

Infoprint 6500 Series Line Matrix Printers



Ethernet Interface User's Manual

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Ethernet Interface User's Manual

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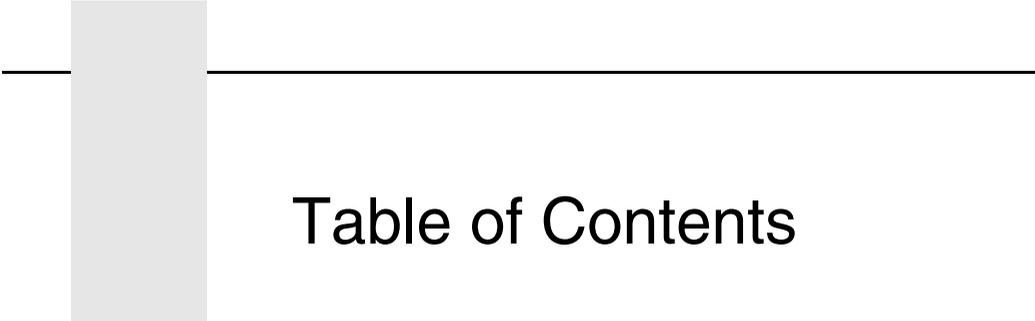


Table of Contents

1	Introduction	35
	Overview	35
	What Is The Ethernet Interface?	35
	Printer Models And Applicable Ethernet Interface Cards.....	36
	What Special Features Are Available?.....	36
	Logical Printer Architecture	38
	Destinations/Queues.....	40
	Models.....	40
	Interfaces.....	42
	10/100Base-T.....	42
	Speed Setting for 10/100Base-T.....	47
	Conventions Used In This Manual	48
	Notes And Notices.....	49
2	Installation And Configuration	51
	Installation	51
	Connecting To The Network	51
	Configuration Tools	52
	Configuration Using The Control Panel.....	53
	Ethernet Interface Verification.....	57
	Wireless Ethernet Interface Configuration Using The Control Panel	58
	Wireless Cisco LEAP	66
	Kerberos Enabled Wireless NIC Configuration	67
	HTML Forms	69
	Configuration Alternatives	72

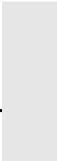


Table of Contents

3 Embedded Ethernet Interface Web	
Page	73
Overview	73
Configuration	74
Network Configuration	76
TCP/IP Network	76
802.11b	78
Windows Network (NetBIOS TCP/IP)	81
Novell Network	82
Print Path Configuration	84
Destination Settings	84
Current Model Settings	86
Current Log Path Settings	87
Print Model Configuration	88
Log Path Configuration	91
TN5250/3270 Configuration	93
SNMP Configuration	97
Administration Configuration	105
System Information	105
Passwords	108
System Configuration	108
Status	109
Status - I/O Port	109
Status - Network	110
IBM Printing Systems	110

Table of Contents

4	Windows Configuration	111
	Overview	111
	Windows Environment Description.....	111
	Windows Ethernet Interface Configuration.....	112
	Mandatory	112
	Optional.....	112
	Configuration Using ARP	112
	Communicating Across Routers.....	114
	Changing Workgroup Names.....	115
	Changing Destination Names	116
	Windows Host Configuration	118
	Windows XP/2000 Host Setup	118
	Windows NT 4.0 Host Setup	126
	Windows NT 3.51 Host Setup	131
	Windows Me or 9x Host Setup.....	132
	Windows Troubleshooting Tips	134
	Technical Support	134
	Ethernet Interface Cannot Be Found On The Network.....	134
	HTML Configuration Forms Will Not Display.....	135
	Errors Occur When Defining An LPR Printer	135
	Cannot Browse The Ethernet Interface On The Network.....	136
	Printer Errors When Printing Or No Output.....	136
	TCP/IP Access Problem.....	137
	Web Browser/HTTP Problem.....	139
	Windows NT 4.0 Or 2000 Host Setup Problems.....	139

Table of Contents

5	AIX/Unix Configuration	143
	Overview	143
	Unix Environment Description	143
	Unix Ethernet Interface Configuration	144
	Mandatory	144
	Optional.....	144
	Using ARP	144
	Using RARP	146
	Using BOOTP	147
	Communicating Across Routers.....	148
	Unix Host Configuration	149
	Manual System V Host Setup	149
	Ethernet Installation on HP-UX	150
	Solaris 2.6 – 7 Ethernet Setup	151
	SCO Setup	152
	Manual LPR/LPD Host Setup.....	159
	Ethernet Configuration for AIX 4	161
	AIX Remote Queue Time-Out Setting	163
	Printing With FTP	163
	Direct Socket Printing.....	165
	Printing From AIX	165
	Setting Up AIX 4.x.....	166
	Unix Troubleshooting Tips	167
	Ethernet Interface Cannot Be Found On The Network.....	167
	Nothing Prints	168
	Stair-Stepped Output	169
	No Form Feed Or Extra Page Comes Out.....	170
	TCP/IP Access Problem.....	170
	Front Panel Message - Dynamically Set Params Read Only	172

Table of Contents

6	Novell Configuration	173
	Overview	173
	Novell Environment Description	173
	Novell Ethernet Interface Configuration	174
	Using HTML Forms	175
	Novell Host Configuration.....	176
	NetWare Version 3.x PSERVER Setup	176
	NetWare Version 3.x RPRINTER Setup	179
	NetWare Version 4.x and 5.x PSERVER Setup.....	182
	NetWare Version 4.x and 5.x RPRINTER Setup	185
	Novell Troubleshooting Tips.....	187
	NetWare 3.x - No PSERVER Connection	188
	NetWare 4.x and 5.x- No PSERVER Connection	189
7	Novell Configuration For	
	10/100Base-T Interfaces	191
	Overview	191
	Novell Ethernet Interface Configuration (10/100Base-T)	192
	Preferred File Server (NDS and Bindery Setups)	192
	Setting Password Security	
	(NDS and Bindery Setups).....	195
	Adjusting Polling Time (NDS and Bindery Setups)	197
	Changing The Ethernet Interface Name	
	(NDS and Bindery Setups).....	198
	Changing The Ethernet Interface Frame Type	
	(NDS and Bindery Setups).....	200
	Changing The Ethernet Interface Mode	
	(NDS and Bindery Setups).....	201
	Setting The Ethernet Interface NDS Context	
	(NDS Setups)	202
	Setting The Ethernet Interface Preferred NDS Tree	
	(NDS Setups)	203

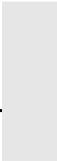


Table of Contents

Novell Host Configuration (10/100Base-T)	204
NDS PSERVER Setup (Netware 4.x/5.x).....	205
Bindery PSERVER Setup (Netware 3.x, Netware 4.x, and Netware 5.x)	208
Referencing A Bindery Queue In NDS (Netware 3.x, Netware 4.x, and Netware 5.x)	208
RPRINTER/NPRINTER Setup (Netware 3.x, Netware 4.x, and Netware 5.x)	209
NDPS Configuration (Netware 4.11 and Above).....	212
Troubleshooting (10/100Base-T)	215
PSERVER Setup	215
RPRINTER/NPRINTER Setup.....	218
Printing Related	220
8 iSeries Configuration, ASCII Printer	223
Overview	223
Configuring iSeries For ASCII Using TCP/IP	225
Configuring With ADDTCPIFC	225
Configuring A Router Definition With ADDTCP RTE	227
Configuring A Local Domain And Hostname.....	227
Configuring A TCP/IP Host Table Entry	228
Configuring The iSeries For Printing	228
Setting Up Printing For ASCII Files.....	228
Verify Printing On iSeries	236
iSeries ASCII Troubleshooting	237
TCP/IP Access Problem.....	238
Web Browser/HTTP Problem.....	240

9	iSeries Configuration, IPDS Printer	241
	Configuring On iSeries As An IPDS Printer.....	241
	Printing AFP, IPDS, And SCS Files	241
	Requirements.....	242
	Configuration Checklist	242
	Configuring An iSeries TCP/IP Interface With ADDCPIFC.....	243
	Configuring PSF For IPDS On V3R7 Or V4R1	246
	Configuring PSF for IPDS On V4R2 And Above.....	252
	Verifying The IPDS Configuration On iSeries.....	259
	Sharing The iSeries Printer On The Network	260
	Printer Sharing Parameters.....	261
	iSeries Troubleshooting.....	262
	Cannot PING The Printer	262
	PSF Terminates When Initialized.....	263
	Spooled Print File Remains In PND Status.....	263
	Spooled Files Disappear Without Printing.....	264
	Data Is Being Clipped	264
10	z/OS Configuration, IPDS Printer	265
	Overview	265
	Requirements.....	265
	Configuration Checklist	266
	Configuring PSF for z/OS to Print IPDS Files	267
	Configuration Procedure	267
	Verifying a TCP/IP-Attached Printer on z/OS.....	277
	Sharing IBM 6500-v Printers on z/OS	278
	JES Spool Printer Sharing	278
	Port Switching Printer Sharing	280
	Handling z/OS Connectivity Problems	280
	Ping is Not Successful	280
	Ping is Successful	281

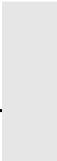


Table of Contents

11 z/OS Configuration, TN3270E	283
z/OS Configuration For A TN3270E Printer	283
Coax Printer Support FMID	283
Program Materials	284
VTAM Definitions For SCS and DSE TN3270E	285
TCPIP Configuration With TN3270E	287
Printer Inventory Manager As Defined With TN3270E...	288
Configuration Screens.....	297
12 iSeries Configuration, TN5250	301
Setting Up TN5250 Print Queues on iSeries.....	301
Setting Up A TN5250 Connection/Device Via A Telnet Session	302
User Supplied Values	303
Using Telnet Commands for TN5250	303
Command List.....	303
Getting Started	304
TN5250 Job Formatting	305
Font Identifier (FONT) - Help	307
13 ISeries Configuration, SNMP	309
Configuring for a *LAN 3812 SNMP Device Description.....	309
Configuration Instructions	309
Varying on the Printer	315
Problem Areas for Consideration	316
Additional Information	317

Table of Contents

14	Monitoring Printers	319
	Implementing Printer Management	319
	Agent/Manager Model.....	319
	MIB.....	320
	SNMP.....	322
	Monitoring Tools.....	322
	Monitoring With AIX NetView/6000	322
	Setting The SNMP Community Name.....	323
	The Printer Management Utility Software (PMU)	323
15	IBM Network Printer Manager	325
	Overview	325
16	Commands	327
	Command Shell Overview.....	327
	npsh Access Methods	327
	Main npsh Command Prefixes	327
	Getting Command Help.....	328
	Complete Command List.....	328
	Store Commands	329
	Set Commands	344
	List Commands	356
	Miscellaneous Commands	360
17	Extra Features.....	365
	Ethernet Interface Security.....	365
	Users And Passwords.....	365
	Reset The Ethernet Password	367
	TCP Access Lists	369
	Printer Monitoring And Logging.....	371
	Printer And Print Job Monitoring	371
	Printer Logging Through Logpaths.....	372
	Ethernet Interface Naming Schemes	373



Table of Contents

Glossary	375
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1

Introduction

Overview

This chapter introduces you to the Ethernet Interface architecture and special features, as well as providing information on installation and configuration tools.

What Is The Ethernet Interface?

The Ethernet Interface allows you to attach printers on a local area network (LAN) rather than attaching them directly to a host system. Following simple configuration steps, these peripherals can be simultaneously shared with users on the network whether you are using TCP/IP, NetBIOS over TCP/IP, or IPX (Novell®).

The Ethernet Interface package contains an Ethernet Interface to attach itself and the printer to the network. The Ethernet Interface is supplied in one of four forms:

- an Ethernet adapter attached to the printer parallel port
- a wireless Ethernet adapter
- an integrated Ethernet card
- an integrated wireless Ethernet card.

Throughout this manual, features specific to each Ethernet Interface type will be indicated by the sideheads ADAPTER, WIRELESS ADAPTER, ETHERNET, and WIRELESS.

Printer Models And Applicable Ethernet Interface Cards

The following lists the 6500-v printer model with its corresponding Ethernet Interface Card type.

Printer	Ethernet Interface Card Type
6500-v	Power PC Based PCI Ethernet (wired) Power PC Based PCI Ethernet (wireless) External Ethernet to Parallel Port ¹
¹ This is the IBM Network Print Server which is available through IBM. This feature is offered with limited support. The information in this manual does not apply to the IBM Network Print Server. Contact your IBM representative for more details.	

What Special Features Are Available?

The Ethernet Interface offers an extensive list of features including:

- built-in HTML forms for easy cross-platform configuration
- availability of remote management software (IBM Printer Management Utility)
- a detailed and easy-to-use command shell built-in to the firmware
- multi-level configuration security through passwords, permission levels, and access lists
- WAN-wide communication access
- numerous printer logging methods (e.g., automatic email) to record printer errors and usage
- remote management through HTML forms, Telnet sessions, `rsh/rcmd/remsh` commands, SNMP, and pre-defined log methods
- extensive built-in troubleshooting tools
- built-in `telnet` and `ping` clients

What Special Features Are Available?

- configurable memory usage by disabling protocols and destination services
- multiple destinations/queues for versatile printer manipulation and distinct print setups
- header and trailer strings to instruct printers on font, pitch, printing, etc.
- flexible naming conventions
- automatic network connection and frame type sensing
- simultaneous printing across all I/O ports and all supported protocols
- multiple network protocol support

Logical Printer Architecture

The Ethernet Interface implements a logical printer architecture which gives the system administrator the possibility to configure the print server to handle and act upon the print data in several ways. When a print job comes through the print server, there is a certain logical print path that it follows before it gets to the printer. Each logical print path consists of a sequence of logical steps where extra processing may be performed on the print data before it is sent to the printer. This ability to preprocess the print data before it is sent to the printer allows elimination of certain printing problems, or implementation of printer enhancements that may be difficult and time consuming to solve or introduce at the system, spool file or queue level. The preprocess ability is also simplistic to perform at the print server level.

NOTE: If the printer is configured for IPDS, any reference to “d4prn” should be understood to mean “dipdsprn.” This queue should only be used to print IPDS.

The logical print path for a print job going through the Ethernet Interface consists of three different phases:

- **Phase 1** - the host sends the job to a destination or queue on the Ethernet Interface (e.g. d1prn).
- **Phase 2** - the print job passes through the associated “model” (e.g. model “m1”) on the Ethernet Interface for any extra processing associated with the model.
- **Phase 3** - the processed print job is directed to the printer for output.

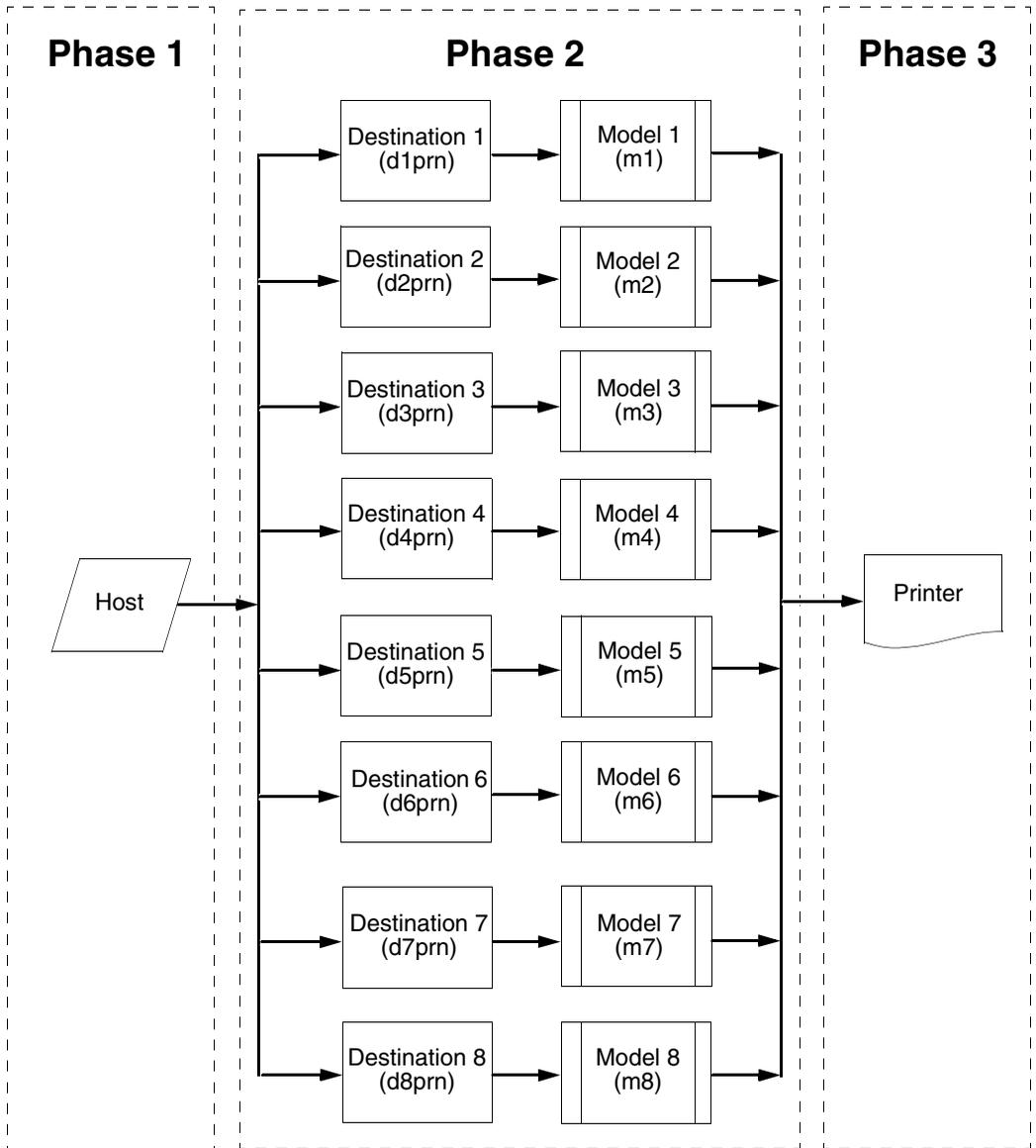


Figure 1. Print Path

Destinations/Queues

For every I/O port on the Ethernet Interface, there is at least one pre-defined logical print queue or destination to accept print jobs destined for it. This includes print job that is sent directly to the I/O port, such as port 9100. These queue or destination names are pre-defined but can be changed by the user.

Models

For every destination or queue, there is a pre-defined model associated with it. The model defines how the print job will be processed as it passes through to the printer. Models are a set of mini filters that can be used to modify the print data stream. The functions available for each model are as follows:

1. Insert carriage return after line feed
2. Insert a banner page before or after each print job
3. Insert header strings to
 - Print in landscape mode
 - Print in portrait mode
4. Insert trailer strings to
 - Reset the printer once the print job completes
 - Force the end of the job
 - Perform a form feed at the end of the data

5. Log one or all of the following information as each print job passes through the model
 - Job ID and username
 - User ID and three messages per job about the start and finish
 - Checksum value of the data transferred
 - Miscellaneous messages from the printer
 - Status of the printer based on the port interface signals
6. Load a specific printer configuration before processing a print job
 - Specify a printer configuration to be associated with a print queue.
 - When a job is set to that print queue, the associated printer configuration will be loaded before the job is processed.
 - Feature allows you to define up to eight unique and independent printer personalities in a single printer.
 - Allows you to effectively have eight different printers in one.

Interfaces

The Ethernet interfaces with your printer through an Ethernet™ 10/100Base-T interface connector.

10/100Base-T

ADAPTER The Ethernet Interface at the rear of the printer for the 10/100Base-T interface has two indicator lights and two DIP switches, as shown in Figure 2.

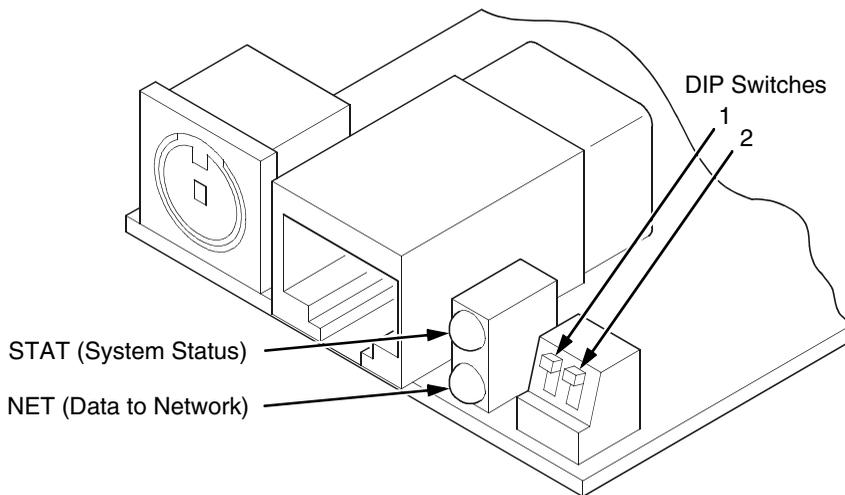


Figure 2. Status Indicator Lights and DIP Switches

Run and Auto Reset Modes

Run mode is the normal operating state of the Ethernet Interface. Auto Reset mode is entered when the watchdog timer is triggered and the Print Server resets itself. In either mode, the STAT LED flashes at a varying rate, depending on whether the unit IP address is configured. The Run Mode and Auto Reset Mode indicator descriptions are given in Table 1.

Table 1. Run Mode and Auto Reset Mode Indicator Descriptions

STAT	Indication	Description
OFF	flashes on once per second	Normal Mode, IP address configured
OFF	flashes on two times per second	IP address not configured
ON	flashes off once per second	Download (MOS)
ON	flashes off twice per second	Error

Network Indicator

The NET LED displays the status of the network link. When the NET LED is on, link integrity is confirmed. The NET LED flashes off for 1/3 second when a data packet is being transferred. When the NET LED is off, the network connection has been severed.

Table 2. NET LED Indicator

NET	Indication	Description
ON	constantly	Indicates link integrity
ON	flashes off 1/3 second	Flashes off 1/3 second each time a packet is transmitted

ETHERNET Integrated NIC Card LED:

Table 3. Integrated NIC LED Indicator

NET	Indication	Description
ON	flashes	Indicates activity
ON	constant	Indicates that the link is good at 10 Mbps
ON	constant	Indicates that the link is good at 100 Mbps

Wireless Network Indicator

WIRELESS

The wireless Ethernet Interface has 2 bi-color LEDs which can produce three colors each: green, red, and yellow (green and red combined). Table 4 shows the STAT LED states for various sytem conditions:

Table 4. Wireless Ethernet Interface STAT LED States

System Condition	STAT LED
System is running without an IP address.	Green, 2 Hz flash
System is running with an IP address.	Green, 1 Hz flash
System error.	Red 2Hz flash
System is in upgrade mode with an IP address.	Yellow, 1 Hz flash
System is in upgrade mode without an IP address.	Yellow, 2 Hz flash

Table 5 shows the NET LED states for various network conditions when a WLAN card is inserted into the wireless Ethernet. The Ethernet (wired) interface will not affect the NET LED while a WLAN card is present.

Table 5. Wireless Ethernet Interface NET LED States

WLAN Network Condition	NET LED
Network-link quality is good	Green
Network-link quality is fair	Yellow
Network-link quality is bad	Red
Network-link not present	Off
Network-link present and transmitting	Link quality + blink

Table 6 shows the NET LED states for various network conditions when no WLAN card is found or present.

**Table 6. Wireless Ethernet Interface NET LED States
(No WLAN)**

Wired Ethernet Network Condition (No WLAN)	NET LED
Network-link is present	Green
Network-link is not present	Off
Network-link present and transmitting	Blink

DIP Switches

ADAPTER, WIRELESS ADAPTER

On the back of the printer, you will find a small window where you can access two DIP switches labeled 1 and 2 (see Figure 2 on page 42). The functions of the DIP switches are explained in Table 7.

NOTE: The DIP switches are not marked with “on” or “off” labels. Instead, the status of the switch is indicated by its position, up or down. If the interface card has been installed upside down (i.e., the DIP switches are to the left of the cable connector), your DIP switch positions will be reversed and the settings inverted.

Table 7. 10/100Base-T DIP Switch Settings

DIP Switch		Comments
1	2	
up	up	Normal operation. With both DIP switches in the “off” position, the Ethernet Interface boots up using the settings in flash memory rather than the default settings.
down	up	Factory default. With the DIP switches in this configuration, the Ethernet Interface boots up and all settings stored in flash memory are erased except the Ethernet address and key value.
up	down	Default IP. With the DIP switches in this configuration, the Ethernet Interface boots up with factory default settings. However, the stored settings in flash memory are intact. Setting DIP switch 2 to “on” does not clear any settings stored in flash memory; it boots the unit in a different state with the settings in flash memory temporarily ignored.
down	down	Reserved. This DIP switch configuration is not for customer use.

Speed Setting for 10/100Base-T

When the router is set to auto-negotiation enable, the following is the correct behavior of the Ethernet Interface with each setting:

1. **10mbps Half Duplex**

Use parallel detection because the Ethernet Interface is using force mode and thus has auto-negotiation disabled.

PORs to Half Duplex. Resets to Half Duplex. Reconnection at switch maintains Half Duplex.

2. **10mbps Full Duplex**

Use parallel detection because the Ethernet Interface is using force mode and thus has auto-negotiation disabled.

PORs to Half Duplex. Resets to Half Duplex. Reconnection at switch maintains Half Duplex.

3. **100mbps Half Duplex**

Use parallel detection because the Ethernet Interface is using force mode and thus has auto-negotiation disabled.

PORs to Half Duplex. Resets to Half Duplex. Reconnection at switch results in Half Duplex.

4. **100mbps Full Duplex**

Use parallel detection because the Ethernet Interface is using force mode and thus has auto-negotiation disabled.

PORs to Half Duplex. Resets to Half Duplex. Reconnection at switch results in Half Duplex.

5. **Ethernet in Auto mode in 100mbps Full Duplex environment**

Use auto negotiation to the highest common local and remote capability, i.e. 100 Full Duplex in this case.

PORs to 100/Full Duplex. Resets to 100/Full Duplex. Reconnection at switch remains 100/Full Duplex.

6. Ethernet in Auto mode in 10mbps Half Duplex environment (determined using 10hd hub)

Use auto-negotiation to the highest common local and remote capability, i.e. 100 Half Duplex in this case.

PORs to 10 Half Duplex. Resets to 10 Half Duplex.

Reconnection at switch maintains 10 Half Duplex.

NOTE: With parallel detection, only speed can be determined. The duplex mode sets to half duplex.

Conventions Used In This Manual

All uppercase print indicates control panel keys.

Example: Press the CLEAR key, then press the ONLINE key.

Quotation marks (“ ”) indicate messages on the Liquid Crystal Display (LCD).

Example: Press the ONLINE key. “OFFLINE” appears on the LCD.

Command syntax and examples are formatted as follows:

- The Courier font in **boldface** indicates commands that you type. For example:

At the prompt, type:

```
ping ftp.CompanyWebsite.com
```

- Regular Courier font indicates references to command syntax and output. For example:

The ftp.CompanyWebsite.com site is working properly.

- Variable values are shown in brackets < > in command syntax, output, and in text. For example:

```
ping <ipname>
```

The <ipname> is working properly.

Notes And Notices

For your safety and to protect valuable equipment, read and comply with the notes included in this manual. A description follows:

NOTE: A Note gives you helpful information and tips about printer operation and maintenance.

2

Installation And Configuration

Installation

The Ethernet Interface provides an RJ-45 connector for 10/100Base-T (UTP) networks.

WIRELESS ADAPTER

Connecting To The Network

To attach the Ethernet Interface to a network, plug the network cable into the Ethernet Interface connector.

Watch the LEDs in the rear of the printer as they cycle through the power-on self-test. When the test is complete, the STAT LED will begin to flash.

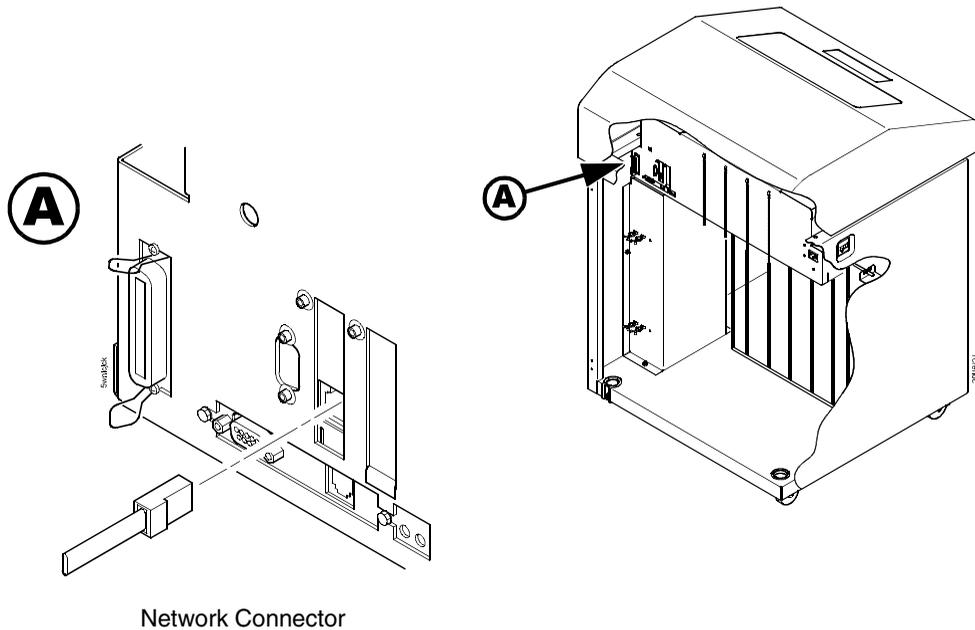


Figure 3. Interior View of the Cabinet Model Showing Network Interface Location and Setup

Configuration Tools

There are two parts to a Ethernet Interface setup:

- Configuring the Ethernet Interface so it can be seen on the network. This involves network-related settings (e.g., an IP address within TCP/IP environments) configured through the built-in command shell, npsh, or from the control panel.
- Configuring a host with a new printer so it knows how to send data to the Ethernet Interface. Just being able to see the printer on the network does not mean you can automatically print to it. A host has to be told where to send the data.

NOTE: Some network environments do not require any network settings to be configured on the Ethernet Interface. However, all network setups require configuration on the host end.

Configuration Using The Control Panel

You can set Ethernet Interface settings from the printer control panel.

CAUTION

When the printer is first powered on, the message “ETHERNET INITIALIZING” displays on the control panel. To prevent a loss of Ethernet Interface configuration information, do not change the Ethernet Interface settings while this message is displayed. When the initialization is complete, the message “ETHERNET IS READY” displays, and you can safely change the Ethernet Interface settings from the control panel.

1. You can set any of three listed parameters from the printer control panel. These parameters are located in the Ethernet Address, Adapter Address, or Wireless Address menu. Arrange to have an IBM service technician install the Ethernet Interface card if it is not already installed; this is not a customer installable feature.
2. Power on the printer. The message “ETHERNET INITIALIZING” appears when the printer is powered on. Configuration can be done after the “ETHERNET IS READY” message appears.
3. Disable the Power Saver mode before starting this procedure to ensure that the configuration process runs uninterrupted. See the *Infoprint 6500 User's Guide* for instructions.

4. Always print an Ethernet Adapter test page before performing any updates or network configuration using the following steps:

For 6500-v *printers*:

- a. Press **STOP** to take the printer offline. The printer is in the NOT READY state.
 - b. Press **RETURN** + **ENTER** simultaneously to unlock the printer menu.
 - c. Press **MENU** to display OPERATOR MENU.
 - d. Press **↑ Scroll/Micro** until “OPERATOR PRINT TESTS” displays, then press **ENTER**.
 - e. Press **↑ Scroll/Micro** until the following displays:
“ETHERNET TEST PAGE” for the integrated or wireless Ethernet.
“ADAPTER TEST PAGE” for the Ethernet Adapter.
 - f. Press **ENTER**.
5. Verify the current Ethernet Interface firmware version number.

NOTE: Firmware exists within the Ethernet Interface and the printer itself. Each firmware is a separate entity with its own version number. Please pay close attention to the type of firmware referenced in the remaining sections of this document.

The Ethernet Interface version should be 1.1.3 or higher for 10/100Base-T Ethernet adapters. If the Ethernet Interface version is current, skip to step 6 below. If the Ethernet Interface version is not current, you need to update both the Ethernet Interface and printer firmware.

If you need to update the printer firmware, you must do so now. After the update is complete, you must restart this instruction from the beginning. To upgrade the printer firmware, contact your IBM service representative.

CAUTION Turning off the printer before the firmware update is complete may permanently damage the Ethernet Interface adapter.

Updating the printer firmware takes time. Please be patient and wait for the “ETHERNET IS READY” message to display on the LCD. Do not turn off the printer before it has completed the firmware download procedure. The LCD will display “ONLINE / ETHERNET IS READY” when the download is complete. Wait for this message before turning off the printer.

6. To enter IP Address parameters, do the following:
 - a. Press **STOP** to get to the NOT READY state.
 - b. Press **RETURN** + **ENTER** to unlock the printer menu.
 - c. Press **Menu** to display OPERATOR MENU.
 - d. Press **↑ Scroll/Micro** until NETWORK SETUP displays, then press **Enter**.
 - e. Press **↑ Scroll/Micro** until ADAPTER ADDRESS or ETHERNET ADDRESS displays, then press **Enter**.
 - f. Press **↑ Scroll/Micro** until IP ADDRESS displays, then press **Enter**.
 - g. Press **Enter** again, then **↑ Scroll/Micro** to choose an IP address octet to change. Press **Enter**.
 - h. Press **↑ Scroll/Micro** to choose the desired value for the octet, then press **Enter**. The new value is shown with an asterisk. Press **Return**.
 - i. Repeat steps d and e until you have set all IP address octets to the desired value.
 - j. Press **Return** until ADAPTER ADDRESS or ETHERNET ADDRESS is on the first display line.
 - k. Press **↑ Scroll/Micro** to choose other IP parameters to change, then follow the above steps for each of these.
 - l. When finished, press **Return** multiple times until NOT READY displays.
 - m. Press **Start**.

- n. Wait for “ETHERNET IS READY” to display.
 - o. Press **RETURN** + **ENTER** to lock the printer menu.
7. Put the printer online and wait for the “ETHERNET IS READY” message to display on the front panel. Placing the printer online starts the Ethernet Interface IP Address and Netmask update process. This process will take several minutes.

NOTE: If you do not put the printer online, the setting you just entered will not take effect. Do not turn the printer off until you see the “ETHERNET IS READY” message. If you turn the printer off before the new values are written to memory in the Ethernet Interface adapter, you will need to repower the printer and repeat steps 6 and 7 above immediately.

8. Once the “ETHERNET IS READY” message displays, you may enter the Gateway Address by repeating front panel steps 6 and 7 above. This will ensure the correct Netmask becomes associated with the Gateway value you enter. From the front panel navigate to the Gateway Address and enter the appropriate value. You must press ENTER after inputting each segment of the Gateway Address.
9. Put the printer online and wait for the “ETHERNET IS READY” message to display on the front panel.
10. Enable the Power Saver mode if desired.

Ethernet Interface Verification

Before performing the verification, you must connect the Ethernet Interface card to the network.

1. Print an Ethernet test page (following the steps on page 53) to verify the settings you made.
2. Verify the Netmask is correct in two locations on the Ethernet test page:
 - NETWORK INTERFACES
 - TCP/IP ROUTING TABLE

The Netmask must be the same in both locations. For example, if the Netmask is listed as 255.255.255.0 in NETWORK INTERFACES and is listed as 255.255.255.255 in the TCP/IP ROUTING TABLE, they do not match and you must correct it for the Gateway. Also, if a Gateway Address was entered, verify that “xxx.xxx.xxx.xxx is alive” is printed under the Default Gateway Ping Test, where xxx.xxx.xxx.xxx is the Gateway Address. If a Gateway Address was not entered, the Default Gateway Ping test is not required and will not display on the page.

If the Netmask does not match, complete the following steps:

- a. Place the printer offline.
- b. Using the front panel, modify the Gateway value to 0.0.0.0. (non-configured).
- c. Place the printer online and wait for the “ETHERNET IS READY” message to display.
- d. Place the printer offline and enter the Gateway Address you desire.
- e. Place the printer online and wait for the “ETHERNET IS READY” message. This saves the new Gateway Address.

Your Ethernet Interface is now configured and connected to your network.

Wireless Ethernet Interface Configuration Using The Control Panel

WIRELESS ADAPTER,

NOTE: The Access Point must be configured according to the manufacturer's installation guide.

WIRELESS

To configure Wireless Ethernet Interface, configure the ethernet and wireless IP addresses so they can be seen on the network. This includes several network-related settings (e.g., an IP address within TCP/IP environments) configured through the built-in command shell, npsh, or from the control panel.

IP Address Configuration

You can set the wireless Ethernet Interface IP settings from the printer control panel.

CAUTION

When the printer is first powered on, the message “ETHERNET INITIALIZING” displays on the control panel. To prevent a loss of Ethernet Interface configuration information, do not change the Ethernet Interface settings while this message displays. When the initialization is complete, “ETHERNET IS READY” displays, and you can safely change the Ethernet Interface settings from the control panel.

You need to set both the ethernet and wireless network IP addresses according to the TCP/IP environment that the printer is connected to. There are four parameters accessed from the printer control panel that are IP address related. These parameters are located in the "ETHERNET ADDRESS" menu and the "WIRELESS ADDRESS" menu:

- **IP Address**

This is the host for IP addresses that have four segments. They are displayed as SEG1, SEG2, SEG3, and SEG4 which can be set to any value in the range of 0 to 255.

Wireless Ethernet Interface Configuration Using The Control Panel

- **Subnet Mask**

This is the subnet mask for the host IP that has four segments. They are displayed as SEG1, SEG2, SEG3, and SEG4 which can be set to any value in the range of 0 to 255.

- **Gateway Address**

This is the gateway IP addresses that have four segments. They are displayed as SEG1, SEG2, SEG3, and SEG4 which can be set to any value in the range of 0 to 255.

- **DHCP**

The DHCP option allows you to obtain host server IP addresses when powering onto the network. The DHCP can be configured to:

- **Enable** – each time you power on, the host server automatically assigns you a different address (if the IP address has not been previously assigned).
- **Disable** – You choose the host server IP address. After the selection, the IP Address remains fixed even after you reboot.

Wireless Parameter Configuration

Certain "WIRELESS PARAMETERS" must be configured to match the Access Point settings:

NOTE: The "ETHERNET PARAMETERS" are configured the same way as the 10/100 Ethernet external Ethernet Interface. Please refer to the Ethernet menu.

- **Signal Strength**

This menu displays the strength of the wireless signal.

NOTE: This is a display value only and cannot be changed.

- **Operation Mode**

This is the operation mode of the wireless network. The options include "Infrastructure" or "Ad Hoc" mode.

- **SSID Name**

This is the Service Set Identifier which must be identical to the Access Point's SSID name. The SSID name can be configured to a maximum of 32 alphanumeric characters. The SSID name and alphanumeric characters are divided into three parts in the control panel menu as "SSID Name (01-15)", "SSID Name (16-30)" and "SSID Name (31-32)".

NOTE: When two or more consecutive space characters are used in the SSID, enclose it in a double quoted string; otherwise upon resetting the Ethernet, the SSID Name will be saved in the Wireless Ethernet with only one space.

- **Minimum Transfer Rate**

Allows you to set the minimum speed at which the Wireless Option will accept a connection (in million bits per second).

This is the wireless transfer rate, and can be set to either "enable" or "disable." It is set to "enable" when the operation mode is "Infrastructure" so that the Ethernet Interface can automatically detect the optimal transfer rate. If the operation mode is "Ad Hoc" and the transfer rate is known, the user can enable or disable the corresponding transfer rate in the menus "Xfer Rate 1Mb", "Xfer Rate 2Mb", "Xfer Rate 5.5Mb" or "Xfer Rate 11Mb".

- **Channel**

This is the frequency used for wireless communication. The 2.4GHz band spectrum is divided into different channels (1-15). It is set to "Default" so that the Ethernet Interface can detect the correct channel to communicate with the Access Point in infrastructure mode. If the operation mode is "Ad Hoc" and the channel is known, the user can set the corresponding channel in this menu.

- **Antenna Diversity**

This is used to select the antenna for communication. It is recommended to set to "Diverse" for the Ethernet Interface to detect for optimal communication. It can also be set to "Primary" or "Auxiliary".

Wireless Ethernet Interface Configuration Using The Control Panel

- **Preamble**

This is the preamble used in the wireless packets. It is recommended to set to "Default" so that the Ethernet Interface can detect the correct preamble. The preamble is approximately 8 bytes of the packet header generated by the AP and is attached to the packet prior to transmission. The preamble length is transmission data rate dependent. The "short" preamble is 50% shorter than the "long" preamble. It must match the Access Point's preamble configuration.

- **Power Management**

This option allows you to set power-save mode and sleep time. A value specifying the sleep time in milliseconds will be provided. If set to zero, power-save mode will be disabled.

- **Transmit Power**

This option allows you to specify the power level used by the wireless card to send network packets to the access point. Transmit power is specified as a percentage of full power (0 – 100%).

- **International Mode**

When enabled, the Wireless option adapts to international frequency requirements in Europe.

- **Authentication Method**

This feature allows the user to select the authentication method used for the wireless network interface. The options include open, shared, kerberos, and leap.

- **Default WEP Key**

The default key must match the Access Point's configuration. If the Access Point is configured to use "Open System", the default key should be set to 0. If the Access Point is configured to use 40-bit or 128-bit WEP encryption key, the encryption key must be set to the same setting as the Access Point's setting. See the following section on how to set up the encryption key. In addition, there may be four keys (1-4) that an Access Point can use. If the Access Point is set to use key 1, the default key must be set to 1 to correspond to the Access Point's setting.

Encryption Key Configuration

As mentioned above, there are four encryption keys that can be configured through the control panel. For each encryption key x (where x can be 1 to 4), the following control menu can be used to configure the key:

- **WEP Key x Format**

This is the format of the key. It can be set to either ASCII or Hexadecimal.

- **WEP Key x Width**

This is the number of bits used for encryption. This can be set to either 40 Bits or 128 Bits and must match the Access Point's configuration.

- **WEP Key X**

This is the key value. If the "KEY WIDTH" is set to 40 Bits, the key values can be entered in the following 5 sub menus (BYTE 1, ..., BYTE 5). If the "KEY WIDTH" is set to 128 Bits, the key values can be entered in the following 13 sub menus (BYTE 1, ..., BYTE 13). The key values must configure to match the corresponding key in the Access Point's key configuration.

Authentication Method

This feature allows the user to select the authentication method used for the wireless network interface. The options include open, shared, kerberos, and leap.

Kerberos Parameters

NOTE: Kerberos parameters are available only with a Symbol radio card.

Kerberos Enable

- **Enable.** Enable Kerberos authentication in the wireless network interface.
- **Disable** (default). Disable Kerberos authentication in the wireless network interface.

Kerb. Pwd (01–15)

First 15 characters of the Kerberos password (maximum number of characters is 40).

Kerb. Pwd (16–30)

Characters 16 to 30 of the Kerberos password (maximum number of characters is 40).

Kerb. Pwd (31–40)

Characters 31 to 40 of the Kerberos password (maximum number of characters is 40).

Reset Kerb. Pwd.

Reset Kerberos password to an empty string.

KDC Port Number

KDC (Key Distribution Center) port number is the 2-byte UDP/TCP port used for Kerberos Communication.

- 88 (default)
- 0–65535

Clock Skew Units

- Seconds (default)
- Minutes

Clock Skew (SEC)

Sets the maximum allowable amount of time in seconds (SEC) or minutes (MIN), as specified by the Clock Skew Units, that Kerberos authentication will tolerate before assuming that a Kerberos message is invalid.

- **Seconds:** The range is 60-900, and the default is 300.
- **Minutes:** The range is 1-15, and the default is 5.

NOTE: Whatever submenu is selected in Clock Skew Units will display on the Clock Skew (SEC) menu. For example, if you select Minutes, the Clock Skew (SEC) menu name will change to Clock Skew (MIN).

Tckt Life Units

Ticket lifetime unit in either seconds, minutes, hours, or days.

- Seconds (default)
- Minutes
- Hours
- Days

Tckt Life (SEC)

Sets the maximum allowable amount of time in seconds (SEC), minutes (MIN), hours (HR), or days (DAY), as specified by the Tckt Life Units, that a ticket obtained from the Kerberos server is valid before getting a new one.

- **Seconds:** The range is 300-259200, and the default is 43200.
- **Minutes:** The range is 5-4320, and the default is 720.
- **Hours:** The range is 1-72, and the default is 12.
- **Days:** The range is 1-3, and the default is 1.

NOTE: Whatever submenu is selected in Tckt Life Units will display on the Tckt Life (SEC) menu. For example, if you select Hours, the Tckt Life (SEC) menu name will change to Tckt Life (HR).

Renew Life Units

Renew lifetime unit in either seconds, minutes, hours, or days.

- Seconds (default)
- Minutes
- Hours
- Days

Renew Life (SEC)

Sets the maximum allowable amount of time in seconds (SEC), minutes (MIN), hours (HR) or days (DAY), as specified by the Renew Life Units, before warning for a new Kerberos password.

- **Seconds:** The range is 0-604800, and the default is 0.
- **Minutes:** The range is 0-10080, and the default is 0.
- **Hours:** The range is 0-168, and the default is 0.
- **Days:** The range is 0-7, and the default is 0.

The selected submenu is in Renew Life Units will display on the Renew Life (SEC) menu. For example, if you select Days, the Renew Life (SEC) menu name will change to Renew Life (DAY).

Equivalent Wireless Ethernet Interface Configuration Using The Telnet Command

```
store ifc 2 wlan ssid <network-name>
store ifc 2 wlan mode adhoc|pseudol|managed
store ifc 2 wlan speed auto|(1 2 5 11)
store ifc 2 wlan channel default|(1-15)
store ifc 2 wlan antenna diverse|primary|aux
store ifc 2 wlan preamble default|long|short
store ifc 2 wlan pmm on|off
store ifc 2 wlan txpwr (0-100)
store ifc 2 wlan opts [[-]openauth][[-]jintnl]
store ifc 2 wlan defkey disable|(1-4)
store ifc 2 wlan key <key-num> <key-sequence>
store ifc 2 wlan auth <auth-method> (e.g. openauth, shared, leap,
kerb)
store ifc 2 wlan user <auth-user-name>
store ifc 2 wlan pass <auth-password>
```

Refer to page 328 for the complete command set.

Wireless Cisco LEAP

LEAP is a Cisco wireless security scheme. The Cisco LEAP allows for a WEP key timeout that forces re-authentication, resulting in the derivation of a new WEP key for the session. To enable LEAP in the NIC, enter the username and password corresponding to the RADIUS server with the following commands:

```
store ifc 2 wlan auth leap
store ifc 2 wlan user <username>
store ifc 2 wlan pass <password>
```

NOTE: Disable the defkey to use LEAP.

WIRELESS ADAPTER, WIRELESS

Kerberos Enabled Wireless NIC Configuration

This section provides an example of how a user configures the Print Server to use the Kerberos authentication via the wired Telnet session.

This example assumes Symbol's Access Point and RF card is used and the Print Server has not been configured for Kerberos authentication. It also assumes that the KDC, Access Point and the Print Server are in the same realm.

To set up the Print Server for Kerberos authentication, the administrator first has to enable Kerberos in the Access Point according to Symbol's instructions. Symbol's Access Point must have its Network time set up with the correct time server. Once the Access Point is configured, the Print Server is ready to be configured for Kerberos authentication.

Configuring the Print Server for Kerberos Authentication

1. Create a user in the Windows 2000 server that identifies the Print Server.

NOTE: The user name should be the Print Server's name. The password selected will be used as the Kerberos password and should be set with no expiration.

2. In a secure networked environment, log in as a root user via Telnet in the wired LAN.
3. Once logged in, use the Telnet commands to set up the wireless LAN parameters (e.g. SSID = 103, operating mode = Infra Structure mode, etc.) that match the Access Point configuration.

In addition to the normal wireless LAN parameter settings, use the following commands to enable Kerberos on the wireless LAN interface and Kerberos for authentication (minimum settings):

4. Set the wireless LAN interface parameters to enable Kerberos.
`store kerberos opts auth`

5. Set the Kerberos parameters to enable Kerberos authentication.

The Kerberos password must match the Windows 2000 user password for the Print Server. The administrator should choose at least 9 alphanumeric characters with a combination of upper and lower case.

The following is a suggestion for creating strong password for computer security. Make sure the password:

- is at least seven characters long. The most secure passwords are seven to 14 characters long.
- contains characters from each of the following groups: letters (uppercase and lowercase), numerals, and symbols (all characters not defined as letters or numerals, i.e., ! @ # \$ % ^ & *, etc.)

The kname is default to “krbtgt” which is the default name used in Windows 2000 KDC. It must be configured to match with the KDC if the default is changed. The krealm is case sensitive; it must match the Access Point’s realm.

The SSID of the Print Server must be configured to match the Access Point’s SSID which also has Kerberos enabled. For example, if a Windows 2000 user created the password aBcd-12345 and the Access Point’s realm is set to REALM.PRINTRONIX.COM, the following telnet commands are used:

```
store kerberos password aBcd-12345
store kerberos config krealm REALM.IBM.COM
```

NOTE: If the Kerberos authentication fails, the user will not be able to Telnet to the Print Server via the wireless LAN interface. In this case, Telnet to the Print Server via the wired LAN interface. It should display an error message indicating the reason for the Kerberos authentication failure.

HTML Forms

The Ethernet Interface settings can be configured over TCP/IP through a standard Web browser. The Ethernet Interface Web pages provide a handy way to access some of the commands built into the print server.

NOTE: If a router is used, make sure a Gateway value is configured.

To access the Ethernet Interface home page:

1. Make sure the print server has an IP address and Subnet Mask so it is recognizable on your TCP/IP network.
2. Make sure your network station can successfully ping the Ethernet Interface over the network.
3. Direct your Web browser to the URL:
http://IPaddress
(e.g., `http://192.75.11.9`)
where **IPaddress** is the IP address of your Ethernet Interface.

The Ethernet Interface HTML structure is divided into several menus as shown in Figure 4.

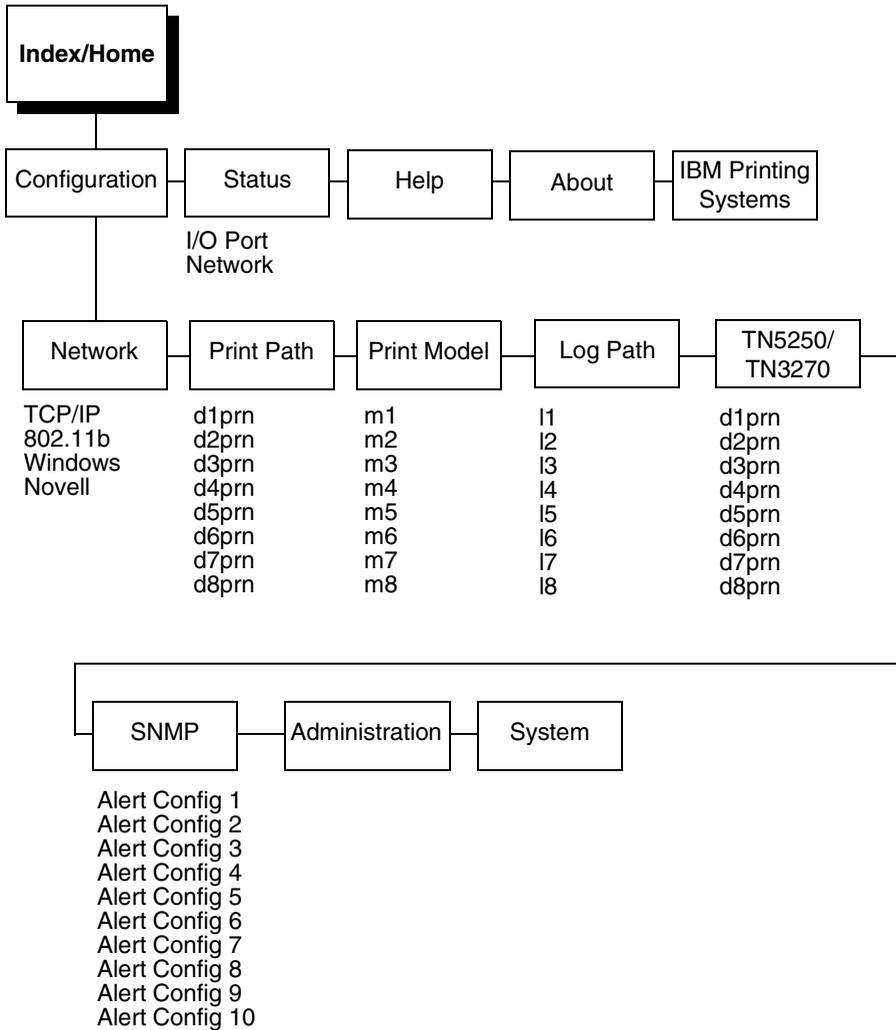


Figure 4. Ethernet Interface HTML Structure

NOTE: Online help is available for all HTML pages.

Printer Status Screen

Using the printer IP Address and any standard Web browser, you can check the status of the printer. Figure 5 shows the exact state of the printer by showing the printer LCD message. (This screen automatically refreshes every minute.)

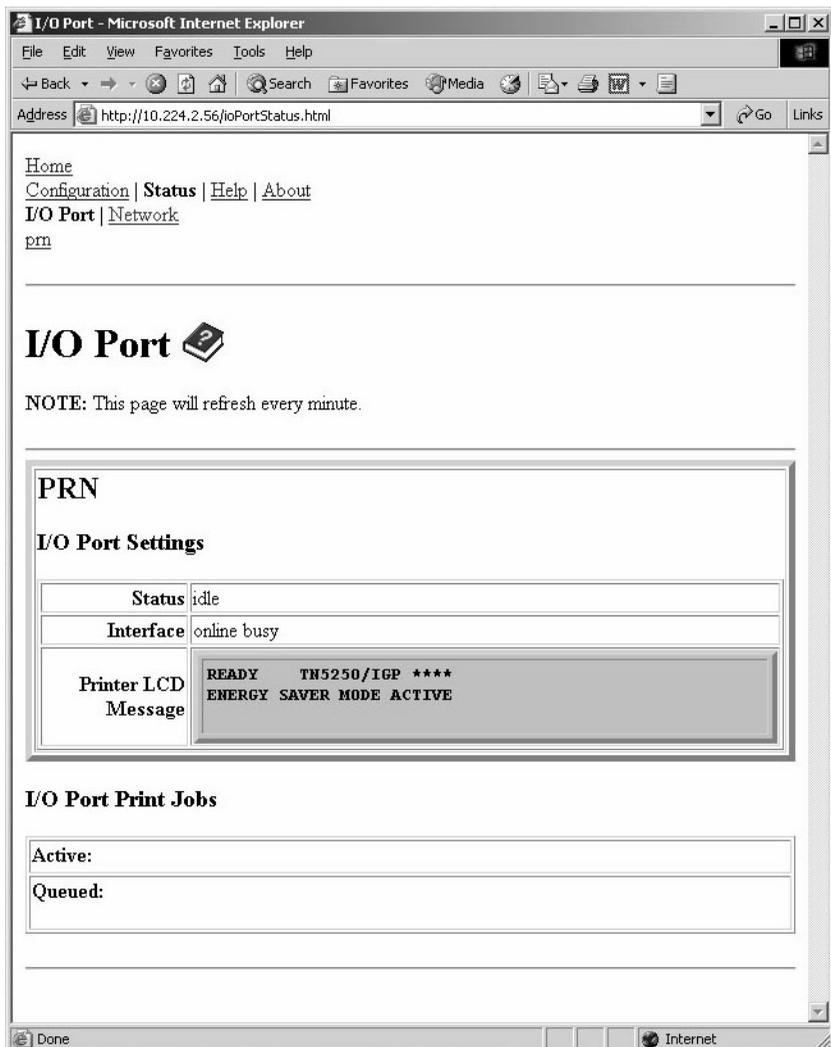


Figure 5. Printer Status Screen

Configuration Alternatives

Besides the HTML forms and software provided, the Ethernet Interface internal command shell, nps, can also be reached using Telnet and Remote Shell, and FTP.

Telnet

A TCP/IP command that helps configure Ethernet Interface settings remotely. A TCP/IP host starts a Telnet session with the print server and logs into the device command shell to alter and view settings.

Example:

```
telnet 192.75.11.9
```

Remote Shell

A TCP/IP command that helps configure print server settings remotely. A TCP/IP host uses this command to remotely execute a single command on the Ethernet Interface.

Example:

```
rsh spike list prn
```

This command remotely executes the nps command `list prn` on the Ethernet Interface named `spike`.

FTP

FTP can also be used to configure print server settings remotely. A TCP/IP host uses FTP to store a file containing 1 or more NPSH commands on the FTP file system. The configuration file must be FTP 'put' to the `/config/default/defaultCfg` file. The configuration file can later be executed on demand using the 'load oem' command during a telnet (NPSH) session. The configuration file is also executed automatically during the power-up sequence when DIP switch 1 is closed.

3

Embedded Ethernet Interface Web Page

Overview

The Ethernet Interface comes with an extremely powerful printer management tool that allows you to monitor, configure, and manage both the printer and its print job. The Ethernet Interface comes with an embedded web server that allows System Administrators and users access to its printer management capabilities from a standard web browser.

The Ethernet Interface printer's IP address is used as a URL, similar to the URL of an Internet web page. When a web browser is activated and the printer's IP address is entered, the printer's embedded web server will display its home page, with links to the printer's status and configuration settings.

All of the Ethernet Interface's configuration settings are protected by a password so unauthorized users cannot make changes. When you try to open any of the Ethernet Interface's configuration pages, you are asked for your user name and password. At the prompt, you need to enter `root` (unless you have another user configured with root privileges) followed by the associated password. If there is no password, just press **ENTER**. For more information on setting passwords, refer to "Ethernet Interface Security" on page 365.

After you configure the Ethernet Interface settings, and click the SUBMIT button on the related form, reset the Ethernet Interface to ensure the latest settings are in use. To reset the Ethernet Interface, go to the System form under the Configuration Menu and click the REBOOT button.

The embedded Ethernet Interface Web server gives you the ability to configure the network adapter, monitor printer status, and to manage print jobs. The Ethernet Interface Web page structure is divided into several menus, as shown in Figure 4.

Configuration

The Configuration menu items allow you to configure the settings for the following items:

- Network - this menu item allows you to change the network setting for each protocol: TCP/IP, 802.11b, NetBIOS over TCP/IP, and Netware.
- Print Path - this menu item allows you to change the name of the destination queues, and define how the print job will be preprocessed before printing. It allows you to select what information to log.
- Print Model - this menu item displays model settings one at a time.
- Log Path - this menu item displays log path settings one at a time.
- TN5250/3270 - this menu item allows you to configure the TN5250/3270 settings.

- **SNMP** - this menu item allows you to configure the SNMP trap manager settings. It also allows you to define the printer event types to monitor, and the e-mail address that should receive alert notifications.
- **Administration** - this menu item allows you to define or change the printer name, location, description, etc. It also allows you to change the root and guest user passwords and SMTP server.
- **System** - this menu item allows you to reboot the Ethernet Interface, or restore its settings to the factory default.

Network Configuration

The network configuration allows you to specify the setting for each network protocol. Beside each protocol name is a checkbox which allows you to enable or disable each protocol depending on your network printing needs.

NOTE: TCP/IP is the only supported protocol which is always enabled.

TCP/IP Network

TCP/IP								
Interface 1 10/100Mbps Ethernet	IP Address	Subnet Mask	RARP	BOOTP	DHCP	DNS	PERSIST	
	Stored	<input type="text" value="10.224.2.95"/>	<input type="text" value="255.255.0.0"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Active	10.224.2.95	255.255.0.0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Interface 2 Wireless PCMCIA	IP Address	Subnet Mask	RARP	BOOTP	DHCP	DNS	PERSIST	
	Stored	<input type="text" value="10.224.2.96"/>	<input type="text" value="255.255.0.0"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Active	10.224.2.96	255.255.0.0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Routing	Destination	Mask	Gateway			Interface		
	<input type="text"/>	<input type="text"/>	<input type="text"/>			C 1 C 2		
	<input type="text"/>	<input type="text"/>	<input type="text"/>			C 1 C 2		
	<input type="text"/>	<input type="text"/>	<input type="text"/>			C 1 C 2		
	<input type="text"/>	<input type="text"/>	<input type="text"/>			C 1 C 2		
	<input type="text"/>	<input type="text"/>	<input type="text"/>			C 1 C 2		
	default1		Stored	<input type="text" value="10.224.1.254"/>			C 1 C 2	
		Active	10.224.1.254					
default2		Stored	<input type="text" value="10.224.1.254"/>			C 1 C 2		
		Active	10.224.1.254					

Figure 6. TCP/IP Network Configuration

Interface

The two edit fields contain the Ethernet Interface's IP address and subnet mask. The check boxes enable the RARP, BOOTP, DHCP, DNS, and Persist DHCP protocols, which are alternate methods of assigning IP addresses. On most networks, you want to enter a permanent IP address and subnet mask and disable RARP, BOOTP, DHCP, DNS, and Persist DHCP. However, if your network requires one of these, you should clear the IP address (and possibly the subnet mask) fields and ensure that the appropriate check box is selected.

Routing

The routing table tells the Ethernet Interface which router or gateway to use to access other subnets or hosts. In most situations, you can simply add your router's IP address as the default router. All packets destined for other subnets will be forwarded to the default router for delivery to the destination host. If you have more complex routing requirements, add static routing entries for specific hosts or networks in the remaining Routing rows. Packets with IP addresses that match a given Destination and Mask (from the first two fields in a Routing row) will be routed to the router/gateway named in the third field. Packets which do not match any of the listed Destinations and Masks will be routed to the default router if one is set.

802.11b

802.11b

Network Name	<input type="text"/>
Mode	managed <input type="button" value="v"/>
Speed	auto <input type="button" value="v"/> <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 5.5 <input type="checkbox"/> 11 Mbps (auto is default if no options selected.)
Channel	<input checked="" type="radio"/> Default <input type="radio"/> 0 <input type="text" value="0"/> (0-15)
Antenna	diverse <input type="button" value="v"/>
Preamble	default <input type="button" value="v"/>
Power Management Mode	Off <input type="button" value="v"/>
Transmit Power	100 <input type="text" value="100"/> (0-100)
Options	<input type="checkbox"/> International Mode
Key	# <input type="button" value="v"/> <input checked="" type="radio"/> Hex <input type="text"/> <input type="radio"/> String <input type="text"/> <input type="button" value="v"/> Length (optional)
Default key	disable <input type="button" value="v"/>
Authentication Method	open <input type="button" value="v"/>
User	<input type="text"/>
Password	<input type="text"/>

Network Name

Enter the wireless network name. Maximum length of 32 characters.

NOTE: When you use telnet, Network Name is called SSID.

Mode

Set the mode of operation for the wireless device. Pseudo, Adhoc, and Managed are the available settings.

NOTE: When you use telnet, the “managed” setting is called “infrastructure.”

Speed

Change the selected bit-rates. Choosing "auto" will select auto settings even if some or all of the checkboxes are selected. To manually choose bit-rates, change speed option to "user" and check the appropriate checkboxes. If "user" is selected, and no checkboxes are checked, then the automatic setting is used.

Channel

Set the RF Channel for the wireless device. Selecting "Default" will ignore user entered value in field, and set the RF Channel to the default setting.

Antenna

Choose the antenna type. Diverse, Primary, and Aux are the available settings.

Preamble

Change the preamble length. Default, Short, and Long are the available settings.

Power Management Mode

Change the power management mode and adjust the power-save sleep time (milliseconds). Selecting "Off" will turn the Power Management Mode off and set the power-save sleep time to zero.

Transmit Power

Adjust RF transmit power in percent of full power.

Options

Set the International Mode option

Key

Change the key used for WEP encryption. Ascii-Hex Format.
Ex: 0123456789abcdef0123456789

Default Key

Change the default key number used for WEP encryption.

Authentication Method

Select the desired authentication method to be used when communicating with an access point.

User

Enter a user name to be used when authenticating with an access point. Currently only used for LEAP authentication.

Password

Enter the password to be used when authenticating with an access point. Currently only used for LEAP authentication.

Windows Network (NetBIOS TCP/IP)

TCP/IP is used for Windows (i.e. Netbios, Windows 95/98/Me, and Windows for Workgroups) printing unless another protocol like IPX is available. Therefore, mandatory TCP/IP settings (i.e. IP address and subnet mask) are necessary on the Ethernet Interface. Go to “TCP/IP Network” on this form to fill in these settings if you haven't done so already.

Windows (NetBIOS TCP/IP)	
NOTE: This setting relies on NetBIOS over a TCP/IP Network	
Protocol	<input checked="" type="checkbox"/> Enable
Workgroup Name	<input type="text" value="WORKGROUP"/>

Figure 7. Windows Network (NetBIOS TCP/IP) Configuration

Workgroup Name

This name specifies which Windows workgroup the Ethernet Interface will reside in.

Novell Network

ADAPTER, WIRELESS ADAPTER

Novell configuration is supported only on the Ethernet Adapter and Wireless Adapter.

Novell				
Protocol	<input checked="" type="checkbox"/> Enable			
Frame Type	<input checked="" type="radio"/> Autosense <input type="radio"/> Ethernet II <input type="radio"/> 802.3 <input type="radio"/> 802.2 <input type="radio"/> 802.2/SNAP			
Service Type	<input checked="" type="radio"/> auto <input type="radio"/> bindery <input type="radio"/> nds			
File Server	<input type="text"/>			
NDS	Context	<input type="text"/>		
	Preferred Tree	<input type="text"/>		
Pserver	Password	<input type="text"/>		
Rprinter	Enabled	Print Server Name	Printer Number	Destination
	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	d1pm ▾
	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	d1pm ▾
	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	d1pm ▾
<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	d1pm ▾	

Figure 8. Novell Network Configuration

FrameType

This option determines which framing scheme will be used in processing Novell signals. The different types of Ethernet packet formats include:

- Auto Sensing (the default)
- Ethernet II
- Ethernet 802.3
- Ethernet 802.2
- 802.2 Snap

Service Type

Allows you to change the Nest Server. The options are:

- Bindery
- NDS
- Auto

File Server

Define a Novell file server for the Ethernet Interface to service as either a PSERVER or an RPRINTER.

NDS

NDS (Novell Directory Services) is a distributed database of network information. An NDS contains information that defines every object on the network. For more information please see your Novell administrator.

Pserver

Define a password for the Ethernet Interface to use when logging in to the file server as a PSERVER. This is an optional file server security feature.

Rprinter

Define an RPRINTER setup so the Ethernet Interface knows to service a PSERVER.NLM on a Novell file server. Define the PSERVER.NLM name, the number of the printer serviced by the Ethernet Interface within this PSERVER.NLM, and the destination on the Ethernet Interface you want the print jobs to pass through.

Print Path Configuration

The Ethernet Interface print path is the path a print job takes when it reaches the network adapter. First the job goes to a destination/queue (e.g. d1prn) where it then passes through an associated model (e.g. m1) for extra processing and logpath (e.g., l1) for job and printer logging. Finally the job reaches the Ethernet Interface's I/O port (e.g. PRN) where it passes through to the attached printer. The "Print Path" form displays one destination's settings at a time. From here, you can then select another destination or you can go directly to an I/O port to configure port settings.

Destination Settings

Print Path

Destination Settings: d1prn								
Name	<input type="text" value="d1prn"/>							
BackChannel	<input type="radio"/> prn <input checked="" type="radio"/> none							
Services	<input checked="" type="checkbox"/> socket	<input checked="" type="checkbox"/> lpd	<input checked="" type="checkbox"/> lpsched	<input checked="" type="checkbox"/> rprinter				
	<input checked="" type="checkbox"/> pserver	<input checked="" type="checkbox"/> netbios	<input checked="" type="checkbox"/> ftpd	<input checked="" type="checkbox"/> tm5250/3270				
Selected Model:	<input checked="" type="radio"/> m1	<input type="radio"/> m2	<input type="radio"/> m3	<input type="radio"/> m4	<input type="radio"/> m5	<input type="radio"/> m6	<input type="radio"/> m7	<input type="radio"/> m8

Figure 9. Print Path Configuration, Destination Settings

Name

Name of the destination. The default destination queue names are d1prn, d2prn, d3prn, and d4prn, d5prn, d6prn, d7prn, and d8prn.

Back Channel

I/O port to receive printer feedback when a print job passes through this destination. By default all print queues have no backchannel.

Services

Define what type(s) of print services the destination will support. By default all services are enabled.

	Parameters	
	socket	Printing to a TCP port number (e.g. 9100) on the Ethernet Interface
	lpd	Remote printing using the Line Printer Daemon
	lpsched	System V printing using the "lp" command
ADAPTER, WIRELESS ADAPTER	rprinter	Novell's remote printer setup
ADAPTER, WIRELESS ADAPTER	pserver	Novell's PSERVER setup
	netbios	Printing from Windows stations relying on NetBIOS over TCP/IP
	ftpd	Printing using the File Transfer Protocol (FTP)
	tn5250/3270	Printing using tn5250/3270 configuration

Selected Model

Defines the model configuration that is to be associated with the current destination. The default model names are m1, m2, m3, m4, m5, m6, m7, and m8.

Current Model Settings

Current Model Settings:	
Model Type	raw
Banner Page	Type: none Position: before
Filter	None selected
Header String	None selected
Trailer String	None selected
Printer Configuration	None

Selected Log Path: 11 12 13 14 15 16 17 18

Figure 10. Print Path Configuration, Current Model Settings

Model Type

The option is available on the Print Model web page. For a description, see page 88.

Banner Page

The option is available on the Print Model web page. For a description, see page 89.

Filter

The option is available on the Print Model web page. For a description, see page 89.

Header String

The option is available on the Print Model web page. For a description, see page 89.

Trailer String

The option is available on the on the Print Model web page. For a description, see page 90.

Printer Configuration

The option is available on the Print Model web page. For a description, see page 90.

Selected Log Path

This option defines the log path configuration that is to be associated with the current destination.

Current Log Path Settings

Current Log Path Settings:	
Log Path Type	None selected
Log Path Port	None selected

Figure 11. Print Path Configuration, Current Log Path Settings

Log Path Type

The option is available on the Log Path web page. For a description, see page 91.

Log Path Port

The option is available on the Log Path web page. For a description, see page 92.

Print Model Configuration

Print Model

Model Settings: m1	
Name	<input type="text" value="m1"/>
Model Type	<input checked="" type="checkbox"/> raw
Banner Page	Type: <input checked="" type="radio"/> none <input type="radio"/> text Position: <input checked="" type="radio"/> before <input type="radio"/> after
Filter	<input type="checkbox"/> insert carriage return after line feed
Header String	<input type="text" value="(None)"/>
	<input type="text" value="(None)"/>
	<input type="text" value="(None)"/>
	<input type="text" value="(None)"/>
Trailer String	<input type="text" value="(None)"/>
	<input type="text" value="(None)"/>
	<input type="text" value="(None)"/>
Printer Configuration	<input type="text" value="(None)"/>

Figure 12. Print Model Configuration

Name

Name of the model. The default model names are m1, m2, m3, m4, m5, m6, m7, and m8.

Model Type

Define what processing (if any) will be performed on print jobs passing through the associated destination. If set to “raw”, the job will not be modified by the network adapter.

Banner Page

Tells the Ethernet Interface to produce a banner page with each print job. The type of banner page data can be text. You can also specify whether the banner page should come at the front or the end of a print job.

Filter

Specify whether the Ethernet Interface is to add carriage returns to print jobs passing through that contain solitary linefeeds. This is common with Unix text jobs resulting in stair-stepped output.

Header String

Define an escape sequence to be sent to the printer before each print job. For example, you may want to send a sequence to print the job in landscape mode or to a certain tray on the printer. You can specify up to four separate sequences per header string. The Ethernet Interface will execute them in order from top to bottom. If specifying fewer than four sequences, be sure to start at the top leaving undefined fields at the bottom.

The most common sequences are listed on the form:

- Print landscape - tells the printer to print in landscape mode.
- Print portrait - tells the printer to print in portrait mode.

Trailer String

Define an escape sequence to be sent to the printer after each print job. For example, you may want to send a sequence to add a formfeed so you don't have to manually press the formfeed button on the printer. You may also want to tell the printer to reset itself in case you have set a header string which tells the printer to do something special with the job. You can specify up to three separate sequences per trailer string. The Ethernet Interface executes them in order from top to bottom. If specifying fewer than three sequences, be sure to start at the top leaving undefined fields at the bottom.

The most common sequences are listed on the form:

- PCL Reset - tells the printer to reset itself once the data completes
- End of Transmission (EOT) - tells the printer to force the end of the job
- Formfeed - tells the printer to do a formfeed at the end of the data.

Printer Configuration

Specify a printer configuration number to be loaded before processing the print job. This ability to associate a printer configuration to a logical printer model allows you to define up to eight unique and independent printer personalities in a single printer. Using this feature, you effectively have eight different printers in one.

To associate a printer configuration to the currently selected destination queue, just select the desired printer configuration number from the drop down list. Once a printer configuration has been associated with a destination queue, any print job sent to that destination queue name will cause the printer to load the associated printer configuration before processing the print job.

Logpath Port

Define where logging information for print jobs passing through the associated destination will be reported. The choices are:

- prn - reported to the PRN port
- none - don't report any logging information
- TCP/IP port - to a TCP port number (specified in the edit field)
- syslog - to a host (specified by the IP address in the edit field) running a SYSLOG daemon
- email - to an e-mail address (specified by the e-mail address and the SMTP server IP address edit fields). You can set the option on the Administration web page.

NOTE: The values defined in Logpath Type and Logpath Port are common among all destination queue.

Default: no logging turned on.

TN5250/3270 Configuration

The TN5250/3270 configuration form allows you to specify settings for up to eight different TN5250/3270 sessions.

NOTE: The standard Ethernet module does not support TN5250/3270 protocol. However, the TN5250/3270 software is available as an option you can order or as factory installed.

TN5250/3270 Configuration

Configuration for Print Path d1prn

NOTE: Changes will only take effect after you reset the IBM 6500 from the [System](#) page.

Mode: TN5250 [Click here for TN3270 mode](#)

Host
(eg. 204.191.175.114 or host.domain.com)

Port

Device Description

Message Queue Name

Message Queue Library

Device Type IBM

WSCST Name

WSCST Library

Auto Connect

Start Auto Connect [Click here](#)

Figure 14. TN5250/3270 Configuration, TN5250 Mode

TN5250/3270 Configuration

Configuration for Print Path d1prn

NOTE: Changes will only take effect after you reset the IBM 6500 from the [System](#) page.

Mode: TN3270 [Click here for TN5250 mode](#)

Host ok
(eg. 204.191.175.114 or host.domain.com)

Port 23

Resource Name

Auto Connect

Start Auto Connect [Click here](#)

Figure 15. TN5250/3270 Configuration, TN3270 Mode

Mode

Specifies the TN protocol mode for the current configuration.

Default: TN5250

Host IP

Specifies the IP address or domain name of the host (iSeries for TN5250) for the current configuration.

Default: Unconfigured (empty) host.

Port

Specifies the UDP port number of the TN5250 or TN3270 server for the current configuration.

Default: 23

Resource Name

(TN3270 mode) Specifies the name of the iSeries LU session for the current configuration. The resource name entered will be the name of the printer device created on the iSeries host for the current session. The name is limited to 10 characters in length, must start with an alpha character (a-z, A-Z), and contain only alphanumeric characters and underscores.

Default: Unconfigured (empty) resource name

Device Description

(TN5250 mode) Specifies the name of the printer device for the current configuration. The description entered will be the name of the printer device created on the iSeries host for the current session. The name is limited to 10 characters in length, must start with an alpha character (a-z, A-Z), and contain only alphanumeric characters and underscores.

Default: Unconfigured (empty) description

Message Queue Name

(TN5250 mode) Specifies the queue name to which system messages will be logged.

Default: QSYSOPR

Message Queue Library

(TN5250 mode) Specifies the queue library to which system messages will be logged.

Default: *LIBL

Device Type

By default, the device type is always set to IBM.

WSCST Name

(TN5250 mode) As declared on the iSeries host for the created printer device.

Default: Unconfigured (empty) name

WSCST Library

(TN5250 mode) As declared on the iSeries host for the created printer device.

Auto Connect

Specifies whether the Ethernet will automatically connect to the iSeries host.

Default: Disabled

Start/Stop Auto Connect

Specifies whether the Ethernet should retry automatic connection to the iSeries host.

Default: 'Start' if Auto Connect is currently stopped, 'Stop' if Auto Connect is currently started.

SNMP Configuration

The SNMP Configuration form allows you to configure SNMP trap managers and the e-mail alert features of the Ethernet Interface. It allows you to configure how SNMP alerts are processed by a SNMP trap manager, an Unix syslog logging daemon, and/or have e-mail notifications sent. Up to 10 SNMP trap managers and e-mail recipients may be specified. Individual alerts fall into one of 12 alert group categories, providing the ability to filter alert notices as desired.

SNMP Manager Alert Posting Settings

Alert Posting Configuration 1:

SNMP Manager Alert Posting

Enabled

SNMP Manager IP Address

UDP Port

Community Name

Figure 16. SNMP Manager Alert Posting Configuration

Specifies whether alerts from the enabled alert group categories for this configuration will be sent to the SNMP manager. If this option is enabled, the following information must be entered:

- SNMP Manager IP Address - specifies the IP address of the SNMP trap manager
- UDP Port - specifies the UDP port number used by the SNMP trap manager for receiving trap messages. Acceptable values are 162, and 49152 through 65535
- Community Name - up to 15 character string specifying the trap community name.

Syslog Alert Posting Settings

Syslog Alert Posting

Enabled

Figure 17. SNMP Syslog Alert Posting Configuration

Specifies whether alerts from the enabled alert group categories for this configuration will be sent to the Unix syslog daemon. If this option is enabled, the syslog daemon IP address must be entered in the syslog field in the System Information section of the Administration Configuration form.

Email Alert Posting Settings

Email Alert Posting

Enabled

Email Address
(e.g. username@domain.com)

Short Email Format

Short Email Message Length

Send Test Message

Figure 18. SNMP Email Alert Posting Configuration

Specifies whether alerts from the enabled alert group categories for this configuration will be sent to the specified e-mail address. If this option is enabled, the following information must be entered:

Email Address

Specifies an e-mail address to which alert information will be sent.

Short E-mail Format

Specifies whether a short (15-80 character) alert e-mail message should be sent.

If enabled, the message will contain the alert description, the severity level, the device description, and device name (unless the length of the message exceeds the Short E-mail Message Length, in which case the message will be truncated).

If disabled, the message will contain additional information including the device description, device name and location, alert description, alert group, alert severity level, and printer status.

Default: Disabled

Short E-mail Message Length

Specifies the maximum size of the short e-mail message. Acceptable values are 15 to 80 characters.

Default: 80 characters

Send Test Message

provides a way to test the validity of the e-mail address/SMTP server address. If checked, a test message will be sent to the specified e-mail address when the submit button is pressed.

Default: All alert groups are disabled by default.

If the alert message is to be sent to a cellular phone or pager, the Short Email Format option should be enabled. Once this option is enabled, you may specify the maximum e-mail message length (15-80 characters). When enabled, the message will contain the alert description, the severity level, device description, and device name (unless the length of the message exceeds the Short Email Message Length, in which case the message will be truncated).

If the Short Email format is disabled, the message will contain additional information including the device description, device name and location, alert description, alert group, alert severity level, and printer status.

To test the validity of the e-mail address and the SMTP server address, enable the Send Test Message option. If the Send Test Message box is checked, a test message will be sent to the specified email address when the submit button is pressed.

Alert Groups

Alert Groups (check to enable):

- | | | | | | |
|--|--|---|--|--|--|
| <input type="checkbox"/> Warning Alerts | <input type="checkbox"/> Offline Alerts | <input type="checkbox"/> Media Input Alerts | <input type="checkbox"/> Media Output Alerts | <input type="checkbox"/> Media Path Alerts | <input type="checkbox"/> Marker Alerts |
| <input type="checkbox"/> Cutter Alerts | <input type="checkbox"/> Bar Code Alerts | <input type="checkbox"/> Scanner Alerts | <input type="checkbox"/> Intervention Alerts | <input type="checkbox"/> Consumable Alerts | <input type="checkbox"/> Label Alerts |
| <input type="checkbox"/> Power Cart Alerts | <input type="checkbox"/> RFID Alerts | | | | |

Figure 19. SNMP Alert Groups Configuration

Specifies which alert groups are enabled for reporting for this configuration. When an alert occurs that is contained in one of the enabled alert groups, it will be posted to the specified SNMP manager, Unix syslog daemon, and/or e-mail address. The following table describes which printer events belongs to which Alert Group.

Table 8. Alert Groups and Printer Events

Alert Group	Printer Events
Offline	Printer is Offline Hold Print Time Out
Warning	COMM Check Invalid Address CU Time Out CU Not Enabled File System Full File Exist Hex Dump Mode Half Speed Mode Printer Warm Print Head Warm 2B-Toner Density Too High 2C-Toner Density Too Low
Media Input	Load Paper Paper Out Time Out Fanfold Paper Empty No Fanfold Paper 63-CutSheet Feeder Fail Cutsheet Pick Miss No Paper Tray Paper Jam at Entrance Cutsheet Cover Open Cutsheet Paper Empty Tray Mismatch

Table 8. Alert Groups and Printer Events

Alert Group	Printer Events
Media Output	Stacker Full Stacker Jam Time Out Stacker Full Time Out Stacker Fault Time Out Stacker Jam Stacker Fault Stack Over Flow Stack Under Flow Stacker Fail Stacker Interlock Fail Stacker Not Ready
Media Path	Clear Paper Jam Paper Jam Time Out Paper Jam Fuser Paper Jam Exit Cutsheet Path Open Paper Jam at Drum Paper Jam at Fuser Paper Jam at Exit Tractor MTR FWD Speed Error Tracker MTR BKWD Speed Error Paper Jam at Entrance Cutsheet Motor Fail Cutsheet Feeder Fail Clear Jam at Fuser Input Clear Jam at Fuser Exit Clear Jam Near TOF Lever

Table 8. Alert Groups and Printer Events

Alert Group	Printer Events
Marker	Ribbon Stall Time Out Ribbon Ink Out Ribbon Stall Ribbon Drive Shuttle Over Speed Ribbon Fault Ribbon Detected Print Head Up Ribbon Broken Ribbon Load Bad Ribbon Take-up Full 2A-Toner Empty Add Toner Install Toner Cup
Cutter	Cutter Fault Cutter Fail
Bar Code	Barcode Fail Specification Barcode Quiet Zone Too Small Barcode Improper Data Format
Scanner	Unscannable Check Media Poor Scanning Check Head and Heat Poor Scanning Inspect Head Poor Scanning Check Media Contrast Too Low Check Media
Intervention	These are error messages that need some kind of user intervention to solve them.
Consumable	Ribbon Low Toner Low
Label	Label Present Gap Not Detected

Table 8. Alert Groups and Printer Events

Alert Group	Printer Events
Power Cart	Recharge Battery Batt High Volt Batt Low Volt
RFID	RFID Tag Failed RFID Max Retry RFID Comm Error RFID Read-Only Tag

NOTE: Not all of the alerts are available on all of the printers. The alerts available for monitoring will depend on the printer type and the options installed on the printer.

Administration Configuration

The Administration Configuration form is broken down into general print server-related settings and password security.

System Information

Administration

System Information	
NOTE: Changes in server name setting only take effect after you reset the IBM 6500 from the System page.	
Name	<input type="text" value="P_010012"/>
Description	<input type="text"/>
Location	<input type="text"/>
Contact	<input type="text"/>
Printer Serial Number	<input type="text" value="000896010012"/>
Syslog	<input type="text"/> (eg. 204.191.175.114)
Email	<input type="text"/> (eg. username@domain.com)
SMTP server	<input type="text"/> (e.g. 204.191.175.114 or smtp.domain.com)
DNS server	<input type="text"/> (eg. 204.191.175.114)

Figure 20. Administration Configuration, System Information

The System Information form allows you to specify the following information about the printer:

Name

Name given to the print server in Novell and Windows environments.

- For the integrated Ethernet, the default is P_xxxxxx
- For the external (E-Net) Adapter, the default is M_xxxxxx

where xxxxxx represents the last six digits of the network adapter's Ethernet address (e.g., P_01001C and M_091C1A, respectively). For the Wireless Adapter, the default name is "M302_xxxxx" where "xxxxx" equals the five digit adapter serial number.

Description

Optional field to help identify the printer's features and capabilities.

Location

Optional field to help identify the printer's physical location.

Contact

Optional field to help identify the individual or group responsible for the printer.

Printer Serial Number

A serial number that the user can enter through the PrintNet Webpage to keep track of the PrintNet/printer.

NOTE: If the user has not entered a serial number through one of the Ethernet Interface cards, the printer may use its internal serial number from EEPROM. If EEPROM is blank, i.e. no serial number on the board, it will use the MAC address of the embedded Ethernet, embedded wireless Ethernet, or external Ethernet, respectively, as the printer's serial number.

Syslog

Specifies the IP address of a host running the SYSLOG daemon. IBM 6500-v debugging or printer logging information can be sent to the IP address.

Default: Unconfigured (empty).

Email

Defines the user email address to receive printer and job logging information from log paths on the IBM 6500-v.

Default: Unconfigured (empty).

SMTP Server

Specifies the IP address of the SMTP server to be used for processing email messages generated by the IBM 6500-v.

Default: Unconfigured (empty).

DNS Server

Specifies the IP address of the domain name server to be used for resolving host names (e.g. host.domain.com) to IP addresses (e.g. 192.168.0.42).

Default: Unconfigured (empty).

NOTE: If the DNS server is initially blank, the Ethernet will automatically use the IP address of the DNS server and enter it in the DNS server field when DHCP is enabled.

Passwords

Passwords			
NOTE: Reauthorization is necessary after changing a password.			
Root Password	Old: <input type="text"/>	New: <input type="text"/>	Confirm: <input type="text"/>
Guest Password	Old: <input type="text"/>	New: <input type="text"/>	Confirm: <input type="text"/>

Figure 21. Administration Configuration, Passwords

Only a user with root privileges can alter the Ethernet Interface's settings. Guest users can only view settings but cannot alter them. Both types of users can be assigned passwords. To change a password, type in the old password in the "Old" field. Then type the new password twice: once in the "New" field, and once in the "Confirm" field.

Default: No passwords for root or guest users.

System Configuration

System

NOTE: The following actions will immediately shut down all services on the IBM 6500 and reset the unit.

Reboot

This will reboot the IBM 6500.

Default

This will reboot the IBM 6500 with factory default settings.

Figure 22. System Configuration

The System Configuration form allows you to change the Ethernet Interface's operation mode. Select "Reboot" to re-power the print server. Select "Default" to reset the print server and have it come up with factory default settings.

Status

The Status menu items allow you to view the current status of both the printer and the network. The submenu items available are as follows:

- I/O Port - this menu item allows you to view the current status of the printer, including the print jobs that are queued or are currently active.
- Network - this menu item allows you to view the current status of the network connection.

Status - I/O Port

The I/O Port Status form allows you to remotely see what is happening on the Ethernet Interface I/O port. The port's status and a list of active and queued jobs will be displayed. You can cancel a job (as long as you have permission to) by clicking on the Cancel icon beside the desired job. If you see "waiting" in the "Status" line, this indicates the network adapter is either waiting for data from the host or for feedback from the printer. If you see "blocked" in this line, this indicates the printer is not allowing the Ethernet Interface to send any more data. The printer could be busy processing data it has already received or it could be in an error state.

The printer status display is automatically refreshed every minute.

NOTE: You cannot cancel a print job with an IPDS Emulation. Do not click the Cancel icon.

The printer's buffer size may not allow you to monitor the real time status of the printer and the print job at the same time. The status feedback to the host usually reads "printer idle" unless the print job is significantly large.

Status - Network

This form allows you to view the current status of the network. The statistical data provided is broken down by network protocol. You can use this form to troubleshoot network-related problems.

IBM Printing Systems

The IBM Printing Systems web site which contains product information, technical support, and more.

4

Windows Configuration

Overview

This chapter details a complete Windows configuration setup including:

- Identifying the Ethernet Interface on the network using TCP/IP as the underlying protocol
- Configuring the Ethernet Interface with its mandatory TCP/IP settings (IP address and subnet mask)
- Configuring a new printer on the Windows station

Windows Environment Description

The Ethernet Interface supports network printing under Windows environments by using TCP/IP. In a Windows NT[®] setup, pure TCP/IP is used as the network protocol whereas with Windows 95/98[®] or Windows Me[®], NetBIOS is used over TCP/IP.

The ideal configuration is a network printer defined on the NT/2000 server to be shared by Windows 95/98/Me clients. However, any Windows station can also go directly to the Ethernet Interface.

Windows Ethernet Interface Configuration

The IP address and subnet mask are mandatory TCP/IP settings and are needed before the print server can be detected on the network. There are also additional optional settings. This section offers alternative methods for configuring your Ethernet Interface in a Windows environment and describes some of the more common optional settings available.

Mandatory

Since TCP/IP is used for Windows printing, the Ethernet Interface must be configured with a minimum of an IP address and subnet mask before it can be seen on the network.

Optional

Additional settings, like routing entries, can be configured. This allows communication across subnets when no other router exists.

You can configure the Ethernet Interface from the printer control panel, Web browser, host commands, or other IBM utility software. To configure these options, see “Configuration Tools” on page 52.

Configuration Using ARP

To configure the Ethernet Interface with its IP settings using a manual `arp` command:

1. Log on to a Windows station with TCP/IP loaded and located on the same subnet as the Ethernet Interface.
2. Find the Ethernet address for the Ethernet Interface on the configuration printout. It must be entered as part of this procedure.

3. Use the `arp` command to add an entry into the Windows station ARP table for the Ethernet Interface. This is the most common syntax for this command:

Syntax:

```
arp -s <ipaddress> <ethernetaddress>
```

Example for Microsoft® TCP stacks:

```
arp -s 192.75.11.9 00-80-72-07-00-60
```

This example specifies a Ethernet Interface using IP address 192.75.11.9 and Ethernet address 00-80-72-07-00-60.

4. Check if the ARP entry was accepted.

```
arp -a
```

You should see an entry in the listed ARP table with the IP address and Ethernet address specified in Step 3.

5. Ping this IP address to see if the Ethernet Interface can be seen on your network.

At this point, you should be able to communicate with the Ethernet Interface from your local Windows station. This means the print server knows about an IP address and subnet mask and has these settings in its current memory. However, if the Ethernet Interface is power cycled, these settings will disappear unless you store them into flash memory. To do this:

- a. Load a Web browser on your Windows station and direct it to the URL:

```
http://EthernetInterfaceIPaddress/  
networkConf.html
```

(e.g., `http://192.75.11.9/networkConf.html`).

NOTE: If prompted for a “User ID” and password first, type `root` for the ID and press ENTER at the password prompt (since there is no password by default).

- b. At the “Network Configuration” HTML form that displays, click in the field below the “IP Address” heading and type in the IP address for the Ethernet Interface.

- c. Under the “Subnet Mask” heading, enter the Ethernet Interface subnet mask.

NOTE: If you would like to communicate with the Ethernet Interface from across routers, you will need to fill in an entry within the “Routing” section. Please see “Communicating Across Routers” on page 114 for more details.

6. Click the SUBMIT button when done and physically repower the printer to make the new settings take effect.

Communicating Across Routers

Since Windows environments rely on TCP/IP to communicate with the Ethernet Interface, crossing routers becomes an issue.

After you have followed one of the Ethernet Interface configuration methods mentioned, most likely you will only be able to communicate with the print server from the same subnet. This means any hosts across a router will not be able to see your Ethernet Interface. In order for hosts across a router to see your Ethernet Interface, store a default router/gateway within the print server so that any packets destined for another subnet get forwarded to this router automatically. The router (or series of routers) can then take over, ensuring the packets get to their final destination on another subnet on your network.

To configure a default router/gateway within the Ethernet Interface:

1. Load a Web browser on your Windows station and direct it to the URL:

```
http://EthernetInterfaceIPAddress/  
networkConf.html  
(e.g., http://192.75.11.9/networkConf.html).
```

NOTE: If prompted for a “User ID” and password first, type in `root` for the ID and press ENTER at the password prompt (since there is no password by default).

2. At the “Network Configuration” HTML form that displays, click in the first field below the “Gateway” heading and type in the IP address of the default router/gateway for the Ethernet Interface subnet.
3. Click the SUBMIT button when done and physically repower the print server to make the new settings take effect.

Changing Workgroup Names

Windows environments define groups of related computers as “workgroups.” By default, “WORKGROUP” is the name that is assigned to the Ethernet Interface workgroup. However, you may want to change this to suit your network better. To do this:

1. Load a Web browser on your Windows station and direct it to the URL:
`http://EthernetInterfaceIPAddress/
networkConf.html`
(e.g., `http://192.75.11.9/networkConf.html`).

NOTE: If prompted for a “User ID” and password first, type in `root` for the ID and press ENTER at the password prompt (since there is no password by default).

2. At the “Network Configuration” HTML form that displays, search for the “Windows (NetBIOS TCP/IP)” section and highlight the “Workgroup Name” field.
3. Type in the new workgroup name for the Ethernet Interface.
4. Click on the SUBMIT button when done and physically repower the print server to make the new settings take effect.

Changing Destination Names

When defining some printers within Windows environments, the Ethernet Interface requires that you specify a predefined destination rather than any name you would like. For example, when creating a new printer under Windows NT, a screen similar to Figure 23 displays.

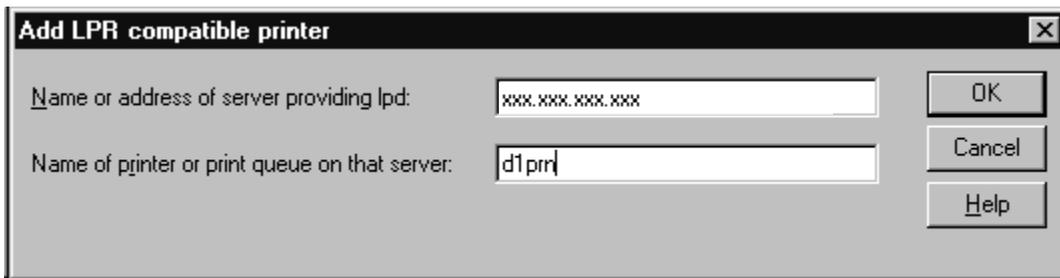


Figure 23. Windows NT Print Setup Dialogue Box

The first field requires the IP address for the Ethernet Interface, and the second field must be filled in with a valid destination from the print server (e.g., d1prn). Otherwise, LPR will not be able to access the printer. Table 9 outlines the default destinations to choose from.

Table 9. Ethernet Interface Default Destinations

Destination	Mapped I/O Port
d1prn	PRN
d2prn	PRN
d3prn	PRN
d4prn	PRN
d5prn	PRN
d6prn	PRN
d7prn	PRN
d8prn	PRN

This name can be changed to something more meaningful using the built-in HTML forms. To do this:

1. Load a Web browser on your Windows station and direct it to the URL:

```
http://EthernetInterfaceIPAddress/  
destConf.html
```

(e.g., `http://192.75.11.9/destConf.html`).

NOTE: If prompted for a “User ID” and password first, type in `root` for the ID and press ENTER at the password prompt (since there is no password by default).

2. At the “Print Path Configuration” HTML form that displays, select a destination link from the top of the page to bring up the appropriate destination form. By default, you should see a line near the top of the form showing the destinations listed in Table 9.
3. Once the desired destination HTML form displays, highlight the “Name” field and type in the new name for this destination.
4. Click on the SUBMIT button when done and physically repower the print server to make the new setting take effect.

Windows Host Configuration

This section covers Windows XP, Windows 2000, Windows NT, Windows Me, and Windows 9x.

Windows XP/2000 Host Setup

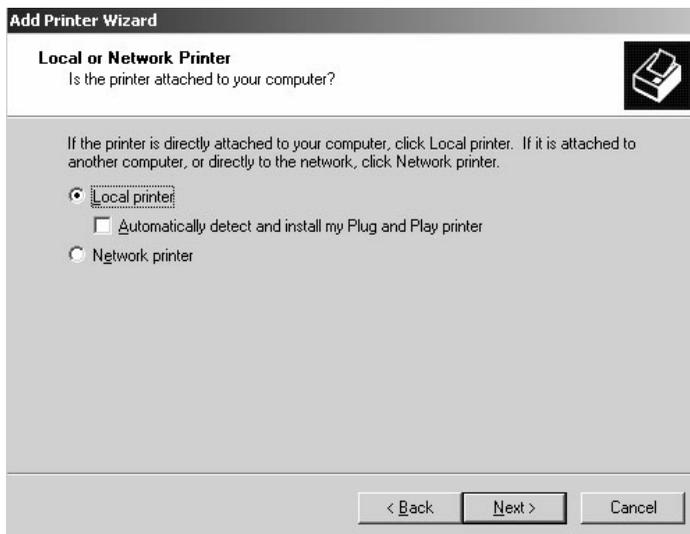
This installation procedure assumes that the Ethernet Interface adapter is configured with the correct IP address, subnet mask, and gateway (if required). In addition, the administrator can “ping” and Telnet to the Ethernet Interface adapter from the server console.

If this is not the case, use the printer front panel to configure the Ethernet Interface adapter before proceeding.

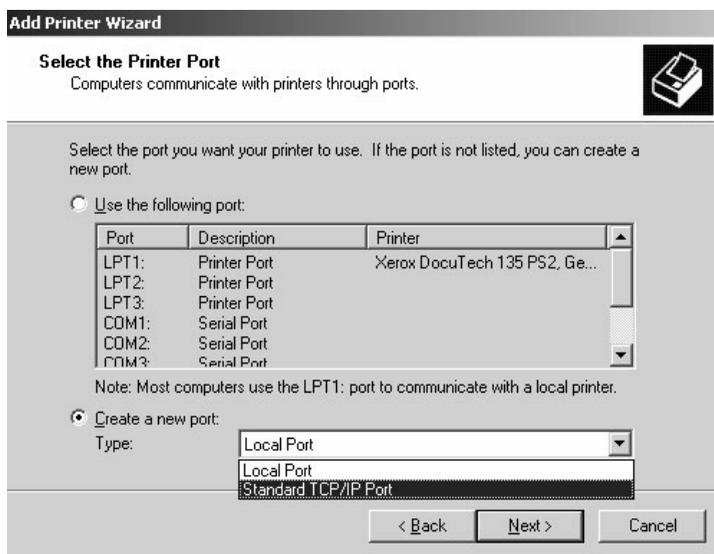
1. For Windows 2000: select **Start ▶ Settings ▶ Printers**.
For Windows XP: select **Start ▶ Printers and Faxes**.
2. For Windows 2000: double click the **Add Printer** icon.
For Windows XP: click **Add A Printer**.
The **Add Printer Wizard** window displays.



3. Click **Next**.



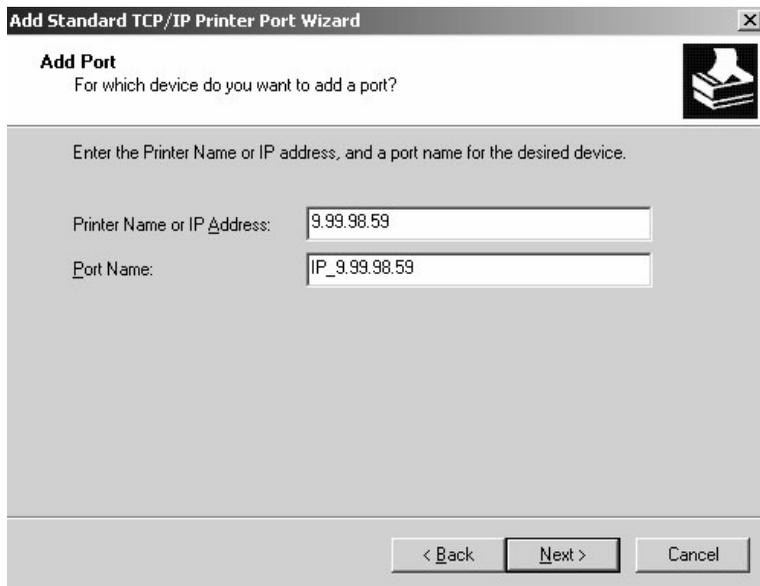
4. If necessary, uncheck the **Automatically detect and install my Plug and Play printer** box. Click **Next**.



5. Click **Create a new port** and select **Standard TCP/IP Port** from the pull down menu. Click **Next**.



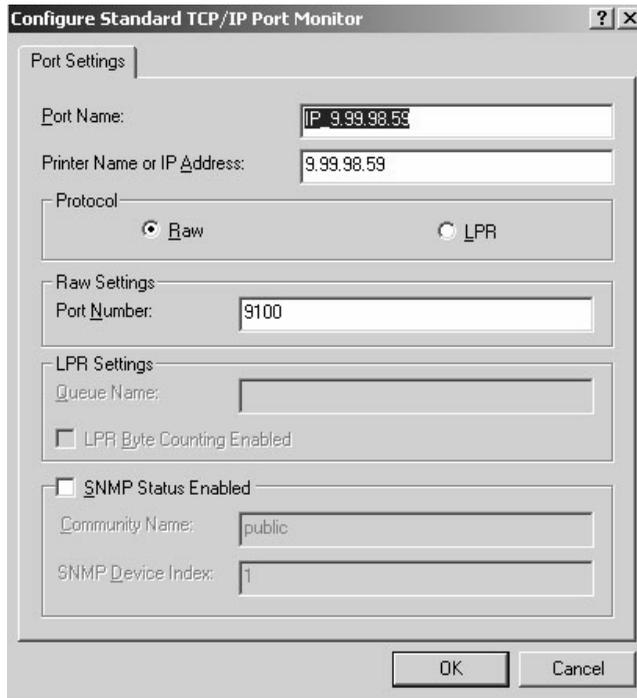
6. Click **Next**.



7. Input the printer name or IP address in the “Printer Name or IP Address” field. Click **Next**.



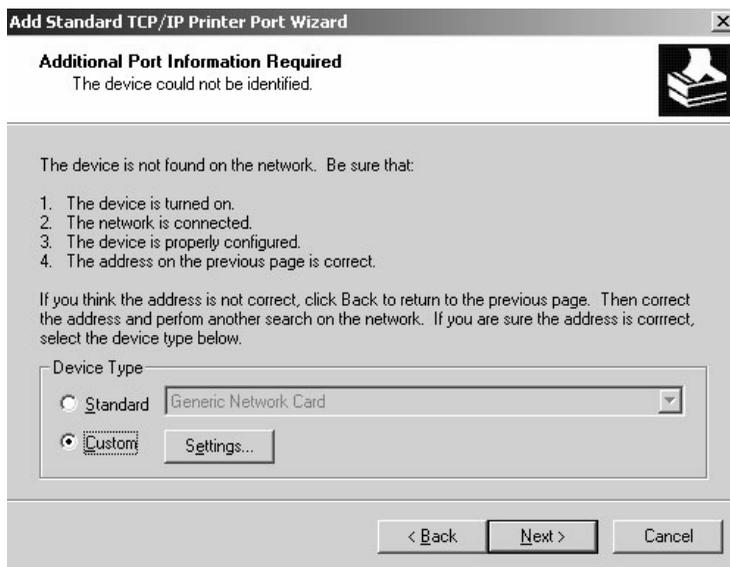
8. Select **Custom** and click **Settings...**



9. Complete the Port Settings tab as desired:

- **Raw.** (The default.) Make sure “Raw” is selected in the “Protocol” field. Leave the setting at 9100 (the default) in the “Raw Settings Port Number” field.
- **LPR.** To select the LPR setting, click **LPR** in the “Protocol” field. In lowercase characters, type the desired queue name of d1prn through d8prn in the “LPR Settings Queue Name” field.
- **SNMP Status Enable.** Check the **SNMP Status Enable** box if you want the status returned using SNMP. You must also enter the appropriate information in the “Community Name” and “SNMP Device Index” fields.

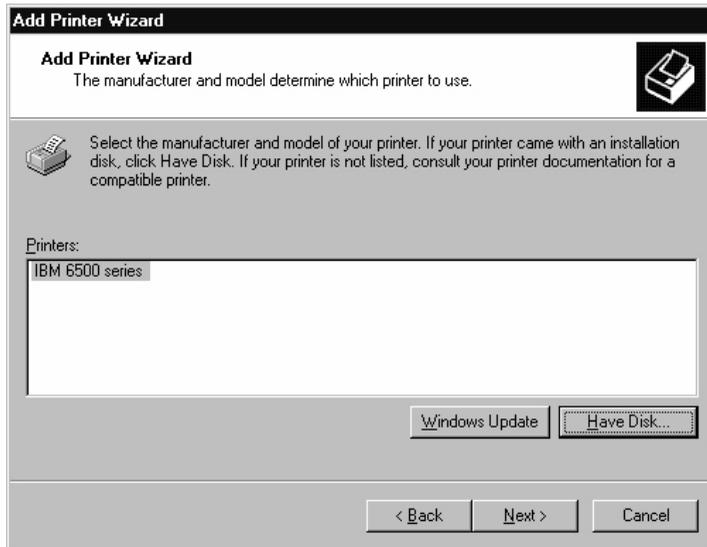
Upon completion, click **OK**. The Port Settings text box disappears and the Additional Port Information Required text box reappears.



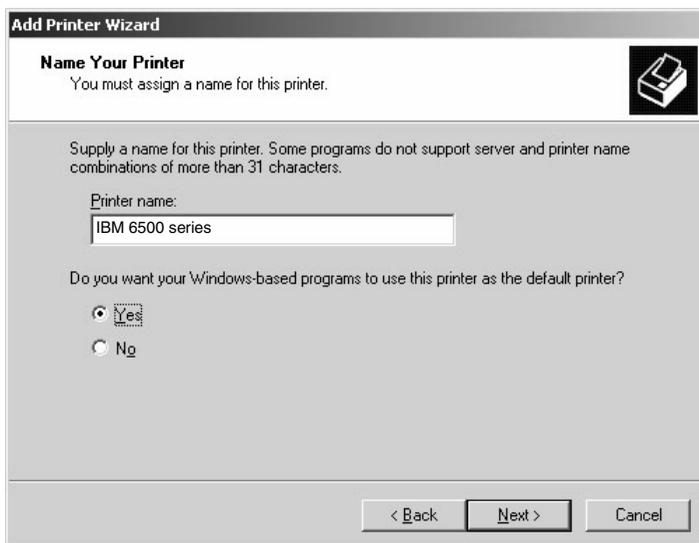
10. Click **Next**.



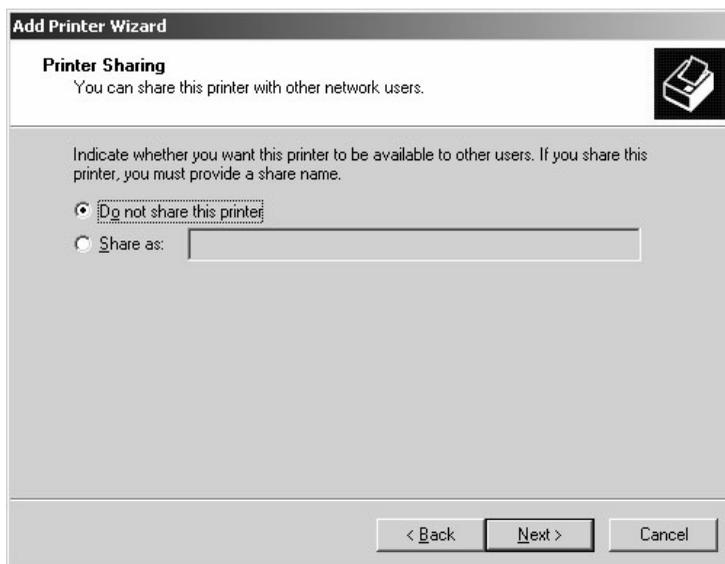
11. Click **Finish**.



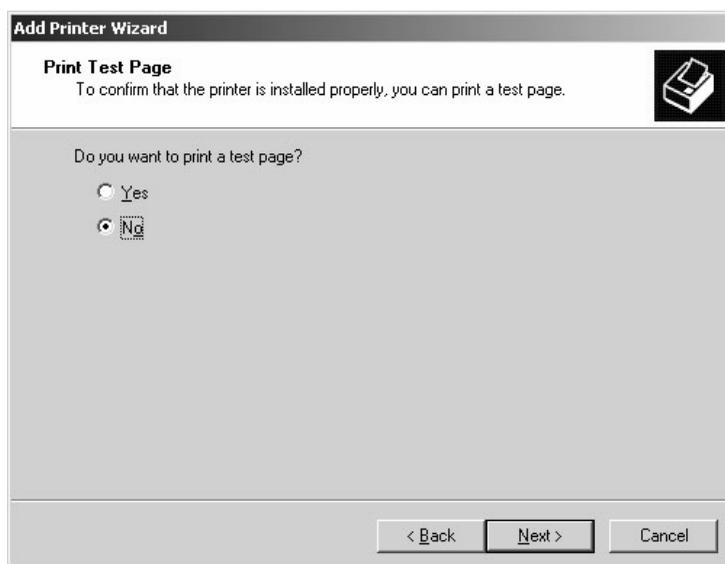
12. Select the IBM 6500 printer driver or download and install it from the IBM Printer's Web page at www.printers.ibm.com. Click **Next**.



13. Select **Yes** then click **Next**.



14. Click **Next**.



15. If you want to print a test page, select **Yes** and click **Next**.
If not, click **Next**.



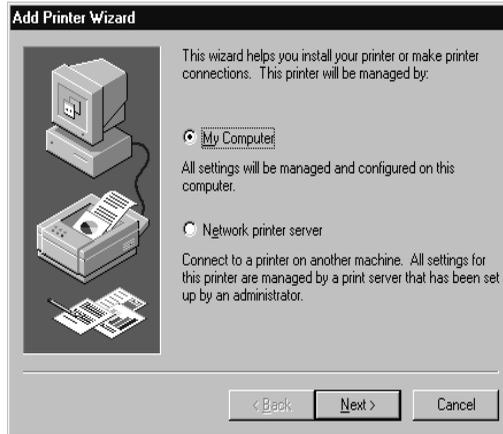
16. Upon completion, click **Finish**.

Windows NT 4.0 Host Setup

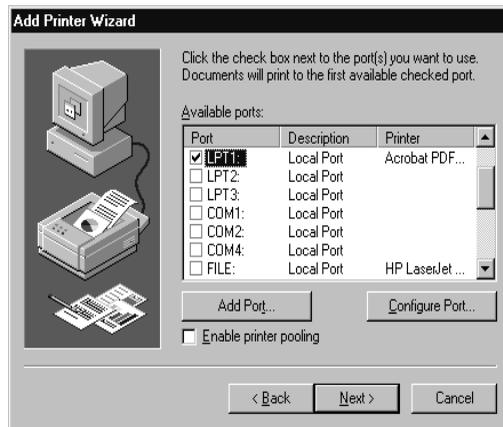
This installation procedure assumes that the Ethernet Interface adapter is configured with the correct IP address, subnet mask and gateway (if required). In addition, the administrator can “ping” and Telnet to the Ethernet Interface adapter from the server console.

If this is not the case, use the printer front panel to configure the Ethernet Interface adapter before proceeding.

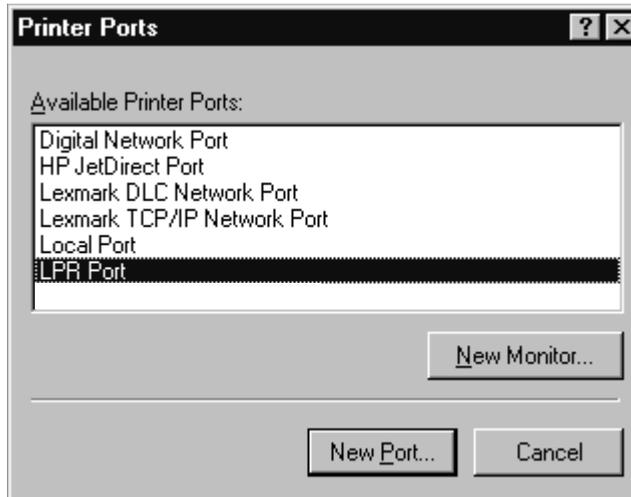
1. Select **Start ▶ Settings ▶ Printers**.
2. Double click the **Add Printer** icon. The Add Printer Wizard window displays.



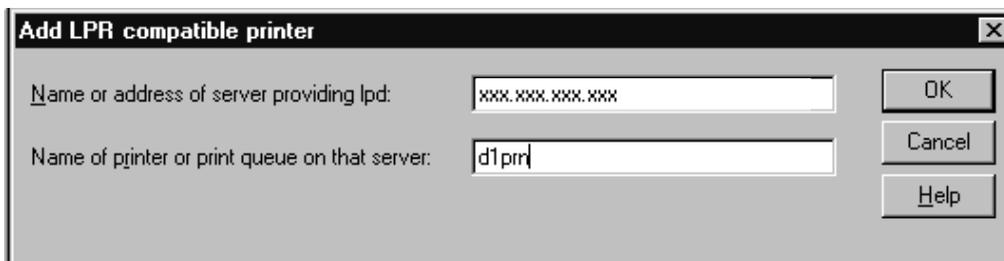
3. Select **My Computer** and click **Next**.



4. Click **Add Port ...**

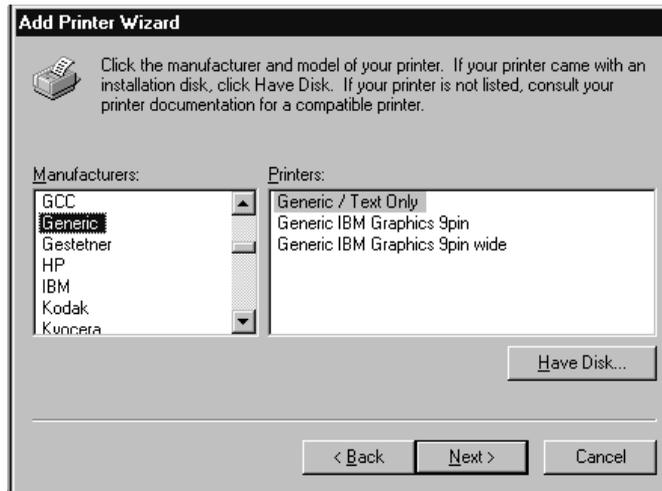


5. Double click **LPR Port**. If LPR Port is not listed, the Microsoft TCP/IP Printing service is not installed. To install the Microsoft TCP/IP Printing service, refer to “Installing Microsoft TCP/IP Printing” on page 140.



6. Enter the IP address of the Ethernet Interface in the **Name or address of server providing lpd:** field.
Enter the name of the print queue in the **Name of printer or print queue on that server:** field.

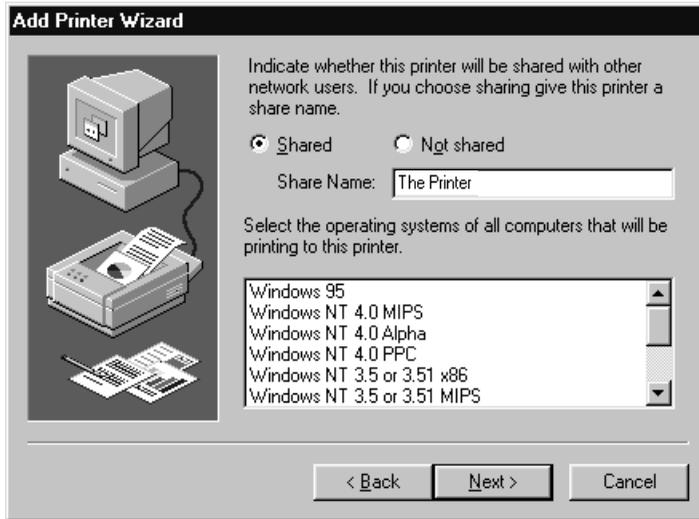
NOTE: This name must be a name of an existing destination/queue on the Ethernet Interface, and it must be lowercase by default. You will probably use `d1prn`.



7. Select the **Generic/Text only** printer driver or install the IBM 6500-v driver from the IBM Printer's Web page at www.printers.ibm.com. The generic driver is good for troubleshooting installation problems. The network administrator can always go back and install the printer driver at a later time.



8. Enter a name for the printer in the **Printer Name** field.



9. Determine if the printer is shared with other network users. If it is shared, the share name and operating system(s) of the other workstations that may use this printer must be selected.



10. Print a Windows test page.

11. If there are any problems during or after installation, see “Windows NT 4.0 Or 2000 Host Setup Problems” on page 139.

Windows NT 3.51 Host Setup

To configure a new printer on a Windows NT 3.51 station:

1. Open the Control Panel.
2. Double click **Printers**.
3. Select **Create a Printer** from the **Printer** menu to display the dialog box in Figure 24.

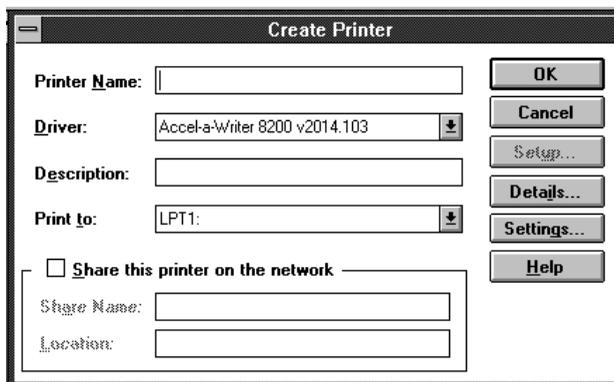


Figure 24. Create a Printer Dialog Box

4. Define a name to represent this print setup and select the appropriate driver for the printer that will be used in this setup. For the printer driver, choose **generic text**, **Epson FX1050**, or **Proprinter**.
5. Select **Other...** under the **Print To** field.
6. Select **LPR Port** from the list that displays, and click **OK** to display a dialog box similar to the one in Figure 25.

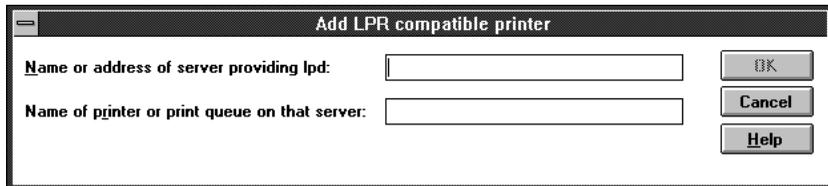


Figure 25. Add LPR Compatible Printer Dialog Box

7. Enter the IP address or host name of the Ethernet Interface in the **Name or address of server providing lpd:** field.
8. Enter the name of a predefined destination/queue on the Ethernet Interface in the **Name of printer or print queue on that server:** field.

NOTE: This name must be a name of an existing destination/queue on the Ethernet Interface, and it must be lowercase by default. You will probably use `d1prn`.

9. Click **OK** when you have specified these two fields.

You now have a new network printer which relies on the standard TCP/IP print protocol, LPD, to print remotely to a printer with the Ethernet Interface.

Windows Me or 9x Host Setup

To configure a new printer on a Windows Me or 9x station:

1. Select **Start ▶ Settings ▶ Printers**.
2. Double click the **Add Printer** icon.
3. Select **Network Printer** from the Add Printer wizard window.
4. Click **Browse** to fill in the network path of this printer. The Browse for Printer dialog box displays.
5. Double click the appropriate workgroup containing the Ethernet Interface. By default, the print server falls under the workgroup, "WORKGROUP."

6. Continue searching the network until you see the Ethernet Interface name, "P_XXXXXX" or "M_XXXXXX", where "XXXXXX" equals the last six digits of the print server Ethernet address found when a configuration is printed.
7. Once you see the Ethernet Interface, double click it to display a list of predefined destinations/queues from which to choose.
8. Select a destination/queue that will use `d1prn`.
9. Click **OK** once you have selected a destination. The network path window reappears with the path filled in.
10. Click **Next**.
11. Select the appropriate print driver and click **Next**.
12. Fill in a name for this new network printer at the next window and decide if you want this to be the default printer. This printer name can be anything you would like as long as it is unique.
13. When prompted for a test page, select either **Yes** or **No** depending on the state of the attached printer, and click **Finish**.

NOTE: Windows may ask for a disk or CD-ROM to load the appropriate printer driver to complete this new printer setup.

There should now be a new printer icon within the "Printers" folder. This new network printer relies on NetBIOS over TCP/IP as the underlying protocol to print to the Ethernet Interface.

Windows Troubleshooting Tips

This section provides information on possible solutions to some standard Windows and Ethernet Interface configuration errors.

Technical Support

If you require technical support, please have the following information available when you call:

1. Level of software are you running.
2. Type of attachment do you have.
3. Your host operating system.
4. A detailed description of the problem.
5. How often, and when the problem occurs
6. A detailed description of your network and the components attached.

Ethernet Interface Cannot Be Found On The Network

Please follow these tips to determine what the problem may be with your Ethernet Interface configuration.

- Have you assigned the Ethernet Interface a unique and valid IP address which corresponds with the other IP addresses on your network? For example, are you sure no other device is using this IP address?
- Are you sure you are trying to talk to the Ethernet Interface from a Windows station on the same subnet? The print server can only be seen locally unless you configured a routing entry earlier.

HTML Configuration Forms Will Not Display

- If you look at the back of the printer, is the STAT LED flashing once a second, or is it quicker than that? A slower, once-a-second rate indicates that the print server is in fact configured with an IP address. A faster rate means it knows nothing about this, so you may need to try the configuration process again.
- Have you confirmed that the network connection to the Ethernet Interface is working correctly? Trying different network cables and locations will help narrow down the problem.
- For wireless NIC, is the SSID correct? Is the operation mode correct?

HTML Configuration Forms Will Not Display

- Can you ping the Ethernet Interface from the Windows station? If not, refer to “Ethernet Interface Cannot Be Found On The Network” on page 134.
- Have you used the correct URL for the Ethernet Interface home page? It should be
`http://EthernetInterfaceIPAddress`
(e.g., `http://192.75.11.9`).
- Is HTTP support enabled? If not, refer to “Web Browser/HTTP Problem” on page 139.

Errors Occur When Defining An LPR Printer

- Can you ping the Ethernet Interface from your Windows NT station? If not, please refer to “Ethernet Interface Cannot Be Found On The Network” on page 134.
- Did you specify the correct IP address or host name for the Ethernet Interface in the first field of the “Add LPR Compatible Printer” box?
- Did you specify a valid destination/queue on the Ethernet Interface in the second field of the “Add LPR Compatible Printer” dialogue box? If so, did you also enter it in lowercase letters?

Cannot Browse The Ethernet Interface On The Network

- Have you looked under the right Windows workgroup? By default, the Ethernet Interface will be found under “WORKGROUP.”
- Are you able to browse other Windows stations and devices on the network from this same station?
- Has this Windows station been given enough time to update its registry so it can see this newly added workgroup device? Sometimes Windows stations can take considerable time, depending on the size of the network.

Printer Errors When Printing Or No Output

- Is there a large job currently printing which is taking up all of the printer resources? Usually when printing from Windows 95/98 stations, a busy printer can cause Windows to display a printer error message. This is because it demands immediate printer attention rather than holding the data until the printer is ready again. The best way around this is to use a central spooling station like an NT server.
- Have you tried restarting the spooler under “Control Panel:Services?” Sometimes this is needed to get printing started.

NOTE: As a last resort, you may want to reboot the Windows station. Sometimes this is the only option to completely clear this situation. The Ethernet Interface usually has nothing to do with this problem.

TCP/IP Access Problem

If you can ping the printer from a workstation, but you cannot Web browse, Telnet, or print to the printer through the Ethernet Interface, there may be an incorrect entry in the TCP access list. For this workstation to use the Ethernet Interface interface in this case, one of two things must happen.

- The TCP list must have an entry added to grant access to this workstation

— OR —

- All entries must be deleted from the TCP list to grant all workstations/hosts access to the above TCP services.

To view the current access list, use the printer control panel to access the configuration menu (see the *User's Manual* for configuration menu information). From the DIAGNOSTICS/Printer Tests menu choose the E-Net Test Page. When the page prints, look under the “TCP ACCESS TABLE” section for the TCP access list entries.

To add/delete a TCP access list entry, refer to “TCP Access Lists” on page 369.

NOTE: When the following procedure is used, the TCP access list will be cleared, but all IP addresses will need to be entered again after the procedure is complete.

ADAPTER, WIRELESS ADAPTER

To reset all Ethernet Adapter or Wireless TCP/IP values to the factory defaults when access is impossible:

1. Obtain a printer configuration printout using the control panel. See the *User's Manual* for configuration menu information.
2. Power off the printer.
3. On the Ethernet Adapter or Wireless Interface, place SWITCH 1 in the down position.
4. Power on the printer and wait for the ONLINE state.
5. On the Ethernet Adapter or Wireless Interface, place SWITCH 1 in the up position.

6. From a workstation attached to this network segment, create an ARP entry. The Ethernet Interface IP address and hardware or Machine Address Code (MAC) address are needed. At the workstation enter:

```
arp -s <ipaddress> <MACaddress>
ping <ipaddress>
```

7. Try to ping this IP address to see if the Ethernet Interface can be seen on your network. If the interface does not respond, verify you are on the same network segment as the printer and that the ARP entry was created.
8. Telnet into the Ethernet Interface using the same IP address as above. Log in as root. There is no password by default.
9. At the system prompt, enter:

```
store tcpip from default
config http on
save
reset
```

NOTE: This will reset all TCP/IP settings to factory default and reset the Ethernet Interface.

10. Power the printer off and then back on.
11. Set the IP address, subnet mask, and default gateway parameters to the desired values.

WIRELESS, ETHERNET

To reset all Integrated Ethernet Interface TCP/IP values to the factory defaults when access is impossible, contact your IBM service representative for assistance.

Web Browser/HTTP Problem

In some cases, you may not be able to browse the printer Web page simply because the Ethernet Interface HTTP may be turned off.

If you cannot ping the Ethernet Interface IP address, make sure the IP Address, subnet mask, and default gateway are set correctly by checking the Ethernet Parameters menu from the operator panel. See the *User's Manual* for configuration menu information.

If you can ping the Ethernet Interface IP address but cannot access the Web pages, perform the following procedure to verify the Ethernet Interface HTTP is turned on.

1. **telnet** into the Ethernet Interface and log in as **root**. There is no password by default.
2. At the system prompt, enter the following commands:

```
config http on
save
reset
```
3. After approximately 30 seconds, point your browser to the Ethernet Interface IP address. The printer Web pages should now be accessible.

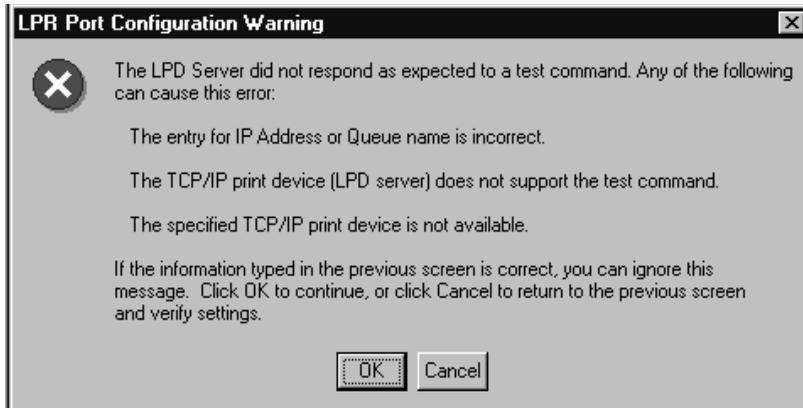
Windows NT 4.0 Or 2000 Host Setup Problems

The installation procedure covered earlier in this chapter assumes that the Ethernet Interface adapter is configured with the correct IP address, subnet mask and gateway (if required), and that the administrator can ping and telnet to the Ethernet Interface adapter from the server console. If this is not the case, use the printer front panel to configure the Ethernet Interface adapter before proceeding.

Installing Microsoft TCP/IP Printing

The Ethernet Interface installation for Windows NT 4.0/2000 also requires the “Microsoft TCP/IP Printing” service on the server. To install this service, click the Network icon in the Control Panel and click the “Services” tab. Click “Add Service” and select “Microsoft TCP/IP printing.” You may encounter the following:

- Do you have administrative privileges?
This installation requires administrator privileges.
- “LPR port” is not listed in step 6 on page 128.
Cancel the installation and install the Microsoft TCP/IP printing service on the server.
- LPR configuration warning during step 7 on page 128.



The Ethernet cable is not plugged in or the printer is not turned on. This message is a communication failure between the NT/2000 server and the Ethernet Interface. Check cabling, IP address settings, gateway, etc.

- Test page does not print or prints incorrectly:
 1. Is the printer online? Re-send test page.
 2. The print queue name in step 6 on page 128 should be d1prn; however, the name can be changed. To verify the queue names, print an E-Net Test Page. Refer to your *User's Manual* for information.
 3. The IBM NT print driver requires P-Series emulation active on the printer. The Generic/Text driver should print in any printer emulation.
 4. Delete then re-install the Microsoft TCP/IP Print service on the server.

If you are still experiencing difficulty accessing or browsing the printer, contact an IBM representative for further assistance.

5

AIX/Unix

Configuration

Overview

This chapter details a complete Unix setup including:

- Configuring the Ethernet Interface with its mandatory TCP/IP settings (e.g., IP address and subnet mask).
- Configuring the Unix host station with a new printer.

Unix Environment Description

The Ethernet Interface supports network printing under various TCP/IP environments including all variations of Unix. Printing can come from multiple hosts directly or through central spooling machines.

Unix Ethernet Interface Configuration

There are mandatory and optional settings needed before the print server can be detected on the network. This section offers alternative methods for configuring your Ethernet Interface and mentions some of the more common optional settings available.

Mandatory

Since TCP/IP is used, the Ethernet Interface must be configured with a minimum of an IP address and subnet mask before it can be seen on the network. To configure these options, see “Configuration Tools” on page 52.

Optional

Additional settings, like routing entries, can be configured allowing for communication across subnets.

Configuration of the Ethernet Interface can be done from the control panel through host commands via Telnet or through the Web browser interface. To configure these options, see “Configuration Tools” on page 52.

Using ARP

To configure the Ethernet Interface with its TCP/IP settings using a manual `arp` command, the syntax is:

```
arp -s ipaddress ethernetaddress
```

For the `aix` command, the syntax is:

```
aix -s ether ipaddress Mac_address
```

To use either of these commands:

1. Log on to a Unix station as **superuser** or **root**. This station must be located on the same subnet as the Ethernet Interface since ARP is limited to subnets.

2. Find the Ethernet address for the Ethernet Interface by printing a configuration or reading it from the control panel. It must be entered as part of this procedure.
3. Use the `arp` command to add an entry into the Unix station ARP table for this Ethernet Interface. Here is the most common syntax for this command:

```
arp -s <ipaddress> <ethernetaddress>
```

Example for Microsoft TCP stacks:

```
arp -s 192.75.11.9 00:80:72:07:00:60
```

This example specifies an Ethernet Interface using IP address 192.75.11.9 and Ethernet address 00:80:72:07:00:60.

4. Verify that the ARP entry was properly applied.

```
arp -a
```

You should see an entry in the listed ARP table with the IP address and Ethernet address specified in step 3.
5. Try to `ping` this IP address to see if the Ethernet Interface can be seen on your network.

At this point, you should be able to communicate with the Ethernet Interface from your local Unix station. This means the printer knows about an IP address and subnet mask and has these settings in its current memory. However, if the Ethernet Interface is shut off, these settings will be lost unless you store them in flash memory, as follows:

1. Start a Web browser on your local station and direct it to the URL:

```
http://EthernetInterfaceIPaddress/  
networkConf.html
```

(e.g., `http://192.75.11.9/networkConf.html`).

NOTE: If prompted for a “User ID” and password first, type in `root` for the ID and press ENTER at the password prompt (since there is no default password).

2. At the “Network Configuration” HTML form that displays, click in the field below the “IP Address” heading and type in the IP address for the Ethernet Interface.

3. Under the “Subnet Mask” heading, enter the Ethernet Interface subnet mask.

NOTE: If you would like to communicate with the Ethernet Interface from across routers, you will need to fill in an entry within the “Routing” section. Please see “Communicating Across Routers” on page 148 for further details.

4. Click on the SUBMIT button when done and physically repower the print server to make sure the new settings are in effect.

Using RARP

RARP allows you to dynamically assign an IP address to the Ethernet Interface upon bootup. To configure the Ethernet Interface with its TCP/IP settings using RARP:

1. On your RARP server, make an entry in the `/etc/ethers` file for the Ethernet Interface.

Syntax:

```
<ethernetaddress> <EthernetInterfaceIPAddress>
```

Example:

```
00:80:72:07:00:60 192.75.11.9
```

2. Start the RARP daemon on the RARP server if not already running. If it is running, send an HUP signal to it with the `kill` command:

Syntax:

```
kill -HUP <pid>
```

where `<pid>` is the process ID of the RARP daemon.

3. Power on the Ethernet Interface so that it immediately sends out an RARP request. Wait one minute to allow the address assignment process to complete. You should see the STAT LED on the Ethernet Interface slow down, to indicate that it knows about an IP address to use.

4. Try to **ping** the Ethernet Interface IP address from a local Unix station to see if it can be seen on your network.

NOTE: You will only be able to communicate with the Ethernet Interface from a network station on the same subnet as the print server. The Ethernet Interface needs to be told about a default router/gateway so any packets that come in from a different subnet can be returned via this gateway. Please see “Communicating Across Routers” on page 148 to set this up.

Using BOOTP

BOOTP allows you to dynamically assign an IP address to the Ethernet Interface upon bootup. In addition, the BOOTP server can provide additional details like a default router/gateway address. To configure the Ethernet Interface with its TCP/IP settings using BOOTP:

1. On your BOOTP server, make an entry in the `/etc/bootptab` file for the Ethernet Interface.

Syntax:

```
EthernetInterfaceIPname: \  
:sm=netmask: \  
:hd=homedirectory: \  
:bf=null: \  
:gw=defaultgateway: \  
:ht=ethernet: \  
:ha=ethernetaddress: \  
:ip=ipaddress: \  
:ts=timeserver: \  
:to=timezone:
```

Example:

```
spike: \  
:sm=255.255.255.0: \  
:hd=/usr/null: \  
:bf=null: \  
:gw=192.75.11.1: \  
:ht=ethernet: \  
:ha=008072070060: \  
:ip=192.75.11.9: \  
:ts=192.75.11.7: \  
:to=25200:
```

2. Turn the Ethernet Interface on so that it immediately sends out a BOOTP request. Wait one minute to allow the IP address assignment process to complete. You should see the STAT LED (on the Ethernet Interface) slow down, indicating it knows about an IP address to use.
3. Try to `ping` the Ethernet Interface IP address from a network station to see if it can be seen on your network.

NOTE: You will be able to communicate with the Ethernet Interface from network stations on different subnets if the print server has been told about its default router/gateway in the BOOTP response from the BOOTP server.

Communicating Across Routers

Since Unix environments rely on TCP/IP to communicate with the Ethernet Interface, crossing routers becomes an issue.

After you have followed one of the Ethernet Interface configuration methods mentioned (other than the BOOTP method), most likely, you will only be able to communicate with the print server from the same subnet. This means any host across a router will not be able to see your Ethernet Interface. To communicate across a router, store a default router/gateway within the print server so that any packets destined for another subnet get forwarded to this router automatically. The router (or series of routers) can then take over the process of ensuring the packets get to their final destination on another subnet on your network.

To configure a default router/gateway within the Ethernet Interface:

1. Start a Web browser on your local station and direct it to the URL:
`http://EthernetInterfaceIPAddress/
networkConf.html`
(e.g., `http://192.75.11.9/networkConf.html`).

NOTE: If prompted for a “User ID” and password first, type in `root` for the ID and press ENTER at the password prompt (since there is no default password).

2. At the “Network Configuration” HTML form that displays, click in the first field below the “Gateway” heading and type in the IP address of the default router/gateway for the Ethernet Interface subnet.
3. Click the SUBMIT button when done and physically repower the print server to make sure the new setting is in effect.

Unix Host Configuration

There may be times when you would prefer or need to perform the manual setup steps for a new printer definition. There may also be times when you require a less common print solution such as direct socket capabilities. This section covers these additional setups.

Manual System V Host Setup

This setup involves any Unix operating system using System V print spooling (e.g., SCO, Solaris[®], HP-UX[®], DG/UX[®], etc.). This means an interface file is used for each defined printer and, in the case of any System V print setup involving an Ethernet Interface, the RSHD protocol is used to transfer data from the host to the print server.

To manually configure a new System V printer on a Unix station, create a dummy device file that acts as a locking mechanism between contending print jobs.

Syntax:

```
touch /dev/EthernetInterfacename.portname
```

where *EthernetInterfacename* is the host or IP name of the print server and *portname* is one of its four I/O ports.

Example:

```
touch /dev/spike.prn
```

Ethernet Installation on HP-UX

LPR is supported in HP/UX Version 9.0 and greater. To configure a print queue using LPR, issue the following commands.

NOTE: Requires root privilege. The default BSD interface file “rmodel” will be used.

Syntax:

```
lpshut
lpadmin -pqueue_name -mrmmodel -v/dev/null
        -orm[printer_ip] -orpd1prn -ob3
lpsched
accept queue_name
enable queue_name
```

queue_name = any unique printer name

[printer_ip] = IP address of the printer or the DNS name (without brackets)

d1prn = Ethernet remote printer name*

Explanation of command line:

-m indicates the model rmodel

-v indicates the use of /dev/null as a file interlock to avoid contention

-orm is the name of remote Print Server

-orp is the name of the remote printer on the remote Print Server

-ob3 declares that the remote Print Server is a BSD type

NOTE: The “lpshut” command stops the HP spooling system; do not perform when print jobs are active.

The default Ethernet destination name is d1prn, however, this name can be changed. To verify the queue name, print an Ethernet Test Page or telnet to the adapter and run a “list dest” command.

To print to this queue, use normal lp syntax:

```
# lp -dqueue_name filename
```

Solaris 2.6 – 7 Ethernet Setup

NOTE: Requires Superuser privilege in the borne shell. Assume that you can ping and Telnet to the adapter.

The IP address of the Ethernet adapter must be placed in the `/etc/hosts` file.

Syntax:

```
lpadmin -p [queue_name] -v /dev/null
lpadmin -p [queue_name] -i /usr/lib/lp/model/
netstandard
lpadmin -p [queue_name] -o dest=[host_name] -o
protocol=bsd -o timeout=60
lpadmin -p [queue_name] -s [host_name]!d1prn -I any
enable {queue_name}
accept [queue_name]
```

where

[queue_name] = any name, but not the name in the `etc/hosts` file or `d1prn`

[host_name] = name in `etc/hosts` file

Troubleshooting

This installation procedure assumes that the Ethernet adapter is configured with the correct IP address, subnet mask, and gateway (if required). You can also ping and telnet to the Ethernet adapter.

Print an E-Net Test Page to verify the Ethernet settings.

DIAGNOSTICS ▶ Printer Tests ▶ E-Net Test Page or Ethernet Test ▶ Enter.

The default Ethernet queue name is `d1prn`, however, the name can be changed. To verify the queue name, print an E-net Test Page or telnet to the adapter and run a “list dest” command.

NOTE: Depending on the shell, precede the `!` character with a `\` to avoid shell script errors.

SCO Setup

1. Login as a root or administrator privileges user.
2. Acquire an unused Internet address (IP) from your Network Administrator and choose a unique name for the Ethernet adapter.
3. Add your Ethernet Internet address and host name to your system host table by appending the following line to the `/etc/hosts` file:

<Internet address> <host name>

Example:

199.230.23.76 salesdept

4. If you have not installed the SCO RLP (BSD lpd) package which is part of the TCP/IP package, run **mkdev** to invoke the RLP installation script:

```
#mkdev rip
```

The following screen displays:

Remote printing configuration

Do you want to install or delete remote printing (i/d/q)?

Type **i** to install and press Enter or Return. The additional prompts display.

```
Remote printing configuration
Do you want to install or delete remote printing (i/d/q)? i
Installing Remote Line Printing

Remote line printing working directory already exists.
```

Now type **y** and press Enter or Return. **y** allows you to configure an LPD printer. Type **n** and press Enter or Return. **n** will exit.

5. Run `rlpconf` as root user. The following prompts display:

```
Remote printing configuration
Enter information for remote printers or local printers accepting
remote printing requests

Please enter the printer name (q to quit):
```

Type in the name you wish to call this printer within SCO and press Enter or Return. The following prompt displays:

```
Remote printing configuration
Enter information for remote printers or local printers accepting
remote printing requests

Please enter the printer name (q to quit): d1prn

Is d1prn a remote printer or a local printer (r/l)?
```

Type **r** for a remote printer and press Enter or Return. The following prompt displays:

```
Remote printing configuration
Enter information for remote printers or local printers accepting
remote printing requests

Please enter the printer name (q to quit): d1prn

Is d1prn a remote printer or a local printer (r/l)? r

Please enter the name of the remote host that d1prn is attached
to:
```

Type in the host name as configured in the /etc/hosts file. Press Enter or Return. The following prompt displays:

```
Remote printing configuration
Enter information for remote printers or local printers accepting
remote printing requests

Please enter the printer name (q to quit): d1prn

Is d1prn a remote printer or a local printer (r/l)? r

Please enter the name of the remote host that d1prn is attached
to:
salesdept

Printer d1prn is connected to host salesdept
Is this correct (y/n)?
```

Type **y** and press Enter or Return. The following prompt displays:

```
Remote printing configuration
Enter information for remote printers or local printers accepting
remote printing requests

Please enter the printer name (q to quit): d1prn

Is d1prn a remote printer or a local printer (r/l)? r

Please enter the name of the remote host that d1prn is attached
to:
salesdept

Printer d1prn is connected to host salesdept

Is this correct (y/n)? y

If 'salesdept' currently runs SCO OpenServer Release 5 or
above, it can support the extended remote printer protocol.

Do you want to turn on the "extended RLP protocol" support flag.
If you're not sure, answer 'n'? (y/n) [n]:
```

Type n and press Enter or Return. The following prompt displays:

```
Remote printing configuration
Enter information for remote printers or local printers accepting
remote printing requests

Please enter the printer name (q to quit): d1prn

Is d1prn a remote printer or a local printer (r/l)? r

Please enter the name of the remote host that d1prn is attached
to:
salesdept

Printer d1prn is connected to host salesdept

Is this correct (y/n)? y

If 'salesdept' currently runs SCO OpenServer Release 5 or
above, it can support the extended remote printer protocol.

Do you want to turn on the "extended RLP protocol" support flag.
If you're not sure, answer 'n'? (y/n) [n]: n

Would you like this to be teh system default printer? (y/n):
```

If it is the system default, then all jobs submitted without a printer name will go to this printer. If it is not the system default, it must be specified when printing. Type **y** or **n** and press Enter or Return.

The printer is now installed and ready to print.

6. From a shell prompt, use this command to test the printer:

```
#lp -dprint_name file_name
```

where `print_name` is the name of the printer you created and `file_name` is the name of an appropriate file to test print.

Troubleshooting

This installation procedure assumes that the Ethernet adapter is configured with the correct IP address, subnet mask and gateway (if required). In addition, the administrator can ping and telnet to the Ethernet adapter from the server console.

NOTE: If this is not the case, use the printer front panel or the IPAssign utility to configure the Ethernet adapter before proceeding.

Manual LPR/LPD Host Setup

The Ethernet Interface also supports Unix operating systems which follow a BSD print system (e.g., SunOS 4.1.x). This means a printcap file is used to define all printers available on the host, and interface scripts are not commonly used. Instead, LPR/LPD printers are defined.

To manually configure an LPR/LPD printer on a BSD Unix system:

1. Define an entry for this new printer within the printcap file, `/etc/printcap`.

Syntax:

```
printername:
:sh:pw#80:mx#0:\
:rm=EthernetInterfacename:\
:rp=EthernetInterfacedestination:\
:lp=:\
:sd=/usr/spool/lpd/printername:\
:lf=/usr/spool/lpd/printername/log:\
:af=/usr/spool/lpd/printername/acct:
```

where *printername* is any name you would like to give to this new printer, *EthernetInterfacename* is the host or IP name of the print server, and *EthernetInterfacedestination* is one of the pre-defined destinations/queues on the device.

Example:

```
6500-v:
:sh:pw#80:mx#0:\
:rm=spike:\
:rp=dlprn:\
:lp=:\
:sd=/usr/spool/lpd/ 6500-v:\
:lf=/usr/spool/lpd/ 6500-v/log:\
:af=/usr/spool/lpd/ 6500-v/acct:
```

2. Create the spool directory specified by the `sd=` entry in the printcap entry for this printer.

Example:

```
touch /usr/spool/lpd/ 6500-v
```

3. Create the log and account files specified by the `lf=` and `af=` entries in the `printcap` entry for this printer.

Example:

```
touch /usr/spool/lpd/6500-v/log
touch /usr/spool/lpd/6500-v/acct
```

4. Change permissions and ownership on the spool directory and everything within it.

Example:

```
chmod -R g+rwX,o+rX /usr/spool/lpd/ 6500-v
chmod -R daemon.daemon /usr/spool/lpd/ 6500-v
```

5. Start the printer daemon for this new printer.

Example:

```
lpc start 6500-v
```

You now have a new printer which relies on LPR/LPD to print to a Ethernet Interface printer. Use the following command to test printing:

Syntax:

```
lpr -P printername filename
```

Example:

```
lpr -P 6500-v /etc/hosts
```

Ethernet Configuration for AIX 4

Before you set up the printer, it is good to know the ways a print job can be filtered.

1. **Standard processing.** Filtering is done on the printer with no processing on the host.
2. **Local Filtering.** Filtering is done on the host. Be sure to specify the printer model during install.

Standard Processing

1. Enter SMIT select devices.
2. Select **Printer/Plotter**.
3. Select **Print Spooling**.
4. Add a **Remote** Print Queue.
5. Set the type of Remote Printing to **Standard processing**.
6. Enter the following Remote printer settings:

Name of queue	any_name, user selectable
Host Name of Remote Server	name in /etc/hosts file or the NIC IP address
Name of Queue on Remote Server	d1prn
Type of Print Spooler	BSD (Press the list button and choose BSD)

Local Filtering

1. Enter **smitty mkvirprt**.
2. Add a **Remote** Print Queue.
3. Set the type of Remote Printing to **Local Filtering...**
4. Set the Printer Manufacturer to **IBM**.
5. Set the Printer Type to **IBM4202**.

IMPORTANT

You must change the printer emulation to Proprinter.

6. Enter the following Remote Print Queue with Local Filtering settings:

Name of queue	any_name, user selectable
Host Name of Remote Server	name in /etc/hosts file or the Ethernet IP address
Name of Queue on Remote Server	d1prn
Type of Print Spooler	BSD (Press the list button and choose BSD)
Leave Pass-Through Flag	Yes

Troubleshooting

This installation procedure assumes that the Ethernet adapter is configured with the correct IP address, subnet mask, and gateway (if required). In addition you can also ping and telnet to the Ethernet adapter.

To verify the Ethernet settings, print an E-net Test Page by doing the following:

- **DIAGNOSTICS ▶ Printer Tests ▶ E-Net Test Page or Ethernet Test ▶ Enter.**

The default Ethernet queue name is `d1prn` (in lower case), however the name can be changed. To verify the queue name, print an E-net Test Page or telnet to the adapter and do a “list dest” command.

AIX Remote Queue Time-Out Setting

Symptoms: Print jobs restart or queue goes down.

If the queue is set up for standard processing (not local filtering), add `-T50` flag to `rembak` to the queue device stanza for the queue in `/etc/qconfig`

```
backend = /usr/lib/lpd/rembak -T50
```

If the queue was set up for local filtering edit the file `/usr/lib/lpd/pio/etc/piorlfb` and change the line;

```
typeset piorlfb_rbflags=""
```

to

```
typeset priorlfb_rbflags="-T50"
```

Printing With FTP

Print jobs can also be sent to the Ethernet Interface using the File Transfer Protocol (FTP). To do this:

1. On your network station, change to the directory containing the file you want to print.
2. Open an FTP session with the Ethernet Interface.

Syntax:

```
ftp EthernetInterfaceIPAddress
```

3. Log in as `root`.
4. At the password prompt, press ENTER (since there is no default password).

5. Change to the `dest` directory.

Syntax:

```
cd dest
```

6. List the contents of this directory using the `dir` command and determine which destination/queue you would like to send the print job through. Most likely, you will select `dlprn` for the PRN port.

7. Change to this destination directory.

Example:

```
cd dlprn
```

8. Change the mode to correspond with the type of file you are going to print. By default, ASCII is set for text-only files, but if you need to print both text and graphics, select binary using the `bin` command.
9. Place the file to be printed within this directory on the Ethernet Interface, so it can be spooled and printed.

Syntax:

```
put filename
```

10. Close the FTP session, unless you have more jobs to print.

Syntax:

```
quit
```

Direct Socket Printing

Within TCP/IP environments, there are some setups which require the host to print directly to a TCP port number on the Ethernet Interface, bypassing all of the higher level destination/queue names. If you run into a setup which requires this, you will need to define two parameters for a new print setup:

1. **Ethernet Interface IP address.** The IP address or host name of the print server to which you want to print.
2. **Ethernet Interface TCP port number.** A pre-defined number for the I/O port on the print server. 9100 is the default port number.

Though the host will be sending directly to a TCP port number on the Ethernet Interface, the port numbers are still mapped to destinations/queues in case there is some type of special processing or logging to be done to the job. However, the destination name is of no concern in this type of printer definition. Only the two parameters mentioned above need to be defined for printing to work.

Printing From AIX

Version 4.0 and higher of AIX® offers LPR/LPD support for network printing. This means, to set up a new printer under this operating system, you only need to define these two parameters:

1. **Ethernet Interface IP address.** The IP address or host name of the print server to which you want to print.
2. **Ethernet Interface destination/queue.** A pre-defined name on the print server telling the device to which I/O port to send the jobs. Most likely, you will use `d1prn` for the PRN.

Setting Up AIX 4.x

1. Ensure the 6500-v AIX driver/colon files are installed on the AIX machine. Syntax:

```
lsdev -P -c printer -F "type subclass description"  
| sort -u | grep 6500-v
```

If "ibm6500-v" does not appear on the list, the proper driver files are not installed. Obtain the driver files and follow the instructions included with them to install the files on your machine.

2. At the command prompt, enter **smitty mkvirprt**.
3. At the "Add a Printer Queue" screen, select "remote."
4. At "Type of Remote Printing," select "Local Filtering..."
5. At "Remote Printing Type," select "IBM."
6. At the next "Remote Printing Type," select "ibm6500-v."
7. At "Add a Remote Print Queue with Local Filtering," perform the following:

- a. Type in any print queue names desired in the entry fields next to the desired emulation(s).

NOTE: At least one print queue name field must be filled in.

- b. In the "HOSTNAME" field, type in the hostname or IP address of the printer Ethernet.
- c. In the "QUEUE" field, type in one of the four possible print queue names found on the printer Ethernet. d1prn, d2prn, d3prn, and d4prn are the four default LPD print queues on the Ethernet. If the defaults have not been changed, choose any one of these queues.

NOTE: When the IPDS feature is installed, queue name d4prn is not available.

- d. In the "TYPE" field, leave the value as "AIX Version 3 or 4."
- e. Leave "PASS-THROUGH FLAG" field as "yes."
- f. Press ENTER to complete the setup.
- g. After processing has finished, press F10 to exit SMIT.

Ethernet Interface Cannot Be Found On The Network

8. At the command prompt, enter `eng -A` to view the print queues just entered.
9. Enter `qprt -PqueueName filename` to send a job to the printer.

Unix Troubleshooting Tips

This section provides information on possible solutions to some standard configuration errors. If you require technical support, please have as much of the following information available when you call:

1. Level of software are you running.
2. Type of attachment do you have.
3. Your host operating system.
4. How often, and when the problem occurs.
5. A detailed description of the problem.
6. A detailed description of your network and the components attached.

Ethernet Interface Cannot Be Found On The Network

- Have you configured the Ethernet Interface with a unique and valid IP address which corresponds with the other IP addresses on your network? For example, are you sure no other device is using this IP address?
- Are you sure you are trying to talk to the Ethernet Interface from a Unix station on the same subnet? Currently, the print server can only be seen locally unless you configured it with a routing entry.

- If you look at the back of the printer, is the STAT LED flashing once a second or is it quicker than that? A slower, once-a-second rate tells you that the print server is in fact configured with an IP address. A faster rate indicates it knows nothing about this, so you may need to try the configuration process again.
- Have you confirmed that the network connection to the Ethernet Interface is working correctly? Trying different network cables and locations will help narrow down the problem.

Nothing Prints

- Can you `ping` the Ethernet Interface from your Unix station? If not, please refer to “Ethernet Interface Cannot Be Found On The Network” shown above.
- Is the Ethernet Interface able to communicate with the attached printer? To test this, you can:
 1. `Telnet` to the print server (e.g., `telnet 192.75.11.9`) and log in as `root`.
 2. Enter the command `start fox prn`.
 3. Execute `stop prn` right after starting the test.
 4. This test will send the same text line over and over to the attached printer.
- Is the job getting stuck in the Unix host queue? If so, check that the printer is online. If it is, there is a configuration error on the Unix station, so creating a new print setup may be needed.
- Is the control panel showing any activity to indicate it is receiving data? If so, but there is nothing printing, check if a manual form feed is needed. Also, ensure that the printer can support the type of job coming through.

- Do all jobs fail or just certain ones? For example, is it possible that jobs from a certain application are the only ones to fail? If so, check the type of data it sends to make sure it matches the printer emulation. Check the application printer configuration for mistakes.
- If you are using System V, was the spooler restarted?

Stair-Stepped Output

Stair-stepped output is print which starts at the top left of the page but every line thereafter starts a little further over to the right. It also refers to Unix jobs that print one line of text at the top of a page followed by a series of blank pages.

This kind of output happens only with Unix text jobs if carriage return insertion is not incorporated into the print setup. The printer may be told to do a linefeed, but the Unix job does not specify anything about a carriage return to follow this.

To fix this, carriage return insertion must be enabled somewhere in the print setup. The easiest and most common location is on the Ethernet Interface itself within the appropriate model. The feature is called “onlcr” and the command syntax is:

```
set model modelName stty onlcr
save
```

For example, if printing to the destination, `d1prn`, the associated model is `m1`. Therefore, the command is:

```
set model m1 stty onlcr
save
```

No Form Feed Or Extra Page Comes Out

Unix text jobs may also have problems outputting the last page of a job especially when the BSD Remote (LPD) print method is used. This means the form feed button has to be pressed on the printer to get this last page out.

To make this process automatic, tell the Ethernet Interface to handle this task by setting this feature “on” in the appropriate model. The command syntax is:

```
set model <modelname> trailer $FF
save
```

For example, if printing to the destination, `d2prn`, the associated model is `m2`. Therefore, the command is:

```
set model m2 trailer $FF
save
```

For default destination model mappings of the Ethernet Interface, please see “Ethernet Interface Naming Schemes” on page 373.

TCP/IP Access Problem

If you can ping the printer from a workstation, but you cannot Web browse, Telnet, or print to the printer through the Ethernet Interface, there may be an incorrect entry in the TCP access list. In order for this workstation to use the Ethernet Interface in this case, one of two things must happen:

- the TCP list must have an entry added to grant access to this workstation, or
- all entries must be deleted from the TCP list to grant all workstations/hosts access to the above TCP services.

To view the current access list, use the printer control panel to access the configuration menu (see the *User's Manual* for configuration menu information). From the DIAGNOSTICS/Printer Tests menu choose the E-NET Test Page. When the page prints, look under the “TCP ACCESS TABLE” section for the TCP access list entries.

To add/delete a TCP access list entry, refer to “TCP Access Lists” on page 369.

NOTE: When the following procedure is used, the TCP access list will be cleared, but all IP addresses will need to be entered again after the procedure is complete.

ADAPTER, WIRELESS ADAPTER

To reset all Ethernet Adapter or Wireless TCP/IP values to the factory defaults when access is impossible:

1. Obtain a configuration printout using the control panel. See the *User's Manual* for configuration menu information.
2. Power off the printer.
3. On the Ethernet Adapter or Wireless Interface, place SWITCH 1 in the down position.
4. Power on the printer and wait for the ONLINE state.
5. On the Ethernet Adapter or Wireless Interface, place SWITCH 1 in the up position.
6. From a workstation attached to this network segment, create an ARP entry. The Ethernet Interface IP address and hardware or Machine Address Code (MAC) address are needed. At the workstation enter:

```
arp -s <ipaddress> <MACaddress>
ping <ipaddress>
```
7. Try to ping this IP address to see if the Ethernet Interface can be seen on your network. If the interface does not respond, verify you are on the same network segment as the printer and that the ARP entry was created.
8. Telnet into the Ethernet Interface using the same IP address as above. Log in as root with no password.
9. At the system prompt, enter:

```
store tcpip from default
config http on
reset
```

NOTE: This will reset all TCP/IP settings to factory default and reset the Ethernet Interface.

10. Power the printer off and then back on.
11. Set the IP address, subnet mask, and default gateway parameters to the desired values.
12. If the Web browser access does not work, `telnet` into the Ethernet Interface as `root`. Enter the following command:
`config http on`

ETHERNET, WIRELESS

To reset all Integrated Ethernet Interface TCP/IP values to the factory defaults when access is impossible, contact your IBM service representative for assistance.

Front Panel Message - Dynamically Set Params Read Only

This is not an error. It is an informational message warning that the IP address has been dynamically set by dhcp, rarp, or bootp.

To assign a static IP address, turn off the rarp, bootp, and dhcp on the adapter. Use the following procedure:

1. Telnet to the adapter. Login = root, password = (Enter key)

Telnet commands are:

```
store tcpip 1 opts -rarp -bootp -dhcp  
reset
```

Wait two minutes for the adapter to reset.

2. Program the IP address, Subnet Mask, and Gateway (if required) from the front panel.

6

Novell Configuration

Overview

NOTE: Novell configuration is not applicable to the integrated Ethernet.

**ADAPTER,
WIRELESS
ADAPTER**

This chapter applies to the Ethernet Adapter and Wireless Adapter and details a complete Novell setup, including:

- Identifying the Ethernet Interface on the network.
- Configuring the Ethernet Interface with its mandatory print setup settings.
- Configuring a new print queue on the file server.

For information about additional options available with the 10/100 Base-T interface, see “Novell Configuration For 10/100Base-T Interfaces” on page 191.

NOTE: The NetWare 3.x PConsole procedures (page 176) use PConsole v3.75. The NetWare 4.x PConsole procedures (page 182) use PConsole v4.15.

Novell Environment Description

The Ethernet Interface supports network printing under Novell environments by using IPX. It supports all 3.x versions of NetWare. Version 4.x and 5.x is supported under bindery emulation only.

Novell Ethernet Interface Configuration

ADAPTER, **Mandatory**

WIRELESS ADAPTER

Under all Novell environments, the Ethernet Interface does not require any network settings to make it visible on the network. Simply plug it in to your network and power it on. However, with a new print queue setup on a Novell file server, there can be mandatory settings needed on the Ethernet Interface.

Optional

Additional settings are available to fine-tune the Ethernet Interface's Novell functionality. These options include:

- **NDS Context.** The NDS context in which the print server object was created. If you create the printer server object in a different file server object from the file server you logged into, then to ensure the absolute path, you must activate the NDS context.
- **NDS Tree.** The NDS tree the print server object was created in. This is only needed if your environment uses more than one NDS tree.
- **Mode.** The mode the Ethernet Interface will run in. This can be auto, bindery, or NDS. The default is auto so that the Ethernet Interface can autosense which mode it should run in. See "NetWare Version 4.x and 5.x RPRINTER Setup" on page 185 for information on what to do when using both bindery and NDS file servers at the same time.

- **Preferred File Server.** In a bindery setup, this specifies the file server that the print server object was created on. In an NDS setup, this specifies a file server(s) that the print server object resides on. Since NDS is distributed, most administrators will not know which file server(s) the print server object is actually stored on, so in most NDS environments this option is not used.

For additional information about these options, see “Novell Configuration For 10/100Base-T Interfaces” on page 191.

Using HTML Forms

ADAPTER, WIRELESS ADAPTER

When defining a new print queue on a Novell file server, a new print server must be defined to represent the Ethernet Interface. This name must match the predefined name given to the print server.

The default print queue name is M_XXXXXX, where XXXXXX represents the last six digits of the Ethernet Interface address found on the configuration printout or control panel settings under Ethernet Parameters, MAC address (e.g., M_091C1A)

To use the HTML forms to define a print queue, do the following:

1. Load a Web browser on a network station that can communicate with the print server over TCP/IP. The command to change the print server name is:

Syntax:

```
store pserver name newname
```

Example to change the name to `micro1`:

```
store pserver name micro1
```

2. Direct your Web browser to URL:

```
http://EthernetInterfaceIPAddress/  
adminConf.html
```

(e.g., `http://192.75.11.9/adminConf.html`).

NOTE: If prompted for a “User ID” and password first, type in `root` for the ID and press ENTER at the password prompt (since there is no password by default).

3. At the “Administration Configuration” HTML form that displays, highlight the field beside the “Name” heading and type in the new name of the print server.
4. Click the SUBMIT button when done and physically repower the printer to make the new setting take effect.

Novell Host Configuration

ADAPTER, WIRELESS ADAPTER

Under all versions of NetWare, both PSERVER and RPRINTER setups are supported by the Ethernet Interface. Since a PSERVER setup is the most common, you will find the necessary steps to configure the Ethernet Interface as a PSERVER shown first. Configuration for RPRINTER and NPRINTER setup follow the PSERVER information.

NOTE: In a NetWare environment the Ethernet Interface will service only one of the four available printer objects (such as d1prn); do not configure more than one printer object from the printer. The Ethernet Interface cannot service multiple file servers at one time; do not configure multiple file servers to access the printer.

NetWare Version 3.x PSERVER Setup

To configure a print queue on a NetWare 3.x network:

1. Log on to the Novell file server as **supervisor**.
2. Enter PCONSOLE.
3. Select “Print Queue Information” from the PCONSOLE Main Menu.
4. Press INSERT to add a new queue to the list of currently defined queues showing.
5. Type in the name of this new queue when prompted and press ENTER. This can be any name you would like.
6. Press ESCAPE to return to the Main Menu.
7. Select “Print Server Information” and press ENTER.

8. Press INSERT when the list of existing print servers displays.
9. Type the name of the Ethernet Interface when prompted for a print server name, and press ENTER when done. The default is M_XXXXXX, where XXXXXX represents the last six digits of the Ethernet address found on the configuration printout or control panel settings under Ethernet Parameters, MAC address (e.g., M_091C1A).
10. Back at the print server list, select this newly defined Ethernet Interface and press ENTER.
11. Select "Print Server Configuration" from the menu that displays.
12. Select "Printer Configuration" from the next menu to display a list of configured printers.
13. Select the first item listed as "NOT INSTALLED" and press ENTER.
14. At the printer configuration window, type in the name for this new printer. The name must be one of the predefined destinations/queues on the Ethernet Interface, normally dlprn.
15. Go to the "Type" field and press ENTER to see the possible choices.
16. Select "Defined Elsewhere" from this list.
17. When done, press ESCAPE and select "Yes" to save the changes to this new printer.
18. Press ESCAPE again to return to the "Print Server Configuration" menu.
19. Select "Queues Serviced by Printer."
20. Select this new printer from the printer list that displays and press ENTER.
21. At the empty queue list that displays, press INSERT.
22. Select the queue created in step 5 and press ENTER.
23. When prompted for the priority, press ENTER to select the default or select a priority.

24. Press ESCAPE until back at the PCONSOLE Main Menu.
25. Repower the printer.
26. Wait two minutes and then select “Print Queue Information” from the PCONSOLE Main Menu.
27. Select this new queue from the menu that displays.
28. Select “Currently Attached Servers” to see which print server is servicing this queue.

At this point, the Ethernet Interface name (e.g., M_091C1A) should show within this window. This means the Ethernet Interface knows about this new Novell print queue it must service as a PSERVER. Therefore, it will poll this queue regularly looking for jobs to print.

NOTE: In a NetWare environment the Ethernet Interface will service only one of the four available printer objects (such as d1prn); do not configure more than one printer object from the printer. The Ethernet Interface cannot service multiple file servers at one time; do not configure multiple file servers to access the printer.

NetWare Version 3.x RPRINTER Setup

These steps are for Novell environments with Netware 3.x (or earlier) file servers.

To configure a new RPRINTER on a NetWare 3.x network:

1. Log in to the Ethernet Interface command shell, npsh, as `root`.

If you have TCP/IP available and this print server already has an IP address stored within it, you can use the built-in HTML configuration forms or a Telnet session. Please see “Configuration Tools” on page 52 for further details. If you have only Novell available, you will need to use a PC, laptop, or terminal.

NOTE: If you use HTML configuration, you will need to go to the “Network Configuration” HTML form (i.e., `http://IPaddress/networkConf.html`; e.g., `http://192.75.11.9/networkConf.html`) and look under the “Novell” section. The settings in the following step are found there. If using a Telnet session, you will need to manually execute the commands listed in the next step.

2. Store the RPRINTER settings on the Ethernet Interface. This will refer to an existing PSERVER.NLM on the file server or to one that you will create later in these steps.

Syntax:

```
store rprinter add <PSERVERname> <printernumber>  
<EthernetInterfacedestination>
```

An example for an RPRINTER servicing printer 0 of the PSERVER.NLM called `pserver1` and sending jobs to the Ethernet Interface destination `d1prn` is:

```
store rprinter add pserver1 0 d1prn
```

3. Leave this Ethernet Interface login session and log on to the NetWare 3.x file server as “Supervisor.”

4. Load a PSERVER.NLM if one is not already loaded. This will be the PSERVER that the Ethernet Interface services as an RPRINTER, so it must match the PSERVER name given in step 2.
5. Enter PCONSOLE.
6. Select "Print Queue Information" from the PCONSOLE Main Menu.
7. Press INSERT to add a new queue to the list of currently defined queues.
8. Type in the name of this new queue when prompted, and press ENTER. This can be any name you would like.
9. Click ESCAPE to return to the Main Menu.
10. Select "Print Server Information" and press ENTER.
11. Press INSERT when the list of existing print servers displays.
12. Select the print server that you want the Ethernet Interface to service as an RPRINTER. This is the PSERVER.NLM loaded in step 4.
13. Select "Print Server Configuration" from the menu that displays.
14. Select "Printer Configuration" from the next menu to display a list of configured printers.
15. Select an item from the list (e.g., an existing printer name or "Not Installed") to display the printer configuration window.
16. Assign a name (if not an existing printer) to this printer.
17. At the "Type" field, select "Remote Other/Unknown."
18. Click ESCAPE to save the changes.
19. Click ESCAPE until you are back at the "Print Server Configuration" menu.
20. Select "Queues Serviced by Printer" to display a list of defined printers.
21. Select the printer you just defined and press ENTER.
22. At the list of queues that displays, press INSERT to add a queue to the list.

23. Select the queue defined and press ENTER.
24. When prompted for a priority, press ENTER to select the default or select a priority.
25. Click ESCAPE until you have exited PCONSOLE.
26. Reload the PSERVER.NLM that the Ethernet Interface is to service as an RPRINTER.
27. Repower the Ethernet Interface by turning the printer off and then back on.
28. Wait two minutes and then check your PSERVER to see if the appropriate printer is being serviced. The PSERVER should indicate that the printer is "Waiting for job."

At this point, the Ethernet Interface knows to receive any jobs this PSERVER.NLM has to send to it through the defined printer.

NetWare Version 4.x and 5.x PSERVER Setup

Ethernet Interface destinations are case sensitive and will not be recognized if they are typed incorrectly. By default, they are all lower case. If you are setting up a NetWare 4 environment, the destination must be renamed to uppercase to match the PCONSOLE entry.

The Ethernet Interface can be used in a NetWare 4 or 5 environment with either of the following options:

- Set the Ethernet Interface up as a PSERVER, replacing a dedicated printer.
- Set the Ethernet Interface up as an RPRINTER, interacting with an existing PSERVER (see page 185).

NOTE: Following a PSERVER setup, bindery emulation is required.

To configure the Ethernet Interface as a PSERVER in a NetWare 4 environment:

1. Log in to the Novell as `supervisor`.
2. Enter PCONSOLE.
3. Press F4.
4. Select PRINT QUEUES.
5. Press INSERT to add a queue.
6. Type in a new queue name and press ENTER.
7. Press ESCAPE.
8. Select PRINT SERVERS.
9. Press INSERT to add the new print server.

10. Type the name of the Ethernet Interface. The default is M_XXXXXX, where XXXXXX represents the last six digits of the network adapter's Ethernet address (e.g., M_091C1A).
11. Select this new print server and press ENTER.
12. Select PRINTERS.
13. Press INSERT to add a new printer (d1prn) to the list.
14. Select this new printer and press ENTER. Go to the Type field.
15. Press ENTER at this field and select DEFINED ELSEWHERE. If DEFINED ELSEWHERE is not available, choose PARALLEL.
16. Press ENTER on the Print Queues Assigned field.
17. Press INSERT to display all queues; select the one you defined in step 5 and press ENTER.
18. Select a priority and press ENTER. Priority 1 should be sufficient.
19. Press ESCAPE, saving your changes, until you are back to Main Menu.
20. Reboot the Print Server by repowering the printer.
21. Check the CURRENTLY ATTACHED SERVERS and verify the print server is active.
22. Press ESCAPE until you are out of the PCONSOLE.

Even though the entire print set up is done through PCONSOLE, you may want to communicate directly with the print server to modify settings, monitor the unit, etc. To communicate with the print server, the optional host software, `npsd.exe`, is included. `npsd.exe` is a DOS executable program that can be run from a DOS prompt on a NetWare workstation.

`npsh.exe` performs the following:

`npsh nvplist`

Lists all of the Ethernet Interface devices on the network; each name is in the following format:

- For the Ethernet Adapter, the default is `M_xxxxxx`

where `xxxxxx` represents the last six digits of the network adapter's Ethernet address (e.g., `M_091C1A`). This is regardless of whether it is configured as a `PSERVER` or as an `RPRINTER`.

`npsh <unitname>`

Starts a Telnet-like session with the named print server, allowing you to configure, monitor, and troubleshoot the unit with the built-in command set.

`npsh <unitname> <command>`

Initiates a single command with guest access only to the unit instead of entering into a complete session.

To communicate with the unit using `npsh.exe`:

1. From a DOS prompt on a Novell workstation, begin an `npsh` session with the unit:

`npsh unitname`

Starts a Telnet-like session with the named print server with guest access only.

2. To obtain root access to the unit, type:

`supervisor`

A standard login screen displays prompting you for the login name and password.

3. Log in to the unit as root user:

`root`

NOTE: Root users require the use of a password as configured in the unit user list.

4. Enter the password. If this password is not yet set, press ENTER at the password prompt. Otherwise, enter the password that is already stored in the unit:

password

You are now logged in to the unit as a root user and can access any `npsh` command on the unit.

NOTE: Because `npsh.exe` makes use of broadcasts, you may have problems communicating across a router.

NetWare Version 4.x and 5.x RPRINTER Setup

The Ethernet Interface can be configured to service both RPRINTER, NDS mode, and PSERVER, bindery mode.

Use the following procedure to set up an RPRINTER form of attachment on a 4.x or 5.x server:

1. The Ethernet Interface requires a bindery server login on the 4.x or 5.x as the first step to servicing RPRINTER. This bindery login is necessary for registering the Ethernet Interface Pserver name; no bindery queues or printers are set up. Using PCONSOLE, bindery mode, create a bindery printer server object whose name matches that of the Ethernet Interface at the root context of the 4.x or 5.x box (e.g., M_03092B). After creating the bindery PrintServer on the 4.x or 5.x server, reboot the Ethernet Interface and print out the E-NET Test Page to make sure there is a successful server login.
2. Using either PCONSOLE in NDS mode or NWADMIN:
 - a. Create an NDS queue (any name you want), or simply use an existing one
 - b. Create a print server to use (any valid name, or choose one already in existence)
 - c. Create a printer object to use with the print server object you chose or created, and attach it to the chosen queue

NOTE: The 4.x or 5.x queue name, print server name, and printer object do not have to match any Ethernet Interface name; multiple printers can be defined, but only one print server can be attached to.

Example:

```
NDS queue name:      Finance
NDS print server name:  Fin_Q
NDS printer name:     Fin_Prt_1
NDS printer name:     Accounting_Prt_1
```

3. At a 4.x or 5.x console session, if a `pserver.nlm` session is already running for `Fin_Q`, first unload it, then reload it to find the new objects, or simply issue `load pserver Fin_Q`.

If you are successful, the print server console screen will show a “printer status” option. In the “printer status” window, note the numbers assigned to the printers you created. Assume for our example that one printer previously existed (number 0), and we are adding two more whose numbers became 1 and 2.

NOTE: On the load command, you must strictly follow the case of the name (this is not required on the Ethernet Interface).

4. Via a Telnet or `npsh` session, create RPRINTER attachments:

```
store rprinter add Fin_Q 1 d1prn
```

This command assigns destination `d1prn` as the RPRINTER 1 service path.

```
store rprinter add Fin_Q 2 d4prn
```

This command assigns destination `d4prn` as the RPRINTER 2 service path.

For Ethernet Interface entries, case does not have to be observed. Also, if you want to change the destination names from `dxprn`, do so first with the `set dest <dest> name <new name>` command, being sure to use the `save` command so these reappear after a reboot.

5. Reboot the Ethernet Interface adapter (power the printer off and on, or use the `reset` command) so the new RPRINTER service names are broadcast.

6. Open a Telnet or npsh session and log into the Ethernet Interface. Wait a minute or two, then use the `list rprinter` command, and you should see your entries. You could also do this by looking at the connection status on the 4.x or 5.x PSERVER printer status entries.
7. If you add, delete, or change RPRINTER entries on the Ethernet Interface or 4.x or 5.x console, you should always unload and reload the `pserver.nlm` module to register the changes. The Ethernet Interface can be configured and ready before the `pserver.nlm` is reloaded, or the Ethernet Interface can be reset after `pserver.nlm` is reloaded.
8. A Web browser can also be used to see the RPRINTER attachments and status.

Novell Troubleshooting Tips

This section provides information on possible solutions to some standard configuration errors. If you require technical support, please have as much of the following information available when you call:

1. Level of software are you running.
2. Type of attachment do you have.
3. Your host operating system.
4. A detailed description of the problem.
5. When and how often the problem occurs.
6. A detailed description of your network and the components attached.

Please follow these tips to determine what the problem may be with your Ethernet Interface configuration.

NetWare 3.x - No PSERVER Connection

- Was the Ethernet Interface power cycled after the PCONSOLE steps were completed? This will make the print server boot up and realize which print queue and file server it needs to service.
- Is the Ethernet Interface already servicing a queue on another file server? If so, it cannot service another file server at the same time.
- When defining a new `print server` within PCONSOLE, did you use the correct name for the Ethernet Interface (e.g., `M_091C1A`)?

For the Ethernet Adapter, it recognizes itself as the default, `M_xxxxxx`, where `xxxxxx` represents the last six digits of the network adapter's Ethernet address (e.g., `M_091C1A`) found on the configuration printout.

- When defining a new `printer name` within PCONSOLE, did you use a predefined destination/queue rather than a name of your own? By default, the Ethernet Interface only recognizes names like `d1prn`. All other names will be ignored by the device.
- Is the Ethernet Interface in `Bindery` mode as seen under the `list pserver` output on the device? If servicing only a NetWare 3.x file server, it must be set to handle Bindery services. The default setting is Bindery.
- Is there an available NetWare user license for the Ethernet Interface to use while it acts as a PSERVER? Every PSERVER takes up one user license since it logs into the Novell file server.
- Have you given the connection process some time after repowering the Ethernet Interface? In larger Novell environments, the file server identification and connection process can take several minutes.

NetWare 4.x and 5.x- No PSERVER Connection

- Was the Ethernet Interface power cycled after the PCONSOLE steps were completed? This will make the print server boot up and realize which print queue and file server it needs to service.
- Is the Ethernet Interface already servicing a queue on another file server? If so, it cannot service another file server at the same time.
- When defining a new `print server` within PCONSOLE, did you use the correct name for the Ethernet Interface (e.g., M_091C1A)?

For the Ethernet Adapter, it recognizes itself as the default, M_xxxxxx, where xxxxxx represents the last six digits of the network adapter's Ethernet address (e.g., M_091C1A) found on the configuration printout.

- When defining a new `printer name` within PCONSOLE, did you use a predefined destination/queue rather than a name of your own? By default, the Ethernet Interface only recognizes names like `dlprn`. All other names will be ignored by the device.
- Is the Ethernet Interface in `Bindery` mode as seen under the `list pserver` output on the device? If servicing only a NetWare 4.x or 5.x file server, it must be set to handle Bindery services. The default setting is Bindery.
- Is there an available NetWare user license for the Ethernet Interface to use while it acts as a PSERVER? Every PSERVER takes up one user license since it logs into the Novell file server.
- Have you given the connection process some time after repowering the Ethernet Interface? In larger Novell environments, the file server identification and connection process can take several minutes.

7

Novell Configuration For 10/100Base-T Interfaces

Overview

**ADAPTER,
WIRELESS
ADAPTER**

This chapter applies to the Ethernet Adapter and Wireless Adapter and provides additional information for Novell environments using the 10/100Base-T interface, including:

- **Ethernet Interface Configuration.** This section includes setting the preferred file server, setting password security, adjusting polling time, changing the Ethernet Interface name, changing the Ethernet Interface frame type, changing the Ethernet Interface mode, setting the Ethernet Interface NDS context, and setting the Ethernet Interface preferred NDS tree.
- **Host Configuration.** This section includes NDS PSERVER setup, Bindery PSERVER setup, referencing a Bindery queue in NDS, and RPRINTER/NPRINTER setups.
- **Troubleshooting tips.** This section covers PSERVER setups, RPRINTER/NPRINTER setups, and printing related problems.

Novell Ethernet Interface Configuration (10/100Base-T)

ADAPTER, There are no mandatory Novell settings needed before the print server can be detected on the network. However, there can be some mandatory settings needed before a Novell print queue can be serviced by the Ethernet Interface. These mandatory settings are covered separately for Netware 3.x, 4.x and 5.x under the Host Configuration heading.

**WIRELESS
ADAPTER**

The print server setup in a Novell environment is much simpler than that required in a TCP/IP one. No addresses, masks, or router entries are necessary and, in most cases, the Ethernet Interface can simply be connected to the network, turned on, and then configured for printing from a Novell station through PCONSOLE or Netware Administrator.

However, there are some optional parameters you may wish to change, such as the preferred file server(s), print server password, polling time, frame type, print server name, NDS context, and NDS preferred tree. The following sections describe these optional parameters.

Preferred File Server (NDS and Bindery Setups)

In a bindery setup, the preferred file server specifies the file server on which the print server object was created. In an NDS setup, it specifies a file server on which the print server object resides. Since NDS is distributed, most administrators will not know which file server(s) the print server object is actually stored on, so in most NDS environments this option is not used. This feature is useful in a large Novell network, so that the Ethernet Interface does not ignore important file servers. If you are setting up the Ethernet Interface to work with a Bindery file server, it is a good idea to set a preferred server on the Ethernet Interface.

Adding Preferred File Server

HTML Method

1. Load a Web browser on a network station that can communicate with the print server over TCP/IP.
2. Direct your Web browser to URL:
`http://EthernetInterfaceIPAddress/
networkConf.html`
(e.g., `http://192.75.11.9/networkConf.html`).

NOTE: If prompted for a “User ID” and password first, type in `root` for the ID and press ENTER at the password prompt (since there is no password by default).

3. Look under the “Novell” section and add the name of the preferred file server in the “File Server” field.
4. Click on the SUBMIT button when done and physically repower the print server to make the new settings take effect.

Manual (Telnet) Method

1. `Telnet` to the print server. This will bring up a login screen:
`telnet ipaddress`

NOTE: If prompted for a “User ID” and password first, type in `root` for the ID and press ENTER at the password prompt (since there is no password by default).

2. You should see a prompt with the Ethernet Interface IP address:
`ipaddress:root>`
3. At the prompt, enter:
`store pserver novell fserver add fservername`
where `fservername` is the name of the Novell file server you want to add as a preferred file server. This adds the specified file server as a preferred file server on the Ethernet Interface.
4. Reset the unit to ensure the changes take effect.
`reset`

Removing Preferred File Server

HTML Method

1. Load a Web browser on a network station that can communicate with the print server over TCP/IP.
2. Direct your Web browser to URL:
`http://EthernetInterfaceIPAddress/
networkConf.html`
(e.g., `http://192.75.11.9/networkConf.html`).

NOTE: If prompted for a “User ID” and password first, type in `root` for the ID and press ENTER at the password prompt (since there is no password by default).

3. Look under the “Novell” section and remove the name of the preferred file server from the “File Server” field.
4. Click the SUBMIT button when done and physically repower the print server to make the new settings take effect.

Manual (Telnet) Method

1. Telnet to the print server:
`telnet ipaddress`

NOTE: If prompted for a “User ID” and password first, type in `root` for the ID and press ENTER at the password prompt (since there is no password by default).

2. You should see a prompt with the Ethernet Interface IP address:
`ipaddress:root>`
3. At the prompt, enter:
`store pserver novell fserver del fservername`
where `fservername` is the name of the Novell file server you want to remove as a preferred file server.
4. Reset the unit to ensure the changes take effect.
`reset`

Setting Password Security (NDS and Bindery Setups)

Besides the general security measures, a Novell setup provides further password security. A password can be set on the Ethernet Interface and within your PCONSOLE or Netware Administrator setup so that when the Ethernet Interface tries to login to the file server, the passwords are compared.

To set the password on the Novell host for use in a PSERVER setup, you will need to:

Netware 4.x and 5.x

1. Log in to Netware Administrator on your Novell host as a user with security equal to "Admin."
2. Double click the print server object you are using for your setup. This will bring up the print server objects details page.
3. Select the "Change Password..." button on the "Identification" page.
4. At the prompts, type and retype the new password. Click OK when you are finished.
5. Proceed to the next section to store the password on the Ethernet Interface.

Netware 3.x

1. Log in to PCONSOLE on your Novell host as **supervisor**.
2. Select "Print Server Information" from the main menu.
3. Select the appropriate printer and press ENTER.
4. Select "Change Password."
5. At the prompts, type and retype the new password. Press ENTER when you are finished.
6. Proceed to the next section to store the password on the Ethernet Interface.

Print Server Setup - HTML Method

1. Load a Web browser on a network station that can communicate with the print server over TCP/IP.
2. Direct your Web browser to URL:
`http://EthernetInterfaceIPAddress/
networkConf.html`
(e.g., `http://192.75.11.9/networkConf.html`).

NOTE: If prompted for a “User ID” and password first, type `root` for the ID and press ENTER at the password prompt (since there is no password by default).

3. Look under the “Novell” section and add the new password to the “Pserver Password” field.

NOTE: The passwords entered in Netware Administrator or PCONSOLE must match the password set on the unit.

4. Click the SUBMIT button when done and physically repower the printer to make the new settings take effect.

Print Server Setup - Manual (Telnet) Method

1. `Telnet` to the print server:
`telnet ipaddress`

NOTE: If prompted for a “User ID” and password first, type `root` for the ID and press ENTER at the password prompt since there is no password by default.

2. You should see a prompt with the Ethernet Interface IP address:
`ipaddress:root>`

3. At the prompt, enter:
`store pserver novell passwd password`

NOTE: The passwords entered in Netware Administrator or PCONSOLE must match the password set on the unit.

4. Reset the unit to ensure the changes take effect:
`reset`

Adjusting Polling Time (NDS and Bindery Setups)

To set the poll time the Ethernet Interface will use when checking for new jobs under a PSERVER setup:

Netware 4.x and 5.x

1. Log in to Netware Administrator as a user with security equal to “Admin” on your Novell host.
2. Double click the printer object for which you wish to change the poll time. This will bring up the printer object detail pages.
3. Click “Configuration” to display the configuration page.
4. Change the “Service Interval” to the desired number (in seconds).

NOTE: You may also want to change the “Service mode for forms” to “Change forms as needed.” If you do not do this, the Ethernet Interface will need to poll the file server twice as much to get all the information it needs.

5. Repower the Ethernet Interface by turning the printer off and on to make the changes take effect.

Netware 3.x

1. Log in to PCONSOLE on your Novell host as `supervisor`.
2. Select “Print Server Information” from the main menu and press ENTER.
3. Select the print server you have been using for your PSERVER setup and press ENTER. By default, this will be “P_xxxxxx” or “M_xxxxxx” where “xxxxxx” equals the last six digits of the print server’s Ethernet address found on the bottom of the device (e.g., “P_01001C” or “M_091C1A”).
4. Select “Print Server Configuration” from the menu that displays.
5. Select “Printer Configuration” from the next menu to display a list of configured printers.

6. Select the printer for which you wish to alter the poll time, and press ENTER.
7. Change the “Sampling Interval” to the desired number (in seconds).

NOTE: You may also want to change the “Service mode for forms” to “Change forms as needed.” If you do not do this, the Ethernet Interface will need to poll the file server twice as much to get all the information it needs.

8. Press ESCAPE and select “Yes” to save the changes to this new printer.
9. Repower the Ethernet Interface by turning the printer off and on to make the changes take effect.

Changing The Ethernet Interface Name (NDS and Bindery Setups)

When defining a new print queue on a Novell file server, you must define a new print server to represent the Ethernet Interface. This name must match the predefined name given to the print server. For the Ethernet Adapter, the default is M_XXXXXX, where XXXXXX represents the last six digits of the network adapter's Ethernet address (e.g., M_091C1A).

Make sure that the print server object you are using for your PSERVER setup has the same name as that stored on the Ethernet Interface. If you need to rename the print server object in Netware Administrator, delete the object and re-create it with the new name. Netware Administrator seems to have some problems with renaming objects.

NOTE: Changing the name will affect all of the protocols that are running on the Ethernet Interface.

HTML Method

1. Load a Web browser on a network station that can communicate with the print server over TCP/IP.
2. Direct your Web browser to URL:
`http://EthernetInterfaceIPAddress/adminConf.html`
(e.g., `http://192.75.11.9/adminConf.html`).

NOTE: If prompted for a “User ID” and password first, type in `root` for the ID and press ENTER at the password prompt (since there is no password by default).

3. Look under the “System Information” section and enter the new name into the “Name” field.
4. Click the SUBMIT button when done and physically repower the printer to make the new settings take effect.

Manual (Telnet) Method

1. **Telnet** to the print server:
`telnet ipaddress`

NOTE: If prompted for a “User ID” and password first, type `root` for the ID and press ENTER at the password prompt (since there is no password by default).

2. You should see a prompt with the Ethernet Interface IP address:
`ipaddress:root>`
3. At the prompt, enter:
`store pserver name name`
4. Reset the unit to ensure the changes take effect.
`reset`

Changing The Ethernet Interface Frame Type (NDS and Bindery Setups)

The Ethernet Interface allows you to store a particular frame type for the unit to adhere to in a Novell environment.

HTML Method

1. Load a Web browser on a network station that can communicate with the print server over TCP/IP.
2. Direct your Web browser to URL:
`http://EthernetInterfaceIPAddress/networkConf.html`
(e.g., `http://192.75.11.9/networkConf.html`).

NOTE: If prompted for a “User ID” and password first, type `root` for the ID and press ENTER at the password prompt (since there is no password by default).

3. Look under the “Novell” section and go to the “Frame Type” field to select the appropriate frametype.
4. Click the SUBMIT button when done and physically repower the printer to make the new settings take effect.

Manual (Telnet) Method

1. Telnet to the print server. This will bring up a login screen:
`telnet ipaddress`

NOTE: If prompted for a “User ID” and password first, type `root` for the ID and press ENTER at the password prompt (since there is no password by default).

2. You should see a prompt with the Ethernet Interface IP address:
`ipaddress:root>`
3. At the prompt, enter:
`store pserver novell frametype [ethernet2 | 802.3 | 802.2 | 802.2snap | autosense]`

Changing The Ethernet Interface Mode (NDS and Bindery Setups)

4. Reset the unit to make the changes take effect:

```
reset
```

Changing The Ethernet Interface Mode (NDS and Bindery Setups)

The Ethernet Interface allows you to store a particular mode for the unit to operate in. This will be either NDS, Bindery, or autosense. If you use autosense, the Ethernet Interface will first attempt to log in to an NDS file server and, if it fails, will try to log in to a Bindery file server.

NOTE: If you are using both NDS and Bindery file servers in your setup, set the mode to auto.

HTML Method

1. Load a Web browser on a network station that can communicate with the print server over TCP/IP.

2. Direct your Web browser to URL:

```
http://EthernetInterfaceIPAddress/  
networkConf.html
```

(e.g., `http://192.75.11.9/networkConf.html`).

NOTE: If prompted for a “User ID” and password first, type `root` for the ID and press ENTER at the password prompt (since there is no password by default).

3. Look under the “Novell” section and go to the “Service Type” field to select the appropriate mode.
4. Click the SUBMIT button when done and physically repower the printer to make the new settings take effect.

Manual (Telnet) Method

1. Telnet to the print server:

```
telnet ipaddress
```

NOTE: If prompted for a “User ID” and password first, type `root` for the ID and press ENTER at the password prompt (since there is no password by default).

2. You should see a prompt with the Ethernet Interface IP address:

```
ipaddress:root>
```

3. At the prompt, enter:

```
store pserver novell mode [nds | bindery | auto]
```

4. Reset the unit to make the changes take effect:

```
reset
```

Setting The Ethernet Interface NDS Context (NDS Setups)

The Ethernet Interface allows you to store the print server object in any context within the NDS tree you choose. By default the Ethernet Interface will look for the print server object in the same context as the file server object it connects to is stored in.

HTML Method

1. Load a Web browser on a network station that can communicate with the print server over TCP/IP.

2. Direct your Web browser to URL:

```
http://EthernetInterfaceIPAddress/  
networkConf.html
```

(e.g., `http://192.75.11.9/networkConf.html`).

NOTE: If prompted for a “User ID” and password first, type `root` for the ID and press ENTER at the password prompt (since there is no password by default).

3. Look under the “Novell” section and enter the new context in the “NDS Context” field.

Setting The Ethernet Interface Preferred NDS Tree (NDS Setups)

4. Click the SUBMIT button when done and physically repower the printer to make the new settings take effect.

Manual (Telnet) Method

1. Telnet to the print server:

```
telnet ipaddress
```

NOTE: If prompted for a “User ID” and password first, type `root` for the ID and press ENTER at the password prompt (since there is no password by default).

2. You should see a prompt with the Ethernet Interface IP address:

```
ipaddress:root>
```

3. At the prompt, enter:

```
store pserver novell context context
```

4. Reset the unit to make the changes take effect:

```
reset
```

Setting The Ethernet Interface Preferred NDS Tree (NDS Setups)

The Ethernet Interface supports Novell environments that have multiple trees. If your environment has more than one tree you may want to set a preferred tree. By default, the Ethernet Interface will try to log in to each tree it finds until it is successful.

HTML Method

1. Load a Web browser on a network station that can communicate with the print server over TCP/IP.

2. Direct your Web browser to URL:

```
http://EthernetInterfaceIPAddress/  
networkConf.html
```

(e.g., `http://192.75.11.9/networkConf.html`).

NOTE: If prompted for a “User ID” and password first, type `root` for the ID and press ENTER at the password prompt (since there is no password by default).

3. Look under the “Novell” section and enter the preferred tree in the “NDS Preferred Tree” field.
4. Click the SUBMIT button when done and physically repower the printer to make the new settings take effect.

Manual (Telnet) Method

1. Telnet to the print server:

```
telnet ipaddress
```

NOTE: If prompted for a “User ID” and password first, type `root` for the ID and press ENTER at the password prompt (since there is no password by default).

2. You should see a prompt with the Ethernet Interface IP address:

```
ipaddress:root>
```

3. At the prompt, enter:

```
store pserver novell tree tree
```

4. Reset the unit to make the changes take effect.

```
reset
```

Novell Host Configuration (10/100Base-T)

ADAPTER,

This section covers PSERVER and RPRINTER/NPRINTER setups on the Ethernet Interface. The Ethernet Interface can handle up to eight RPRINTER/NPPRINTER setups.

WIRELESS ADAPTER

Although the entire print setup is done through Netware Administrator or PCONSOLE, you may need to communicate directly with the print server in order to modify settings, monitor the unit, etc.

For Netware 4.x and Netware 5.x environments, you can obtain a NWAdmn3x snap-in program called MPAdmin. This snap-in can be used to configure PSERVER setups as well as additional settings on the Ethernet Interface.

NOTE: NWAdmn3x is only included with Netware 4.11 and higher releases. If you are using Netware 4.10, you can either upgrade to Netware 4.11 or go to Novell's Web site and get the patches to upgrade the Nwadmin program for Netware 4.10 to Nwadm3x for Netware 4.11. Alternatively, you can perform the setup without using MPAdmin.

NDS PSERVER Setup (Netware 4.x/5.x)

There are a number of ways to configure the Ethernet Interface for use in a Novell NDS PSERVER setup. These include using the MPAdmin snap-in for Netware Administrator, using generic print server objects in Netware Administrator, or by using PCONSOLE. The following steps describe a setup using a generic print server object in Netware Administrator. Setups using PCONSOLE are less common and will not be discussed.

To create a printer/print queue in an NDS environment using Netware Administrator print server objects:

1. Log in to Netware Administrator as a user with security equal to "Admin" on your Novell host.
2. Click the right mouse button on a branch in the tree in which you would like to create a print queue object.
3. Select "Create..." from the pop-up menu. The "New Object" dialog box displays.
4. Select "Print Queue" from the "Class of new object" list, and click "OK."
5. Select "Directory Service Queue" and type the name of the queue into the "Print Queue name" field.
6. Fill in the "Print Queue Volume" field by typing in a volume or browsing for one. Click "Create."
7. Click the right mouse button on a branch in the tree in which you would like to create a printer object.
8. Select "Create..." from the pop-up menu. The "New Object" dialog box displays.

9. Select “Printer” from the “Class of new object” list and click “OK.”

10. Type the name of the printer in the “Printer name” field.

NOTE: The Printer object name must match one of the destination names on the Ethernet Interface. Most likely, this will be `dlprn`.

In NDS, a printer object can only be attached to one print server object at a given time, because Novell uses the printer object to represent a physical printer. A physical printer can only be attached to one parallel or serial port at a time. Thus, if you assign a printer object to another print server object, the new print server object will “steal” it from the old one (this also happens with non-Ethernet Interface print server objects).

To properly process print jobs sent to the Ethernet Interface, the printer object created in Novell must refer to the destination on this server and not to the actual physical printer. On the Ethernet Interface, print jobs must pass through an extra layer (a “destination”) before being sent on to the printer.

If you are using multiple print servers, you will have to either rename all your destinations to ensure that no printer object names conflict or keep all the printer objects for one print server in a different context than those for the other print server.

11. Select “Define additional properties” and click “Create.”

12. Click “Assignments” in the dialog box and then click the “Add...” button.

13. Select the queue you defined earlier or browse for a different one.

14. Click “OK” to assign the queue to the printer.

15. Click “OK” to close the “Printers Details” dialog box and make the changes permanent.

16. Click on a branch in the tree (i.e., context) that you would like to create the Ethernet Interface print server object in.

NOTE: If the context you choose is different than the one the file server object for the file server you are using is in, you must set the context on the Ethernet Interface. See “Setting The Ethernet Interface NDS Context (NDS Setups)” on page 202.

17. Click the right mouse button to bring up a submenu and choose “Create...” from this menu.

18. A dialog box titled “New Object” displays. In the “Class of new object” list, select “Print Server” and click “OK.”

19. Type the name for the print server in the “Print Server name” field. For the Ethernet Adapter, the default is M_XXXXXX, where XXXXXX represents the last six digits of the network adapter's Ethernet address (e.g., M_091C1A).

NOTE: The name you use here must match the name stored on the Ethernet Interface. This name can be found by using the `list pserver` command. See “List Commands” on page 356 for more information.

20. Select the “Define additional properties” and click the “Create” button.

21. Click “Assignments” in the dialog box and then the “Add...” button.

22. Select the printer you created earlier.

23. Click “OK” to assign this printer to this print server.

24. Click “OK” to close the “Printer Servers Details” dialog box and make the changes permanent.

25. Physically repower the printer to make the new settings take effect.

Bindery PSERVER Setup (Netware 3.x, Netware 4.x, and Netware 5.x)

A Bindery PSERVER setup is possible under both Netware 3.x, Netware 4.x and Netware 5.x. If you are using Netware 4.x or Netware 5.x, Bindery emulation is required. Please consult your Novell manual on how to set up Bindery emulation. A Bindery set up using PCONSOLE in Netware 3.x is described in “NetWare Version 3.x RPRINTER Setup” on page -179. The setup using PCONSOLE in Netware 4.x or Netware 5.x is described in “NetWare Version 4.x and 5.x RPRINTER Setup” on page 185.

Referencing A Bindery Queue In NDS (Netware 3.x, Netware 4.x, and Netware 5.x)

If you would like to reference a Bindery queue when you perform your PSERVER setup in NDS, you must create a PSERVER object for the Ethernet Interface on the file server where the Bindery queue resides. This is important because, in order to service the queue, the Ethernet Interface must log in to the queue’s file server. Since the queue is not an NDS queue, the Ethernet Interface cannot log in under NDS, so it must log in under Bindery.

This will only work if there is a valid PSERVER object on the file server. This PSERVER object must have the same name that was used for the NDS setup. For the Ethernet Adapter, the default is M_XXXXXX where XXXXXX represents the last six digits of the network adapter’s Ethernet address (e.g., M_091C1A). This PSERVER object does not need any printers or queues assigned to it. Also, when referencing a Bindery queue in NDS, set the Novell Mode on the Ethernet Interface to “auto” so that both NDS and Bindery logins are possible. See “Setting The Ethernet Interface NDS Context (NDS Setups)” on page 202.

RPRINTER/NPRINTER Setup (Netware 3.x, Netware 4.x, and Netware 5.x)

This procedure associates an existing PSERVER with a remote Ethernet Interface acting as a RPRINTER/NPRINTER in a Netware 3.x, Netware 4.x, or Netware 5.x environment. It is the PSERVER's responsibility to get jobs from the queue and to pass them off to the Ethernet Interface acting as the remote printer. Unlike a PSERVER setup, the Ethernet Interface does not deal directly with the queues.

NOTE: As a RPRINTER/NPRINTER, the print server does not use a login ID. A non-Ethernet Interface print server such as PSERVER.NLM or PSERVER.EXE must be running for RPRINTER to operate. Also, if the Ethernet Interface loses a connection to a PSERVER, it will automatically reconnect when that server becomes available again.

The following steps assume that you have created a PSERVER object in Netware 3.x, Netware 4.x, or Netware 5.x and have assigned printers and queues to it. If you have not already done this, do it now. The setup is similar to creating a PSERVER setup for the Ethernet Interface, except that there are no restrictions about which names may be used for the print server and printer objects.

NOTE: Write down the printer number(s) assigned to the printer(s) you are going to be using for this setup. You will need them in a later step.

HTML Method

1. Load a PSERVER on your Netware 3.x, Netware 4.x, or Netware 5.x file server (i.e., issue a `load pserver pservername` command on the file server).

NOTE: If it is an NDS PSERVER on a Netware 4.x/5.x file server, you must specify the PSERVER name and context for `pservername`. For example:

```
load pserver .sales_ps.sales.microplex
```

2. Load a Web browser on a network station that can communicate with the print server over TCP/IP.

3. Direct your Web browser to URL:
`http://EthernetInterfaceIPAddress/
networkConf.html`
(e.g., `http://192.75.11.9/networkConf.html`).

NOTE: If prompted for a “User ID” and password first, type in `root` for the ID and press ENTER at the password prompt (since there is no password by default).

4. Look under the “Novell” section and find a row in the RPRINTER category.
5. Click “Enabled” and enter the name used with the PSERVER.NLM into the “Print Server Name” field.

NOTE: If it is an NDS pserver, enter only the PSERVER name and not the context (e.g., `sales_ps`).

6. Enter the printer number of the printer you would like serviced into the “Printer Number” field, and then select the destination on the Ethernet Interface you would like to use for output.
7. Repeat steps 4 through 6 for each additional printer you would like to have serviced.
8. Click the SUBMIT button when done and physically repower the printer to make the new settings take effect.

Manual (Telnet) Method

1. Load a PSERVER on your Netware 3.x, Netware 4.x, or Netware 5.x file server (i.e., issue a `load pserver pservername` command on the file server).

NOTE: If it is an NDS PSERVER on a Netware 4.x/5.x file server, you must specify the pserver name and context for `pservername`. For example:
`load pserver .sales_ps.sales.IBM`

2. **Telnet** to the print server:
`telnet ipaddress`

NOTE: If prompted for a “User ID” and password first, type `root` for the ID and press ENTER at the password prompt (since there is no password by default).

RPRINTER/NPRINTER Setup (Netware 3.x, Netware 4.x, and Netware 5.x)

3. You should see a prompt with the Ethernet Interface's IP address:

```
ipaddress:root>
```

4. At the prompt, **store** the RPRINTER settings on the Ethernet Interface. The *pservername* refers to the existing PSERVER.NLM on the file server created in step 1.

Syntax:

```
store rprinter add <pservername> <printernumber>  
<EthernetInterfacedestination>
```

An example of an RPRINTER servicing printer 0 of the PSERVER.NLM called *pserver1* and sending jobs to the Ethernet Interface destination *d1prn* is:

```
store rprinter add pserver1 0 d1prn
```

- NOTE:** If it is an NDS pserver, enter only the PSERVER name and not the context (e.g., *sales_ps*).

5. Physically repower the printer to make the new settings take effect.

Wait two minutes and then check your PSERVER to see if the appropriate printer is being serviced. The printer should display a message such as "Waiting for job." At this point, the Ethernet Interface knows to receive any jobs this PSERVER.NLM has to send to it through the defined printer.

NDPS Configuration (Netware 4.11 and Above)

Overview

In 1998, Novell released a new printing system designed to make network administration of printers easier and more fully functional. This system is called Novell Distributed Print Services (NDPS), and can be used with Novell Netware 4.11 and above along with the supporting software on clients. This section gives high-level instructions to install and use NDPS with the printer. These instructions assume that you understand NDPS architecture well enough to be able to use these instructions along with Novell's instructions to install the Ethernet Interface into NDPS. See Novell's documentation to understand terms not defined here.

The drivers used with the IBM printer, can be found on www.printers.ibm.com. For a driver to be automatically downloaded to a Windows machine when an NDPS printer is installed, the driver must be installed into the NDPS Broker Resource Management Service. See Novell's documentation for more information.

The Ethernet Interface can be installed into NDPS using the Novell Printer Gateway feature of NDPS. Within this Novell Printer Gateway, various printer connection modes can be used to install the printer into NDPS. The ones described here are:

- Setup using Forward Jobs to a Queue Mode
- Setup using LPR Mode
- Setup using RPRINTER Mode

Setup using Forward Jobs to a Queue Mode

In this mode, an NDPS printer agent receives jobs from an NDPS client, then forwards these jobs to an existing Netware queue. The Netware queue would then be serviced by the printer in some manner.

1. The IBM printer must first be set up to service some Netware queue, either by doing a PSERVER or RPRINTER mode setup from previous chapters.
2. When setting up the NDPS printer agent, use the “Novell Printer Gateway”.
3. For the “Novell PDS”, choose “((NONE))”.
4. For the “Port Handler”, choose “Forward Jobs to a Queue”, then choose the queue used in step 1 above, and note the Caution statement about the Queue User Name.
5. For the “Select Printer Drivers” dialog, choose no driver unless you have a driver installed into the Broker's RMS which is to be used with the printer.

Any jobs sent to this printer agent will then be forwarded to the specified queue.

Setup using LPR Mode

In this mode, an NDPS printer agent receives jobs from an NDPS client, then forwards these jobs to a printer using the LPR protocol.

1. The printer must first be set up with IP connectivity and be able to receive jobs using the LPR protocol.
2. When setting up the NDPS printer agent, use the “Novell Printer Gateway”.
3. For the “Novell PDS”, choose “((NONE))”.
4. For the “Port Handler”, choose “Remote (LPR on IP)”, then enter the hostname/ipaddress and printer name (d1prn – d8prn by default) in the next dialog.

NOTE: When the IPDS feature is installed, queue name d4prn is not available.

5. For the “Select Printer Drivers” dialog, choose no driver unless you have a driver installed into the Broker's RMS which is to be used with the printer.

Setup Using RPRINTER Mode

In this mode, an NDPS printer agent receives jobs from an NDPS client, then forwards these jobs to a printer using the RPRINTER IPX protocol.

1. The printer must first be set up to function in RPRINTER mode, choosing any desired Print Server Name and Printer Number.
2. When setting up the NDPS printer agent, use the “Novell Printer Gateway”.
3. For the “Novell PDS”, choose “((NONE))”.
4. For the “Port Handler”, choose “Remote (rprinter on IPX)”.
5. In the next dialog, for the “SAP Name” enter the Print Server Name from step 1, and enter the Printer Number from step 1 above.
6. For the “Select Printer Drivers” dialog, choose no driver unless you have a driver installed into the Broker's RMS which is to be used with the printer.

The printer will need to be rebooted to attach to the NDPS printer agent in this mode.

Troubleshooting (10/100Base-T)

PSERVER Setup

If you cannot get a connection with the Ethernet Interface after completing the print setup, confirm the following:

- Have you tried repowering the Ethernet Interface? Wait about a minute before checking if it has logged in and attached to a queue.
- Is the network connector fastened tightly to the unit?
- Is the Ethernet Interface already servicing a queue on another file server? If so, it cannot service another file server at the same time.
- Is there an available Netware user license for the Ethernet Interface to utilize while it acts as a PSERVER? Every PSERVER takes up one user license since it logs in to the Novell file server.
- When going through the PSERVER setup steps, did you name the Ethernet Interface M_XXXXXX, where XXXXXX represents the last six digits of the network adapter's Ethernet address? This is the default format of the unit's name when it is acting as a PSERVER.

NOTE: This "M_XXXXXX" and name must have six digits after the "_" so, if necessary, pad out each byte with a zero (0).

- Has the Ethernet Interface's name been changed from its default of "M_XXXXXX" and if so, have you incorporated this new name into your PSERVER setup?
- Is there a password set for the print server to utilize when it is logging in to the file server? Make sure the Ethernet Interface's PSERVER password matches that of the PSERVER setup, or set both places to no password.

- When setting the Ethernet Interface up as a PSERVER, did you specify a destination on the Ethernet Interface (e.g., `d1prn`) for the printer name, and did you remember this name is case sensitive?

NOTE: Ethernet Interface destinations are case sensitive, so they will not be recognized if they are typed incorrectly. By default, they are all in lowercase. If you are setting up in a Netware 4.x or Netware 5.x environment, the destination must be renamed to uppercase to match the PCONSOLE or Netware Administrator entry. Please see “`set dest <dest> name <new_name>`” on page 344 for information on changing names.

- Does the destination you used in your PSERVER setup have the Novell service enabled? Please see “Commands” on page 327 for information on enabling/disabling services.

NOTE: The debug information that follows can be found by trying to `telnet` the Ethernet Interface and issuing the commands given or launching a browser to the Novell status page on the Ethernet Interface (e.g., `http://192.168.11.9/networkNovellStatus.html`).

- Find the “IPX Layer” section on the Novell HTML status page. Check that a board has been bound to the Ethernet Interface and that the network number is correct for your network. If not, you may want to set a specific frame type for the Ethernet Interface to use.
- Find the “File Servers” section on the Novell HTML status page. If no file servers show up, then there is probably a problem with the network connection, or the Ethernet Interface is not on a Novell network. Find the “SAP” section on the Novell HTML status page to see if the Ethernet Interface is seeing any network activity.

- Find the “PSERVER” section on the Novell HTML status page. Look for a valid queue under the “EPS QUEUES” section. If the printer field contains a number, and there is a valid file server but no queue, then you probably made an error in the setup. At this point try again. If it is an NDS PSERVER setup, look for a line with the following type of message: “Could not login to NDS Tree <TREE> as <PSERVER.<CONTEXT>”. This indicates one of the following: the tree is wrong; the context stored on the Ethernet Interface for the print server object is wrong; the print server object password is wrong; or the print server object name is wrong.
- Find the “RPRINTER” section on the Novell HTML status page. Look for the following type of line: “(0:ENPReadConfig):[0:213] Destination = <X>”, where <X> is between 0 and 3. If they all read: “Destination = 65536,” then the PSERVER setup did not complete properly. If there is a valid “Destination =” line, then double check that there is an entry for this number under the “ENP INFO” section.
- Find the “General Messages” section on the Novell HTML status page. Look for a valid entry for the printer. It will look similar to: “(0:InitSinglePrinter): printer=<X> name=<NAME>”. Then look for the following lines: “(0:Printf): RemoteMonitor(<X>); printer is” and “(0:Printf): WAITING_FOR_JOB”. If you see these lines, the Ethernet Interface is set up properly, and the problem points to a setup issue on the workstation.
- If the Ethernet Interface has logged in to the file server but has not attached to the queue, there may be a permission problem. Make sure the appropriate users have rights to this queue (they should be in the group “everyone”). Also, you may have to assign the queue to `root` so it is available to everyone.
- Did you rename any objects in Netware Administrator during your setup? Netware Administrator seems to have a problems renaming objects. If so, delete everything and start over.

If none of these solutions help your situation, try the whole setup again. Completely delete the setup that is giving you trouble and go through the setup again, following each step carefully.

NOTE: After completing a PSERVER setup and before beginning a new setup, be sure to reboot the printer. Wait at least a minute for the Print Server to login and attach to a queue.

RPRINTER/NPRINTER Setup

If you cannot get a connection with the Ethernet Interface after completing the print setup, confirm the following:

- Have you tried repowering the printer? Wait about a minute before checking to see if it has logged in and attached to a queue.
- Is the network connector fastened tightly to the unit?
- Is the Ethernet Interface already servicing a queue on another file server? If so, it cannot service another file server at the same time.
- Is an entry produced when a `list rprinter telnet` command is done on the Ethernet Interface (not found on the Novell HTML status page)? When the Ethernet Interface is configured as an RPRINTER, this command should produce the appropriate entry.
- If the Ethernet Interface has logged in to the file server but has not attached to the queue, there may be a permission problem. Make sure the appropriate users have rights to this queue (they should be in the group “everyone”). Also, you may have to assign the queue to `root` so it is available to everyone.

- Does the destination you used in your RPRINTER setup have the Novell service enabled? Please see “Commands” on page 327 for information on enabling/disabling services.
- Find the “IPX Layer” section on the Novell HTML status page. Check that a board has been bound to the Ethernet Interface and that the network number is correct for your network. If not, set a specific frame type for the Ethernet Interface to use. You can find out what frame type is bound to which board number from the “ODI Layer” section on the Novell HTML status page.
- Find the “SAP” section on the Novell HTML status page to see if the Ethernet Interface is seeing any network activity.
- Find the “RPRINTER” section on the Novell HTML status page. Look for an entry for one of the numbers 4 to 7 under “ENP INFO.” The “dest” field should match the destination used on the Ethernet Interface. If no entry is found, check that the destination has the Novell service enabled. If the “ERROR-CODE” field has an error of 308, make sure no other RPRINTER setup is servicing this printer object at the same time. Only one RPRINTER connection is allowed to service a PSERVER.NLM printer.
- If the Ethernet Interface has logged in to the file server but has not attached to the queue, there may be a permission problem. Make sure the appropriate users have rights to this queue (they should be in the group “everyone”). Also, you may have to assign the queue to `root` so it is available to everyone.

If none of these help your situation, try the whole setup again. Completely delete the setup that is giving you trouble and go through the setup again following each step carefully.

NOTE: After completing a PSERVER set up and before beginning a new set up, be sure to reboot the printer. Wait at least a minute for the Print Server to login and attach to a queue.

Printing Related

The Job Goes To The Queue But Nothing Prints

If nothing is printing, first make sure you have a connection to the Ethernet Interface. Please see “RPRINTER/NPRINTER Setup” on page 218 if you are having connection-related problems.

Otherwise, consider these points when trying to solve printing problems in a Novell environment:

- Does the job leave the queue or is it stuck there indefinitely? If it leaves properly, the problem points to the actual printing mechanism on your Novell system (e.g., CAPTURE, NPRINT, etc.), to the print job format, or to the printer itself. Otherwise, review the configuration steps you have already followed.
- Have you confirmed that you can print from the Ethernet Interface to the printer and ignore the Novell setup altogether? Please see “start fox|tts|loopb prn” on page -363 for a good test.
- Is anything happening on the printer when the print job is sent? Sometimes, the print job may have arrived at the printer but might be waiting for a manual form feed. If so see “Commands” on page 327 for information on trailer strings.
- Is the printing mechanism you are using (e.g., CAPTURE, NPRINT, etc.) configured to service the appropriate queue?
- Is the Ethernet Interface configured as the queue’s “Currently Attached Server”? If not, make sure you have associated the queue and the printer. See “Novell Host Configuration” on page 176.
- Is there a hold on the print job? If you select the job from PCONSOLE’s CURRENT PRINT JOB ENTRIES, change the User Hold or Operator Hold to “no.”
- If you look in PCONSOLE’s CURRENT QUEUE STATUS within the PRINT QUEUE INFORMATION menu, is the server configured to service entries in this queue? It is possible to turn servicing off here.

If you have followed the suggestions above and are still having printing problems, try rebooting the Ethernet Interface. Then either review every step you took when configuring the Ethernet Interface or try redoing the setup, paying special attention to each step explained in “Novell Host Configuration” on page 176.

The Job Prints Incorrectly

This category can be broken down into several sub-categories such as lost characters, garbled data, extra banner pages, or blank pages at the end of a job. However, the reason for these mishaps can generally be traced back to the printing mechanism used on your Novell system. Consider these points when configuring your print method (e.g., CAPTURE, NPRINT, etc.):

- Did you include the “No Tabs” option?
- Did you specify “No Banner” with PostScript printers?
- Did you turn off banner pages and form feeds if this is already taken care of within an application or on the Ethernet Interface? Doubling up these types of print features is easy to do since these options are provided both on the Ethernet Interface (in a model) and within the print command.
- Are you running the latest version of PSERVER (later than 1.22)? If not, upgrade the PSERVER software.
- In a PSERVER setup, did you ensure that the printer name (e.g., d1prn) was set up as “Defined Elsewhere”?
- Is the timeout option in the CAPTURE command set high enough so the printer does not time out before the print processing has had a chance to complete? This can be a problem with graphic jobs.
- When garbled data persists, consider the following:
 - tab expansion (`xtab`) set on (in a model) with graphic jobs
 - the correct driver for the printer if printing from within Windows

For additional information on these suggestions, please refer to your Netware user manuals.

8

iSeries Configuration, ASCII Printer

Overview

This chapter details a complete iSeries configuration setup including:

- Developing Line Descriptions with CRTLINETH
- Configuring the iSeries for TCP/IP
- Configuring the iSeries for Printing
- Verifying Printing from the iSeries

This document assumes no iSeries printer configuration has been done. If any configuration has been done, please follow the procedure to the point at which continued configuration is required.

Developing Line Descriptions With CRTLINETH

For each LAN adapter on the iSeries, a line description needs to be created for the Ethernet Interface.

If a line description already exists, make sure the SSAP list includes default options “AA” and “12.” You must also know the LAN speed for the iSeries LAN adapter.

NOTE: To change a line description, you need to vary the line off before making the change. After making the change, you need to vary the line back on.

To change an existing line description, use the CHGLINETH command. To create a line description, use CRTLINETH.

NOTE: SSAPs of “AA” and “12” are automatically set as default values in the line description when “*CALC” is used in creating new line descriptions. You do not need to set these values unless they have been changed.

To create a line description, enter the following command:

CRTLINETH LIND(ETHLAN) RSRNAME(LIN041)

Your completed screen should look like Figure 26.

```

5763SS1 V3R2M0 960517                               BLDD60 09/11/96 12:25:46
Line description . . . . . : LIND      ETHLAN
Option . . . . . : OPTION    *ALL
Category of line . . . . . :          *ELAN
Resource name . . . . . : RSRNAME  LIN041
Online at IPL . . . . . : ONLINE  *YES
Vary on wait . . . . . : VRYWAIT  *NOWAIT
Local adapter address . . . . . : ADPTADR *ADPT
Exchange identifier . . . . . : EXCHID 056A1005
Ethernet standard . . . . . : ETHSTD  *ALL
Maximum controllers . . . . . : MAXCTL 40
Error threshold level . . . . . : THRESHOLD *OFF
Text . . . . . : TEXT      *BLANK
-----Active Switched Controllers-----
(No active switched controllers attached)
SSAP list . . . . . : SSAP
-----Source Service Access Points-----
SSAP      Maximum Frame   Type          SSAP      Maximum Frame   Type
  04             1496      *SNA          AA             1496      *NONSNA
  12             1496      *NONSNA      C8             1496      *HPR
Group address . . . . . : GRPADR
-----Group Addresses-----
(No group addresses found)
Link speed . . . . . : LINKSPEED 10M
Cost/connect time . . . . . : COSTCNN 0
Cost/byte . . . . . : COSTBYTE 0
Security for line . . . . . : SECURITY *NONSECURE
Propagation delay . . . . . : PRPDLY *LAN
User-defined 1 . . . . . : USRDFN1 128
User-defined 2 . . . . . : USRDFN2 128
User-defined 3 . . . . . : USRDFN3 128
Autocreate controller . . . . . : AUTOCRTCTL *NO
Recovery limits . . . . . : CMNRCYLMT
  Count limit . . . . . :          2
  Time interval . . . . . :          5

```

Figure 26. Example Ethernet Interface Line Description

The following three parameters must be specified:

Line Description (LIND)

The line description name is the user's name for the iSeries adapter. This name must be identical to the name entered when the TCP/IP is configured on the iSeries.

Resource Name (RSRCNAME)

The system-assigned name for the interface (for example, LIN041).

SSAP

When *CALC is used, the values of "12" and "AA" are entered automatically as defaults. Verify that those SSAP values have not been changed.

Configuring iSeries For ASCII Using TCP/IP

The next step is to configure the interface on the iSeries for TCP/IP.

NOTE: The iSeries interface is not the Ethernet Interface. Do not set the iSeries interface address to the same address as the Ethernet Interface IP address. Also, do not add the Ethernet Interface to the iSeries TCP/IP interface list.

Configuring With ADDTCPIFC

ADDTCPIFC is used to add a TCP/IP interface to the iSeries. This step configures the iSeries for attachments to a TCP/IP network.

At the iSeries command line, enter the following command:

```
ADDTCPIFC INTNETADR ('9.99.15.188') LIND(ETHLAN)  
SUBNETMASK ('255.255.255.0')
```

Your completed screen should look like Figure 27.

System: Add TCP/IP Interface (ADDTCPIFC)		
Internet address:		
Line description:		Name, *LOOPBACK...
Subnet mask:		
Associated local interference	*NONE	
Type of service:	*Normal	*MINDELAY, *MAXTHRPUT...
Maximum transmission unit:	*Lind	576-16388, *LIND
Autostart:	*Yes	*Yes, *No
PVC logical channel identifier + for more values		
X.25 idle circuit timeout	60	1-600
X.25 maximum virtual circuits	64	0-64
X.25 DDN interface	*NO	*YES, *NO
TRLAN bit sequencing	*MSB	*MSB, *LSB

Figure 27. Example of ADDTCPIFC Interface

The following parameters must be specified:

Internet Address

Internet address of the iSeries LAN adapter.

NOTE: Do not use the IP address of the Ethernet Interface.

Subnet Mask

The Subnet Mask for this iSeries TCP/IP interface (for example, 255.255.255.0).

Line Description

The name assigned to the iSeries line description as described in “Developing Line Descriptions With CRTLINETH” on page 223.

NOTE: Each iSeries LAN adapter will have its own line description.

Configuring A Router Definition With ADDTCP RTE

If necessary, use the ADDTCP RTE command to create a route definition. This is required if the printer is somewhere other than on a local segment and must cross bridges.

Configuring A Local Domain And Hostname

The iSeries print commands, described in “Setting Up Printing For ASCII Files” on page 228, require a local name and hostname. If you have already configured LAN attached TCP/IP printers on the iSeries system, you will have a local domain name and hostname configured on the system.

NOTE: If you already have a local domain name and hostname configured on the system, do not change your setup.

If the local domain name and hostname file is empty, the file must be set up. This control file information is used to determine if a print request comes from an authorized host.

To configure the local domain and hostname, you will run the CFGTCP command and select Option “12” from the menu. Enter a local domain name, such as *city.company.com*. Enter a local hostname, such as *as400-01*. This is the name of your iSeries system and must match the hostname for your system in the host entry table. Refer to “Configuring A TCP/IP Host Table Entry” for more information.

NOTE: If the printer and iSeries are not on the same local LAN segment, use CFGTCP Option 2 to verify that there is a route defined in the TCP/IP route list.

Configuring A TCP/IP Host Table Entry

Although creating a TCP/IP host table entry is optional, it is a good idea to take this step. Add the iSeries name and the IP address of the LAN adapter to the “Host Table Entries.”

Configuring The iSeries For Printing

To configure an iSeries for printing, you must:

- set up the printing capability, and
- verify the setup with a print job.

You will need the following information:

Remote Printer Queue name

Set to `'d1prn'` through `'d8prn'`.

NOTE: The Remote Printer Queue name must be in lowercase letters. Do not use “PASS.”

NOTE: When the IPDS feature is installed, the queue name `'d4prn'` is not available.

IP Address

The IP address for the Ethernet Interface.

Setting Up Printing For ASCII Files

The next step is to set up the remote printing capability. There are two ways to do this: you can either specify the LPR parameters manually each time you send a file to the printer, or use Remote Writer and a remote output queue for automatic printing to the printer.

To Use LPR Manually

1. Start TCP/IP, if it is not already running, by entering the command `STRTCP`.
2. At the iSeries command line, enter `LPR`.
3. Figure 28 displays in **bold** the parameters you need to specify.

Send TCP/IP Spooled File (LPR)		
Type choices, press Enter.		
Remote system		
Printer queue		
Spooled file		
Job name	*	Name, *
User		Name
Number		000000-999999
Spooled file number	*ONLY	000000-999999, *ONLY, *LAST
Destination type	*OTHER	*AS400, *PFS2, *OTHER
Transform SCS to ASCII	*YES	*YES, *NO
User data transform	*NONE	Name, *NONE
Library		Name, *LIBL, *CURLIB
Manufacturer type and model	*IBM42011	
Internet address		
Workstation customizing object	*NONE	Name, *NONE

Library		Name, *LIBL, *CURLIB
Delete file after sending	*NO	*NO, *YES
Destination-dependent options		
Print separator page	*YES	*NO, *YES

Figure 28. ASCII LPR Parameters

The following parameter values are required:

Remote System

Enter the hostname of your printer or ***INTNETADR**, which then prompts you to specify the IP address of your printer.

Printer Queue (PRTQ)

Set to `'d1prn'` through `'d8prn'`. The remote printer queue name must be in lowercase letters, entered in single quotes.

NOTE: When the IPDS feature is installed, queue name `'d4prn'` is not available.

Destination Type (DESTTYP)

Specify ***OTHER** for the DESTTYP parameter.

Transform (TRANSFORM)

Specify ***YES**.

Manufacturer Type and Model (MFRTYPMDL)

Select a manufacturer type and model. This is the name of the WSCO. Select ***IBM6500-v** for Proprinter Emulation or **IBM6500-vEP** for Epson Emulation.

Internet Address (INTNETADR)

The IP address of the Ethernet Interface.

NOTE: You may specify either ***INTNETADR** (and the Ethernet Interface IP address) or the hostname for the Ethernet Interface (if you added the printer to the host table entry as directed in “Configuring A TCP/IP Host Table Entry” on page 228).

To Create An Automatic Remote Output Queue

1. From the iSeries command line, enter `CRTOUTQ`.
2. Figure 29 displays in **bold** the parameters you need to specify.

Create Output Queue (CRTOUTQ)

Type choices, press Enter.

Output queue	6500	> Name
Library	*CURLIB	Name, *CURLIB

Maximum spooled file size:

Number of pages	*NONE	Number, *NONE
Starting time		Time
Ending time		Time

+ for more values

Order of files on queue	*FIFO	*FIFO, *JOBNBR
Remote system	*NONE	
Remote printer queue	*USER	
Writer to autostart	*NONE	1-10, *NONE
Queue for writer messages	QSYSOPR	Name

Chapter 8 Configuring The iSeries For Printing

Library	*LIBL	*Name, *LIBL, *CURLIB
Connection type	*SNA	*SNA, *IP, *USRDFN
Destination type	*OS400	*OS400, *OS400V2, *PSF2...
Host print transform	*YES	*YES, *NO
User data transform	*NONE	Name, *NONE
Library		*Name, *LIBL, *CURLIB
Manufacturer type and model	*IBM42011	See NOTE on page 235.
Workstation Customizing Object	*NONE	Name, *NONE
Library		Name, *LIBL, *CURLIB
Image configuration	*NONE	*NONE, *IMGA01, *IMGA02,...
Internet address		
VM/MVS class	A	A, B, C, D, E, F, G, H, I...
Forms Control Buffer	*NONE	Character value, *NONE...
Destination options	*NONE	
Print separator page	*YES	*YES, *NO
User defined option	USRDFNOPT	*NONE
+ for more values		
User defined object:		
Object	*NONE	Name, *NONE
Library		Name, *LIBL, *CURLIB

Object type		*DTAARA, *DTAQ, *FILE...
User driver program	*NONE	Name, *NONE
Library	*NONE	*DTAARA, *DTAQ, *FILE...
Spooled file ASP	*SYSTEM	*SYSTEM, *OUTQASP
Text 'description'	*BLANK	
Additional Parameters		
Display any file	*NO	*NO, *YES, *OWNER
Job separators	0	0-9, *MSG
Operator controlled	*YES	*YES, *NO
Data queue	*NONE	Name, *NONE
Library		Name, *LIBL, *CURLIB
Authority to check	*OWNER	*OWNER, *DTAAUT
Authority	*USE	Name, *USE, *ALL, *CHANGE...

Figure 29. Automatic Remote Output Queue Configuration

3. Enter values for the following parameters:

Output Queue (OUTQ)

The name of the iSeries output queue. The name can be anything you would like. This name is not the same as the printer internal queue name, 'dlprn'.

Remote System (RMTSYS)

Internet address of the Ethernet Interface on the printer (*INTNETADR prompts you for this) or the hostname of the Ethernet Interface.

Remote Printer Queue (RMTPRQT)

Default name of the network printer. Set for any of 'd1prn' through 'd8prn'. The remote printer queue name must be lowercase, entered in single quotes.

NOTE:When the IPDS feature is installed, queue name 'd4prn' is not available.

Writer to Autostart (AUTOSRTWTR)

Set the value to 1. This will start the Remote Writer when the queue is created, and it automatically starts the Remote Writer after each IPL of the iSeries and whenever STRTCP is started.

Connection Type (CNNTYPE)

Specify this value as *IP.

Destination Type (DESTTYP)

Specify *OTHER. *OTHER is a performance enhancement, in which data is not required to be transformed again if the connection is interrupted and allows printing of multiple copies.

Transform (TRANSFORM)

Specify this value as *YES.

Destination Options (DESTOPT)

Specify XAUTOQ, XAIX. XAUTOQ is a performance enhancement, in which data is not required to be transformed again if the connection is interrupted. XAIX allows printing of multiple copies.

Manufacturer Type (MFRTPMDL)

NOTE: Select a manufacturer type and model. This is the name of the WSCO. Select *IBM6500-v for Proprinter Emulation or 6500-vEP for Proprinter for Epson Emulation. Select the Manufacturer Type Model based on the data type.

- a. Report printing, text only, no IGP or barcodes.

Manufacturer Type Model = *IBM6500
Workstation customizing object = *NONE

Since IBM42023 is a Printronix XL emulation, the printer emulation must also be switched to Proprinter emulation. Be sure to save the printer emulation as the power-up configuration.

Alternate selection:

Manufacturer Type Model = *IBM6500EP
Workstation Customizing Object = *NONE

Since IBM6500EP is an Epson emulation, the printer emulation must be also switched to Epson emulation. Be sure to save the printer emulation as the power-up configuration.

- b. PGL or VGL program.

Manufacturer Type Model = *WSCSTCONT132
Workstation Customizing Object = QWPDEFAULT
Library = QSYS

This selects a generic object that passes the data unchanged without any escape codes to the printer. Text files will print in the currently selected printer configuration, cpi, lpi, and form length. OS/400 versions below V3R7 may not have this selection and may require manual creation of a generic WSCST. Please contact your IBM representative for assistance.

NOTE: For occasional text reports, create a printer configuration for each report and use the [Job Select] key to select a report configuration.

Internet address (INTNETADR)

Specify the IP address of the printer.

Troubleshooting

This installation procedure assumes that the Ethernet adapter is configured with the correct IP address, subnet mask, and gateway (if required). In addition you can also ping and telnet to the Ethernet adapter.

Print an E-net Test Page to verify the Ethernet settings.

(6500-v) **DIAGNOSTICS ▶ Printer Tests ▶ E-net Test Page ▶ Enter.**

The default Ethernet queue name is d1prn, however, the name can be changed. Substitute the changed name for the RMTPRTO parameter. To verify the queue name, print an E-net Test Page or telnet to the adapter and perform a “list dest” command.

Verify Printing On iSeries

This section verifies that the printer is capable of printing ASCII files and that the printer can be pinged on the network.

To test ASCII printing:

1. Start TCP/IP, if it is not already running, by entering the command `STRTCP`.
2. Verify that the iSeries TCP/IP interface is active.
3. **P**ing the printer from an iSeries workstation with the command:

```
ping ip_address.
```

Where *ip_address* is the Internet address of the remote system printer (the Ethernet Interface) or the hostname of the printer (if you put the hostname in the host entry table as directed in “Configuring A TCP/IP Host Table Entry” on page 228).

4. If the printer cannot be pinged, proceed to “iSeries ASCII Troubleshooting” on page 237.
5. Use one of the following methods to send a spooled file to the printer:
 - Enter the LPR command on the iSeries command line with the appropriate parameters. See “To Use LPR Manually” on page 229.
 - Enter `STRMTWTR name` on the iSeries command line, where *name* is the name of the iSeries remote output queue (not the printer Internet queue, as described on “To Create An Automatic Remote Output Queue” on page 231).
 - Use the `WRKOUTQ` command to send jobs.

iSeries ASCII Troubleshooting

During power up, the printer performs an interface hardware test. The presence of the ETHERNET PARAMS menu selection at the printer control panel indicates that the Ethernet Interface hardware is functioning properly. See the *User's Manual* for configuration menu information.

If you have trouble pinging the printer:

1. Verify the configuration of the iSeries, including the printer and any intervening devices such as routers and bridges.
2. Verify that the iSeries line description is varied on and the printer is turned on and displays an ONLINE status.
3. Verify that the iSeries TCP/IP is active.

TCP/IP Access Problem

If you can ping the printer from a workstation, but you cannot Web browse, Telnet, or print to the printer through the Ethernet Interface, there may be an incorrect entry in the TCP access list. So that the workstation can use the Ethernet Interface in this case, one of two things must happen:

- the TCP list must have an entry added to grant access to this workstation, or
- all entries must be deleted from the TCP list to grant all workstations/hosts access to the above TCP services.

To view the current access list, use the printer control panel to access the menu. See the *User's Manual* for configuration menu information. From the Operator Print Test menu, choose the Ethernet Test Page. When the page prints, look under the "TCP ACCESS TABLE" section for the TCP access list entries.

To add/delete a TCP access list entry, refer to "TCP Access Lists" on page 369.

NOTE: When the following procedure is used, the TCP access list will be cleared, but all IP addresses will need to be entered again after the procedure is complete.

To reset all Ethernet Adapter or Wireless TCP/IP values to the factory defaults when access is impossible:

1. Obtain a printer configuration printout using the control panel. See the *User's Manual* for configuration menu information.
2. Power off the printer.
3. On the Ethernet Adapter or Wireless Interface, place SWITCH 1 in the down position.
4. Power on the printer and wait for the ONLINE state.
5. On the Ethernet Adapter or Wireless Interface, place SWITCH 1 in the up position.

6. From a workstation attached to this network segment, create an ARP entry. The Ethernet Interface IP address and hardware or MAC address are needed. At the workstation, enter:

```
arp -s <ipaddress> <MACaddress>
ping <ipaddress>
```
 7. Try to ping this IP address to see if the Ethernet Interface can be seen on your network. If the interface does not respond, verify you are on the same network segment as the printer and that the ARP entry was created.
 8. Telnet into the Ethernet Interface using the same IP address as above. Log in as root with no password.
 9. At system prompt, enter:

```
store tcpip from default
config http on
reset
```
- NOTE:** This will reset all TCP/IP settings to factory default and reset the Ethernet Interface.
10. Wait five minutes for the Ethernet Interface to reset.
 11. Power the printer off and then back on.
 12. Wait for the “ETHERNET IS READY” message to display.
 13. Set the IP address, subnet mask, and default gateway parameters to the desired values. (See “Configuration Tools” on page 52.)

Web Browser/HTTP Problem

In some cases you may not be able to browse the printer Web page simply because the Ethernet Interface HTTP may be turned off.

If you cannot ping the Ethernet Interface IP address, make sure the IP address, subnet mask, and default gateway are set correctly by checking the ETHERNET PARAMS menu from the control panel. See the *User's Manual* for configuration menu information.

If you can ping the Ethernet Interface IP address but cannot access the Web pages, perform the following procedure to verify the Ethernet Interface HTTP is turned on:

1. **Telnet** into the Ethernet Interface and log in as **root** with no password.
2. At the system prompt, enter the following commands:

```
config http on
save
reset
```
3. After approximately 5 minutes, point your browser to the Ethernet Interface IP address. The printer Web pages should now be accessible.

9

iSeries Configuration, IPDS Printer

Configuring On iSeries As An IPDS Printer

Use this chapter to configure your printer on iSeries as an IPDS printer. To print IPDS, you must install the IPDS option on your printer. Once configured as an IPDS printer, the printer can also print AFP™ and SCS, but these datastreams must be converted to IPDS first.

NOTE: Do not cancel IPDS print jobs by using WebPage cancel.

Printing AFP, IPDS, And SCS Files

Printers configured as IPDS only print IPDS files. AFP and SCS files can be printed, but they must be transformed to IPDS before printing.

- APF files are transformed directly by Print Services Facility™ (PSF), which then sends the transformed file to the printer.
- SCS files are transformed into IPDS by setting the IPDSPASTHR parameter to YES (see Figure 32 on page 250 or Figure 31 on page 247). This path yields the best performance by sending IPDS files directly to the printer with no transform.

Requirements

Contact technical support to obtain the latest PTFs for PSF.

For IPDS printing, you also need to install the IPDS option on the printer.

Configuration Checklist

NOTE: All of the following configuration steps carried out on the iSeries may require “create” or “change” authority.

1. If you have not already done so, set up the printer and install the Ethernet Interface. See “Configuration Using The Control Panel” on page 53.
2. Using the printer control panel, set up the printer for IPDS by setting the parameters and values shown in Table 10.

Table 10. Control Panel Settings

Menu	Item	Setting
C/T PORT	Port Type	Twinax
TWINAX SETUP 4234-12	IPDS Emulation	I4234-12

3. Set TCP/IP addresses for the printer, such as an IP Address, Gateway Address, or Subnet Mask. See “Configuration Tools” on page 52.
4. If the printer and iSeries are not on the same LAN segment, verify there is a route defined in the TCP/IP route list. If necessary, use the `ADDTCPRTE` command to create a route definition. You need this if your printer is somewhere other than on a local segment.
5. You need the IP address of the Ethernet Interface to configure the Ethernet Interface.

Configuring An iSeries TCP/IP Interface With ADDTCPIFC

6. If you have not done so yet, create a line description for your Ethernet Interface. See “Developing Line Descriptions With CRTLINETH” on page 223.
7. Create or verify the existence of an iSeries TCP/IP interface for the Ethernet Interface. See “Configuring An iSeries TCP/IP Interface With ADDTCPIFC” on page 243.
8. The next step depends on your iSeries release. See “Configuring PSF For IPDS On V3R7 Or V4R1” on page 246 to configure your printer.

NOTE: When the IPDS feature is installed, the queue name ‘d4prn’ is not available.

9. Verify the printer is ON using the `VFYCFG` command.
10. Verify that TCP/IP has been started using the `STRTCP` command.
11. Test your configuration. See “Verifying The IPDS Configuration On iSeries” on page 259.
12. To share the printer on the network, verify that the necessary parameters have been set correctly. See “Sharing The iSeries Printer On The Network” on page 260.
13. If you have problems, refer to “iSeries Troubleshooting” on page 262.

Configuring An iSeries TCP/IP Interface With ADDTCPIFC

NOTE: Do not enter the IP address of the Ethernet Interface. Do not set the iSeries interface address to the same address as the Ethernet Interface IP address. Also, do not add the Ethernet Interface to the iSeries TCP/IP interface list.

Configuring An Interface For Ethernet

ADDTCPRFC is used to add a TCP/IP interface to iSeries. This step configures the iSeries for attachments to a TCP/IP network.

1. At the iSeries command line, enter the following command:

```
ADDTCPRFC INTNETADR ('9.99.15.188') LIND(ETHLAN)  
SUBNETMASK ('255.255.255.0')
```

2. Your completed screen should look like Figure 30.

System: ADDTCPRFC	
Internet address:	
Line description	
Subnet mask:	
Associated local interface	*NONE
Type of service	*NORMAL
Maximum transmission unit:	*LIND
Autostart:	*YES
PVC logical channel identifier	
+ for more values	
X.25 idle circuit timeout	60
X.25 maximum virtual circuits	64
X.25 DDN interface	*NO
TRLAN bit sequencing	*MSB

Figure 30. Example ADDTCPRFC Interface

3. The following parameters must be specified:

a. Internet Address

Internet address of the iSeries Ethernet LAN adapter.

NOTE: Do not use the IP address of the Ethernet Interface.

b. Subnet Mask

The Subnet Mask for this iSeries TCP/IP interface (for example, **255.255.255.0**).

c. Line Description

The name assigned to the iSeries line description as described in “Developing Line Descriptions With CRTLINETH” on page 223. Each iSeries LAN adapter will have its own line description.

Configuring A TCP/IP Host Table Entry

Although optional, it is recommended that you create a TCP/IP host table entry. Add the iSeries name and the IP address of the LAN adapter to the “Host Table Entries.” Also, add the hostname and IP address of the printer to the list. You can access the host table entries function by using the `CFGTCP` command, then selecting option 10 from the menu.

You can also add entries to your host table for both the hostname and the fully qualified network name for your system. The entry name should match the name you configured for host and domain. For example, if your hostname is “RCHASM03” and your domain name is “RCHLAND.IBM.COM”, your fully qualified network name is “RCHASM03.RCHLAND.IBM.COM”. In your host entry table, enter both RCHASM03 and RCHASM03.RCHLAND.IBM.COM.

Configuring PSF For IPDS On V3R7 Or V4R1

To configure IPDS on iSeries V3R7 and above, use the following commands:

- CRTPSFCFG (Optional)
- CRTDEVPRT

Configuring AFP With CRTPSFCFG On V3R7 Or V4R1 (Optional)

New for V3R7 is the ability to specify three TCP/IP-related parameters for PSF in a printer device description: RMTLOCNAME, PORT, and ACTTMR. In V3R2, CRTPSFCFG, which replaced WRKAFF2, was used to specify these same parameters, along with other parameters. In V3R7 and higher, these three parameters are ignored when specified in a PSF configuration object, since they are specified in a printer device description. However, you may wish to use a PSF configuration object to specify other parameters, such as IPDS pass through and so on.

The PSF configuration object created with this command is used by PSF when printing IPDS files only if the object is specified with the USRDFNOBJ parameter in the printer device description.

To configure iSeries for IPDS printing on V3R7 or V4R1:

1. At the iSeries command line, enter a command in the form:

```
CRTPSFCFG  PSFCFG(AFP/NET6500
           IPDSPASTHR(*YES) RLSTMR(*SEC15)
           TEXT('printer_type NETWORK PRINTER')
```

2. A completed screen looks like Figure 31.

PSF Configuration Information	
PSF configuration: NET6500-v	Library: AFP
User resource library:	*JOBLIBL
IPDS pass through:	*YES
Activate release timer:	*NORDYF
Release timer:	*SEC15
Restart timer:	*IMMED
SNA retry count:	2
Delay time between retries:	0
Blank page:	*YES
Page size control:	*YES
Resident fonts:	*YES
Resource retention:	*YES
Edge orient:	*NO
Remote location:	
Name or address:	*NONE
TCP/IP port:	*NONE
TCP/IP activation timer:	170
PSF defined options:	
*NONE	
Text description:	6500-v Network Printer
Device resource library list:	*DFT

Figure 31. Example CRTPSFCFG Command (V3R7 or V4R1)

NOTE: The lines in **bold** in Figure 31 are not used by PSF. Instead, PSF uses the information entered in the device description screen.

3. The following parameters are recommended:
 - a. **PSF configuration (PSFCFG)**

The name used for this PSF configuration object. The name must match the user-defined object name (USRDFNOBJ) in the printer DEVD.
 - b. **IPDS pass through (IPDSPASTHR)**

To print SCS files, specify ***YES**, PSF transforms SCS into IPDS before printing.
 - c. **Activate release timer (ACTRLSTMR)**

Specifies the point at which the release timer (RLSTMR) is activated. Set to ***NORDYF**.
 - d. **Release timer (RLSTMR)**

Specifies the amount of time to wait before a session or dialog is released without terminating the writer. The ACTRLSTMR parameter specifies when this timer is to be activated. Set the parameter to a value at least equal to the TIMEOUT value on the printer. The recommended value is ***SEC15**.
 - e. **Page Size Control (PAGSIZCTL)**

Specifies if the page size (FORMS) is set by PSF/400. Usually set to ***YES**.

Configuring PSF With CRTDEVPRT On V3R7 Or V4R1

This section describes how to create a printer device description.

1. At the iSeries command line, enter a command in the form:

```
CRTDEVPRT DEVD(NETPRT64) DEVCLS(*LAN) TYPE(*IPDS)
MODEL(0) LANATTACH(*IP) AFP(*YES) PORT(5001)
FONT(11) FORMFEED(*CONT)
RMTLOCNAME('128.9.12.134')
USRDFNOBJ(AFP/5000NETPRT *PSFCFG)
TEXT('printer_type NETWORK PRINTER')
```

NOTE: Only use the USRDFNOBJ parameter if it was defined in the previous procedure. See “Configuring AFP With CRTPSFCFG On V3R7 Or V4R1 (Optional)” on page 246.

2. A completed screen looks like the example shown in Figure 32.

Display Device Description		
5716SS1 V3R7M0 961108	BLDRB1	
Device Description:	DEVD	<i>NETPRT64</i>
Option:	OPTION	*ALL
Category of device:		*PRT
Device class:	DEVCLS	*LAN
Device type:	TYPE	*IPDS
Device model:	MODEL	0
LAN attachment:	LANATTACH	*IP
User-defined object:	USRDFNOBJ	<i>NET6500-v</i>
Library:		AFP
Object type:		*PSFCFG
Data transform program:	USRDTATFM	*NONE
User-defined driver program:	USRDRVPGM	*NONE
Advanced function printing:	AFP	*YES

Chapter 9 Configuring On iSeries As An IPDS Printer

Port number:	PORT	5001
Online at IPL:	ONLINE	*YES
Font:	FONT	
Identifier:		011
Point size:		*NONE
Form feed:	FORMFEED	*CONT
Separator drawer:	SEPDRAWER	*FILE
Separator program:	SEPPGM	*NONE
Library:		
Printer error message:	PRTERRMSG	*INQ
Message queue:	MSGQ	QSYSOPR
Library:		*LIBL
Activation timer:	ACTTMR	170
Maximum pending requests:	MAXPNDRQS	6
Print while converting:	PRTCVT	*YES
Print request timer:	PRTRQSTMR	*NOMAX
Form definition:	FORMDF	F1C10110
Library:		*LIBL
Remote location:	RMTLOCNAME	
Name or address:		128.9.12.134
Dependent location name:	DEPLOCNAME	*NONE
Text:	TEXT	6500-v Network Printer
User-defined options:	USRDFNOPT	

Figure 32. Example CRTDEVPRN Command (V3R7 and above)

3. Values must be entered for the following parameters:
 - a. **Device Description (DEV D)**

The device description or name.
 - b. **Device Class (DEVCLS)**

Specify *LAN
 - c. **Device Type (TYPE)**

Specify *IPDS
 - d. **Device Model (MODEL)**

Specify 0
 - e. **LAN Attachment (LANATTACH)**

Specify *IP
 - f. **Port Number (PORT)**

Specify 5001
 - g. **Font (FONT)**

Enter an appropriate value.
 - h. **Form Feed (FORMFEED)**

Specify *CONT
 - i. **Activation Timer (ACTTMR)**

This value specifies the number of seconds that PSF waits for a printer to respond to an activation request. If only one system is using the printer, use the default value (170 seconds). If more than one system is using the printer, specify *NOMAX, which causes PSF to wait indefinitely for a response to an activation request.
 - j. **Remote Location (RMTLOCNAME)**

Enter the IP address or hostname of the printer.

k. User-Defined Object (USRDFNOBJ)

To use a PSF configuration object, specify its name and library here. This object type must be *PSFCFG. For V3R7 and higher, a single PSF configuration object may be referenced by multiple device descriptions, if required.

Configuring PSF for IPDS On V4R2 And Above

To configure IPDS on the iSeries V4R3, use the following commands:

- CRTDEVPRT
- CRTPSFCFG (Optional)

Configuring AFP with CRTPSFCFG on V4R3 and above (Optional)

To configure the iSeries for IPDS printing on V4R3:

1. At the iSeries command line, enter a command in the form:

```
CRTPSFCFG PSFCFG(AFP/NETPRT6500-v) IPDSPASTHR(*YES)
RLSTMR(*SEC15) TEXT(`IBM 6500-v NETWORK ATTACHED
PRINTER`) PAGESIZCTL(*YES) ACTRLSTMR(*NORDYF)
```

2. A completed screen looks like Figure 33.

Configuring PSF for IPDS On V4R2 And Above

Create PSF Configuration (CRTPSFCFG)		
PSF configuration		Name
Library	>*CURLIB	Name, *CURLIB
User resource library list	*JOBLIBL	*JOBLIBL, *CURLIB, *NONE
Device resource library list	*DFT	Name, *DFT
	+ for more values	
IPDS pass through	>*NO	*NO, *YES
Activate release timer.....	*NORDYF	*NORDYF, *IMMED...
Release timer	>*NOMAX	1-1440, *NOMAX, *SEC15...
Restart timer.....	*IMMED	1-1440, *IMMED
APPC and TCP/IP retry count ...	15	1-99, *NOMAX
Delay between APPC retries.....	90	0-999
Acknowledgment frequency	100	1-32767
Printer response timer	*NOMAX	5-3600, *NOMAX
Generate PDF output	*NONE	*NONE, SPLF, *STMF, *MAIL
Text 'description'	>*BLANK	
	Additional Parameters	
Automatic session recovery:		
Enabled	*NO	*NO, *YES
Message option		*INFO, *INQ
Blank page	*YES	*YES, *NO
Page size control	>*YES	*NO, *YES
Resident fonts	*YES	*YES, *NO
Resource retention	*YES	*YES, *NO
Edge orient	*NO	*YES, *NO
Use outline fonts.....	*NO	*YES, *NO
PSF defined option.....	*NONE	
	+ for more values	
Font substitution messages.....	*YES	*YES, *NO
Capture host fonts at printer.....	*NO	*NO, *YES
Font resolution for formatting ...	*SEARCH	*SEARCH, 240, 300
Font mapping table.....	*NONE	Name, *NONE
Library.....		Name

Cut sheet emulation mode	*NONE	*NONE, *CHKFIRST, *CHKALL
Use DBCS simulation fonts	*NO	*YES, *NO
Replace	*YES	*YES, *NO
Authority	*LIBCRTAUT	Name, *LIBCRTAUT, *CHANGE...

Figure 33. Example CRTPSFCFG Command (V4R2 and above)

3. The following parameters are recommended: PSF configuration (PSFCFG)

The name used for this PSF configuration object. The name must match the user-defined object name (USRDFNOBJ) in the printer DEVD.

PSF configuration (PSFCFG)

The name used for this PSF configuration object. The name must match the user-defined object name (USRDFNOBJ) in the printer DEVD.

IPDS pass through (IPDSPASTHR)

To print SCS files, specify ***YES**, PSF transforms SCS into IPDS before printing.

Release timer (RLSTMR)

Specifies the amount of time to wait before a session or dialog is released without terminating the writer. The ACTRLSTMR parameter specifies when this timer is to be activated. Set the parameter to a value at least equal to the TIMEOUT value on the printer. IBM recommends ***SEC15**.

Page size control (PAGSIZCTL)

Specifies if the page size (forms) is set by PSF. Usually set to ***YES**.

Remote Location name or address (RMTLOCNAME)

Enter the IP address or hostname of the printer.

Configuring PSF with CRTDEVPRT On V4R2 and above

This section describes how to create a printer device description.

1. At the iSeries command line, enter a command in the form:

```
CRTDEVPRT DEVD(P6500-v) DEVCLS(*LAN) TYPE(*IPDS)
MODEL(0)
LANATTACH(*IP) AFP(*YES) PORT(5001) FONT(11)
FORMFEED(*CONT) RMTLOCNAME('128.9.12.134')
USRDFNOBJ(AFP/NETPRT6500-v *PSFCFG)
TEXT('IBM 6500-v NETWORK PRINTER')
```

Only use the USRDFNOBJ parameter if it was defined in the previous procedure.

A completed screen looks like the example shown in Figure 34.

Chapter 9 Configuring On iSeries As An IPDS Printer

Create Device Desc (Printer) (CRTDEVPRT)

Device description	>P6500	Name
Device class	>*LAN	*LCL, *RMT, *VRT, *SNPT, *LAN
Device type	>*IPDS	3287, 3812, 4019, 4201...
Device model	>0	0, 1, 2, 3, 4, 10, 13, 301...
LAN attachment	>*IP	*LEXLINK, *IP, *USRDFN
Advanced function printing	*YES	*NO, *YES
Port number	>5001	0-65535
Online at IPL	*YES	*YES, *NO
Font:		
Identifier	>011	3, 5, 11, 12, 13, 18, 19...
Point size	*NONE	000.1-999.9, *NONE
Form feed	*CONT	*TYPE, *CONT, *CONT2, *CUT...
Separator drawer	*FILE	1-255, *FILE
Separator program	*NONE	Name, *NONE
Library		Name, *LIBL, *CURLIB
Printer error message	*INQ	*INQ, *INFO
Message queue	*CTLD	Name, *CTLD, *SYSOPR, QSYSOPR
Library		Name, LIBL, *CURLIB
Activation timer	170	1-2550, *NOMAX
Image configuration	*NONE	*NONE, *IMGA01, *IMGA02...
Maximum pending requests	6	1-31
Print while converting	*YES	*NO, *YES
Print request timer	*NOMAX	1-3600, *NOMAX
Form definition	F1C10110	Name
Library	*LIBL	Name, *LIBL, *CURLIB
Remote location:		
Name or address		
User-defined options	*NONE	Character value, *NONE
+ for more values		
User-defined object:		
Object	*NONE	Name, *NONE
Library		Name, *LIBL, *CURLIB
Object type		*DTAARA, *DTAQ, *FILE...
Data transform program	*NONE	Name, *NONE
Library		Name, *LIBL, *CURLIB
User-defined driver program	*NONE	Name, *NONE
Library		Name, *LIBL, *CURLIB
Secure connection	*NO	*NO, *YES
Validation list	*NONE	Name, *NONE
Library		Name, *LIBL, *CURLIB

Configuring PSF for IPDS On V4R2 And Above

Publishing information:		
Support duplex	*UNKNOWN	*UNKNOWN, *SIMPLEX, *DUPLEX
Support color	*UNKNOWN	*UNKNOWN, *NOCOLOR, *COLOR
Pages per minute black.....	*UNKNOWN	1-32767, *UNKNOWN
Pages per minute color	*UNKNOWN	1-32767, *UNKNOWN
Location.....	*BLANK	
Data steams supported	*UNKNOWN	*UNKNOWN, *PCL, *PS, *PDF
+ for more values		
Text 'description'	*BLANK	
Additional Parameters		
Remote network identifier	*NETATR	Name, *NETATR, *NONE
Workstation customizing object	*NONE	Name, *NONE
Library		Name, *LIBL, *CURLIB
Authority.....	*ALL	Name, *LIBCRTAUT, *CHANGE...

Figure 34. Example CRTDEVPRT Command (V4R2 and above)

2. Values must be entered for the following parameters:

Device Description (DEVVD)

The device description or name.

Device Class (DEVCLS)

Specify *LAN.

Device Type (TYPE)

Specify *IPDS.

Device Model (MODEL)

Specify 0.

LAN attachment (LANATTACH)

Specify *IP.

Port number (PORT)

Specify 5001.

Font (FONT)

Enter an appropriate value.

Form Feed (FORMFEED)

Specify ***CONT**.

Activation timer (ACTTMR)

This value specifies the number of seconds that PSF waits for a printer to respond to an activation request. If only one system is using the printer, use the default value (170 seconds). If more than one system is using the printer, specify ***NOMAX**, which causes PSF to wait indefinitely for a response to an activation request.

Remote Location (RMTLOCNAME)

Enter the IP address or hostname of the printer.

User-Defined Object (USRDFNOBJ)

To use a PSF configuration object, specify its name and library here. This object type must be ***PSFCFG**. For V3R7 and higher, a single PSF configuration object may be referenced by multiple device descriptions, if required.

Verifying The IPDS Configuration On iSeries

To test IPDS printing:

1. If it is not already on, vary on the line description:
`VRYCFG CFGTYPE(*LIN)`
2. To start TCP/IP, enter `STRTCP`.
3. Verify that the iSeries TCP/IP interface is active. Use the command:
`WRKTCPSTS`
and then select option 1.
4. Turn the printer on and wait until the printer control panel displays “ETHERNET IS READY.”
5. To verify the printer is connected to iSeries, ping the printer from an iSeries workstation with one of the following commands:
`PING ip_address`
or
`PING hostname`
where *ip_address* is the Internet address of the remote system printer (the Ethernet Interface), and *hostname* is the hostname you defined for the printer, if any.
 - If the ping is not successful, refer to “Cannot PING The Printer” on page 262.
 - If the ping is successful, vary on the printer device description with the command:
`VRYCFG (printer_device) CFGTYPE(*DEV)`
`STATUS (*ON)`
6. To use PSF to send an IPDS file to the printer, enter:
`STRPRTWTR DEV (printer_device)`
where *printer_device* is the name of the printer.
7. If you have problems printing, do the following:
 - Print an Ethernet Test Page. Refer to your *User's Manual*.
 - Verify that port number 5001 is being used.

8. If you are still unable to print IPDS files, contact technical support.

Sharing The iSeries Printer On The Network

To support printer sharing, your printer automatically switches among all attached ports (serial, twinax/coax, LAN). Basically, the printer prints jobs for one port until no new jobs appear and the port “times out.” The printer then switches to the next port and does the same thing.

To change the default “time out” value for a port, update the TIMEOUT value for the port on the appropriate menu (Serial Interface, Ethernet Parameters, Twinax Interface, or Coax Interface).

Printer Sharing Parameters

To set up iSeries for printer sharing, set the following parameters.

Table 11. Printer Sharing

iSeries Version	Where Set	Parameter	Recommended Value	Description
V3R7 V4R1	CRTPSFCFG CHGPSFCFG	ACTRLSTMR	*NORDYF	Specifies the point at which the release timer (RLSTMR) is activated. Set to *NORDYF. This means that the release timer is activated when there are no spooled files in the printer's output queue with a status of RDY and the last page of the last spooled file processed has printed. *NORDYF is used so that all files with a status of RDY are printed before releasing the session (which does not terminate the writer).
V3R7 V4R1	CRTPSFCFG CHGPSFCFG	RLSTMR	*SEC15	Specifies the amount of time to wait before a session or dialog is released without terminating the writer. The ACTRLSTMR parameter specifies when this timer is to be activated. Set the parameter to a value at least equal to the TIMEOUT value on the printer. The recommended value is *SEC15.

Table 11. Printer Sharing (continued)

iSeries Version	Where Set	Parameter	Recommended Value	Description
V3R7 V4R1	CRTDEVPRT CHGDEVPRT	ACTTMR	*NOMAX	The value specifies the number of seconds that PSF will wait for a printer to respond to an activation request. If only one system will be using the printer, use the default value (170 seconds). If more than one system will be using the printer, set the value to *NOMAX, which causes PSF to wait indefinitely for a response to an activation request.

iSeries Troubleshooting

Use this section to resolve problems configuring iSeries on TCP/IP networks.

Cannot PING The Printer

If you have problems trying to ping the printer:

- Verify the configuration of iSeries, including the printer and any intervening devices such as routers and bridges.
- Verify that the iSeries line description is varied on and the printer is turned on and displays a status of ONLINE.
- Verify that the iSeries TCP/IP interface is active.

PSF Terminates When Initialized

If PSF terminates when you initialize it for IPDS printing and issues message PQT3603, check for the following error codes:

- Code 10 means an incorrect `RMTSYS` or `RMTLOCNAME` (V3R2, V3R7, or V4R1) has been specified for the printer.
- Code 15 means that PSF timed out waiting for the printer's response. Check the value you entered for Activation Timer when using `WRKAFFP2`, `CRTPSFCFG` (V3R2), or `CRTDEVPR1` (V3R7 or V4R1).
- Codes 20-39 indicate a general communications failure. Make sure all of the components in your network are operational, such as routers. If necessary, call IBM technical support.
- Codes 40-59 indicate a logic error between PSF and the printer control unit. Contact IBM technical support.

Spoiled Print File Remains In PND Status

Check the output queue with the command:

```
WRKOUTQ queuename
```

This typically indicates that PSF is waiting for a response from the printer. This can be verified by displaying the `QSPL` subsystem, `WRKACTJOBSBS` (`QSPL`). If the status of the PDJ job for the printer is `SELW`, then PSF is waiting for a response from the printer. Make sure that the printer is in `ONLINE` mode and that all network connections (for example, routers) between the iSeries and the printer are active.

Spooled Files Disappear Without Printing

To resolve this problem:

- Check that the correct printer queue name and correct IP address have been used.
- `ping` the IP address. If the `ping` is successful, disconnect the network cable from the printer/print server, and `ping` the address again. If the `ping` is still successful, there is another printer with that IP address on the network.

Data Is Being Clipped

To resolve this problem, you may want to set the PSC (Page Size Control) parameter to `*YES` in the `CRTPSFCFG` command (V3R2, V3R7, or V4R1).

10

z/OS Configuration, IPDS Printer

Overview

Use this chapter to configure z/OS to print IPDS files on your IBM 6500-v network printer.

To print IPDS files, you must have the IPDS option on the printer.

Requirements

Verify that you have the following required software:

- PSF Version 2.2.0 with APAR OW15599 (for TCP/IP support)
- z/OS Scheduler with APAR OW12236 to support two new PRINTDEV keywords: IPADDR and PORTNO
- TCP/IP Version 3 Release 1, or higher, installed and configured on z/OS

To obtain the PTFs associated with these APARs, contact the IBM Support Center.

Configuration Checklist

All of the following configuration steps carried out on z/OS require appropriate RACF authority.

1. Using the printer operator panel, set up the IPDS printer emulation to 6408/6412.
2. Set TCP/IP addresses for the printer, such as IP address, gateway address, or subnet mask. See “Configuration Tools” on page 52.
3. Configure the host environment.
See “Configuring PSF for z/OS to Print IPDS Files” on page 267.
4. Verify the configuration. See “Verifying a TCP/IP-Attached Printer on z/OS” on page 277.
5. If you want to share the printer, do the procedure in “Sharing IBM 6500-v Printers on z/OS” on page 278.
6. If you have problems, refer to “Handling z/OS Connectivity Problems” on page 280.

Configuring PSF for z/OS to Print IPDS Files

To perform this procedure, you need the IP address of the Ethernet.

Configuration Procedure

Configuring PSF to print IPDS files includes the following steps:

1. Define the z/OS communications control unit to z/OS. See “Define the Communications Control Unit to z/OS” on page 268.
2. Modify the TCP/IP profile on your z/OS system, if necessary. See “Modify the TCP/IP Profile in z/OS” on page 268.
3. “Ping” the printer. See “Verify the Printer Connection” on page 271.
4. Define the printer as a writer-controlled printer to JES. See “Define the Printer to JES” on page 272.
5. Define the printer to PSF with a PRINTDEV statement, including the IP address. See “Define the Printer to PSF” on page 273.

This section does not provide all the information you need to install and configure TCP/IP on your z/OS system. For more information on installing TCP/IP, refer to *TCP/IP for z/OS: Customization and Administration Guide*.

The routing of information is determined on the basis of the IP address, and is performed by IP gateways. After the network is configured correctly, the z/OS host appears to be communicating directly with the TCP/IP-attached printer.

Define the Communications Control Unit to z/OS

If you have not already done so, define the communications control unit for the z/OS host, such as the 3172 or the 3745 control unit, to z/OS. Use either an z/OS configuration program (MVSCP) or a hardware configuration definition (HCD), depending on the version of your z/OS system:

- When using a version earlier than z/OS 4.1.0, use an MVSCP.
- When using a version of z/OS 4.1.0 or later, use an HCD or an MVSCP.

For more information about using these methods, refer to:

- MVS/ESA* Migration Planning: Dynamic I/O Configuration
- MVS/ESA Hardware Configuration: Using the Dialog

Modify the TCP/IP Profile in z/OS

The TCP/IP profile contains system configuration statements used to initialize the TCP/IP address space. Of those statements, the following are subject to special considerations when you are printing from PSF on TCP/IP-attached printers. Samples of these statements are printed in bold in the example shown in Figure 35.

ACBPOOLSIZE	1000					
ADDRESSTRANSLATIONPOOLSIZE	1500					
CCBPOOLSIZE	150					
DATABUFFERPOOLSIZE	160	32768				
ENVELOPEPOOLSIZE	750					
IPROUTEPOOLSIZE	300					
LARGEENVELOPEPOOLSIZE	50					
RCBPOOLSIZE	50					
SCBPOOLSIZE	256					
SKCBPOOLSIZE	256					
SMALLDATABUFFERPOOLSIZE	256					
TCBPOOLSIZE	512					
TINYDATABUFFERPOOLSIZE	256					
UCBPOOLSIZE	100					
KEEPALIVEOPTIONS INTERVAL 10 SENDGARBAGE FALSE ENDKEEPALIVEOPTIONS						
GATEWAY						
;	* Network	First hop	Linkname	Packet Size	Subnet mask	Subnet value
	9	=	BPCLAN	2000	0.255.255.0	0.99.12.0
	DEFAULTNET	9.99.12.254	BPCLAN	2000	0.255.255.0	0

Figure 35. Modifying TCP/IP Profile

This section contains information about the statements, the special considerations that apply to them, and the changes they may make necessary. If you change any of the values in the TCP/IP profile, restart TCP/IP to pick up the changes.

For information about the TCP/IP profile and the statements described in this section, refer to:

- IBM TCP/IP z/OS Customization and Administration Guide
- IBM TCP/IP Performance and Tuning Guide

DATABUFFERPOOLSIZ

The DATABUFFERPOOLSIZ statement defines the number and size of the data buffers. For printing on TCP/IP-attached printers, IBM recommends that you specify at least **160** data buffers, **32768** buffer size.

SMALLDATABUFFERPOOLSIZ

The SMALLDATABUFFERPOOLSIZ statement defines the number of small data buffers. For printing on TCP/IP-attached printers, IBM recommends that you specify at least **256** small data buffers.

TINYDATABUFFERPOOLSIZ

The TINYDATABUFFERPOOLSIZ statement defines the number of tiny data buffers. For printing on TCP/IP-attached printers, IBM recommends that you specify at least **256** tiny data buffers.

KEEPALIVEOPTIONS

PSF relies on TCP to detect when a connection with a TCP/IP-attached printer is no longer usable. When no data has been exchanged between PSF and its connection partner, TCP sends keep-alive probes to the connection partner periodically. These periodic probes, called keep-alive transmissions, enable TCP to discover when a connection is no longer usable even if the connection partner is abruptly powered off or is no longer accessible through the network.

The frequency of keep-alive transmissions is controlled by the INTERVAL parameter on the KEEPALIVEOPTIONS statement. The frequency applies to all TCP applications that direct TCP to send keep-alive transmissions. The default frequency is after about two hours of inactivity.

For printing on TCP/IP-attached printers, IBM recommends that you specify a shorter interval than the default, such as 10 minutes, for the interval between keep-alive transmissions.

Also, if any target host requires that the keep-alive packet contain data, specify `SENDGARBAGE TRUE`. For example:

```
KEEPALIVEOPTIONS INTERVAL 5 SENDGARBAGE TRUE
ENDKEEPALIVEOPTIONS
```

GATEWAY

The Packet Size parameter of the GATEWAY statement defines the maximum transmission unit (MTU) for the z/OS host. For IBM 10/100Base-T Ethernet Interface printers, the MTU size is fixed at 1024 bytes. The value cannot be adjusted.

Verify the Printer Connection

To verify that the z/OS system can establish a connection with the TCP/IP-attached printer, “ping” the printer from the MVS system.

From a TSO session, enter the following command:

```
TSO PING ip_address
```

In JES2, enter the following command from the System Display and Search Facility (SDSF) menu 6:

```
ping ip_address
```

ip_address specifies the IP address of the Ethernet.

Here is an example of a successful “ping” command:

```
EZA0458I Ping V3R1: Pinging host 9.99.12.33
(Use ATTN to interrupt.)
EZA0463I PING: Ping #1 response took 0.084 seconds.
Successes so far = 1.
```

Here is an example of an unsuccessful “ping” command:

```
EZA0458I Ping V3R1: Pinging host 9.99.12.33
(Use ATTN to interrupt.)
EZA0464I PING: Ping #1 timed out
```

NOTE: If you have problems “ping”-ing a printer, refer to “Handling z/OS Connectivity Problems” on page 280.

Define the Printer to JES

When a TCP/IP-attached printer is to be used with JES, it must be defined for deferred printing mode with JES.

JES2 Printer Definitions

Below is an example of the JES2 printer definition initialization member, located in the system PARMLIB:

```
FSS (FSS1) , PROC=PSFPROC , HASPFSSM=HASPFSM  
PRT1      FSS=FSS1 , MODE=FSS , PRMODE= (LINE , PAGE , SOSI1) ,  
          CLASS=C , UCS=0 , SEP , NOSEPDS , CKPTPAGE=100 ,  
          DRAIN , MARK , TRKCELL=YES
```

The above example is correct for JES2 3.11 and above. For earlier versions of JES2, the statement is named **FSSDEF** and would be stated as **FSSDEF FSSNAME=FSS1**.

The value you specify for the PROC parameter must match the name on the PSF Startup procedure.

JES3 Printer Definitions

Below is an example JES3 printer definition. This example is not executable, but it is intended to help the JES3 systems programmer define the printer to the z/OS host.

```
FSSDEF , TYPE=WTR , FSSNAME=FSS1 , PNAME=PSFPROC , SYSTEM=SYS1 ,  
TERM=NO DEVICE , JNAME=PRT1 , JUNIT= ( , SYS1 , , OFF) ,  
FSSNAME=FSS1 , MODE=FSS , PM= (LINE , PAGE , SOSI1) ,  
CHARS= (YES , GT12) ,
```

The value you specify for the JNAME parameter must match the name of the printer in the PSF Startup procedure.

The value you specify for the PNAME parameter must match the name on the PSF Startup procedure.

Define the Printer to PSF

Each TCP/IP-attached printer must be defined to PSF with a PRINTDEV statement in the PSF startup procedure.

Figure 36 shows a sample PSFPROC procedure that you can modify to suit your installation. The PRINTDEV statement shows the required IPADDR keyword.

No 6500-v printer-specific writer procedure is currently supplied by IBM. You can, however, copy the APSWPROT sample from the APAR medium and modify it for the IBM 6500-v printer.

NOTE: The IBM 6500-v printer supports only resident symbol sets.

```
//PSFPROC PROC
//***** IBM NETWORK PRINTERS WRITER PROCEDURE *****
//*
//*01* MODULE-NAME = PSFPROC
//*
//*01* DESCRIPTIVE-NAME = START PROCEDURE FOR PSF:
//*TCP/IP ATTACHED IBM NETWORK PRINTERS
//*
//*01* NOTES = THE FULL NAME OF THE DEFAULT PAGEDEF IS
//*P1A06462.
//*THE FULL NAME OF THE DEFAULT FORMDEF IS
//*F1A10110.
//*THE FULL NAMES OF THE DEFAULT FONTS ARE
//*X0GF10, X0GS10, X0TU10, AND X0GU10.
//*THE FULL NAME OF THE SEPARATOR PAGE PAGEDEF IS
//*P1V06483.
//*THE FULL NAME OF THE SEPARATOR PAGE FONT IS
```

Chapter 10 Configuring PSF for z/OS to Print IPDS Files

```
/*X0GT15.
/*
/*
/*01* CHANGE-ACTIVITY:
/*
/**** END OF SPECIFICATIONS ***/
//STEP01EXEC PGM=APSPPIEP,REGION=4096K
//JOBHDR OUTPUT PAGEDEF=V06483,/* JOB SEPARATOR PAGEDEF*/
//FORMDEF=A10110,CHARS=GT15,/* JOB SEPARATOR FORMDEF*/
//JOBLTR OUTPUT PAGEDEF=V06483,/* JOB SEPARATOR PAGEDEF*/
//FORMDEF=A10110,CHARS=GT15,/* JOB SEPARATOR FORMDEF*/
//DSHDR OUTPUT PAGEDEF=V06483,/* DS SEPARATOR PAGEDEF*/
//FORMDEF=A10110,CHARS=GT15,/* DS SEPARATOR FORMDEF*/
//MSGDS OUTPUT PAGEDEF=A06462,/* MESSAGE DATASET PAGEDEF*/
//FORMDEF=A10110,/* MESSAGE DATASET FORMDEF*/
//FONT300DDDSN=SYS1.FONT300,/* SYSTEM FONTS - 300 PEL*/
//DISP=SHR
//PSEG01DDDSN=SYS1.PSEGLIB,/* SYSTEM PAGE SEGMENTS*/
//DISP=SHR
//OLAY01DDDSN=SYS1.OVERLIB,/* SYSTEM MEDIUM OVERLAYS*/
//DISP=SHR/*
//PDEF01DDDSN=SYS1.PDEFLIB,/* SYSTEM PAGEDEFS*/
//DISP=SHR
//FDEF01DDDSN=SYS1.FDEFLIB,/* SYSTEM FORMDEFS*/
//DISP=SHR
/* *****/
```

```
/*PRINTDEV
/* *****/
//PRT1CNTL
//PRT1PRINTDEV FONTDD=.FONT300,/* 300 PEL FONT LIBRARY DD*/
//OVLYDD=.OLAY01,/* OVERLAY LIBRARY DD*/
//PSEGDD=.PSEG01,/* SEGMENT LIBRARY DD*/
//PDEFDD=.PDEF01,/* PAGEDEF LIBRARY DD*/
//FDEFDD=.FDEF01,/* FORMDEF LIBRARY DD*/
//JOBHDR=.JOBHDR,/* JOB HEADER SEPARATOR*/
/*/* OUTPUT*/
//JOBTRLR=.JOBTLR,/* JOB TRAILER SEPARATOR*/
/*/* OUTPUT*/
//DSHDR=.DSHDR,/* DATA SET HEADER*/
/*/* SEPARATOR*/
//MESSAGE=.MSGDS,/* MESSAGE DATA SET OUTPUT*/
//BUFNO=5,/* NUMBER OF WRITE DATA BUFFERS*/
//PAGEDEF=A06462,/* DEVICE PAGEDEF DEFAULT*/
//FORMDEF=A10110,/* DEVICE FORMDEF DEFAULT*/
//CHARS=(GF10,/* DEVICE*/
//GS10,TU10,GU10),/* DEFAULT FONT SET*/
//PIMSG=YES,/* ACCUMULATE DATA SET*/
/*/* MESSAGES*/
//DATAACK=BLOCK,/* REPORT ALL DATA-CHECK*/
/*/* ERRORS*/
//TRACE=NO,/* CREATE INTERNAL TRACE*/
//FAILURE=WCONNECT,/* PSF ACTION ON PRINTER*/
```

```
/**/* FAILURE*/  
//TIMEOUT=REDRIVE/* PSF ACTION ON TIMEOUT*/  
//MGMTMODE=OUTAVAIL,/* PRINTER MANAGEMENT MODE*/  
//DISCINTV=15,/* DISCONNECT INTERVAL IN*/  
/**/* SECONDS*/  
//IPADDR='xxx.xxx.xxx.xxx'/* IP ADDRESS FOR TCP/IP*/  
//PRT1ENDCNTL
```

Figure 36. Sample PSFPROC procedure

NOTE: To specify a TCP/IP address space name other than the default, TCPIP, code the following exec statement in the writer procedure:

```
//STEP01EXEC PGM=ASPPIEP,REGION=4096K,  
PARM=( , , , , tcPIP_name)
```

where *tcPIP_name* is the name of the TCP/IP address space. If this parameter is not coded, PSF uses the default name, TCPIP.

The IP address is the only required parameter. Other parameters may be set to facilitate printer sharing as described in “Sharing IBM 6500-v Printers on z/OS” on page 278. For a description of the PRINTDEV statement, which is not given here, see the *PSF System Programming Guide*.

IPADDR

Specifies the IP address for the printer or attachment, in dotted-decimal notation. Do not specify a hostname in place of the dotted-decimal address.

Verifying a TCP/IP-Attached Printer on z/OS

To operate a TCP/IP-attached printer, use JES operator commands.

Starting a TCP/IP-attached Printer

To start a TCP/IP-attached printer, do the following:

1. Start TCP/IP.
2. Power on the printer.
3. Start the printer FSA.
 - On **JES2**, the command is:
`$Sprinter_name`
 - On **JES3**, the command is:
`*VARY printer_name,ON`

Stopping a TCP/IP-attached Printer

You can stop a TCP/IP-attached printer in several ways:

- The preferred method is to first stop the PSF FSA for the printer by entering the following command from the z/OS console:

JES2:

`$Pprinter_name`

JES3:

`*VARY printer_name,OFF`

`*CANCEL printer_name`

where `printer_name` specifies the name of the printer FSA.

Then you can turn off power to the printer.

- To end the PSF FSA for the printer, use the JES commands. If you are unable to purge or cancel the printer by use of the JES commands, enter the following command:
`MODIFY FSSname,FORCE,printer_name`

Resolving IPDS Printing Problems

If you have problems printing, do the following:

- Print an Ethernet Test Page. Refer to your *User's Manual*.
- Verify that the IPDS service is enabled.
- Verify the service name.
- Verify that port number 5001 is being used.

If you are still unable to print IPDS files, contact IBM support.

Sharing IBM 6500-v Printers on z/OS

IBM 6500-v printers can be shared on PSF in one of two ways:

- By using the MGMTMODE and DISCINTV parameters via the JES spool.
- By port switching on the printer.

JES Spool Printer Sharing

JES spool printer sharing is valid for TCP/IP attached network printers. A session with the printer is maintained while there is output on the JES spool and the printer is available. When there is no more output on the spool and the disconnect interval expires, PSF ends the session with the printer. PSF attempts to restart the session when there is more work on the spool for the printer. After the session is restarted, PSF must reload the resources required for the print jobs. When using this method of network printer sharing, PSF cannot determine if another print driver is active.

You can request this method of network printer sharing by specifying the following parameters in the PSF Startup Proc.

```
MGMTMODE=OUTAVAIL  
FAILURE=WCONNECT  
TIMEOUT=REDRIVE  
DISCINTV=n
```

MGMTMODE

Set to OUTAVAIL. OUTAVAIL requests that PSF start a communications session with the printer only when output is available on the JES spool.

FAILURE

Specifies the action PSF is to take after a printer failure or a TCP/IP network failure. If FAILURE=WCONNECT and the printer is connected to another host when PSF attempts to establish a connection on TCP/IP, PSF continuously retries (up to the limit specified by CONNINTV) until the printer becomes available. FAILURE=STOP stops the attempt to connect to the printer.

TIMEOUT

Specifies the action that PSF is to take after a timeout when no output is available on JES. The DISCINTV parameter specifies the timeout interval. TIMEOUT=REDRIVE requests that PSF redrive the printer FSA using the value of the MGMTMODE parameter. TIMEOUT=STOP requests that PSF stop the printer FSA, which can then be restarted only by an operator command.

DISCINTV

Specifies the disconnect interval in seconds. The value can range from zero through 86400. IBM suggests you set the value to **15**. When no output is available from JES for this time period, PSF ends the session with the network printer. If the value is set to zero, PSF does not end the session because of lack of output.

NOTE: PSF supports two other methods of printer sharing, which are not applicable to IBM 10/100Base-T Ethernet Interface printers. VTAM RELREQ is available for printer sharing under SNA. Port switching is available for SNA- and TCP/IP-attached printers when a printer can support multiple active ports.

Port Switching Printer Sharing

To support printer sharing, IBM 10/100Base-T Ethernet Interface printers automatically switch among all attached ports (serial port, the twinax or coax port, or the Ethernet network port). Basically, the printer prints jobs for one port until no new jobs appear and the port “times out”. The printer then switches to the next port and does the same thing.

To change the default “time out” value for a port, update the TIMEOUT value for the port on the appropriate menu (Serial Interface, Ethernet, Twinax Interface, or Coax Interface).

Handling z/OS Connectivity Problems

If you encounter problems when “ping”-ing a network printer from z/OS, here is how to resolve them.

Ping is Not Successful

If the “ping” is not successful, verify the following:

- The printer is powered on.
- The IP address is unique in the TCP/IP network.
If the IP address of the z/OS system is not unique, see your network administrator to resolve the IP address problem.
- The Maximum Transmission Unit (MTU) size of the IP packet for the z/OS system is equal to the MTU size of the printer. For information about the values recommended for the z/OS system, see “Modify the TCP/IP Profile in z/OS” on page 268.

To change the MTU size for the z/OS system, change the GATEWAY statement in the z/OS TCP/IP profile, and restart TCP/IP to pick up the changes.

You cannot change the MTU size on an IBM 10/100Base-T Ethernet Interface printer. The MTU size is fixed at 1024 bytes.

If these items are all in order, consult your TCP/IP network administrator about a possible network problem.

Ping is Successful

A successful “ping” usually indicates that the z/OS system can communicate with the printer; however, you might receive a successful “ping” even though the IP address of the TCP/IP-attached printer is a duplicate of another IP address.

If PSF is unable to establish a network connection with the TCP/IP-attached printer or if PSF output for this printer prints elsewhere, follow these steps to determine whether the IP address of the printer is unique:

1. Turn the printer off.
2. Wait at least 5 minutes for TCP/IP to clear the Address Resolution Protocol (ARP) tables. (If your installation specified a longer interval on the ARPAGE configuration statement in the TCP/IP profile, you may need to wait longer. For information about the ARPAGE statement, refer to the *IBM TCP/IP z/OS Customization and Administration Guide*.)
3. Enter the “ping” command again from the z/OS system.

NOTE: If you receive a successful response to the “ping” command, there is a duplicate IP address. Consult your TCP/IP network administrator.

11

z/OS Configuration, TN3270E

z/OS Configuration For A TN3270E Printer

The following configuration information shows how a 6500-v printer can be configured on z/OS and Info Print Server to print TN3270E. Modtabs are provided for both an SCS and DSC printer. The z/OS level is 1.3.

These basic configurations provided a starting point for users new to printing in this manner.

NOTE: Since Info Print Server (IPS) treats the TN3270E printer as a COAX attached printer, additional COAX feature for IPS is required.

Coax Printer Support FMID

Coax Printer Support consists of the following FMID:
HPRT100

Program Materials

An IBM program is identified by a program number and a feature number. The program number for Coax Printer Support is 5697-F51.

Additional information regarding the telnet server and Info Print Server can be found in the following manuals.

- For z/OS V1R2 and above, the TCPIP information can be found in SG24-5227-3, Communications Server for z/OS V1R2 TCP/IP Implementation Guide.
 - InfoPrint Server Customization Guide, S544-5744-03.
 - InfoPrint Server Operation and Administration, S544-5745-03.
1. Look at the JES definition defining and associating printer, PRINTER9 with INFOPRINT SERVER.

```
/* PRT9 AND FSSDEF FOR 6500          06/27/97 MM    */
PRINTER9 CLASS=K,SEP,NOMARK,MODE=FSS,FSS=PRINTWAY,      X
PRMODE=(LINE,PAGE),WS=(W,Q),SETUP=NOHALT,START=NO
/* ASSOCIATE PRINTWAY WITH ITS START UP PROCEEDURE      */
FSS(PRINTWAY) PROC=COURWTR,AUTOSTOP=YES
```

Figure 37. JES Definition Defining PRINTER9

```
//COURWTR PROC
/* -----*
//IEFPROC EXEC PGM=ANFFIEP,REGION=3M,PARM='INV=AOP1' z/OS4 INV
//STEPLIB DD DSN=IPPW.PW311.SANFLOAD,DISP=SHR
//ANFQUEUE DD DSN=ANDREE.z/OS4.QUEUE,DISP=SHR
//ANFMMSG DD DSN=ANDREE.z/OS4.MSGFILE,DISP=SHR
//SYSPRINT DD SYSOUT=*
//SYSABEND DD SYSOUT=*
//SYSUDUMP DD SYSOUT=*
//
```

Figure 38. Example Of Proc Used To Start INFOPRINT Server

```

NETSPL1  VBUILD TYPE=APPL
*
*   APPL REPRESENTING IPS
*
APIPP101 APPL MODETAB=MODETAB1,DLOGMOD=SCS,AUTH=(ACQ)
LUPRT101 APPL MODETAB=MODETAB1,DLOGMOD=SCS
    
```

Figure 39. Example Of The APPLID That Represents A Copy Of IPDS

VTAM Definitions For SCS and DSE TN3270E

The following are VTAM definitions for SCS and DSE TN3270E printers.

NOTE: These definitions are identical to those of COAX attached printers.

```

*****
* JES2 TN3270E VTAM MAJOR NODE                                     *
*****
*
* LU1 Printer
RMT2  APPL AUTH=(ACQ),EAS=1,PARSESS=NO,SESSLIM=YES,              X
      MODETAB=MODETAB1,DLOGMOD=SCS
*
* LU3 Printer
RMT3  APPL AUTH=(ACQ),EAS=1,PARSESS=NO,SESSLIM=YES,              X
      MODETAB=MODE4245,DLOGMOD=LU3PRT
    
```

Figure 40. MODTAB Entries

Chapter 11 Program Materials

```
*****
*
* PRINTER WITH SNA CHARACTER SET (LU_1) @DA22961*
*
*****
SCS MODEENT
LOGMODE=SCS,FMPROF=X'03',TSPROF=X'03',PRIPROT=X'B1', *
SECROT=X'90',COMPROT=X'3080',RUSIZES=X'87C6', *
PSERVIC=X'01000000E10000000000000', *
PSNDPAC=X'01',SRCVPAC=X'01'
TITLE 'DSC4K'
```

```
*****
*
* DSC PRINTER (LU_3) *
*
*****
LU3PRT MODEENT LOGMODE=LU3PRT,FMPROF=X'03',TSPROF=X'03', X
PRIPROT=X'B1',SECROT=X'20',COMPROT=X'3080', X
SSNDPAC=X'00',SRCVPAC=X'00',RUSIZES=X'C7C7', X
PSNDPAC=X'80',PSERVIC=X'03800000000018502B507F00'
```

TCPIP Configuration With TN3270E

The following is the portion of the system's TCPIP configuration involved with TN3270E printers.

```
;
; Define the VTAM parameters required for the Telnet server.
;
BeginVTAM
;

PRTGROUP PGRPLU1
  RMT2
ENDPRTGROUP

PRTGROUP PGRPLU3
  RMT3
ENDPRTGROUP

IPGROUP TESTPRT
  9.99.98.62
ENDIPGROUP

IPGROUP TESTPRT3
  9.99.98.67
ENDIPGROUP

PRTMAP PGRPLU1 TESTPRT GENERIC

PRTMAP PGRPLU3 TESTPRT3 GENERIC

; End telnet printer section

EndVTAM
```

NOTE: Only additions required for the TN3270E printers are shown.

Printer Inventory Manager As Defined With TN3270E

The following screens show areas of the Printer Inventory Manager involved with the definition of the TN3270E printers.

1. At main panel, select option 4 to look at the FSS definition.

InfoPrint Server: Printer Inventory Manager	
Option ===>	
Printer Definitions	
1 Add	Add a printer definition
2 List	List printer definitions
3 Select	Select printer definitions to list
Other Functions	
4 FSS/FSA/Pool	Manage other inventory definitions
5 PrintWay Queue	View IP PrintWay transmission queue
6 PrintWay Message	View IP PrintWay message log
7 Configure	Change panel configuration
Printer Definition List	Row 17 of 23

Printer Inventory Manager As Defined With TN3270E

2. Select option 5 from this panel to list the FSSs.

```
FSA, FSS, and Pool Management
Option ==>

FSA
 1 Add      Add an FSA
 2 List     List FSAs
 3 Select   Select FSAs to list

FSS
 4 Add      Add an FSS
 5 List     List FSSs
 6 Select   Select FSSs to list

Pool of Printer Definitions
 7 Add      Add a Pool
 8 List     List Pools
 9 Select   Select Pools to list
```

3. From the panel below, browse the PRINTWAY FSS to see how the TN3270E FSS was defined.

```

                                FSS List                                Row 1 of 3
Command ==>                                Scroll ==> HALF

Actions:
  A-Add B-Browse C-Copy D-Delete E-Edit
A FSS Name Type Description
= =====
=====
B PRINTWAY IPPW APPLID for TN3270E Printers APIPP101
  PRT10 IPPW Howard's PrintWay FSS
  WTRES700 PSF Howard's FSS
***** Bottom of data *****
```

Chapter 11 Program Materials

The panel below shows how the FSS (PRINTWAY) is associated with its VTAM Applid APIPP101.

```
Browse                IP PrintWay FSS
Command ==>

FSS name. . . PRINTWAY
Description . APPLID for TN3270E Printers  APIPP101          (extend)

  Old-style translation
  Hiperspace blocks . .
  TCP/IP job name . . .
  Document code page. .
  Applid. . . . . . . APIPP101
  National language . . 1  1. English  2. Japanese
  Trace mode. . . . . 1  1. None  2. Internal  3. No printing  4. Full
    Trace prompt
    Trace table size .
```

4. Next look at the printer definition for the DSE (LU_3) printer in the printer inventory.
5. Select option 2 from the Printer Inventory Manager main panel, to list the printers.

Printer Inventory Manager As Defined With TN3270E

```

Command ==>>                               Scroll ==>> HALF

Actions:

  A-Add B-Browse C-Copy D-Delete E-Edit X-Chg type
A Printer Name   Type Description Location  DEST   C FORMS  LU Name
=====
=====
PRT717          PSF 6500 IPDS  B5 lab   PRT717 Y
B VTAM_DSE1     IPPW A TN327E Pri IMPACT LAB      K
VTAM_SCS1      IPPW A TN327E Pri IMPACT LAB      J
VTAM_SCS2      IPPW                               L
***** Bottom of data *****
  
```

6. While browsing VTAM_DSE1, notice that the DSC printer is defined to IPS as a COAX attached printer.

```

Browse          IP PrintWay Printer Definition
Command ==>>

Printer definition name . VTAM_DSE1
Description . A TN327E Printer using the DSE (LU_3) Datastream. (extend)
Location. . . IMPACT LAB (extend)

          Component name      Custom values
Section   (enter to browse)   (enter to browse)
Allocation =>                 => *
  
```

Chapter 11 Program Materials

```
Processing      =>                => *
NetSpool options =>                =>
NetSpool end-of-file =>          =>
IP PrintWay options =>          => *
Protocol        =>                => *
```

```
/ Use DEST, CLASS, and FORMS for IP PrintWay printer selection
NetSpool LU name .      LU classes . .      (extend)
```

Printer Inventory Manager As Defined With TN3270E

The following panel shows the Allocation section of the setup, where the printer is associated with Class K jobs.

Browse	Allocation
Command ==>	
Printer definition name . VTAM_DSE1	
	More: +
Spool allocation values:	
CLASS K	LINECT. . .
DEST.	PRMODE. . .
JES node. . .	PRTY. . . .
FCB	SEGMENT . .
FLASH count .	THRESHLD. .
FLASH name. .	UCS
FORMS	WRITER. . .
GROUPID . . .	
USERDATA	
..	(extend)
BURST	1. Yes 2. No
HOLD.	1. Yes 2. No
OUTDISP . . .	1. Purge 2. Leave 3. Keep 4. Hold 5. Write
Values for Separator Pages:	
Address	
..	(extend)
Building . .	

In the IP Printway options, retry time, retry limit, and response timeout is already for the printer.

NOTE: The values of these settings are account specific. Other values may best serve your printing environment.

```
Browse                IP PrintWay Options
Command ==>

Printer definition name . VTAM_DSE1

                                More:  +

Retention period:
  Successful. . . . . Failure . .
Retry time . . . . . 0000:05:00
Retry limit. . . . . 2

Connection timeout . 30
Response timeout . . 100
Exits:
  Begin data set. .      End data set. .      Record. .

Document header . . . . . (extend)
  / Translate document header
Document trailer . . . . . (extend)
  / Translate document trailer
Dataset grouping . . 2 1. None 2. Job 3. Concatenate job

Formatting:
  Line termination. . . .
```

```
Browse                IP PrintWay Options
Command ==>

Printer definition name . VTAM_DSE1

                                More: -

Document header . . . . . (extend)
  / Translate document header
Document trailer . . . . . (extend)
  / Translate document trailer
Dataset grouping . . 2 1. None 2. Job 3. Concatenate job

Formatting:
  Line termination. . . .
  Transparent data char . 35
  Carriage control type . 2 1. None 2. Machine 3. ANSI
  Delete form feed. . . . 4 1. None 2. Leading 3. Trailing 4. Both
  Formatting. . . . . 1. None      2. Standard
                        3. Translate only 4. Use FCB
  PostScript header . . . 1. Add      2. Ignore
                        3. Landscape  4. Always landscape
  Omit line termination at EOF
```

Chapter 11 Program Materials

The following shows where the VTAM parameters were set for the printer. For the DSE printer we chose RMT3 and the logmode of LU3PRT.

```
Browse          VTAM Protocol
Command ==>

Printer definition name . VTAM_DSE1

Printer LU name. . . RMT3

VTAM Processing Options:
Printer logmode. . . LU3PRT
Checkpoint pages . . 5
Send as transparent data
```

The next panel shows these settings for the SCS printer.

```
Browse          VTAM Protocol
Command ==>

Printer definition name . VTAM_SCS1

Printer LU name. . . RMT2

VTAM Processing Options:
Printer logmode. . . SCS
Checkpoint pages . . 5
Send as transparent data
```

The last thing you need to configure is the printer.

NOTE: At this time, InfoPrint Server and all related LUs should be active.

Using the printer's web pages go to the configuration screen

Configuration Screens

1. To configure the IBM 6500-v, fill out and submit the forms using the following links.

Table 12. Configuration Forms

Configuration	HTML Forms
Network	TCP/IP (including Windows) and Novell network settings
Print Path	Destination, Model, Log Path, and I/O port configuration
Print Model	Shortcut to the print path model configuration forms
Log Path	Shortcut to the print path log path configurations form
TN5250/3270	TN5250/3270 configuration settings
SNMP	SNMP configuration settings
Administration	Names and passwords
System	System operation modes (reboot, factory defaults)

2. Select the TN5250/3270 section from the configuration screen.

NOTE: Changes will only take effect after you reset the IBM 6500-v from the System page.

Chapter 11 Configuration Screens

The following displays:

Mode: TN5250	Click here for TN3270 mode
Host	ok (eg. 204.191.175.114 or host.domain.com)
Port	
Device Description	
Message Queue Name	
Message Queue Library	
Device Type	IBM
WSCST Name	
WSCST Library	
Auto Connect	
Start Auto Connect	Click here

3. Select TN3270E Mode.

The following displays:

Configuration for Print Path d2prn	
Mode: TN3270	Click here for TN5250 mode
Host	ok (eg. 204.191.175.114 or host.domain.com)
Port	23
Resource Name	
Auto Connect	
Stop Auto Connect	Click here

NOTE: Changes will only take effect after you reset the IBM 6500-v from the System page.

4. Enter the address of your system for the host IP address

The port address is the port configured for your telnet server. It is usually port 23.

The Resource name will be the printer name defined in the VTAM portion of your Telnet server configuration. For this example use RMT3.

5. Select auto connect.
6. Go to the system page and reboot for the changes to take effect.
7. After the printer reboots, enter the command /DTCPIP, T, CONN from the SDSF console. The following messages show that the printer is connected.

```
D TCPIP,,T,CONN
EZZ6064I TELNET CONNECTION DISPLAY 044
      EN                TSP
CONN  TY IPADDR..PORT  LUNAME  APPLID  PTR LOGMODE
-----
00000468  9.99.98.62..2000  RMT3  *PRINTER  PPE LU3PRT
----- PORT:   23  ACTIVE      PROF: CURR CONNS:   1
-----
3 OF 3 RECORDS DISPLAYED
```

You are now ready to print.

12

iSeries Configuration, TN5250

Setting Up TN5250 Print Queues on iSeries

Start with V5R1 or later and the most recent PTF level. The iSeries should have TCP/IP installed, be fully configured, and functional. To set up the TN5250 print queues, do the following:

1. Make sure the iSeries has sufficient resources to add additional virtual devices.
2. Establish the IP value (not the dns name) of the iSeries.
3. Set the IP, subnet mask, and default router on the Ethernet adapter.
4. Use a telnet session or web browser session to configure three items per dest (logical Ethernet queue) for use as a logical network connection to the iSeries.

NOTE: The three values (i.e., 192.168.168.34) represent the iSeries IP in dotted notation and are the entries for the iSeries.

The newly created TN5250 device/queue (i.e. pallet form, first chair is alpha, 10 char. max) assumes the new name "devicedesc."

5. Determine whether or not to autoconnect (initiate connection on power up or through Ethernet reset) the TN5250 device/queue.

NOTE: It is not necessary to set up the devd or queue name on the iSeries manually or in advance. The configuration and reset of the Ethernet adapter automatically sets up the devd or queue name.

Setting Up A TN5250 Connection/Device Via A Telnet Session

In a telnet session, the command “list tn” shows the configured values. To set up a TN5250 connection/device via a telnet session, use the commands “store TN...” and the following:

NOTE: The Ethernet sessions can be configured either by a web browser or by telnet.

1. Use cmd WRKCTLD *VWS, choice 5, display, enter to list the number of virtual devices this controller.
2. Use cmd DSPSYSVAL QAUTOVRT. Note the number of auto-configured virtual devices permitted on the system. This number must be greater than one.
3. Use cmd DSPYSYVAL QCHRID. This is the system language (code page) available.
4. Use cmd WRKTCPSTS *IFC to determine the IP address of the iSeries. This value is used in setting the Ethernet TN5250 devices.

User Supplied Values

iSeries: For this session, use the IP value from (step 4 above).

Device description: This is the name of the virtual device.

Auto connect:

- If true (enabled) then queue and device automatically attach.
- If not true (disabled) the command “tn dest dxprn start/stop” allows individual sessions to start or stop.

NOTE: Leave other values at their default descriptions.

Example of telnet session commands:

```
store tn dest d8prn iSeries 192.168.168.34
store tn dest d8prn devicedesc palletform
store tn dest d8prn autoconnect
reset
```

This example creates a device/queue named “palletform” on the iSeries with IP 192.168.168.34. The Ethernet adapter initiates the connection each time it is reset or the printer power is cycled.

Using Telnet Commands for TN5250

Command List

The following commands for TN5250 are available via a Telnet session with the Ethernet.

Store Commands

```
store tn dest <dxprn>iSeries<IPaddress>
store tn dest <dxprn>port<portnumber>
store tn dest <dxprn>devicedesc<devicename>
store tn dest <dxprn>msgqname<msgqname>msgqlib<msgqlib>
store tn dest
<dxprn>WSCSTname<WSCSTname>WSCSTlib<WSCSTlib>
store tn dest <dxprn>from default
store tn dest <dxprn>[-]autoconnect
```

```
store tn dest <dxprn>copytimeout<copytimeoutvalue>
```

See page 329 for store command descriptions.

List Commands

```
list tn  
list stored tn  
list default tn
```

See page 356 for list command descriptions.

TN5250/3270 Auto Connect Command

```
tn dest <dxprn>start|stop
```

See page 363 for a detailed description.

Getting Started

Set the following items when first configuring the Ethernet for use with an iSeries running TN5250:

- The IP address of the iSeries you are planning to use.
Example: store tn dest d1prn as400 192.75.11.1
- The device description or queue name you want built on the iSeries for the printer. This must be unique to the printer.
Example: store tn dest d1prn devicedesc MOCHA3812
- Enable the printer to automatically connect to the iSeries when it is first powered up or automatically reconnect if the original connection is lost.

Example: store tn dest d1prn autoconnect

In most circumstances, all other settings can be left as default. The printer should be reset (powered off and on again) for the settings to take effect.

If you do not wish the printer to connect automatically when powered up then leave the autoconnect disabled and control the connection manually with the following command:

Example: tn dest d1prn start

By using the manual method, time is allowed to properly prepare the iSeries after the printer is powered up but before a connection is established. This method should only be used during an initial installation until the printer and the iSeries are synchronized. The normal method is to have autoconnect enabled.

The autoconnect feature has a cycle time of approximately one minute. A little patience may be required when first turning on the printer before the connection becomes visible on the iSeries.

TN5250 Job Formatting

Forms width, forms length, CPI and LPI are controlled by the TN5250 data stream unless the front panel TN5250 Host Override option is enabled. The CPI is controlled through TN5250 via the font selection in the Change Device Description (CHGDEVPRT) command.

A completed screen looks like the example shown in Figure 41.

Change Device Desc (Printer) (CHGDEVPRT)		
Type choices, then press Enter .		
Device description	DEV D	
Online at IPL	ONLINE	*NO
Font:	FONT	
Identifier		011
Point Size		*NONE
Form Feed	FORMFEED	*CONT
Separator drawer	SEPDRAWER	*FILE

Chapter 12 TN5250 Job Formatting

Separator program	SEPPGM	*NONE
Library		
Printer error message	PRTERMSG	*INFO
Library		*LIBL
Host print transform	TRANSFORM	*NO
Manufacturer type and model	MFRTYPMDL	*SAME
Paper source 1	PPRSRC1	*MFRTYPMDL
Paper source 2	PPRSRC2	*MFRTYPMDL
Envelope source	ENVELOPE	*MFRTYPMDL
ASCII code page 899 support	ASCII899	*NO
Image configuration	IMGCFG	*NONE
Character identifier:	CHRID	
Graphic character set		*SAME
Code page		
User-defined options	USRDFNOPT	*SAME
+ for more values		
User-defined object:	USRDTATFM	
Object		*NONE
Library		
Object type		
Data transform program	USRDTATFM	*NONE
Library		
User-defined driver program	USRDRVPGM	*NONE
Library		

Text 'description'	TEXT	'Device created for S1045PXM.'
Workstation customizing object	WSCST	*NONE
Library		

Figure 41. Example of CHGDEVPR command

Font Identifier (FONT) - Help

Specifies the font identifier used by the 3812, 3816, and 5219 printers (including ASCII printers emulating the 5219 printer), and the IPDS printers.

The Printer Font Table (Font Parameter) in the CRTDEVPR command lists the valid font identifiers, the display values, the characters per inch value implied with each font style, a description of each font style, and whether the font is supported on a particular printer.

NOTE: Some fonts may be substituted by the printer. Consult the various printer reference guides of details.

The possible values are:

- **identifier.** Specify the 3-, 4-, or 5-digit identifier associated with this printer.
- **point-size.** Specify a point size ranging from 0.1 through 999.9. If you do not specify a point size, the system will set one.
- ***SAME.** This value does not change.

The print quality/typeface setting in TN5250 mode is NOT set by the TN5250 data stream. It is only set through the front panel. This is true regardless of the front panel TN5250 Host Override setting.

13

iSeries Configuration, SNMP

Configuring for a *LAN 3812 SNMP Device Description

Support for SNMP is available in the base code for iSeries OS V4RS and above. *LAN 3812 SNMP device descriptions are similar to *LAN 3812 PJI device descriptions, and they fully support the page range function.

Configuration Instructions

To configure a 6500-v, for SNMP system device driver program, use the CRTDEVPRT command. The following parameters should be specified:

Device Class (DEVCLS)

This needs to be set to *LAN.

Device Type (TYPE)

This needs to be set to 3812.

Device Model (MODEL)

This needs to be set to 1.

LAN Attachment (LANATTACH)

This needs to be set to *IP.

Port number (PORT)

This needs to be set to 9100.

Font (FONT) = 011

This is typically set to 011, which is the default 10 CPI font. A font ID is required to create the device description. Unless special requirements in your operation dictate something different, this should suffice.

Form Feed (FORMFEED)

This should be set to *CONT. Leaving this set at *TYPE or setting it to the wrong value can cause problems with both drawer selection and paper size.

Printer Error Message (PRTERMSG)

This defaults to *INQ, but can be set to *INFO so the printer's message queue will receive informational messages whenever possible. If this is set to *INQ and a problem occurs on the printer (such as out of forms or a paper jam) a message will be sent to the printer's message queue that must be answered before printing can continue.

Activation Timer (ACTTMR)

This defaults to 170 (seconds), but can be set to any value from 1 to 2550 seconds (or 42.5 minutes). The activation timer refers to the amount of time for the system to wait for the LAN-attached printer device to respond before ending a connection attempt. If the printer refuses a connection attempt by the host for any reason before the timer expires, it will be considered not available and an error message will post.

Inactivity Timer (INACTTMR)

This defaults to *ATTACH, but can be set to any value from 1 to 30 (minutes), as well as *SEC15 (15 seconds), *SEC30 (30 seconds) or *NOMAX (no maximum). This value determines when the print driver closes the connection to the printer (freeing it up to received spooled output from another source) once there are no iSeries OS spooled files left in RDY (ready) status. It is recommended that this be set to *SEC15 so the iSeries OS will free up the printer 15 seconds after all RDY spooled files have been processed. Setting it to *NOMAX will cause the iSeries OS to maintain the connection until the writer ends, so the printer device will not be shared with other systems.

Host Print Transform (TRANSFORM)

This needs to be set to *YES so the iSeries OS system's Host Print Transform (HPT) function will convert both SCS and AFPDS spooled files to the printer's data stream.

Manufacturer Type and Model (MFRTPMDL)

This indicates the type of ASCII printer being used. This value is used by HPT to determine what ASCII controls to use when converting the spooled file from SCS or AFPDS to ASCII. The recommended values are determined by the ASCII emulation setting on the printer. The choices are: *IBM6500-vEP for Epson emulation, *IBM6500-v or *IBM4203 for Proprinter.

Remote Location (RMTLOCNAME)

This should be set to the printer's IP address, host name or DNS name. If an IP address is used, it should be entered without leading zeros (for example, use 192.186.10.2 instead of 192.186.010.002). If an IP address is used, verify that the iSeries OS can reach the printer by using either the PING or Verify TCP/IP Connection (VFYTCPCNN) command with that IP address. If a host name or DNS name is used, verify that the iSeries OS can reach the printer by using either the PING or Verify TCP/IP Connection (VFYTCPCNN) command with that host name or DNS name.

User-Defined Options (USRDFNOPT)

Specifies, for spooled output only, one or more user-defined options to be used by user applications, user-specified programs or the writer. A maximum of four user-defined options can be specified. This should be set to *IBMSHRCNN whenever configuring a *LAN 3812 SNMP.

Specifying *IBMSHRCNN will cause the print driver to open and close the connection to the data port on the printer for every copy of every spooled file. This allows multiple writers and systems to access the printer, while the print driver is active and there are files in ready status. When this option is specified, the printer is capable of being shared and the value that is specified for the Inactivity Timer is ignored.

System Driver Program (SYSDRVPGM)

Specifies the name of a system-defined driver program, which provides the capability to send the iSeries OS printer output to a printer attached over a TCP/IP network. This should be set to *IBMSNMPDRV whenever configuring a *LAN 3812 SNMP device description.

Workstation Customizing Object (WSCST)

This is typically set to *NONE, but can be used to specify a modified workstation customer object.

All other parameters should be specified like any other printer.

Configuration Example

To configure a *LAN 3812 SNMP device description type CRTDEVPRT and press the F4 (Prompt) key. The following is an example of using the Create Device Printer (CRTDEVPRT) command to create a *LAN 3812 SNMP device description:

```
CRTDEVPRT DEVD(SNMP6500-v) DEVCLS(*LAN) TYPE(3812)
MODEL(1) LANATTACH(*IP) PORT(9001) FONT(011)
FORMFEED(*CONT) PARITY(*NONE)
STOPBITS(1) TRANSFORM(*YES) MFRYTPMDL
(*IBM6500-v) RMTLOCNAME('9.5.208.46')
USRDFNOPT(*IBMSHRCNN) USRDRVPGM(*NONE)
SYSDRVPGM(*IBMSNMPDRV)
```

Create Device Desc (Printer) (CRTDEVPRT)

Type **choices**, then press Enter.

Create Device Desc (Printer) (CRTDEVPRT)		
Device description	P6500	Name
Device class	*LAN	*LCL, *RMT, *VRT, *SNPT, *LAN
Device type	*IPDS	3287, 3812, 4019, 4201...
Device model	0	0, 1, 2, 3, 4, 10, 13, 301...
LAN attachment	*IP	*LEXLINK, *IP, *USRDFN
Port number	5001	0-65535
Online at IPL	*YES	*YES, *NO
Font:		
Identifier	011	3, 5, 11, 12, 13, 18, 19...
Point size	*NONE	000.1-999.9, *NONE
Form feed	*CONT	*TYPE, *CONT, *CONT2, *CUT...
Separator drawer	*FILE	1-255, *FILE
Separator program	*NONE	Name, *NONE

Chapter 13 Configuring for a *LAN 3812 SNMP Device Description

Library		Name, *LIBL, *CURLIB
Printer error message	*INQ	*INQ, *INFO
Message queue	*CTLD	Name, *CTLD, *SYSOPR, QSYSOPR
Library		Name, *LIBL, *CURLIB
Activation timer	170	1-2550, *NOMAX
Image configuration	*NONE	*NONE, *IMGA01, *IMGA02...
Maximum pending requests	6	1-31
Print while converting	*YES	*NO, *YES
Print request timer	*NOMAX	1-3600, *NOMAX
Form definition	F1C10110	Name
Library	*LIBL	Name, *LIBL, *CURLIB
Remote location:		
Name or address	'9.5.208.46	
User-defined options	*NONE	Character value, *NONE
+ for more values		
User-defined object:		
Object	*NONE	Name, *NONE
Library		Name, *LIBL, *CURLIB
Object type		*DTAARA, *DTAQ, *FILE...
Data transform program	*NONE	Name, *NONE
Library		Name, *LIBL, *CURLIB
Secure connection	*NO	*NO, *YES
Validation list	*NONE	Name, *NONE
Library		Name, *LIBL, *CURLIB

Publishing information:		
Support duplex	*UNKNOWN	*UNKNOWN, *SIMPLEX, *DUPLEX
Support color	*UNKNOWN	Name, *LIBL, *CURLIB
Pages per minute black	*UNKNOWN	1-32767, *UNKNOWN
Pages per minute color	*UNKNOWN	1-32767, *UNKNOWN
Location	*BLANK	
Data streams supported	*UNKNOWN	*UNKNOWN, *PCL, *PS, *PDF...
+ for more values		
Text 'description'	*BLANK	
Additional Parameters		
Remote network identifier	*NETATR	Name, *NETATR, *NONE
Workstation customizing object	*NONE	Name, *NONE
Library		Name, *LIBL, *CURLIB
Authority	*ALL	Name, *LIBCRTAUT, *CHANGE...

Varying on the Printer

Once you have created the printer device description, you need to vary on the printer device description using either the Vary Configuration (VRYCFG) command or Work with Configuration Status (WRKCFGSTS) command. Once the device has been varied on, you must start the printer writer using either (STRPRTWTR) or Work with Writers (WRKWTR) command.

Problem Areas for Consideration

If you then place a spooled file in the printer's output queue and it goes to MSGW (message wait) status with MSGCPA3394 "Load form type '&4' device &5 writer &1. (G B I H R C)" then chances are good that the spooled file will print once you answer this message with a "G."

However, if the spooled file stays in RDY (ready) status or goes to PND (pending) status without printing or if the WTR ends you can look in the Message queue you specified in the devd, the SYSOPR message queue or the writer job log for messages that may indicate why the spooled file is not printing or why the WTR ended.

To look in the message queue you specified in the devd or the SYSOPR message queue, simply Type, `DSPPMSG`, then press F4 (to Prompt the cmd) and enter either your queue name/library or *SYSOPR. You should see the a message indicating that the job was submitted and then above that the failure. You may press F1 on that message to obtain the second level text. If you are referred to the WTR job log for additional information, refer to the following instructions.

To look at the writer job, do the following:

NOTE: Check to see if the writer is still active.

1. On the iSeries OS command line, type the following:

`WRKJOB JOB (writer-name)` The writer name is typically the same name given to the device description. Press the Enter key. This brings you to the Select Job panel or the Work with Job panel. If you are at the Select Job panel, the most current writer job is at the top of the list. Place a 1 in the Option field to the left of the most recent WTR job and press the Enter key.

If the writer has ended, take menu option 4 (Work with spooled files) on the Work with Job panel. From the Work with Job Spooled Files panel, select Option 5 (Display) to display the QPJOBLOG spooled file or Option 2 (Change) to requeue the spooled file to a different output queue so it can be printed and investigated. Make any suggested corrections, restart the writer, and re-submit the job.

If the writer is still active, select menu option 10 (Display job log, if active or on job queue) on the Work with Job panel. Press the F10 key and the Page Up and Page Down keys to view the messages in the writer job log.

Additional Information

The success of *LAN 3812 SNMP device descriptions is dependent on the configuration settings in the iSeries OS as well as on the printer and print server hardware. For more information about configuring the time-out values on the printer and print server hardware and common error messages that you can receive when printing through a *LAN 3812 SNMP device description, please refer to the following document:

19935220 Configuration Settings and Error Messages for *LAN 3812 SNMP Device Descriptions located on the iSeries support line Knowledge base Web site.

14

Monitoring Printers

Implementing Printer Management

Printer management includes the following tasks:

- Monitoring the status of network printers
- Responding to alarms
- Gathering statistics on printer operations

The three elements of network printer monitoring and management are:

- Agent/manager model
- The management information database (MIB)
- SNMP, the protocol used to get management information
- Printer management utility (PMU)

Agent/Manager Model

The elements of a monitoring system, MIB and SNMP, are implemented in an agent/manager model:

- The MANAGER is a console, workstation, or server on working hubs or routers which has a global knowledge of Ethernet Interfaces and printers.
- AGENTS are utilities that reside on devices, such as a Ethernet Interface, that respond through SNMP to management requests for information. The information is stored in an MIB.

MIB

An MIB contains information a device makes available through SNMP. The MIB is a management information base that describes information about actual objects to be managed and controlled.

Standards Of Network Printer MIBs

The Printer MIB is based on the following standards:

- System and Interfaces Group MIB (RFC 1213 of March 1991)
- Host Resource MIB (RFC 1514 of September 1993)
- Printer MIB (RFC 1759 of March 1995)
- Ethernet contains the Standard Printer MIB per RFC 1759, available from www.ietf.org.

Components Of The Printer MIB

The printer MIB gives the network manager access to most of the information that is normally accessible through the Ethernet Interface command set for configuring the server with SNMP. Some objects identified by this MIB are not applicable to the Ethernet Interface.

The printer MIB is composed of the following sections:

- General
- Cover
- Localization
- Input
- Output
- Marker
- Media Path
- Channel

- Interpreter
- Console
- Alert

Information Provided By The MIB

The printer MIB contains the following types of information about network printers:

Descriptions. Printer configuration, location, and contact.

Status. Current operating status of printers.

Alerts. Reportable events from printers.

General Information About MIBs

For further information on SNMP and MIB, refer to the following:

- RFC 1155 — Structure and Identification of Management Information for TCP/IP-based Internets (SMI)
- RFC 1156 — Management Information Base for Management of TCP/IP Internets (MIB)
- RFC 1157 — A Simple Network Management Protocol (SNMP)
- The Simple Book: An Introduction to Management of TCP/IP-based Internets

Getting The Latest MIB Information

To obtain the latest copy of these and other RFCs, FTP the files from one of the following two sources:

Internet:

`ftp://ftp.isi.edu/internet-drafts`

World Wide Web:

`http://www.ietf.cnri.reston.va.us/lid-abstracts.html`

SNMP

SNMP is the protocol used to communicate between manager and agent. Managers request information, usually through automated polling at specified intervals, and agents respond. Though used primarily on TCP/IP networks, SNMP can be implemented on other protocols, for example, IPX.

SNMP is a standard by which a network manager can get statistics and configuration information from the Ethernet Interfaces and other devices on the network. This is done through a Network Management Station (NMS) such as NetView®.

Monitoring Tools

Many tools can be used to monitor printers with SNMP agents. One of these tools is NetView. There are also other MIB browsers which are not described here.

Monitoring With AIX NetView/6000

The AIX NetView/6000 program can manage any IP-addressable device with an SNMP agent.

NetView/6000 can be used to set a network topology, monitor a network, diagnose problems, and measure network performance.

Through its MIB Browser, information about the resources affecting an event (such as an alarm) can be obtained.

Setting The SNMP Community Name

The default SNMP read-only community name is “public” and cannot be changed.

Change the SNMP R/W community name with the command:

```
set user passwd snmp com_name  
save
```

where *com_name* is the new SNMP R/W community name.

The default is no R/W community name.

NOTE: Changing SNMP community names or access rights may hinder or disable applications that are monitoring your printers.

The Printer Management Utility Software (PMU)

The IBM printer manager utility is a versatile and dynamic program. It allows you to organize all of the printers in your office remotely in a single database, download software and printer settings from a host computer with a single mouse click, and use a virtual operator's panel to configure printers in the same room or on the other side of the world. Refer to *IBM Printer Management Utility User's Manual* for more details on this tool.

15

IBM Network Printer Manager

Overview

IBM Network Printer Manager (NPM) lets network administrators monitor, control, and configure IBM 6500-v printers in various environments. NPM works with the IBM 6500-v, the network printer family, including IBM InfoPrint 20 and 32 (except for NPM for OS/2), and IBM Network Printers 12, 17, and 24. For the Windows and IP and Web versions, you can also use NPM with other manufacturer's network printers that comply with RFC 1759, such as the Hewlett-Packard** LaserJet** 5si and the Lexmark** Optra** N.

NOTE: IBM 6500-v is supported only in the "web" and NT versions, not OS/2.

Using NPM, administrators can:

- View the status of each printer, such as its alarm conditions
- View and change printer properties, such as the default input tray
- View and change printer network properties, such as the NetBIOS printer network workgroup name
- Add new network services to printers so you can customize the environment, such as creating high- and low-priority print services.

For detailed information on how to use NPM, please refer to NPM online help.

You can configure NPM using either the TCP/IP or NetBIOS network protocols, and use TCP/IP to monitor the printers.

NPM is available on the World Wide Web. To obtain the latest version of NPM:

1. Access the IBM Printing Systems Home Page at:
`http://www.printers.ibm.com`
2. Navigate to IBM Network Printer Manager.
3. Follow the instructions to download NPM. Installation instructions are in the README file.

NOTE: NPM for Windows NT requires that a specific SNMP R/W community name be defined in the printer before it can be successfully discovered. The SNMP R/W community name must be set to `ibmpsc_admin` with the following telnet commands:

```
set user passwd snmp ibmpsc_admin
save
```

16

Commands

Command Shell Overview

The Ethernet Interface comes with an in-depth command shell called `npsh`. It allows you to manipulate objects like destinations, I/O ports, and models and provides monitoring and troubleshooting capabilities.

npsh Access Methods

This command shell can be accessed by:

- built in HTML forms
- a Telnet session from a TCP/IP host to the Ethernet Interface
- a single remote shell command (e.g., `rsh`, `rcmd`, `remsh`) from a TCP/IP host

Main npsh Command Prefixes

All configurable commands either start with `store` or `set`, and view commands start with `list`.

NOTE: If the `store` prefix is used, the Ethernet Interface must be repowered to make the changes take effect. Since `store` affects flash memory settings only, the print server must reset and read the new settings now in flash memory.

NOTE: If the `set` prefix is used, a `save` command must be executed as well so that the new settings are retained after power cycles. Since `set` only affects the settings in memory, they will be lost after a power cycle unless they are saved to flash memory.

Getting Command Help

The Ethernet Interface command shell provides several online help tools, including:

“?” Command

Typing “?” when logged in to the command shell will produce a full list of all available commands.

Command Prefixes

Typing in the first portion of a command will produce an error message showing the correct syntax. For example, typing in `store tcpip` will produce a list of all commands that start with this prefix.

Complete Command List

This section outlines the entire Ethernet Interface command set including the command syntax, a description, and in most cases, an example for each command listed.

NOTE: If you see the word *ifnum* in any npsd commands, you should substitute a 1 or 2 unless told otherwise. The 1 represents the one network interface (e.g., Ethernet) supported. The 2 represents the wireless network interface if it exists in the system.

Store Commands

These commands change the settings stored in flash memory and do not affect the current or working settings in memory. A power cycle is needed before the stored settings become current.

```
store ifc ifnum utp [-]li [-]rx
```

example: `store ifc 1 utp li`

Modify the physical UTP interface properties where `li` enables link integrity and `rx` enables the increased receive threshold.

```
store ifc from default
```

Set all UTP settings back to factory defaults.

```
store ifc from current
```

Store all current UTP settings to flash memory so they are retained after a power cycle. This ensures all current settings match what is stored in flash memory.

```
store ifc default <ifnum>|<0> (0 for no default)
```

Store the specified interface as the default interface. The other interface is no longer active after power cycle. The 0 allows for both interfaces to be active.

```
store ifc <ifnum> mode auto|10half|10full|100half|100full
```

Store the specified interface mode as automatic, 10mbps half duplex, 10mbps full duplex, 100mbps half duplex, 100mbps full duplex. See page 47.

WIRELESS ADAPTER, WIRELESS

Defines the authentication scheme:

```
store ifc <ifnum> wlan auth <auth-method>
(eg. openauth, shared, leap, kerb)
```

Open system authentication allows all devices that have the authentication algorithm number for open system to authenticate. Shared key authentication involves a four step process using secure or encrypted text by means of WEP. Option `leap` is to enable/disable LEAP operation. Option `kerb` is for Kerberos.

WIRELESS ADAPTER, WIRELESS

Define a auth-user-name to be used in the LEAP operation:

```
store ifc <ifnum> wlan user <auth-user-name>
```

This auth-user-name needs to match the user name entered in the LEAP Access Point.

WIRELESS

Define a auth-password to be used in the LEAP operation:

```
store ifc <ifnum> wlan pass <auth-password>
```

This auth-password needs to match the password entered in the LEAP Access Point.

WIRELESS

Set the network name (SSID):

```
store ifc <ifnum> wlan ssid <network-name>
```

<ifnum> is the interface number for the WLAN interface.

<network-name> is a 1 to 32 ASCII character string.

WIRELESS ADAPTER, WIRELESS

Set network mode:

```
store ifc <ifnum> wlan mode adhoc|pseudo|managed  
<net-mode>
```

<ifnum> is the interface number for the WLAN device.

<net-mode> is the type of network operation mode: “adhoc,” “pseudo” or “managed.” “pseudo” stands for pseudo IBSS (Proprietary adhoc).

WIRELESS ADAPTER, WIRELESS

Set transfer rate (speed):

```
store ifc <ifnum> wlan speed auto|<1 2 5 11>
```

<ifnum> is the interface number for the WLAN device.

<1 2 5 11> are the speeds being selected. They are entered as a list of integers, separated by 'space' characters. The following values are supported: 1 for 1Mbps, 2 for 2Mbps, 5 for 5.5Mbps, and 11 for 11Mbps. Using the word “auto” instead of any number will set the card to use automatic negotiation.

WIRELESS ADAPTER, WIRELESS

Set channel number:

```
store ifc <ifnum> wlan channel default <1-15>
```

<ifnum> is the interface number for the WLAN device.

<1-15> selects the RF channel number (1 to 15) used in ad-hoc mode. The word “default” will inform the device driver to use the card's factory set default channel.

WIRELESS ADAPTER, WIRELESS

Set antenna type:

```
store ifc <ifnum> wlan antenna diverse|primary|aux  
<antenna-type>
```

<ifnum> is the interface number for the WLAN device.

<antenna-type> is the type of antenna to be used: “primary,” “aux” (auxiliary or external) and “diverse”. “diverse” allows the WLAN card to decide on the optimal antenna during operation.

WIRELESS ADAPTER, WIRELESS

Set preamble length:

```
store ifc <ifnum> wlan preamble default|long|short  
<len-type>
```

<ifnum> is the interface number for the WLAN device.

<len-type> is the type of preamble length required. It can be “long,” “short,” or “default.” “default” allows the card to use its own factory default.

WIRELESS ADAPTER, WIRELESS

Set power management mode:

```
store ifc <ifnum> wlan pmm on|off
```

<ifnum> is the interface number for the WLAN device.

The string “off” disables power-save mode. The string “on” enables power-save mode with a default sleep-time of 100ms.

WIRELESS ADAPTER, WIRELESS

Set transmit power:

```
store ifc <ifnum> wlan txpwr <0-100>
```

<ifnum> is the interface number for the WLAN device.

<0-100> the power level as a percentage of full power.

WIRELESS ADAPTER, WIRELESS

Set options:

```
store ifc <ifnum> wlan opts [[-]openauth][[-]intnl]
```

<ifnum> is the interface number for the WLAN device.

An option is enabled by including it in the list and disabled by preceding it with a '-' character in the list. Supported option is “intnl,” for international mode and “openauth” for open authentication.

WIRELESS ADAPTER, WIRELESS

Set the default key for WLAN encryption:

```
store ifc <ifnum> wlan defkey disable|<1-4>
```

<ifnum> is the interface number for the WLAN device.

<1-4> is the number identifying one of the four keys (1-4). A value of zero or the word “disable” disables encryption.

WIRELESS ADAPTER, WIRELESS

Set the key to a given value:

```
store ifc <ifnum> wlan key <key-num> <key-value>|  
<$<string-key>{<length>}>
```

<ifnum> is the interface number for the WLAN interface.

<key-num> is the number identifying one of the four keys (1-4).

<key-value> is the encryption key value for <key-num>. The value must consist of 5 or 13 double- or quad-digit HEX numbers, separated by colon (':') or dash ('-') characters for readability (e.g. D1C2-B3A4-9586-7768-594A-3B2C-1D).

Alpha characters are NOT case sensitive. All zero disables encryption for <key-num>. If '\$' is the first character the remainder of the argument is treated as a literal string with all alpha-numeric characters allowed except spaces). Key length is inferred from the length of key-value so leading zeroes of longer keys must be entered (not blanked).

WIRELESS ADAPTER, WIRELESS

Enables or disables Kerberos:

```
store kerberos opts [-]auth
```

Sets the maximum allowable amount of clock skew in seconds or minutes that Kerberos authentication will tolerate before assuming that a Kerberos message is invalid:

```
store kerberos config clockskew <clock_skew><s|m>
```

The time units cannot be mixed and there must at least be one space between the <renew_life_time> value and the time unit (s or m). The default is 300 seconds, (i.e. five minutes). The minimum allowable value is 60 seconds (i.e. 1 minute). The maximum allowable value is 900 seconds (i.e. 15 minutes).

NOTE: The Microsoft step-by-step Guide to Kerberos 5 (krb5 1.0) Interoperability recommends that your system clock be synchronized within two minutes to the KDC system's clock. Otherwise, clock skew errors will cause Kerberos authentication to fail. If this is the case, the clock skew default may need to scale down to two minutes.

**WIRELESS
ADAPTER,
WIRELESS**

Sets the maximum allowable ticket lifetime in seconds, minutes, hours, or days:

```
store kerberos config tktlife <life_time> <s|m|h|d>
<life_time> is between 300 seconds and 259200 seconds (3
days). The time units cannot be mixed and there must be at
least one space between the <life_time> value and the time
units (s, m, h, or d). Default value is 43200 seconds.
```

**WIRELESS
ADAPTER,
WIRELESS**

Sets the maximum allowable renewable lifetime in seconds, minutes, hours, or days:

```
store kerberos config renewlife <renew_life_time>
<s|m|h|d>
<renew_life_time> is 0 (i.e. no limit) or between 300 seconds
and 604800 seconds (7 days). The time units cannot be mixed
and there must be at least one space between the
<renew_life_time> value and the time unit (s, m, h, or d).
Default value is 0.
```

**WIRELESS
ADAPTER,
WIRELESS**

Configures the KDC port:

```
store kerberos config kport <kdc_port>
<kdc_port> is the 2-byte UPD/TCP port used for Kerberos
communication. Default is 88.
```

**WIRELESS
ADAPTER,
WIRELESS**

Configures the KDC name portion of the service principal:

```
store kerberos config kname <kdc_name>
<kdc_name> has a maximum of 127 characters excluding
“.” and “/”. Default is krbtgt.
```

WIRELESS ADAPTER, WIRELESS

Configures the KDC realm portion:

```
store kerberos config krealm <kdc_realm>
```

<kdc_realm> is usually set to the uppercase name of the Windows 2000 KDC to which the Access Point is configured. <kdc_realm> has 0 to 127 characters excluding “:” and “/”. Default is localrealm.

WIRELESS ADAPTER, WIRELESS

Sets the Kerberos password that must match the Windows 2000 user password for the Print Server:

```
store kerberos password <kerberos_password>
```

<kerberos_password> is either a string without any space and tab, or a double quoted string with a maximum of 40 alphanumeric characters or symbols. The administrator should choose at least 9 alphanumeric characters with a combination of upper and lower case characters and symbols. In the Windows environment, this is the Windows 2000 user password for the Print Server and they must be exactly the same.

```
store ping opts [-]enable
```

Example: store ping opts enable

Store the state of periodic ping flag. If the periodic ping flag is enable the NIC periodic ping client will attempt to ping its default gateway on its active NIC interfaces.

Default: disabled

```
store ping packet <number of packets>
```

Example: store ping packet 5

Store the value of the packet. It is the number of ICMP Echo Request packets that will be sent by the periodic ping client on each period.

```
store ping period <minutes>
```

Example: store ping period 5

Store the value of the period. <minutes> is the amount of time from 1 to 5 minutes defines the periodic ping sequence will be repeated.

Default: 5

```
store pping from default
```

Example: store pping from default

Store all the periodic ping default setting to flash memory so that they are retained after power up.

```
store pserver from default
```

Set all general print server settings back to factory defaults.

```
store pserver from current
```

Store all current general print server settings to flash memory so they are retained after a power cycle. This ensures all current settings match what is stored in flash memory.

```
store pserver name
```

Example: store pserver name NIC1234

Command to change the print server name.

```
store pserver opts [[-]jobsecurity] [jobtimeout  
seconds]
```

Example: store pserver opts jobsecurity jobtimeout 5

If `jobsecurity` is disabled, any user can cancel queued jobs on the Ethernet including guest users. If `jobtimeout` is set to some value other than 0, the Ethernet will only wait this amount of `seconds` when getting printer feedback. This is only used if you have a `logpath` port and type set on a particular destination.

```
store pserver opts [[-]jobsecurity]  
[jobtimeout <seconds>] [jobcontrol[off|standard|  
enhanced]]
```

Example: store pserver opts [-]jobcontrol

If `jobcontrol` is disabled then the need for start of job / end of job flow control with the printer is determined by the printer. Job flow control is used for jobs requiring backchannel responses such as IPDS, TN and PDL jobs only. This is available as a performance enhancement for LPR, TCP socket printing etc. The job flow control has no affect on IPDS, TN, and PDL jobs. These options perform their own control. When `jobcontrol` is enabled all jobs will be supported with job flow control.

NOTE: When `jobcontrol` is disabled, dynamic config loading on a model change is also disabled.

- **off.** no job control; no SOJ/EOJ commands. The printer prints faster in off mode.
- **standard.** (the default) traditional job control with immediate acknowledgements of SOJ/EOJ commands.
- **enhanced.** job control with EOJ acknowledgements held off by the printer until job is fully printed. The printer prints slower in enhanced mode.

To monitor the printer, use the telnet command “lpstat.” The normal status reported on the first line of the lpstat response is the status of the queue (LPQ) within the Ethernet. The status reported does not reflect the state of the print job once it has been sent from the Ethernet to the printer.

The new line at the bottom of the lpstate response labeled “printer job:” can report one of two status values:

- a. **In Progress.** A job in the printer is not yet finished.
- b. **Done.** There are no jobs in the printer. All previous jobs are finished.

```
store pserver lpd [-]dest1default
```

```
Example: store pserver lpd dest1default
```

If dest1default is disabled and upon verification, the printer name supplied by the LPR protocol and the destination name does not match, then an error message is returned and the service is refused. If dest1default is enabled and upon verification, the printer name supplied by the LPR protocol and the destination name does not match, then the job is automatically routed to the first destination and the service is accepted.

Default: enabled

```
store pserver tcpsocket <tcp-port> port <new-tcp-port>
```

```
Example: store pserver tcpsocket 4000 port 5000
```

Change a pre-defined TCP port number <tcp-port> on the Ethernet Interface to a new TCP port number <new-tcp-port>. The default number is 9100 for prn.

```
store pserver tcpsocket <tcp-port> dest <dest>
```

```
Example: store pserver tcpsocket 5000 dest d1prn
```

Assign a pre-defined TCP port number <tcp-port> to a particular destination <dest> on the Ethernet Interface. Therefore, if you are using a print method that sends jobs directly to a TCP port number, you still have the option to process the job data through this destination setting.

```
store pserver tcpsocket add <tcp-port> dest <dest>
```

```
Example: store pserver tcpsocket add 9101 dest d2prn
```

Maps the port number to a destination.

```
store pserver tcpsocket del <tcp-port> dest <dest>
```

```
Example: store pserver tcpsocket del 9101 dest d2prn
```

Deletes a mapped port number destination already defined by listed commands.

ADAPTER, WIRELESS ADAPTER

```
store pserver novell passwd [<password>]
```

```
Example: store pserver novell passwd ibm
```

Store the password <password> for the Ethernet Interface to use when logging in to a Novell file server. This password would have to match one set on the file server.

ADAPTER, WIRELESS ADAPTER

```
store pserver novell fserver add|del <fileserver>
```

```
Example: store pserver novell fserver add fs1
```

Add or remove a server entry on the Ethernet Interface for the Novell file server it will be servicing.

ADAPTER, WIRELESS

```
store pserver novell frametype [ethernet2|802.2|802.3|  
802.2 snap|autosense]
```

Sets the frame type for the Novell protocol.

```
store pserver novell mode [auto|bindery|nds]
```

```
Example: store pserver novell mode [auto|bindery|nds]
```

Stores the mode for the unit to operate in either autosense, Bindery, or NDS.

```
store pserver novell context [<context>]
```

```
Example: store pserver novell context context
```

Stores the print server object in any context within the NDS tree choosen.

```
store pserver smb workgrp <workgroup>
```

Example: store pserver smb workgrp eng

Define a different Windows workgroup as defined by <workgroup> for the Ethernet Interface to be visible within (should be 14 characters or less). By default, the print server only comes up within the group called "WORKGROUP."

```
store pserver tree [<tree>]
```

Example: store pserver novell tree tree

Stores the print server object in a specified tree.

ADAPTER, WIRELESS ADAPTER

```
store rprinter add <psname> <printer_num> <dest>
```

Example: store rprinter add pserver1 0 dlprn

Add the RPRINTER settings on the Ethernet Interface for a Novell environment. <psname> must be the name of an existing PSERVER.NLM on your Novell file server. <printer_num> is the printer number within this PSERVER.NLM. <dest> is the queue on the Ethernet Interface where the print jobs will be sent.

ADAPTER, WIRELESS ADAPTER

```
store rprinter del <psname> <printer_num> <dest>
```

Example: store rprinter add pserver1 0 dlprn

Delete the RPRINTER settings on the Ethernet Interface for a Novell environment. <psname> must be the name of an existing PSERVER.NLM on your Novell file server. <printer_num> is the printer number within this PSERVER.NLM. <dest> is the queue on the Ethernet Interface where the print jobs will be sent.

```
store tcpip <ifnum> addr <address>
```

Example: store tcpip 1 addr 192.75.11.9

Store the IP address for the Ethernet Interface.

```
store tcpip <ifnum> frametype [[-]ethernet2]  
[[-]802.2snap]
```

Example: store tcpip 1 frametype ethernet2 802.2snap

Control which frame type(s) is supported with the TCP/IP protocol. By default, both Ethernet2 and 802.2snap are enabled, but normal TCP/IP communications rely on Ethernet 2. This setting has no affect on other supported network protocols (e.g., Novell).

```
store tcpip <ifnum> mask <netmask>
```

```
Example: store tcpip 1 mask 255.255.255.0
```

Store the subnet mask for the Ethernet Interface.

```
store tcpip <ifnum> opts [[-]rarp] [[-]bootp] [[-]dhcp]
[[-]persistdhcp] [[-]dns]
```

```
Example: store tcpip 1 opts -rarp -bootp -dhcp
```

Enable or disable the automatic RARP, BOOTP, DHCP, DNS, persistent DHCP requests for IP addresses upon bootup. If you are storing the Ethernet Interface TCP/IP network settings within the device, you will not need to rely on RARP, BOOTP, DHCP, or DNS for new settings.

```
store tcpip route add [host|net] <network> [/mask]
<router> <ifnum> [<metric>]
```

```
Example: store tcpip route add net 192.75.12.0 1
```

Add a static route to a particular TCP/IP host or subnet specified by <network> so the Ethernet Interface knows how to communicate with it. Normally one entry for a default router/gateway is all that is needed for communications between different subnets. Please see the next command for details.

```
store tcpip route del [host|net] <network>
```

```
Example: store tcpip route add net 192.75.12.0 1
```

Delete a static route to a particular TCP/IP host or subnet specified by <network> so the Ethernet Interface knows how to communicate with it. Normally one entry for a default router/gateway is all that is needed for communications between different subnets. Please see the next command for details.

```
store tcpip route add|del default [1|2] <router>
<ifnum> [<metric>]
```

```
Example: store tcpip route add default1 192.75.11.1 1
```

Store a default router/gateway defined by <router> <ifnum> so the Ethernet Interface knows where to direct packets destined for another subnet. It is easier to store one default entry rather than an entry per remote host or network as in the previous command.

```
store tcpip del default [1|2]
```

```
Example: store tcpip route del default1 192.75.11.1 1
```

Delete a default router/gateway defined by router IP Address (<router> <ifnum>) so the NIC knows where to direct packets destined for another subnet.

```
store tcpip tcp rxwin <packets>
```

```
Example: store tcpip tcp rxwin 2
```

Determine the receive window size for the Ethernet Interface. Usually the <packets> value ranges from 2 to 8, with the lower number allowing for more simultaneous TCP connections with the print server.

```
store tcpip tcp opts [-]keepalive [-]disbufmgmt  
[-]zeroIPArp [-]keepalivedata
```

```
Example: store tcpip tcp opts keepalive -disbufmgmt
```

Control whether the Ethernet Interface maintains a connection with a host when data cannot be accepted into its buffer. Normally the `keepalive` feature is enabled so when the printer cannot accept data, the print job connection is maintained and continued once the situation clears. The `keepalivedata` option controls whether the `keepalive` packet contains a data byte for hosts that require it. If `disbufmgmt` is disabled (i.e., "-"), the Ethernet Interface will not buffer any data when there is a blocked situation with the printer. Normally, it is best to have both `keepalive` and `disbufmgmt` enabled.

```
Example: store tcpip tcp opts zeroIPArp
```

If `zeroIPArp` is disabled then a Ethernet Interface with an IP address of 0.0.0.0 will not allow IP access until the IP address is configured. If `zeroIPArp` is enabled on an Ethernet Interface with an IP address of 0.0.0.0 then any attempted access with a valid IP address is assumed for this Ethernet Interface and an Arp lookup is performed.

Default: enabled

```
store tcpip tcp access [root] add|del <network>
[<netmask>]
```

Example: store tcpip tcp access add 192.75.11.25

Add or remove an entry from the Ethernet Interface TCP access list defined by <network>. If the list has an entry, only this host can print to and remotely interact with the print server.

```
store tcpip from default|current
```

Example: store tcpip from default

Set all TCP/IP network settings back to factory defaults.

Example: store tcpip from current

Store all current TCP/IP network settings to flash memory so they are retained after a power cycle. This ensures all current settings match what is stored in flash memory.

```
store tn dest <dest> connect <resourcename>
```

Example: store tn dest dlprn connect MYRESNM

Store the resource name for the host session. The resource name must be the same as the name of the printer device created on the host for the session.

Default: Unconfigured (empty) resource name

```
store tn dest <dest> mode 5250|3270
```

Example: store tn dest dlprn mode 3270

Store the TN protocol mode.

Default: 5250

```
store tn dest <dxprn> host <IPaddress>
```

Example: store tn dest dlprn host 192.75.11.1

Store the IP address of the TN5250/3270 host

Default: Unconfigured (empty) IP address

```
store tn dest <dxprn> port <portnum>
```

Example: store tn dest dlprn port 27

Store the UDP port number of the TN server.

Default: 23

```
store tn dest <dxprn> devicedesc <devname>
```

```
Example: store tn dest dlprn devicedesc MOCHA3812
```

Store the name of the printer device. The description entered will be the name of the printer device created on the iSeries host for the current session.

Default: Unconfigured (empty) description.

```
store tn dest <dxprn> msgqname <msgqname>
```

```
Example: store tn dest dlprn msgqname QSYSOPR
```

Store the queue name to which system messages will be logged.

Default: QSYSOPR

```
store tn dest <dxprn> msgqlib <msgqlib>
```

```
Example: store tn dest dlprn msgqlib *LIBL
```

Store the queue library to which system messages will be logged.

Default: *LIBL

```
store tn dest <dxprn> WSCSTname <WSCSTname>
```

```
Example: store tn dest dlprn WSCSTname *NONE
```

Store the queue name to which system messages will be logged.

Default: *NONE

```
store tn dest <dxprn> WSCSTlib <WSCSTlib>
```

```
Example: store tn dest dlprn WSCSTlib *LIBL
```

Store the queue library to which system messages will be logged.

Default: *LIBL

```
store tn dest <dxprn> [-] autoconnect
```

```
Example: store tn dest dlprn autoconnect
```

Store the state of the autoconnect flag. If the autoconnect flag is enabled the Ethernet Interface TN client will attempt a connection and binding with the specified TN host automatically on power-up. This connection sequence will be repeated every 60 seconds until successful or the autoconnect flag is disabled.

See “tn dest destination start | stop” command.

Default: disabled

```
store tn dest <dxprn> copytimeout
```

```
Example: store tn dest dlprn copytimeout 1000
```

Store the value of the copytimeout. When consecutive TN5250/3270 jobs are sent to the Ethernet, they are treated differently depending how soon they arrive. In an attempt to provide a perception of collation when multiple copies are sent from one host, if the time between jobs is less than the copytimeout value then they are treated as copies and the job is given precedence over other host documents. This keeps documents, which are sent in rapid succession together as if they were copies of the same document. A higher value improves the likelihood of collation but impacts performance.

Default: 500

```
store tn from default|current
```

```
Example: store tn from default
```

Store all tn default settings to flash memory so that they are retained after power up.

Set Commands

These settings alter the current or working settings in memory only. Therefore, they will be lost if the Ethernet Interface is power cycled. To ensure this does not happen, issue a `save` command so the current settings get written to flash memory.

```
set dest <dest> alternate [<alt_dest>]
```

Example: `set dest d1prn alternate d4prn`

Sets an alternate destination for a queue other than itself.

```
set dest <dest> backchannel [prn]
```

Example: `set dest d1prn backchannel prn`

Establish a return path for printer feedback for a given destination `<dest>`. The Ethernet Interface I/O port is bi-directional, however, you will most likely use the same I/O port to which the destination is currently sending jobs.

```
set dest <dest> logpath <logpath>
```

Example: `set dest d1prn logpath l4`

Associate a logpath with a destination. Jobs sent to the named destination `<dest>` are logged according to the settings defined in the named logpath.

```
set dest <dest> model <model>
```

Example: `set dest d1prn model m4`

Associate a model with a destination. Jobs sent to the named destination `<dest>` are processed according to the options defined in the named model.

```
set dest <dest> name <new_name>
```

Example: `set dest d1prn name line matrix`

Change the current name of the destination `<dest>` to a new name as indicated by `<new_name>`. `<new_name>` must be nine characters or less or it will be truncated. These names are case sensitive.

```
set dest <dest> service [[-]socket][[-]lpd]
[[-]lpsched] [[-]rprinter] [[-]pserver] [[-]netbios]
[[-]ftpd] [[-]tn]
```

Example: `set dest dlprn service -netbios`

Set the destination <dest> to handle only certain print services. To add a service, specify the service name. To disable a service, use “-” before the name. The available services are:

**ADAPTER,
WIRELESS
ADAPTER**

**ADAPTER,
WIRELESS
ADAPTER**

Parameter	
socket	Direct socket printing via TCP/IP.
lpd	LPR printing with TCP/IP, including LPR clients on any platform.
lpsched	LP or System V printing with TCP/IP.
rprinter	Novell RPRINTER support.
pserver	Novell PSERVER support.
netbios	Windows 95 and Windows for Workgroups printing.
ftpd	Printing using the File Transfer Protocol (FTP) via TCP/IP.
tn	Printing using the TN5250/3270 session.

```
set dest from default
```

Set all destination settings back to factory defaults.

```
set dest from stored
```

Set all current destination settings to the values stored in flash memory.

Chapter 16 Complete Command List

```
set logpath <logpath> name <new_name>
```

Example: `set logpath 11 name pagecount`

Change the current name of the logpath <logpath> to a new name as indicated by <new_name>. These names are case sensitive.

```
set logpath <logpath> type [[-]job] [[-]user]
[[-]cksum] [[-]printer] [[-]ioport]
```

Example: `set logpath 12 type job user printer pgcnt`

Establish the type of printer and print job logging to be done within this logpath. The options are:

job	Job ID, username, etc.
user	User ID along with three messages per job about start and finish.
cksum	16-bit checksum value to confirm integrity of data printed.
printer	For special printer feedback.
ioport	Printer error messages determined through the parallel port pins.

```
set logpath <logpath> port <TCP-port>|email|syslog
```

Example: `set logpath 13 port 2000`

Determine where the log information should be sent for a print job or attached printer. The choices are:

TCP-port	TCP port number ranging from 1024 to 65000.
email	Particular user's email address. This address is set using the <code>set sysinfo email emailname@IPaddress</code> or <code>emailname@domain.com</code> command.
syslog	A central TCP/IP host running the SYSLOG daemon. This host is set using the <code>set sysinfo syslog IPaddress</code> command.

```
set logpath from default
```

Set all logpath settings back to factory defaults.

```
set logpath from stored
```

Set all current logpath settings to the values stored in flash memory.

```
set model <model> name <new_name>
```

```
Example: set model m1 name landscape
```

Change the current name of the model <model> to a new name as indicated by <new_name>. These names are case sensitive.

```
set model <model> type raw
```

```
Example: set model m2 type raw
```

Set the model `type` to `raw` so that it does not process the data passing through it in any way.

```
set model <model> banner [text] [after]
```

```
Example: set model m2 banner text
```

Determine whether a banner page should be added for print jobs passing through the model <model> mapped destination/queue. By default, banner pages are added to the front of the job. If `after` is set, the banner page will come at the end.

```
set model <model> stty [[-]onlcr] [[-]descramble]  
[xtab <1-6>|none]
```

```
Example: set model m3 stty onlcr
```

Control extra job processing done by the *model*. The processing options are:

- | | |
|-------------------|--|
| onlcr | Carriage return insertion for Unix text jobs. Adds carriage returns to text jobs with solitary linefeeds. This will prevent stair-stepped output or output running off the right side of the page. |
| descramble | Automatic descrambling of print jobs passing through which have been scrambled using proprietary Unix scramble utility, <code>npscramble</code> . |
| xtab | Tab expansion from 1 to 16 spaces. |

```
set model <model> header [<string>]
```

Example: `set model m1 header 0x20`

Set a header string to be sent to the printer at the start of any print jobs passing through this model <model>. The header <string> can consist of up to nine elements. An example element is a hexadecimal code (e.g., 0x04) or a pre-defined variable on the print server (e.g., \$FF for a formfeed). Use *list var* to see all available variables. To erase the header, send the command with no *headerstring* value; for example 'set model m1 header'.

```
set model <model> trailer [<string>]
```

Example: `set model m7 trailer $FF`

Set a trailer string to be sent to the printer at the start of any print jobs passing through this model <model>. The trailerstring <string> can consist of up to nine elements. An example element is a hexadecimal code (e.g., 0x04) or a pre-defined variable on the print server (e.g., \$FF for a formfeed). Use *list var* to see all available variables. To erase the trailer, send the command with no *trailerstring* value; for example 'set model m1 trailer'.

```
set model <model> config [config_num]
```

Set a printer configuration number [config_num] to be loaded prior to printing a job on the specified model. If the command is sent with config_num set to 0, the factory configuration is loaded before the job prints. If config_num is in the range 1 through 8, the corresponding configuration number is loaded before the job prints. To return to the default state where no configuration is loaded, send the command with no config_num value; for example 'set model m1 config'. When no new configuration is loaded, the current configuration settings will be in effect for any jobs sent to model <model>. To see which configuration, if any, will be loaded at the start of a job, use the command 'list model' or 'list model <model>'.

```
set model from default
```

Set all model settings back to factory defaults.

`set model from stored`

Set all current model settings to the values stored in flash memory.

`set prn [-]autofd`

Example: `set prn -autofd`

Assert or do not assert the AUTOFD line for carriage return insertion. This only affects printers that support this function, such as impact printers.

`set prn flush`

Flush the data in the parallel port input and output buffers.

`set prn unlock`

Release the access lock on the parallel port.

`set prn timeout <int>|none`

Example: `set prn timeout none`

Terminate the print job sent to the parallel port if it is not printed after the timeout period in minutes <int> expires. The <int> value ranges from 0 though 255, with 0 indicating no timing out to take place. This is the default setting and should be fine for most print setups.

`set prn [-]opost`

Example: `set prn -opost`

Allow or disallow output processing on the parallel port such as carriage return insertion (e.g., onlcr).

`set prn [-]onlcr`

Example: `set prn -onlcr`

Enable or disable carriage return insertion on the parallel port. This may be needed for Unix text jobs coming through with solitary linefeeds. This feature is almost always set at the model level rather than the I/O port level.

`set prn xtab <int>|none`

Example: `set prn xtab none`

Set the tabstop width as indicated by <int>. The range is 1 through 16 spaces.

`set prn from default`

Set all parallel port settings back to factory defaults.

`set prn from stored`

Set all current parallel port settings to the values stored in flash memory.

`set snmp`

To add a user named `snmp` with root privileges, follow the steps below:

1. Login to the Ethernet Interface as a root user.

2. Add a user named `snmp`:

```
set user add snmp
```

3. Set the user type to `root`:

```
set user type snmp root
```

4. Set the password for the `snmp` user:

```
set user passwd snmp snmppassword
```

5. Save the changes:

```
save
```

The user `snmp` is now created and *snmppassword* is the only community string which will allow write access.

`set snmp manager <index> <ipaddress> <trap-community>`

The Ethernet Interface continuously generates traps. To set the Ethernet Interface to send traps to a particular SNMP manager, use this command to add an SNMP manager to the trap table.

`<index>` is the index number of the trap table. `<ipaddress>` is the IP address of the SNMP manager receiving traps.

`<trap-community>` is the community string sent along with the trap information.

`set snmp trapport <index> <udp_port>`

Set the UDP port number in the SNMP trap manager table.

This value should correspond to the port number monitored by the SNMP manager application running on the host at the IP address specified in the 'set snmp manager' command.

`<index>` is the index number of the SNMP trap manager table.

`<udp_port>` is the desired UDP port number. Acceptable values are 162, and 49152 through 65535.

```
set snmp trap <index> [-]active
```

Enable or disable an SNMP trap manager table entry.

<index> is the index number of the SNMP trap manager table. “active” enables the table entry, “-active” disables the entry.

```
set snmp emailaddr <index> <emailaddress>
```

The Ethernet Interface can also send SNMP alert messages to a desired e-mail address. To specify an e-mail address to send alert messages to, use this command to add the e-mail address to the SNMP alert table.

<index> is the index number of the SNMP trap manager table.
<emailaddress> is the desired e-mail address of the form user@domain.com.

```
set snmp emailformat <index> [-]short
```

Enable or disable the short e-mail message format for an SNMP alert table entry. When enabled, the short e-mail format can be used when messages will be viewed on devices having a limited display size (a cellular phone or pager, for example).

<index> is the index number of the SNMP alert table. “short” enables the short e-mail format, “-short” disables it.

```
set snmp shortmsglen <index> <length>
```

Specify the length of the short e-mail message format for an SNMP alert table entry. This command is effective only when the short e-mail message format for an SNMP alert table entry is enabled.

<index> is the index number of the SNMP alert table. “length” specifies the length of the short e-mail message, and has an acceptable range of 15 to 80 characters.

```
set snmp email <index> [-]active
```

Enable or disable sending e-mail alert messages for an SNMP alert table entry.

<index> is the index number of the SNMP alert table. “active” enables sending e-mail alert messages, “-active” disables it.

```
set snmp alerts <index> [-]all | [[-]warning]
[[-]offline] [[-]mediainput] [[-]mediaoutput]
[[-]mediapath] [[-]marker] [[-]cutter] [[-]barcode]
[[-]scanner] [[-]intervention] [[-]consumable]
[[-]label] [[-]powercart] [[-]rfid]
```

Example: `set snmp alerts 1 warning -cutter]`

Specifies which alert groups are enabled for reporting via an SNMP manager, e-mail alert message, and/or Unix syslog daemon. See Table 8 on page 101 for a description of specific printer events belonging to each group.

<index> is the index number of the SNMP manager/alert table.

“-all” disables and “all” enables reporting of alerts in all alert groups. Individual alert groups can be selectively enabled or disabled via combinations of alert group switches. For example, to enable warning alerts and disable cutter alerts for SNMP table entry 1, enter the following:

```
set snmp alerts 1 warning -cutter
```

```
set snmp syslog <index> [-]active
```

The Ethernet Interface can also log SNMP alert messages to the defined SYSLOG host (see the ‘set sysinfo syslog’ command description). Use this command to enable or disable logging of alert messages for an SNMP alert table entry.

<index> is the index number of the SNMP alert table. “active” enables alert message logging, “-active” disables it.

```
set sysinfo contact [<string>]
```

Example: `set sysinfo contact Paul_Harris`

Set a person or department to contact in case of print server trouble.

```
set sysinfo email <email>
```

Example: `set sysinfo email JohnDoe@IBM.com`

Define the user email address to receive printer and job logging information from a particular logpath on the Ethernet Interface. Email name is the host or IP name of the user.

```
set sysinfo email emailname@domain
```

```
Example: set sysinfo email joe@IBM.com
```

Define the user email address to receive printer and job logging information from a particular logpath on the Ethernet Interface. E-mail name is the host or IP name of the user.

Default: Unconfigured.

```
set sysinfo label|name [<string>]
```

```
Example: set sysinfo name salesprinter
```

Set a descriptive name defined by <string> for Ethernet Interface identification purposes. This is not used in the operation of the print server in any way.

```
set sysinfo location [<string>]
```

```
Example: set sysinfo location salesdept
```

Set the physical location of the Ethernet Interface. This is for identification purposes and is not used in the operation of the print server in any way.

```
set sysinfo loginfo [-]sys | [-]tcp | [-]ipx | [-]spx
```

```
Example: set sysinfo loginfo -sys ipx
```

Set the Ethernet Interface debugging information type. Usually this information includes unexpected errors or exceptions from the print server divided into these groups:

sys	General system messages
tcp	TCP stack messages
ipx	IPX stack messages
spx	SPX stack messages

NOTE: This is not printer or job logging information.

```
set sysinfo logport null|prn|syslog
```

```
Example: set sysinfo logport null
```

Define to where the debugging information should be sent. This can be sent to an output device off of the Ethernet Interface I/O port or to a central TCP/IP host running a SYSLOG daemon. To set TCP/IP host, use the command `set sysinfo syslog hostIPaddress`.

```
set sysinfo smtp <IPAddress> [port <portnum>]
```

```
Example: set sysinfo smtp 192.75.11.5 port 25
```

Define the SMTP (Simple Mail Transfer Protocol) server IP address or domain name and port number where the mail is stored on your network.

Default: Unconfigured, 25

```
set sysinfo syslog <IPAddress>
```

```
Example: set sysinfo syslog 192.75.11.30
```

Set the IP address of the host running the SYSLOG daemon. Ethernet Interface debugging or print job and printer logging information can be sent to that IP address.

```
set sysinfo dns <IPAddress>
```

```
Example: set sysinfo dns 192.75.11.2
```

Set your DNS server IP address so the Ethernet Interface can resolve host names when used with its built-in Telnet and ping clients.

```
set sysinfo descramblekey <hexval>
```

```
Example: set sysinfo descramblekey 1234
```

Set the key value used for descrambling print jobs that have passed through Printronix npscrumble utility on a TCP/IP host. This key is a four-digit hexadecimal value obtained from the host software, npscrumble. Within the npscrumble source code, there is a variable called SR_KEY which contains the default key value. This can be changed to any four-digit value you would like.

```
set sysinfo module [[-]novell] [[-]netbios]
```

```
Example: set sysinfo module -novell
```

Enable and disable certain network protocol stacks within the Ethernet Interface. Sometimes it helps to disable any protocols you are not using on your network.

NOTE: [-] novell option is available on Adapter, Wireless only.

```
set user add|del <name>
```

```
Example: set user add eng
```

Add or remove a user on the Ethernet Interface defined by <name>.

IMPORTANT Do not delete the root user, or you will be unable to configure any further settings on the print server. You will have to go back to factory defaults to correct this problem.

```
set user passwd <name> [<password>]
```

```
Example: set user passwd eng ibm
```

Assign a password to a defined user on the Ethernet Interface.

```
set user type <name> root|guest
```

```
Example: set user type eng root
```

Assign root or guest privileges to a particular user defined by <name>. Guest permissions allow viewing of settings only.

Root permissions allow complete control of the Ethernet Interface.

```
set user from default
```

Set all user settings back to factory defaults.

```
set user from stored
```

Set all current user settings to the values stored in flash memory.

```
set user passwd snmp <com_name>
```

Set the new SNMP R/W community name as the <com_name> value.

```
set var <var> [<variable-string>]
```

```
Example: set var LANDSCAPE 0x1b 0x26 0x6c 0x31 0x4f
```

Define a new variable to be used in header, trailer, or switch strings on the Ethernet Interface and call it <variable-string>.

<variable-string> can be a space-separated list of words, hexadecimal numbers (e.g., 0x04), or references to other pre-defined variables. It is easiest to make up the <variable-string> with hexadecimal values, as shown in the example.

NOTE: One variable counts as one element within header and trailer strings.

Defined variables are referenced in strings by placing a “\$” before the variable name (e.g., set model m1 trailer \$FF).

`set var from default`

Set all variable settings back to factory defaults.

`set var from stored`

Set all current variable settings to the values stored in flash memory.

List Commands

These commands list the current or working settings for a particular section within the command shell. To view stored settings in flash memory, insert `stored` after `list`. For example, `list prn` shows the current printer settings but `list stored prn` shows the settings in flash memory. Normally these should match.

`list all`

Lists all current settings.

`list arp`

List the current ARP table that the Ethernet Interface adheres to in a TCP/IP network.

`list dest [destination]`

List the current destination settings (e.g., names and mapped I/O ports, models, and logpaths).

`list diff`

List the differences between the current settings and the stored settings in flash memory. Normally, you want these values to match, so issue a `save` command followed by a `reset` command.

`list ifc`

List the current UTP interface settings (e.g., link integrity).

**WIRELESS
ADAPTER,
WIRELESS**

For the wireless Ethernet, the WLAN interface settings will also be included. The WLAN parameters display in the following manner, after the interface list has displayed:

WLAN

```
ifnum      = <ifnum>
ssid       = <network name>
mode       = <net-mode>
channel    = <channel-num>
antenna    = <antenna-type>
speed     = <speed-flags>
preamble   = <len-type>
pmm       = <sleep-time>
defkey     = <key-num>
auth      = <auth-method>
txpwr     = <power>
opts      = <option-list>
Status    = <status>
Quality   = <comms-quality>
```

Where:

<ifnum> is the interface number for the WLAN device.

<network name> is a 1 to 32 ASCII character string.

<net-mode> is the type of network mode of operation: “adhoc,” “pseudo,” or “managed.”

<channel-num> is the RF channel being used for communication.

<antenna-type> is the type of antenna (“Primary,” “Auxiliary,” or “Diverse”).

<speed-flags> is the speeds being used for communication ([1 2 511], or “auto”).

<len-type> indicates the selected preamble length (“long,” “short,” or “default”).

<sleep-time> indicates the power-save sleep-time in milliseconds. If power-save is disabled (time is set to zero), “normal” (power-save off) displays.

<key-num> is the number identifying one of the four encryption keys, starting from one. Encryption is disabled if “Encryption disabled” displays.

<auth-method> is the authentication method e.g. open, shared, kerb, leap.

<power> is a percentage indicating the approximate fraction of full power.

<option-list> is a list of options that are enabled (disabled options are not shown).

<status> is the current access point association status (“disassociated” or “associated with <MAC address>”).

<comms-quality> indicates the strength or quality (in percent) of the wireless signal.

NOTE: The “list stored ifc” command does not display the “Status” or “Quality” lines.

list kerberos

For Wireless Ethernet with Symbol RF cards only.

list key

List the license details and license key number.

list logins

List any active user logins on the Ethernet Interface.

list logpath [logpath]

List the current logpath settings (e.g., names and mapped destinations).

`list model [model]`

List the current model settings (e.g., names and mapped destinations). List the current model settings (e.g., names and mapped destinations). With no *model* parameter, a table of values for name, type, banner, config and the size in bytes of header and trailer are shown for all models m1 through m8. When the *model* parameter is supplied, the specific bytes used in the header and trailer are shown, along with the banner type, data type and configuration number for that specific model.

`list mosinfo`

List the MOS version

`list net`

List all current TCP/IP network settings (e.g., IP address and subnet mask).

`list pping`

List all the current periodic ping setting.

`list prn`

List the current parallel port setting (e.g., mode).

`list pserver`

List the current general print server settings (e.g., print server name and Novell mode).

NOTE: Novell parameters are listed on Adapter and Wireless Ethernet Interfaces only.

ADAPTER, WIRELESS ADAPTER

`list rprinter`

List any current RPRINTER definitions.

`list snmp`

List the Trap Table containing SNMP Managers.

`list stored tn`

List all the tn protocol settings which are stored in the flash memory. If there is no valid settings stored in flash then the default setting are listed. If this is done then an “*” is added to the word “stored” in the top left corner of the displayed list table.

`list sysinfo`

List the current Ethernet Interface system information (e.g., contact name and protocol stacks enabled).

`list tcpip`

List all current TCP/IP network settings (e.g., IP address and subnet mask).

`list test`

List the status of output tests on the I/O ports.

`list tn`

List all current tn protocol settings.

`list uptime`

Lists how long the Ethernet Interface Card has been up and running from the last reset.

`list user`

List the current user definitions (e.g., user names and types).

`list var`

List all pre-defined variables including any newly created ones. Any of these defined variables can be referenced in a string by placing a "\$" before the variable name (e.g., `set model m1 trailer $FF`).

Miscellaneous Commands

These commands do not fall under any specific section of the command shell, but they are used quite frequently.

`cancel jobID`

Example: `cancel dlprn-10`

Remove a job from an I/O port queue. Use `lpstat` to find a particular job ID first.

`chr <string>`

Echo `<string>` or redirect `<string>` to an I/O port using the `chr <string> ioport`.

`close tcp TCPindexnumber`

Example: `close tcp 3`

Close the a TCP/IP connection between a TCP/IP host and the Ethernet Interface. The *TCPindexnumber* can be retrieved from “debug tcp” output.

`disable ioport|destination|printer mgr`

Example: `disable prn`

Disable an *I/O port* so that queued jobs are not printed, or disable a *destination* so jobs cannot be queued to it.

Example: `enable printermgr`

Enables the printer debug port to allow remote printer management software to function.

`enable ioport|destination`

Example: `enable prn`

Enable an *I/O port* so that queued jobs are printed, or enable a *destination* so jobs can be queued to it.

`load [default]`

Load the settings stored in flash memory and use them as the current or working settings. If `default` is specified as well, factory settings will be loaded.

`lpstat [ioport] [jobID]`

Example: `lpstat prn`

Display active and queued jobs and I/O port status for a given *ioport* or *jobID*. Specifying one of these parameters will shorten the output and focus on the particular I/O port or print job specified.

`keycode`

Determine the hexadecimal value for a key to be used as the escape character with the Ethernet Interface built-in telnet command.

`ping [-s] hostIPAddress [datasize [packetnumber]]`

Example: `ping 192.75.11.30`

`ping` another TCP/IP host specified by *hostIPAddress* on the Ethernet Interface network. *datasize* is the datagram packet size which defaults to 64 bytes if no size is included in the syntax and *packetnumber* is the number of requests to be sent.

NOTE: To use a host or IP name instead of the address, you must have set the DNS server on the Ethernet Interface. Use the command `set sysinfo dns...` to do this.

`reboot`

Perform a warm boot or hardware reset to simulate a power-on reset. This restores current settings to those stored in flash memory, since the flash memory settings will be read and loaded into memory upon bootup.

`reset`

Perform a warm boot or hardware reset to simulate a power-on reset. This restores current settings to those stored in flash memory, since the flash memory settings will be read and loaded into memory upon bootup.

`save [default]`

Save the current settings to flash memory so they are available after power cycles. Sysinfo, destination, model, logpath, variable, user, and I/O port settings will be saved. If `default` is specified as well, factory settings will be saved, overwriting any new settings you have configured.

```
start fox|tts|loopb prn
```

Example: start fox prn

Begin a debugging test on one of the I/O ports on the Ethernet Interface. The tests available are:

fox	A continuous stream of text sent to the attached printer. This is a good test for troubleshooting hardware as long as the attached printer supports text output.
tts	A continuous stream of Gandalf 400C TTS-compatible text sent to the attached printer.
loopb	Loopback test. Any input characters from the device attached to the I/O port is echoed back.

```
stop all|prn
```

Stop an output test on an I/O port.

```
telnet hostIPAddress [escapecharacter]
```

Example: telnet 192.75.11.35

Start a Telnet session with another TCP/IP host specified by *hostIPAddress* on the Ethernet Interface network. If *escapecharacter* is used, it resets the key sequence used to exit the Telnet session. It will return you to the telnet> prompt where you can execute *quit*. Use the *keycode* command to find out exact escape characters if needed. The default character is CTRL].

NOTE: To use a host or IP name instead of the address, you must have set the DNS server on the Ethernet Interface. Use the command `set sysinfo dns...` to do this.

```
tn dest destination start|stop
```

Example: tn dest dlprn start

Set the tn autoconnect flag temporarily to enable (start) or disable (stop). For more information, see the command “store tn dest <dxprn> [-]autoconnect” on page 343.

```
? (Help)
```

Lists all available commands.

Chapter 16 Complete Command List

17

Extra Features

Ethernet Interface Security

There are TCP access lists available to restrict host connections with the device.

Users And Passwords

The Ethernet Interface supports two user types:

<code>root</code>	Access to everything within the print server including all configurable settings.
<code>guest</code>	Ability to list settings only.

Passwords can be set for each user type. However, most often you will just set a password for the `root` user to protect the Ethernet Interface configuration. `Guest` users cannot alter the print server configuration in any way.

To configure a `root` password on your Ethernet Interface:

1. Load a Web browser on a network station that can communicate with the print server over TCP/IP. The commands to set a `root` password are:

Syntax:

```
set user passwd username password
save
```

Example:

```
set user passwd root your_password_for_root
save
```

2. Direct your Web browser to URL:
`http://EthernetInterfaceIPAddress/
adminConf.html`
(e.g., `http://192.75.11.9/adminConf.html`).
- NOTE:** If prompted for a “User ID” and password first, type `root` for the user ID and press ENTER at the password prompt (since there is no password by default).
3. At the “Administration Configuration” HTML form that displays, scroll down to the “Passwords” section.
 4. Click within the “Old” field beside the “Root Password” heading and enter the existing root password. By default, there is no root password, so you can go to the next step without typing anything in this field.
 5. Within the “Root Password” section, click within the “New” field and enter the new root password.
 6. Within the “Root Password” section, click within the “Confirm” field and enter the new root password again. Remember this is case sensitive.
 7. Click the SUBMIT button when done and physically repower the print server to make the new setting take effect.

From this point on, anytime you log in to the Ethernet Interface as `root`, you will need to specify this password or your login attempt will fail.

NOTE: To clear this password or change it, use the same “Administration Configuration” HTML form. Just enter the appropriate “Old” password and put in the new one (or nothing if you do not want a root password any longer). The commands directly on the Ethernet Interface are:

```
set user from default  
save
```

Reset The Ethernet Password

Occasionally a user will set a root user password on the Ethernet adapter and then forget it. This is the procedure to reset the root password back to the default (no password).

IMPORTANT First determine the number of dip switches on the back of the adapter, and the Ethernet version from the printer configuration printout.

Do the appropriate procedure for the type of Ethernet contained in the printer.

2 dip switches, Wireless Ethernet	See Procedure A, page 367
2 dip switches, Ethernet version greater than 1.1.20.0	See Procedure A, page 367
2 dip switches, Ethernet version less than 1.1.20.0	See Procedure B, page 368
3 dip switches, any ethernet version	See Procedure B, page 368
No dip switches, embedded Ethernet. Any version.	See Procedure C, page 369

ADAPTER, WIRELESS ADAPTER

Procedure A

1. Turn the printer off.
2. Flip dip switch 1 down on the Ethernet adapter.
3. Turn the printer on, and wait about 1 minute for the adapter to boot.
4. Flip dip switch 1 up.
5. Turn printer off, wait 15 seconds, then turn it back on.
6. Re-program the IP address information from the front panel.

NOTE: Steps 1 – 5 also clears the IP address information and SSID and sets the adapter back to the factory default.

7. Type the following at the telnet prompt:
set user passwd root
save
reset

8. Wait about 1 minute for the adapter to reboot after the reset command.
9. Turn the printer off, wait 15 seconds, and turn the printer back on. Wait 1 minute for the adapter to boot.
10. Telnet back into the adapter, logging in as `root` with no password, and pressing **Enter**.

Procedure B

1. Turn the printer off.
2. Flip dip switch 2 down on the Ethernet adapter.
3. Turn the printer on, and wait about 1 minute for the adapter to boot.
4. Telenet to the adapter.
5. Login as `root` and press **Enter** for the password.
6. Flip dip switch 2 up.
7. Type the following at the telnet prompt:
set user passwd root
save
reset
8. Wait about 1 minute for the adapter to reboot after the reset command.
9. Turn the printer off, wait 15 seconds, and turn the printer back on. Wait 1 minute for the adapter to boot.
10. Telnet back into the adapter, logging in as `root` with no password, and pressing **Enter**.

Procedure C

1. Turn the printer on.
2. Take the printer offline and unlock the front panel by pressing the up and down arrows keys at the same time, then releasing.
3. Press all four arrow keys (up, down, prev, next) at the same time, and release.
4. Press the right (next) arrow until PRINTER MGMT appears.
5. Press the down arrow and then the right (next) arrow until “E-NET to DEFAULT” appears.
6. Press **Enter**.
7. Re-program the IP address information from the front panel.

NOTE: Steps 1 – 5 also clears the IP address information and sets the adapter back to the factory default.

TCP Access Lists

Within TCP/IP environments, the Ethernet Interface can restrict host access to destinations/queues and remote command (e.g., rsh, rcmd, remsh, and telnet) execution services. This is done using an access list similar in function to the Unix .rhosts file.

NOTE: Access list settings are not configurable through the HTML forms provided with the Ethernet Interface.

To view the current access list on the print server:

1. Start a Telnet session with the Ethernet Interface.

Syntax:

```
telnet EthernetInterfaceIPAddress
```

2. Log in as **root** and press ENTER at the password prompt since there is no password by default (or your password for your home set).
3. List the current access list.

Syntax:

```
List tcpip
```

If the list is empty, all hosts have access to the Ethernet Interface services. If there are entries in the list, only those hosts specified have access to printing and remote command execution.

To add and delete access list entries, the commands are:

Syntax:

```
store tcpip tcp access add|del hostIPAddress|  
networkaddress  
reset
```

where *hostIPAddress* is the IP address of a TCP/IP host on your network and *networkaddress* is the address of a subnet on your network.

Example:

```
store tcpip tcp access add 192.75.11.25  
store tcpip tcp access add 192.75.12.0  
store tcpip tcp access del 192.75.11.25  
reset
```

NOTE: Although the maximum number of entries in the access list is 10, each entry can refer to a network rather than a specific host. This allows all hosts on that specified network and any individual hosts specified in the list to have access.

Printer Monitoring And Logging

The Ethernet Interface allows you to monitor printer status and log information through its built-in HTML forms, command set, and logpaths.

Printer And Print Job Monitoring

To view the current status of an I/O port on the Ethernet Interface, two methods are available:

- select the desired I/O port on the “Status” HTML form (i.e., `http://EthernetInterfaceIPAddress/indexStatus.html`; e.g., `http://192.75.11.9/indexStatus.html`) that comes with the Ethernet Interface.
- enter the `lpstat` command directly on the print server once logged in as `guest` or `root`.

In each case, you are given a description of each I/O port status and a list of queued jobs. Table 13 describes some of the common terms you may encounter.

Table 13. Key Printer Logging Terms

Term	Description
idle	There is no job queued for the Ethernet Interface I/O port.
blocked	The printer is not allowing the Ethernet Interface to send data to it. Check that there is not a printer error and it is online and ready to go.
waiting	The Ethernet Interface knows about a print job but is waiting for the host to send more data or to send an expected packet.

Printer Logging Through Logpaths

In the Ethernet Interface product manual, destinations are described as logical queues with associated models and logpaths. Models determine if any extra processing is needed with the print jobs passing through, and logpaths determine whether any logging is needed for each job.

Each logpath on the Ethernet Interface consists of two parts:

TYPE	The type of log information to be captured. The choices are <code>job</code> for job ID and username, <code>user</code> for user ID (and three messages per job), <code>pgcnt</code> for total pages printed in a job, <code>cksum</code> for file checksums, <code>printer</code> for special printer feedback, and <code>ioport</code> for parallel printer status messages.
PORT	Where this log information will be sent to. The choices are a TCP port number (e.g., 2000), an email address (including an alias), or a central host running a SYSLOG daemon.

To view the current logpath settings on the print server:

1. Load a Web browser on a network station that can communicate with the print server over TCP/IP or using Telnet (e.g. Telnet *ipaddress*). The command to view the logpath settings is:

Syntax:

```
list logpath
```

NOTE: If prompted for a “User ID” and password first, type in `root` for the ID and press ENTER at the password prompt since there is no password by default.

2. Direct your Web browser to URL
`http://EthernetIPaddress/destConf.html`
(e.g., `http://192.75.11.9/destConf.html`).

NOTE: If prompted for a “User ID” and password first, type in `root` for the ID and press ENTER at the password prompt (since there is no password by default).

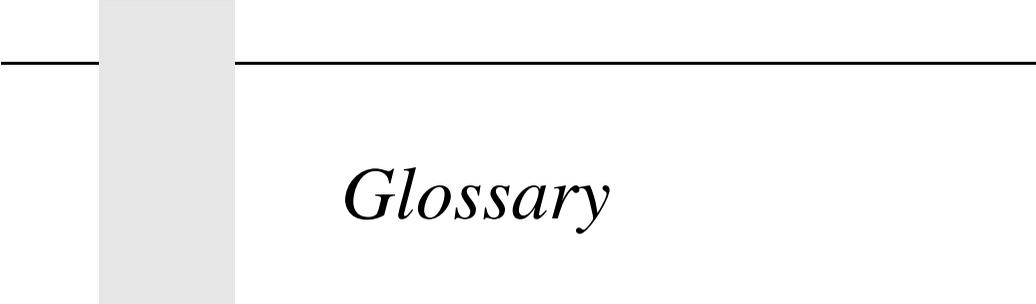
3. At the “Print Path Configuration” HTML form that displays, select a destination link (e.g., d1prn) from the top of the page to bring up the appropriate destination form.
4. Once the desired destination HTML form displays, scroll down to the “Logpath Type” and “Logpath Port” sections to view the current logpath settings for this particular destination.

At this point, you can alter any of these settings and then click the SUBMIT button to store them into the Ethernet. Remember to repower the Ethernet to make the settings take effect.

Ethernet Interface Naming Schemes

A single I/O Port destination can be configured with a variety of model and logpath combinations. For instance, once you set the parameters for m1 and l1, you can assign the model and logpath to more than one I/O port destination such as d1prn, d2prn, and d8prn. You may now use the same set of model and logpath parameters more than once without having to redefine those parameters each time for another I/O Port destination.

Chapter 17 Ethernet Interface Naming Schemes

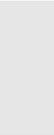


Glossary

ARP	Address Resolution Protocol. Associates a selected IP address with a network device Ethernet address.
bps	Bits per second.
Centronics	Parallel port interface standard found on most printers.
daemon	A continuously running process that handles system-wide functions like print spooling.
default router	Local device that forwards any IP packets destined for another subnet.
destination	Logical print queue on the Ethernet to which hosts send their print jobs. There are eight destinations by default.
DHCP	Dynamic Host Configuration Protocol. Allows a network device to discover its IP address dynamically upon bootup. The IP address does not need to be stored within the device itself permanently.
Download Mode	Refers to the condition of the Ethernet when in a startup condition, downloading configuration information.
DNS	Domain Name Server. Host providing responses to queries for a given host name IP address.
EEPROM	Electrically Erasable/Programmable Read-Only Memory.

factory defaults	Settings shipped with the Ethernet.
Factory Settings	S2 jumper position stating all factory default settings are to be used while the Ethernet is up and running.
Firmware Panic	Unrecoverable errors detected by the Ethernet firmware force the Print Server into Firmware Panic mode. Manually reset the Ethernet to resume operation.
Flash	Stores firmware code and configurable settings. Allows for upgrades without replacing hardware inside the Ethernet.
FTP	File Transfer Protocol. Used for transferring files from one TCP/IP host to another and used in the upgrade process.
gateway	A hardware device that translates data between two incompatible networks.
gateway address	The IP address of a gateway.
Hardware Exception	Bus errors, address errors, and illegal instructions force the Ethernet into this non-operational mode.
HTML	HyperText Markup Language. Format used for documents viewable on the World Wide Web.
ifnum	Interface Number. Represents the network interface. With an Ethernet, this will always be "1."
interface script	Unix host filter file that processes the print job before it is sent over the network to the Ethernet.
I/O port	Port for attaching peripherals to. The Ethernet provides four: PRN1, PRN2, COM1, COM2.

IP Address	The Internet Protocol Address. A numeric address such as 123.45.61.23 which identifies a printer or server in a LAN or WAN.
LAN	Local Area Network.
LED	Light Emitting Diode. The printer has an LED display which shows the status of the printer to the operator.
logpath	Determines the type of print job and printer logging needed per job. One logpath is associated with every destination.
LPD/LPR	Line Printer Daemon. The most common TCP/IP remote printing protocol that crosses all hardware utilizing IP.
MAC	Machine Address Code.
MIB	Management Information Base. A set of variables (database) managed by an SNMP manager application.
model	Defines how a print job should be processed (e.g., banner pages added, ASCII to PostScript conversion) as it passes through the Ethernet. One model is associated with every destination.
NetBIOS	Network Basic Input Output System. Common interface among PC networks.
Monitor Mode	Refers to the condition of the Ethernet with no configuration or IP address loaded.
npsh	Extensive built-in command shell within the Ethernet.
PDF	Portable Document Format. Encodes different types of documents enabling them to be read across multiple platforms.



Persistent DHCP	When this option is enabled, the IP Address, Gateway, and Subnet Mask obtained through DHCP is saved. If the DHCP server does not provide an address, the device will use the previously saved DHCP IP address. This option only works when DHCP is enabled. The default is disabled.
ping	Standard command to test a TCP/IP connection. (e.g., <code>ping 192.75.11.9</code>)
print path	Three-stage path a print job takes when it is sent from a host to a printer through the Ethernet.
protocol	A set of rules or conventions governing the exchange of information between computer systems or between a printer and a host computer. For computer printers, a protocol is the coding convention used to convey and print data. A printer protocol includes codes for printing text and graphics, as well as codes instructing the printer to perform special operations and machine-to-machine communication codes.
PSERVER	Print Server. A Novell print method where the Ethernet continuously polls the Novell file server print queue looking for print jobs.
RAM	Random Access Memory. Volatile memory within the Ethernet that contains current/working settings. Settings are lost once the power is removed.

RARP	Reverse Address Resolution Protocol. Allows a network device to discover its IP address dynamically upon bootup. The IP address does not need to be stored within the device itself permanently.
ROM	Read-Only Memory.
router	A device that forwards IP packets to their destination. Also called a gateway.
RPRINTER	Remote Printer. A Novell print method where the Ethernet waits for jobs to be sent to it from a defined PSERVER.
SNMP	Simple Network Management Protocol. A standard protocol used to monitor network devices called "SNMP agents."
socket	TCP connection between two hosts consisting of a source and destination TCP port number at each end.
subnet mask	A binary value used to divide IP networks into smaller sub-networks or subnets. This mask is used to help determine whether IP packets need to be forwarded to other subnets.
TCP/IP	Transmission Control Protocol/Internet Protocol. Suite of protocols that act as the base protocol for the Internet.
TCP port	A logical connection point in the software of a TCP host or device. When two IP devices talk, they establish a socket which consists of a source and destination TCP port number on both ends.
telnet	Command and protocol to establish a terminal connection between two hosts on an IP network.



UTP	Unshielded Twisted Pair. A cable used for telephone and computer-to-computer connections.
WAN	Wide Area Network.

Index

Symbols

- *LAN 3812 SNMP
 - configuration instructions, 309
 - Device Description, 309
- ? command, 328

Numerics

- 10/100Base-T
 - indicators, 42
 - Novell Ethernet Interface
 - configuration, 192
 - Novell host configuration, 204
 - RPRINTER/NPRINTER setup,
 - troubleshooting, 218
 - speed setting, 47
 - troubleshoot printing, 220
 - troubleshooting, 215
 - Wireless Network Indicator, 44
- 802.11b, 78
 - Antenna, 79
 - Authentication Method, 80
 - Channel, 79
 - Default Key, 80
 - Key, 79
 - Mode, 78
 - Network Name, 78
 - Options, 79
 - Password, 80
 - Power Management Mode, 79
 - Preamble, 79

- Speed, 79
- Transmit Power, 79
- User, 80

A

- Access lists, TCP, 369
- Access methods, npsh, 327
- Activation Timer (ACTTMR), 310
- Add preferred file server, 193
- Additional information, 317
- ADDTCPIFC, configuring with, 225
- ADDTCPRTE, router definition, 227
- Administration
 - configuration, 105
 - Contact, 106
 - Description, 106
 - DNS Server, 107
 - Email, 107
 - Location, 106
 - Name, 106
 - Passwords, 108
 - Printer Serial Number, 106
 - SMTP Server, 107
 - Syslog, 107
 - System information, 105
- AFP file printing, 241
- Agent model, printer monitoring, 319
- AIX
 - NetView/6000, monitoring, 322
 - printing, 165

- AIX 4, Ethernet configuration, 161
- AIX 4.x setup, 166
- AIX, remote queue time-out setting, 163
- Alert groups, 100
- Alternatives, configuration, 72
- Antenna, 802.11b, 79
- APR, Ethernet Interface, 144
- ASCII
 - configuring iSeries, 225
 - setting up for printing, 228
- ASCII Troubleshooting, iSeries, 237
- Authentication Method, 62
- Authentication Method, 802.11b, 80
- Auto Connect, TN5250/3270, 96
- Auto reset mode, 42
- Automatic remote output queue, iSeries, 231

B

- Bindery PSERVER setup
 - NetWare 3.x, 208
 - NetWare 4.x, 208
 - NetWare 5.x, 208
- Bindery setup
 - change Ethernet Interface frame type, 200
 - change Ethernet Interface mode, 201
 - change Ethernet Interface name, 198
 - password security, 195
 - polling time, 197
 - preferred file server, 192

- BOOTP, Unix, 147
- Browse Ethernet Interface, troubleshooting, 136

C

- Change destination names, Ethernet Interface, 116
- Change Ethernet Interface frame type
 - Bindery setup, 200
 - NDS setup, 200
- Change Ethernet Interface mode
 - Bindery setup, 201
 - NDS setup, 201
- Change Ethernet Interface name
 - Bindery setup, 198
 - NDS setup, 198
- Channel, 802.11b, 79
- Cisco LEAP, 66
- Coax Printer Support FMD, 283
- Command
 - ?, 328
 - complete list, 328
 - getting help, 328
- Command list
 - List commands, 304
 - store commands, 303
 - TN5250, 303
 - TN5250/3270 Auto Connect Command, 304

- Command prefixes, 328
 - npsh, 327
- Command Shell, 327
 - ways to access, 69
- Commands
 - list, 356
 - miscellaneous, 360
 - set, 344
 - store, 329
- Communication routers, Windows, 114
- Configuration
 - Administration, 105
 - alternatives, 72
 - Encryption Key, 62
 - Equivalent Wireless Ethernet
 - Interface, 66
 - Ethernet for AIX 4, 161
 - front panel, 53
 - IP Address, 58
 - Log Path, 91
 - Network, 76
 - Print Model, 88
 - Print Path, 84
 - PSF for IPDS on V3R7 or V4RI, 246
 - PSF for IPDS on V4R2 and above, 252
 - SNMP, 97
 - System, 108
 - TN5250/3270, 93
 - wireless Ethernet Interface, 58
 - Wireless Parameter, 59
- Configuration checklist, MVS, 266
- Configuration example, 313
- Configuration instructions
 - *LAN 3812 SNMP, 309
 - Activation Timer (ACTTMR), 310
 - Configuration example, 313
 - Device Class (DEVCLS), 309
 - Device Model (MODEL), 309
 - Device Type (Type), Device Type (Type), 309
 - Font (FONT) = 011, 310
 - Form Feed (FORMFEED), 310
 - Host Print Transform (TRANSFORM), 311
 - Inactivity Timer (INACTTMR), 311
 - LAN Attachment (LANATTACH), 309
 - Manufacturer Type and Model (MFRTYPMDL), 311
 - Port number (PORT), 310
 - Printer Error Message (PRTERMSG), 310
 - Remote Location (RMTLOCNAME), 311
 - System Driver Program (SYSDRVPGM), 312
 - User-Defined Options (USRDFNOPT), 312
 - Workstation Customizing Object (WSCST), 312
- Configuration menu, Ethernet Interface, 74
- Configuration Screens, TN3270E, 297
- Configuration tools, 52
- Configuring for a *LAN 3812 SNMP Device Description, 309

Index

Connecting to the network, 51
CRTLINETH, line descriptions, 223

D

Default Key, 802.11b, 80
Define LPR printer, error, 135
Destination settings, Print Path, 84
Destinations
 Ethernet Interface, 40
 models, 40
Device Class (DEVCLS), 309
Device Description, *LAN 3812 SNMP, 309
Device Description, TN5250/3270, 95
Device Model (MODEL), 309
Device Type, TN5250/3270, 96
Direct socket printing, 165
Document conventions, 48

E

Encryption Key Configuration, 62
Equivalent Wireless Ethernet Interface
Configuration, 66
Errors, defining LPR printer, 135
Ethernet Interface, 35
 cannot be found, 134
 cannot be found on network,
 troubleshooting, 167
 card type, 36
 change destination names, 116
 configuration (10/100Base-T), Novell, 192
 configuration menu, 74
 configuration, Windows, 112
 384

 destinations, 40
 guest user, 365
 HTML structure, 69
 installation, 51
 naming schemes, 373
 NDS content, NDS setup, 202
 passwords, 365
 preferred NDS tree, NDS setup, 203
 queues, 40
 root user, 365
 security, 365
 Set NDS content, 202
 Set preferred NDS tree, 203
 special features, 36
 users, 365
 verification, 57
Ethernet, configuration for AIX 4, 161

F

Font (FONT) = 011, 310
Font Identifier, TN5250, 307
Form Feed (FORMFEED), 310
Front panel, configuration, 53
FTP, 72
FTP printing, 163

G

Getting Help command, 328
Getting started, NIC with AS400 running
TN5250, 304
Guest user, Ethernet Interface, 365

H

- Help command, getting, 328
- Home page, URL, 69
- Host configuration
 - Novell, 176
 - Unix, 149
- Host IP, TN5250/3270, 94
- Host Print Transform (TRANSFORM), 311
- Host setup
 - Windows 2000, 118
 - Windows 9x, 132
 - Windows Me, 132
 - Windows NT 3.51, 131
 - Windows NT 4.0, 126
 - Windows XP, 118
- HP-UX, 150
- HTML
 - forms, 69
 - forms, Novell, 175
 - method, print server setup, 196
 - structure, Ethernet Interface, 69
- HTTP, troubleshooting, 139

I

- I/O Port, status, 109
- IBM Network Printer Manager (NPM), 325
- IBM Printing Systems, 110
- Inactivity Timer (INACTTMR), 311
- Indicators, 10/100Base-T, 42
- Installation
 - HP-UX, 150
 - SCO, 152
 - Solaris 2.6, 151

- Installation Solaris 7, 151
- Installation, Ethernet Interface, 51
- IP Address Configuration, 58
- IPDS
 - configuration checklist, iSeries, 242
 - configuration, verify on iSeries, 259
 - file printing, 241
 - printer, configuring on iSeries, 241
- iSeries
 - ASCII HTTP problem, 240
 - ASCII troubleshooting, 237
 - automatic remote output queue, 231
 - configuring as an IPDS printer, 241
 - configuring for ASCII, 225
 - configuring for printing, 228
 - CRTLINETH, 223
 - hostname, 227
 - IPDS configuration checklist, 242
 - local domain, 227
 - network sharing, 260
 - printer sharing parameters, 261
 - printing AFP files, 241
 - printing IPDS files, 241
 - printing SCS files, 241
 - remote printer queue name, 228
 - TCP/IP access problem, 238
 - TCP/IP host table entry, 228
 - troubleshooting, 262
 - verify IPDS configuration, 259
 - verify printing, 236

iSeries troubleshooting

- cannot PING the printer, 262
- clipped data, 264
- PSF terminates when initialized, 263
- spooled files disappear without printing, 264
- spooled print file remains in PND status, 263

J

- Job formatting, TN5250, 305

K

- Kerberos, 67
 - Parameters, 63
- Key, 802.11b, 79

L

- LAN Attachment (LANATTACH), 309
- LEAP, 66
- Line descriptions, CRTLINETH, 223
- List commands, 356
 - TN5250, 304
- Log Path
 - configuration, 91
 - Logpath Port, 92
 - Logpath Type, 91
 - Name, 91
- Logging, printer, 371
- Logical printer architecture, 38
- Logpaths, printer logging, 372
- LPR/LPD Host setup, 159

M

- Manager model, printer monitoring, 319
- Manual (Telnet) method, print server setup, 196
- Manual LPR/LPD Host setup, 159
- Manual system, V Host setup, 149
- Manufacturer Type and Model (MFRTYMDL), 311
- Message Queue Library, TN5250/3270, 95
- Message Queue Name, TN5250/3270, 95
- MIB, 320
- Microsoft TCP/IP printing, 140
- Miscellaneous commands, 360
- Mode
 - 802.11b, 78
 - auto reset, 42
 - run, 42
 - TN5250/3270, 94
- Models, 40
 - setting a formfeed, 170
 - setting onlcr, 169
- Monitoring
 - print job, 371
 - printer, 371
- MVS
 - configuration checklist, 266
 - define printer to JES, 272
 - JES spool printer sharing, 278
 - port switching printer sharing, 280
 - printer connection, 271
 - requirements, 265

N

- Naming schemes, Ethernet Interface, 373
- NDPS configuration, NetWare 4.11 and above, 212
- NDS PSERVER setup
 - NetWare 4.x, 205
 - NetWare 5.x, 205
- NDS setup
 - change Ethernet Interface frame type, 200
 - change Ethernet Interface mode, 201
 - change Ethernet Interface name, 198
 - Ethernet Interface NDS content, 202
 - Ethernet Interface preferred NDS tree, 203
 - password security, 195
 - polling time, 197
 - preferred file server, 192
- NetBIOS TCP/IP, Windows Network, 81
- NetWare 3.x
 - Bindery PSERVER setup, 208
 - no PSERVER connection, 188
 - password security, 195
 - polling time, 197
 - reference a Bindery queue, 208
 - RPRINTER/NPRINTER setup, 209
- NetWare 4.11 and above, NDPS configuration, 212
- NetWare 4.x
 - Bindery PSERVER setup, 208
 - NDS PSERVER setup, 205
 - no PSERVER connection, 189
 - password security, 195
 - polling time, 197
 - reference a Bindery queue, 208
 - RPRINTER/NPRINTER setup, 209
- NetWare 5.x
 - Bindery PSERVER setup, 208
 - NDS PSERVER setup, 205
 - no PSERVER connection, 189
 - password security, 195
 - polling time, 197
 - reference a Bindery queue, 208
 - RPRINTER/NPRINTER setup, 209
- NetWare Version 3.x
 - Pserver setup, 176
 - RPrinter setup, 179
- NetWare Version 4.x
 - PSERVER setup, 182
 - RPRINTER setup, 185
- NetWare Version 5.x
 - PSERVER setup, 182
 - RPRINTER setup, 185
- Network
 - configuration, 76
 - connection, 51
 - Ethernet Interface cannot be found, 134
 - Novell, 82
 - sharing, iSeries, 260
 - status, 110
 - TCP/IP, 76
- Network Name, 802.11b, 78
- Network Printer Manager (NPM), IBM, 325

NIC

- reset password, 367
- running AS400 with TN5250, 304

No extra page, troubleshooting, 170

No form feed, troubleshooting, 170

Novell

- environment, 173
- Ethernet Interface configuration, 174
- Ethernet Interface configuration
(10/100Base-T), 192
- file server, 83
- frametype, 82
- Host configuration, 176
- host configuration, 10/100Base-T, 204
- HTML forms, 175
- NDS, 83
- Network, 82
- Pserver, 83
- Rprinter, 83
- service type, 83
- troubleshooting, 187

Npsh

- access methods, 327
- command prefixes, 327

O

Onlcr, 169

Options, 802.11b, 79

P

Parameters, Kerberos, 63

Password security

- Bindery setup, 195
- NDS setup, 195
- NetWare 3.x, 195
- NetWare 4.x, 195
- NetWare 5.x, 195

Passwords, 108

802.11b, 80

Ethernet Interface, 365

reset, 367

PMU, 323

Polling time

- adjusting, 197
- Bindery setup, 197
- NDS setup, 197
- NetWare 3.x, 197
- NetWare 4.x, 197
- NetWare 5.x, 197

Port number (PORT), 310

Port, TN5250/3270, 95

Power Management Mode, 802.11b, 79

Preamble, 802.11b, 79

Preferred file server

- adding, 193
- Bindery setup, 192
- NDS setup, 192
- removing, 194

Prefixes, command, 328

Print job monitoring, 371

- Print Model
 - Banner Page, 89
 - configuration, 88
 - Filter, 89
 - Header String, 89
 - Model Type, 88
 - Name, 88
 - Printer Configuration, 90
 - Trailer String, 90
- Print Path
 - Back Channel, 84
 - Banner Page, 86
 - configuration, 84
 - destination settings, 84
 - Filter, 86
 - Header String, 86
 - Log Path Port, 87
 - Log Path Type, 87
 - Model Type, 86
 - Name, 84
 - Printer Configuration, 87
 - Selected Log Path, 87
 - Selected Model, 85
 - Services, 85
 - Trailer String, 86
- Print server setup
 - HTML method, 196
 - manual (Telnet) method, 196
- Printer
 - errors, 136
 - ethernet card type, 36
 - logging, 371
 - logging through logpaths, 372
 - monitoring, 371
 - sharing parameters, iSeries, 261
 - status screen, 71
 - varying, 315
- Printer Error Message (PRTERMSG), 310
- Printer Inventory Manager, TN3270E, 288
- Printer management implementation, 319
- Printer management utility (PMU), 323
- Printer monitoring
 - Agent model, 319
 - Manager model, 319
 - MIB, 320
 - SNMP, 322
 - tools, 322
- Printing
 - AIX, 165
 - ASCII, 228
 - configuration, iSeries, 228
 - direct socket, 165
 - FTP, 163
 - troubleshooting, 168
 - verification, iSeries, 236
- Problem
 - iSeries ASCII HTTP, 240
 - iSeries ASCII Web browser, 240
- Problem areas, 316
- Program materials, TN3270E, 284
- PSERVER setup
 - NetWare Version 4.x, 182
 - NetWare Version 5.x, 182

PSEVER setup (10/100Base-T),
troubleshooting, 215
Pserver setup, NetWare Version 3.x, 176
PSF for IPDS
 on V3R7 or V4RI, configuring, 246
 on V4R2 and above, configuring, 252

Q

Queues
 Ethernet Interface, 40
 models, 40

R

RARP, Unix, 146
Reference a Bindery queue in NDS
 NetWare 3.x, 208
 NetWare 4.x, 208
 NetWare 5.x, 208
Remote shell, 72
Remove preferred file server, 194
Resource Name, TN5250/3270, 95
Root user, Ethernet Interface, 365
Routers, Unix, 148
RPRINTER setup
 NetWare Version 4.x, 185
 Netware Version 5.x, 185
RPrinter setup, NetWare Version 3.x, 179
RPRINTER/NPRINTER setup
 NetWare 3.x, 209
 NetWare 4.x, 209
 NetWare 5.x, 209
Run mode, 42
390

S

SCO setup, 152
SCS file printing, 241
Security, Ethernet Interface, 365
Set commands, 344
Setup, AIX 4.x, 166
Shell, command, 327
SNMP, 322
 Alert groups, 100
 configuration, 97
 Email alert posting, 98
 manager alert posting, 97
SNMP community name, 323
SNMP support, 309
Solaris 2.6, 151
Solaris 7, 151
Special features, Ethernet Interface, 36
Speed setting, 10/100Base-T, 47
Speed, 802.11b, 79
Stair-stepped output, troubleshooting, 169
Start/Stop Auto Connect, TN5250/3270, 96
Status
 I/O Port, 109
 menu, 109
 Network, 110
Status screen, printer, 71
Store commands, 329
 TN5250, 303
Syslog alert posting, 98
System configuration, 108
System Driver Program (SYSDRVPGM), 312

T

- TCP access lists, 369
- TCP/IP
 - access, troubleshooting, 137
 - configuring iSeries for ASCII, 225
 - network, 76
- TCP/IP access problem
 - iSeries, 238
 - Unix, 170
- TCPIP Configuration, TN3270E, 287
- Technical support, 134
- Telnet, 72
- Telnet commands, TN5250, 303
- TN3270E
 - Configuration Screens, 297
 - Printer Inventory Manager, 288
 - Programs materials, 284
 - TCPIP Configuration, 287
 - VTAM Definitions, 285
 - z/OS Configuration, 283
- TN5250
 - command list, 303
 - Font Identifier, 307
 - job formatting, 305
 - running AS400, 304
 - set up connection device via
 - telenet, 302
 - set up print queue on iSeries, 301
 - Telnet commands, 303
 - user supplied values, 303
- TN5250/3270
 - Auto Connect, 96
 - Auto Connect command, 304
 - configuration, 93
 - Device Description, 95
 - Device Type, 96
 - Host IP, 94
 - Message Queue Library, 95
 - Message Queue Name, 95
 - Mode, 94
 - Port, 95
 - Resource Name, 95
 - Start/Stop Auto Connect, 96
 - WSCST Library, 96
 - WSCST Name, 96
- Tools, printer monitoring, 322
- Transmit Power, 802.11b, 79
- Troubleshooting
 - (10/100Base-T) RPRINTER/
NPRINTER, 218
 - 10/100Base-T, 215
 - 10/100Base-T printing, 220
 - cannot browse Ethernet Interface on
Network, 136
 - defining LPR printer, 135
 - Ethernet Interface cannot be
found, 134
 - Ethernet Interface cannot be found on
Network, 167
 - HTML configuration forms, 135
 - HTTP, 139
 - iSeries, 262
 - NetWare 3.x, no PSERVER
connection, 188

Index

NetWare 4.x, no PSERVER
 connection, 189
NetWare 5.x, no PSERVER
 connection, 189
no extra page, 170
no form feed, 170
Novell, 187
printer errors, 136
printing, 168
PSERVER setup (10/100Base-T), 215
stair-stepped output, 169
TCP/IP access problem, 137
Unix, 167
Web browser, 139
Windows, 134
Windows 2000 Host setup, 139
Windows NT 4.0 Host setup, 139

U

Unix

 crossing routers, 148
 environment, 143
 Ethernet Interface configuration, 144
 Host configuration, 149
 manual system V Host setup, 149
 TCP/IP access problem, 170
 troubleshooting, 167
 using APR, 144
 using BOOTP, 147
 using RARP, 146
URL, home page, 69
User, 802.11b, 80
User-Defined Options (USRDFNOPT), 312

Users, Ethernet Interface, 365
Using ARP, Windows, 112

V

V Host setup, manual system, 149
Varying on the Printer, 315
Verification, Ethernet Interface, 57
VTAM Definitions, TN3270E, 285

W

Web browser
 problem, 240
 troubleshooting, 139
Web server, overview, 73
Windows
 communication routers, 114
 configuration, 111
 environment, description, 111
 Ethernet Interface configuration, 112
 mandatory configuration, 112
 optional configuration, 112
 troubleshooting, 134
 using ARP, 112
Windows 2000
 Host setup, 118
 Host setup, troubleshooting, 139
Windows 9x, Host setup, 132
Windows Me, Host setup, 132
Windows Network (NetBIOS TCP/IP), 81
Windows NT 3.51, Host setup, 131
Windows NT 4.0
 Host setup, 126
 Host setup, troubleshooting, 139

Windows XP, Host setup, 118

Wireless

 Cisco LEAP, 66

 Kerberos, 67

Wireless Ethernet Interface

 Configuration, 58

Wireless Network Indicator, 44

Wireless Parameter Configuration, 59

Workstation Customizing Object
(WSCST), 312

WSCST Library, TN5250/3270, 96

WSCST Name, TN5250/3270, 96

Z

z/OS

 communications control unit, 268

 connectivity problems, 280

 define printer to PSF, 273

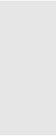
 printer sharing, 278

 printing IPDS, 267

 TCP/IP profile, 268

 verifying TCP/IP-attached printer, 277

z/OS Configuration, TN3270E, 283



Index

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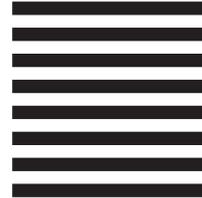
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