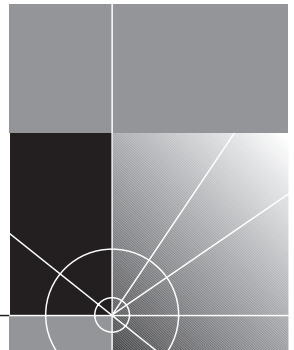




GETTING CONNECTED GUIDE

<http://www.3com.com/>

Part No. 980-000077/002
Published: September 1997



3Com Corporation ■ 5400 Bayfront Plaza ■ Santa Clara, California ■ 95052-8145

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ABOUT THIS GUIDE

About This Guide provides an overview of this guide, describes guide conventions and tells you where to look for specific information.

This guide describes the basic steps required to configure a unit to bridge or route IP or IPX data packets to a remote site using ISDN.

This guide is intended to be used by people with some technical competence. It is not intended for experienced network administrators configuring extensive and complex networks.



If the information in the release notes shipped with this product differs from the information in this guide, follow the instructions in the release notes.

Finding Specific Information in this Guide

This table shows the location of specific information in this guide.

| If you are looking for: | Turn to: |
|--|-----------------|
| The scope of this guide and procedures prior to configuration. | Chapter 1 |
| How to configure IP and bridging between a central site and a remote site. | Chapter 2 |
| How to configure IP routing between a central site and a remote site | Chapter 3 |
| How to configure IPX bridging between a central site and a remote site | Chapter 4 |
| How to configure IPX routing between a central site and a remote site | Chapter 5 |
| How to configure a PPP connection to an Internet Service Provider | Chapter 6 |

Conventions

Table 1 and Table 2 list conventions that are used throughout this guide.

Table 1 Notice Icons




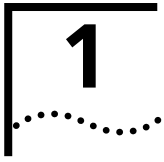
| Icon | Notice Type | Description |
|---|------------------|---|
|  | Information note | Important features or instructions |
|  | Caution | Risk to personal safety, system damage, or loss of data |
|  | Warning | Risk of severe personal injury |

Table 2 Text Conventions

| Convention | Description |
|---------------------------------|---|
| Commands | This typeface means you must enter the command exactly as shown in text and press the Return or Enter key. Example: CO IS AUTO IPX Commands are not case-sensitive. |
| Screen displays | This typeface represents information as it appears on the screen. |
| The words “enter” and “type” | When you see the word “enter” in this guide, you must type something, and then press the Return or Enter key. Do not press the Return or Enter key when an instruction simply says “type.” |
| [Key] names | Key names appear in text in one of two ways: <ul style="list-style-type: none"> ■ Referred to by their labels, such as “the Return key” or “the Escape key” ■ Written with brackets, such as [Return] or [Esc]. If you must press two or more keys simultaneously, the key names are linked with a plus sign (+). Example: Press [Ctrl]+[Alt]+[Del]. |
| Words in <i>italicized</i> type | Italics emphasize a point or denote new terms at the place where they are defined in the text. |
| Words in bold-face type | Bold text denotes key features. |



INTRODUCTION

This guide is intended to aid the configuration of a unit in a number of common circumstances. It assumes that the reader is familiar with basic networking terminology and techniques and has read the *Internetworking Concepts Guide*.

Requirements

Before attempting any configuration of the unit, the IP address (and subnet mask) of the local area network and the ISDN number of the unit must be known.

The unit must be powered-up and connected to a correctly functioning ISDN line, using the supplied cable, following the instructions given in the unit's *Installation Guide*.

Management System Commands

The commands in this guide are always shown in upper-case letters (for clarity) but they can be entered in either upper- or lower-case with the exception of passwords and unit names. These are case-sensitive and must be entered correctly. The default password for a unit in factory standard configuration (**PASSWORD**) **must** be entered in upper-case letters only.

Unit Naming Convention

Throughout this guide the text uses the convention of "central site unit" to represent a unit situated on a network at a larger branch or regional office, to which a number of units may connect using dial-up ISDN links. The text refers to these latter units as "remote site units", which are likely to be situated in smaller offices.

“One-to-one” Configuration

In situations where a very simple connection is required between two units only, it is recommended that one unit is nominated as the “central site” (configured first) and the other as the “remote site” (configured second), following the relevant sequence for each.

Leased Lines

It is good practise that the WAN port of an existing installation which has already been configured for bridging or routing, and has an additional fixed-link serial line (sometimes called a “Kilostream” line) connected to the WAN port, should be disabled prior to the new configuration.



Take a note of the current WAN port configuration parameters before disabling the port and keep it in a safe, accessible place

- 1 Enter **CO PO** to display the Port Configuration screen.
- 2 Select the WAN port using the Arrow keys.
- 3 Enter **TY NO** to disable the WAN port
- 4 Enter **SAVE** to save the new configuration.

New installations and those units which have been reset to the factory default configuration have their WAN ports disabled.

Configuration by Telephone

It is possible to connect a standard telephone handset to units which are fitted with a Voice port. This is a useful configuration aid for units which have been correctly installed and connected to a functioning ISDN line. A telephone connected to a central site unit Voice port can dial the ISDN number of the remote site unit and connect to a telephone plugged into the remote site unit Voice port. This connection allows an experienced technician to guide a less-experienced technician through the configuration steps of the remote site unit.

2

BRIDGING AND IP

This chapter shows how to configure units to operate as bridges, using the *Internet Protocol* (IP) data packets between two networks for management and control only.

Configuration steps are given for:

- Manual configuration of the central site unit.
- Quick Configuration of the remote unit.
- Remote configuration of the remote unit from the central site.

Bridging and IP

It is essential to remember that a bridged network using IP for management only, even if it consists of several segments, always has the same IP network address for each segment. If any segment of the network has a different IP network address, then data must be *routed* to and from that network segment.

Configuration Options

When configuring a unit to bridge IP packets using a dial-up ISDN link between a central site and one or more remote sites, it is recommended that the central site should be configured manually first.

The central site unit cannot be automatically configured using the Quick Configuration facility of the unit because this facility requires a ready-configured unit to act as a reference point.



The Quick Configuration facility should only be used at a remote site.

Alternatively, the remote site unit can be configured by utilizing the remote configuration facility (**REM**) of the central site unit.

Outline of Configuration Procedure

The steps below are intended as an outline of the sequence for configuring a unit for bridging and IP. They are for guidance only and must be used in conjunction with the full description given in the following pages.

There are five basic steps for manual configuration of a unit for bridging and IP. The sequence for remote configuration of a unit necessitates a similar sequence with additional steps. The additional steps are given in [“Configuring a Remote Unit from the Central Site”](#) on [page 2-8](#). The Quick Configuration facility has three steps.

The five basic steps for manual configuration are:

- Assign a unique name to the unit.
- Configure a unique IP address for the unit.
- Configure the ISDN network type, if required.



It is very important to assign a unique name and IP address to each unit.

- Set up the ISDN Numbers table to associate a remote unit name with an ISDN number.
- Make an entry in ISDN Autocall table to associate a unit IP address with a remote unit name.

The three Quick Configuration steps are:

- Assign the unit name, configure the unit IP address and the ISDN network type (if required).
- Specify the ISDN number of the central site unit.
- Make a manual call to the central site unit, if required.

Manual Configuration of a Central Site Unit for Bridging and IP

The central site unit becomes the main host/node for bridging.



CAUTION: Do not reset the unit if has already been installed on the network and configured to bridge or route IPX, and is required to continue bridging or routing IPX.

CAUTION: If the unit has already been configured, and it is necessary to keep some of the settings, take a note of the current configuration settings and port type and put it in a safe, accessible place.

If the central site unit is being configured for the first time, or if it is an entirely new installation, then reset the unit to the factory default settings.

- 1 Press the [Return] key.
- 2 Enter **PASSWORD** (in upper-case letters) when the Enter Password screen is displayed.
- 3 Enter **CO STD**
- 4 Do you wish to keep IP Addresses and ISDN parameters. KEEP (Y/N)? is displayed at the command line. Enter **N**
- 5 This will ERASE all configurations. ERASE (Y/N) is displayed. Enter **Y**
- 6 System will now reboot is displayed.
- 7 Follow the on-screen instructions.
- 8 Enter **PASSWORD** when the Enter Password screen is displayed.
- 9 Enter **SAVE** and then enter **QUIT**
- 10 Power-cycle the unit by removing and then refitting the power lead.
- 11 Follow the on-screen instructions.
- 12 Enter **PASSWORD** when the Enter Password screen is displayed.

Following the above sequence will ensure that the unit is reset to the factory default configuration and that the unit database is empty.

Assign the Unit Name

The unit *must* be assigned a unique name. The unit software relies on associating unit names with ISDN numbers and IP addresses for its core functionality.

- 1 Enter **CO SYS** to display the System Parameters screen.
- 2 Type a unique name for the unit in the Unit Name field. It can have up to 12 characters but note that the name is case-sensitive. Do not include spaces in the unit name.
- 3 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

Configure the Ethernet Port

A valid, unique port IP address is required for the Ethernet port.

- 1 Enter **CO PO** to display the Port Configuration screen.
- 2 Select the LAN1 port using the Arrow keys and enter **ED** to display the Edit Ethernet Port screen.
- 3 Type a valid, unique IP address for the unit in the Port IP Address field. Do not type the local network IP address.
- 4 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

Configure the ISDN Network Type

The ISDN network type parameter must be set to the correct ISDN service, otherwise connections and data transmission over dial-up ISDN links will not be possible. In the U.S.A., an additional customer identification number, known as a *Service Provider Identification Number* (SPID) may be required.

- 1 Enter **CO IS PA** to display the ISDN Parameters screen.
- 2 Toggle the Network Type field, using the Spacebar, to the correct ISDN network type as given by the service provider.
- 3 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

Configure the ISDN Numbers Table

Set up the ISDN numbers table to associate each remote unit name with an ISDN number and an IP address. Central site autocalls rely on

each remote unit having a valid, unique IP address. Ensure that one is entered for each remote unit.

- 1 Enter **CO IS NU** to display the ISDN Numbers screen.
- 2 Enter **ADD** to add a new entry to the numbers table.
- 3 Type the name of the *remote* unit in the Name field and the ISDN number for that unit in the ISDN Number 1 field.



Unit names are case-sensitive and must be entered correctly.

- 4 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

Configure the ISDN IP Autocall Table

Normally, the ISDN Autocall tables are built automatically by the units. However, in some cases, it may be necessary to manually add ISDN Autocall entries.

If it is necessary, manually add an entry to the central site unit's ISDN Autocall table to associate the remote unit IP address with the remote unit name.

- 1 Enter **CO IS AUTO IP** to display the ISDN IP Autocall Addresses screen.
- 2 Enter **ADD** to add a new entry to the Autocall table.
- 3 Type the name of the remote unit in the Remote Unit field.



Unit names are case-sensitive and must be entered correctly.

- 4 Type the IP address of the remote unit in the IP Address field.
- 5 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

Configuring a Remote Unit for Bridging and IP

If the remote site unit is being configured for the first time, or if it is an entirely new installation, then reset the unit to the factory default settings.

Follow the sequence of steps for resetting the unit as described in [“Manual Configuration of a Central Site Unit for Bridging and IP”](#) on page 2-3.

Configuring a Unit using the “Quick Configuration” Utility

If the central site unit has been configured, the Quick Configuration utility can be used at the remote site to configure the remote site unit.

Assign the Unit Name, IP Address and Subnet Mask

The remote unit must be assigned a unique name and a valid, unique IP address appropriate to the IP network environment. The name and IP address must exactly match the entries in the central site unit's ISDN Numbers and ISDN Autocall tables for this remote unit. Set the ISDN network type to match the ISDN service.

- 1 Enter **QC NA** to display the Unit Parameters screen.
- 2 Type the unique name for the unit in the Unit Name field. It can have up to 12 characters. Do not include spaces in the unit name.
- 3 Type a valid IP address for the unit in the Unit LAN IP Address field.
- 4 Toggle the Network Type field to the correct ISDN network type using the Spacebar, if required.
- 5 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

Connect to an IP Network

It is important that the central site unit, to which the remote unit will connect at the completion of this section, has been correctly configured prior to the connection.

- 1 Enter **QC IPB** to display the Connect To The Same IP Network screen.
- 2 Type the number of the *central site unit* in the ISDN number of the remote unit you want to call field.
- 3 Type the IP address of the central site unit in the IP Address of the remote host field.
- 4 Press [Ctrl]+[E] to submit the new setting.

If the ISDN line has been correctly connected to the units and is functioning correctly, an automatic call is made to the central site unit which allows both units to add new entries to their ISDN Numbers and ISDN Autocall tables.

- 5 When the automatic call has shut down (after approximately 90 seconds), enter **CO IS AUTO IP** to check the entries in the IP Autocall table.
- 6 If there are no new entries in the ISDN Autocall table, check that the name and ISDN number for the central site unit have been entered correctly and then repeat steps 1–3 above.
- 7 Enter **SAVE** to save the new configuration.

Test the ISDN Numbers and IP Autocall Tables

Before testing the ISDN Number and IP Autocall entries, a manual call must be made to the central site unit to complete the configuration.

- 1 Enter **CO IS NU** to display the ISDN Numbers screen.
- 2 Select the entry for the central site unit using the Arrow keys and enter **CALL**.
- 3 Enter **REM** to display the Remote Units screen and type [Ctrl]+[V] at regular intervals to refresh the screen, until the name of the central site unit appears in the list.
- 4 Enter **CO IS NU** to display the ISDN Numbers screen again.
- 5 Select the entry for the central site unit and enter **CANC** to cancel the call.
- 6 Enter **SAVE** to save the new configuration.



Ensure that the ISDN call has been correctly cancelled.

See ["Cancelling ISDN Calls"](#) on [page 2-13](#) for how to cancel the call if it is still up.

To test that the IP Autocall and ISDN Number table entries are correct:

- 1 Enter **REM** followed by the name of the central site unit. For example, if the central site unit is named "london", then enter **REM london**
 - If the tables are working correctly and the ISDN lines are functioning properly, then the Enter Password screen on the central site unit will be displayed. Go to step 8, below.
- 2 If the Enter Password screen on the central site unit is not displayed within 30 seconds, press [Ctrl]+[D] to return to the local unit management system.

- 3 Enter **REM** to display the Remote Units screen.
- 4 If the central site unit name and IP address are not listed, make a manual call of 5 minutes duration.
- 5 Enter **CALL** followed by the central site number.
- 6 While the call is up, press [Ctrl]+[V] at frequent intervals to refresh the Remote Units screen. When the central site unit name appears, cancel the manual call.
- 7 Enter **CANC** followed by the central site number. Follow step 1 in this section for testing the IP Autocall and ISDN Number tables.

If the central site unit name is not listed on the Remote Units screen after 5 minutes, carefully check the configuration of both the remote and central site units.
- 8 Enter **QUIT** to close the remote management session or press [Ctrl]+[D] if that command cannot be used.

Configuring a Remote Unit from the Central Site

A unit at a remote site can be remotely configured as an IP bridge. The remote management and configuration capability allows the unit to be configured from the central site, without the need for a technician to travel to a remote site.

It is good practise to have ensured that the remote unit was restored to the factory default settings before being despatched to the remote site.



CAUTION: *Prior to despatch, it is essential that the unit has the ISDN Network Type field configured to match the ISDN network type at the remote site.*

Prior to Despatch

Power on the unit and follow the sequence of steps for resetting the unit to the factory default configuration, as described in [“Manual Configuration of a Central Site Unit for Bridging and IP”](#) on [page 2-3](#).

Configure the ISDN network type to the correct setting for the remote site, following the sequence of steps described in “[Configure the ISDN Network Type](#)” on [page 2-4](#).



When the unit is received at the remote site, ensure that it is powered on and that the ISDN Port is connected to a correctly functioning ISDN line, using the supplied ISDN cable.

Configuring the Central Site Unit

The central site unit must be correctly configured with the following parameters:

- Unit name (see [page 2-4](#)).
- A valid IP address (see [page 2-4](#)).
- The correct ISDN network type (see [page 2-4](#)).

Configure the ISDN Numbers Table on the Central Site Unit

The ISDN Numbers table entry on the central site unit must be completed with the name that the remote unit will have, once that unit has been fully configured.

- 1 Enter **CO IS NU** to display the ISDN Numbers screen.
- 2 Enter **ADD** to add a new entry to the numbers table.
- 3 Type the name *assigned to the remote unit* in the Name field and the ISDN number for that unit in the ISDN Number 1 field.



Unit names are case-sensitive and must be entered correctly.

- 4 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

Configure the ISDN Autocall Table on the Central Site Unit

The ISDN Autocall table entry must be completed with the IP address which the remote unit will have, once that unit has been fully configured.

- 1 Enter **CO IS AUTO IP** to display the ISDN IP Autocall Addresses screen.
- 2 Enter **ADD** to add an entry to the ISDN Autocall Addresses table.

- 3 Type the name assigned to the remote unit in the Remote Unit field.



Unit names are case-sensitive and must be entered correctly.

- 4 Type the IP address assigned to the remote unit in the IP Address field.
- 5 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

Establish a Remote Management Session

A manual call must be placed before the remote configuration of the remote unit can proceed.

- 1 Enter **CO IS NU** to display the ISDN Numbers table.
- 2 Select the entry for the remote unit using the Arrow keys and enter **CALL**
- 3 Enter **REM** to display the Remote Units screen. Press [Ctrl]+[V] at regular intervals to refresh the screen, until an entry for NoName 10.0.0.1 appears.
- 4 Select the NoName 10.0.0.1 entry using the Arrow keys and enter **REM**
- 5 The Enter Password screen on the remote unit should be displayed within 30 seconds.
 - If the Enter Password screen is not displayed, check that the name and IP address for the remote unit have been entered correctly on the central site unit and that the ISDN line is connected and working normally at both ends of the link.
- 6 Enter **PASSWORD** (in upper-case letters) when the Enter Password screen is displayed.

Configuring the Remote Site Unit

Assign the Unit Name

- 1 Enter **CO SYS** to display the System Parameters screen.
- 2 Type in the name assigned to the unit in the Unit Name field. The name must be exactly the same as that used to configure the entry for this unit in the central site unit ISDN Numbers table.

- 3 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

Configure the Ethernet Port



Changing the IP address during the remote management session causes the session to be disconnected when the new IP address is submitted. This is normal.

- 1 Enter **CO PO** to display the Port Configuration screen.
- 2 Select the LAN1 port using the Arrow keys and enter **ED** to display the Edit Ethernet Port screen.
- 3 Type the IP address assigned to the unit in the Port IP Address field. The IP address must be exactly the same as that used to configure the central site unit ISDN Autocall table.
- 4 Press [Ctrl]+[E] to submit the new setting.
Submitting the new settings causes the remote management session to disconnect immediately.
- 5 Press [Ctrl]+[D] to return to the central site unit management screens.
- 6 Enter **REM** to display the Remote Units screen and press [Ctrl]+[V] to refresh the screen.
- 7 Select the entry for the remote unit using the Arrow keys. Note that the entry now contains the remote unit name and IP address.
- 8 Enter **REM** to establish a new remote management session.
- 9 Enter **PASSWORD** at the Enter Password screen.
- 10 Save the new configuration by entering **SAVE**

Configure the ISDN Numbers Table

Set up the ISDN numbers table to associate the *central site* unit name with its ISDN number.

- 1 Enter **CO IS NU** to display the ISDN Numbers screen.
- 2 Enter **ADD** to add an entry to the ISDN Numbers table.
- 3 Type the name *assigned to the central site* unit in the Name field and the ISDN number for that unit in the ISDN Number 1 field.



Unit names are case-sensitive and must be entered correctly.

- 4 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

Configure the ISDN Autocall Table

Set up the ISDN Autocall table to associate the central site unit IP address with its name.

- 1 Enter **CO IS AUTO IP** to display the ISDN IP Autocall Addresses screen.
- 2 Enter **ADD** to add an entry to the ISDN IP Autocall table.
- 3 Type the name of the *central site* unit in the Remote Unit field. Ensure that the name is correctly typed because this field is case-sensitive.



Unit names are case-sensitive and must be entered correctly.

- 4 Type the IP address of the *central site* unit in the IP Address field.
- 5 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

Close the Remote Management Session

- 1 Enter **QUIT** to close the remote management session.
The Remote Units screen on the central site unit is displayed.

Cancel the Manual Call

It is important to remember that a manual call is still running from the initial connection to the remote unit. The call must be cancelled manually.

- 1 Enter **CO IS NU** to display the ISDN Numbers screen.
- 2 Select the entry for the remote site unit and enter **CANC** to cancel the call.
- 3 Enter **SAVE** to save the new configuration.



All manual calls must be cancelled when the unit configuration is complete. A "call guillotine" operates after 60 minutes (the default setting) to cancel the calls but during this time, additional, unnecessary, call charges will have accrued.

Cancelling ISDN Calls

All ISDN calls made by the unit, and those which are being answered by the unit, can be cancelled using the following technique:

- 1** Enter **CO PO** to display the Port Configuration screen.
- 2** Select the first ISDN port using the Arrow keys and enter **ED PO**
- 3** Type [Ctrl]+[E] to “submit”. The unit software interprets this as a configuration change and resets the port, cancelling any calls.
- 4** Repeat steps 2 and 3 with the other ISDN port.

It is good practise to enter **SAVE** to save the “new” configuration.



3

ROUTING IP

This chapter shows how to configure units to route IP data packets between two networks, using ISDN.

Configuration steps are given for:

- Manual configuration of the central site router.
- Quick Configuration of the remote router.
- Remote configuration of the remote router from the central site.

Routing IP

If data is required to be shared or transferred between IP networks with *different* network numbers or subnets, the IP protocol cannot be bridged and has to be routed.

Configuration Options

When configuring a unit to route IP packets using a dial-up ISDN link between a central site and one or more remote sites, it is recommended that the central site should be configured manually first.

The central site unit cannot be automatically configured using the Quick Configuration facility, because this facility requires a ready-configured unit to act as a reference point.



The Quick Configuration facility should only be used at a remote site.

Alternatively, the remote site unit can be configured by utilizing the remote configuration facility (**REM**) of the central site unit.

Outline of Configuration Procedure

The steps below are intended as an outline of the sequence for configuring a unit for bridging and IP. They are for guidance only and must be used in conjunction with the full description given in the following pages.

There are seven basic steps required for manual configuration of a unit for routing IP. The sequence for remote configuration of a unit necessitates a similar sequence with additional steps. The additional steps are given in [“Configuring a Remote Unit from the Central Site”](#) on [page 3-9](#). The Quick Configuration facility has three steps.

The seven basic steps are:

- Assign a unique name to the unit.
- Configure the IP address and subnet mask for the unit.



It is very important to assign a unique name and IP address to each unit.

- Configure the ISDN network type, if required.
- Set up the ISDN Numbers table to associate a remote unit name with an ISDN number.
- Set up the ISDN Autocall table to associate a unit IP address with a remote unit name.
- Set up the IP Routing table to associate an IP route with a unit name.
- Enable IP routing.

The three Quick Configuration steps are:

- Assign the unit name, configure the IP address, a valid network subnet mask and the ISDN network type (if required).
- Specify the ISDN number of the central site router.
- Make a manual call to the central site router.

Manual Configuration of a Central Site Unit for Routing IP

If the central site unit is being configured for the first time, or if it is an entirely new installation, then reset the unit to the factory default settings by entering **CO STD**



CAUTION: Do not reset the unit if has already been installed on the network and configured to bridge or route IPX, and is required to continue bridging or routing IPX.

CAUTION: If the unit has already been configured, and it is necessary to keep some of the settings, take a note of the current configuration settings and port type and put it in a safe, accessible place.

If the central site unit is being configured for the first time, or if it is an entirely new installation, then reset the unit to the factory default settings.

- 1 Press the [Return] key.
- 2 Enter **PASSWORD** (in upper-case letters) when the Enter Password screen is displayed.
- 3 Enter **CO STD**
- 4 Do you wish to keep IP Addresses and ISDN parameters. **KEEP (Y/N)?** is displayed at the command line. Enter **N**
- 5 This will **ERASE** all configurations. **ERASE (Y/N)** is displayed. Enter **Y**
- 6 **System will now reboot** is displayed.
- 7 Follow the on-screen instructions.
- 8 Enter **PASSWORD** when the Enter Password screen is displayed.
- 9 Enter **SAVE** and then enter **QUIT**
- 10 Power-cycle the unit by removing and then refitting the power lead.
- 11 Follow the on-screen instructions.
- 12 Enter **PASSWORD** when the Enter Password screen is displayed.

Following the above sequence will ensure that the unit is reset to the factory default configuration and that the unit database is empty.

Assign the Unit Name

The unit *must* be assigned a unique name. The unit software relies on associating unit names with ISDN numbers and IP addresses for its core functionality.

- 1 Enter **CO SYS** to display the System Parameters screen.
- 2 Type a unique name for the unit in the Unit Name field. It can have up to 12 characters but note that the name is case-sensitive. Do not include spaces in the unit name.
- 3 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

Configure the Ethernet Port

A unique port IP address and the network subnet mask are required for the Ethernet port.

- 1 Enter **CO PO** to display the Port Configuration screen.
- 2 Select the LAN1 port using the Arrow keys and enter **ED** to display the Edit Ethernet Port screen.
- 3 Type a valid, unique IP address for the unit in the Port IP Address field. Do not type the local network IP address.
- 4 Type a valid subnet mask for the network in the Port IP Mask field.
- 5 Type a number between 6 and 10 in the Port Hop Count field. Increasing this setting from the default may help to prevent routing problems in some cases.
- 6 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

Configure the ISDN Network Type

The ISDN network type parameter must be set to the correct ISDN service, otherwise connections and data transmission over dial-up ISDN links will not be possible. In the U.S.A., an additional customer identification number, known as a *Service Provider Identification Number* (SPID) may be required.

- 1 Enter **CO IS PA** to display the ISDN Parameters screen.
- 2 Toggle the Network Type field, using the Spacebar, to the correct ISDN network type as given by the service provider.
- 3 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

Configure the ISDN Numbers Table

Set up the ISDN numbers table to associate each remote unit name with an ISDN number and an IP address. Central site autocalls rely on each remote unit having a valid, unique IP address. Ensure that one is entered for each remote unit.

- 1 Enter **CO IS NU** to display the ISDN Numbers screen.
- 2 Enter **ADD** to add a new entry to the numbers table.
- 3 Type the name of the *remote* unit in the Name field.



Unit names are case-sensitive and must be entered correctly.

- 4 Type the ISDN number of the remote unit the ISDN Number 1 field.
- 5 Type an IP address of **0.0.0.0** in the IP Address field if unnumbered links are to be used.



Unnumbered links make the best use of available IP addresses.

- 6 Type a subnet mask of **0.0.0.0** in the IP Mask field if unnumbered links are to be used.
- 7 Type a number between 6 and 10 in the IP Hop Count field. Increasing this setting from the default may help to prevent routing problems, in some cases.
- 8 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

Configure the ISDN IP Autocall Table

Set up the ISDN Autocall table to associate the remote unit IP address with the remote unit name in the central site unit's ISDN IP Autocall table.

- 1 Enter **CO IS AUTO IP** to display the ISDN IP Autocall Addresses screen.
- 2 Enter **ADD** to add a new entry to the Autocall table.
- 3 Type the IP address of the remote unit in the IP Address field.
- 4 Type the subnet mask of the remote network in the IP Mask field.
- 5 Type the name of the remote unit in the Remote Unit field. Ensure that the name is correctly typed because this field is case-sensitive.

- 6 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

Configure IP Routing—“Static Route” Entries

IP routes which are manually entered into the IP Routing table are called *static routes*. These routes are added to the routing table to ensure that routes between units or the critical paths for important applications are fully defined for management.

It is important to enter static routes when configuring the unit to use unnumbered links because these routes will not be learned by the unit.

Set up the IP Routing table to associate an IP route with a unit name.

- 1 Enter **CO RO IP** to display the Configured IP Routes screen.
- 2 Enter **ADD** to display the Add Routing Table Entry screen.
- 3 Type the IP address of the remote LAN in the Target field.
- 4 Type a valid subnet mask for the remote network in the Subnet Mask field.
- 5 Type the name of the remote unit in the Router field.



Unit names are case-sensitive and must be entered correctly.

- 6 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

Enable IP Routing

IP routing must be enabled to allow the unit to function as an IP router.

- 1 Enter **CO RO PA** to display the Router Options screen.
- 2 Toggle the IP Routing field to **ENABLED** using the Spacebar.
- 3 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

Configuring a Remote Unit to Route IP

If the remote site unit is being configured for the first time, or if it is an entirely new installation, then reset the unit to the factory default settings.

Follow the sequence of steps for resetting the unit as described in “Manual Configuration of a Central Site Unit for Routing IP” on page 3-3.

Configuring a Unit Using the “Quick Configuration” Utility

If the central site unit has been configured, the Quick Configuration utility can be used at the remote site to configure the remote site unit.

Assign the Unit Name, IP Address and Subnet Mask

The remote unit must be assigned a unique name and a valid, unique IP address. A valid subnet mask must be specified too. The name and IP address must exactly match the entries in the central site unit's ISDN Numbers and ISDN Autocall tables for this remote unit. Set the ISDN network type to match the ISDN service.

- 1 Enter **QC NA** to display the Unit Parameters screen.
- 2 Type a unique name for the unit in the Unit Name field. It can have up to 12 characters. Do not include spaces in the unit name.
- 3 Type a valid IP address for the unit in the Unit LAN IP Address field.
- 4 Type a valid subnet mask for the network in the Unit LAN IP Mask field.
- 5 Toggle the Network Type field to the correct ISDN network type using the Spacebar, if required.
- 6 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

Connect to an IP Network

It is important that the central site router, to which the remote unit will connect at the completion of this section, has been correctly configured as an IP router prior to the connection.

- 1 Enter **QC IPR** to display the Connect To Another IP Network screen.
- 2 Type the number of the *central site unit* in the ISDN number of the remote unit you want to call field.



The IP Address of this units LAN field and the IP Mask of this units LAN field receive their settings from the data entered into the Unit Parameters screen.

- 3 Leave the three fields for configuring the ISDN link set to **UNNUMBERED**
- 4 Leave the IP Address of the remote hosts network field and the IP Mask of the remote hosts network field at the suggested defaults.
- 5 Press [Ctrl]+[E] to submit the new setting.

If the ISDN line has been correctly connected to the units and is functioning correctly, an automatic call lasting approximately 90 seconds is made to the central site unit which allows both units to add new entries to their ISDN Numbers and ISDN Autocall tables.

- 6 Press [Return] to continue.
- 7 Enter **CO IS AUTO IP** to check the entries in the IP Autocall table.
- 8 If there are no new entries in the ISDN Autocall table, check that the name and ISDN number for the central site unit have been entered correctly and then repeat steps 1–5 above.
- 9 Enter **SAVE** to save the new configuration.

Test the ISDN Line

To check that the ISDN line is working, make a manual call. The manual call also allows the remote unit to update its Routing and Remote Unit tables, which are necessary for testing the operation of the IP Autocall and ISDN Number tables.

- 1 Enter **CALL** followed by the central site number.
For example, if the ISDN number of the central site is 01642 123456, then enter **CALL 01642123456**
- 2 Wait for approximately 90 seconds and then enter **CANC** followed by the central site number.
For example, if the ISDN number of the central site is 01642 123456, then enter **CANC 01642123456**

Test the IP Autocall and ISDN Numbers Tables

Before testing the IP Autocall and ISDN Number entries, a manual call must be made as described above. The manual call allows the unit to update its Remote Units and IP Routing tables.

- 1 Enter **REM** followed by the name of the central site unit to test that the IP Autocall and ISDN Number table entries are correct. For

example, if the central site unit is named "london", then enter **REM london**

- If the tables are working correctly and the ISDN lines are functioning properly, then the Enter Password screen on the central site unit will be displayed. Go to step 8, below.
- 2 If the Enter Password screen on the central site unit is not displayed within 30 seconds, Press [Ctrl]+[D] to return to the local unit management system screens.
 - 3 Press [Ctrl]+[V] to refresh the Remote Units screen.
 - 4 If the central site unit name and IP address are not listed, make a manual call of 5 minutes duration.
 - 5 Enter **CALL** followed by the central site number.
 - 6 While the call is up, press [Ctrl]+[V] at frequent intervals to refresh the Remote Units screen. When the central site unit name appears, cancel the manual call.
 - 7 Enter **CANC** followed by the central site number. Follow step 1 in this section for testing the IP Autocall and ISDN Number tables.

If the central site unit name is not listed on the Remote Units screen after 5 minutes, carefully check the configuration of both the remote and central site units. Ensure that IP routing has been enabled on both units.
 - 8 Enter **QUIT** to close the remote management session or press [Ctrl]+[D] if that command cannot be used.

Configuring a Remote Unit from the Central Site

A unit at a remote site can be remotely configured as an IP router. The remote management and configuration capability allows the unit to be configured from the central site, without the need for a technician to travel to a remote site.

It is good practise to have ensured that the remote unit was restored to the factory default settings before being despatched to the remote site.



CAUTION: *Prior to despatch, it is essential that the unit has the ISDN Network Type field configured to match the ISDN network type at the remote site.*

Prior to Despatch

Power on the unit and follow the sequence of steps for resetting the unit to the factory default configuration, as described in “[Manual Configuration of a Central Site Unit for Routing IP](#)” on [page 3-3](#).

Configure the ISDN network type to the correct setting for the remote site, following the sequence of steps described in “[Configure the ISDN Network Type](#)” on [page 3-4](#).



When the unit is received at the remote site, ensure that it is powered on and that the ISDN Port is connected to a correctly functioning ISDN line, using the supplied ISDN cable.

Configuring the Central Site Unit

The central site unit must be correctly configured with the following parameters:

- Unit name (see [page 3-4](#)).
- A valid IP address, subnet mask and hop count (see [page 3-4](#)).
- The correct ISDN network type (see [page 3-4](#)).

An existing central site IP router only requires IP routing to be temporarily disabled, the remote site unit parameters to be added to the ISDN Numbers and ISDN Autocall tables and a static return route to be entered into the IP Routing table, prior to configuring the remote unit.

Disable Routing on the Central Site Unit

It is not possible to remotely configure a unit while the central site is routing IP packets. IP routing must be disabled on the central site unit before the remote unit can be configured as an IP router.

- 1 Enter **CO RO PA** to display the Router Options screen.
- 2 Toggle the IP Routing field to **DISABLED** using the Spacebar.
- 3 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

Configure the ISDN Numbers Table on the Central Site Unit

The ISDN Numbers table entry on the central site unit must be completed with the name that the remote unit will have, once that unit has been fully configured.

- 1 Enter **CO IS NU** to display the ISDN Numbers screen.
- 2 Enter **ADD** to display the Edit ISDN Number screen.
- 3 Type the name *assigned to the remote unit* in the Name field and the ISDN number for that unit in the ISDN Number 1 field.
- 4 Type an IP address of **0.0.0.0** in the IP Address field if unnumbered links are to be used. Using unnumbered links is recommended for the most economical use of IP addresses.
- 5 Type a subnet mask of **0.0.0.0** in the IP Mask field if unnumbered links are to be used.
- 6 Type a number between 6 and 10 in the IP Hop Count field.
- 7 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

Configure the ISDN Autocall Table on the Central Site Unit

The ISDN Autocall table entry must be completed with the IP address and subnet mask which the remote unit will have, once that unit has been fully configured.

- 1 Enter **CO IS AUTO IP** to display the ISDN IP Autocall Addresses screen.
- 2 Enter **ADD** to display the Edit ISDN IP Autocall Address screen.
- 3 Type the IP address assigned to the remote unit in the IP Address field.
- 4 Type the subnet mask of the remote network in the IP Mask field.
- 5 Type the name assigned to the remote router in the Remote Unit.
- 6 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

Configure IP Routing—“Static Route” Entries

IP routes which are manually entered into the IP Routing table are called *static routes*. These routes are added to the routing table to ensure that routes between units or the critical paths for important applications are fully defined for management.

It is important to enter static routes when configuring the unit to use unnumbered links because these routes will not be learned by the unit. Static routes must be entered at **both** ends of the link.

Set up the IP Routing table to associate an IP route with a unit name.

- 1 Enter **CO RO IP** to display the Configured IP Routes screen.
- 2 Enter **ADD** to display the Add Routing Table Entry screen.
- 3 Type the IP address of the remote LAN in the Target field.
- 4 Type a valid subnet mask for the remote network in the Subnet Mask field.
- 5 Type the name of the remote unit in the Router field.



Unit names are case-sensitive and must be entered correctly.

- 6 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

Establish a Remote Management Session

A manual call must be placed before the remote configuration of the remote unit can proceed.

- 1 Enter **CO IS NU** to display the ISDN Numbers table.
- 2 Select the entry for the remote unit using the Arrow keys and enter **CALL**
- 3 Enter **REM** to display the Remote Units screen. Refresh the screen by pressing [Ctrl]+[D] at regular intervals until an entry for NoName appears.
- 4 Select the NoName 10.0.0.1 entry using the Arrow keys and enter **REM**
- 5 The Enter Password screen of the remote unit should be displayed within 30 seconds.
 - If the Enter Password screen is not displayed, check that the name and IP address for the remote unit have been entered correctly on the central site unit and that the ISDN line is connected and working normally at both ends of the link.
- 6 Enter **PASSWORD** (in upper-case letters) when the Enter Password screen is displayed.

Configuring the Remote Unit

Assign the Unit Name

- 1 Enter **CO SYS** to display the System Parameters screen.
- 2 Type in the name assigned to the unit in the Unit Name field. The name must be exactly the same as that used to configure the central site unit ISDN Numbers table.



Unit names are case-sensitive and must be entered correctly.

- 3 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

Configure the Ethernet Port



Changing the IP address during the remote management session causes the session to be disconnected when the new IP address is submitted. This is normal.

- 1 Enter **CO PO** to display the Port Configuration screen.
- 2 Select the LAN1 port using the Arrow keys and enter **ED** to display the Edit Ethernet Port screen.
- 3 Type the IP address assigned to the unit in the Port IP Address field. The IP address must be exactly the same as that used to configure the central site unit ISDN Autocall table.
- 4 Type a valid subnet mask for the network in the Port IP Mask field.
- 5 Type a number between 6 and 10 in the Port Hop Count field. Increasing this setting from the default may help to prevent routing problems, in some cases.
- 6 Press [Ctrl]+[E] to submit the new setting.
Submitting the IP address causes the remote management session to disconnect immediately.
- 7 Press [Ctrl]+[D] to return to the central site unit management screens.
- 8 Enter **REM** to display the Remote Units screen and press [Ctrl]+[V] to refresh the screen.
- 9 Select the entry for the remote unit using the Arrow keys. Note that the entry now contains the remote unit name and IP address.

- 10 Enter **REM** to establish a new remote management session.
- 11 Enter **PASSWORD** at the Enter Password screen.
- 12 Enter **SAVE** to save the new configuration.

Configure the ISDN Numbers Table

Set up the ISDN numbers table to associate the *central site* unit name with its ISDN number.

- 1 Enter **CO IS NU** to display the ISDN Numbers screen.
- 2 Enter **ADD** to add an entry to the ISDN Numbers table.
- 3 Type the name *assigned to the remote unit* in the Name field and the ISDN number for that unit in the ISDN Number 1 field.



Unit names are case-sensitive and must be entered correctly.

- 4 Type an IP address of **0.0.0.0** in the IP Address field if unnumbered links are to be used. Using unnumbered links is recommended for the most economical use of IP addresses.
- 5 Type a subnet mask of **0.0.0.0** in the IP Mask field if unnumbered links are to be used.
- 6 Type a number between 6 and 10 in the IP Hop Count field.
- 7 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

Configure the ISDN Autocall Table

Set up the ISDN Autocall table to associate the *central site* unit IP address with its name.

- 1 Enter **CO IS AUTO IP** to display the ISDN IP Autocall Addresses screen.
- 2 Enter **ADD** to add an entry to the ISDN IP Autocall table.
- 3 Type the name of the *central site* unit in the Remote Unit field.



Unit names are case-sensitive and must be entered correctly.

- 4 Type the IP address of the *central site* unit in the IP Address field.
- 5 Type the subnet mask of the *central site* network in the IP Mask field.
- 6 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

Configure IP Routing—“Static Return Route” Entry

It is important to enter a static return route when configuring the remote unit to use unnumbered links because these routes will not be learned by the unit. The static return route must be entered before IP routing is enabled otherwise the return route to the central site unit will not be established.

Set up the IP Routing table to associate an IP route with a unit name.

- 1 Enter **CO RO IP** to display the Configured IP Routes screen.
- 2 Enter **ADD** to display the Add Routing Table Entry screen.
- 3 Type the IP address of the central site LAN in the Target field.
- 4 Type a valid subnet mask for the central site network in the Subnet Mask field.
- 5 Type the name of the *central site* unit in the Router field.



Unit names are case-sensitive and must be entered correctly.

- 6 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

Enable Routing on the Remote Unit

- 1 Enter **CO RO PA** to display the Router Options screen.
- 2 Toggle the IP Routing field to **ENABLED** using the Spacebar.
- 3 Press [Ctrl]+[E] to submit the new setting.



Submitting the new setting turns IP routing on, which immediately disconnects the remote management session.

- 4 Press [Ctrl]+[D] to return to the central site unit management session.
- 5 Enter **CO IS NU** to display the ISDN Numbers screen. Select the remote unit entry.
- 6 Enter **CANC** to cancel the manual call.

Although the remote site configuration has not been permanently saved, the unit is functioning as an IP router.

Enable Routing on the Central Site Unit

The central site unit can now have IP routing re-enabled.

- 1 Enter **CO RO PA** to display the Router Options screen.
- 2 Toggle the IP Routing field to **ENABLED** using the Spacebar.
- 3 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

Save the Remote Unit Configuration

Both of the units must be correctly configured and functioning as IP routers for the new configuration of the remote unit to be saved.

- 1 Enter **REM** to display the Remote Units screen on the central site unit.
- 2 Select the remote unit entry and enter **REM** to establish a remote management session with the remote unit.
 - If the units are successfully routing IP packets, then the Enter Password screen of the remote unit is displayed within 30 seconds.
- 3 Enter **PASSWORD** (in upper-case letters) to access the remote unit management screens.
- 4 Save the new configuration by entering **SAVE**

Close the Remote Management Session

- 1 Enter **QUIT** to close the remote management session.

The Remote Units screen on the central site unit is displayed.

Cancel the Manual Call

It is important to remember that a manual call is still running from the initial connection to the remote unit. The call must be cancelled manually.

- 1 Enter **CO IS NU** to display the ISDN Numbers screen.
- 2 Select the entry for the remote site unit and enter **CANC** to cancel the call.
- 3 Enter **SAVE** to save the new configuration.



All manual calls must be cancelled when the unit configuration is complete. A "call guillotine" operates after 60 minutes (the default

setting) to cancel the calls but additional, unnecessary, call charges will have accrued.

Cancelling Calls

To cancel all of the ISDN calls, follow the sequence of steps described in [“Cancelling ISDN Calls”](#) on [page 2-13](#).





NOVELL IPX AND BRIDGING

This chapter shows how to configure units to bridge *Internet Packet Exchange* (IPX) Protocol data packets between two networks, using ISDN.



Note that the IPX protocol, although similarly named, is completely different from the Internet Protocol (IP) and must not be confused with it.

Configuration steps are given for:

- Manual configuration of the central site unit.
- Quick Configuration of the remote unit.
- Remote configuration of the remote unit from the central site.

Novell IPX Bridging

Novell Netware® has a software router built into the Novell server that leads to an internal network which links the file server and other services. The presence of this internal software router means that a Novell Netware network can never be an entirely bridged network, “bridging” actually takes place only between networks that have the same Novell network number.

Configuration Options

When configuring a unit to bridge IPX packets using a dial-up ISDN link between a central site and one or more remote sites, it is recommended that the central site should be configured manually first.

The central site unit cannot be automatically configured using the Quick Configuration facility of the unit because this facility requires a ready-configured unit to act as a reference point.



The Quick Configuration facility should only be used at a remote site.

Alternatively, the remote site unit can be configured by utilizing the remote configuration facility (**REM**) of the central site unit.

Outline of Configuration Procedure

The steps below are intended as an outline of the sequence for configuring a unit for bridging and IPX. They are for guidance only and must be used in conjunction with the full description given in the following pages.

There are four basic steps required for manual configuration of a unit for bridging and IPX. The sequence for remote configuration of a unit necessitates a different sequence with additional steps. The additional steps are given in [“Configuring a Remote Unit from the Central Site”](#) on [page 4-7](#). The Quick Configuration facility has two steps.

The five basic steps are:

- Assign a unique name to the unit.
- Configure a unique, valid IP address for the unit.



It is very important to assign a unique name and IP address to each unit.

- It is good practise to configure a valid subnet mask for the unit. Although this step is not absolutely necessary, it is recommended.
- Configure the ISDN network type, if required.
- Set up the ISDN Numbers table to associate a remote unit name with an ISDN number.

The Quick Configuration steps are:

- Assign the unit name, configure the IP address, the network subnet mask and the ISDN network type.
- Specify the ISDN number of the central site unit.

Manual Configuration of a Central Site Unit for Bridging and IPX

The central site unit becomes the main host/node for bridging.



CAUTION: Do not reset the unit if has already been installed on the network and configured to bridge or route IP, and is required to continue bridging or routing IP.

CAUTION: If the unit has already been configured, and it is necessary to keep some of the settings, take a note of the current configuration settings and port type and put it in a safe, accessible place.

If the central site unit is being configured for the first time, or if it is an entirely new installation, then reset the unit to the factory default settings.

- 1 Press the [Return] key.
- 2 Enter **PASSWORD** (in upper-case letters) when the Enter Password screen is displayed.
- 3 Enter **CO STD**
- 4 Do you wish to keep IP Addresses and ISDN parameters. **KEEP (Y/N)?** is displayed at the command line. Enter **N**
- 5 This will **ERASE** all configurations. **ERASE (Y/N)** is displayed. Enter **Y**
- 6 **System will now reboot** is displayed.
- 7 Follow the on-screen instructions.
- 8 Enter **PASSWORD** when the Enter Password screen is displayed.
- 9 Enter **SAVE** and then enter **QUIT**
- 10 Power-cycle the unit by removing and then refitting the power lead.
- 11 Follow the on-screen instructions.
- 12 Enter **PASSWORD** when the Enter Password screen is displayed.

Following the above sequence will ensure that the unit is reset to the factory default configuration and that the unit database is empty.

Assign the Unit Name

The unit *must* be assigned a unique name. The unit software relies on associating unit names with ISDN numbers and IP addresses for its core functionality.

- 1 Enter **CO SYS** to display the System Parameters screen.
- 2 Type a unique name for the unit in the Unit Name field. It can have up to 12 characters but note that the name is case-sensitive. Do not include spaces in the unit name.
- 3 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

Configure the Ethernet Port

A unique port IP address and the network subnet mask are required for the Ethernet port (for management of the unit), even if the network is always entirely connected within a non-IP Network environment.

- 1 Enter **CO PO** to display the Port Configuration screen.
- 2 Select the **LAN1** port using the Arrow keys and enter **ED** to display the Edit Ethernet Port screen.
- 3 Type a valid, unique IP address for the unit in the Port IP Address field. Do not type the local LAN IP address.
- 4 Type a valid subnet mask for the network in the Port IP Mask field.
- 5 Type the IPX network number for the LAN on which the unit is sited in the Port IPX Network field.
- 6 Toggle the setting of the IPX Frame Type field, using the Spacebar, to the correct frame type for the network.



The frame type must be correct for the network environment in which the unit is operating. If the frame type is not correct, the unit will not pass data. Contact the network administrator for more information about the frame type used.

- 7 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

Configure the ISDN Network Type

The ISDN network type parameter must be set to the correct ISDN service, otherwise connections and data transmission over dial-up

ISDN links will not be possible. In the U.S.A., an additional customer identification number, known as a *Service Provider Identification Number* (SPID) may be required.

- 1 Enter **CO IS PA** to display the ISDN Parameters screen.
- 2 Toggle the Network Type field, using the Spacebar, to the correct ISDN network type as given by the service provider.
- 3 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

Configure the ISDN Numbers Table

It is good practise to set up the ISDN numbers table to associate the remote unit name with an ISDN number.

- 1 Enter **CO IS NU** to display the ISDN Numbers screen.
- 2 Enter **ADD** to add a new entry to the numbers table.
- 3 Type the name of the *remote* unit in the Name field and the ISDN number for that unit in the ISDN Number 1 field.



Do not alter the IP Address, IP Mask or IPX Network fields. Unit names are case-sensitive and must be entered correctly.

- 4 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

Configuring a Remote Unit for Bridging and IPX

If the remote site unit is being configured for the first time, or if it is an entirely new installation, then reset the unit to the factory default settings.

Follow the sequence of steps for resetting the unit as described in [“Manual Configuration of a Central Site Unit for Bridging and IPX”](#) on page 4-3.

Configuring a Unit Using the “Quick Configuration” Utility

If the central site unit has been configured, the Quick Configuration utility can be used to at the remote site to configure the remote site unit.

Assign the Unit Name, IP Address and Subnet Mask

The remote unit must be assigned a unique name and IP address. A valid subnet mask must be specified too. The name and IP address must exactly match the entries in the central site unit's ISDN Numbers and ISDN Autocall tables for this remote unit. Set the ISDN network type to match the ISDN service.

The unit IP address and subnet mask are required (for management of the unit) even if the network is always entirely connected within a non-IP Netware environment.

- 1 Enter **QC NA** to display the Unit Parameters screen.
- 2 Type a unique name for the unit in the Unit Name field. It can have up to 12 characters but do not include spaces in the unit name.
- 3 Type a valid IP address for the unit in the Unit LAN IP Address field.
- 4 Type the subnet mask for the network in the Unit LAN IP Mask field.
- 5 Toggle the Network Type field to the correct ISDN network type using the Spacebar, if required.
- 6 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

Connect to a Novell Network

It is important that the central site unit, to which the remote unit will connect at the completion of this section, has been correctly configured for IPX and bridging prior to the connection.

- 1 Enter **QC NO** to display the Connect To Novell Network screen.
- 2 Toggle the Do you have a local server field to the correct value using the Spacebar.
- 3 Type the number of the *central site unit* in the ISDN number of the remote unit you want to call field.
- 4 Press [Ctrl]+[E] to submit the new setting.

When the configuration parameters have been submitted, the remote unit automatically makes an ISDN call to the central site unit lasting around 90 seconds. It makes this call to learn the NRIPs and SAPs being advertised by the Netware Server.

Although the unit is bridging it is using the information gathered to build the IPX Autocall Table. After the 90 second call has cleared,

there should be NSAP entries, NRIP entries and Autocall entries in the table.

- 5 Press [Return] to continue the unit configuration.



It is normal that no NRIP or NSAP table entries are added on the remote unit.

- 6 Enter **CO IS AUTO IPX** to check the entries in the IPX Autocall table.
- 7 Enter **SAVE** to save the new configuration.

Whether or not the SAP entries have `nearest server` as an entry under `options` is dependent on whether or not the local server field in the Connect To Novell Network screen was set to `Yes` or `No`.

If there several SAP entries in the IPX Autocall Table with the Bridge Parameters Nearest Server field set to `Enabled`, the entries can be edited to show only one nearest server entry, which will then receive the Get Nearest Server requests from a Novell client workstation.



If none of the entries in the IPX Autocall table have a Nearest Server entry and there is no local server, the Novell client will not receive a GNS response and it will fail to log on to any server.

If the IPX Autocall table has a 1 in the hops field, it indicates the presence of the software router in the Novell server. This parameter confirms that IPX packets are never truly bridged because a true bridging environment shows the number of hops as zero.

Test the IPX Autocall Table

To test that the IPX Autocall table is functioning correctly, run a Novell client on a computer at the remote site to see if that client can access the server located at the central site.

Configuring a Remote Unit from the Central Site

A unit at a remote site can be remotely configured for IPX and bridging. The remote management and configuration capability allows the unit to be configured from the central site, without the need for a technician to travel to a remote site.

It is good practise to have ensured that the remote unit was restored to the factory default settings before being despatched to the remote site.



CAUTION: *Prior to despatch, it is essential that the unit has the ISDN Network Type field configured to match the ISDN network type at the remote site.*

Prior to Despatch

Power on the unit and follow the sequence of steps for resetting the unit to the factory default configuration, as described in “[Manual Configuration of a Central Site Unit for Bridging and IPX](#)” on [page 4-3](#).

Configure the ISDN network type to the correct setting for the remote site, following the sequence of steps described in “[Configure the ISDN Network Type](#)” on [page 4-4](#).



When the unit is received at the remote site, ensure that it is powered on and that the ISDN Port is connected to a correctly functioning ISDN line, using the supplied ISDN cable.

Configuring the Central Site Unit

The central site unit must be correctly configured with the following parameters:

- Unit name (see [page 4-4](#)).
- A valid IP address and subnet mask (see [page 4-4](#)).
- The IPX network number (see [page 4-4](#)).
- The IPX frame type (see [page 4-4](#)).
- The correct ISDN network type (see [page 4-4](#)).

Configure the ISDN Numbers Table on the Central Site Unit

A new entry must be added to the ISDN Numbers table on the central site unit, giving the name that the remote unit will have once that unit has been fully configured, and the ISDN number for the unit.

- 1 Enter **CO IS NU** to display the ISDN Numbers screen.
- 2 Enter **ADD** to add a new entry to the numbers table.
- 3 Type the name *assigned to the remote unit* in the Name field and the ISDN number for that unit in the ISDN Number 1 field.



Do not alter the IP Address, IP Mask or IPX Network fields. Unit names are case-sensitive and must be entered correctly.

- 4 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

Establish a Remote Management Session

A manual call must be placed before the configuration of the remote unit can proceed.

- 1 Enter **CO IS NU** to display the ISDN Numbers table.
- 2 Select the entry for the remote unit using the Arrow keys and enter **CALL**
- 3 Enter **REM** to display the Remote Units screen. Press [Ctrl]+[V] at regular intervals to refresh the screen, until an entry for NoName 10.0.0.1 appears.
- 4 Select the NoName 10.0.0.1 entry using the Arrow keys and enter **REM**
- 5 The Enter Password screen on the remote unit should be displayed within 30 seconds.
 - If the Enter Password screen is not displayed, check that the name and IPX network address for the remote unit have been entered correctly on the central site unit and that the ISDN line is connected and working normally at both ends of the link.
- 6 Enter **PASSWORD** (in upper-case letters) when the Enter Password screen is displayed.

Configuring the Remote Unit

Assign the Unit Name

- 1 Enter **CO SYS** to display the System Parameters screen.
- 2 Type the name assigned to the unit in the Unit Name field. The name must be exactly the same as that used to configure the central site unit ISDN Numbers table.



Unit names are case-sensitive and must be entered correctly.

- 3 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

Configure the Ethernet Port

A unique port IP address and the network subnet mask are required for the Ethernet port (for management of the unit, even if the network is always entirely connected within a non-IP Netware environment).



Changing the IP address during the remote management session causes the session to be disconnected when the new IP address is submitted. This is normal.

- 1 Enter **CO PO** to display the Port Configuration screen.
- 2 Select the LAN1 port using the Arrow keys and enter **ED** to display the Edit Ethernet Port screen.
- 3 Type a valid, unique IP address for the unit in the Port IP Address field. Do not type the network IP address.
- 4 Type a valid subnet mask for the network in the Port IP Mask field.
- 5 Type the IPX network number in the Port IPX Network field. This must be the same number as the central site LAN or LAN segment, or IPX and bridging will not work.
- 6 Use the Spacebar to toggle the setting of the IPX Frame Type field to the correct frame type for the network.



The frame type must be correct for the network environment in which the unit is operating. If the frame type is not correct, the unit will not pass data. Contact the network administrator for more information about the frame type used.

- 7 Press [Ctrl]+[E] to submit the new setting.
- 8 Submitting the new settings causes the remote management session to disconnect immediately. This is normal.
- 9 Press [Ctrl]+[D] to return to the central site unit management screens.
- 10 If the Remote Units screen is not displayed, enter **REM** to display it.



The remote unit entry should now contain the remote unit name and IP address.

- 11 Select the remote unit and enter **REM**
- 12 Enter **PASSWORD** when the Enter Password screen is displayed.
- 13 Enter **SAVE** to save the new configuration.

Configure the ISDN Numbers Table

Set up the ISDN numbers table to associate the *central* site unit name with its ISDN number.

- 1 Enter **CO IS NU** to display the ISDN Numbers screen.
- 2 Enter **ADD** to add a new entry to the ISDN Numbers table.
- 3 Type the name *assigned to the central site unit* in the Name field and the ISDN number for that unit in the ISDN Number 1 field.



Do not alter the IP Address, IP Mask or IPX Network fields. Unit names are case-sensitive and must be entered correctly.

- 4 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

Enable NRIP/SAP Learning

RIP/SAP learning has to be enabled to allow the IPX Autocall table to be constructed.

- 1 Enter **CO BR PA** to display the Filter Parameters screen. Toggle the Learn Novell RIP/SAP field to **ENABLE** using the Spacebar.
- 2 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

Build the IPX Autocall Table

The IPX Autocall table will not be constructed if RIP/SAP learning has not been enabled.

Make a manual call to the central site.

- 1 Enter **CO IS NU** to display the ISDN Numbers table.
- 2 Select the entry for the central site unit using the Arrow keys and enter **CALL**

This call is made to allow the unit to receive NRIP and NSAP updates being advertised by the Novell server at the central site, which are essential for the IPX Autocall table construction.

Enter **CO IS AUTO IPX** to monitor the construction of the IPX Autocall table. Press [Ctrl]+[V] at regular intervals to refresh the screen.

The manual call will last for approximately 90 seconds to enable the unit to receive all of the information which it requires.

- 3 Enter **CO IS NU** to display the ISDN Numbers table.
- 4 Select the entry for the central site unit and enter **CANC**
- 5 Save the new configuration by entering **SAVE**

Nearest Server

The nearest server parameter must be enabled.

- 1 Enter **CO IS AUTO IPX** to display the ISDN IPX Autocall table.
- 2 Select the **SAP** entry using the Arrow keys and enter **ED**
- 3 Select the **BRIDGE PARAMETERS Nearest Server** entry using the [Tab] key and toggle the setting to **ENABLED** using the Spacebar.
- 4 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

Disable NRIP/SAP Learning

RIP/SAP learning has to be disabled when the IPX Autocall table has been constructed.

- 1 Enter **CO BR PA** to display the Filter Parameters screen. Toggle the Learn Novell RIP/SAP field to **DISABLE** using the Spacebar.
- 2 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

Close the Remote Management Session

- 1 Enter **QUIT** to terminate the remote configuration session. Press [Ctrl]+[D] if this command is not available.

The Remote Units screen on the central site unit is displayed.

Cancel the Manual Call

It is important to remember that a manual call is still running from the initial connection to the remote unit. The call must be cancelled manually.

- 1 Enter **CO IS NU** to display the ISDN Numbers screen.
- 2 Select the entry for the remote site unit and enter **CANC** to cancel the call.
- 3 Enter **SAVE** to save the new configuration.



All manual calls must be cancelled when the unit configuration is complete. A "call guillotine" operates after 60 minutes (the default setting) to cancel the calls but during this time additional, unnecessary, call charges will have accrued.

To ensure that all ISDN calls are cancelled, follow the sequence of steps described in ["Cancelling ISDN Calls"](#) on [page 2-13](#).

It is good practise to enter **SAVE** to save the "new" configuration.

Test the IPX Autocall Table

To test that the IPX Autocall table is functioning correctly, run a Novell client on a computer at the remote site to see if that client can access the server located at the central site.

Cancelling Calls

To cancel all of the ISDN calls, follow the sequence of steps described in ["Cancelling ISDN Calls"](#) on [page 2-13](#).



5

NOVELL IPX ROUTING

This chapter shows how to configure units to route *Internet Packet Exchange* (IPX) Protocol data packets between two networks, using ISDN.



Note that the IPX protocol, although similarly named, is completely different from the Internet Protocol (IP), which was covered in Chapter 3, and must not be confused with it.

Configuration steps are given for:

- Manual configuration of the central site router.
- Manual configuration of the remote router.
- Remote configuration of the remote router from the central site.

Novell IPX Routing

IPX routing is necessary for transferring data between two Novell Netware® networks which have different IPX network numbers.

Configuration Options

When configuring a unit to route IPX packets using a dial-up ISDN link between a central site and one or more remote sites, the central site *should* be configured manually first.

The Quick Configuration facility is not recommended for configuring IPX routing.

The remote site unit *should* be configured manually, either by direct cable connection to the serial manager port, or by utilizing the remote configuration facility (**REM**) of the central site unit.

Outline of Configuration Procedure

The steps below are intended as an outline of the sequence for configuring a unit for routing IPX. They are for guidance only and must be used in conjunction with the full description given in the following pages.

There are seven basic steps required for manual configuration of a unit as an IPX router. There is a different sequence for remote configuration with additional steps. The additional steps are given in [“Configuring a Remote Unit from the Central Site”](#) on [page 5-9](#).

The seven basic steps are:

- Assign a unique name to the unit.
- Configure a unique, valid IP address for the unit.



It is very important to assign a unique name and IP address to each unit.

- It is good practise to configure a valid subnet mask for the unit. Although this step is not absolutely necessary, it is recommended.
- Configure the ISDN network type, if required.
- Set up the ISDN Numbers table to associate a remote unit name with an ISDN number.
- Enable IPX routing.
- Enable NRIP/SAP learning.
- Make a manual call to the central site router (remote site only).

Configuring a Central Site Unit for Routing IPX

If the central site unit is being configured for the first time, or if it is an entirely new installation, then enter **CO STD** to reset the unit to the factory default settings.



CAUTION: *Do not reset the unit if has already been installed on the network and configured to bridge or route IP, and is required to continue bridging or routing IP.*

CAUTION: *If the unit has already been configured, and it is necessary to keep some of the settings, take a note of the current*

configuration settings and port type and put it in a safe, accessible place.

If the central site unit is being configured for the first time, or if it is an entirely new installation, then reset the unit to the factory default settings.

- 1 Press the [Return] key.
- 2 Enter **PASSWORD** (in upper-case letters) when the Enter Password screen is displayed.
- 3 Enter **CO STD**
- 4 Do you wish to keep IP Addresses and ISDN parameters. KEEP (Y/N)? is displayed at the command line. Enter **N**
- 5 This will ERASE all configurations. ERASE (Y/N) is displayed. Enter **Y**
- 6 System will now reboot is displayed.
- 7 Follow the on-screen instructions.
- 8 Enter **PASSWORD** when the Enter Password screen is displayed.
- 9 Enter **SAVE** and then enter **QUIT**
- 10 Power-cycle the unit by removing and then refitting the power lead.
- 11 Follow the on-screen instructions.
- 12 Enter **PASSWORD** when the Enter Password screen is displayed.

Following the above sequence will ensure that the unit is reset to the factory default configuration and that the unit database is empty.

Assign the Unit Name

The unit *must* be assigned a unique name. The unit software relies on associating unit names with ISDN numbers for its core functionality.

- 1 Enter **CO SYS** to display the System Parameters screen.
- 2 Type a unique name for the unit in the Unit Name field. It can have up to 12 characters but note that the name is case-sensitive. Do not include spaces in the unit name.
- 3 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

Configure the Ethernet Port

A unique port IP address and the network subnet mask are required for the Ethernet port (for management of the unit), even if the network is always entirely connected within a non-IP Netware environment.

- 1 Enter **CO PO** to display the Port Configuration screen.
- 2 Select the **LAN1** port using the Arrow keys and enter **ED** to display the Edit Ethernet Port screen.
- 3 Type a valid, unique IP address for the unit in the Port IP Address field. Do not type the local network IP address.
- 4 Type a valid subnet mask for the network in the Port IP Mask field.
- 5 Type the IPX network number for the LAN on which the unit is sited in the Port IPX Network field.
- 6 Toggle the setting of the IPX Frame Type field, using the Spacebar, to the correct frame type for the network.



The frame type must be correct for the network environment in which the unit is operating. If the frame type is not correct, the unit will not pass data. Contact the network administrator for more information about the frame type used.

- 7 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

Configure the ISDN Network Type

The ISDN network type parameter must be set to the correct ISDN service, otherwise connections and data transmission over dial-up ISDN links will not be possible. In the U.S.A., an additional customer identification number, known as a *Service Provider Identification Number* (SPID) may be required.

- 1 Enter **CO IS PA** to display the ISDN Parameters screen.
- 2 Toggle the Network Type field, using the Spacebar, to the correct ISDN network type as given by the service provider.
- 3 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

Configure the ISDN Numbers Table

Set up the ISDN numbers table to associate each remote unit name with an ISDN number.

- 1 Enter **CO IS NU** to display the ISDN Numbers screen.
- 2 Enter **ADD** to add a new entry to the numbers table.
- 3 Type the name of the *remote* unit in the Name field.



Unit names are case-sensitive and must be entered correctly.

- 4 Type the ISDN number of the remote unit in the ISDN Number 1 field.



*It is very important to remember that Novell IPX routing uses **numbered** links. This means that the ISDN line between this unit and a remote site represents an additional Novell network and has to be assigned a valid Novell network number.*

- 5 Type the IPX network address of the *numbered link* in the IPX Network field, not the IPX network address of the remote unit.
- 6 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

Enable IPX Routing

- 1 Enter **CO RO PA** to display the Router Options screen.
- 2 Toggle the IPX Routing field to **ENABLED** using the Spacebar.
- 3 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

Enable Novell RIP/SAP Learning

Novell RIP/SAP learning must be enabled at both ends of the link.

- 1 Enter **CO BR PA** to display the Filter Parameters screen.
- 2 Toggle the Learn Novell RIP/SAP field to **ENABLE** using the Spacebar.
- 3 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

The central site unit is now ready for routing the Novell IPX protocol.

Configuring a Remote Unit to Route IPX

If the remote site unit is being configured for the first time, or if it is an entirely new installation, then reset the unit to the factory default settings.

Follow the sequence of steps for resetting the unit as described in “Configuring a Central Site Unit for Routing IPX” on page 5-2.

Assign the Unit Name

The unit *must* be assigned a unique name. The unit software relies on associating unit names with ISDN numbers for its core functionality.

- 1 Enter **CO SYS** to display the System Parameters screen.
- 2 Type in the name assigned to this remote unit in the Unit Name field. The name must be *exactly* the same as that used when configuring the central site unit ISDN Numbers table.
- 3 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

Configure the Ethernet Port

A unique port IP address and the network subnet mask are required for the Ethernet port (for management of the unit), even if the network is always entirely connected within a non-IP Network environment.

- 1 Enter **CO PO** to display the Port Configuration screen.
- 2 Select the LAN1 port using the Arrow keys and enter **ED** to display the Edit Ethernet Port screen.
- 3 Type a valid, unique IP address for the unit in the Port IP Address field. Do not type the local network IP address.
- 4 Type a valid subnet mask for the network in the Port IP Mask field.
- 5 Type the IPX network number in the Port IPX Network field.
- 6 Toggle the setting of the IPX Frame Type field, using the Spacebar, to the correct frame type for the network.



The frame type must be correct for the network environment in which the unit is operating. If the frame type is not correct, the unit will not

pass data. Contact the network administrator for more information about the frame type used.

- 7 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

Configure the ISDN Network Type

- 1 Enter **CO IS PA** to display the ISDN Parameters screen.
- 2 Toggle the Network Type field to the correct ISDN network type as given by the service provider.
- 3 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

Enable IPX Routing

- 1 Enter **CO RO PA** to display the Router Options screen.
- 2 Toggle the IPX Routing field to **ENABLED** using the Spacebar.
- 3 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

Configure the ISDN Numbers Table

Set up the ISDN numbers table to associate the central site unit name with an ISDN number.

- 1 Enter **CO IS NU** to display the ISDN Numbers screen.
- 2 Enter **ADD** to add a new entry to the numbers table.
- 3 Type the name of the *central site* unit in the Name field.



Unit names are case-sensitive and must be entered correctly.

- 4 Type the ISDN number of the central site unit in the ISDN Number 1 field.



*It is very important to remember that Novell IPX routing uses **numbered** links. This means that the ISDN line between this unit and the central site represents an additional Novell network and has to be assigned a valid Novell network number.*

- 5 Type the IPX network address of the *numbered link* in the IPX Network field, not the IPX network address of the central site unit. The IPX network number of the numbered link must be the same as that entered for this link in the central site ISDN Numbers table.

- 6 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

Enable Novell RIP/SAP Learning

Novell RIP/SAP learning must be enabled at both ends of the link.

- 1 Enter **CO BR PA** to display the Filter Parameters screen.
- 2 Toggle the Learn Novell RIP/SAP field to **ENABLE** using the Spacebar.
- 3 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**



NRIP and SAP tables will be built automatically during normal operation of the unit.

Manual Call

A manual call must be made to the central site unit to enable the IPX Autocall table to be built automatically on the remote unit. This call is made to allow the unit to receive NRIP and SAP updates being advertised by the Novell server at the central site.

- 1 Enter **CO IS NU** to display the ISDN numbers table, which was configured earlier.
- 2 Select the central site unit entry and enter **CALL**

The manual call (which should last for approximately 10 minutes), coupled with NRIP/SAP learning enabled, allows the IPX Autocall table to be constructed.

Enter **CO IS AUTO IPX** to monitor the construction of the IPX Autocall table. Press [Ctrl]+[V] at intervals to refresh the screen.



The manual call must be cancelled manually.

Wait until the entries in the IPX Autocall table screen have been stable for several minutes.

- 3 Enter **CO IS NU** to display the ISDN Numbers screen.
- 4 Select the remote site entry and enter **CANC** to cancel the manual call.

Specific Server for 'Get Nearest Server' Responses

Although the purpose of the manual call is to construct the IPX Autocall table automatically, the NRIP and SAP tables will have entries

too. In a large network, there will be a large number of entries in the tables.

- 1 Enter **CO RO NS** to view the entries in the Novell IPX SAP table.
- 2 Enter **CO RO NR** to view the entries in the Novell IPX RIP table.

If there are two or more servers listed in the Novell IPX SAP table but only one is required, a specific server can be configured to respond to Novell clients' Get Nearest Server requests.

- 1 Enter **CO RO NE** to display the IPX Nearest Server screen.
- 2 Enter **ADD** and type in the name of the specific Novell server. This name must be exactly the same as that displayed in the SAP table. Novell server names are case-sensitive.
- 3 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**
- 4 Enter **CO RO PA** to display the Router Options screen.
- 5 Move the cursor to the IPX Nearest Servers field and toggle the setting to **INCLUSIVE_LIST** using the Spacebar.
- 6 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

No Specific Server for GNS Responses

If no specific server is required, the entry in the SAP table with the lowest hop count is used.

- 1 Enter **CO RO NS** to display the Novell IPX SAP screen which shows the number of hops to each server.

The hop count in the NRIP table is the same as the hop count in the SAP table.

Configuring a Remote Unit from the Central Site

A unit at a remote site can be remotely configured for IPX and bridging. The remote management and configuration capability allows the unit to be configured from the central site, without the need for a technician to travel to a remote site.

It is good practise to have ensured that the remote unit was restored to the factory default settings before being despatched to the remote site.



CAUTION: *Prior to despatch, it is essential that the unit has the ISDN Network Type field configured to match the ISDN network type at the remote site.*

Prior to Despatch

Power on the unit and follow the sequence of steps for resetting the unit to the factory default configuration, as described in [“Configuring a Central Site Unit for Routing IPX”](#) on page 5-2.

Configure the ISDN network type to the correct setting for the remote site, following the sequence of steps described in [“Configure the ISDN Network Type”](#) on page 5-4.



When the unit is received at the remote site, ensure that it is powered on and that the ISDN Port is connected to a correctly functioning ISDN line, using the supplied ISDN cable.

Configuring the Central Site Unit

The central site unit must be correctly configured with the following parameters:

- Unit name (see [page 5-3](#)).
- A valid IP address and subnet mask (see [page 5-4](#)).
- The IPX network number (see [page 5-4](#)).
- The IPX frame type (see [page 5-4](#)).
- The correct ISDN network type (see [page 5-4](#)).

An existing central site IPX router only requires IPX routing to be temporarily disabled and the remote site unit parameters to be added to the ISDN Numbers table, prior to configuring the remote unit.

Enable Novell RIP/SAP Learning

Novell RIP/SAP learning must be enabled at both ends of the link.

- 1 Enter **CO BR PA** to display the Filter Parameters screen.
- 2 Toggle the Learn Novell RIP/SAP field to **ENABLE** using the Spacebar.
- 3 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

Configure the ISDN Numbers Table on the Central Site Unit

Set up the ISDN numbers table to associate the name which the remote unit will have *once it has been configured*, with the ISDN number.

- 1 Enter **CO IS NU** to display the ISDN Numbers screen.
- 2 Enter **ADD** to add a new entry to the numbers table.
- 3 Type the name that the *remote* unit will have in the Name field.
- 4 Type the ISDN number for the remote unit in the ISDN Number 1 field.



*It is very important to remember that Novell IPX routing uses **numbered** links. This means that the ISDN line between this unit and a remote site represents an additional Novell IPX network and has to be assigned a valid Novell IPX network number.*

- 5 Type the IPX network address of the *numbered link* in the IPX Network field, not the IPX network address of the remote unit.
- 6 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

Establish a Remote Management Session

A manual call must be placed before the remote configuration of the remote unit can proceed.

- 1 Enter **CO IS NU** to display the ISDN Numbers table.
- 2 Highlight the entry for the remote unit and enter **CALL**
- 3 Enter **REM** to display the Remote Units screen. Press [Ctrl]+[V] at regular intervals to refresh the screen, until an entry for NoName 10.0.0.1 appears.
- 4 Select the NoName 10.0.0.1 entry using the Arrow keys and enter **REM**
- 5 The Enter Password screen on the remote unit should be displayed within 30 seconds.
 - If the Enter Password screen is not displayed, check that the name and IP address for the remote unit have been entered correctly on the central site unit and that the ISDN line is connected and working normally at both ends of the link.

- 6 Enter **PASSWORD** (in upper-case letters) when the Enter Password screen is displayed.

Configuring the Remote Unit

Changing the IP address during the remote management session will cause the session to be disconnected when the new address is submitted. This is normal.

Assign the Unit Name

The unit *must* be assigned a unique name. The unit software relies on associating unit names with ISDN numbers for its core functionality.

- 1 Enter **CO SYS** to display the System Parameters screen.
- 2 Type in the name assigned to this remote unit in the Unit Name field. The name must be *exactly* the same as that used when configuring the central site unit ISDN Numbers table.



Unit names are case-sensitive and must be entered correctly.

- 3 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

Configure the Ethernet Port

A unique port IP address and the network subnet mask are required for the Ethernet port (for management of the unit), even if the network is always entirely connected within a non-IP Network environment.

- 1 Enter **CO PO** to display the Port Configuration screen.
- 2 Select the LAN1 port using the Arrow keys and enter **ED** to display the Edit Ethernet Port screen.
- 3 Type a valid, unique IP address for the unit in the Port IP Address field. Do not type the local network IP address.
- 4 Type a valid subnet mask for the network in the Port IP Mask field.
- 5 Type the IPX network number in the Port IPX Network field.
- 6 Toggle the setting of the IPX Frame Type field, using the Spacebar, to the correct frame type for the network.



The frame type must be correct for the network environment in which the unit is operating. If the frame type is not correct, the unit will not pass data. Contact the network administrator for more information about the frame type used.

- 7 Press [Ctrl]+[E] to submit the new setting.

The remote configuration session is disconnected when the new settings are submitted. Note that the configuration has not been permanently saved.

- 8 Press [Ctrl]+[D] to return to the central site unit management screens.
- 9 If the Remote Units screen is not displayed, enter **REM** to display it.



The Remote Units screen should now contain the remote unit name and IP address.

- 10 Select the remote unit using the Arrow keys and then enter **REM**
- 11 Enter **PASSWORD** when the Enter Password screen is displayed.
- 12 Enter **SAVE** to save the new configuration.

Configure the ISDN Numbers Table

Set up the ISDN numbers table to associate the central site unit name with an ISDN number.

- 1 Enter **CO IS NU** to display the ISDN Numbers screen.
- 2 Enter **ADD** to add a new entry to the numbers table.
- 3 Type the name of the *central site* unit in the Name field.



Unit names are case-sensitive and must be entered correctly.

- 4 Type the ISDN number of the central site unit in the ISDN Number 1 field.



*It is very important to remember that Novell IPX routing uses **numbered** links. This means that the ISDN line between this unit and the central site represents an additional Novell network and has to be assigned a valid Novell network number.*

- 5 Type the IPX network address of the *numbered link* in the IPX Network field, not the IPX network address of the central site unit.

The IPX network number of the numbered link must be the same as that entered for this link in the central site ISDN Numbers table.

- 6 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

Enable IPX Routing

- 1 Enter **CO RO PA** to display the Router Options screen.
- 2 Toggle the IPX Routing field to **ENABLED** using the Spacebar.
- 3 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**



Submitting the new setting turns IPX routing on.

- 4 Enter **QUIT** to return to the central site unit management session.
- 5 Enter **CO IS NU** to display the ISDN Numbers screen. Use the Arrow keys to select the remote unit entry.
- 6 Enter **CANC** to cancel the manual call.
- 7 Enter **SAVE** to save the new configuration at the central site.

Although the remote site configuration has not been permanently saved, the unit is functioning as an IPX router.

Enable Novell RIP/SAP Learning

Novell RIP/SAP learning must be enabled at both ends of the link.

- 1 Enter **CO BR PA** to display the Filter Parameters screen.
- 2 Toggle the Learn Novell RIP/SAP field to **ENABLE** using the Spacebar.
- 3 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**



NRIP and SAP tables will be built automatically during normal operation of the unit.

The remote configuration of the remote unit will not be successful unless Novell RIP/SAP learning has been enabled on *both* ends of the link.

Manual Call

A manual call must be made to the remote site unit to enable the IPX Autocall table to be built automatically on the remote unit. This call is

made to allow the unit to receive NRIP and SAP updates being advertised by the Novell IPX server at the central site.

- 1 Enter **CO IS NU** to display the ISDN numbers table.
- 2 Select the remote site unit entry using the Arrow keys and enter **CALL**
- 3 Enter **REM** to display the Remote Units screen.
- 4 Select the remote site unit entry using the Arrow keys and enter **REM** to establish a remote management session with the remote unit.
- 5 Enter **PASSWORD** when the Enter Password screen is displayed.

The manual call (which should last for approximately 10 minutes), coupled with NRIP/SAP learning enabled, allows the IPX Autocall table to be constructed automatically.

Enter **CO IS AUTO IPX** to monitor the construction of the IPX Autocall table. Press [Ctrl]+[V] at intervals to refresh the display.

Wait until the entries in the IPX Autocall table screen have been stable for several minutes.

If a specific server is required to respond to GNS requests, follow the steps given in "[Specific Server for 'Get Nearest Server' Responses](#)" on [page 5-8](#).

- 6 Enter **SAVE** to save the new configuration.
- 7 Enter **QUIT** to cancel the remote management session.
- 8 Enter **CO IS NU** to display the ISDN numbers table on the central site unit.
- 9 Select the entry for the remote site using the Arrow keys unit and enter **CANC**



The manual call is not cancelled automatically; it must be cancelled manually.

- 10 Enter **SAVE** to save the new configuration.

Test the IPX Autocall Table

To test that the IPX Autocall table is functioning correctly, run a Novell client on a computer at the remote site to see if that client can access the server located at the central site.

Cancelling Calls

To cancel all of the ISDN calls, follow the sequence of steps described in [“Cancelling ISDN Calls”](#) on [page 2-13](#).

6

PPP CONFIGURATION FOR IP CONNECTIONS

This chapter gives the basic steps for configuring a simple *Point-to-Point Protocol* (PPP) connection to an Internet Service Provider (ISP). Configuring a PPP connection using numbered links is a complex procedure and should only be attempted by experienced networking technicians. The configuration is not covered in this guide.

Requirements

In order to establish a PPP connection, the unit must have been configured with a unit name and a valid IP address and subnet mask. The ISDN network type must be configured correctly to match the ISDN service.

To configure these parameters:

- 1 Enter **QC NA** to display the Unit Parameters screen.
- 2 Type the unique name for the unit in the Unit Name field. It can have up to twelve characters. Do not include spaces in the unit name.
- 3 Type a valid IP address for the unit in the Unit LAN IP Address field.
- 4 Toggle the Network Type field to the correct ISDN network type using the Spacebar, if required.
- 5 Press [Ctrl]+[E] to submit the new setting and then enter **SAVE**

A number of essential parameters have to be supplied by the Internet Service Provider before configuration can be completed.

The parameters which have to be supplied by the ISP are:

- The Internet Service Provider's name.
- The ISDN number to call at the ISP.

- The ISDN call type.
- The name or (any) ID required to login to the ISP router.
- The Password Authentication Protocol (PAP) or Challenge Handshake Authentication Protocol (CHAP) passwords required to login to the ISP router. It is essential that the ISP specifies which of these are used by their router.

Configuring a PPP Connection

A PPP connection can be most easily configured using the Quick Configuration facility of the unit.

- 1 Enter **QC IN** to display the Connect To Another PPP IP Router screen.
- 2 Type the name supplied by the ISP in the Name of your Internet Provider or remote site field. This field is for reference only.
- 3 Type the ISDN number for the ISP the ISDN number of the remote unit you want to call field.
- 4 Toggle the Call Type field using the Spacebar to match the ISDN call type specified by the ISP.
- 5 If the unit LAN port has already been configured, then the IP Address of this unit's LAN port field will contain that address.
 - If the LAN port has not been configured, please refer to [Chapter 3](#) for details on how to configure the unit as an IP router.
- 6 If the unit LAN port has already been configured, then the IP Mask of this unit's LAN port field will contain the subnet mask.
 - If the LAN port has not been configured, please refer to [Chapter 3](#) for details on how to configure the unit as an IP router.

It is good practise to configure the PPP connection over ISDN to use *unnumbered* links because this makes best use of available IP addresses and is simple to configure.

- 7 To configure the PPP connection to the ISP to use unnumbered links, leave the following three fields set to UNNUMBERED:
 - IP Address of this end of the ISDN link.
 - IP Address of the remote end of the ISDN link.
 - IP Mask of the ISDN link.

- 8 For simple connections to the ISP, where all IP traffic goes to the Internet, leave the IP Address of the remote hosts network field set to `Internet`.
- 9 For simple connections to the ISP, where all IP traffic goes to the Internet, leave the IP Mask of the remote hosts network field set to `Internet`.
- 10 For simple connections to the Internet, leave the Manufacturer of remote router field set to `Default`. This field only needs to be changed if the unit has also been configured as an IPX router. See the *Software Reference* for more details in this case.
- 11 Type the user ID allocated for the authentication protocol used by the ISP in the ID to log into remote site field. Take care to enter the user ID exactly as given because this field is case-sensitive.

The authentication protocol specified by the ISP determines which one of password fields needs to be set. Occasionally, both a PAP and a CHAP password are supplied. In this case, both fields must be completed correctly.

- 12 If the ISP has supplied a PAP password, type the password in the PAP Password to log into remote site field. Note that the password must be entered exactly as given because this field is case-sensitive.
- 13 If the ISP has supplied a CHAP password, type the password in the CHAP Password to log into remote site field. Note that the password must be entered exactly as given because this field is case-sensitive.



Internet Service Providers may use either, or both, forms of user authentication. No successful connection to the ISP will be possible unless these parameters are configured correctly.

- 14 Press [Ctrl]+[E] to submit the new settings and then enter **SAVE**

If the ISP has already established an account then the PPP connection can be tested by using "Ping" to send test IP packets to an Internet site.

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