	NTEX11BA70
Additional Extension microphones with 7 ft. cable	NTEX11DA70
Power accessory kit (PIM, Universal power supply, cabling)	NTEX11CA
IP Phone IP Audio Conference Phone 2033 Power cords	
NA NEMA 5-15P, 125V 13A (10ft.)	NTTK14AB
Euro CEE (7) VII, 250V, 10A (2.5m)	NTTK16AB
ANZ AS3112, 250V 10A (2.5m)	NTTK15AA
Swiss SEV 1011, 250V 10A (8ft.)	NTTK17AB
UK/Ireland BS1363, 240V 10A (8ft.)	NTTK18AB
Denmark AFSNIT, 250V 10A (2.5m)	NTTK22AB
Argentina IRAM 2073, 250V 10A (8ft.)	A0814961

Before you begin

The following section provides a step-by-step guide through the IP Audio Conference Phone 2033 installation process. Before installing the IP Audio Conference Phone 2033, complete Procedure 50 “Pre-installation checklist” on [page 283](#).

Procedure 50 **Pre-installation checklist**

- 1** Ensure there is one IP Audio Conference Phone 2033 boxed package for each IP Audio Conference Phone 2033 being installed. See Table 29 on [page 282](#) for a list of package contents.
- 2** To install and configure an IP Audio Conference Phone 2033, the host system must be installed with the Voice Gateway Media Card.
- 3** If an AC power adapter is required, ensure the correct AC power transformer is used. The voltage rating of the transformer must match the wall outlet voltage. Refer to Table 29 on [page 282](#).
- 4** Understand the three configuration modes you can choose as you proceed through the installation of the IP Audio Conference Phone 2033. The three configuration modes are:
 - Static IP address – see “Static IP address assignment” on [page 284](#).
 - Dynamic Partial DHCP – see “Dynamic IP address assignment—Partial DHCP” on [page 284](#).
 - Dynamic Full DHCP – see “Dynamic IP address assignment—Full DHCP” on [page 285](#).
- 5** Make sure a DHCP server and DHCP relay agents, if required, are installed, configured, and running.

End of Procedure

First time installation



CAUTION — Service Interruption

Do not plug your IP Audio Conference Phone 2033 into an ISDN connection. Severe damage can result. Consult your system administrator to ensure you are plugging your IP Phone into a 10/100BaseT Ethernet jack.

IP address assignments

During the first-time installation, there are IP address parameters that are entered either manually or automatically depending on the installation configuration. As well, you are prompted to enable or disable 802.1Q VLAN. For more information, see “802.1Q VLAN description” on [page 407](#).

There are three configuration modes which you can choose from to obtain the IP parameters. Review the following sections for more information on the configuration mode you are using.

Static IP address assignment

During the installation, the IP Audio Conference Phone 2033 parameters are entered manually using the dialpad.

Your system administrator provides the following information: IP address, subnet mask, and default Gateway.

You must also enter the Connect Server parameters, including: IP address, port number, action, and retry count.

Go to Procedure 51, “Installing an IP Audio Conference Phone 2033 for the first time using manual configuration” on [page 285](#).

Dynamic IP address assignment—Partial DHCP

For a partial DHCP installation, you must provide, through the IP Audio Conference Phone 2033 dialpad, the Connect Server parameters, including: IP address, port number, action, and retry count. Other parameters (IP Phone

IP address, subnet mask, default Gateway, and TFTP Server IP address) are retrieved from the DHCP server.

The IP Audio Conference Phone 2033 password, node ID and TN must be entered manually from the dialpad.

For more information about DHCP servers, see *Converging the Data Network with VoIP* (553-3001-160).

Go to Procedure 52, “Installing an IP Audio Conference Phone 2033 for the first time using DHCP” on [page 293](#).

Dynamic IP address assignment—Full DHCP

For a full DHCP installation, all parameters (IP Phone IP address, subnet mask, default Gateway, Connect Server IP address, port number, action, and retry count) are retrieved from the DHCP server to recognize the IP Audio Conference Phone 2033.

The IP Audio Conference Phone 2033 password, node ID, and TN must be entered manually from the dialpad.

For more information on how to set up DHCP servers for use with the IP Audio Conference Phone 2033, refer to *Converging the Data Network with VoIP* (553-3001-160).

Go to Procedure 52, “Installing an IP Audio Conference Phone 2033 for the first time using DHCP” on [page 293](#).

Procedure 51

Installing an IP Audio Conference Phone 2033 for the first time using manual configuration

- 1 Configure a virtual loop on the system using LD 97.

For more information, see *Software Input/Output: Administration* (553-3001-311).

- 2 Configure the IP Audio Conference Phone 2033 on the system using LD 11. At the prompts, enter the following:

```
REQ:chg  
TYPE:i2001
```

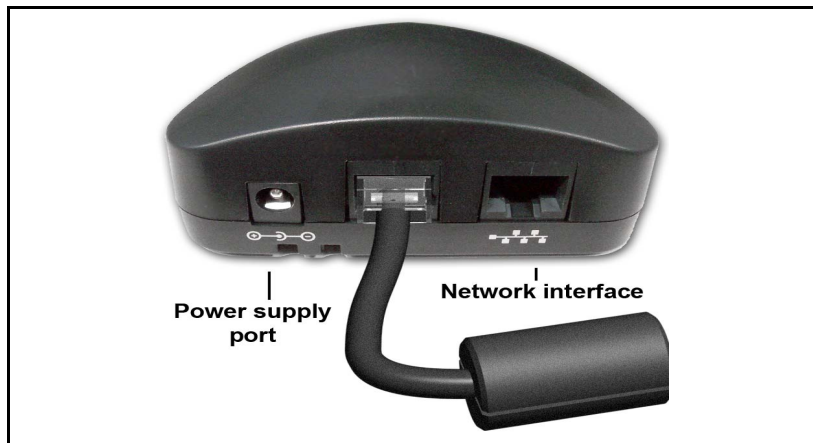
```
TN cc uu
ECHG yes
ITEM cls hfa
ITEM
```

For more information, see *Software Input/Output: Administration* (553-3001-311).

- 3 Connect one end of the CAT5 Ethernet cable to the network interface located on the back of the Power Interface Module (PIM). See Figure 46. Plug the other end of the CAT5 Ethernet cable into your IP network interface.

Figure 46 shows the Power Interface Module (PIM).

Figure 46
PIM



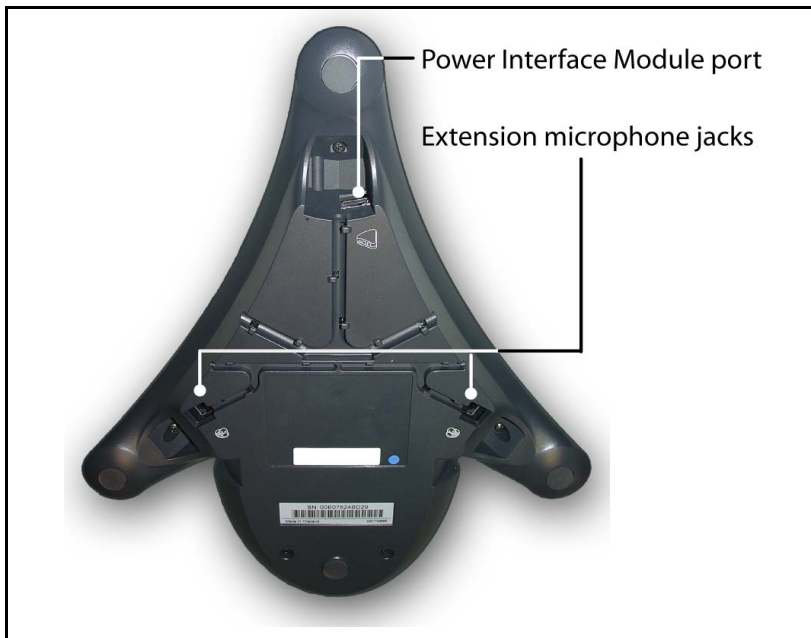
- 4 Connect one end of the AC power adapter cord to the power supply port located on the back of the PIM. Thread the cord through the channel on the bottom of the PIM and plug the other end into the AC power source. Ensure the correct AC power transformer is used. The voltage rating of the transformer must match the wall outlet voltage. Refer to Table 29 on [page 282](#).

- 5 The middle port of the PIM (see Figure 46 on [page 286](#)) has an attached CAT5 Ethernet cable. Thread the cord through the channel on the bottom of the IP Phone and plug it into the PIM port on the IP Phone. See Figure 47 on [page 288](#).

Note: Red LEDs indicate power. Messages indicating system start up, such as Loading, Initializing network, and Loading boot parameters appear after a short delay.

Figure 47 on [page 288](#) shows the bottom view of the IP Audio Conference Phone 2033.

Figure 47
Bottom view of IP Audio Conference Phone 2033



IMPORTANT!

Timing information

When you see the Nortel logo, you have one second to respond by pressing the three soft keys at the bottom of the display in sequence from left to right. If you miss the one-second response time, the IP Audio Conference Phone 2033 attempts to locate the connect server. Wait until it is finished, and then begin the power-up sequence again.

You will hear a tone shortly before the IP Phone is ready to start the Nortel IP Phone application. Once the application has loaded and started, you will see the Nortel logo and **Starting DHCP** will appear at the bottom of the screen.

- 6 To enter the configuration menu, press the three soft keys at the bottom of the display in sequence from left to right.
- 7 At the prompt, DHCP Yes/NO?, select **No**.

- 8** Enter the following information provided by your system administrator:

Screen prompt	Description
set IP	a valid IP Audio Conference Phone 2033 IP address
net msk	a subnet mask
def gw	the default Gateway for the IP Audio Conference Phone 2033 on the LAN segment to which it is connected.
Emulation Key Mapping (0 HS 1 HF) :0	1 for (HF)
TFTP Server IP 0.0.0.0.	the TFTP Server IP address

Note: The TFTP Server is required to download the current firmware. For further information on TFTP Server configuration, see Appendix E:“TFTP Server” on [page 489](#).

- 9 Enter the information for the primary Connect Server (S1) and the secondary Connect Server (S2):

Screen prompt	Description
S1 IP	The node IP address of the IP line node
S1 Port	This is a fixed value: 4100
S1 action	This is a fixed value: 1
S1 retry	The number of times the IP Audio Conference Phone 2033 attempts to connect to the server. Enter 10.
S2 IP	Same as S1 in most cases (see note below)
S2 Port	Same as S1
S2 action	Same as S1
S2 retry	Same as S1
Cfg XAS? (0-No,1-Yes)	Enter 0 (for No), since External Application Server is not supported on the IP Audio Conference Phone 2033. This prompt exists to support future implementation of External Application Server.
VLAN? (0-No, 1-Ma, 2-Au)	Default 0-No 802.1Q VLAN remains off and initialization continues.

1-MA

Enter a VLAN ID manually, then press OK.

The following VLAN ID displays:

Manual Cfg

VLAN: 1234

Note: The VLAN ID is entered as a decimal. The VLAN ID is a 12-bit value between 0 and 4095.

The IP Audio Conference Phone 2033 is configured with 802.1Q VLAN enabled, priority = 6, and the VLAN ID set to the entered value.

2-Au

Enter a VLAN ID automatically. This prompt exists to support future implementation of DHCP.

VLANFILTER (0-No, 1-Yes)

Default 0 (for No)

You will not be prompted for VLANFILTER if VLAN? is not enabled.

Data VLAN? (0-No, 1-Yes)

After the value is entered, the DATA VLAN configuration option appears on the display.

Select **0-No**, since DATA VLAN is not supported on the IP Phone Audio Conference Phone 2033.

Duplex (0-Auto, 1-Full) :0

Default 0 (for Auto)

GARP Ignore? (0-No,1-Yes)

Default 0 (for No)

Note: The IP Audio Conference Phone 2033 can support a primary (S1) and secondary (S2) connect server. If you require IP Phones to register on multiple nodes, refer to *IP Line: Description, Installation, and Operation* (553-3001-365).

The IP Audio Conference Phone 2033 searches for the TFTP Server for firmware upgrade. If the filename specified in i2033.cfg is not the same as the current firmware, the telephone downloads the file and upgrades the firmware. This takes several minutes. When the upgrade is complete, the IP Audio Conference Phone 2033 reboots. The current system date and time appear on the top line of the display when the configuration is complete. Self-labeling keys also appear.

Note: A TFTP Server is required to download the current version of firmware. For further information on TFTP Server configuration, see Appendix E:“TFTP Server” on [page 489](#).

The IP Audio Conference Phone 2033 searches for the connect server. When the connection is complete, proceed with Step 10.

10 Enter the following information:

Screen prompt	Description
Password	IP Phone Installer Password
	You are not prompted to enter the IP Phone Installer Password if it has not been configured in your system.
Node	The node ID.
TN	The TN or VTN.

Note: Select the **Shift** soft key labeled (>>) and press **Clear** to edit the TN field. The IP Audio Conference Phone 2033 by default will place you in the units field of the TN. You can not use backspace to move to the loop, shelf or card fields.

The current system date and time appear on the top line of the display when the configuration is complete. Self-labeling keys also appear.

- 11 Check for dial tone and the correct DN above the display.
- 12 (Optional) Customize the soft keys as required. For more information, see *Software Input/Output: Administration* (553-3001-311) and IP Audio Conference Phone 2033 User Guide.

End of Procedure

Procedure 52**Installing an IP Audio Conference Phone 2033
for the first time using DHCP**

- 1 Configure a virtual loop on the system using LD 97.

For more information, see *Software Input/Output: Administration* (553-3001-311).

- 2 Configure the IP Audio Conference Phone 2033 on the system using LD 11. At the prompts, enter the following:

```
REQ:chg
TYPE:i2001
TN cc uu
ECHG yes
ITEM cls hfa
ITEM
```

For more information, see *Software Input/Output: Administration* (553-3001-311).

- 3 Connect CAT5 Ethernet cable attached to the Power Interface Module (PIM). Thread the cord through the channel on the bottom of the IP Phone and plug it into the PIM port on the IP Phone. See Figure 46 on [page 286](#).
- 4 Connect one end of the AC power adapter cord to the power supply port located on the back of the PIM. Thread the cord through the channel on the bottom of the PIM and plug the other end into the AC power source. Ensure the correct AC power transformer is used. The voltage rating of the transformer must match the wall outlet voltage. Refer to Table 29 on [page 282](#).
- 5 Connect one end of the CAT5 Ethernet cable to the network interface located on the back of the PIM (see Figure 46 on [page 286](#)). Plug the other end of the CAT5 Ethernet cable into your IP network interface.

Note: Red LEDs indicate power. Messages indicating system start up, such as Loading, Initializing network, and Loading boot parameters appear after a short delay.

Figure 47 on [page 288](#) shows the bottom view of the IP Audio Conference Phone 2033.

IMPORTANT!

Timing information

When you see the Nortel logo, you have one second to respond by pressing the three soft keys at the bottom of the display in sequence from left to right. If you miss the one-second response time, the IP Audio Conference Phone 2033 attempts to locate the connect server. Wait until it is finished, and then begin the power-up sequence again.

You will hear a tone shortly before the IP Phone is ready to start the Nortel IP Phone application. Once the application has loaded and started, you will see the Nortel logo and **Starting DHCP** will appear at the bottom of the screen.

- 6 To enter the configuration menu, press the three soft keys at the bottom of the display in sequence from left to right.
- 7 At the prompt DHCP *Yes/No?*, select **Yes**.
- 8 Select Partial or Full DHCP.
 - a. If you select Full DHCP, then the following parameters are retrieved from the DHCP server:
 - a valid IP Audio Conference Phone 2033 IP address
 - a subnet mask
 - the default Gateway for the IP Audio Conference Phone 2033 on the LAN segment to which it is connected
 - the S1 node IP address of the IP line node
 - the S1 action
 - the S1 retry count. This is the number of times the IP Audio Conference Phone 2033 attempts to connect to the server
 - the S2 node IP address of the IP line node
 - the S2 action
 - the S2 retry count

- b.** If you select Partial DHCP, then you must enter the following parameters:

Screen prompt	Description
S1 IP	the node IP address of the IP line node
S1 Port	this is a fixed value: 4100
S1 action	this is a fixed value: 1
S1 retry	the number of times the IP Audio Conference Phone 2033 attempts to connect to the server; enter 10
S2 IP	same as S1 in most cases (see note below)
S2 Port	same as S1
S2 action	same as S1
S2 retry	same as S1
Cfg XAS? (0-No,1-Yes)	Enter 0 (for No), since External Application Server is not supported on the IP Audio Conference Phone 2033. This prompt exists to support future implementation of External Application Server.
VLAN? (0-No, 1-Ma, 2-Au)	Default 0 for No 802.1Q VLAN remains off and initialization continues. 1-MA Enter a VLAN ID manually, then press OK. The following VLAN ID displays: Manual Cfg VLAN: 1234 Note: The VLAN ID is entered as a decimal. The VLAN ID is a 12-bit value between 0 and 4095. The IP Audio Conference Phone 2033 is configured with 802.1Q VLAN enabled, priority = 6, and the VLAN ID set to the entered value.

2-Au

Enter a VLAN ID automatically. This prompt exists to support future implementation of DHCP.

VLANFILTER (0-No, 1-Yes)

Default 0 (for No)

You will not be prompted for VLANFILTER if VLAN? is not enabled.

Data VLAN? (0-No, 1-Yes)

After the value is entered, the DATA VLAN configuration option appears on the display.

Select **0-No**, since DATA VLAN is not supported on the IP Audio Conference Phone 2033.

Duplex (0-Auto, 1-Full)

Default 0 (for Auto)

GARP Ignore? (0-No,1-Yes)

Default 0 (for No)

Note: The IP Audio Conference Phone 2033 can support a primary (S1) and secondary (S2) connect server. If you require IP Phones to register on multiple nodes, refer to “Enhanced Redundancy for IP Line Nodes” in *IP Line: Description, Installation, and Operation* (553-3001-365).

The IP Audio Conference Phone 2033 searches for the TFTP Server for firmware upgrade. If the filename specified in i2033.cfg is not the same as the current firmware, the telephone downloads the file and upgrades the firmware. This takes several minutes. When the upgrade is complete, the IP Audio Conference Phone 2033 reboots. The current system date and time appear on the top line of the display when the configuration is complete. Self-labeling keys also appear.

Note: A TFTP Server is required to download the current version of firmware. For further information on TFTP Server configuration, see Appendix E: “TFTP Server” on [page 489](#).

The IP Audio Conference Phone 2033 searches for the connect server. When the connection is complete, proceed to Step 9.

- 9 Enter the following information:

Screen prompt	Description
Password	IP Phone Installer Password You are not prompted to enter the IP Phone Installer Password if it has not been configured in your system.
Node	The node ID.
TN	The TN or VTN.

Note: Select the **Shift** soft key labeled (>>) and press **Clear** to edit the TN field. The IP Audio Conference Phone 2033 by default will place you in the units field of the TN. You can not use backspace to move to the loop, shelf or card fields.

The current system date and time appear on the top line of the display when the configuration is complete. Self-labeling keys also appear.

- 10 Check for dial tone and the correct DN above the display.
- 11 (Optional) Customize the soft keys as required. For more information, see *Software Input/Output: Administration* (553-3001-311) and IP Audio Conference Phone 2033 User Guide.

End of Procedure

Startup sequence

When an IP Audio Conference Phone 2033 is connected to the network, it must perform a startup sequence. The elements of the startup sequence include:

- obtaining the IP parameters
- finding a default Gateway server
- authenticating the user

Table 30 lists a summary of the IP parameters and how they are obtained.

Note: For all static IP address assignments, your system administrator provides the network information.

Table 30
IP Audio Conference Phone 2033 IP parameters

Parameter	Method of Acquisition
IP Address	Manually entered or automatically retrieved through Partial or Full DHCP.
Net Mask	Manually entered or automatically retrieved through Partial or Full DHCP.
Default Gateway	Manually entered or automatically retrieved through Partial or Full DHCP.
Connect Server (IP address, port, action and retry count — primary and secondary)	Manually entered or automatically retrieved through Full DHCP.
User ID (Node ID, Node Password and TN)	Manually entered for first-time configuration. Retrieved from local storage on subsequent power cycles. Note: Your system administrator provides the information to enter.

Full Duplex mode

In the **Configuration** menu, Auto Negotiate mode is the default setting for initial startup. Typically, the IP Phone is connected to a network that supports Auto Negotiate, and it selects the best speed and duplex mode available. There is no intervention required under normal operation.

If the IP Phone is connected to a network configured for Full Duplex mode only, it is not able to automatically negotiate the proper configuration. To allow the IP Phones to work at the optimum speed and duplex mode, Auto Negotiate must be disabled. Use Procedure 53 to disable Auto Negotiate and enable Full Duplex mode.

Procedure 53
Disabling Auto Negotiate and enabling
Full Duplex mode

- 1 Reset the IP Phone by disconnecting and re-connecting power.
- 2 When the Nortel logo appears, press each of the soft keys in sequence. See Procedure 52 on [page 293](#).
- 3 If no other configuration changes are required, press the **OK** soft key repeatedly until the Duplex network option appears.
- 4 Select 1 to enable Full Duplex mode.
- 5 When the Speed option appears, select one of the following:
 - 0 for 10 Mbps
 - 1 for 100 Mbps (default)
- 6 Select **OK** to confirm the change.
- 7 Restart the IP Phone. The firmware reads the new setting, and the IP Phone operates in Full Duplex mode.

End of Procedure

When the IP Phone is restarted, the firmware reads the setting for Full Duplex mode and sets port 0, the network interface port, accordingly.

Gratuitous Address Resolution Protocol Protection

Gratuitous Address Resolution Protocol Protection (GARP) prevents the IP Audio Conference Phone 2033 from GARP Spoof attacks on the network. In a GARP Spoof attack, a malicious device on the network takes over an IP address (usually the default gateway) by sending unsolicited (or Gratuitous) ARP messages, thus manipulating the ARP table of the victim's machine. This allows the malicious device to launch a variety of attacks on the network, resulting in undesired traffic routing. For example, a GARP attack can convince the victim machine that the malicious device is the default gateway. In this scenario, all traffic from the victim's machine flows through the malicious device.

To enable GARP Protection during configuration, refer to Procedure 51, "Installing an IP Audio Conference Phone 2033 for the first time using

manual configuration” on [page 285](#) or Procedure 51, “Installing an IP Audio Conference Phone 2033 for the first time using DHCP” on [page 293](#).

Reinstalling an IP Audio Conference Phone 2033

You can reinstall an existing previously configured IP Audio Conference Phone 2033 on the same system. For example, the IP Audio Conference Phone 2033 can be assigned to a new user (new TN) or to an existing user who moved to a new subnet by changing the TN of the IP Audio Conference Phone 2033.

Procedure 54
Changing the TN of an existing
IP Audio Conference Phone 2033

- 1 Repower the IP Audio Conference Phone 2033.

Note: During the reboot sequence of a previously configured the IP Audio Conference Phone 2033 displays the existing node number for approximately five seconds.
- 2 If node password is enabled and NULL, choose one of the following:
 - a. Disable password.
 - b. Set password as non-NULL.
- 3 Press **OK** when the node number displays.

If	Then
node password is enabled and is not NULL	a password screen displays. Go to step 4.
node password is disabled	a TN screen displays. Go to step 5.
- 4 Enter password at the password screen, and press **OK**.
 A TN screen displays.

- 5 Select the **Shift** soft key labeled (>>) and press **Clear** to edit the TN field. The IP Audio Conference Phone 2033 by default will place you in the units field of the TN. You can not use backspace to move to the loop, shelf or card fields.

End of Procedure

Replacing an IP Audio Conference Phone 2033

IMPORTANT!

Two IP Phones cannot share the same TN. You must remove the IP Audio Conference Phone 2033 that is currently using the TN.

Procedure 55

Replacing an IP Audio Conference Phone 2033

- 1 Disconnect the IP Audio Conference Phone 2033 that you want to replace.
- 2 Follow either Procedure 51 on [page 285](#) (static IP assignment) or Procedure 52 on [page 293](#) (dynamic IP assignment) to install and configure the IP Audio Conference Phone 2033.
- 3 Enter the same TN and Node Number as the IP Audio Conference Phone 2033 you replaced. The system associates the new IP Audio Conference Phone 2033 with the existing TN.

End of Procedure

Removing an IP Audio Conference Phone 2033 from service

Procedure 56 **Removing an IP Audio Conference Phone 2033** **from service**

- 1 Disconnect the IP Audio Conference Phone 2033 from the network or turn off the power.

Note: The service to the PC is disconnected as well if the PC is connected to the IP Audio Conference Phone 2033.

If the IP Audio Conference Phone 2033 was automatically configured, the DHCP lease expires and the IP address returns to the available pool.

- 2 In LD 11, OUT the TN.

End of Procedure

Connecting an extension microphone

Procedure 57 **Connecting an extension microphone to the** **IP Audio Conference Phone 2033**

- 1 Thread the microphone cord through the channels on the bottom of the IP Phone.

Note: A maximum of two microphone jacks are supported on the IP Audio Conference Phone 2033.

- 2 Connect the microphone cord to one of the microphone jacks on the bottom of the IP Phone.

End of Procedure

SIP Phone

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Introduction

SIP is a protocol standard used for establishing, modifying, and terminating conference and telephony sessions in IP networks. A SIP session can be a simple two-way telephone call or it can be a collaborative multimedia conference session. SIP initiates real-time, multimedia sessions which can integrate voice, data, and video.

Nortel supports certified compatible third-party SIP phones. In contrast to IP Phones, SIP Phones use an industry standard open standards-based signaling protocol, whereas IP Phone signaling is UNISTim based. A Signaling Server is required to establish signaling for SIP Phones and SIP Phones exchange signaling with SIP components residing on the Signaling Server. Available features for SIP Phones depend on the devices themselves, and the communication server, and vary from manufacturer to manufacturer and between models. Features are delivered to IP Phones from the communication server.

SIP Phones communicate with SIP-network components which reside on the Signaling Server. These components include the following:

- **SIP Gateway** — The SIP Gateway provides a direct trunking interface between the CS 1000 systems and a SIP domain. The SIP Gateway is implemented according to SIP standards. The SIP Gateway connects CS 1000 systems to other Nortel or third-party SIP-enabled products. This direct SIP interface is used to interwork with products such as the Multimedia Communication Server (MCS) 5100 or CS 2000.
- **SIP Redirect Server** — The SIP Redirect Server is used to facilitate centralized dialing plan management and the configuration of the network routing information for the SIP domain. A SIP Redirect Server translates telephone numbers recognized by Enterprise Business Network (EBN) voice systems to IP addresses in the SIP domain. As a result, the SIP Redirect Server interfaces with SIP-based products. The SIP Redirect Server has the ability to access the CS 1000 system's endpoint/location database in order to direct SIP Gateways and SIP Phones within the networked environment.
- **SIP Registrar** — The SIP Registration Server, which is also known as the SIP Registrar, is used for endpoint registration. Registration is one way that the server can learn the location of a user (SIP client). Upon initialization, and at periodic intervals, a user's telephone sends REGISTER messages to the SIP Registrar in the same domain. The contact information from the REGISTER request is then made available to other SIP servers, such as proxies and redirect servers, within the same administrative domain. The registration process precedes the call setup.

SIP-based Converged Desktop Service (CDS) provides the telephony features of the CS 1000 systems, along with the multimedia applications of the MCS 5100. CDS allows a user to have an identity in the SIP domain (for example, a registered PC client), as well as in the CS 1000 system as a telephone. For further information, refer to *Multimedia Communication Portfolio Interworking - Basics* (NN10372-111), and for information about calls between SIP Phones and SIP Gateways, refer to *IP Peer Networking: Installation and Configuration* (553-3001-213).

SIP Phone features

The following is a list of features delivered through the Communication Server 1000:

- Calling Line Identification (CLID)
- Network Call Party Name display
- Network Call Redirection
- Message Waiting Indication
- Network Class of Service Access controls
- Network Alternate Route Selection (NARS, UDP, CDP)
- Call Detail Recording (CDR) — using Tandem CDR features

Other telephony features are available and vary, depending on the particular SIP Phone.

The following list contains examples of intelligent SIP Phone-based features that may be supported on a SIP Phone. Please consult the particular phone specification for details.

- Conference calling
- Call hold
- Call waiting
- Call forwarding
- Call transfer
- Caller ID
- Call waiting caller ID
- Speed dial from phone book
- Call logs

Installation and configuration overview

A SIP Phone must be installed and properly configured before it can be used. SIP Phone configuration involves configuration on the phone itself and configuration on the Signaling Server.

- Follow the manufacturer's installation and configuration instructions to set up your SIP Phone.
- To configure a SIP Phone on the Signaling Server, refer to *IP Peer Networking: Installation and Configuration* (553-3001-213) which provides the required configuration procedures for adding a SIP Phone user endpoint to the Signaling Server using the Network Routing Service (NRS) Manager.

IP Phone 1120E

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Introduction

This section explains how to install and maintain the IP Phone 1120E. For information on using the IP Phone 1120E, see the *IP Phone 1120E User Guide*.

This section contains the following procedures:

- Procedure 58, “Pre-installation checklist” on [page 328](#).
- Procedure 59, “Installing an IP Phone 1120E for the first time” on [page 330](#).
- Procedure 60, “Disabling Auto Negotiate and enabling Full Duplex mode” on [page 343](#).
- Procedure 61, “Checking Ethernet Statistics” on [page 344](#).
- Procedure 62, “Changing the TN of an existing IP Phone 1120E” on [page 345](#).
- Procedure 63, “Replacing an IP Phone 1120E” on [page 346](#).
- Procedure 64, “Removing an IP Phone 1120E from service” on [page 347](#).

Note: After an IP Phone has been installed and configured, if power to the phone is interrupted, re-entry of the IP parameters, Node Number, TN, or re-acquisition of firmware is not required.

Description

The IP Phone 1120E brings voice and data to the desktop environment. It connects directly to the LAN through the Ethernet connection.

The IP Phone 1120E translates voice into data packets for transport using Internet Protocol. A Dynamic Host Configuration Protocol (DHCP) server can be used to provide information that enables the IP Phone 1120E network connection, and connection to the Voice Gateway Media Card. The IP Phone 1120E uses the customer’s IP network to communicate with the Signaling Server.

Figure 48
IP Phone 1120E



Supported features

The IP Phone 1120E supports the following features:

- four user-defined feature keys with labels and indicators
- four soft keys

Note: Functions for the soft keys are configured in LD 11.

- graphical, high-resolution LCD display, backlit, with adjustable contrast
- high quality speaker phone

- volume control keys for adjusting ringer, speaker, handset, and headset volume
 - six specialized feature keys:
 - Quit
 - Directory
 - Message/Inbox
 - Shift/Outbox
 - Services
 - Copy
 - six call-processing fixed keys:
 - Mute
 - Handsfree
 - Goodbye
 - Expand to PC
 - Headset
 - Hold
 - gigabit Ethernet ports
 - integrated gigabit Ethernet switch for shared PC access
 - headset jack with On/Off key
 - USB port, to support keyboard or mouse
- Note:** Powered downstream 1.1 compliant USB hubs are supported, including USB 2.0 hubs, if they offer USB 1.1 backwards compliancy.
- automatic network configuration
 - hearing-aid compatibility

The IP Phone 1120E supports the following additional features:

- 802.1Q VLAN and 802.1p priority support, industry standards for managing bandwidth usage—full VLAN capability, including a manageable integrated switch in the IP Phone for VLAN and priority tagging for PC and IP Phone traffic
- 802.1x Port-based network access control, industry standard for passing Extensible Authentication Protocol (EAP) over a LAN
- integrated hardware to support power over Ethernet, for IEEE 802.3af standard power; also including support for PowerDsine Power over LAN Hub powering, and Cisco proprietary powering as tested with specific Cisco Ethernet switch equipment
- Gratuitous Address Resolution Protocol Protection (GARP)
- VLAN filtering
- Call Duration Timer
- ability to change the feature key labels
- Corporate Directory
- Personal Directory
- Redial List
- Callers List
- Password Administration
- Virtual office
- Branch Office
- Active Call Failover
- Enhanced UNISlim Firmware Download
- 10/100/1000 Mbps Full Duplex mode
- language support: English, French, Swedish, Danish, Norwegian, German, Dutch, Portuguese, Czech, Finnish, Hungarian, Italian, Polish, Spanish, Russian, Latvian, Turkish, and Katakana

Note: In the case of the prompts locally generated by the phone for the Local Tools menu and in all local features, the language is controlled locally by the phone. Thus there are two language selection mechanisms on the phone: one for local features, which is selected in the Local Tools menu (press the Services key twice to access the Local Tools menu), and another for TPS features, which is selected in the Telephone Options menu (press the Services key, and select Telephone Options to access the Telephone Options menu). Refer to the appropriate IP Phone User Guide for more information.

- External Application Server (XAS)

Features not currently supported

The following features are not supported on the IP Phone 1120E:

- Live Dialpad
- Group Listening
- Set-to-Set messaging
- Context-sensitive soft keys

The three-port switch that is internal to the IP Phone 1120E is an unmanaged switch. It passes the packets (unmodified) and does not interpret the 802.1Q header. The three-port switch provides priority based on the port. The IP Phone port traffic takes priority over the Ethernet.

The IP Phone 1120E components are shown in Table 31.

Table 31
IP Phone 1120E components and functions (Part 1 of 7)

Component	Function
Hold	Press the Hold key to put an active call on hold. Press the line (DN) key beside the flashing LCD to return to the caller on hold.
Goodbye	Press the Goodbye key to terminate an active call.

Table 31
IP Phone 1120E components and functions (Part 2 of 7)

Component	Function
Message waiting indicator	When a message is waiting, the orange Message waiting indicator flashes. Also, this indicator flashes when the ringer is set to On.
Data Message waiting Indicator	<p>When a data-related message, such as an instant message, is received, the blue Data message waiting indicator flashes. Also, this indicator flashes when a contact has come on-line.</p> <p>Note: This function requires server support and, therefore, is not available on all phones.</p>
User-defined feature key labels	<p>User-defined feature key labels are configured for various features on the IP Phones.</p> <p>A steady LCD light beside a line (DN) key indicates the feature or line is active. A flashing LCD indicates the line is on hold or the feature is being programmed.</p>
Soft keys	<p>Soft keys are located below the display area. The LCD label above the key changes, based on the active feature.</p> <p>Note: A triangle before a key label indicates that the key is active.</p>
Fixed feature keys	Use these keys to access non-programmable standard features.
Expand to PC	The Expand to PC key is used to access external server applications such as External Application Server (XAS).
Navigation keys	Use the Navigation keys to scroll through menus and lists appearing on the LCD display screen. The outer part of this key cluster rocks for up, down, left, and right movements.

Table 31
IP Phone 1120E components and functions (Part 3 of 7)

Component	Function
Send/Enter	Press the Send/Enter key, at the center of the Navigation key cluster, to confirm menu selections. In many cases, you can use the Send/Enter key instead of the Select soft key.
Message/Inbox	Press the Message/Inbox key to access your voicemail box.
Shift/Outbox	The Shift/Outbox key is a fixed key that is reserved for future feature development.
Quit/Stop	Press the Quit/Stop key to end an active application. Pressing the Quit/Stop key does not affect the status of the calls currently on your IP Phone.
Directory	Press the Directory key to access Directory services.
Mute	Press the Mute key to listen to the receiving party without transmitting. Press the Mute key again to return to a two-way conversation. The Mute key applies to Handsfree, Handset, and Headset microphones. The Mute LED flashes when the Mute option is in use.
Headset	Press the Headset key to answer a call using the headset or to switch a call from the handset or Handsfree to the headset. The Headset LED flashes when the Headset option is in use.

Table 31
IP Phone 1120E components and functions (Part 4 of 7)

Component	Function
Volume control keys	<p>Press the volume control keys to adjust the volume of the handset, headset, speaker, ringer, and, Handsfree feature.</p> <p>Press the volume key with the loudspeaker icon to increase volume; press the volume key without the loudspeaker icon to decrease volume.</p>

Table 31
IP Phone 1120E components and functions (Part 5 of 7)

Component	Function
Services	<p>Press the Services key to access the following items:</p> <ul style="list-style-type: none">• Telephone Options (see Notes 1 and 2):<ul style="list-style-type: none">— Volume Adjustment— Contrast Adjustment— Language— Date/Time— Display diagnostics— Local Dialpad Tone— Set Info— Diagnostics— Call Log Options— Ring type— Call Timer— OnHook Default Path— Change Feature Key Label— Name Display Format• Virtual Office Login and Virtual Office Logout (if Virtual Office is configured)• Test Local Mode and Resume Local Mode (if Branch Office is configured)• Password Admin• Display Network Diagnostics Utilities

Table 31
IP Phone 1120E components and functions (Part 6 of 7)

Component	Function
	<p>Press the Services key twice to access the Local Tools menu. The following items appear in the Local Tools menu:</p> <ul style="list-style-type: none"> • 1. Preferences • 2. Local Diagnostics • 3. Network Configuration • 4. Lock Menu <p>Note: If you are prompted to enter a password when you double-press the Services key, password protection is enabled. For more information about password protection, see “Password protection of the Tools menu” on page 320.</p> <p>To make a selection, press the number associated with the menu item, or use the navigation keys to scroll through the menu items.</p> <p>Press the Services key to exit from any menu or menu item.</p> <p>For information about configuring the IP Phone 1120E Local Tools menu, see “Configure IP Phone 1120E and IP Phone 1140E Local Tools options” on page 463.</p>
Copy	<p>Press the Copy Key to copy entries to your Personal Directory from other lists, such as the Caller List, Redial List and Corporate Directory.</p>
Speaker	<p>Press the Handsfree key to activate the speaker.</p>

Table 31
IP Phone 1120E components and functions (Part 7 of 7)

Component	Function
Handsfree	<p>Press the Handsfree key to activate the Handsfree feature.</p> <p>The LED lights to indicate when handsfree is active.</p>
<p>Note 1: If a call is presented while the user is manipulating an option, the IP Phone 1120E rings and the DN key flashes. However, the screen display is not updated with Caller ID information and programming text is not disturbed.</p> <p>Note 2: The user can originate a call using Autodial or Last Number Redial while manipulating an option. However, the display is not updated with the dialed digits or the Caller ID information, and Autodial and Last Number Redial intercept the dialpad.</p>	

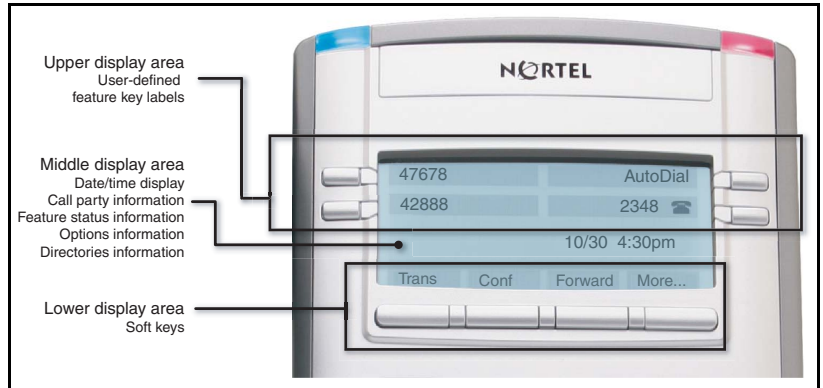
Display characteristics

An IP Phone 1120E has three major display areas:

- user-defined feature key label
- soft key label
- information line

Figure 49 shows these three display areas.

Figure 49
1120E IP display area



Cleaning the IP Phone display screen

Gently wipe the IP Phone display screen with a soft, dry cloth.



CAUTION

Do not use any liquids or powders on the IP Phone. Using anything other than a soft, dry cloth can contaminate IP Phone components and cause premature failure.

User-defined feature key label display

The feature key label area displays a 10 character string for each of the four feature keys. Each feature key includes the key label and an icon. The icon state can be on, off, or flashing. Key labels are left-aligned for keys on the left side of the screen, and right-aligned for keys on the right side of the screen.

Note: If a label is longer than ten characters, the last ten characters are displayed and the excess characters are deleted from the beginning of the string.

Soft key label display

A maximum of ten functions can be assigned to the soft keys. Functions are assigned to the soft keys in layers in LD 11.

Use the **More** soft key to navigate through the layers of functions. If there are only four functions assigned to the soft keys, the **More** key does not appear and all four functions are displayed.

The soft key label has a maximum of seven characters. Each soft key includes the soft key label and an icon. When a soft key is in use, a flashing icon displays at the beginning of the soft key label, and the label shifts one character to the right. (If the label is six characters long, the last or rightmost character is truncated.) If a feature is enabled, the icon state turns to On. It remains in the on state until the feature key is pressed again. This cancels the enabled feature and turns the icon off, returning the soft key label to its original state.

Information line display

An IP Phone 1120E has a one-line information display area with the following information:

- Caller number
- Caller name
- Feature prompt strings
- User-entered digits
- Date and time information (if the IP Phone is in an idle state)

The information in the display area changes, according to the call processing state and active features.

Password protection of the Tools menu

When password protection is enabled, the Tools menu is locked to prevent accidental or unwanted changes. The fixed password is required whenever the **Services** key is double-pressed or whenever the Local Diagnostics and

Network Configuration sub menus are accessed. Use the dialpad to enter the fixed password 26567*738 (color*set).

Password protection is enabled during Full DHCP configuration if the SECUREMENU parameter, or the PARTSECUREMENU parameter are present at the end of the S4 part of the Full DHCP string. If neither the SECUREMENU parameter, nor the PARTSECUREMENU parameter is present, password protection is not enabled.

You can still enable password protection by setting the S4 IP address to 0.0.0.0 and the other fields, such as ActionByte and RetryCount, to another setting. Nortel recommends you use 0 as the setting for ActionByte and RetryCount.

The following examples show how to configure password protection through the DHCP string:

- Menu protection on, GraphicalXAS configured:

```
Nortel-i2004-A,xxx.xxx.xxx.xxx:pppppp,aaa,rrr;  
xxx.xxx.xxx.xxx:pppppp,aaa,rrr;xxx.xxx.xxx.xxx:  
pppppp,aaa,rrr,SECUREMENU
```

```
Nortel-i2004-A,147.19.11.70:4100,1,10;  
147.19.11.70:4100,1,5;37.165.238.90:44443,1,5,  
SECUREMENU
```

or

```
Nortel-i2004-A,xxx.xxx.xxx.xxx:pppppp,aaa,rrr;  
xxx.xxx.xxx.xxx:pppppp,aaa,rrr;xxx.xxx.xxx.xxx:  
pppppp,aaa,rrr,PARTSECUREMENU
```

```
Nortel-i2004-A,147.19.11.70:4100,1,10;  
147.19.11.70:4100,1,5;37.165.238.90:44443,1,5,  
PARTSECUREMENU
```

- Menu protection off, GraphicalXAS configured:

```
Nortel-i2004-A,xxx.xxx.xxx.xxx:pppppp,aaa.rrr;  
xxx.xxx.xxx.xxx:pppppp,aaa,rrr;xxx.xxx.xxx.xxx:  
pppppp,aaa
```

```
Nortel-i2004-A,147.19.11.70:4100,1,10;147.19.11.7:  
4100,1,5;37.165.238.90:4443,1
```

- Menu protection off, no XAS configured:

```
Nortel-i2004-A,147.19.11.70:4100,1,10;147.19.11.7:  
4100,1,5;0.0.0.0:0,0,0,SECUREMENU
```

or

```
Nortel-i2004-A,147.19.11.70:4100,1,10;147.19.11.7:  
4100,1,5;0.0.0.0:0,0,0,PARTSECUREMENU
```

IMPORTANT!

In Full DHCP mode, the server must be configured to respond to the request for vendor-specific encapsulated options.

For further information on configuring Full DHCP, refer to *Converging the Data Network with VoIP* (553-3001-160).

Accessing the Tools menu

If the SECUREMENU parameter was set during Full DHCP configuration, you are prompted to enter the fixed password (26567*738) whenever the **Services** key is double-pressed on the IP Phone 1120E. If the PARTSECURE parameter was set during Full DHCP configuration, you are prompted to enter the fixed password whenever you access 2. Local Diagnostics or 3. Network Configuration menu items from the Tools menu. You are always prompted to enter the fixed password whenever you access the Lock Menu sub menu.

The Tools menu remains active for 5 minutes. You can freely navigate, exit and reenter the Tools menu without being prompted to reenter the password. To reset the timer before the 5 minute time expires, double-press the **Services** key.

You can also press the 5 key to access the **Lock Now** item from the Lock Menu. The Lock Now item immediately exits the Tools menu, closes any open Tools menu pages, and locks the **Tools** menu. Alternatively, when time expires, the Tools menu and any open submenus are closed. Double-press the **Services** key to open the password prompt window to reaccess the Tools menu.

If you enter an incorrect password, the Tools menu will not open. Double-press the Services key to open the password prompt window. Only three incorrect password entries are allowed. Any entry after the three attempts is ignored for 5 minutes. The password prompt window is visible and you can reenter the password but the password is not processed until the 5 minute time expires.

Note: Some items appear dimmed depending on the current state of the menu lock and the mode of the IP Phone. The current selected mode is dimmed. Only configuration options which are enabled from the current state appear active.

For more information about configuring the Local Tools menu for the IP Phone 1120E, refer to “Configure IP Phone 1120E and IP Phone 1140E Local Tools options” on [page 463](#).

Key number assignments

The IP Phone 1120E has four soft-labeled, predefined soft keys that are used to provide up to ten features. Because they are pre-defined, the user cannot change the key number assignment.

The Message key is numbered 16. Key numbers 17 to 26 are the four soft key labels below the display area. See Figure 48 on [page 309](#).

Key numbers 17 to 31 support the features A03, A06, CFW, CHG, CPN, PRK, PRS, RGA, RNP, SCC, SCU, SSC, SSU and TRN, as listed in Table 32 on [page 324](#).

Key number mappings at the Call Server are aligned with that of the IP Phone 2002.

Table 32 describes the IP Phone feature assignment for each of the dedicated keys. Use LD 11 to program keys 16 to 26 on the IP Phone 1120E.

Note: If you attempt to configure anything other than the permitted response, the system generates an error code.

Table 32
IP Phone 1120E soft keys

Key Number	Response	Description
Key 16	MWK	Message Waiting key
Key 17	TRN	Call Transfer key
Key 18	A06	Six-party conference key Alternate: A03 (3-party conference)
Key 19	CFW	Call Forward key
Key 20	RGA	Ring Again key
Key 21	PRK	Call Park key
Key 22	RNP	Ringing Number Pickup key
Key 23	Reserved for speed dial	Speed dial includes SCU, SCC, SSU, SSC
Key 24	PRS	Privacy Release key
Key 25	CHG	Charge Account key
Key 26	CPN	Calling Party Number key
Keys 27 - 31		Reserved

Package components

The approved Nortel AC adapter and a standard local power cord must be ordered separately if local power using the AC adapter is required. Refer to

Table 33 on [page 325](#) for the IP 1120E package components and product codes.

The IP Phone 1120E includes integrated support for a number of power over LAN options, including support for IEEE 802.3af standard power.

WARNING

Use your IP Phone 1120E with the approved Nortel AC adapter (model # N0023000) for this model of phone *only*.

Table 33 lists the IP Phone 1120E package components and product codes.

Table 33
IP Phone 1120E components list (Part 1 of 3)

IP Phone 1120E package contents include:	
<ul style="list-style-type: none"> • IP Phone 1120E • Handset • Handset cord • 2.3 m (7 ft.) CAT5 Ethernet cable • Number plate and lens • Getting Started Card 	
IP Phone 1120E with icon key caps	NTYS03AA
IP Phone 1120E with English key caps	NTYS03BA
Replacement parts	
Handset, Charcoal	NTYS09AA70
Handset cord, Charcoal	NTYS10AA70
Footstand kit, Charcoal	NTYS11AA70
Phone number label and lens kit	NTYS12AA
2.3 m (7 ft) CAT5 Ethernet cable	NTYS13AA

Table 33
IP Phone 1120E components list (Part 2 of 3)

Power adapter	
Global power supply (for local power)	N0023000
AC cord	
1.8 m (5.9 ft), 10 amp, IEC320-C13 North America Note: Nortel recommends you use the thinner cord (NTYS14AA) as an alternative to NTTK14AB.	NTYS14AA

Table 33
IP Phone 1120E components list (Part 3 of 3)

IEC cables	
3 m (9.9 ft), 125 VAC 13 amp, NA power cord, NEMA North America, Middle East, Taiwan, Philippines, Thailand, and Japan	NTTK14AB
2.4 m (8 ft), 240 VAC 10 amp, ANZ power cord AS-3, Australia, New Zealand	NTTK15AA
250 VAC, Option 11C Standard European power cord, Other EMEA, Kenya, Korea, Thailand, Indonesia, Vietnam, India, Pakistan	NTTK16AB
3 m (9.9 ft) 125 VAC, Option 11C Swiss power cord Switzerland	NTTK17AB
240 VAC, Option 11C UK power cord Hong Kong, Ireland, United Kingdom, Singapore, Malaysia, Bangladesh, Brunei, Sri Lanka	NTTK18AB
3 m (9.9 ft), 125 VAC, Option 11C Denmark power cord Denmark	NTTK22AB

Before you begin

The following section provides a step-by-step guide through the IP Phone 1120E installation process. Before installing the IP Phone 1120E, complete the following pre-installation checklist.

Procedure 58
Pre-installation checklist

- 1 Ensure there is one IP Phone 1120E boxed package for each IP Phone 1120E being installed. The package contains:
 - IP Phone 1120E
 - Handset
 - Handset cord
 - 2.3 m (7 ft) CAT5 Ethernet cable
 - Number plate and lens
 - Getting Started Card
- 2 To install and configure an IP Phone 1120E, the host system must be equipped with the Voice Gateway Media Card, or a Signaling Server with the Line TPS application.
- 3 If an AC power adapter is required, ensure the approved Nortel AC adapter (model # N0023000) is used. Refer to Table 33 on [page 325](#).
- 4 Understand the three configuration modes that you can choose as you proceed through the installation of the IP Phone 1120E. The three configuration modes are:
 - Static IP address (see “Static IP address assignment” on [page 329](#))
 - Partial DHCP (see “Dynamic IP address assignment—Partial DHCP” on [page 330](#))
 - Full DHCP (see “Dynamic IP address assignment—Full DHCP” on [page 330](#))
- 5 A DHCP server and DHCP relay agents, if required, must also be installed, configured, and running.

End of Procedure

First-time installation

IP address assignments

During the first-time installation, the three IP address parameters that are entered either manually or automatically depending on the installation configuration are as follows:

- Static IP address assignment
- Partial DHCP
- Full DHCP

As well, you are prompted to enable or disable 802.1Q. For more information, see “802.1Q VLAN description” on [page 407](#).

You can also use an enhanced network configuration menu to configure the IP Phone 1120E. The user can access the Local Tools menu at any time. Information is entered through the dialpad or an attached USB keyboard. For further information on using the Local Tools menu to configure the IP Phone 1120E, refer to “Configure IP Phone 1120E and IP Phone 1140E Local Tools options” on [page 463](#).

Use Procedure 59, “Installing an IP Phone 1120E for the first time” on [page 330](#).

Static IP address assignment

During the installation, the IP Phone 1120E parameters are entered manually using the key pad.

Enter the IP address, subnet mask, and default Gateway address. You must also enter the Connect Server parameters including IP address, port number, action, and retry count.

Dynamic IP address assignment—Partial DHCP

For a partial DHCP installation, you must provide, through the IP Phone 1120E key pad, the Connect Server parameters including: IP address, port number, action, and retry count. Other parameters (IP Phone IP address, subnet mask and default Gateway) are obtained from the DHCP server.

The IP Phone 1120E password, node ID and TN must be entered manually using the telephone dial pad.

For more information about DHCP servers, see *Converging the Data Network with VoIP* (553-3001-160).

Dynamic IP address assignment—Full DHCP

For a full DHCP installation, all parameters (IP Phone IP address, subnet mask, default Gateway, Connect Server IP address, port number, action, and retry count) are obtained from the DHCP server to recognize the IP Phone 1120E.

The IP Phone 1120E password, node ID, and TN must be entered manually using the telephone dial pad.

For more information on how to set up DHCP servers for use with the IP Phones, refer to *Converging the Data Network with VoIP* (553-3001-160).

Procedure 59

Installing an IP Phone 1120E for the first time

- 1 Configure a virtual loop on the system using LD 97.

For more information, see *Software Input/Output: Administration* (553-3001-311).

- 2 Configure the IP Phone 1120E on the system as IP Phone 2002 using LD 11. At the prompt, enter the following:

```
REQ:chg  
TYPE:i2002
```

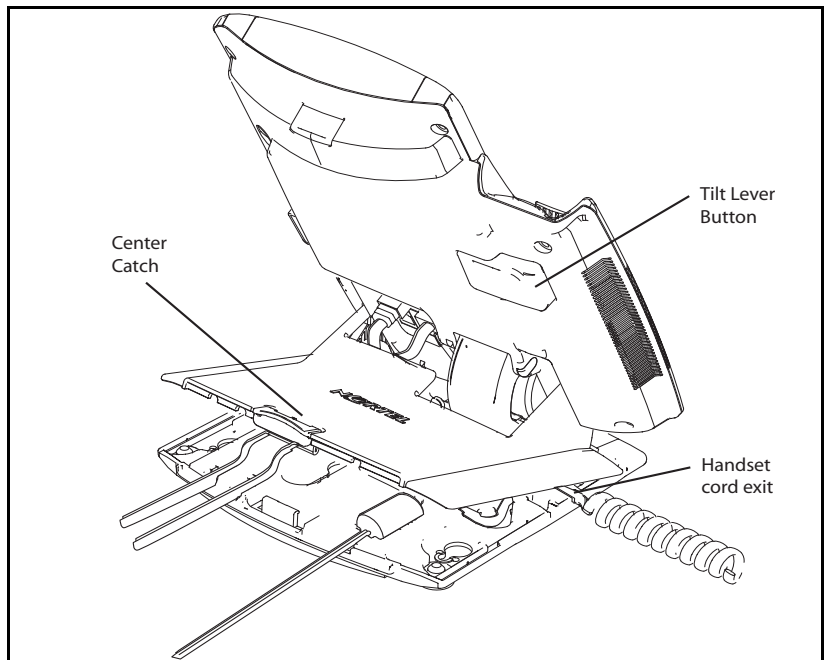
For more information, see *Software Input/Output: Administration* (553-3001-311).

**CAUTION**

The IP Phone 1120E is shipped with the base locked in position. To avoid damaging the IP Phone, press the wall-mount lever located under the Handsfree key to release the base and pull it away from the phone.

- 3 Remove the stand cover. Pull upward on the center catch and remove the stand cover. The cable routing tracks are now accessible. See Figure 50 on [page 331](#).

Figure 50
Stand cover removed



- 4 Connect the AC power adapter (optional). Connect the adapter to the AC adapter jack in the bottom of the phone. Form a small bend in the cable, and then thread the adapter cord through the channels in the stand.

WARNING

Use your IP Phone 1120E with the approved Nortel AC adapter (model # N0023000) for this model of phone *only*.

Note 1: The IP Phone 1120E supports both AC power and Power over LAN options, including IEEE 802.3af standard power. To use local AC power, the optional AC adapter can be ordered separately. To use Power over Ethernet, where power is delivered over the CAT5 cable, the LAN must support Power over Ethernet, and an AC adapter is not required.

Note 2: You must use CAT5e (or later) cables if you want to use gigabit Ethernet.



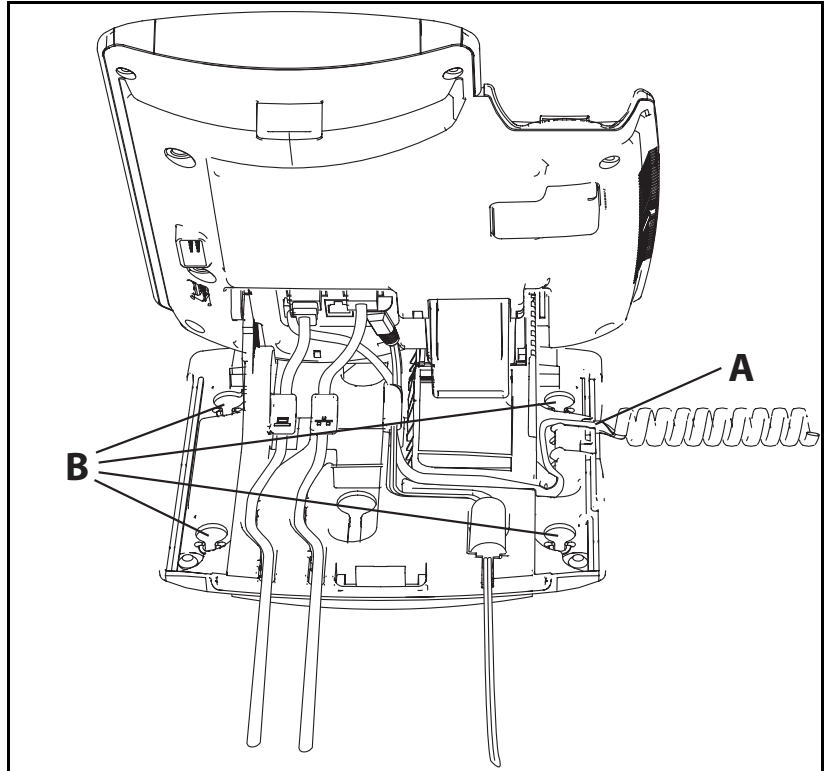






- 5 Install the handset. Connect the end of the handset cable with the short straight section into the handset. Connect the end of the handset cable with the long straight section to the back of the phone, using the RJ-9 handset jack marked with the symbol . Form a small bend in the cable, and then thread the handset cord through the channels in the stand so that it exits behind the handset on the right side, in the channel exit in the stand base marked with the symbol . See Figure 51 on [page 333](#).

Figure 51
Cable routing tracks



- 6** Install the headset (optional). If you are installing a headset, plug the connector into the RJ-9 headset jack marked with the symbol  on the back of the phone, and thread the headset cord along with the handset cord through the channels in the stand, so that the headset cord exits the channel marked with the symbol .
- 7** Install the Ethernet cable. Connect one end of the supplied Ethernet cable to the back of your phone using the RJ-45 connect marked with the symbol , and thread the network cable through the channel marked with the symbol .

- 8 Install the Ethernet cable connecting the PC to the phone (optional). If you are connecting your PC Ethernet through the phone, connect one end of the PD Ethernet cable to your phone using the RJ-45 connector marked with the symbol , and thread it through the channel marked with the symbol . Connect the other end to the LAN connector on the back of your PC.



CAUTION

Damage to Equipment

Do not plug your IP Phone 1120E into any other port but the PC Ethernet port. Severe damage can result.

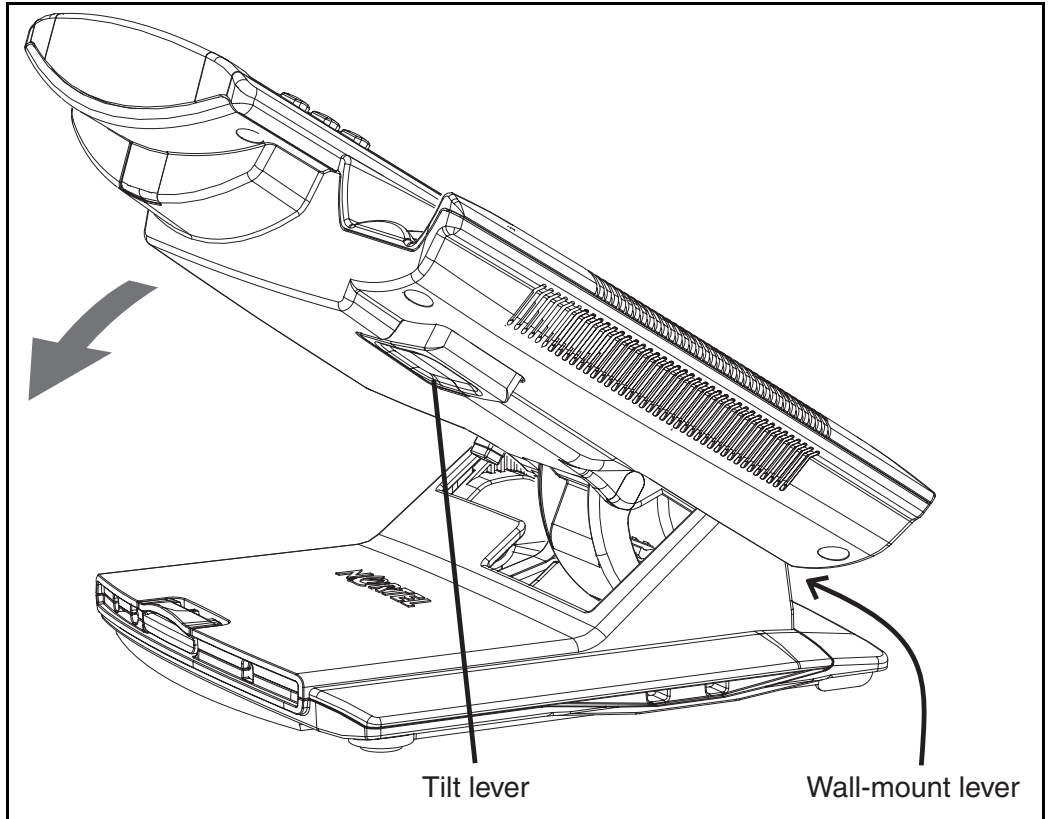
- 9 Install additional cables. If applicable, plug in optional USB devices. Connect the Ethernet cable to the LAN Ethernet connection. If you are using an AC power adapter, plug the adapter into an AC outlet.

Note: Complete steps 1-9, as needed, before wall-mounting the IP Phone.
- 10 Wall-mount your phone (optional). Use Method A or Method B to wall-mount the IP Phone. See Method A—using the mounting holes on the bottom of the phone stand, or Method B—using the traditional-style wall-mount box with a RJ-45 connector and a 15 cm (6 inch) RJ-45 cord (not provided).
 - Method A: Press the wall-mount lever, and pull away from the stand. Using the stand cover (see step 3 on [page 331](#)), mark the wall-mount holes by pressing the bottom of the stand cover firmly against the wall in the location where you wish to install the phone. Four small pins on the bottom of the stand cover make the marks on the wall. Use the marks as a guideline for installing the wall-mount screws (not provided).

Install the screws so that they protrude 3 mm (1/8 inch) from the wall, and then install the phone stand mounting holes over the screw heads. You may need to remove the phone from the wall to adjust the lower screws. When the lower screws are snug, install the phone on the mounting screws, and then tighten the top screws.
 - Method B: Attach the 15 cm (6 inch) CAT5e cable, position the stand over the mounting rivets, and slide the phone down the wall so that the rivets fit into the slots on the stand.
- 11 Replace the stand cover. Ensure that all cables are neatly routed and press the stand cover into place until you hear a click.

- 12 Put the phone in the wall-mount position (optional). If you wall-mount the phone, put it in the wall-mount position by holding the Tilt Lever and press the phone towards the base until the phone is parallel with the base. Release the Tilt Lever and continue to push the phone towards the base until you have an audible click. Ensure the phone is securely locked in to position. See Figure 52.

Figure 52
Rotate the phone into the wall mount position



IMPORTANT!

Timing information

There are only 4 seconds between plugging in the IP Phone 1120E power adapter and the appearance of the Nortel logo in the middle of the display. When you see the logo, you have 1 second to respond by pressing the 4 feature keys at the bottom of the display in sequence from left to right. If you miss the 1-second response time, the IP Phone 1120E attempts to locate the connect server. Wait until it is finished, and then begin the power-up sequence again.

- 13** When the Nortel logo appears in the middle of the display, immediately press the four feature keys at the bottom of the display in sequence from left to right. The **3.Network Configuration** menu opens.

Note: You can press the **Apply&Reset** soft key to save the following settings and to reset the IP Phone. You can press the **Exit** soft key exit the menu to exit the menu without saving any changes and return to the **3.Network Configuration** menu.

When the **3. Network Configuration** menu opens, the **Enable 802.1x (EAP)** check box is highlighted.

- 14** Press the **Enter** key to toggle this item on and off. A check mark appears to indicate the item is active.

If you select the **Enable 802.1x (EAP)** check box, press the Enter key to start the edit mode. Use the keypad to fill in the following information:

- EAP Device ID
- EAP Password

For further information about EAP, refer to Appendix C: "802.1x Port-based network access control" on [page 415](#).

Note: If you select do not select the **Enable 802.1x (EAP)** combo box, you will not be prompted to enter Device ID and Password.

- 15** Use the **Right** navigation key to scroll and highlight **DHCP** combo box.
- 16** Press the **Enter** key.
- 17** Press the **Down** navigation key to open list box.

- 18** Use the **Up/Down** navigation keys to scroll and highlight one of the following DHCP options:
- No—enter the information in the boxes.
 - Partial—enter Server 1 IP address, Server 2 IP address, Port, Action, Retry, and PK numbers in the boxes.
 - Full—all items are dimmed
- Note:** If Full is selected for DHCP in the list, all items are dimmed. If Partial or No is selected for DHCP in the list, all items are accessible. Use the navigation keys to scroll and highlight the items and use the keypad to enter the applicable information.
- 19** Press the **Enter** key.
- 20** Use the **Right** navigation key to scroll and highlight **SET IP**. Press the **Enter** key to start the edit mode. Use the keypad to fill in the information.
- Set IP—a valid IP Phone 1120E IP address.
- 21** Use the **Right** navigation key to scroll and highlight **NET MASK**. Press the **Enter** key to start the edit mode. Use the keypad to fill in the information.
- Net Mask—a subnet mask
- 22** Use the **Right** navigation key to scroll and highlight **Gateway**. Press the **Enter** key to start the edit mode. Use the keypad to fill in the information.
- Gateway—the default gateway for the IP Phone 1120E on the LAN segment to which it is connected
- 23** Use the **Right** navigation key to scroll and highlight **S1 IP**. Press the **Enter** key to start the edit mode. Use the keypad to fill in the information.
- S1 IP—the node IP address of the IP Phone 1120E

- 24 Use the **Right** navigation key to scroll and highlight **Port**.
S1 Port—a fixed value of 4100
- 25 Use the **Right** navigation key to scroll and highlight **S1 Action**. Press the **Enter** key to start the edit mode. Use the keypad to fill in the information.
S1 Action—a fixed value of 1
- 26 Use the **Right** navigation key to scroll and highlight **Retry**. Press the **Enter** key to start the edit mode. Use the keypad to fill in the information.
Retry—the number of times the IP Phone 1120E attempts to connect to the server
- 27 Use the **Right** navigation key to scroll and highlight **S1 PK**. Press the **Enter** key to start the edit mode. Use the keypad to fill in the information.
- 28 Use the **Right** navigation key to scroll and highlight **S2 IP**. Press the **Enter** key to start the edit mode. Use the keypad to fill in the information.
S2 IP—same as S1 in most cases
Note: The IP Phone 1120E can support a primary (S1) and secondary (S1) connect server. If you require IP Phones to register on multiple nodes, refer to *IP Line: Description, Installation, and Operation* (553-3001-365).
- 29 Use the **Right** navigation key to scroll and highlight **Port**. Press the **Enter** key to start the edit mode. Use the keypad to fill in the information.
Port—same as S1 port
- 30 Use the **Right** navigation key to scroll and highlight **S2 Action**. Press the **Enter** key to start the edit mode. Use the keypad to fill in the information.
S2 Action—same as S1
- 31 Use the **Right** navigation key to scroll and highlight **Retry**. Press the **Enter** key to start the edit mode. Use the keypad to fill in the information.
Retry—same as S1
- 32 Use the **Right** navigation key to scroll and highlight **S2 PK**. Press the **Enter** key to start the edit mode. Use the keypad to fill in the information.
S2 PK—same as S1
- 33 Use the **Right** navigation key to scroll and highlight **VoiceVLAN** combo box. Press the **Enter** key. Press the **Down** navigation key to open the list box.

- 34** Use the **Up/Down** navigation keys to scroll and highlight one of the following options:

- No—default
802.1Q VLAN remains off until initialization continues.
- Auto
- value

The VoiceVLAN ID is entered as an integer. The VoiceVLAN ID is a 12-bit value between 1 and 4095.

The IP Phone 1120E is configured with 802.1Q enabled, the VoiceVLAN ID is configured to the entered value and the VoiceVLAN priority is 6.

- 35** Press the **Enter** key.

For more information about VLAN configuration, refer to *Converging the Data Network with VoIP* (553-3001-160).

- 36** Use the **Right** navigation key to scroll and highlight **VLAN Filter** check box. Press the **Enter** key to toggle this item on and off.

Note: The **VLAN Filter** check box will appear dimmed if you select **No** in the **VoiceVLAN** combo box.

- 37** Use the **Right** navigation key to scroll and highlight **Disable PC Port** check box. Press the **Enter** key to toggle this item on and off.

- 38** Use the **Right** navigation key to scroll and highlight **DataVLAN** combo box. Press the **Enter** key. Press the **Down** navigation key to open the list box.

Use the **Up/Down** navigation keys to scroll and highlight one of the following options:

- No—default
- value

The DataVLAN is entered as an integer. The DATA VLAN ID is a 12-bit value between 0 and 4095, and should be different from the VoiceVLAN ID.

The IP Phone 1120E is configured with 802.1Q enabled, the Data VLAN ID is configured to the entered value, and the Data VLAN priority is 0.

- 39** Press the **Enter** key.

- 40** Use the **Right** navigation key to scroll and highlight **PC-Port Untag All** check box. Press the **Enter** key to toggle this item on and off.

- 41 Use the **Right** navigation key to scroll and highlight **Duplex** combo box. Press the **Enter** key. Press the **Down** navigation key to open the list box.

Use the **Up/Down** navigation keys to scroll and highlight one of the following options:

- Auto
- 10BT Full
- 100BT Full

- 42 Press the **Enter** key.

- 43 Use the **Right** navigation key to scroll and highlight **Ignore GARP** check box. Press the **Enter** key to toggle this item on and off.

- 44 Use the **Right** navigation key to scroll and highlight **XAS IP** combo box. Press the **Enter** key to start the edit mode. Use the keypad to fill in the information.

- 45 Use the **Right** navigation key to scroll and highlight **Graphical XAS** check box. Press the **Enter** key to toggle this item on and off.

- 46 Use the **Right** navigation key to scroll and highlight **Port** combo box. Press the **Enter** key to start the edit mode. Use the keypad to fill in the information.

- 47 Use the **Right** navigation key to scroll and highlight **TFTP IP** combo box. Press the **Enter** key to start the edit mode. Use the keypad to fill in the information.

TFTP IP—TFTP Server IP address (for Succession Release 3.0 or CS 1000 Release 4.0)

The TFTP Server is required to download the current firmware if you are using Succession Release 3.0 or CS 1000 Release 4.0. For further information about TFTP Server configuration, see Appendix E: “TFTP Server” on [page 489](#).

- 48 Use the **Right** navigation key to scroll and highlight **Enable Bluetooth** combo box. Press the **Enter** key. Press the **Down** navigation key to open the list box.

- 49** Use the **Up/Down** navigation keys to scroll and highlight one of the following options:
- Auto
 - Yes
 - No
- 50** Press the **Enter** key.
- 51** You can press the **Apply/Reset** soft key to save the settings and to reset the IP Phone. You can press the **Exit** soft key exit the menu to exit the menu without saving any changes and return to the main menu display.
- The IP Phone 1120E searches for the connect server.
- The IP Phone 1120E registers with the Terminal Proxy Server (TPS) and, if needed, begins the firmware download. This takes several minutes. When download is complete, the IP Phone 1120E resets.
- Note 1:** The Enhanced UNISTim Firmware Download feature for IP Phones provides an improved method of delivering new firmware to IP Phones. For further information about Enhanced UNISTim Firmware Download, refer to “Features overview” on [page 397](#).
- Note 2:** For Succession Release 3.0 and CS 1000 Release 4.0, the IP Phone 1120E searches for the TFTP Server for firmware upgrade. If the file name specified in 1120e.cfg is not the same as the current firmware, the IP Phone downloads the file and upgrades the firmware. This takes several minutes. When the upgrade is complete, the IP Phone 1120E reboots.
- The current system date and time appear on the top line of the display when the configuration is complete. Self-labeling keys also appear.
- 52** Check for dial tone and the correct DN on the display.
- 53** (Optional) Customize the feature keys as required. For more information, see *IP Phone 1120E User Guide*.

End of Procedure

Startup sequence

When an IP Phone 1120E is connected to the network, it must perform a startup sequence. The elements of the startup sequence include:

- obtaining the IP parameters
- finding a default Gateway server
- authenticating the user

See Table 34 for a summary of the IP parameters and how they are obtained.

Table 34
IP Phone 1120E IP parameters

Parameter	Method of acquisition
IP Address	Manually entered or automatically retrieved through Partial or Full DHCP.
Net Mask	Manually entered or automatically retrieved through Partial or Full DHCP.
Default Gateway address	Manually entered or automatically retrieved through Partial or Full DHCP.
Connect Server (IP address, port, action and retry count—primary and secondary)	Manually entered or automatically retrieved through Full DHCP.
User ID (Node ID, Node Password and TN)	Manually entered for first-time configuration. Retrieved from local storage on subsequent power cycles.

Full Duplex mode

In the **Configuration** menu, Auto Negotiate mode is the default setting for initial startup. Typically, the IP Phone is connected to a network that supports Auto Negotiate, and it selects the best speed and duplex mode available. There is no intervention required under normal operation.

If the IP Phone is connected to a network configured for Full Duplex mode only, cannot automatically negotiate the proper configuration. Therefore, in

this instance, to allow the IP Phone to work at the optimum speed and duplex mode, Auto Negotiate must be disabled. Use the following procedure to disable Auto Negotiate and enable Full Duplex mode.

Procedure 60**Disabling Auto Negotiate and enabling Full Duplex mode**

- 1** Double-press the **Services** key to open the **Local Tools** menu.
- 2** Press **3** on the dialpad to access the **Network Configuration** menu or use the Up/Down navigation keys to scroll and highlight the Network Configuration option.
- 3** Use the **Right** navigation key to scroll and highlight the **Duplex** combo box.
- 4** Press **Enter** to start the edit mode.
- 5** Press the **Down** navigation key to open list box.
- 6** Use the Up/Down navigation keys to scroll and highlight one of the following options:
 - 10BT Full—10 BT Full Duplex mode
 - 100BT Full—100 BT Full Duplex mode
- 7** Press **Enter** to exit the edit mode.
- 8** Press the **Apply&Reset** soft key to save the changes and to restart the IP Phone 1120E.

End of Procedure

When the IP Phone 1120E is restarted, the firmware reads the setting for Full Duplex mode and sets both port 0, network interface port, and port 1, PC interface port, accordingly.

Use the following procedure to confirm activation of Full Duplex mode.

Procedure 61
Checking Ethernet Statistics

- 1** Double-press the **Services** key.
- 2** Press **2** to select **Local Diagnostics**, then press **3** to open the **Ethernet Statistics** menu.

If Full Duplex mode is active, the following is displayed:

- Link Status: UP
- Duplex Mode: Full
- Network Speed: 10 Mb, 100 Mb or 1G
- Auto Sense/Negotiate
 - Auto-Nego Capability: No
 - Auto-Nego Completed: No

End of Procedure

TFTP firmware upgrade

When you enter Cfg TFTP = 1 (for yes), and enter an IP address, the phone searches for an upgrade file on the TFTP Server.

Note: Users of CS 1000 Release 4.5 or later do not need to enter a TFTP IP address.

Gratuitous Address Resolution Protocol Protection

Gratuitous Address Resolution Protocol Protection (GARP) protects the 1120E IP Phone from GARP Spoof attacks on the network. In a GARP Spoof attack, a malicious device on the network takes over an IP address (usually the default gateway) by sending unsolicited (or Gratuitous) ARP messages, thus manipulating the ARP table of the victim's machine. This allows the malicious device to launch a variety of attacks on the network, resulting in undesired traffic routing. For example, a GARP attack can convince the victim machine that the malicious device is the default gateway. In this

scenario, all traffic from the victim's machine flows through the malicious device.

To enable GARP Protection during configuration, refer to Procedure 59, "Installing an IP Phone 1120E for the first time" on [page 330](#).

Extensible Authentication Protocol

Extensible Authentication Protocol (EAP) is a general protocol that fulfills the protocol requirements defined by 802.1x. For further information on 802.1x, refer to Appendix C: "802.1x Port-based network access control" on [page 415](#).

Reinstalling an IP Phone 1120E

You can reinstall an existing previously configured IP Phone 1120E on the same system. For example, the IP Phone 1120E can be assigned to a new user (new TN) or to an existing user who moved to a new subnet by changing the TN of the IP Phone 1120E.

Procedure 62

Changing the TN of an existing IP Phone 1120E

- 1 Repower the IP Phone 1120E.

Note: During the reboot sequence of a previously configured IP Phone, the IP Phone 1120E displays the existing node number for approximately 5 seconds.

- 2 If node password is enabled and NULL, choose one of the following:
 - a. Disable password.
 - b. Set password as non-NULL.

- 3 Press **OK** when the node number displays.

If

Then

node password is enabled and is not NULL

a password screen displays. Go to step 4.

node password is disabled

a TN screen displays. Go to step 5.

- 4 Enter password at the password screen and press **OK**.
A TN screen displays.
- 5 Select the **Clear** soft key to clear the existing TN.

End of Procedure

Replacing an IP Phone 1120E

IMPORTANT!

Two IP Phones cannot share the same TN. You must remove the IP Phone 1120E that is currently using the TN.

Procedure 63 Replacing an IP Phone 1120E

- 1 Disconnect the IP Phone 1120E that you want to replace.
- 2 Follow Procedure 59 on [page 330](#) to install and configure the IP Phone 1120E.
- 3 Enter the same TN and Node Number as the IP Phone 1120E you replaced. The system associates the new IP Phone 1120E with the existing TN.

End of Procedure

Removing an IP Phone 1120E from service

Procedure 64

Removing an IP Phone 1120E from service

- 1 Disconnect the IP Phone 1120E from the network or turn off the power.

Note: The service to the PC is disconnected as well if the PC is connected to the IP Phone 1120E.

If the IP Phone 1120E was automatically configured, the DHCP lease expires and the IP address returns to the available pool.

- 2 In LD 11, OUT the TN.

IP Phone 1140E

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Introduction

This section explains how to install and maintain the IP Phone 1140E. For information on using the IP Phone 140E, see the *IP Phone 1140E User Guide*.

This section contains the following procedures:

- Procedure 65, “Pre-installation checklist” on [page 372](#).
- Procedure 66, “Installing an IP Phone 1140E for the first time” on [page 374](#).
- Procedure 67, “Disabling Auto Negotiate and enabling Full Duplex mode” on [page 387](#).
- Procedure 68, “Checking Ethernet Statistics” on [page 388](#).
- Procedure 69, “Enabling Bluetooth wireless technology on the IP Phone 1140E” on [page 390](#).
- Procedure 70, “Changing the TN of an existing IP Phone 1140E” on [page 395](#).
- Procedure 71, “Replacing an IP Phone 1140E” on [page 396](#).
- Procedure 72, “Removing an IP Phone 1140E from service” on [page 396](#).

Note: After an IP Phone is has been installed and configured, if power to the phone is interrupted, it is not necessary to reenter IP parameters, Node Number, TN, nor firmware again.

Description

The IP Phone 1140E brings voice and data to the desktop environment. It connects directly to the LAN through the Ethernet connection.

The IP Phone 1140E translates voice into data packets for transport using Internet Protocol. A Dynamic Host Configuration Protocol (DHCP) server can be used to provide information that enables the IP Phone 1140E network connection, and connection to the Voice Gateway Media Card. The IP Phone 1140E uses the customer IP network to communicate with the Signaling Server.

Figure 53 shows the IP Phone 1140E.

Figure 53
IP Phone 1140E




Supported features

The 1140E Phone supports the following features:

- six user-defined feature keys with labels and indicators
- four soft keys providing access to a maximum of 10 features

Note: Functions for the soft keys are configured in LD 11.

- graphical, high-resolution LCD display, backlit, with adjustable contrast
 - high quality speaker phone
 - volume control keys for adjusting ringer, speaker, handset, and headset volume
 - six specialized feature keys:
 - Quit/Stop
 - Directory
 - Message/Inbox
 - Shift/Outbox
 - Services
 - Copy
 - six call-processing fixed keys:
 - Mute
 - Handsfree
 - Goodbye
 - Expand to PC
 - Headset
 - Hold
 - gigabit Ethernet ports
 - integrated gigabit Ethernet switch for shared PC access
 - headset jack with On/Off key
 - USB port, to support keyboard or mouse
- Note:** Powered downstream 1.1 compliant USB hubs are supported, including USB 2.0 hubs, if they offer USB 1.1 backwards compliancy.
- automatic network configuration
 - hearing-aid compatibility

- wireless headset support through Bluetooth®  Bluetooth 1.2 compliant Audio Gateway Headset Profile, Power Classification 2

The IP Phone 1140E supports the following additional features:

- 802.1Q VLAN and 802.1p priority support, industry standards for managing bandwidth usage — full VLAN capability, including a manageable integrated switch in the IP Phone for VLAN and priority tagging for PC and IP Phone traffic
- 802.1x Port-based network access control, industry standard for passing Extensible Authentication Protocol (EAP) over a LAN
- integrated hardware to support power over Ethernet, for IEEE 802.3af standard power; also including support for PowerDsine Power over LAN Hub powering, and Cisco proprietary powering as tested with specific Cisco Ethernet switch equipment
- Gratuitous Address Resolution Protocol Protection (GARP)
- VLAN filtering
- Call Duration Timer
- ability to change the feature key labels
- Corporate Directory
- Personal Directory
- Redial List
- Callers List
- Password Administration
- Virtual office
- Branch Office
- Active Call Failover
- Enhanced UNISim Firmware Download
- 10/100/1000 Mbps Full Duplex mode
- External Application Server (XAS)

- language support: English, French, Swedish, Danish, Norwegian, German, Dutch, Portuguese, Czech, Finnish, Hungarian, Italian, Polish, Spanish, Russian, Latvian, Turkish, and Katakana
- In the case of the prompts locally generated by the phone for the Local Tools menu and in all local features, the language is controlled locally by the phone. Thus there are two language selection mechanisms on the phone: one for local features, which is selected in the Local Tools menu (press the Services key twice to access the Local Tools menu), and another for TPS features, which is selected in the Telephone Options menu (press the Services key, and select Telephone Options to access the Telephone Options menu). Refer to the appropriate telephone User Guide for more information.

Features not currently supported

The following features are not supported on the IP Phone 1140E:

- Live Dialpad
- Group Listening
- Set-to-Set messaging
- Context-sensitive soft keys

The three-port switch that is internal/external to the IP Phone 1140E is an unmanaged switch. It passes the packets (unmodified) and does not interpret the 802.1Q header. The three-port switch provides priority based on the port (that is, the IP Phone port traffic takes priority over the Ethernet).

The IP Phone 1140E components are shown in Table 35.

Table 35
IP Phone 1140E components and functions (Part 1 of 6)

Component	Function
Hold	Press the Hold key to put an active call on hold. Press the line (DN) key beside the flashing LCD to return to the caller on hold.
Goodbye	Press the Goodbye key to terminate an active call.
Message waiting indicator	When a message is left for the user, the orange Message waiting indicator flashes. Also, this indicator flashes when the set ringer is set to On.
Data message waiting indicator	When a data-related message, such as an instant message, is received, the blue Data message waiting indicator flashes. Also, this indicator flashes when a contact has come on-line. Note: This function requires server support and, therefore, is not available on all phones.
User-defined feature keys labels	User-defined feature key labels are configured for various features on the IP Phones. A steady LCD light beside a line (DN) key indicates the feature or line is active. A flashing LCD indicates the line is on hold or the feature is being programmed.
Soft keys	Soft keys are located below the display area. The LCD label above the key changes, based on the active feature. Note: A triangle before a key label indicates that the key is active.

Table 35
IP Phone 1140E components and functions (Part 2 of 6)

Component	Function
Fixed feature keys	Use these keys to access non-programmable standard features.
Expand to PC	The Expand to PC key is used to access external server applications such as External Application Server.
Navigation keys	Use the Navigation keys to scroll through menus and lists appearing on the LCD display screen. The outer part of this key cluster rocks for up, down, left, and right movements.
Send/Enter	Press the Send/Enter key, at the center of the Navigation key cluster, to confirm menu selections. In many cases, you can use the Send/Enter key instead of the Select soft key.
Message/Inbox	Press the Message/Inbox key to access your voicemail box.
Shift/Outbox	The Shift/Outbox key is a fixed key that is reserved for future feature development.
Quit/Stop	<p>Press the Quit/Stop key to end an active application.</p> <p>Pressing the Quit/Stop key does not affect the status of the calls currently on your IP Phone.</p>
Directory	Press the Directory key to access Directory services.

Table 35
IP Phone 1140E components and functions (Part 3 of 6)

Component	Function
Mute	<p>Press the Mute key to listen to the receiving party without transmitting.</p> <p>Press the Mute key again to return to a two way conversation.</p> <p>The Mute key applies to Handsfree, Handset, and Headset microphones.</p> <p>The Mute LED flashes when the Mute option is in use.</p>
Headset	<p>Press the Headset key to answer a call using the headset or to switch a call from the handset or Handsfree to the headset.</p> <p>Press the Headset key twice to access Bluetooth Setup dialog.</p>
Volume control keys	<p>Use the Volume control keys to adjust the volume of the handset, headset, speaker, ringer, and Handsfree feature.</p> <p>Press the volume key with the loudspeaker icon to increase volume; press the volume key without the loudspeaker icon to decrease volume.</p>

Table 35
IP Phone 1140E components and functions (Part 4 of 6)

Component	Function
Services	<p>Press the Services key to access the following items:</p> <ul style="list-style-type: none"> • Telephone Options (see Notes 1 and 2): <ul style="list-style-type: none"> — Volume Adjustment — Contrast Adjustment — Language — Date/Time — Display diagnostics — Local Dialpad Tone — Set Info — Diagnostics — Call Log Options — Ring type — Call Timer — OnHook Default Path — Change Feature Key Label — Name Display Format • Virtual Office Login and Virtual Office Logout (if Virtual Office is configured) • Test Local Mode and Resume Local Mode (if Branch Office is configured) • Password Admin • Display Network Diagnostics Utilities

Table 35
IP Phone 1140E components and functions (Part 5 of 6)

Component	Function
	<p>Press the Services key twice to access the Local Tools menu. The following items appear in the Local Tools menu:</p> <ul style="list-style-type: none">1. Preferences<ul style="list-style-type: none">1. Display Settings2. Languages...3. Bluetooth Setup2. Local Diagnostics<ul style="list-style-type: none">1. IP Set&DHCP Information2. Network Diagnostic Tools3. Ethernet Statistics4. IP Network Statistics5. USB Devices3. Network Configuration4. Lock Menu<ul style="list-style-type: none">1. Manual Secure Local Menu2. Manual Partial Secure Menu3. Manual Disable Secure Menu4. DHCP Secure Menu5. Lock Now <p>To make a selection, press the number associated with the menu item, or use the navigation keys to scroll through the menu items.</p> <p>Press the Services key to exit from any menu or menu item.</p>

Table 35
IP Phone 1140E components and functions (Part 6 of 6)

Component	Function
	For information on configuring IP Phone 1140E Local Tools menu, see “Configure IP Phone 1120E and IP Phone 1140E Local Tools options” on page 463 .
Copy	Press the Copy Key to copy entries to your Personal Directory from other lists, such as the Caller List, Redial List and Corporate Directory.
Speaker	Press the Handsfree key to activate the speaker.
Handsfree key	Press the Handsfree key to activate handsfree. The LED lights to indicate when the handsfree feature is active.
<p>Note 1: If a call is presented while the user is manipulating an option, the IP Phone 1140E rings and the DN key flashes. However, the screen display is not updated with Caller ID information. The programming text is not disturbed.</p> <p>Note 2: The user can originate a call using Autodial or Last Number Redial while manipulating an option. However, the display is not updated with the dialed digits or the Caller ID, and Autodial and Last Number Redial intercept the dialpad.</p>	

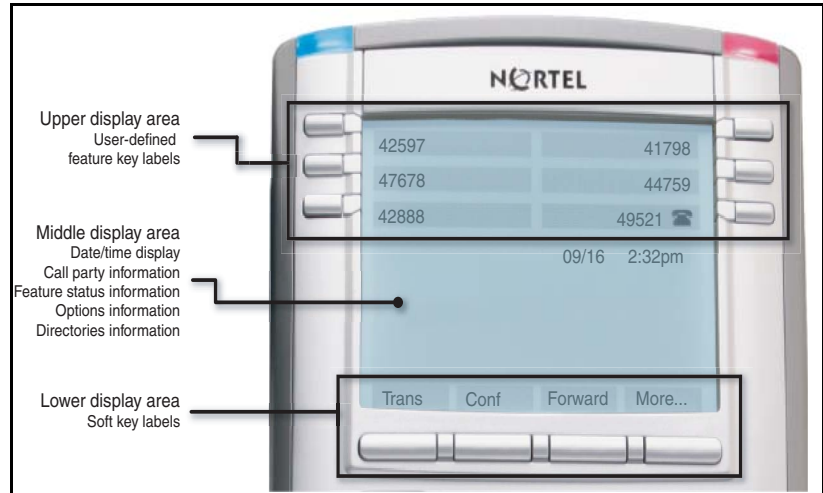
Display characteristics

An IP Phone 1140E has three major display areas:

- user-defined feature key label
- soft key label
- information line

Figure 54 on [page 362](#) shows these three display areas.

Figure 54
IP Phone 1140E display area



Cleaning the IP Phone display screen

Gently wipe the IP Phone display screen with a soft, dry cloth.



CAUTION

Do not use any liquids or powders on the IP Phone. Using anything other than a soft, dry cloth can contaminate IP Phone components and cause premature failure.

User-defined feature key label display

The feature key label area displays a 10-character string for each of the four feature keys. Each feature key includes the key label and an icon. The icon state can be on, off, or flashing. Key labels are left-aligned for keys on the left side of the screen, and right-aligned for keys on the right side of the screen.

Note: If a label is longer than ten characters, the last ten characters are displayed, and the excess characters are deleted from the beginning of the string.

Soft key label display

A maximum of ten functions can be assigned to the soft keys. Functions are assigned to the soft keys in layers in LD 11.

Use the **More** soft key to navigate through the layers of functions. If there are only four functions assigned to the soft keys, the **More** key does not appear and all four functions are displayed.

The soft key label has a maximum of seven characters. Each soft key includes the soft key label and an icon. When a soft key is in use, a flashing icon displays at the beginning of the soft key label, and the label shifts one character to the right. (If the label is six characters long, the last, or rightmost character is truncated.) If a feature is enabled, the icon state turns to On. It remains in the on state until the feature key is pressed again. This cancels the enabled feature and turns the icon off, returning the soft key label to its original state.

Information line display

An IP Phone 1140E has a three-line information display area with the following information:

- caller number
- caller name
- feature prompt strings
- user-entered digits
- date and time information (if the IP Phone is in an idle state)

The information in the display area changes, according to the call processing state and active features.

Password protection of the Tools menu

When password protection is enabled, the Tools menu is locked to prevent accidental or unwanted changes. The fixed password is required whenever the **Services** key is double-pressed or whenever the Local Diagnostics and Network Configuration sub menus are accessed. Use the dialpad to enter the fixed password 26567*738 (color*set).

There are two ways to control the menu lock:

- DHCP Secure Menu option—IP Phone process the secure menu setting retrieved from the Full DHCP response
- 4. Lock Menu—manual user settings
 - 1. Manual Secure Local Menu
 - 2. Manual Partial Secure Menu
 - 3. Manual Disable Secure Menu
 - 4. DHCP Secure Menu
 - 5. Lock Now

The settings configured in the Lock Menu sub menu override the settings received from the DHCP string.

For more information about 4. Lock Menu manual user settings, refer to “4. Lock Menu” on [page 486](#).

DHCP Secure Menu

Password protection is enabled during Full DHCP configuration if the SECUREMENU parameter, or the PARTSECUREMENU parameter are present at the end of the S4 part of the Full DHCP string. If neither the SECUREMENU parameter, nor the PARTSECUREMENU parameter is present, password protection is not enabled.

The SECUREMENU/PARTSECURE item is an optional parameter. If it is present, then the full S4 string needs to be present, including the action and retries. The S4 string will already be present if the XAS support has been configured through the DHCP. If XAS is not configured, the password

protection can still be enabled by setting the S4 IP address to 0.0.0.0 and setting the other fields to anything, although it is recommended you use 0 for these settings.

The following examples show how to configure password protection through the DHCP string:

- Menu protection on, no XAS configured:

```
Nortel-i2004-A,147.19.11.70:4100,1,10;147.19.11.7:
4100,1,5;0.0.0.0:0,0,0,SECUREMENU
```

or

```
Nortel-i2004-A,147.19.11.70:4100,1,10;147.19.11.7:
4100,1,5;0.0.0.0:0,0,0,PARTSECUREMENU
```

- Menu protection off, GraphicalXAS configured:

```
Nortel-i2004-A,xxx.xxx.xxx.xxx:pppppp,aaa.rrr;
xxx.xxx.xxx.xxx:pppppp,aaa,rrr;xxx.xxx.xxx.xxx:
pppppp,aaa
```

```
Nortel-i2004-A,147.19.11.70:4100,1,10;147.19.11.7:
4100,1,5;37.165.238.90:4443,1
```

- Menu protection on, GraphicalXAS configured:

```
Nortel-i2004-A,xxx.xxx.xxx.xxx:pppppp,aaa,rrr;  
xxx.xxx.xxx.xxx:pppppp,aaa,rrr;xxx.xxx.xxx.xxx:  
pppppp,aaa,rrr,SECUREMENU
```

```
Nortel-i2004-A,147.19.11.70:4100,1,10;  
147.19.11.70:4100,1,5;37.165.238.90:44443,1,5,  
SECUREMENU
```

or

```
Nortel-i2004-A,xxx.xxx.xxx.xxx:pppppp,aaa,rrr;  
xxx.xxx.xxx.xxx:pppppp,aaa,rrr;xxx.xxx.xxx.xxx:  
pppppp,aaa,rrr,PARTSECUREMENU
```

```
Nortel-i2004-A,147.19.11.70:4100,1,10;  
147.19.11.70:4100,1,5;37.165.238.90:44443,1,5,  
PARTSECUREMENU
```

IMPORTANT!

In Full DHCP mode, the server must be configured to respond to the request for vendor-specific encapsulated options.

For further information on configuring Full DHCP, refer to *Converging the Data Network with VoIP* (553-3001-160).

Accessing the Tools menu

If the SECUREMENU parameter was set during Full DHCP configuration, you are prompted to enter the fixed password (26567*738) whenever the **Services** key is double-pressed on the IP Phone 1140E. If the PARTSECURE parameter was set during Full DHCP configuration, you are prompted to enter the fixed password whenever you access 2. Local Diagnostics or 3. Network Configuration menu items from the Tools menu. You are always prompted to enter the fixed password whenever you access the 4. Lock Menu sub menu.

Once the password is entered, the Tools menu remains active for 5 minutes. You can freely navigate, exit and reenter the Tools menu without being

prompted to reenter the password. To reset the timer before the 5 minute time expires, double-press the **Services** key.

You can also press the 5 key to select the **Lock Now** item from the Lock Menu. The Lock Now item immediately exits the Tools menu, closes any open Tools menu pages, and locks the **Tools** menu. Alternatively, when time expires, the Tools menu and any open submenus are closed. Double-press the **Services** key to open the password prompt window to reaccess the Tools menu.

If you enter an incorrect password, the Tools menu will not open. Double-press the Services key to open the password prompt window. Only three incorrect password entries are allowed. Any entry after the three attempts is ignored for 5 minutes. The password prompt window is visible and you can reenter the password but the password is not processed until the 5 minute time expires.

Note: Some items appear dimmed depending on the current state of the menu lock and the mode of the IP Phone. The current selected mode is dimmed. Only configuration options which are enabled from the current state appear active.

For more information about configuring the Local Tools menu for the IP Phone 1120E, refer to “Configure IP Phone 1120E and IP Phone 1140E Local Tools options” on [page 463](#).

Key number assignments

The IP Phone 1140E has four soft-labeled, predefined soft keys that are used to provide up to 10 features. Because they are predefined, the user cannot change the key number assignment.

The Message key is numbered 16. Key numbers 17 to 31 are the four soft-key labels below the display area. See Figure 54 on [page 362](#).

Key numbers 17 to 31 support the features A03, A06, CFW, CHG, CPN, PRK, PRS, RGA, RNP, SCC, SCU, SSC, SSU and TRN, as listed in Table 36 on [page 368](#).

Key number mappings at the Call Server are aligned with that of the IP Phone 2004.

Table 36 describes the IP Phone feature assignment for each of the dedicated keys. Use LD 11 to program keys 16 to 26 on the IP Phone 1140E.

Note: If you attempt to configure anything other than the permitted response, the system generates an error code.

Table 36
IP Phone 1140E soft keys (Part 1 of 2)

Key number	Response	Description
Key 16	MWK	Message Waiting key
	NUL	Removes function or feature from key
Key 17	TRN	Call Transfer key
	NUL	Removes function or feature from key
Key 18	A03	Three-party conference key
	A06	Six-party conference key
	NUL	Removes function or feature from key
Key 19	CFW	Call Forward key
	NUL	Removes function or feature from key
Key 20	RGA	Ring Again key
	NUL	Removes function or feature from key
Key 21	PRK	Call Park key
	NUL	Removes function or feature from key
Key 22	RNP	Ringing Number Pickup key
	NUL	Removes function or feature from key

Table 36
IP Phone 1140E soft keys (Part 2 of 2)

Key number	Response	Description
Key 23	SCU	Speed Call User
	SSU	System Speed Call User
	SCC	Speed Call Controller
	SSC	System Speed Call Controller
	NUL	Removes function or feature from key
Key 24	PRS	Privacy Release key
	NUL	Removes function or feature from key
Key 25	CHG	Charge Account key
	NUL	Removes function or feature from key
Key 26	CPN	Calling Party Number key
	NUL	Removes function or feature from key

Package components

The approved Nortel AC adapter and a standard local power cord must be ordered separately if local power using the AC adapter is required. Refer to Table 37 on [page 370](#).

The IP Phone 1140E includes integrated support for a number of power over LAN options, including support for IEEE 802.3af standard power.

WARNING

Use your IP Phone 1140E with the approved Nortel AC adapter (model # N0023000) for this model of phone *only*.

Table 37 lists the IP Phone 1140E package components and product codes.

Table 37
IP Phone 1140E component list (Part 1 of 2)

IP Phone 1140E package contents includes	
<ul style="list-style-type: none"> • IP Phone 1140E • Handset • Handset cord • 2.3 m (7 ft) CAT5 Ethernet cable • Number plate and lens • Getting Started Card 	
IP Phone 1140E with icon keycaps	NTYS05AA
IP Phone 1140E with English keycaps	NTYS05BA
Replacement parts	
Handset, Charcoal	NTYS09AA70
Handset cord, Charcoal	NTYS10AA70
Footstand kit, Charcoal	NTYS11AA70
Phone number label and lens kit	NTYS12AA
2.3 m (7 ft) CAT5 Ethernet cable	NTYS13AA
Power adapter	
Global power supply	N0023000
AC cord	
1.8 m (5.9 ft), 10 amp, IEC320-C13 North America	NTYS14AA
Note: Nortel recommends you use the thinner cord (NTYS14AA) as an alternative to NTTK14AB.	

Table 37
IP Phone 1140E component list (Part 2 of 2)

IEC cable	
3 m (9.9 ft), 125 VAC 13 amp, NA power cord, NEMA North America, Middle East, Taiwan, Philippines, Thailand, and Japan	NTTK14AB
2.4 m (8 ft), 240 VAC 10 amp, ANZ power cord AS-3, Australia, New Zealand	NTTK15AA
250 VAC, Option 11C Standard European power cord, Other EMEA, Kenya, Korea, Thailand, Indonesia, Vietnam, India, Pakistan	NTTK16AB
3 m (9.9 ft) 125 VAC, Option 11C Swiss power cord Switzerland	NTTK17AB
240 VAC, Option 11C UK power cord Hong Kong, Ireland, United Kingdom, Singapore, Malaysia, Bangladesh, Brunei, Sri Lanka	NTTK18AB
3 m (9.9 ft), 125 VAC, Option 11C Denmark power cord Denmark	NTTK22AB

Before you begin

The following section provides a step-by-step guide through the IP Phone 1140E installation process. Before installing the IP Phone 1140E, complete the following pre-installation checklist.

Procedure 65
Pre-installation checklist

- 1 Ensure there is one IP Phone 1140E boxed package for each IP Phone 1140E being installed. The package contains:
 - IP Phone 1140E
 - Handset
 - Handset cord
 - 2.3 m (7 ft) CAT5 Ethernet cable
 - Number plate and lens
 - Getting Started Card
- 2 To install and configure an IP Phone 1140E, the host system must be equipped with the Voice Gateway Media Card, or a Signaling Server with the Line TPS application.
- 3 If an AC power adapter is required, ensure the approved Nortel AC adapter (model # N0023000) is used. Refer to Table 37 on [page 370](#).
- 4 Understand the three configuration modes that you can choose from as you proceed through the installation of the IP Phone 1140E. The three configuration modes are:
 - Static IP address—see “Static IP address assignment” on [page 373](#).
 - Partial DHCP—see “Dynamic IP address assignment—Partial DHCP” on [page 374](#).
 - Full DHCP—see “Dynamic IP address assignment—Full DHCP” on [page 374](#).
- 5 A DHCP server and DHCP relay agents, if required, must also be installed, configured, and running.

End of Procedure

First-time installation

To install and configure an IP Phone 1140E, you must first install a Voice Gateway Media Card in the system.

**CAUTION****Damage to Equipment**

Do not plug your IP Phone 1140E into an ISDN connection. Severe damage can result.

IP address assignments

During the first-time installation, the three IP address parameters that are entered either manually or automatically depending on the installation configuration are as follows:

- Static IP address assignment
- Partial DHCP
- Full DHCP

As well, you are prompted to enable or disable 802.1Q. For more information, see “802.1Q VLAN description” on [page 407](#).

You can also use an enhanced network configuration menu to configure the IP Phone 1140E. The user can access the Local Tools menu at any time. Information is entered through the keypad or an attached USB keyboard. For further information on using the Local Tools menu to configure the 1140E Phone, refer to “Configure IP Phone 1120E and IP Phone 1140E Local Tools options” on [page 463](#).

Use Procedure 66, “Installing an IP Phone 1140E for the first time” on [page 374](#).

Static IP address assignment

During the installation, the IP Phone 1140E parameters are entered manually using the telephone key pad.

Enter the IP address, subnet mask, default Gateway, IP address, port number, action, and retry count.

Dynamic IP address assignment—Partial DHCP

For a partial DHCP installation, you must provide, through the IP Phone's key pad, the Connect Server parameters including: IP address, port number, action, and retry count. Other parameters (IP Phone IP address, subnet mask, and default Gateway) are obtained from the DHCP server.

The IP Phone password, node ID and TN must be entered manually using the telephone key pad.

For more information about DHCP servers, see *Converging the Data Network with VoIP* (553-3001-160).

Dynamic IP address assignment—Full DHCP

For a full DHCP installation, all parameters (IP Phone IP address, subnet mask, default Gateway, Connect Server IP address, port number, action, and retry count) are retrieved from the DHCP server to recognize the IP Phone 1140E.

The IP Phone 1140E password, node ID and TN must be entered manually using the telephone key pad.

Procedure 66

Installing an IP Phone 1140E for the first time

- 1 Configure a virtual loop on the system using LD 97.

For more information, see *Software Input/Output: Administration* (553-3001-311).

- 2 Configure the IP Phone 1140E on the system as IP Phone 2004 using LD 11. At the prompt, enter the following:

```
REQ:chg  
TYPE:i2004
```

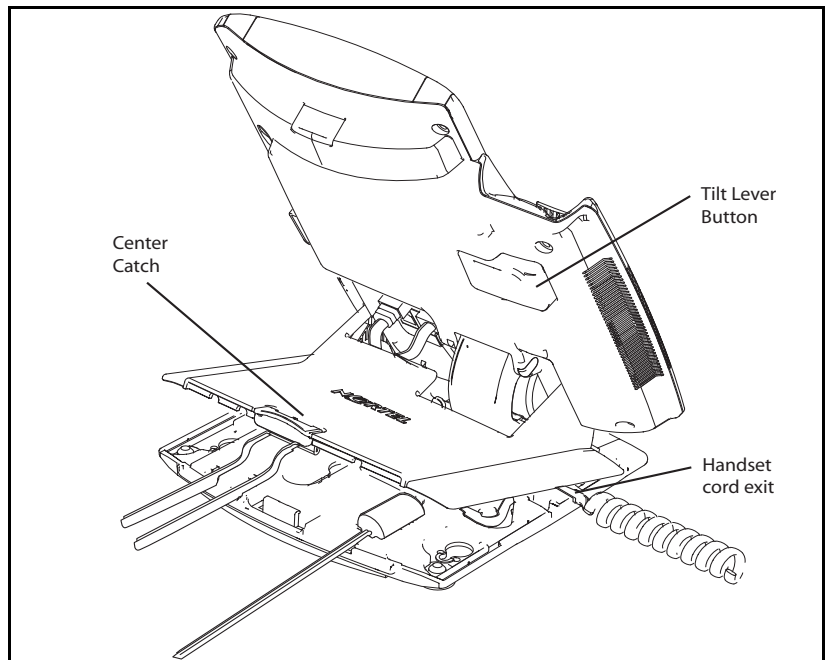
For more information, see *Software Input/Output: Administration* (553-3001-311).

**CAUTION**

The IP Phone 1140E is shipped with the base locked in position. To avoid damaging the IP Phone, press the wall-mount lever located under the Handsfree key to release the base and pull it away from the phone.

- 3 Remove the stand cover. Pull upward on the center catch and remove the stand cover. The cable routing tracks are now accessible. See Figure 55 on [page 375](#).

Figure 55
Stand cover removed



- 4 Connect the AC power adapter (optional). Connect the adapter to the AC adapter jack in the bottom of the phone. Form a small bend in the cable, and then thread the adapter cord through the channels in the stand.

WARNING

Use your IP Phone 1140E with the approved Nortel AC adapter (model # N0023000) for this model of phone *only*.

Note 1: The IP Phone 1120E supports both AC power and Power over Ethernet options, including IEEE 802.3af standard power. To use local AC power, the optional AC adapter can be ordered separately. To use Power over Ethernet, where power is delivered over the CAT5 cable, the LAN must support Power over Ethernet, and an AC adapter is not required.

Note 2: You must use CAT5e (or later) cables if you want to use gigabit Ethernet.



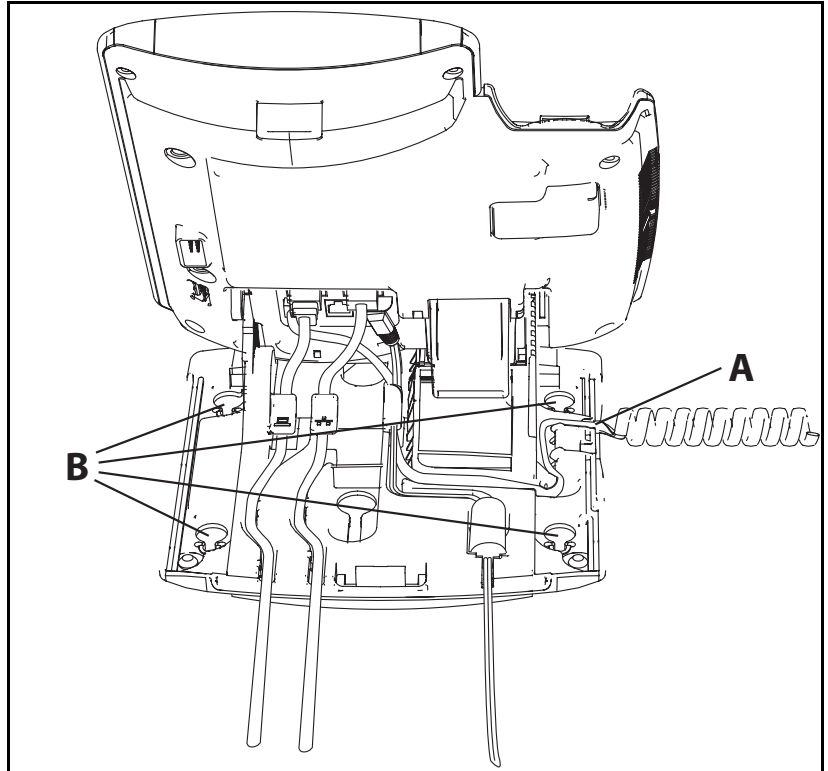





- 5 Install the handset. Connect the end of the handset cable with the short straight section into the handset. Connect the end of the handset cable with the long straight section to the back of the phone, using the RJ-9 handset jack marked with the symbol . Form a small bend in the cable, and then thread the handset cord through the channels in the stand so that it exits behind the handset on the right side, in the channel exit in the stand base marked with the symbol . See Figure 56 on [page 377](#).

Figure 56
Cable routing tracks



- 6** Install the headset (optional). If you are installing a headset, plug the connector into the RJ-9 headset jack marked with the symbol  on the back of the phone, and thread the headset cord along with the handset cord through the channels in the stand, so that the headset cord exits the channel marked with the symbol .
- 7** Install the Ethernet cable. Connect one end of the supplied Ethernet cable to the back of your phone using the RJ-45 connect marked with the symbol , and thread the network cable through the channel marked with

- 8 Install the Ethernet cable connecting the PC to the phone (optional). If you are connecting your PC Ethernet through the phone, connect one end of the PC Ethernet cable to your phone using the RJ-45 connector marked with the symbol , and thread it through the channel marked with the symbol . Connect the other end to the LAN connector on the back of your PC.



CAUTION

Damage to Equipment

Do not plug your IP Phone 1140E into any other port but the PC Ethernet port. Severe damage can result.

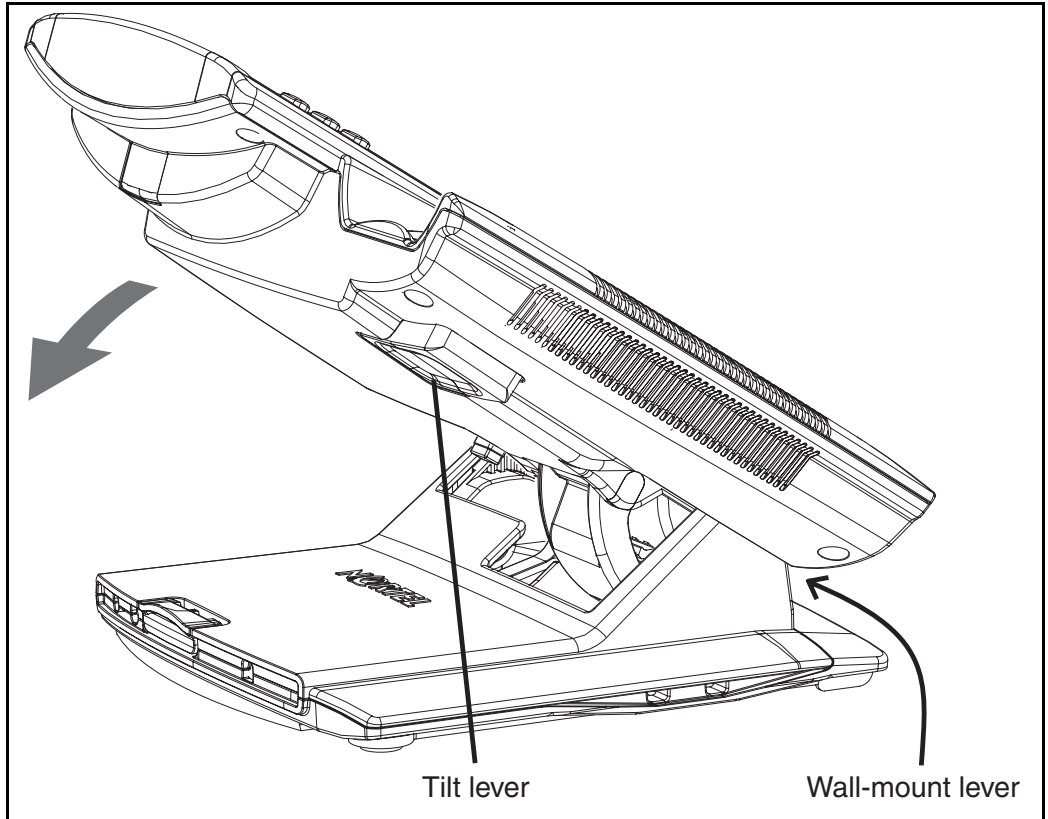
- 9 Install additional cables. If applicable, plug in optional USB devices. Connect the Ethernet cable to the LAN Ethernet connection. If you are using an AC power adapter, plug the adapter into an AC outlet.

Note: Complete steps 1-9, as needed, before wall-mounting the IP Phone.
- 10 Wall-mount your phone (optional). Use Method A or Method B to wall-mount the IP Phone. See Method A—using the mounting holes on the bottom of the phone stand, or Method B—using the traditional-style wall-mount box with a RJ-45 connector and a 15 cm (6 inch) RJ-45 cord (not provided).
 - Method A: Press the wall-mount lever, and pull away from the stand. Using the stand cover (see step 3 on [page 375](#)), mark the wall-mount holes by pressing the bottom of the stand cover firmly against the wall in the location where you wish to install the phone. Four small pins on the bottom of the stand cover make the marks on the wall. Use the marks as a guideline for installing the wall-mount screws (not provided).

Install the screws so that they protrude 3 mm (1/8 inch) from the wall, and then install the phone stand mounting holes over the screw heads. You may need to remove the phone from the wall to adjust the lower screws. When the lower screws are snug, install the phone on the mounting screws, and then tighten the top screws.
 - Method B: Attach the 15 cm (6 inch) CAT5e cable, position the stand over the mounting rivets, and slide the phone down the wall so that the rivets fit into the slots on the stand.
- 11 Replace the stand cover. Ensure that all cables are neatly routed and press the stand cover into place until you hear a click.

- 12 Put the phone in the wall-mount position (optional). If you wall-mount the phone, put it in the wall-mount position by holding the Tilt Lever and press the phone towards the base until the phone is parallel with the base. Release the Tilt Lever and continue to push the phone towards the base until you have an audible click. Ensure the phone is securely locked in to position.

Figure 57
Rotate the phone into the wall mount position



IMPORTANT!

Timing information

There are only 4 seconds between plugging in the IP Phone 1140E power adapter and the appearance of the Nortel logo in the middle of the display. When you see the logo, you have 1 second to respond by pressing the 4 feature keys at the bottom of the display in sequence from left to right. If you miss the 1-second response time, the IP Phone 1140E attempts to locate the connect server. Wait until it is finished, and then begin the power-up sequence again.

- 13** When the Nortel logo appears in the middle of the display, immediately press the four feature keys at the bottom of the display in sequence from left to right. The **3.Network Configuration** menu opens.

Note: You can press the **Apply&Reset** soft key to save the following settings and to reset the IP Phone. You can press the **Exit** soft key exit the menu to exit the menu without saving any changes and return to the **3.Network Configuration** menu.

When the **3. Network Configuration** menu opens, the **Enable 802.1x (EAP)** check box is highlighted.

- 14** Press the **Enter** key to toggle this item on and off. A check mark appears to indicate the item is active.

If you select the **Enable 802.1x (EAP)** check box, press the Enter key to start the edit mode. Use the keypad to fill in the following information:

- EAP Device ID
- EAP Password

For further information about EAP, refer to Appendix C: "802.1x Port-based network access control" on [page 415](#).

Note: If you select do not select the **Enable 802.1x (EAP)** combo box, you will not be prompted to enter Device ID and Password.

- 15** Use the **Right** navigation key to scroll and highlight **DHCP** combo box.
- 16** Press the **Enter** key.
- 17** Press the **Down** navigation key to open list box.

- 18** Use the **Up/Down** navigation keys to scroll and highlight one of the following DHCP options:
- No—enter the information in the boxes.
 - Partial—enter Server 1 IP address, Server 2 IP address, Port, Action, Retry, and PK numbers in the boxes.
 - Full—all items are dimmed
- Note:** If Full is selected for DHCP in the list, all items are dimmed. If Partial or No is selected for DHCP in the list, all items are accessible. Use the navigation keys to scroll and highlight the items and use the keypad to enter the applicable information.
- 19** Press the **Enter** key.
- 20** Use the **Right** navigation key to scroll and highlight **SET IP**. Press the **Enter** key to start the edit mode. Use the keypad to fill in the information.
- Set IP—a valid IP Phone 1140E IP address.
- 21** Use the **Right** navigation key to scroll and highlight **NET MASK**. Press the **Enter** key to start the edit mode. Use the keypad to fill in the information.
- Net Mask—a subnet mask
- 22** Use the **Right** navigation key to scroll and highlight **Gateway**. Press the **Enter** key to start the edit mode. Use the keypad to fill in the information.
- Gateway—the default gateway for the IP Phone 1140E on the LAN segment to which it is connected
- 23** Use the **Right** navigation key to scroll and highlight **S1 IP**. Press the **Enter** key to start the edit mode. Use the keypad to fill in the information.
- S1 IP—the node IP address of the IP Phone 1140E

- 24 Use the **Right** navigation key to scroll and highlight **Port**.
S1 Port—a fixed value of 4100
- 25 Use the **Right** navigation key to scroll and highlight **S1 Action**. Press the **Enter** key to start the edit mode. Use the keypad to fill in the information.
S1 Action—a fixed value of 1
- 26 Use the **Right** navigation key to scroll and highlight **Retry**. Press the **Enter** key to start the edit mode. Use the keypad to fill in the information.
Retry—the number of times the IP Phone 1140E attempts to connect to the server
- 27 Use the **Right** navigation key to scroll and highlight **S1 PK**. Press the **Enter** key to start the edit mode. Use the keypad to fill in the information.
- 28 Use the **Right** navigation key to scroll and highlight **S2 IP**. Press the **Enter** key to start the edit mode. Use the keypad to fill in the information.
S2 IP—same as S1 in most cases
Note: The IP Phone 1140E can support a primary (S1) and secondary (S1) connect server. If you require IP Phones to register on multiple nodes, refer to *IP Line: Description, Installation, and Operation* (553-3001-365).
- 29 Use the **Right** navigation key to scroll and highlight **Port**. Press the **Enter** key to start the edit mode. Use the keypad to fill in the information.
Port—same as S1 port
- 30 Use the **Right** navigation key to scroll and highlight **S2 Action**. Press the **Enter** key to start the edit mode. Use the keypad to fill in the information.
S2 Action—same as S1
- 31 Use the **Right** navigation key to scroll and highlight **Retry**. Press the **Enter** key to start the edit mode. Use the keypad to fill in the information.
Retry—same as S1
- 32 Use the **Right** navigation key to scroll and highlight **S2 PK**. Press the **Enter** key to start the edit mode. Use the keypad to fill in the information.
S2 PK—same as S1
- 33 Use the **Right** navigation key to scroll and highlight **VoiceVLAN** combo box. Press the **Enter** key. Press the **Down** navigation key to open the list box.

- 34** Use the **Up/Down** navigation keys to scroll and highlight one of the following options:

- No—default
802.1Q VLAN remains off until initialization continues.
- Auto
- value

The VoiceVLAN ID is entered as an integer. The VoiceVLAN ID is a 12-bit value between 1 and 4095.

The IP Phone 1140E is configured with 802.1Q enabled, the VoiceVLAN ID is configured to the entered value and the VoiceVLAN priority is 6.

- 35** Press the **Enter** key.

For more information about VLAN configuration, refer to *Converging the Data Network with VoIP* (553-3001-160).

- 36** Use the **Right** navigation key to scroll and highlight **VLAN Filter** check box. Press the **Enter** key to toggle this item on and off.

Note: The **VLAN Filter** check box will appear dimmed if you select **No** in the **VoiceVLAN** combo box.

- 37** Use the **Right** navigation key to scroll and highlight **Disable PC Port** check box. Press the **Enter** key to toggle this item on and off.

- 38** Use the **Right** navigation key to scroll and highlight **DataVLAN** combo box. Press the **Enter** key. Press the **Down** navigation key to open the list box.

Use the **Up/Down** navigation keys to scroll and highlight one of the following options:

- No—default
- value

The DataVLAN is entered as an integer. The DATA VLAN ID is a 12-bit value between 0 and 4095, and should be different from the VoiceVLAN ID.

The IP Phone 1140E is configured with 802.1Q enabled, the Data VLAN ID is configured to the entered value, and the Data VLAN priority is 0.

- 39** Press the **Enter** key.

- 40** Use the **Right** navigation key to scroll and highlight **PC-Port Untag All** check box. Press the **Enter** key to toggle this item on and off.

- 41 Use the **Right** navigation key to scroll and highlight **Duplex** combo box. Press the **Enter** key. Press the **Down** navigation key to open the list box.

Use the **Up/Down** navigation keys to scroll and highlight one of the following options:

- Auto
- 10BT Full
- 100BT Full

- 42 Press the **Enter** key.

- 43 Use the **Right** navigation key to scroll and highlight **Ignore GARP** check box. Press the **Enter** key to toggle this item on and off.

- 44 Use the **Right** navigation key to scroll and highlight **XAS IP** combo box. Press the **Enter** key to start the edit mode. Use the keypad to fill in the information.

- 45 Use the **Right** navigation key to scroll and highlight **Graphical XAS** check box. Press the **Enter** key to toggle this item on and off.

- 46 Use the **Right** navigation key to scroll and highlight **Port** combo box. Press the **Enter** key to start the edit mode. Use the keypad to fill in the information.

- 47 Use the **Right** navigation key to scroll and highlight **TFTP IP** combo box. Press the **Enter** key to start the edit mode. Use the keypad to fill in the information.

TFTP IP—TFTP Server IP address (for Succession Release 3.0 or CS 1000 Release 4.0)

The TFTP Server is required to download the current firmware if you are using Succession Release 3.0 or CS 1000 Release 4.0. For further information about TFTP Server configuration, see Appendix E: “TFTP Server” on [page 489](#).

- 48 Use the **Right** navigation key to scroll and highlight **Enable Bluetooth** combo box. Press the **Enter** key. Press the **Down** navigation key to open the list box.

- 49 Use the **Up/Down** navigation keys to scroll and highlight one of the following options:
- Auto
 - Yes
 - No
- 50 Press the **Enter** key.
- 51 You can press the **Apply/Reset** soft key to save the settings and to reset the IP Phone. You can press the **Exit** soft key exit the menu to exit the menu without saving any changes and return to the main menu display.
- The IP Phone 1140E searches for the connect server.
- The IP Phone 1140E registers with the Terminal Proxy Server (TPS) and, if needed, begins the firmware download. This takes several minutes. When download is complete, the IP Phone 1140E resets.
- Note 1:** The Enhanced UNISTim Firmware Download feature for IP Phones provides an improved method of delivering new firmware to IP Phones. For further information about Enhanced UNISTim Firmware Download, refer to “Features overview” on [page 397](#).
- Note 2:** For Succession Release 3.0 and CS 1000 Release 4.0, the IP Phone 1140E searches for the TFTP Server for firmware upgrade. If the file name specified in 1140e.cfg is not the same as the current firmware, the IP Phone downloads the file and upgrades the firmware. This takes several minutes. When the upgrade is complete, the IP Phone 1140E reboots.
- The current system date and time appear on the top line of the display when the configuration is complete. Self-labeling keys also appear.
- 52 Check for dial tone and the correct DN on the display.
- 53 (Optional) Customize the feature keys as required. For more information, see For more information, see *Software Input/Output: Administration* (553-3001-311) and the *IP Phone 1140E User Guide*.

End of Procedure

Startup sequence

When an IP Phone 1140E is connected to the network, it must perform a startup sequence. The elements of the startup sequence include:

- obtaining the IP parameters
- finding a default Gateway server
- authenticating the user

See Table 38 on [page 386](#) for a summary of the IP parameters and how they are obtained.

Table 38
IP Phone 1140E IP parameters

Parameter	Method of Acquisition
IP Address	Manually entered or automatically retrieved through Partial or Full DHCP.
Net Mask	Manually entered or automatically retrieved through Partial or Full DHCP.
Default Gateway address	Manually entered or automatically retrieved through Partial or Full DHCP.
Connect Server (IP address, port, action and retry count—primary and secondary)	Manually entered or automatically retrieved through Full DHCP.
User ID (Node ID, Node Password and TN)	Manually entered for first-time configuration. Retrieved from local storage on subsequent power cycles.

Full Duplex mode

In the **Configuration** menu, Auto Negotiate mode is the default setting for initial startup. Typically, the IP Phone is connected to a network that supports Auto Negotiate, and it selects the best speed and duplex mode available. There is no intervention required under normal operation.

If the IP Phone is connected to a network configured for Full Duplex mode only, cannot automatically negotiate the proper configuration. Therefore, in this instance, to allow the IP Phone to work at the optimum speed and duplex mode, Auto Negotiate must be disabled. Use the following procedure to disable Auto Negotiate and enable Full Duplex mode.

Procedure 67
Disabling Auto Negotiate and enabling Full Duplex mode

- 1 Double-press the **Services** key to open the **Local Tools** menu.
- 2 Press **3** on the dialpad to access the **Network Configuration** menu or use the Up/Down navigation keys to scroll and highlight the Network Configuration option.
- 3 Use the **Right** navigation key to scroll and highlight the **Duplex** combo box.
- 4 Press **Enter** to start the edit mode.
- 5 Press the **Down** navigation key to open list box.
- 6 Use the **Up/Down** navigation keys to scroll and highlight one of the following options:
 - 10BT Full—10 BT Full Duplex mode
 - 100BT Full—100 BT Full Duplex mode
- 7 Press **Enter** to exit the edit mode.
- 8 Press the **Apply&Reset** soft key to save the changes and to restart the IP Phone 1140E.

End of Procedure

When the IP Phone 1140E is restarted, the firmware reads the setting for Full Duplex mode and sets both port 0, network interface port, and port 1, PC interface port, accordingly.

Use the following procedure to confirm activation of Full Duplex mode.

Procedure 68

Checking Ethernet Statistics

- 1** Double-press the **Services** key to open the **Local Tools** menu.
- 2** Press **2** to select **Local Diagnostics**, then press **3** to open the **Ethernet Statistics** menu.

If Full Duplex mode is active, the following is displayed:

- Link Status: UP
- Duplex Mode: Full
- Network Speed: 10 Mb, 100 Mb or 1G
- Auto Sense/Negotiate
 - Auto-Nego Capability: No
 - Auto-Nego Completed: No

End of Procedure

TFTP firmware upgrade

When you enter Cfg TFTP = 1 (for yes), and enter an IP address, the phone searches for an upgrade file on the TFTP Server.

Note: Users of CS 1000 Release 4.5 or later do not need to enter a TFTP IP address.

Gratuitous Address Resolution Protocol Protection

Gratuitous Address Resolution Protocol Protection (GARP) protects the IP Phone 1140E from GARP Spoof attacks on the network. In a GARP Spoof attack, a malicious device on the network takes over an IP address (usually the default gateway) by sending unsolicited (or Gratuitous) ARP messages, thus manipulating the ARP table of the victim's machine. This allows the malicious device to launch a variety of attacks on the network, resulting in undesired traffic routing. For example, a GARP attack can convince the victim machine that the malicious device is the default gateway. In this

scenario, all traffic from the victim's machine flows through the malicious device.

To enable GARP Protection during configuration, refer to Procedure 66, "Installing an IP Phone 1140E for the first time" on [page 374](#).

Extensible Authentication Protocol

Extensible Authentication Protocol (EAP) is a general protocol that fulfills the protocol requirements defined by 802.1x. For further information on 802.1x, refer to Appendix C: "802.1x Port-based network access control" on [page 415](#).

Bluetooth wireless technology Bluetooth®

The IP Phone 1140E contains both hardware and software support for Bluetooth wireless technology enabled headsets. When the IP Phone 1140E powers up, Bluetooth wireless technology is disabled and it must be explicitly enabled.

Note: The IP Phone 1120E does not support Bluetooth wireless technology.

The following methods are available to enable Bluetooth wireless technology the IP Phone 1140E:

- Manual configuration— can be used to set the Bluetooth wireless technology mode on the IP Phone 1140E on a phone-by-phone basis. If manual configuration is used exclusively, a TFTP server is not required to configure Bluetooth wireless technology.

Use Procedure 115 on [page 485](#) to enable or disable Bluetooth wireless technology through manual configuration using the **Local Tools > Network Configuration** submenu.

- TFTP configuration—can be used to initially set the Bluetooth wireless technology mode then the TFTP Server can be removed. The IP Phone 1140E will now retain the value and will use the last value received if no new value is received.

Use Procedure 69 on [page 390](#) to enable Bluetooth wireless technology on the IP Phone 1140E using the TFTP configuration file (1140e.cfg) retrieved during bootup.

Note: If Bluetooth wireless technology is enabled on your phone, and password-protection for the Local Tools menu has been enabled, you can still double-press the **Headset** key to access the **3. Bluetooth Setup** menu.

Procedure 69 **Enabling Bluetooth wireless technology** **on the IP Phone 1140E**

Note: If the TFTP server is configured and is running, skip to step 5 on [page 392](#) to configure the IP Phone 1140E with the TFTP Server IP address.

- 1 Add the [DEVICE_CONFIG] section to the 1140e.cfg file.
- 2 Create the device configuration file. This file must have the same name as that specified for the FILENAME parameter in the [DEVICE_CONFIG] section of the 1140e.cfg file. See Figure 58.

Figure 58 **Sample of the 1140eDEV.cfg file**

ENABLE_BT 1

- 3 The device configuration file (1140eDEV.cfg) enables Bluetooth wireless technology if ENABLE_BT 1 is present. If ENABLE_BT 0 is present, Bluetooth wireless technology is disabled. Figure 59 shows an example of the 1140e.cfg file with the FW and the ENABLE_BT line.

It is also possible to use the 1140e.cfg file with only the [DEVICE_CONFIG] section for the control of Bluetooth wireless technology. Figure 60 on [page 391](#) shows an example of the 1140e.cfg file with only the [DEVICE_CONFIG] section.

Note: If only the [DEVICE_CONFIG] version is used, you must add the [FW] section before the BootC FW recovery is used. Otherwise, the BootC FW download fails and the IP Phone reverts to the BootC TPS download screen.

Figure 59
Sample of the 1140E.cfg file

```
[FW]
DOWNLOAD_MODE AUTO
VERSION 0625Cxx
FILENAME 0625Cxx.bin
PROTOCOL TFTP
SERVER_IP 192.168.1.100
SECURITY_MODE 0

[DEVICE_CONFIG]
DOWNLOAD_MODE FORCED
VERSION 000001
FILENAME 1140eDEV.cfg
SERVER_IP 192.168.1.100
```

Figure 60
Sample of the DEVICE_CONFIG file with only the [DEVICE_CONFIG] section

```
[DEVICE_CONFIG]
DOWNLOAD_MODE FORCED
VERSION 000001
FILENAME 1140eDEV.cfg
SERVER_IP 192.168.1.100
```

- 4 Start the TFTP Server. The TFTP Server must be running on the network when the IP Phone 1140E powers up to retrieve the Bluetooth wireless technology administrative control. After you put the 1140e.cfg and the device config file in the TFTP Server directory, ensure the TFTP Server is running then reboot the IP Phone 1140E. For information about TFTP Server configuration, refer to Appendix E: "TFTP Server" on [page 489](#).

Once the IP Phone 1140E retrieves the setting when the IP Phone 1140E restarts, it is saved in persistent memory. If the Enable BT setting is set to Auto, then the received value is acted on and Bluetooth wireless technology is either enabled or disabled on the IP Phone 1140E. If the Device Config file with the Enable BT setting is not received for any reason and the Enable Bluetooth mode is set to Auto, then the phone uses the last value received (retrieved from persistent memory).

If administrative control is not retrieved, the previously received value is used. If no value has ever been retrieved, then Bluetooth wireless technology is disabled by default.

If the IP Phone 1140E successfully retrieves the administrative control and enables Bluetooth wireless technology, 3. *Bluetooth Setup* appears in the Preferences menu.

- 5 Configure the IP Phone 1140E with a TFTP Server IP address so the IP Phone can access the TFTP Server.
- 6 Press the **Services** key twice.
- 7 Press 3 on the dialpad to access the **Network Configuration** menu or use the Up/Down navigation keys to scroll and highlight the **Network Configuration** option. Press **Enter**.
- 8 Enter the TFTP IP address in the **TFTP IP** field.
- 9 Press the **Apply&Reset** soft key.

————— **End of Procedure** —————

Table 39 lists the 1140e.cfg field names and definitions.

Table 39
1140e.cfg field name definitions (Part 1 of 2)

Field name	Field value	Definition
[FW]		Section header for firmware download information
DOWNLOAD_MODE	AUTO	Recommended setting. FW is downloaded when the IP Phone's FW version is older than the value in the 1140e.cfg file's VERSION field.
VERSION	0625Cxx	FW version

Table 39
1140e.cfg field name definitions (Part 2 of 2)

Field name	Field value	Definition
FILENAME	0625Cxx.bin	image file name, must match the file name of the FW file
PROTOCOL	TFTP	Download protocol must be TFTP
SERVER_IP	xxx.xxx.xxx.xxx	IP address of the TFTP server that will download the FILENAME file.
SECURITY_MODE	0	For future use.

Possible reasons Bluetooth wireless technology remains disabled on the IP Phone after bootup

The following are possible reasons Bluetooth wireless technology remains disabled on the IP Phone 1140E after bootup:

- The TFTP Server is down or is no longer present on the network.
- Network failure.
- The DEVICE_CONFIG section is missing from the 1140e.cfg file or is present but the specified device config file cannot be accessed, or it can be accessed but the ENABLE_BT line is either missing, or is present but the value of 1 is missing.

Create the DEVICE CONFIG section and file

The file pointed to by the [DEVICE CONFIG] section contains the parameter, ENABLE_BT. The parameter's value is set to 1, which enables Bluetooth wireless technology.

The [DEVICE_CONFIG] section can point to a single file that enables or disables the Bluetooth wireless technology on all phones, or it can point to a device configuration file for specific phones using a wildcard file name to enable the Bluetooth wireless technology for select phones. The configuration files for the specific phones use the IP Phone MAC address as the file name with the .cfg file extension.

Table 40 lists the [DEVICE_CONFIG] section field names and definitions.

Table 40
[DEVICE_CONFIG] field name definitions

Field name	Field value	Definition
[DEVICE_CONFIG]		Section header for device configuration file information
DOWNLOAD_MODE	FORCED	Recommended setting. The version is ignored and the DEVICE_CONFIG file is always read.
	or	
VERSION	000001	The version of the device config file
FILENAME	1140eDEV.cfg	Device config filename. The file name can be anything. If a file name is specified, the file name is loaded to every IP Phone 1140e.
	or	
	*.cfg	A wildcard file name enables a different setting to be configured for every IP Phone. The IP Phone checks for a file with the MAC address as the file name (for example, 001365FEF1C6.cfg).
SERVER_IP	xxx.xxx.xxx.xxx	The IP address of the TFTP Server that will download the FILENAME file.

Reinstalling an IP Phone 1140E

You can reinstall an existing previously configured IP Phone 1140E on the same system. For example, the IP Phone 1140E can be assigned to a new user (new TN) or to an existing user who moved to a new subnet by changing the TN of the IP Phone 1140E.

Procedure 70
Changing the TN of an existing
IP Phone 1140E

- 1** Repower the IP Phone 1140E.

Note: During the reboot sequence of a previously configured IP Phone, the IP Phone 1140E displays the existing node number for approximately five seconds.

- 2** If node password is enabled and NULL, choose one of the following:

- a.** Disable password.
- b.** Set password as non-NULL.

- 3** Press **OK** when the node number displays.

If	Then
node password is enabled and is not NULL	a password screen displays. Go to step 4.
node password is disabled	a TN screen displays. Go to step 5.

- 4** Enter password at the password screen, and press **OK**.

A TN screen displays.

- 5** Select the **Clear** soft key to clear the existing TN.

End of Procedure

Replacing an IP Phone 1140E

IMPORTANT!

Two IP Phones cannot share the same TN. You must remove the IP Phone 1140E that is currently using the TN.

Procedure 71

Replacing an IP Phone 1140E

- 1 Disconnect the IP Phone 1140E that you want to replace.
- 2 Follow Procedure 66 on [page 374](#) to install and configure the IP Phone 1140E.
- 3 Enter the same TN and Node Number as the IP Phone 1140E you replaced. The system associates the new IP Phone 1140E with the existing TN.

End of Procedure

Removing an IP Phone 1140E from service

Procedure 72

Removing an IP Phone 1140E from service

- 1 Disconnect the IP Phone 1140E from the network or turn the power off.
Note: The service to the PC is disconnected as well if the PC is connected to the IP Phone 1140E.
If the IP Phone 1140E was automatically configured, the DHCP lease expires and the IP address returns to the available pool.
- 2 In LD 11, OUT the TN.

End of Procedure

Features overview

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Introduction

This chapter provides an overview of the following software features available for IP Phones.

Personal Directory, Redial List, Callers List, Application Server Administration, Password Administration are software on the Signaling Server. An IP Phone must be registered to a Signaling Server to access these features.

Corporate Directory

The Corporate Directory feature extends the use of a system database, created from Optivity Telephony Manager (OTM) information, to the IP Phones. This database is downloaded and stored on the system CPU platform. For information about using Corporate Directory from IP Phones, see the appropriate user guide. For details about Corporate Directory, see *Features and Services* (553-3001-306).

Personal Directory

Personal Directory allows an end user to create and control a personal directory. Up to 100 Personal Directory entries can be created, edited, copied from other sources, or deleted. (For information about using Personal Directory on IP Phones, see the appropriate user guide. For more information about the Personal Directory feature, see *Features and Services* (553-3001-306).) Personal Directory uses a separate central database, called the Application Server, to store directory data and end-user profile options.

Redial List

Redial List is a call log feature whose content is generated by the system during call processing. The list resides on the Application Server. An end user can scroll through a list of up to 20 entries of the most recent calls dialed from the IP Phone and redial a selected telephone number. For more information about using Redial List with IP Phones, see the appropriate user guide. For more information about the Redial List feature, see *Features and Services* (553-3001-306).

Callers List

Callers List is a call log feature whose content is generated by the system during call processing. The list resides in the Application Server. An end user can scroll through a list of up to 100 entries of the most recent calls received by the IP Phone and call a selected telephone number. For more information about using Callers List with IP Phones, see the appropriate user guide. For more information about the Callers List feature, see *Features and Services* (553-3001-306).

Password Administration

Once the Station Control password (SCPW) has been set by the system administrator on the Call Server, end users can operate this feature from IP Phones to protect private directory information stored on the Application Server. For more information about using Password Administration from IP Phones, see the appropriate user guide. For information about the Password Administration feature, see *Features and Services* (553-3001-306).

IP Call Recording

IP Call Recording enables an IP Call Recording Server to monitor the media stream for the active call and record it by providing the IP address and port information for an IP Phone on an active call. The following recording models are supported:

- bulk call recording — records all calls on an IP Phone
- quality monitor recording — records individual calls on an IP Phone

Note: If the network connection between the IP Call Recording Server and the IP Phone is lost, active calls cannot be recorded.

For more information about the IP Call Recording feature, see *IP Line: Description, Installation, and Operation* (553-3001-365) and *Automatic Call Distribution: Description* (553-3001-351).

Virtual Office

The Virtual Office feature enables end users to log into any IP Phone using their own user ID and password. This redirects the end-user's telephone calls and other features to the Virtual Office logged-in IP Phone. For information about using Virtual Office on an IP Phone, see the appropriate user guide. For more information about the Virtual Office feature, see *Features and Services* (553-3001-306).

Emergency Services for Virtual Office

The E911 for Virtual Office feature allows Virtual Office users to place an emergency call to the correct Public Safety Answering Point (PSAP) for their

geographic location. For more information about the E911 for Virtual Office feature, see *Emergency Services Access: Description and Administration* (553-3001-313).

Active Call Failover

The Active Call Failover (ACF) feature enables an IP Phone to reregister in the ACF mode during a Signaling Server failure.

The ACF mode preserves the following:

- active media stream
- LED status of the Mute, Handsfree, and Headset keys
- DRAM content

Note: All other elements (feature keys, soft keys and text areas) are retained until the user presses a key or the connection with the Signaling Server is resumed. If the user presses a key during the failover, the display is cleared and a localized “Server Unreachable” message is displayed.

The IP Phone uses this new mode of reregistration only when the Signaling Server explicitly tells the IP Phone to do so. IP Phones clear all call information if they register to a Signaling Server or Line Terminal Proxy Server (LTPS) that does not support the ACF feature.

For more information on Active Call Failover, refer to *IP Line: Description, Installation, and Operation* (553-3001-365).

Enhanced UNISTim Firmware download

Enhanced UNISTim firmware download feature provides the following functionality for IP Phones:

- Enhanced firmware file header that includes the IT_TYPE and name string for each IP Phone type.
- Revised definition of the IP Client’s IP Phone identification.

- Maximum number of simultaneous firmware downloads from the Signaling Server's UNISim FTP (UFTP) server is 100.
- Maintenance Mode for the Signaling Server that allows more simultaneous firmware downloads.

Note: Maintenance Mode is not applicable to Voice Media Gateway Cards.

- Identification of the registered IP Phones using string names and detailed identification of IP Phones that register as emulations of the base IP Phone 2001, IP Phone 2002, and IP Phone 2004.
- UNISim IP Phones are able to register with older versions of firmware when the UFTP servers are busy, and are periodically offered the option start the firmware upgrade to the IP Phone.

Enhanced UNISim Firmware download feature requires a Signaling Server to be present on the node. Without a Signaling Server, the only firmware files available for downloading are the three available in CS Release 4.0 for the Phase 0/1/2 IP Phone 2001, IP Phone 2002, and IP Phone 2004.

For further information on Enhanced UNISim Firmware download, refer to *IP Line: Description, Installation, and Operation* (553-3001-365).

Appendix A: Specifications

Contents

This section contains information on the following topics:

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IP Phone power requirements

Phase II IP Phones have integrated hardware to support power over Ethernet for 802.3af standard power and other powering options, including ongoing support for PowerDsine Power over LAN Hub powering, and Cisco proprietary powering (as tested with specific Cisco Ethernet switch equipment). Nortel recommends Power over Ethernet deployment since it allows for power backup in case of power failures. Note that, with Phase II IP Phones, power splitters are no longer needed to support Power over Ethernet.

Phase II IP Phones also support connection to AC local power using the appropriate adapter. If local power using the AC adapter is required with a Phase II IP Phone, the AC adapter must be ordered separately. If the network LAN infrastructure supports Power over Ethernet, an AC adapter may not be required.

Note 1: You must order a country-specific power adapter. See the IP Phone components list table in the applicable IP Phone chapter for AC adapter descriptions and product codes.

Note 2: If you are using local power with the IP Phone 1120E and IP Phone 1140E, you must use the AC adapter (model # N0023000) *only*.

Nortel does not advise connecting a local power adapter in addition to power over Ethernet.

Table 41 provides power requirements for Phase II IP Phones using Power over Ethernet Classification 2.

Table 41
Power requirements for Phase II IP Phones using Power over Ethernet Classification 2

IP Phone	Product Code	Maximum Load	Normal Load
2001	NTDU90BA	4.0 W	3.0 W
2002	NTDU91BA	4.5 W	3.0 W
2004	NTDU92BA	4.5 W	3.4 W
Note 1: Heavy load is defined as all LEDs on and 1 kHz tone on the speaker.			
Note 2: Normal load is defined as set powered up.			

Table 42 provides power requirements for the IP Phone 2007, IP Phone 1120E, and IP Phone 1140E using Power over Ethernet Classification 3.

Table 42
Power requirements for IP Phone 2007 using Power over Ethernet Classification 3

IP Phone	Product Code	Maximum Load	Normal Load
2007	NTDU96AB	10.0 W	7.0 W
1120E	NTYS03AA NTYS03BA	8.0 W	6.0 W
1140E	NTYS05AA NTYS05BA	8.0 W	6.0 W
Note 1: Heavy load is defined as all LEDs on and 1 kHz tone on the speaker.			
Note 2: Normal load is defined as set powered up.			

Environmental specifications

Table 43 shows the environmental specifications of IP Phones.

Table 43
Environmental specifications

Parameter	Specifications
Operating temperature	+5° to +40°C, ambient
Operating humidity	+5% to 95% RH (29 g/m3 mean absolute humidity)
Storage temperature	−40° to +70° C

Appendix B: 802.1Q VLAN description

Contents

This section contains information on the following topics:

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Introduction

The 802.1Q support is available for IP Phone 2001, IP Phone 2002, IP Phone 2004, IP Audio Conference Phone 2033, IP Phone 2007, IP Phone 1120E, IP Phone 1140E, the IP Softphone 2050 (through the PC operating system).

The 802.1Q support is configured from the user display interface of the IP Phone. Configure 802.1Q VLAN support when you initially configure an IP Phone. The switch ports for Voice Gateway Media Card TLAN network interfaces must be configured as untagged ports so the header is removed. While the IP Phone 2001 and the IP Audio Conference Phone 2033 provide VLAN support, they do not provide a port for a PC.

The 802.1Q IEEE protocol standard allows virtual LANs (VLANs) to be defined within a single LAN. This improves bandwidth management and limits the impact of broadcast and multicast messages. A higher level of security between segments in a network can also be achieved.

Note: 802.1Q functionality is supported only on the IP Phone. The IP Line application IP stack does not provide 802.1Q support for the Voice Gateway Media Card.

Description

The p bits within the 802.1Q standard allow packet prioritization at Layer 2 improving network throughput for VoIP data.

The 802.1Q standard specifies a new format of Ethernet frame. A standard Ethernet frame contains:

- a header consisting of a six-byte destination MAC address (following the header is a data area)
- a six-byte source MAC address
- a two-byte protocol identifier

The 802.1Q formatted frame is identical to a standard Ethernet frame, with the exception of the 4-byte 802.1Q tag that is inserted between the source MAC address and the protocol identifier. The first 16 bits of the 802.1Q tag field is the Tag Protocol Identifier containing 8100 (hex), allowing the Ethernet interface to distinguish it from standard Ethernet frames. The last 16 bits of the 802.1Q tag contain the following information:

- a 3-bit Priority field (the 802.1p defined bits)
- a 1-bit Canonical Field Identifier (CFI)
- a 12-bit VLAN ID field

IP Phone support

The IP Phone 2001, IP Phone 2002, IP Phone 2004, IP Phone 2007, IP Audio Conference Phone 2033, IP Phone 1120E, and IP Phone 1140E support 802.1Q as follows:

- 802.1Q can be enabled or disabled at boot time using manual configuration or control downloaded from the TPS.
- If 802.1Q is disabled, standard Ethernet frames are transmitted.
- If 802.1Q is enabled, all frames transmitted by the Ethernet driver have the 802.1Q tag bytes inserted between the source MAC address and the protocol type field. The tag protocol identifier field contains 8100 (hex) and the CFI bit is set to 0.
- When 802.1Q is enabled, the configuration of separate voice and data VLANs is possible. Each VLAN has its own ID and priority on the IP Phone. Voice messages have the priority bits of all frames set to 6 (octal) and the VOICE VLAN ID is set to 000 (hex) by default. Data messages have the priority bits of all frames set to 0 and the DATA VLAN ID is set to 000 (hex) by default. The GUI and TPS configured values override these values.
- The IP Phone's Ethernet driver receives any Ethernet frame destined for it, regardless of whether 802.1Q is enabled or whether the received frame is an 802.1Q tagged frame.

Note: The only exception is any 802.1Q tagged frame with the CFI = 1. In this case the frame is discarded.

- The IP Phone's Ethernet driver strips the 802.1Q tag information from the frame prior to passing it on to the IP stack.
- The IP Phone's Ethernet driver filters packets by the VLAN tag and MAC address. Tagged traffic is prioritized and routed based on the priority bits.

IP Softphone 2050 support

The IP Softphone 2050 supports 802.1Q with Windows 2000. By default, when 802.1Q is enabled, the priority bits of all frames are set to 6 and the VLAN ID is set to 0 (a restriction of Windows 2000).

For more information, see the “Nortel IP Softphone 2050” on [page 193](#).

Three-port switch support

The IP Phone 2002, IP Phone 2004, IP Phone 2007, IP Phone 1120E, and IP Phone 1140E three-port switch does not interpret the 802.1Q header, but rather, allows the packets to pass through unmodified. Priority is achieved on a per port basis. The phone “port” traffic has higher priority over the Ethernet port to which the PC is connected.

An IP Phone can receive Broadcast frames from a PC’s data VLAN. Any data network broadcast storm packets from the network are seen by the IP Phone. Significant broadcast storms occurring on the DATA VLAN can impact IP Phone performance. Refer to “Enhanced VLAN Tagging” on [page 412](#) for configuration information to filter network activity from impacting IP Phone performance.

Enhanced 802.1P and 802.1Q support on the IP Phones improves voice quality by taking advantage of the VLAN filtering available on the three-port switch on the BCM 1100/1101.

The following functions are available on the three-port switch:

- hardware VLAN filter
- two TX (out) queues on each port —High Priority Queue (HPQ) and Low Priority Queue (LPQ)

Therefore, traffic other than Voice VLAN can be filtered by enabling the VLAN filtering feature and taking advantage of the hardware VLAN filter. Voice traffic is always queued to the HPQ thereby providing a higher quality of service.

VLAN IDs

The VOICE and DATA VLAN ID fields can be specified on a *per interface* basis. There is only one network interface on the IP Phone; however, the IP Phone has two internal IDs, one for voice and one for data traffic. The IP Phone firmware can detect and route the voice and data traffic.

The VLAN ID fields are *global* settings. That is, all voice packets transmitted by the IP Phone have the same VOICE VLAN ID. If DATA VLAN is enabled, the IP Phone will add the DATA VLAN ID to untagged traffic. However, if the traffic arriving on the PC port is already tagged, the frame will pass through unchanged.

Each VLAN ID is specified as follows:

- The default VLAN ID is 000 (hex).
- The VOICE and DATA VLAN IDs can be specified in the manual configuration user interface.
- Or, in the case of the VOICE VLAN ID, the VOICE VLAN ID can also be configured by the DHCP parameter when using the Automatic VLAN discovery using DHCP approach.

Automatic VOICE VLAN ID configuration

As part of the 802.1Q feature, there is an option to automatically discover the VOICE VLAN ID using DHCP. This process reduces the configuration steps since entering data manually (the VOICE VLAN ID) is not required.

When the Automatic VOICE VLAN Discovery using DHCP approach is used, and the IP Phone has been configured as such, the following steps are automatically taken to obtain the VOICE VLAN ID:

- 1** The IP Phone 2001, IP Phone 2002, IP Phone 2004, IP Phone 2007, IP Audio Conference Phone 2033, IP Phone 1120E, and IP Phone 1140E perform an initial DHCP Discovery Request in the default VLAN.
- 2** The DHCP server returns a DHCP Ack message with an IP address in the data VLAN and one or more voice VLAN IDs in the vendor-specific field.
- 3** The telephone reads and saves the VOICE VLAN IDs.
- 4** The telephone rejects the DHCP offer (accepts it but immediately gives up the lease).
- 5** The telephone reboots and sends a DHCP Discovery Request with the first VLAN ID from the saved list. This is repeated for each VLAN ID in the list until a response is received.

This works because the Layer 2 switch discards every DHCP Discovery Request it receives from the IP Phone if the VLAN ID does not match the VLAN IDs configured on the port. When the IP Phone sends a DHCP Discovery Request with the port's configured VLAN ID, the packet passes into the network and the DHCP server's Ack message is passed back.

When a DHCP Ack message is received, the IP Phone accepts the offer and saves the IP address and Node IP address.

Enhanced VLAN Tagging

Enhanced VLAN has two main functions:

- Enhance the current Voice VLAN by implementing the hardware VLAN filter on the IP Phone port (SMP).
- Use TX High Priority Queue (HPQ) and 802.1P VLAN priority to enhance the traffic control on the IP Phone and PC network interface.

Enable/Disable menu is available to enable or disable telephony packets filtering based on a VLAN ID. The Enable/Disable menu is only available if tagging is enabled on the telephony port.

IMPORTANT!

VLAN filtering on the telephony port is disabled by default. If tagging is enabled on the telephony port, you can enable VLAN filtering on the telephony port. When VLAN filtering is enabled, packets destined for the IP Phone port are filtered based on the MAC address and the VLAN tag.

If VLAN filtering is not enabled on the telephony port, packets destined for the IP Phone port are filtered only on the MAC address. Filtering based on the VLAN tag does not occur. This makes the telephony port susceptible to broadcast storms and a Denial of Service (DOS) attack.

Enhanced DATA VLAN

Enhancements for DATA (PC Port) VLAN for the IP Phone 1120E and IP Phone 1140E include the following:

- DATA (PC Port) VLAN packet handling
 - PC Port (Ingress direction)
 - PC Port (Egress direction)
- DATA (PC Port) VLAN Tag Stripping

DATA (PC Port) VLAN packet handling

Packets processed to and from the PC port operate as follows:

PC Port (Ingress direction)

- DATA VLAN disabled—all traffic received on the PC port is switched based on MAC address. The packets are not modified in any way.
- DATA VLAN enabled—all untagged packets received on the PC port have the 802.1Q header appended and the VLAN ID is set to the value that was manually configured in the Data VLAN field. Any packet arriving on the PC port that is already tagged is dropped.

PC Port (Egress direction)

- DATA VLAN disabled—all traffic received on the PC port has the 802.1Q header appended and the VLAN ID is set to the value which was manually configured in the DATA VLAN field. Any packet arriving on the PC port which is already tagged is dropped.
- DATA VLAN enabled—all traffic is forwarded to the PC port based on a review of the MAC address and the 802.1Q value that was manually configured in the DATA VLAN field. Traffic is forwarded out the PC port only if the packets contain the DATA VLAN tag. Untagged traffic and traffic without the DATA VLAN tag is dropped.

DATA (PC Port) VLAN Tag Stripping

DATA VLAN Tag Stripping can be configured in the Network Configuration menu. To enable DATA VLAN Tag Stripping, select the PC-Port Untag All check box, DATA VLAN Tag Stripping can be enabled or disabled independent of enabling VLAN support on the PC Port.

If the DATA VLAN Tag Stripping is disabled, the packet is sent to the PC Port unmodified. If the DATA VLAN Tag Stripping is enabled, the 802.1Q header if one exists, is removed from the packet before the packet is forwarded to the PC port.

During manual configuration, if DATA VLAN is enabled by configuring a VLAN ID, the PC-Port Untag All check box is selected and is enabled by default. By default, the egress tag is stripped. To manually override this setting and disable egress stripping, clear the PC-Port Untag All check box.

If DATA VLAN is not enabled during manual configuration, the PC-Port Untag All check box is not selected. By default, the ingress tag is not stripped. To manually override this setting and enable ingress stripping, select the PC-Port Untag All check box.

Appendix C: 802.1x Port-based network access control

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Introduction

The 802.1x support is available for IP Phone 2001, IP Phone 2002, and IP Phone 2004, IP Phone 2007, IP Phone 1120E, and IP Phone 1140E.

Extensible Authentication Protocol

Extensible Authentication Protocol (EAP) supports multiple authentication methods, such as MD5, PEAP, TLS, and TTLS, and represents a technology framework that facilitates the adoption of Authentication, Authorization, and Accounting (AAA) schemes, such as Remote Authentication Dial In User Service (RADIUS). RADIUS is defined in RFC 2865.

802.1x defines the following three roles:

- Supplicant—an IP Phone which requires access to the network to use network services.

- Authenticator—the network entry point to which the supplicant physically connects (typically a Layer 2/3 switch). The authenticator acts as the proxy between the supplicant and the authentication server. The authenticator controls access to the network based on the authentication status of the supplicant.
- Authentication server—performs authentication of the supplicant.

Authorization

If 802.1x is configured and the IP Phone is physically connected to the network, the IP Phone (supplicant) initiates 802.1x authentication by contacting the Layer 2/3 switch (authenticator). The IP Phone also initiates 802.1x authentication after the Ethernet connection (network interface only) is restored following a network link failure.

However, if the phone resets, the IP Phone assumes the Layer 2 link has remained in service and is authenticated.

The IP Phone fails to authorize if the DeviceID and the IP Phone passwords do not match the DeviceID and IP Phone password provisioned on the RADIUS Server. The Layer 2 switch (authenticator) locks out the IP Phone and network access is denied. If this happens during reauthorization, all phone services are lost. The connected PC operates as normal.

Enabling and disabling EAP

The following section provides steps to enable and disable EAP on the IP Phone.

Procedure 73

Enable the 802.1x supplicant

- 1 Reset the phone by disconnecting and reconnecting power.
- 2 When the Nortel logo appears, press each of the soft keys in sequence.
- 3 If no other configuration changes are required, press **OK** repeatedly until the **802.1x Options** menu appears.
- 4 Press the **Select** soft key.
- 5 Enter **1** to enable EAP.

- 6 Press the **OK** soft key to accept the setting and return to the **802.1x Options** menu.
Note: Press the **Exit** soft key at any time to return to the **Configuration** menu.
- 7 Use the Navigation keys to scroll through the list and select **DeviceID**.
The current DeviceID is shown between the brackets []. This value is compared to the corresponding entry in the RADIUS Server for authentication.
Note: There is no default value when the IP Phone is shipped.
- 8 Enter the DeviceID.
 - Enter text using the numeric key pad. See “Dialpad entry” on [page 419](#) for information on entering text using the numeric keypad.
 - Press the **BkSpace** soft key to delete a single character to the left of the insertion point.
 - Press the **Clear** soft key to delete the entire DeviceID entry, and place the insertion point at the beginning of the string.
- 9 Press the **OK** soft key to accept the DeviceID and advance to the Password screen.
The current password, if one exists, is shown as a string of * * * *.
- 10 Enter the Password.
 - Enter text using the numeric keypad. See “Dialpad entry” on [page 419](#) for information on entering text using the numeric keypad.
When you enter a new password, the password is displayed in clear text.
 - Press the **BkSpace** soft key to delete a single character to the left of the insertion point.
 - Press the **Clear** soft key to delete the entire DeviceID entry and place the insertion point at the beginning of the string.
- 11 Press the **OK** soft key to accept the password and exit the EAP menus.
Note: If the OK soft key is pressed before any changes are made, the current password is saved.

End of Procedure

Procedure 74
Disabling 802.1x supplicant

- 1 Reset the IP Phone by disconnecting and reconnecting power.
- 2 When the Nortel logo appears, press each of the soft keys in sequence.
- 3 If no other configuration changes are required, press **OK** repeatedly until the **802.1x Options** menu appears.
- 4 Press the **Select** soft key.
- 5 Enter **0** to disable EAP.
- 6 Press the **OK** soft key to accept the change.

Note: Press the **Cancel** soft key at any time to exit the menu and discard any changes.

End of Procedure

Enabling and disabling EAP on the IP Phone 2007

The following section provides steps to enable and disable EAP on the IP Phone 2007. EAP is enabled or disabled in **Network Configuration** in the **Tools** menu.

Procedure 75
Enabling the 802.1x supplicant on the IP Phone 2007

- 1 Tap the **Tools** icon.
- 2 Enter the Tools menu password (if password protection is enabled). For information on password protection, refer to “Password Protection” on [page 149](#).
- 3 Tap the **Network Configuration** menu entry.

The screen displays **Apply & Reset** and **Exit** soft keys, and the parameters used when configuring the IP Phone 2007.
- 4 From the drop-down list, select **Enable EAP**.
- 5 Tap the screen to the right of the **DeviceID** prompt, then enter a Device.

Use the dial pad to enter digits only. To enter alpha characters, use either the IP Phone 2007 pop-up keyboard, or a USB keyboard.

- 6 Tap the **Apply&Reset** soft key to accept the DeviceID and advance to the Password screen.
- 7 Tap on the screen to the right of the **Password** prompt. Enter the password. Enter text using the numeric key pad. See Dialpad entry for information on entering text using the numeric keypad.

The password is shown as a string of * * * *.
- 8 Tap the screen to the right of the **Re-type** prompt. Reenter the password.
- 9 Tap the **Apply&Reset** soft key.

End of Procedure

Dialpad entry

The following rules apply when you enter text and special characters using the key pad.

- Press a key from 0 – 9 once to enter the corresponding number.
- Press a key from 2 – 9 repeatedly to cycle through the letters assigned to that key, first in lower case and then in upper case.

For example, if you press the **5** key repeatedly, the following characters are displayed, one at a time:

j -> k -> l -> J -> K -> L -> 5 ->

See Table 44 on [page 420](#) for character key mappings.

- The insertion point remains in the its current position as long as you continue to press the same key.
- The entry is accepted if either a new key is pressed or if two seconds pass with no entry. The insertion point moves one space to the right.

For example, to enter the word “Nortel”, press the following key sequence:

6 [2 second delay] **6 7 8 3 5**

Note: Although special characters are not required, key 1 generates commonly used special characters, such as the period (.), at symbol (@), and underscore (_).

Table 44:Character key mappings

Key	Generates
1	_ - . ! @ \$ % & + 1
2	a b c A B C 2
3	d e f D E F 3
4	g h i G H I 4
5	j k l J K L 5
6	m n o M N O 6
7	p q r s P Q R S 7
8	t u v T U V 8
9	w x y z W X Y Z 9

Appendix D: IP Phone diagnostic utilities

Contents

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Introduction

Two types of IP Phone diagnostic utility are described in this section: set-based, and call server console-based. These utilities provide testing and verification of end-to-end connectivity, verification of statistics and settings, and retrieval of set information.

IP Phone diagnostics

Network Diagnostic Utilities

Network Diagnostic Utilities are accessible on IP Phone 2001, IP Phone 2002, IP Phone 2004, and the IP Audio Conference Phone 2033 to isolate voice quality and network performance problems. For information on network diagnostics from the IP Phone 2007, refer to Table 15 [page 152](#). For information on IP Phone 1120E and 1006 Network Diagnostic Utilities, see “Configure IP Phone 1120E and IP Phone 1140E Local Tools options” on [page 463](#).

The diagnostic utilities are available on the IP Phone itself, or from the Command Line Interface (CLI). For further information about CLI, see “IDU commands” on [page 451](#).

The Network Diagnostic Utilities include Network Diagnostic Tools (Ping and traceRoute), Ethernet Statistics, IP Networking Statistics, DHCP Information Process, RUDP Statistics, and Network QoS Process.

IP Phone-based Network Diagnostic Utilities are available for Phase II Nortel IP Phone 2001, IP Phone 2002, IP Phone 2004, and the IP Audio Conference Phone 2033. See Table 45 for a description of diagnostic utilities availability for each phone state.

For detailed information on Quality of Service (QoS) and Proactive Voice Quality Management (PVQM), refer to *Converging the Data Network with VoIP* (553-3001-160).

Table 45 lists the Network Diagnostic Utilities available on the IP Phone in different states.

Table 45
Network Diagnostic Utilities availability

Function module	Before IP Address assignment	After IP Address assignment, unregistered - Local Mode	Registered (TPS) - Remote Mode	Call in progress (TPS)
Local diagnostic tools (Ping & TraceRoute)	N/A	Yes	Yes	Yes
Ethernet statistics	Yes	Yes	Yes	Yes
IP Networking statistics	N/A	Yes	Yes	Yes
DHCP information process	N/A	Yes, part of information	Yes	Yes
UNISlim/RUDP statistics	N/A	N/A	Yes	Yes
RTP/RTCP statistics	N/A	N/A	Yes	Yes
Network QoS process	N/A	N/A	Yes, last call	Yes, renew
Supplicant Status	N/A	N/A	Yes	Yes
Supplicant Authentication Status	N/A	N/A	Yes	Yes
Supplicant Device ID	N/A	N/A	Yes	Yes
Supplicant Authenticator ID	N/A	N/A	Yes	Yes

Ping and TraceRoute

The system administrator can use the local diagnostic tools, Ping or Traceroute command, from a specific endpoint with any arbitrary destination, typically another endpoint or Signaling Server. Ping and TraceRoute are available in Local or Remote mode.

Ethernet statistics

In Local or Remote Mode, the system administrator can view ethernet statistics (for example, number of collisions, VLAN ID, speed and duplex) for the IP Phone on a particular endpoint. The exact statistics will depend on what is available from the IP Phone for the specific endpoint. The user may select either the Network Port (NIport) or PC port (PCport).

IP Networking statistics

In Local or Remote Mode, the system administrator can view information on the packets sent, packets received, broadcast packets received, multicast packets received, incoming packets discarded, and outgoing packets discarded.

DHCP information process

In Remote Mode, the system administrator can view DHCP settings (for example, IP address, S1, S2, and S4 addresses) for each IP Phone. In Local Mode partial information is available.

UNISlim/RUDP statistics

In Remote Mode, the system administrator can view RUDP statistics (for example, number of messages sent, received, retries, resets, and uptime) for the IP Phones.

RTP/RTCP statistics

In Remote Mode, the system administrator can view RTP/RTCP QoS metrics (for example, packet loss and jitter) while a call is in progress.

Network QoS Process

In Remote Mode, the system administrator can view QoS statistics (for example, packets sent, packets received, packet loss, jitter average and jitter maximum, and round trip delay).

Supplicant Status

The system administrator uses this option to determine whether 802.1x is enabled or disabled 802.1x.

Authentication State

The system administrator uses this option to determine whether the IP Phone is currently authenticated with the 802.1x system. The following are valid state values:

- LogOff
- Disconnected
- Connected
- Acquired
- Authorizing
- Held
- Authorized
- Dbl Authd

DeviceID

The system administrator uses this option to check the user name configured for the device that is sent to the switch for authentication. This should match the corresponding entry in the RADIUS Server.

Authenticator ID

The system administrator uses this option to check the MAC address of the Authenticator (switch).

Accessing Network Diagnostic Utilities from the IP Phone

Local diagnostics are available from the IP Phone for either Local or Remote mode.

Note: Diagnostics prompts are presented in English.

Local Mode

When the IP Phone is not registered with the signaling server, the **Network Diagnostic Tools** menu is available from the IP Phone in Local Mode (see Table 45 on [page 423](#)). This menu is controlled by the firmware on the IP phone.

Use Procedure 76 on [page 426](#) to access the Network Diagnostic Tools in Local mode.

Procedure 76
Accessing the Network Diagnostic Tools
menu in Local mode

- 1 Double-click the **Services** key. The Local Main Menu, Network Diagnostic Tools, appears.
- 2 Press **Cancel** to quit, or use the **Navigation** keys to scroll through the menu and select one of the following:
 - Ping
 - TraceRoute
 - Ethernet Statistics
 - IP Network Statistics
 - IP Set & DHCP Information

End of Procedure

Procedure 77
Executing Ping

- 1 Select **Ping** from the **Network Diagnostic Tools** submenu.
- 2 Press the **IP** soft key and enter the IP address to Ping.

Tip: Use the dialpad to enter the IP address. The * key is used for dots and the # key produces a space.
- 3 Press the **Ping** soft key. The results of the Ping appear on the display.
- 4 Use the **Navigation** keys to browse the data. See Figure 61 on [page 437](#).

Tip: Press the **Ping** soft key again to stop the pinging.
- 5 Press one of the following soft keys:
 - **Reset** — to clear the data
 - **Exit** — to return to the **Network Diagnostic Tools** menu.

End of Procedure

Procedure 78**Executing TraceRoute**

- 1 Select **TraceRoute** from the **Network Diagnostic Tools** submenu.
- 2 Press the **IP** soft key and enter the IP address to trace.
- 3 Press the **Tracert** soft key. The results of the TraceRoute appear on the display.
- 4 Use the **Navigation** keys to browse the data. See Figure 62 on [page 438](#).

Tip: Press the **Tracert** soft key again to stop the route tracing.

- 5 Press one of the following soft keys:
 - **Reset** — to clear the data
 - **Exit** — to return to the **Network Diagnostic Tools** menu

End of Procedure

Procedure 79**Accessing Ethernet Statistics**

- 1 Select **Ethernet Statistics** from the **Network Diagnostic Tools** menu. The Ethernet statistics appear on the display.
- 2 Use the **Navigation** keys to browse the data. See Figure 63 on [page 439](#).
- 3 Press one of the following soft keys:
 - **Reset**— to clear the data and reset the statistic counter
 - **Exit** — to return to the **Network Diagnostic Tools** menu

End of Procedure

Procedure 80**Accessing IP Network Statistics**

- 1 Select **IP Network Statistics** from the **Network Diagnostic Tools** menu. The IP Network Statistics appear on the display.
- 2 Use the **Navigation** keys to browse the data. See Figure 64 on [page 440](#).
- 3 Press one of the following soft keys:
 - **Reset** — to clear the data and reset the statistic counter
 - **Exit** — to return to the **Network Diagnostic Tools** menu

Procedure 81

Accessing IP Set & DHCP Information

- 1 Select **IP Set & DHCP Information** from the **Network Diagnostic Tools** menu. The IP Set and DHCP information appears on the display.
- 2 Use the **Navigation** keys to browse the data. See Figure 65 on [page 441](#).

Note: In Local Mode, **Exit** is the only soft-key available in this submenu.

End of Procedure

Remote Mode

When the IP Phone is registered to the signaling server, diagnostics are available through the Telephone Options menu in Remote Mode. This menu is controlled by the TPS.

Note: When the user selects **Diagnostics** from the **Telephone Options** menu, if an IP Phone Installer Password is enabled in the Signaling Server, the **Diagnostics** menu is locked and the message “Access denied” displays on the IP Phone display.

Use Procedure 82 to access the **Diagnostics** submenu in Remote Mode:

Procedure 82

Accessing the Diagnostics submenu in Remote Mode

- 1 Press the **Services** key.
- 2 Select **Telephone Options**.
- 3 Select **Diagnostics**.
- 4 Do one of the following:
 - Press the **Cancel** soft key to quit the **Diagnostics** submenu and return to the **Telephone Options** menu.
 - Use the **Navigation** keys to scroll through the **Diagnostics** submenu.
 - Press **Select** to select one of the diagnostics.

The following items are available on the **Diagnostics** submenu:

- Diag Tools (Diagnostic Tools: Ping and TraceRoute)

- EtherStats (Ethernet Statistics)
- IP Stats (IP Statistics)
- RUDP Stats (RUDP Statistics)
- QoS Stats (Quality of Service Statistics)

End of Procedure

Procedure 83**Accessing Diagnostic Tools in Remote mode**

- 1 Select **Diagnostic Tools** from the **Diagnostics** submenu.
- 2 Do one of the following:
 - Press the **Cancel** soft key to return to the **Diagnostics** submenu.
 - Use the **Navigation** keys to scroll to the DiagnosticTools selection.
- 3 Press the **Select** soft key to choose one of the following:
 - Ping (see Figure 68 on [page 444](#))
 - TraceRoute (see Figure 69 on [page 445](#))

End of Procedure

Ping

The following items are available on the **Ping** submenu in Remote mode:

- IP Addr
- Nr of Pings
- Ping!
- Last ping

Procedure 84**Entering an IP address**

- 1 Scroll through the **Ping** submenu to the **IP Addr** menu item. An IP address appears if previously entered. Example 47.249.48.20.
- 2 Press the **Select** soft key.
- 3 Use the **Navigation** keys to scroll to the destination IP address.

- If the destination IP address is in the list, press the **Select** soft key to select the IP address. Press the **Select** soft key again to return to the **Ping** submenu.
- If the destination IP address is not in the list, continue scrolling through the available IP address list until the IP address 0.0.0.0 appears. Press the **Select** soft key.

Tip: To edit the IP address, use the keypad and the **Delete** soft key and the **Cancel** soft key. Use the * key for dots.

- 4 Press the **Select** soft key to save the new IP address or press the **Cancel** soft key to return to the **Ping** submenu.

End of Procedure

Procedure 85

Changing the number of Pings

- 1 From the **Ping** submenu, use the **Navigation** keys to scroll to the **Nr of Pings** submenu item.

- 2 Press the **Select** soft key.

Tip: Use the **Delete** and **Clear** soft keys to enter the number of pings.

- 3 Do one of the following:
 - Press the **Select** soft key to accept the change and return to the **Ping** submenu.
 - Press the **Cancel** soft key to return to the **Ping** submenu.

End of Procedure

Procedure 86

Pinging an IP address

- 1 From the **Ping** submenu, use the **Navigation** keys to scroll to the **Ping!** submenu item.

- 2 Press the **Select** soft key. Pinging starts.

Tip: Press the **Stop** soft key to stop pinging.

- 3 Press the **OK** soft key to return to the **Ping** submenu.

Procedure 87**Reviewing the results of the Ping:**

- 1 Use the **Navigation** keys to scroll to the **Last Ping** submenu item.
- 2 Press the **Select** soft key.
- 3 Use the **Navigation** keys to scroll through the results.
- 4 Press the **Cancel** soft key to return to the **Ping** submenu.

End of Procedure

TraceRoute

The following items are available on the **TraceRoute** submenu in Remote mode:

- IP Addr
- Max Nr of Hops
- TraceRt!
- Last TraceRt

Procedure 88**Entering an IP address**

- 1 Scroll through the **TraceRoute** submenu to the **IP Addr** menu item. An IP address appears if previously entered. Example 47.249.48.20.
- 2 Press the **Select** soft key.
- 3 Use the **Navigation** keys to scroll to the destination IP address.
 - If the destination IP address is in the list, press the **Select** soft key to select the IP address. Press the **Select** soft key again to return to the **TraceRoute** submenu.
 - If the destination IP address is not in the list, continue scrolling through the available IP address list until the IP address 0.0.0.0 appears. Press the **Select** soft key.

Tip: To edit the IP address, use the **Delete** soft key and the **Cancel** soft key. Use the * key for dots.

- 4 Press the **Select** soft key to save the new IP address, or press the **Cancel** soft key to return to the **TraceRoute** submenu.

End of Procedure

Procedure 89 **Changing the number of Hops**

- 1 From the **TraceRoute** submenu, use the **Navigation** keys to scroll to the **Max Nr of Hops** submenu item.
- 2 Press the **Select** soft key.

 Tip: Use the keypad and the **Delete** and **Clear** soft keys to enter the number of Hops.
- 3 Do one of the following:
 - Press the **Select** soft key to accept the change and return to the **TraceRoute** submenu.
 - Press the **Cancel** soft key to return to the **TraceRoute** submenu.

End of Procedure

Procedure 90 **Tracing a route**

- 1 From the **TraceRoute** submenu, use the **Navigation** keys to scroll to the **TraceRoute!** submenu item.
- 2 Press the **Select** soft key. Route tracing starts.

 Tip: Press the **Stop** soft key to stop the trace.
- 3 Press the **OK** soft key to return to the **TraceRoute** submenu.

End of Procedure

Procedure 91 **Reviewing the results of the trace**

- 1 From the **TraceRoute** submenu, use the **Navigation** keys to scroll to the **Last TraceRt** submenu item.
- 2 Press the **Select** soft key.

- 3 Use the **Navigation** keys to scroll through the results.
- 4 Press the **Cancel** soft key to return to the **TraceRoute** submenu.

End of Procedure

Ethernet Statistics

Use Procedure 92 to access the **EtherStats** submenu item in Remote mode.

Procedure 92

Browsing Ethernet Statistics

- 1 Select **EtherStats** from the **Diagnostics** submenu. The Ethernet statistics appear on the display.
- 2 Do one of the following:
 - Press the **OK** soft key to return to the **Diagnostics** submenu.
 - Use the **Navigation** keys to browse the data. See Figure 70 on [page 446](#).
 - Press the **Cancel** soft key to return to the **Diagnostics** submenu.

End of Procedure

Procedure 93

Checking 802.1x Supplicant status

- 1 Select **EtherStats** from the **Diagnostics** submenu.
- 2 Scroll through the EtherStats menu and select **Supplicant Status**.
- 3 Press the **Select** soft key.
- 4 Do one of the following:
 - Press the **OK** soft key to return to the **EtherStats** submenu.
 - Use the **Navigation** keys to browse the data.
- 5 Press the **Cancel** softkey to return to the **EtherStats** submenu.

End of Procedure

Procedure 94

Checking 802.1x Supplicant Authentication state

- 1 Select **EtherStats** from the **Diagnostics** submenu.
- 2 Scroll through the EtherStats menu and select **Authentication State**.
- 3 Press the **Select** soft key.
- 4 Do one of the following:
- 5 Press the **OK** soft key to return to the **EtherStats** submenu.
 - Use the **Navigation** keys to browse the data.
- 6 Press the **Cancel** softkey to return to the **EtherStats** submenu.

End of Procedure

Procedure 95

Checking Device ID

- 1 Select **EtherStats** from the **Diagnostics** submenu.
- 1 Scroll through the **EtherStats** menu and select **Device ID**.
- 2 Press the **Select** soft key.
- 1 Do one of the following:
 - Press the **OK** soft key to return to the **EtherStats** submenu.
 - Use the **Navigation** keys to browse the data.
- 2 Press the **Cancel** soft key to return to the **EtherStats** submenu.

End of Procedure

Procedure 96

Checking Authenticator ID

- 1 Select **EtherStats** from the **Diagnostics** submenu.
- 1 Scroll through the **EtherStats** menu and select **Authenticator ID**.
- 2 Press the **Select** soft key.
- 3 Do one of the following:

- 4 Press the **OK** soft key to return to the **EtherStats** submenu.
 - Use the **Navigation** keys to browse the data.
- 5 Press the **Cancel** soft key to return to the **EtherStats** submenu.

End of Procedure

IP Statistics

Use Procedure 97 to access the **IP Stats** submenu item in Remote mode.

Procedure 97

Browsing IP Statistics

- 1 Select **IP Stats** from the **Diagnostics** submenu. The IP Statistics appear on the display.
- 2 Do one of the following:
 - Press the **OK** soft key to return to the **Diagnostics** submenu.
 - Use the **Navigation** keys to scroll through the data display results. See Figure 71 on [page 447](#).
 - Press the **Cancel** soft key to return to the **Diagnostics** submenu.

End of Procedure

RUDP Statistics

Use Procedure 98 to access the **RUDP Stats** submenu item in Remote mode.

Procedure 98
Browsing RUDP Statistics

- 1 Select **RUDP Stats** from the **Diagnostics** submenu. The RUDP statistics appear on the display.
- 2 Do one of the following:
 - Press the **OK** soft key to return to the **Diagnostics** submenu.
 - Use the **Navigation** keys to scroll through the data display results. See Figure 72 on [page 448](#).
 - Press the **Cancel** soft key to return to the **Diagnostics** submenu.

End of Procedure

QoS Statistics

Use Procedure 99 to access the **QoS Stats** submenu item in Remote mode.

Procedure 99
Browsing Quality of Service Statistics

- 1 Select **QoS Stats** from the **Diagnostics** submenu. The Quality of Service statistics appear on the display.
- 2 Do one of the following:
 - Press the **OK** soft key to return to the **Diagnostics** submenu.
 - Use the **Navigation** keys to scroll through the results. See Figure 73 on [page 448](#).
 - Press the **Cancel** soft key to return to the **Diagnostics** submenu.

Note: The IP Phone screen display returns to an idle state after 5 minutes if the user does not interact with menu items.

End of Procedure

Network Diagnostic Utilities data display pages

Data from the diagnostic utilities is displayed on the IP Phone screen display. One line of data at a time is displayed on IP Phone 2001 and IP Phone 2002 and 3 lines of data are displayed at a time on IP Phone 2004. Each line of data

is up to 24 characters long. Use the **Navigation** keys to scroll through the lines of data.

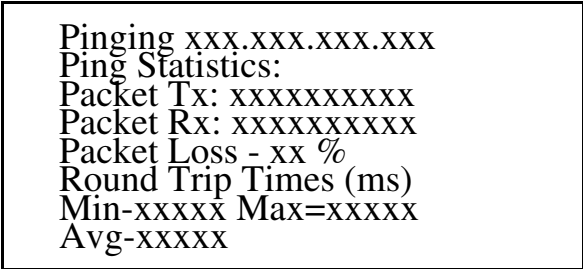
Local Mode data display pages

The following figures illustrate the Network Diagnostic Utilities data display pages in Local Mode.

Ping

Figure 61 illustrates the data displayed from the **Ping** diagnostic tool.

Figure 61
PING data display page



```
Pinging xxx.xxx.xxx.xxx
Ping Statistics:
Packet Tx: xxxxxxxxxxxx
Packet Rx: xxxxxxxxxxxx
Packet Loss - xx %
Round Trip Times (ms)
Min-xxxxx Max=xxxxx
Avg-xxxxx
```

In Figure 61,

- PacketTx = packets sent
- PacketRx = packets received

TraceRoute

Figure 62 on [page 438](#) illustrates the data displayed from the **TraceRoute** diagnostic tool. Browse through the last 30 items by pressing the **Navigation** keys.

Figure 62
TraceRoute data display screen

```
xxx: xxxxx xxxxx xxxxx
IP: xxx.xxx.xxx.xxx
xxx: xxxxx xxxxx xxxxx
IP: xxx.xxx.xxx.xxx
xxx: xxxxx xxxxx xxxxx
IP: xxx.xxx.xxx.xxx
xxx: xxxxx xxxxx xxxxx
IP: xxx.xxx.xxx.xxx
xxx: xxxxx xxxxx xxxxx
IP: xxx.xxx.xxx.xxx
```

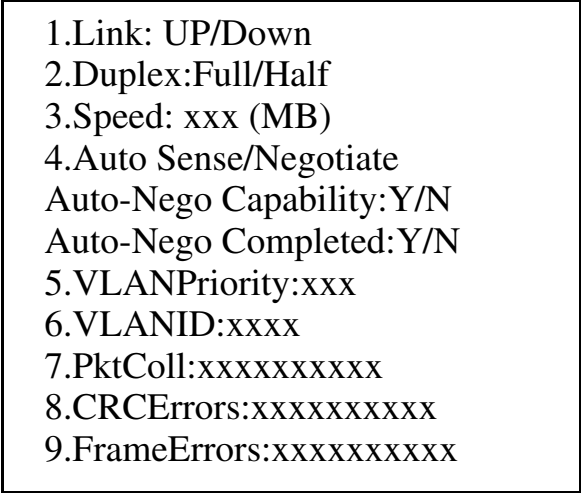
In Figure 62,

- xxx: = Time To Live (TTL):Round Trip Time1, Round Trip Time2, Round Trip Time3
- IP: = IP address

Ethernet Statistics

Figure 63 on [page 439](#) illustrates the data displayed from the **Ethernet Statistics** submenu item.

Figure 63
Ethernet Statistics data display page



```
1.Link: UP/Down
2.Duplex:Full/Half
3.Speed: xxx (MB)
4.Auto Sense/Negotiate
Auto-Nego Capability:Y/N
Auto-Nego Completed:Y/N
5.VLANPriority:xxx
6.VLANID:xxxx
7.PktColl:xxxxxxxxxxx
8.CRCErrors:xxxxxxxxxxx
9.FrameErrors:xxxxxxxxxxx
```

In Figure 63,

- Duplex = duplex mode
- Speed = network speed 10MB/100MB
- Auto Sense/Negotiate = Auto Negotiate Protocol Received or Not (Y – Yes, N – No)

Note: In the **IP Phone Configuration** menu, Auto Negotiate mode is the default setting for initial startup. If the telephone is connected to a network that supports Auto Negotiate, it selects the best speed and duplex mode available. For more information, see “Full Duplex mode” on [page 61](#), on [page 96](#), and on [page 131](#).

- VLANPriority = IP Phone VLAN priority
- VLANID = IP Phone VLAN ID
- PCollision = network packet collision peg counts
- CRCErrors = network CRC errors peg counts
- FrameErrors = network Framing errors peg counts

IP Networking Statistics

Figure 64 illustrates the data displayed from the **IP Networking Statistics** submenu item.

Figure 64
IP Networking Statistics data display screen

1. Packet Tx: xxxxxxxxxxxx
2. PacketRx: xxxxxxxxxxxx
3. BcastPktRx: xxxxxxxxxxxx
4. McastPktRx: xxxxxxxxxxxx
5. InPktDisc: xxxxxxxxxxxx
6. OutPktDisc: xxxxxxxxxxxx
7. UnknownPkts: xxxxxxxxxxxx
8. ICMPType—Code: xxx—xxx

In Figure 64,

- PacketTx = IP Phone packets sent
- PacketRx = IP Phone packets received
- BcastPktRx = broadcast packets received
- McastPktRx = multicast packets received
- InPktDisc = incoming packets discarded
- OutPktDisc = outgoing packets discarded
- UnknownPkts = unknown protocol packets discarded
- ICMPType-Code = the last ICMP message: XXX-XXX

DHCP Statistics

Figure 65 on [page 441](#) illustrates the data displayed from the **DHCP Statistics** submenu item.

Figure 65
DHCP information data display page

```
1.Configuration:
NetworkDataValided:Yes/No
MACAddressStored:Yes/No
PerformDHCP:Full/Partial
VLANEnable:Yes/No
VLANConfig:Manual/Auto
VLANIDsDiscovered:Yes/No
PrimaryServer:S1/S2
2.FWVersion:xxxxxxx
3.HWIDxxxxxxxxxxxxxxxxxxxxx
4.SetIP:xxx.xxx.xxx.xxx
5.SbMask:xxx.xxx.xxx.xxx
6.GtWay:xxx.xxx.xxx.xxx
7.PROMS1:xxx.xxx.xxx.xxx
  Port:xxxx Act:xxx
  Retries:xxx
8.PROMS2:xxx.xxx.xxx.xxx
  Port:xxxx Act:xxx
  Retries:xxx
9.VLANPriority:xxx
10.VLANID:xxxx
11.DHCPRespondString:
xxxxxxxxxxxxxxxxxxxxxxxxxxx
xxxxx.....
12.Servers'Information:
  SN:xxx.xxx.xxx.xxx
  Port:xxxx Act:xxx
  Retries:xxx FailOver:xxx
```

In Figure 65,

- NetworkDataValided = is EEPROM Network Data validated?
- MACAddressStored = is MAC Address stored in EEPROM?
- FWVersion = IP Phone firmware version
- HWID = IP Phone hardware ID
- SbMask = subnet mask
- GtWay = Gateway
- PROMS1 = EEPROM Server1 information
- PROMS2 = EEPROM Server2 information
- Sn = S: Server n is from 1 to 16

UNIStim/RUDP statistics

Figure 66 illustrates the data displayed from the **UNIStim/RUDP statistics** submenu item.

Figure 66

UNIStim/RUDP statistics data display screen (TPS)

```
1.MessageTx:xxxxxxxxxxxxx
2.MessageRX:xxxxxxxxxxxxx
3.Retries:xxxxxxxxxxxxx
4.UpTime:xxx/xx/xx/xx
```

In Figure 66,

- MessageTx = messages sent
- MessageRx = messages received
- Retries = number of retries
- UpTime = up-time of current TPS registration
(days/hours/minutes/seconds)

RTP/RTCP statistics

Figure 67 illustrates the data displayed from the **RTP/RTCP statistics** submenu item.

Figure 67
RTP/RTCP statistics data display page

```
1.EndIP:xxx.xxx.xxx.xxx
2.PortID:xxxx
3.PacketTX:xxxxxxxxxx
4.PacketRx:xxxxxxxxxx
5.DiscPktRx:xxxxxxxxxx
6.PacketLossRx:xxx%
7.JittAveRx:xxxxxxxxxx
8.JittMaxRx:xxxxxxxxxx
9.RdTripDelay:xxxxx ms
```

In Figure 67,

- EndIP = endpoint IP address
- PortID = port ID
- PacketTx = RTP packets sent
- PacketRx = RTP packets received
- DPacketRx = BTR Disorder packets received
- PacketLossRx = packet loss received xxx%
- JittAveRx = jitter average received xxxxx
- JittMaxRx = jitter maximum received xxxxx
- RdTripDelay = round trip delay

Note: Each new call resets the counters.

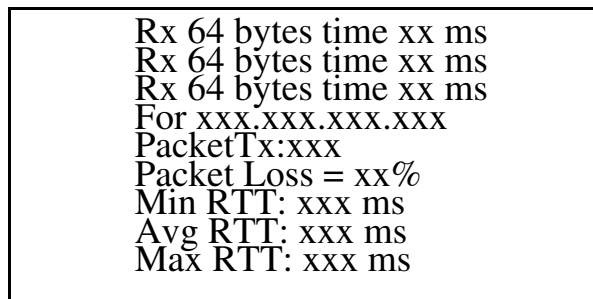
Remote Mode data display pages

The following figures illustrate the **Network Diagnostic Utilities** data display pages in Remote Mode.

PING

Figure 68 illustrates the data displayed from the **Ping** Diagnostic Tool.

Figure 68
Ping data display page



```
Rx 64 bytes time xx ms
Rx 64 bytes time xx ms
Rx 64 bytes time xx ms
For xxx.xxx.xxx.xxx
PacketTx:xxx
Packet Loss = xx%
Min RTT: xxx ms
Avg RTT: xxx ms
Max RTT: xxx ms
```

In Figure 68,

- Packet TX = packets sent
- Packet Rx = packets received
- RTT - Round Trip Time (for Min RTT, Avg RTT, and Max RTT)

TraceRoute

Figure 69 illustrates the data displayed from the **Tracert** Diagnostic tool.

Figure 69
Tracert data display screen

```
Hopxxx: RTT = xxx xxx xxx
IP: xxx.xxx.xxx.xxx
Hopxxx: RTT = xxx xxx xxx
IP: xx.xxx.xxx.xxx
Hopxxx: RTT = xxx xxx xxx
IP: xxx.xxx.xxx.xxx
Hopxxx: RTT = xxx xxx xxx
IP: xxx.xxx.xxx.xxx
Hopxxx: RTT = xxx xxx xxx
IP: xxx.xxx.xxx.xxx
```

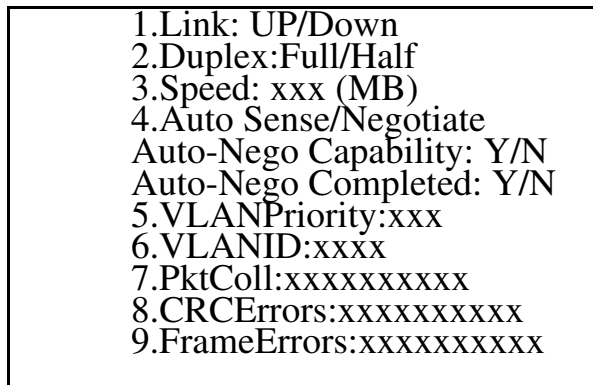
In Figure 69,

- Hopxxx = the Hop number
- xxx = Round Trip Time1, Round Trip Time2, Round Trip Time3
- IP: = IP address

Ethernet Statistics

Figure 70 illustrates the data displayed from the **EtherStats** submenu item.

Figure 70
Ethernet statistics data display screen



```
1.Link: UP/Down
2.Duplex:Full/Half
3.Speed: xxx (MB)
4.Auto Sense/Negotiate
Auto-Nego Capability: Y/N
Auto-Nego Completed: Y/N
5.VLANPriority:xxx
6.VLANID:xxxx
7.PktColl:xxxxxxxxxxx
8.CRCErrors:xxxxxxxxxxx
9.FrameErrors:xxxxxxxxxxx
```

In Figure 70,

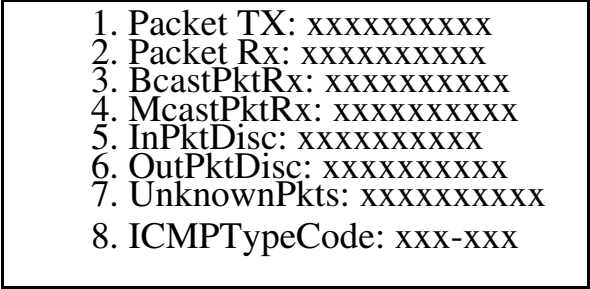
- Duplex - duplex mode
- Speed - network speed 10MB/100MB
- Auto Sense/Negotiate = Auto Negotiate Protocol Received or Not (Y - Yes, N - No)
- VLANPriority = IP Phone VLAN priority
- VLANID = IP Phone VLAN ID
- PCollision = network packet collision peg counts
- CRCErrors = network CRC errors peg counts
- FrameErrors = network Framing errors peg counts

Note: In the **IP Phone Configuration** menu, Auto Negotiate mode is the default setting for initial startup. If the telephone is connected to a network that supports Auto Negotiate, it selects the best speed and duplex mode available. For more information, see “Full Duplex mode” on [page 61](#), on [page 96](#), and on [page 131](#).

IP Networking Statistics

Figure 71 illustrates the data displayed from the **IP Stats** submenu item.

Figure 71

IP Networking statistics data display screen

```
1. Packet TX: xxxxxxxxxx
2. Packet Rx: xxxxxxxxxx
3. BcastPktRx: xxxxxxxxxx
4. McastPktRx: xxxxxxxxxx
5. InPktDisc: xxxxxxxxxx
6. OutPktDisc: xxxxxxxxxx
7. UnknownPkts: xxxxxxxxxx
8. ICMPTypeCode: xxx-xxx
```

In Figure 71,

- PacketTx = IP Phone packets sent
- PacketRX = IP Phone packets received
- BcastPktRx = broadcast packets received
- McastPkeRx = multicast packets received
- InPktDisc = incoming packets discarded
- OutPktDisc = outgoing packets discarded
- UnknownPkts = unknown protocol packets discarded
- ICMPTypeCode = the last ICMP message: xxx-xxx

RUDP statistics data display screen (TPS)

Figure 72 illustrates the data displayed from the **RUDP Stats** submenu item.

Figure 72
RUDP statistics data display page

```
1.MessageTx:xxxxxxxxxxxxx
2.MessageRx:xxxxxxxxxxxxx
3.Retries:xxxxxxxxxxxxx
4.UpTime:xxx/xx/xx/xx
```

In Figure 72,

- MessageTx = messages sent
- MessageRx = messages received
- Retries = number of retries
- UpTime = up-time of current TPS registration (days/hours/minutes/seconds)

Quality of Service statistics

Figure 73 illustrates the data displayed from the **QoS Stats** menu item.

Figure 73
QoS statistics data display page

```
FarEndIP:xxx.xxx.xxx.xxx
PortEndPortID:xxxx
LocPktLossRx:xxxxxxxxxxxx
LocJittAvgRx:xxx
LocLatAvg:xxx
LocPktTx:xxx
LocPktRx:xxx
LocOutOrdRx:xxx
LocListR:xxx
RmtPktLossRx:xxx
RmtJittAvgRx:xxx
RmtLatAvg>xxx
RmtListR:xxx
```


In Figure 73,

- EndIP = endpoint IP address
- PortID = port ID
- PacketTx = RTP packets sent
- Packet Rx = RTP packets received
- DPacketRx = BTR Disorder packets received
- PacketLossRx = packet loss received xxx%
- JittAveRx = jitter average received xxxxxx
- JittMaxRx = jitter maximum received xxxxxx
- RdTripDelay = round trip delay

Note: Each new call resets the counters.

Network Address Translation Traversal

This section describes the Network Address Translation (NAT) Traversal feature as it effects IP Phones. NAT Traversal is required to permit IP Phones working behind a NAT box to connect and maintain signaling and media paths.

NAT Traversal is applicable to all UNISim IP Phone clients and is one-ended. That is, it does not require the other end of a call to support any special protocol, and it is interoperable with any other media termination.

In this document NAT refers to both IP port address mapping and IP address mapping (also known as NAPT). A NAT can be used with or without a Virtual Private Network (VPN).

The NAT Traversal feature supports only IP clients behind cone NAT types. There are three types of cone NAT—the full cone, restricted cone, and the port restricted cone. NAT traversal is not compatible with symmetric NATs. If the IP Phone is behind a Symmetric NAT, the LTPS unregisters the phone from the call server (while remaining registered on the LTPS), and displays the following message on the IP Phone display: “Error! Symmetric NAT”.

For detailed information about the NAT Traversal feature, refer to *IP Line: Description, Installation, and Operation* (553-3001-365).

Network Address Translation information accessible from the IP Phones includes:

- Public Set IP
 - SIG
- Public Set IP
 - RTP
- Private Set IP
 - SIG
- Private Set IP
 - RTP
- type of NAT

Procedure 100
Accessing NAT information

- 1 Press the **Services** key.
- 2 Press the **Navigation** keys to scroll and highlight **Telephone Options**.
- 3 Press the **Select** soft key.
- 4 Press the **Navigation** keys to scroll and highlight **Set Info**.
- 5 Press the **Select** soft key.
- 6 Press the **Navigation** keys to scroll and highlight **Set IP Info**.
- 7 Press the **Select** soft key

- 8** Press the **Navigation** keys to scroll through the NAT information.

IMPORTANT!

Nortel recommends partial DHCP configuration for IP Phones residing behind a NAT router unless the NAT router supports special configuration of the DHCP server. For more information, refer to *IP Line: Description, Installation, and Operation* (553-3001-365).

Using CLI Commands

IDU commands

The system-based IDU command in LD 32 can be used to test the end-to-end IP connectivity of the IP Phone from the call server console instead of using set-based diagnostics.

The IDU command provides the following information:

- TN
- TN ID
- MAC address
- IP address
- LTPS IP address
- Manufacturer code
- Model
- NT code
- Color code
- Release code
- Serial number
- Firmware/Software version

Note: For an IP Phone behind a NAT, the IP address is composed of the public address followed by the private address in parentheses (see Table 46 on page 453). For an IP Phone without a NAT, the IP address is the signaling IP address of the IP Phone as seen by the LTPS (see Table 47 on page 453).

For detailed information, see *Software Input/Output: Maintenance* (553-3001-511).

Table 46 and Table 47 on [page 453](#) provide the output format of the IDU commands in LD 32.

Table 46 provides the output format of the IDU commands in LD 32 for an IP Phone with a NAT.

Table 46
IDU command printout in LD 32 for IP Phone with a NAT

Item	Description
ISet TN:	I s c u
TN ID CODE:	i2001, i2002, i2004, or i2050
ISet MAC ADR	xx.xx.xx.xx.xx.xx
ISet IP ADR	xx.x.x.xxx:xxxx(xxx.xxx.x.xx)
LTPS IP ADR	xx.xx.xxx.xx
MANUFACTURER CODE	[NAME]
MODEL	
NT CODE:	xxxxxxx
COLOR CODE:	xx
RLS CODE:	x
SER NUM:	xxxxxx
FW/SW VERSION	xxxxxxx

Table 47 provides the output format of the IDU commands in LD 32 for an IP Phone without a NAT.

Table 47
IDU command printout in LD 32 for IP Phone without a NAT (Part 1 of 2)

Item	Description
ISet TN:	I s c u
TN ID CODE:	i2001, i2002, i2004, or i2050
ISet MAC ADR	xx.xx.xx.xx.xx.xx

Table 47
IDU command printout in LD 32 for IP Phone without a NAT (Part 2 of 2)

Item	Description
ISSET IP ADR	XX.X.X.XXX:XXXX
LTPS IP ADR	XX.XX.XXX.XX
MANUFACTURER CODE	[NAME]
MODEL	
NT CODE:	XXXXXXXX
COLOR CODE:	XX
RLS CODE:	X
SER NUM:	XXXXXX
FW/SW VERSION	XXXXXXXX

- If the IDU command cannot retrieve the information shown in Table 46 or Table 47, it responds with one of the following:
- prints the IP Phone IP address and the Voice Gateway Media Card address, and generates an NPR0503 message
- the IP Phone is not registered with the Call Server and generates an NPR0048 message
- the IP Phone is registered, but the Call Server is not responding, and generates an NPR0503 message.

Configure IP Phone 2007 Local Options

The IP Phone 2007 has both local and server-based options. The local options cover the following entries in the Tools menu:

- Network Configuration
- Local Diagnostics
- Touch Panel Setup
- Contrast and Brightness

- USB devices
- TFTP Upgrade
- Preferences

Note: Entering Text in the Tools menu items is easier with a USB keyboard.

Network Configuration

The Network Configuration displays the information that was configured when the IP Phone 2007 was installed.

Procedure 101

Displaying Network Configuration information

- 1 Tap the **Tools** icon.
- 2 Enter the **Tools** menu password (if password protection is enabled). For information about password protection, refer to “Password Protection” on [page 149](#).
- 3 Tap the **Network Configuration** menu entry.

The screen displays **Apply & Reset** and **Exit** soft keys, and the parameters used when configuring the IP Phone 2007:

- DHCP status
 - To change the setting, choose an entry in the drop-down list.
- Telephone Set IP address
- Network Mask (NET MASK)
- Gateway IP address
- Server 1 IP address, Port, Action, Retry, and PK numbers
- Server 2 IP address, Port, Action, Retry, and PK numbers
- XAS (S4) IP address, Port, Action, Retry
- Voice VLAN
 - To change the setting, choose an entry in the drop-down list.
- VLAN Filter

- To change the setting, choose an entry in the drop-down list.
 - DATA VLAN
 - To change the setting, choose an entry in the drop-down list.
 - Duplex setting
 - To change the setting, choose an entry in the drop-down list.
 - EAP
 - To change the setting, choose an entry in the drop-down list.
- 4 Tap the arrow keys on the scroll bar to view all the data.
- 5 Tap the **Apply & Reset** soft key to save the changes.
- 6 Tap the **Exit** key to return to the main display.
- See Table 15 on [page 152](#) for further information.

End of Procedure

Local Diagnostics

The **Local Diagnostics** menu contains the following menu items:

- Network Diagnostic Tools
- Ethernet Statistics
- IP Network Statistics
- IP Set&DHCP Information

You can press the **Return** soft key in any submenu item screen to return to the Local Diagnostics submenu. Therefore, you can gather information and run tests without exiting and reentering the Local Diagnostics menu.

Procedure 102 Using Network Diagnostic Tools

- 1 Tap the **Tools** icon.
- 2 Tap the **Local Diagnostics** menu entry.
- 3 Tap the **Network Diagnostic Tools** soft key.

The screen displays **Ping**, **Tracert**, and **EXIT** soft keys, presents a pull-down list for IP addresses, and displays the Ping and Hop parameters.

- 4 Scroll down through the IP addresses and tap an address.
- 5 The number of repetitions of the **Ping** command are shown in the top bar of the screen. The default is 4.

To change the number of repetitions, tap on the number and enter a new value using the USB keyboard.

- 6 The number of hops for the **Tracert** command are shown in the top bar of the screen. The default is 30.

To change the number of hops, tap on the number and enter a new value using the USB keyboard.

- 7 Tap the **Ping** soft key to have the telephone attempt to access the IP address up to the number of times shown on the top of the screen.

The IP Phone displays the following:

```
Pinging x.x.x.x with 64 bytes
(where x.x.x.x is the IP address chosen in step 4 on page 457)
```

The **Exit** soft key changes to **Stop** and the other soft keys become blank.

The IP Phone will attempt to contact (ping) the address the number of configured times, displaying the results of each attempt.

- 8 To stop the ping before completing, tap the **Stop** soft key.

The **Stop** key becomes the **Exit** soft key. The results of ping are displayed as follows:

- Packets transmitted (Tx)
- Packets received (Rx)
- Packets lost (Lost)
- Minimum round trip time (Min)
- Maximum round trip time (Max)
- Average round trip time (Avg)

- 9 Tap the **Tracert** soft key to request the IP Phone to trace the route to the entered IP address, up to MaxHop nodes.

The IP Phone displays the following:

Tracing route to: (x.x.x.x) over a maximum of y hops
(where x.x.x.x is the IP address chosen in step 4 on [page 457](#) and y
is the number of hops displayed at the top of the screen)

The **Exit** soft key changes to **Stop** and the other soft keys become blank.

The IP Phone will trace the route to the address for the configured number of server hops, displaying the hop number (starting at 0), the time in milliseconds, and the IP address.

When the trace is complete, the screen displays the following:

Trace complete.

- 10 To stop Tracert before it completes, tap the **Stop** soft key.

The **Stop** soft key becomes the **Exit** soft key when Tracert stops.

- 11 Tap the **Exit** soft key to return to the Local Diagnostics menu.

End of Procedure

Procedure 103

Using Ethernet Statistics tool

- 1 Tap the **Tools** icon.
- 2 Tap the **Local Diagnostics** menu entry.
- 3 Tap the **Ethernet Statistics** soft key.

The tool displays **Reset**, **NIPort**, and **EXIT** soft keys, and the statistics for the Network Interface Port (NIPort).

The following statistics are displayed:

- Link Status
- Duplex Mode
- Network Speed
- AutoSense/Negotiate Capability
- AutoSense/Negotiate Completed
- Port VLAN Priority
- Port VLAN ID
- Packet Collision
- CRC Error count
- Frame Error count

4 To reset the NIPort counters to 0, tap the **Reset** soft key.

5 Tap the **NIPort** soft key.

The **NIPort** soft key changes to the **PCPort** soft key and the tool displays the statistics for the Personal Computer port (PCPort). The following statistics are displayed:

- Link Status
- Duplex Mode
- Network Speed
- AutoSense/Negotiate Capability
- AutoSense/Negotiate Completed
- Port VLAN Priority
- Port VLAN ID
- Packet Collision
- CRC Error count
- Frame Error count

6 To reset the PCPort statistics to 0, tap the **Reset** soft key.

End of Procedure

Procedure 104
Using the IP Network Statistics tool

- 1 Tap the Tools icon.
- 2 Tap the Local Diagnostics soft key.
- 3 Tap the IP Network Statistics soft key.

The tool displays the Reset, NIPort, and Exit soft keys, and the statistics for the Network Interface Port (NIPort).

The following statistics are displayed:

- Packets sent
- Packets received
- Broadcast Packets received (Rx)
- Multicast Packets received (Rx)
- Incoming Packets discarded
- Outgoing Packets discarded
- Unknown protocols (Unknown protos)
- Last Internet Control Message Protocol (ICMP) message type and code (ICMP Type/Code)

- 4 To reset the NIPort counters to 0, tap the **Reset** soft key.
- 5 Tap the **NIPort** soft key.

The **NIPort** soft key becomes the **PCPort** soft key, and the statistics for the Personal Computer Port (PCPort) are displayed.

The following statistics are displayed:

- Packets sent
- Packets received
- Broadcast Packets received (Rx)
- Multicast Packets received (Rx)
- Incoming Packets discarded
- Outgoing Packets discarded
- Unknown protocols (Unknown protos)
- Last Internet Control Message Protocol (ICMP) message type and code (ICMP Type/Code)

6 Tap the **PCPort** counters to 0, tap the **Reset** soft key.

7 Tap the **Exit** soft key to return to the Local Diagnostics menu.

End of Procedure

Procedure 105

Using the IPSet&DHCP Information tool

1 Tap the **Tools** icon.

2 Tap the **Local Diagnostics** soft key.

3 Tap the **IPSet&DHCP Information** soft key.

The tool displays the **Exit** soft key at the bottom of the display and the following information:

- Configuration
 - Network data validated, MAC address stored, DHCP setting

- Voice VLAN status, type of configuration and discovery status
 - Primary Server identification
 - Firmware version and Hardware Identification number
 - Telephone Set IP address
 - Network subnet mask
 - Gateway IP address
 - EPROM Server S1 and S2 IP addresses, ports, actions, and number of retries
 - Voice VLAN priority and VLAN ID
 - DHCP Respond String
 - Server Information for S01, S02, S03, and S04, including IP addresses, ports, actions, number of retries, and failover values
- 4 Use the scroll bar to display all the information.
 - 5 Tap the **Exit** soft key to return to the Local Diagnostics menu.

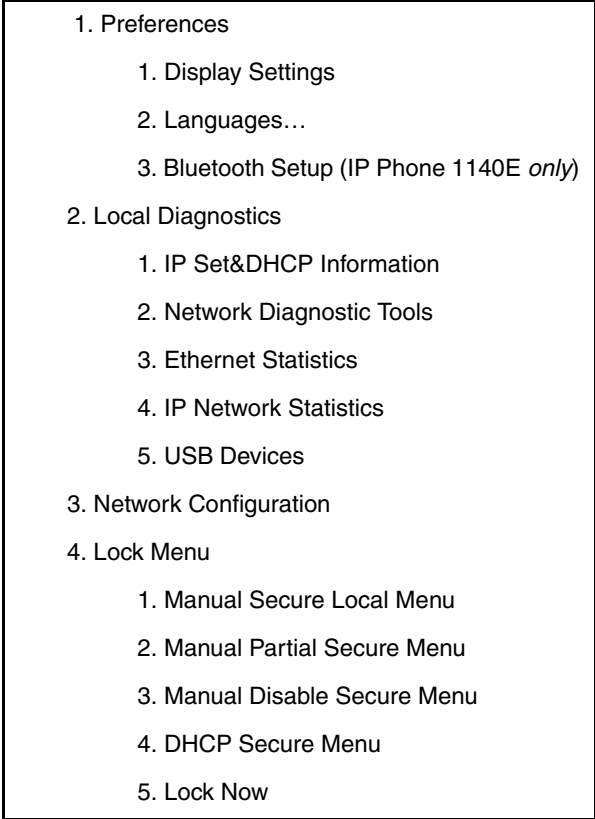
End of Procedure

Configure IP Phone 1120E and IP Phone 1140E Local Tools options

To make a menu selection, you can press the number associated with the menu item (for example, press 21 to show the IP Set&DHCP Information menu) or you can use the navigation keys to scroll through the list of menu items.

Figure 74 shows the options in the Local Tools menu.

Figure 74
Local Tools menu options

- 
- 1. Preferences
 - 1. Display Settings
 - 2. Languages...
 - 3. Bluetooth Setup (IP Phone 1140E *only*)
 - 2. Local Diagnostics
 - 1. IP Set&DHCP Information
 - 2. Network Diagnostic Tools
 - 3. Ethernet Statistics
 - 4. IP Network Statistics
 - 5. USB Devices
 - 3. Network Configuration
 - 4. Lock Menu
 - 1. Manual Secure Local Menu
 - 2. Manual Partial Secure Menu
 - 3. Manual Disable Secure Menu
 - 4. DHCP Secure Menu
 - 5. Lock Now

Note: Bluetooth wireless technology (IP Phone 1140E *only*) is optional and is dimmed if it is not enabled.

1. Preferences

The Preferences submenu offers the following choices:

- 1. Display Settings
- 2. Languages...
- 3. Bluetooth Setup (IP Phone 1140E *only*)

1. Display Settings

The Display Settings menu provides access to the Contrast and Screen Saver tools. Contrast adjusts the viewing angle of the display. Screen Saver controls how long the display remains lit if the phone is inactive.

Note: Nortel recommends you use the Telephone Options menu to adjust the contrast.

2. Languages...

This item is used to select the language in the local menus of the IP Phone.

3. Bluetooth Setup

You can access the Bluetooth Setup options using either of the following two methods:

- Double press the **Headset** key to open the 3. Bluetooth Setup dialog box.
- Double press the **Services** key to open the Local Tools menu, press 1 on the dialpad to select **1. Preferences** and press 3 on the dialpad to open the **3. Bluetooth Setup** dialog box.

The **3. Bluetooth Setup** item is not available on all phones. If the 3. Bluetooth Setup menu item appears dimmed, or fails to open when you double press the **Headset** key, Bluetooth wireless technology is not enabled on your phone. To configure the administration setting for Bluetooth wireless technology, see “Bluetooth wireless technology manual configuration” on [page 484](#).

Use Procedure 106 to pair the Bluetooth wireless technology headset with your IP Phone 1140E.

Procedure 106**Pairing the Bluetooth wireless technology headset with your IP Phone 1140E**

- 1 Restart your IP Phone 1140E using one of the following methods:
 - If you are using an AC power adapter, unplug it, wait ten seconds, and reinsert it.
 - If you are using POE, unplug the LAN Ethernet cable, wait ten seconds, and reinsert it.

- 2 Double-press the **Headset** key to open the 3. Bluetooth Setup dialog box. The **Enable Bluetooth** check box is highlighted.

Note: If the 3. Bluetooth Setup menu fails to open when you double press the Headset key, Bluetooth wireless technology is not enabled on your phone.

- 3 Press the **Enter** key to activate Bluetooth wireless technology.

A check mark is displayed to indicate that Bluetooth wireless technology is activated. The message *BT Enabled* appears at the bottom of the display.

- 4 Put your wireless headset in its pairing or search mode. The procedure for doing this can be different for each wireless headset. Refer to the documentation that accompanied your headset.

For example, if you are using the GN Netcom GN 6210, do the following:

- a. Turn the headset off by pressing and holding the headset **telephone** button for 3 to 4 seconds until a high to low tone is heard through the headset. The headset blue LED turns off.
 - b. Press and hold the headset **telephone** button for about 8 seconds until the blue LED flashes and then lights steadily.
- 5 Search for the headset.
 - a. Press the **Right** navigation key twice to highlight the **Search** button, displayed next to the Search Devices item.
 - b. Press the **Enter** key.

The message *Searching...* is displayed.

- c. If the search is successful, a list of Bluetooth wireless technology headsets appears in the Found: combo box.
- d. Choose one of the following:
 - If the search is successful, proceed to step 6.
 - If the search is not successful, the message *Search completed. No device found* is displayed. Power off the wireless technology, and repeat step 4 and step 5.

6 Wait for the search to finish or press the **Stop** soft key to end the search.

7 Choose one of the following:

- If your headset is displayed as the first item in the Found combo box, proceed to step 8.
- If your headset is not displayed as the first item in the Found combo box, select your headset from the list, as follows:
 - a. Press the **Right** navigation key one or more times to highlight the Found: combo box. Press the **Enter** key to start the edit mode.
 - b. Press the **Down** navigation key to open the list. Press the **Up/Down** navigation keys to scroll and highlight your headset.
 - c. Press the **Enter** key to select the headset and close the list. Press the **Enter** key to exit edit mode.

8 Press the **Right** navigation key one or more times to highlight the **Pair** button (next to the Pair Device item) and press the **Enter** key.

- a. A dialog box appears, with the prompt *Enter PIN#*.
- b. Use the telephone dialpad to enter the Bluetooth wireless technology headset PIN and press the **Enter** key.

Check your headset's documentation to find its PIN (sometimes called a passkey). Typically this value is 0000.

9 Choose one of the following:

- If the headset is successfully paired with your phone, proceed to step 10. To verify that the pairing was successful, ensure that the headset appears in the list next to the Paired: item. If pairing is

successful, the message *Pair completed* also appears at the bottom of the screen.

- If the headset is not successfully paired with your phone, an error message appears at the bottom of the screen. If an error message appears:
 - Confirm that the wireless headset is still in search/pair mode. For example, on the GN Netcom GN 6210 headset the blue LED should still be lighted when the pairing operation starts.
 - If the headset timed out and exited search/pairing mode, put the headset in pairing mode, as discussed in step 4, and repeat step 8.
 - Check that you are using the correct PIN and repeat step 8.

10 Choose one of the following:

- If your headset is displayed as the first item in the Paired combo box, proceed to step 11.
- If more than one device is paired, you may need to navigate to the one you want, as follows:
 - Press the **Right** navigation key one or more times to highlight the item in the Paired combo box. Press the **Enter** key to start the edit mode.
 - Press the **Up/Down** navigation keys to open the list. Press the **Up/Down** navigations key to scroll in the list and highlight your headset.
 - Press the **Enter** key to select the headset and close the list. Press the **Enter** key to exit edit mode.

11 Choose one of the following:

- If only one headset is paired, proceed to step 12.
- If more than one wireless headset is paired, the first headset paired is automatically made the active device.

To make a different headset active, press the **Right** navigation key one or more times to highlight the Set button (next to the Set Active Device item). Press the **Enter** key.

The message *Set active: <device name>* appears. This means the headset named is now the active wireless headset and is used when you press the headset key.

- 12** Press the **Exit** soft key to exit to the main display. Changes are saved automatically.

Note 1: Paired headset information is saved and restored when a reboot of the IP Phone 1140E occurs; therefore, the active wireless headset will remain paired and active.

Note 2: It is not recommended to pair more than one headset of the same model because they will have identical names in the Paired list.

End of Procedure

Dual Pairing Headsets

Take special care when using a dual pairing type of Bluetooth wireless technology headset, for example the GN Netcom GN6210. This headset can be paired to its base as well as to the IP Phone 1140E.

If the headset is paired to both, the IP Phone 1140E is the second device. When you press the headset telephone key and you hear a single tone, the headset is active for a call from the desktop telephone base.

To use the headset with the IP Phone 1140E, press and hold the headset's telephone key for 1 second. You will hear a double beep. The headset is active with the IP Phone 1140E.

If the desktop telephone base is powered off, then the headset is only paired to the IP Phone 1140E. Press the headset's telephone key to connect to the IP Phone 1140E.

Note: Unless there is a need to dual pair the GN6210 headset, the headset's operation with the IP Phone 1140E is simpler if it is only used with its charging-only base. The desktop telephone base should be powered off when not in use.

Using a wired headset

If you connect a wireless headset and a wired headset to the same IP Phone 1104E, the wireless headset interacts with the wired headset as follows:

- If no wireless headset is paired, the wired headset works as normal. Likewise, if a wireless headset is paired with a set but is not in range, the wired headset works as normal.
- When the Use BT Headset check box is selected, the Bluetooth wireless technology headset is used as the phone's headset.

The Bluetooth wireless technology headset can work only within range of the IP Phone 1104E; as a wireless headset approaches the edge of its radio range, the audio quality degrades and radio interference noise increases. When the wireless headset is in connecting range, the **Headset** key controls the headset, even if a wired headset is attached.

If a Bluetooth wireless technology headset moves out of connecting range, a special beep sounds in the headset indicating the connection was lost. For example, on the GN6210, a series of tones from high to low sounds when the connection is lost and when a call ends.

When you do not want to use Bluetooth wireless technology

If a Bluetooth wireless technology headset is connected, and you want to use the wired headset, you can switch between the wireless headset and the wired headset. It is not necessary to unpair or disable Bluetooth wireless technology.

Use Procedure 107 to switch between a wired headset and a wireless headset.

Procedure 107 **Switching between a wired headset** **and wireless headset**

- 1 Double-press the **Headset** key to open the **3. Bluetooth Setup** dialog box.
- 2 Press the **Left/Right** navigation key to select the **Use BT headset** item.
A check mark indicates that the wireless headset is used. This option is on (✓) by default.

- 3 To switch between a wired headset and a wireless headset, do one of the following:
 - Press the **Enter** key to clear the check box and to use the wired headset.
 - Press the **Enter** key to select the check box and to use the wireless headset.
- 4 Press the **Exit** soft key to exit to the main display.

End of Procedure

Use Procedure 108 to unpair the Bluetooth wireless technology headset.

Procedure 108
Unpairing a wireless headset

- 1 Double-press the **Headset** key to open the **3. Bluetooth Setup** dialog box.
- 2 Press the **Right** navigation key to select the Paired: item.
- 3 Choose one of the following:
 - If your headset is displayed in the Paired combo box, proceed to step 4.
 - If more than one device is paired, and your headset is not already displayed in the Paired combo box, do the following:
 - Press the **Right** navigation key one or more times to highlight the Paired: combo box. Press the **Enter** key to open edit mode.
 - Press the **Up/Down** navigation keys to open the list. Press the **Up/Down** navigations key to scroll in the list and highlight your headset.
 - Press the **Enter** key to select the headset and close the box. Press the **Enter** key to exit edit mode.
- 4 Press the **Right** navigation key one or more times to highlight the UnPair button (next to the UnPair Device item).
- 5 Press the **Enter** key.

Your Bluetooth wireless technology headset is unpaired and removed from the Paired: item list.

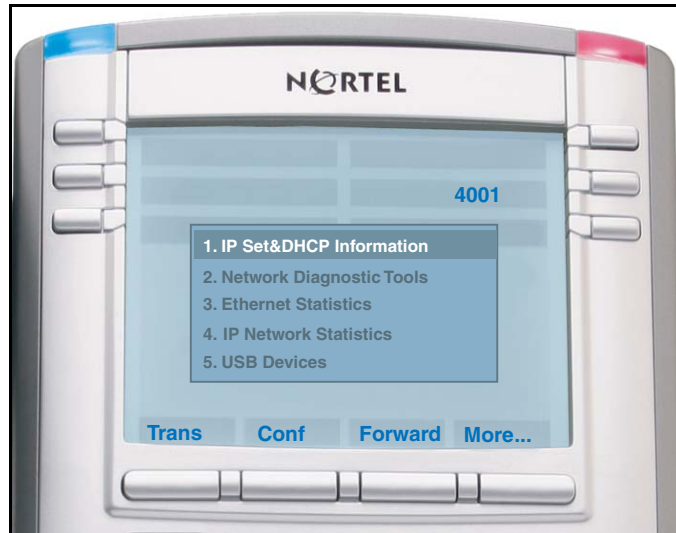
- 6 Press the **Exit** soft key to exit to the main display.

Note: Your Bluetooth wireless technology headset is no longer paired with your phone, and the wired headset can be used. To use the Bluetooth wireless technology headset again, you must perform the pairing and activation procedure.

End of Procedure

2. Local Diagnostics

Figure 75
Local Diagnostics menu



The Local Diagnostics submenu offers the following choices:

- 1. IP Set&DHCP Information
- 2. Network Diagnostic Tools
- 3. Ethernet Statistics
- 4. IP Network Statistics
- 5. USB Devices

1. IP Set&DHCP Information

Use Procedure 109 to use the IP Set&DHCP Information tool.

Procedure 109

Using the IP Set&DHCP Information tool

- 1 Press the **Services** key twice.
- 2 Press 2 1 on the dialpad to access the **IP Set&DHCP Information** menu or use the Up/Down navigation keys to scroll and highlight the IP Set & DHCP Information option.
- 3 Press the **Select** soft key.

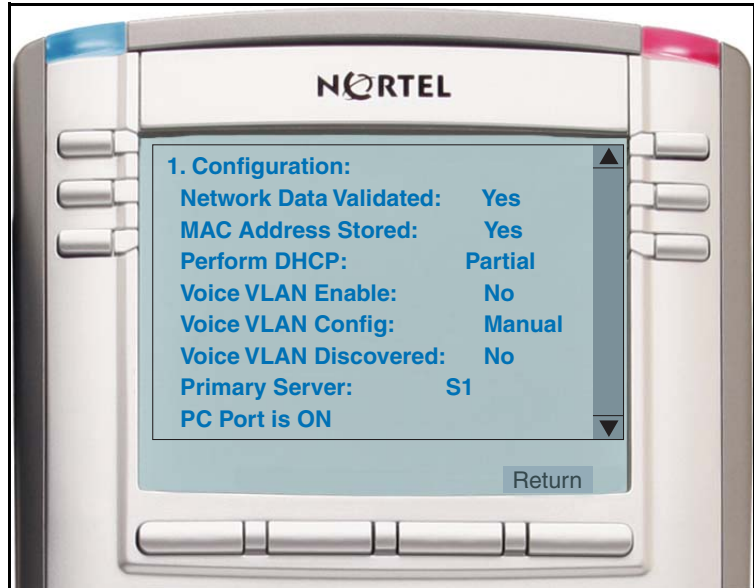
You can press the **Return** soft key to exit the menu and return to **Local Diagnostics** submenu.

The tool displays the following information:

- Configuration
 - Network data validated, MAC address stored, DHCP setting
 - Voice VLAN status, type of configuration and discovery status
 - Primary Server identification, PC Port enabled status
- Firmware version and Hardware Identification number
- Telephone Set IP address
- Network subnet mask
- Gateway IP address
- EPROM Server S1 and S2 IP addresses, ports, actions, and number of retries
- Voice VLAN priority and VLAN ID
- DHCP Response String
- Server information for S01, S02, S03, and S04, including IP addresses, ports, actions, number of retries, and failover values
- TFTP Server IP address

Figure 76 on [page 473](#) shows IP Set & DHCP Information screen.

Figure 76
IP Set & DHCP Information screen



- 4 Use the scroll bar to display all the information.
- 5 Press the **Return** soft key to return to the **Local Tools** menu or the **Stop** key to exit the menu and return to the telephone display.

End of Procedure

2. Network Diagnostic Tools

The Network Diagnostic Tools menu contains the following menu items:

- IP/MaxPing/MaxHop
- Ping
- Tracert
- Exit

Use Procedure 110 on [page 474](#) to use Network Diagnostic Tools.

Procedure 110
Using Network Diagnostic Tools

- 1 Press the **Services** key twice.
- 2 Press 2 2 on the dialpad to access the **Network Diagnostic Tools** menu or use the Up/Down navigation keys to scroll and highlight the IP Set & DHCP Information option.
- 3 Press the **Select** soft key.

You can press the **Return** soft key exit the menu to return to the **Local Diagnostics** submenu.

The screen displays **IP/MaxPing/MaxHop**, **Ping**, **Tracert**, and **Return** soft keys.

Figure 77 on [page 474](#) shows the Network Diagnostic Tools screen.

Figure 77
Network Diagnostic Tools screen



- 4 Enter an IP address or use the Up/Down navigation keys to scroll down through the IP addresses.

- 5 The number of repetitions of the **Ping** command is shown in the top bar of the screen. The default is 4.

To change the number of repetitions, use the arrow keys to select the number and enter a new value using the keypad.

- 6 The number of hops for the **Tracert** command is shown in the top bar of the screen. The default is 30.

To change the number of hops, use the arrow keys to select the number and enter a new value using the keypad.

- 7 Press the **Ping** soft key to have the telephone attempt to access the IP address, up to the number of times shown on the top of the screen.

The IP Phone displays the following:

Pinging x.x.x.x with 64 bytes
(where x.x.x.x is the IP address chosen in step 4 on [page 457](#))

The **Return** soft key changes to **Stop** and the other soft keys become blank.

The IP Phone attempts to contact (ping) the address the number of configured times, and displays the results of each attempt.

- 8 To stop the ping before completing, tap the **Stop** soft key.

The **Stop** soft key becomes the **Return** soft key. The results of ping are displayed as follows:

- Packets transmitted (Tx)
- Packets received (Rx)
- Percentage of Packets Lost (Lost)
- Minimum round trip time (Min)
- Maximum round trip time (Max)
- Average round trip time (Avg)

- 9 Press the **Tracert** soft key to request the IP Phone to trace the route to the entered IP address, up to MaxHop nodes.

The IP Phone displays the following:

Tracing route to: (x.x.x.x) over a maximum of y hops
(where x.x.x.x is the IP address chosen in step 4 on [page 457](#) and y is the number of hops displayed at the top of the screen)

The **Return** soft key changes to **Stop** and the other soft keys become blank.

The IP Phone traces the route to the address for the configured number of server hops, displaying the hop number (starting at 0), the time in milliseconds, and the IP address.

When the trace is complete, the screen displays the following:

Trace complete.

- 10 To stop Tracert before it completes, tap the **Stop** soft key.

The **Stop** soft key becomes the **Return** soft key when Tracert stops.

- 11 Tap the **Return** soft key to return to **Local Tools** menu or the **Stop** key to exit the menu and return to the telephone display.

End of Procedure

3. Ethernet Statistics

Use Procedure 111 on [page 476](#) to use the Ethernet Statistics menu.

Procedure 111

Using Ethernet Statistics tool

- 1 Press the **Services** key twice.
- 2 Press 2 3 on the dialpad to access the **Ethernet Statistics** menu or use the Up/Down navigation keys to scroll and highlight the **Ethernet Statistics** option.
- 3 Press the **Select** soft key.

You can press the **Return** soft key exit the menu to return to the **Local Diagnostics** submenu.

The screen displays **Reset**, **Nlport/PCport**, and **Return** soft keys. The **Nlport/PCport** soft key is used to select the Network (NI) Port or the PC (PC) Port. The soft key label indicates the current display page. For example, when Nlport appears on the soft key label, the information showing on the display is for the network interface port.

When NPort appears on the second soft key label, the following statistics are displayed:

- Link Status
- Duplex Mode
- Network Speed (10 Mb, 100 Mb, or 1 G)
- AutoSense/Negotiate
 - AutoSense/Negotiate Capability
 - AutoSense/Negotiate Completed
- Port VLAN Priority
- Port VLAN ID
- Packet Collision
- CRC Error count
- Frame Error count
- Unicast Packets Sent
- Unicast Packets Received
- Broadcast Packets Received
- Multicast Packets Received
- 802.1x Status (EAP Status)

4 To reset the NPort counters to 0, press the **Reset** soft key.

5 Press the **NPort** soft key.

The **NIPort** soft key changes to the **PCPort** soft key and the tool displays the statistics for the Personal Computer port (PCPort). The following PCPort statistics are displayed:

- Link Status
- Duplex Mode
- Network Speed
- AutoSense/Negotiate Capability
- AutoSense/Negotiate Completed
- Port VLAN Priority
- Port VLAN ID
- Packet Collision
- CRC Error count
- Frame Error count
- Unicast Packets Sent
- Unicast Packets Received
- Broadcast Packets Received
- Multicast Packets Received

Figure 78 on [page 479](#) shows Ethernet Statistics display screen.

Figure 78
Ethernet Statistics display screen



- 6** To reset the PCPort statistics to 0, tap the **Reset** soft key.

End of Procedure

4. IP Network Statistics

Use Procedure 112 to use the Network Statistics tool.

Procedure 112

Using the IP Network Statistics tool

- 1** Press the **Services** key twice.
- 2** Press 2 4 on the dialpad to access the **IP Network Statistics** menu or use the Up/Down navigation keys to scroll and highlight the **IP Network Statistics** option.
- 3** Press the **Select** soft key.

You can press the **Return** soft key exit the menu to return to the **Local Diagnostics** submenu.

- 4 The screen displays **Reset**, **Refresh**, and **Return** soft keys. The Refresh soft key (second soft key on the display) refreshes the counts on the display. This display shows the Network statistics for the IP Phone's port of the 3 port switch.

The following statistics are displayed:

- Packets sent
- Packets received
- Incoming Packet errors
- Outgoing Packet errors
- Incoming Packets discarded
- Outgoing Packets discarded
- Unknown protocols (Unknown protos)
- Last Internet Control Message Protocol (ICMP) message type and code (The Last ICMP Type/Code)

Figure 79 on [page 481](#) shows IP Networks Statistics screen.

Figure 79
IP Networks Statistics screen



- 5 To reset the NIPort counters to 0, press the **Reset** soft key.
- 6 The display counter values are a snapshot and the displayed counter values will not change while the display is shown. To refresh them as you view the counter display, press the **Refresh** soft key.
- 7 You can press the **Return** soft key exit the menu to return to the **Local Diagnostics** submenu, or you can press the **Stop** key to close the menu and return to the telephone display.

End of Procedure

5. USB Devices

The USB Devices tool provides information about an Universal Serial Bus (USB) devices that connect to your IP Phone. The IP Phone automatically detects USB devices when they are connected to the USB port in the back of the IP Phone. The IP Phone will enumerate and list any USB device, but only

USB mice and USB keyboards can be used. The display shows the descriptive text string received from the USB device.

Procedure 113

Using the USB Devices tool

- 1** Press the **Services** key twice.
- 2** Press 2 5 on the dialpad to access the **USB Devices** menu or use the Up/Down navigation keys to scroll and highlight the USB Devices option.
- 3** Press the **Select** soft key.

You can press the **Return** soft key exit the menu to return to the **Local Diagnostics** submenu.

3. Network Configuration

The Network Configuration displays the information that was configured when the IP Phone was installed. Items that are not active appear dimmed.

Use Procedure 114 to display Network Configuration information.

Procedure 114

Displaying Network Configuration information

- 1** Press the **Services** key twice.
- 2** Press 3 on the dialpad to access the **Network Configuration** menu or use the Up/Down navigation keys to scroll and highlight the Network Configuration option.
- 3** Press the **Select** soft key.

You can press the **Apply/Reset** soft key to save the settings and to reset the IP Phone. You can press the **Exit** soft key exit the menu to exit the menu without saving any changes and return to the **Local Diagnostics** submenu.

The screen displays **Select**, **Next** and **Exit** soft keys, and the following parameters used when configuring the IP Phone:

- EAP enable/disable check box

If you select the EAP enable/disable check box, use the keypad to fill in the following boxes:

— EAP Device ID

- EAP Password
- DHCP mode (Full, Partial, No) list

Note: If Full is selected for DHCP in the list, all items are dimmed. If Partial or No is selected for DHCP in the list, all items are accessible. You can use the keypad to enter the information.

 - If Full is selected from the list, all items are dimmed.
 - If No is selected from the list, use the keypad to fill in the information in the boxes.
 - If Partial is selected from the list, use the keypad to enter Server 1 IP address, Server 2 IP address, Port, Action, Retry, and PK numbers in the boxes.
- Voice VLAN (No, Auto, value) list
 - VLAN filter enable/disable check box
- Disable PC Port check box

To disable the PC Port, select the Disable PC Port check box.
- Data VLAN (No, value) list
- PC-Port Untag All check box

To enable VLAN Tag stripping, select the PC-Port Untag All check box.
- Duplex setting (Auto, 10 MB Full, 100 MB Full) list

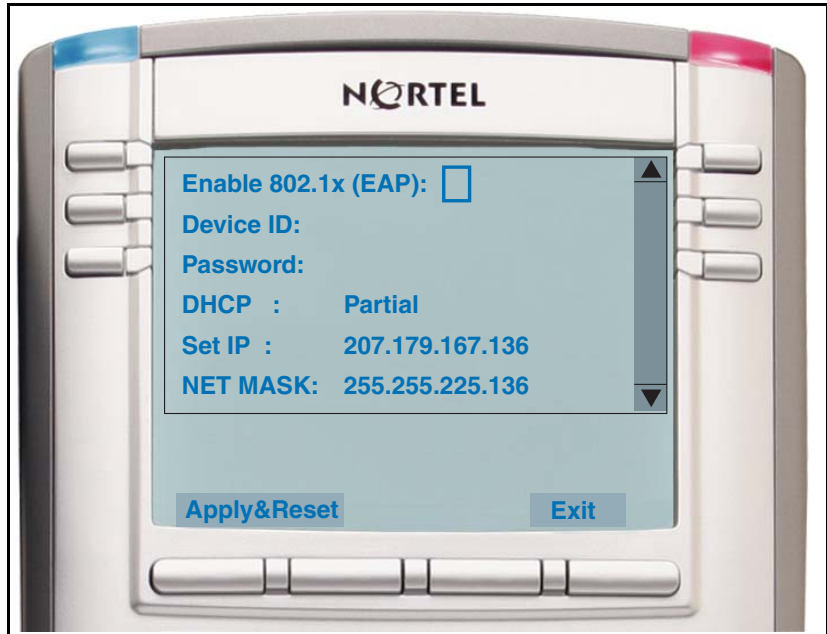
To change this setting, use the keypad to fill in the box.
- Ignore Gratuitous ARP (GARP) check box

To disable GARP, select the Ignore Gratuitous ARP (GARP) check box.
- XAS IP address
- GXAS selection check box
 - GXAS port number
- TFTP IP address
- Enable Bluetooth combo box (Auto, Yes, No)
- 4 Press the **Select** soft key to save the changes.

You can press the **Apply/Reset** soft key to save the settings and to reset the IP Phone. You can press the **Exit** soft key exit the menu to return without saving any changes and return to the **Local Diagnostics** submenu.

Figure 80 shows Network Configuration information.

Figure 80
Network Configuration information



End of Procedure

Bluetooth wireless technology manual configuration

You can also enable or disable Bluetooth wireless technology through the Network Configuration menu. The **Enable Bluetooth** option provides administration control over Bluetooth wireless technology. The following values are available:

- Auto—(default) Bluetooth wireless technology setting received through TFTP configuration

- Yes—Bluetooth wireless technology is enabled on the IP Phone 1140E
- No—Bluetooth wireless technology is disabled on the IP Phone 1140E

When the IP Phone 1140E firmware is upgraded, or when the IP Phone 1140E is received from the manufacturer with the latest firmware, the default power up setting is Auto. When the setting is Auto, the setting received from the TFTP Device Config file controls whether Bluetooth wireless technology is enabled. For more information about enabling Bluetooth wireless technology using TFTP configuration, see Procedure 69, “Enabling Bluetooth wireless technology on the IP Phone 1140E” on [page 390](#).

When the Bluetooth wireless technology setting is Yes or No, the value received from the TFTP Device Config file is saved but is not used. The Bluetooth wireless technology administration setting is forced enabled, or disabled respectively regardless of the value received in the TFTP Device Config file. If the setting is then changed back to Auto, the saved value will take effect if no further setting is received through the TFTP server.

Use Procedure 115 to configure the Bluetooth wireless technology administration setting through the **Local Tools > Network Configuration** submenu.

Procedure 115 **Configure the Bluetooth wireless technology** **administration setting**

- 1 Double-press the **Services** key.
- 2 Press **3** on the dialpad to access the **Network Configuration** menu or use the Up/Down navigation keys to scroll and highlight the Network Configuration option.
- 3 Use the Right navigation key to navigate to the **Enable Bluetooth** combo box. The current setting is displayed.
- 4 Press **Enter** to start the edit mode.
- 5 Use the Down navigation key to open the list.
- 6 Use the Up/Down navigation keys to scroll and highlight the desired Bluetooth wireless technology mode.
- 7 Press **Enter** to select the mode and to close the list.

- 8 Press **Enter** to exit the edit mode.
- 9 Press the **Apply&Reset** soft key to save the change and to restart the phone.

End of Procedure

The new mode takes affect when the IP Phone 1140E restarts. If the administrative control enabled Bluetooth wireless technology on the phone, the item **3. Bluetooth Setup** appears in **1. Preferences** submenu.

After setting administrative control, it is recommended that the Partial Menu Lock feature be activated to prevent users from changing the administration setting. For further information about the Partial Menu Lock feature, see “2. Manual Partial Secure Menu” on [page 487](#).

4. Lock Menu

You must enter the fixed password whenever the Lock Menu sub menu is accessed. Use the dialpad and enter the fixed password 26567*738 (color*set).

Note: The settings configured in the Lock Menu sub menu override the settings received from the DHCP string.

The Lock Menu offers the following choices:

- 1. Manual Secure Lock Menu
- 2. Manual Partial Secure Menu
- 3. Manual Disable Secure Menu
- 4. DHCP Secure Menu
- 5. LockNow

1. Manual Secure Local Menu

When this option is selected, you are prompted to enter the fixed password whenever the **Services** key is double-pressed.

2. Manual Partial Secure Menu

When this option is selected, you are prompted to enter the fixed password whenever you access the Local Diagnostics and the Network Configuration sub menus.

3. Manual Disable Secure Menu

When this option is selected, the Lock Menu is disabled.

4. DHCP Secure Mode

The IP Phone follows the menu lock configuration received from the Full DHCP string:

- if SECUREMENU is present, you are prompted to enter a password after you double-press the Services key
- if PARTSECUREMENU is present, you are prompted to enter a password whenever you select Local Diagnostics and Network Configuration
- if neither SECUREMENU nor PARTSECUREMENU is present, then the menu is not locked

For information about Password Protection, see “IP Phone 1120E” on [page 307](#), or “IP Phone 1140E” on [page 349](#)

5. Lock Now

The Lock Now item immediately exits the Tools menu, closes any open Tools menu pages, and locks the **Tools** menu.

Appendix E: TFTP Server

Introduction

A Trivial File Transfer Protocol (TFTP) Server may be required in an IP Telephony system to distribute firmware to IP Phones. The TFTP Server can reside on a subnet other than the Call Server and can be located on either side of the firewall.

TFTP Server planning

**CAUTION**

TFTP firmware download does not work when the IP Audio Conference Phone 2033 is behind a NAT Server.

The TFTP Server holds the firmware for updating the IP Phones. Assuming the IP address for the TFTP Server has been configured on the IP Phone, each time the IP Phone is powered on, rebooted, or is manually reset, the IP Phone checks the version of firmware against the version of firmware on the TFTP Server. If the versions are different, the IP Phone downloads the new firmware from the TFTP Server.

The following information must be considered when planning for a TFTP Server:

- The process for the IP Phone to check the version of firmware against the firmware on the TFTP Server takes a few seconds for a quiet network.

- The IP Phone attempts to connect to the TFTP Server. If the TFTP Server is offline, unreachable, or no connection is made, the IP Phone uses its existing version.
- The firmware downloading process takes about 30 seconds.
- The TFTP Server must be capable of supporting multiple TFTP sessions.
- When the IP Phone makes a TFTP request, it uses filenames without a full path name. Therefore, firmware updates for the IP Phones must be installed on the root directory of the TFTP Server.

When the firmware is uploaded to the TFTP Server, the files must be unzipped. Allow time for the TFTP Server to refresh. Monitor the TFTP Server for any errors. The TFTP Server can be located anywhere on the network if the IP Phones have the subnet mask and default IP gateway configured correctly. However, the IP Phone expects a response within two seconds to any TFTP Server request. Therefore, the TFTP Server should not be located, for example, at the other end of a slow WAN link.

If too many IP Phones attempt to download new software simultaneously, it can cause the downloads to slow down or return error messages. To reduce the number of retries and error messages, manage the download process by staggering the times the IP Phones download the firmware.

Nortel has tested the following TFTP Servers. They are listed in order of preference:

- Nortel TFTP Server (ONMS application)
- 3COM TFTP Server
- Pumpkin TFTP Server

Pre-download checklist

Ensure the following requirements are met before downloading firmware:

- A LAN must be properly configured and operational.
- The Nortel Telephony system must be connected to the network and completely operational.

- A TFTP Server must be available on the network in order to load the appropriate firmware in the IP Phones.

Downloading the firmware for IP Audio Conference Phone 2033

Procedure 116

Downloading the IP Audio Conference Phone 2033 firmware

Note: Nortel recommends that the user ends an active call before performing firmware upgrade. Otherwise results may be unpredictable.

- 1 Download the latest IP Phones firmware from the Nortel web site.
- 2 Load the latest version of the IP Phones firmware and place it on the TFTP Server. Ensure the TFTP Server is started.

The files required are:

- i2033.cfg
- firmware binary file (2310S10.bin, for instance)

- 3 If you statically assign IP addresses, ensure that the IP address, TFTP Server IP Address, Subnet Mask, and Default Gateway information are accurate. If you are using a DHCP Server, ensure the DHCP options are configured.
- 4 Enter the TFTP Server IP address in the configuration menu, and reboot the IP Audio Conference Phone 2033.

Downloading the firmware for IP Phone 2007

The IP Phone 2007 can perform TFTP firmware upgrade from within the **Tools** menu. This method requires the TFTP Server to store the following files in the root directory:

- i2007.cfg – downloading script file

- i2007.img – firmware image file

Note: i2007.img is the name of the firmware file by default, but the location and the name of the firmware image file being downloaded is specified in the i2007.cfg file and can be any name. The name of the firmware image file can be specified in relative path name notation (for example, /subfolder/name.ext or name.ext).

Procedure 117

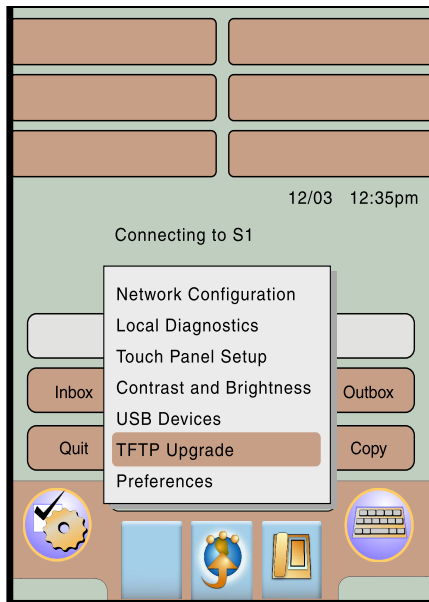
Downloading the firmware for the IP Phone 2007

Note: Nortel recommends that the user ends an active call before performing firmware upgrade otherwise results may be unpredictable.

- 1 Select the TFTP Upgrade option in the **Service > Option > Tools** menu.
 See Figure 81 on [page 492](#).

Figure 81

TFTP Upgrade menu option



- 2 Enter the IP address for the TFTP Server in the **TFTP IP:** edit box. The keypad can be used to enter the IP address by substituting star (*) as dot (.). See Figure 82 on [page 493](#).

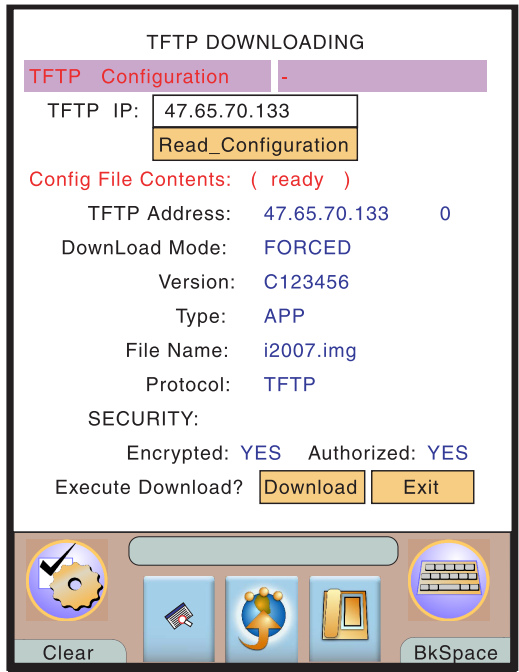
Figure 82
TFTP Server IP address screen

The screenshot shows a screen titled "TFTP DOWNLOADING". At the top, there is a purple header bar with "TFTP Configuration" in red text and a minus sign "-" in a white box. Below this, the "TFTP IP:" label is followed by a text input field containing "192.168.249.10". Below the input field is a yellow button labeled "Read_Configuration". Underneath the button, the text "Config File Content (not read yet)" is displayed in red. Below this, several configuration fields are listed with dashes as values: "TFTP Address:", "DownLoad Mode:", "Version:", "Type:", and "File Name:". At the bottom of the screen is a large numeric keypad with three rows of buttons. The first row contains digits 1-0 and a left arrow. The second row contains symbols for backspace, backslash, at, hash, dollar, percent, ampersand, asterisk, parentheses, and brackets. The third row contains "CAP", hyphen/underscore, equals, tilde, left brace, right brace, apostrophe, pipe, and period/forward slash. The bottom row contains "Shift", "Space", caret, exclamation mark, "abc", and "123".

- 3 Tap on the **Read_Configuration** button.

The IP Phone reads the configuration file information from the TFTP Server and displays the image information in the dialog box. Check your network connection if the phone cannot read the configuration file. See Figure 83 on [page 494](#).

Figure 83
Configuration file information



- 4 Press the **Download** button to start the TFTP Server.

The phone will go blank briefly. Then the message “Starting TFTP download” appears on the screen. Then the firmware is downloaded. The message “Writing firmware to Flash ROM” appears on the screen while the firmware is written to Flash memory. The IP Phone 2007 resets and the application starts.

End of Procedure

For future firmware upgrades, update the firmware file which is stored on the TFTP Server. Each time the IP Phone is powered on, it checks with the TFTP Server to ensure it has the proper firmware version, and it downloads the new software if necessary.

Downloading the firmware for IP Phone 1120E and IP Phone 1140E

Automatic TFTP download at bootup

If a TFTP IP address has been configured and a firmware upgrade is available on the server when the phone restarts, the phone executes the automatic TFTP download. This method requires the TFTP Server to store the .cfg and .img files for the IP Phone in the root directory.

For example, the IP Phone 1120E and IP Phone 1140E require the following files:

- 1120e.cfg
1120e.img
- 1140e.cfg
1140e.img

Note: 1120e.img, or 1140e.img is the name of the firmware file by default, but the location and the name of the firmware image file being downloaded is specified in 1120e.cfg, or 1140e.cfg and can be any name. The name of the firmware image file can be specified in relative path name notation (for example, /subfolder/name.ext or name.ext).

Table 48 describes the fields in the configuration file on the TFTP Server. The download mode can be set to AUTO or FORCED. It is recommended that you set DOWNLOAD_MODE to AUTO.

Table 48
Fields in the TFTP configuration file (Part 1 of 2)

Field Name	Field Value	Descriptions
[FW]		Section header for firmware download info
DOWNLOAD_MODE	AUTO	Recommended setting. The application looks at the version and downloads the FW if it is a newer version than what is on the phone.
	FORCED	The version of firmware is ignored. The firmware is always downloaded.

Table 48
Fields in the TFTP configuration file (Part 2 of 2)

Field Name	Field Value	Descriptions
VERSION	0625Cxx	The version string compared to what is on the phone.
FILENAME	0625Cxx.bin	Image file name. Must match the file name of the actual IP Phone FW file.
PROTOCOL	TFTP	Download protocol. Must be TFTP.
SERVER_IP	xxx.xxx.xxx.xxx	IP Address of the TFTP server in decimal.
SECURITY_MODE	0	For future use.

Use Procedure 118 on [page 497](#) to upgrade the firmware for the IP Phone 1120E and IP 1140E using automatic TFTP download during bootup.

Procedure 118
Upgrading the firmware for IP Phone 1120E
and IP Phone 1140E using automatic
TFTP download at bootup

- 1 Use one of the three methods to configure the TFTP Server address:
 - Access the Network Configuration menu. Enter the address at the TFTP IP prompt. Press the **ApplyandReset** soft key to save the change.
 - Enter the address in the BootC menu. See “Manual TFTP Download from BootC Procedure” on [page 497](#).
 - Enter the IP address in the TFTP IP address field retrieved by the DHCP Server.
- 2 Restart the phone.

After the phone starts and begins to run the latest version of firmware, the 1120e.cfg or 1140e.cfg files are downloaded from the TFTP Server. After the .cfg file is retrieved, the DOWNLOAD_MODE and VERSION fields are checked. If necessary, the firmware file is transferred to the phone using TFTP. The display shows the message “[FW] reading...”. If successful, the display shows “[FW] writing...” and the blue LED starts to flash. After the FW image is written to the phone, the message “[FW] finished” is displayed, the blue LED stops flashing, and the phone resets. The phone registers to the TPS with the new FW version.

End of Procedure

Manual TFTP Download from BootC Procedure

This method of upgrading the firmware is normally used only when you need to force the phone to restore an older firmware version. To use this method, the FW must be placed on the TFTP server, and you must manually configure the phone to point to that TFTP server. The BootC firmware carries out the upgrade. To initiate the FW download task, BootC must be triggered to run. The following steps explain the procedure.

Note: You can create the configuration file with a default file name, such as "1140E.img" so you do not have to change the file name each time a new IP Phone 1140E FW load is released. However, if you take this approach, be sure to rename the released FW file (for example, 0625Cxx.bin) to the default file name when the new FW file is copied into the TFTP server's directory and to update the VERSION string in the configuration file.

After the configuration file is in the TFTP server's home directory together with the image file, the firmware can be upgraded using the following procedure.

Procedure 119
Upgrading the firmware for IP Phone 1120E
and IP Phone 1140E using BootC

- 1 Hold down the [Up] and [2] keys, and while doing so, repower the phone. When the phone restarts, it will load and run BootC instead of the application. When the Msg Waiting LEDs go off, you can release the [Up] and [2] keys.
- 2 The following text menu on a white background appears:

11x0 IP Phone Manual Configuration Nortel

Note: If you do not see this message, you are in the wrong menu. Repeat step 1. If BootC is damaged from a power reset, hold down the [Up] and [3] keys to use the backup BootC.

- 3 When Nortel appears on the screen, press the soft keys 1,2,3,4 in sequence (left to right). BootC goes to manual configuration. If you miss this step, and the phone begins to register to the TPS, repeat step 1.
- 4 Follow the prompts to configure DHCP and other IP parameters or, if DHCP and other parameters are already configured, just keep pressing the 1 soft key or OK. The soft keys functions are listed below:
 - soft key 1 (below the LCD) is OK
 - soft key 2 is BackSpace
 - soft key 3 is Clear
 - soft key 4 is Cancel

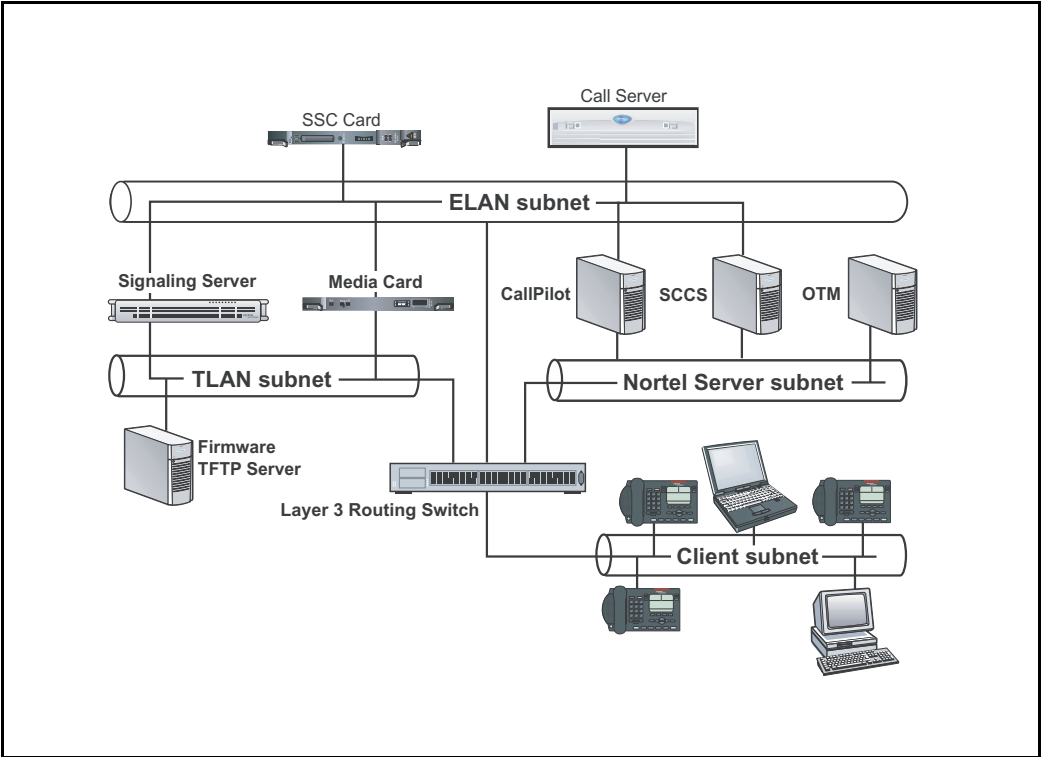
- 5 When prompted: "TFTP Dwnld? (0-No, 1-Yes):0",
 - Press soft key 2 (BKSpace) to clear the 0 (No).
 - Press 1 on the dialpad, then press soft key 1 (OK).
- 6 When prompted: "TFTP IP xxx.xxx.xxx.xxx",
 - If the IP address is correct for the TFTP server, press soft key 1 (OK). After the TFTP address is entered the first time, it is presented the next time you enter the menu.
 - If the IP address is incorrect, press soft key 2 (Clear) to erase the address shown and enter a new address. Press the asterisk (*) key to enter a period (.) in the IP address. You can also use backspace key to erase part of the address or correct errors by pressing soft key 1 (BKSpace). When the address is correct, press soft key 1 (OK).
- 7 The phone reads the configuration file from the TFTP server, extracts the Server_IP and Filename fields, and attempts to download the file. The display shows the message "[FW] reading..."
- 8 The display shows "[FW] writing..." and the blue LED starts to flash.
- 9 After the FW image is written to the phone, the message "[FW] finished" is displayed, the blue LED stops flashing, and the phone resets.

The phone registers to the TPS with the new FW version.

Note: If the TFTP Server, specified by the TFTP IP address entered during configuration, is unreachable or down, the IP Phone attempts to register to the TPS to perform a firmware download. If the IP Phone does not register to the TPS, the IP Phone will not work. Check the TFTP IP address and the state of the TFTP Server, then reboot the IP Phone.
- 10 If the IP Phone remains in this condition because no TPS FW download occurs, check the TFTP IP address and the state of the TFTP Server, then restart the IP Phone.

End of Procedure

Figure 84:
TFTP Server on a network



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Nortel Communication Server 1000

IP Phones

Description, Installation, and Operation

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