



i n v e n t

hp jetdirect
model 610n

**administrator's
guide**

Administrator's Guide

**HP Jetdirect Print Server
(Model 610N)**

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Introducing the HP Jetdirect Print Server

Introduction

HP Jetdirect print servers allow you to connect printers and other devices directly to a network. By attaching a device directly to a network, it can be installed in a convenient location and shared by multiple users. In addition, a network connection allows data transfers to or from the device at network speeds.

HP Jetdirect *internal* print servers are installed in HP printers that have a compatible input/output (I/O) slot. HP Jetdirect *external* print servers connect printers to the network by adapting the printer's parallel or USB port to a network port. Depending on the model, HP Jetdirect external print servers can connect up to three printers to a network.

Note Unless otherwise specified, the term print server in this manual refers to the HP Jetdirect print servers and not a separate computer running print server software.

Supported Print Servers

Unless otherwise specified, the features described in this guide support the following HP Jetdirect print servers with firmware version x.21.01 or greater, where x depends on the print server type.

- HP Jetdirect 610N internal print servers

The installed firmware version can be identified using various methods, including the HP Jetdirect configuration page (see [Chapter 8](#)), Telnet (see [Chapter 3](#)), embedded web server (see [Appendix B](#)), and network management applications. For firmware updates, see “[Software, Driver, and Firmware Upgrades](#)”.

Supported Network Protocols

The supported network protocols, and popular network printing environments that use those protocols, are listed in [Table 1.1](#).

Table 1.1 Supported Network Protocols

Supported Network Protocols	Network Printing Environments*
TCP/IP	Microsoft Windows 95/98/Me/NT4.0/2000 Novell NetWare 5 via NDPS UNIX and Linux, including: Hewlett-Packard HP-UX, Sun Microsystems Solaris (SPARCsystems only), IBM AIX**, HP MPE-iX**, RedHat Linux, SuSE Linux LPD (line printer daemon) IPP (Internet Printing Protocol)
IPX/SPX and compatible	Novell NetWare Microsoft Windows 95/98/Me/NT4.0/2000
AppleTalk	Apple Mac OS (EtherTalk only)
DLC/LLC	Microsoft Windows NT** Artisoft LANtastic**
* Refer to the current HP Jetdirect product data sheets for additional network systems and versions. For operation with other network environments, consult your system vendor or authorized HP dealer. **For these network systems, contact your network system vendor for software, documentation, and support.	

If not supplied with this product, HP network setup and management software for supported systems may be obtained from HP Customer Care Online at:

http://www.hp.com/support/net_printing

For software to set up network printing on other systems, contact your system vendor.

SNMP (IP/IPX)

For network management applications, HP Jetdirect print servers support SNMP v1 (Simple Network Management Protocol) and standard MIB-II (Management Information Base) objects. SNMP is supported over IP and IPX networks.

Supplied Manuals

The manuals listed below are supplied with your print server or with printers that have factory-installed print servers.

- *Getting Started Guide* or equivalent printer documentation (shipped with printers that have factory-installed HP Jetdirect print servers).
- This manual, the *HP Jetdirect Print Server Administrator's Guide*.
- The *HP Jetdirect Print Server Hardware Installation Guide* (supplied on CD-ROM with non-factory-installed print servers).

HP Customer Care



HP Customer Care Online

Click your way to a quick solution! The HP web site

http://www.hp.com/support/net_printing

is a great place to start for answers to questions about your HP Jetdirect print server – 24 hours a day, 7 days a week.

Software, Driver, and Firmware Upgrades

Hewlett-Packard offers downloadable firmware upgrades for HP Jetdirect print servers that contain upgradeable memory. The upgrades are available from the World Wide Web and various online services as shown in [Table 1.2](#).

Current information about HP printer drivers, software versions, and HP Jetdirect firmware upgrades are also available.

Table 1.2 Obtaining Firmware Upgrades

World Wide Web	Access HP Customer Care Online at: http://www.hp.com/support/net_printing
America Online	Receive drivers and upgrades by downloading them to your computer from the HP Forum.
HP Distribution Center	Order drivers and upgrades for HP printers by calling the HP Distribution Center at (805) 257-5565 (USA only).
FTP Site	Download printer drivers and upgrades from HP's anonymous FTP site at: ftp.hp.com/pub/networking/software

Firmware Installation Utility

Firmware upgrades for supported HP Jetdirect print servers may be installed over a network using a firmware installation utility (*HP Jetdirect Download Manager*) for Windows environments. HP Web JetAdmin may be used on supported non-Windows systems. *HP Jetdirect Download Manager* is provided on the HP Jetdirect CD-ROM, and can be downloaded from HP Customer Care Online at:

http://www.hp.com/support/net_printing



HP Customer Care Forum

Go online, anytime, and you'll also find helpful user forums – a great source of ideas and suggestions for using your HP Jetdirect print server. You can access the user forum directly from:

<http://www.hp.com/go/forums>

and select **Network Printing Support Forum**.



HP Customer Care By Phone

Highly trained technicians at our HP Customer Care Center are ready to take your call. For the most recent HP Customer Care telephone numbers and available services worldwide, visit:

http://www.hp.com/support/support_assistance

Note In the USA, call (208) 323-2551.

Note Telephone fees are the responsibility of the caller. Rates may vary. Contact your local telephone company for current rates.

Product Registration

To register your HP Jetdirect print server, use the following HP web page:

http://www.hp.com/go/jetdirect_register

HP Software Solutions Summary

Introduction

HP provides a variety of software solutions to set up or manage your HP Jetdirect-connected network devices. See [Table 2.1](#) to help you determine which software is best for you:

Note For more information on these and other solutions, visit HP Customer Care Online at:

http://www.hp.com/support/net_printing

Table 2.1 Software Solutions (1 of 3)

Operating Environment	Function	Remarks
HP Install Network Printer Wizard (Windows)		
Windows 95, 98, Me, NT 4.0, 2000 NetWare 3.x, 4.x, 5.x TCP/IP, IPX/SPX	Install a single network printer on a peer-to-peer or client-server network	<ul style="list-style-type: none"> ● Simple printer installation, typically integrated with printer system software ● Runs from CD-ROM ● Installable version that runs from your hard disk is available
HP Jetdirect Printer Installer for UNIX		
HP-UX 10.x-10.20, 11.x Solaris 2.5.x, 2.6, 7 (SPARCsystems only) TCP/IP	Fast and easy installation of HP Jetdirect-connected printers	

Table 2.1 Software Solutions (2 of 3)

Operating Environment	Function	Remarks
HP Web JetAdmin		
<p>Windows NT 4.0, 2000 HP-UX Solaris Red Hat Linux, SuSE Linux NetWare* TCP/IP, IPX/SPX *Supports queue creation (NetWare), and peripheral management from HP Web JetAdmin hosted on Windows NT 4.0, 2000</p>	<p>Remote installation, configuration, and management of HP Jetdirect-connected print servers, non-HP printers that support the standard MIBs, and printers with embedded web servers</p> <p>Alerts and consumables management</p> <p>Remote firmware upgrades for HP Jetdirect print servers</p> <p>Asset tracking and utilization analysis</p>	<ul style="list-style-type: none"> ● HP's preferred solution for ongoing management and installation of multiple printers anywhere on your intranet ● Browser-based management
Internet Printer Connection Software		
<p>Windows NT 4.0, 2000 (Intel) TCP/IP only Note: Microsoft Internet Printing software is also integrated with Windows 2000.</p>	<p>Printing via the Internet to Internet Printing Protocol (IPP)-enabled HP Jetdirect-connected printers</p>	<ul style="list-style-type: none"> ● Allows economical distribution of high-quality hardcopy documents over the Internet, replacing fax, mail, and overnight services ● Requires HP Jetdirect print server (firmware version X.07.17 or greater)

Table 2.1 Software Solutions (3 of 3)

Operating Environment	Function	Remarks
HP IP/IPX Printer Gateway for NDPS		
NetWare 4.11, 4.2, 5.x	Simplified installation, printing, and bidirectional management of HP Jetdirect-connected printers under Novell Distributed Print Services (NDPS) Allows automatic discovery and installation of HP Jetdirect-connected printers into NDPS	<ul style="list-style-type: none">● Frees up user licenses● Allows disabling of SAPs to reduce network traffic● Requires HP Jetdirect firmware version X.03.06 or greater
HP LaserJet Utility for Mac OS		
Mac OS 7.5 or greater	Installation and management of HP Jetdirect-connected printers	

HP Install Network Printer Wizard (Windows)

The HP Install Network Printer wizard is a software module for quick and easy printer installation on a Microsoft IP/IPX or Novell NetWare network. The wizard allows you to configure the printer with IP parameters on a TCP/IP network, or NDS/Bindery objects on a Novell NetWare network.

This wizard is typically integrated with your printer system installation software and runs from your CD-ROM. A version that runs from your system disk is also available and can be downloaded from HP Customer Care Online at:

http://www.hp.com/support/net_printing

The HP Install Network Printer wizard is also included on the HP Jetdirect CD-ROM, provided with standalone HP Jetdirect products. The wizard is initiated when you select “Install Network Printer” from the CD-ROM interface.

Requirements

- Microsoft Windows 2000, Windows NT 4.0, Windows 95/98/Me
 - ◆ TCP/IP or IPX/SPX network protocol
- Novell NetWare 3.x, 4.x, and 5.x
 - ◆ Novell Client software for Microsoft Windows 95/98/Me/NT 4.0/2000, Windows NT 4.0, 95/98/Me
 - ◆ Queue Server Mode
 - ◆ IPX/SPX network protocol
- The correct printer driver
- Printer connection to the network through an HP Jetdirect print server

HP Jetdirect Printer Installer for UNIX

The HP Jetdirect Printer Installer for UNIX contains support for HP-UX and Solaris systems. The software installs, configures and provides diagnostics capabilities for HP printers connected to TCP/IP networks using HP Jetdirect print servers.

The software is distributed through the following methods:

- On the HP Jetdirect CD-ROM, provided with standalone HP Jetdirect print servers
- Anonymous FTP site at ftp.hp.com (Directory: /pub/networking/software)
- HP Customer Care Online at:

http://www.hp.com/support/net_printing

For system requirements and installation information, see the documentation provided with the software.

HP Web JetAdmin

HP Web JetAdmin allows you to use a Web browser to install, view, manage, and diagnose devices connected to an HP Jetdirect print server. HP Web JetAdmin supports devices that contain Standard Printer MIB (Management Information Base) objects.

For information about a procedure or window in the HP Web JetAdmin software, see the online help.

System Requirements

HP Web JetAdmin software runs on Microsoft Windows NT 4.0, Windows 2000, HP-UX, Solaris, Red Hat Linux, and SuSE Linux systems. For information on supported operating systems, supported Novell NetWare clients, and compatible browser versions, visit HP Customer Care Online at <http://www.hp.com/go/webjetadmin/>.

Note

When installed on a supported host server, HP Web JetAdmin can be accessed from any client through a compatible web browser by browsing to the HP Web JetAdmin host. This allows printer installation and management on Novell NetWare, and other networks.

Installing HP Web JetAdmin

Before installing the HP Web JetAdmin software, you must have domain administrator or root privileges:

1. Download the installation files from HP Customer Care Online at <http://www.hp.com/go/webjetadmin/>.
2. Follow the instructions on the screen to install the HP Web JetAdmin software.

Note Installation instructions are also contained in the HP Web JetAdmin install file.

Verifying Installation and Providing Access

- Verify that the HP Web JetAdmin software is correctly installed by navigating to it with your browser as shown in the following example:

```
http://server.domain:port/
```

where `server.domain` is the host name of your web server and `port` is the port number assigned during installation.

- Provide users access to HP Web JetAdmin software by adding a link to your web server's home page that is addressed to HP Web JetAdmin's URL. For example:

```
http://server.domain:port/
```

Configuring and Modifying a Device

Using your browser, navigate to HP Web JetAdmin's URL.
For example:

```
http://server.domain:port/
```

Follow the instructions on the appropriate home page to configure or modify your printer.

Note You can also substitute the `server.domain` with the TCP/IP address.

Removing HP Web JetAdmin Software

To remove HP Web JetAdmin software from your web server, use the uninstall program provided with the software package.

Internet Printer Connection Software

HP Jetdirect print servers (firmware version x.07.17 or greater) support the Internet Printing Protocol (IPP). Using the appropriate software on your system, you can create an IPP print path from your system to any HP Jetdirect-connected printer over the Internet.

Note For incoming print path requests, the network administrator must configure the firewall to accept incoming IPP requests. Security features available in the software are currently limited.

Features and benefits provided by Internet printing include:

- High-quality, time-sensitive documents.
- Full-color or black-and-white documents.
- A fraction of the cost of current methods (such as fax, mail, or overnight delivery services).
- Extends the traditional LAN printing model to that of an Internet Printing Model.
- IPP requests can be transmitted outbound through firewalls.

HP Supplied Software

HP Internet Printer Connection software allows you to set up Internet printing from Windows NT 4.0 and Windows 2000 clients.

1. To obtain the software:

Download the HP Internet Printer Connection software from HP Customer Care online at:

http://www.hp.com/go/print_connect

2. To install the software and set up the print path to the printer, follow the instructions provided with the software. Contact your network administrator to get the IP address or URL of the printer to complete the setup.

HP Software System Requirements

- Computer running Microsoft Windows NT 4.0 (Intel based) or Windows 2000
- IPP-enabled HP Jetdirect print server (firmware must be at revision x.07.17 or greater)

HP Software Supported Proxies

- Web proxy with support for HTTP v1.1 or greater (may not be needed if printing over an intranet)

Microsoft Supplied Software

Note Contact Microsoft for support of Windows IPP software.

Windows 2000 Integrated Software

On Windows 2000 systems, an alternative to using the HP supplied software is to use the IPP-client software integrated with Windows 2000. The IPP implementation on the HP Jetdirect print server is compatible with Windows 2000 IPP-client software.

To set up a print path to an HP Jetdirect-connected Internet printer using the Windows 2000 IPP-client software, proceed as follows:

1. Open the Printers folder (click **Start**, select **Settings**, and select **Printers**).
2. Run the Add Printer wizard (double-click **Add Printer**), then click **Next**.
3. Select **Network Printer** and click **Next**.

4. Select **Connect to a printer on the Internet** and enter the print server's URL:

`http://IP_address[/ipp/port#]`

where *IP_address* is the IP address configured on the HP Jetdirect print server. `[/ipp/port#]` identifies the port number on a multi-port HP Jetdirect external print server (port1, port2, or port3) that the printer is connected to (default is `/ipp/port1`).

Examples:	
<code>http://192.160.45.40</code>	An IPP connection to HP Jetdirect 610N internal print server with IP address 192.160.45.40. (" <code>/ipp/port1</code> " is assumed and not required.)
<code>http://192.160.45.39/ipp/port2</code>	An IPP connection to HP Jetdirect external print server with IP address 192.160.45.39 and the printer on port 2

Then click **Next**.

5. You will be prompted for a printer driver (the HP Jetdirect print server does not contain printer drivers, so your system cannot automatically obtain the driver). Click **OK** to install the printer driver onto your system and follow the instructions on the screen. (You may need your printer CD-ROM to install the driver.)
6. To complete the print path setup, follow the instructions on the screen.

Windows Me IPP Client

The IPP implementation on the HP Jetdirect print server is compatible with Windows Me IPP-client software. The IPP client is installed from the Add-Ons folder on the Windows Me CD-ROM. For installation and setup of a Windows Me IPP client, see the instructions provided with the Windows Me CD-ROM.

Novell Supplied Software

The HP Jetdirect print server is compatible with IPP running on NetWare 5.1 with SP1 or later. For NetWare client support, refer to your NetWare technical documentation or contact Novell.

HP IP/IPX Printer Gateway for NDPS

NDPS (Novell Distributed Print Services) is a printing architecture developed by Novell, in partnership with Hewlett-Packard. NDPS simplifies and streamlines the administration of network printing. It eliminates the need to set up and link print queues, printer objects, and print servers. Administrators can use NDPS to manage networked printers within the NetWare 4.11, NetWare 4.2, and NetWare 5.x environments.

The HP IP/IPX Printer Gateway is an NLM developed by HP to provide functionality and compatibility with Novell's NDPS. It seamlessly integrates HP Jetdirect-attached printers into the NDPS environment. Using the HP Gateway, an administrator can view statistics, configure gateway settings, and configure printing for HP Jetdirect-connected printers.

Features

Features and benefits provided by the HP Gateway and NDPS are:

- Smart detection of printers in the NetWare 4.11, 4.2, and NetWare 5.x environments
- Automatic installation of printers using IP/IPX
- Tight integration with Novell's NDS and NWAdmin
- Status updates from printers
- Simplified Automatic Driver Download
- Reduced SAP Traffic
- Reduces the number of required NetWare User Licenses
- Native TCP/IP printing with NetWare 5.x

System Requirements

For the most recent information on system requirements and supported clients, visit HP Customer Care Online at:

http://www.hp.com/go/ndps_gateway

The HP IP/IPX Printer Gateway is included with all current versions of NDPS/NEPS. Novell NetWare 5.x includes NDPS, while NEPS can be added to NetWare 4.11, 4.2.

Note

For more information (including access to the most recent HP IP/IPX Printer Gateway software and the User Guide), access HP Customer Care Online (http://www.hp.com/support/net_printing).

HP LaserJet Utility for Mac OS

This section describes printer installation software for Mac OS-compatible computer systems. It also explains how to use the HP LaserJet Utility to configure HP printers connected to an AppleTalk network through an HP Jetdirect print server. This section also explains how to use the Chooser to select and set up a Mac OS computer to print to your HP printer.

Installing the Printer Software

If the HP LaserJet Utility was included on your printer's CD-ROM, see your printer documentation for installation instructions, then skip to the next section to configure the printer.

If you are installing the HP LaserJet Utility from the *HP Jetdirect* CD-ROM, use the following installation instructions.

Note If you are installing the HP LaserJet Utility from a source other than the CD-ROM, see the README file that accompanies the software for installation instructions.

Note Automatic virus detection programs might interfere with the installation of this software. Turn off any such programs that are active on your Mac OS computer before proceeding with the installation process.

1. Insert the CD-ROM into the CD-ROM drive.
2. In the *HP Installer* window, double-click the installation icon for the software in the language you want.
3. Follow the instructions on the screen.

For more information about configuring your printer driver, see the online documentation provided on the CD-ROM that came with the printer.

Configuring the Printer

The HP LaserJet Utility allows printer settings such as printer name and preferred zone to be configured from your Mac OS system. Hewlett-Packard recommends that only network administrators use the printer configuration capabilities of this utility.

If this printer is to be serviced by a print spooler, set up the printer's name and zone before configuring the spooler to capture the printer.

Running the HP LaserJet Utility

1. With the printer turned on and online, and the print server connected to the printer and to the network, double-click the **HP LaserJet Utility** icon.
2. If the printer's name is not listed as the target printer, click **Select Printer**. The *Select a Target Printer* window appears.
 - Select the zone, if necessary, from the *AppleTalk Zones* list in which the printer resides. The zone the printer is in is shown on the configuration page. See the hardware installation guide for your print server or your printer's getting started guide for instructions on printing a configuration page.
 - Select the printer from the *Available Printers* list and click **OK**.

Verifying Network Configuration

To verify your current network configuration, print a Jetdirect configuration page. If you have not printed a configuration page from your printer, see the hardware installation guide for your print server or your printer's getting started guide for instructions (see [Chapter 8](#) for more information). If your printer has a control panel, make sure a `READY` message appears on the control panel for at least 1 minute, then print the page. The current configuration is listed under "AppleTalk" on the configuration page.

Note

If you have multiple printers on your network, you need to print a configuration page to identify the printer's name and zone.

Renaming the Printer

The factory supplies a default name for your printer.

Hewlett-Packard highly recommends that you rename your printer to avoid having multiple printers with similar names on your network. You can name your printer anything you like—for example, "Michael's LaserJet 4000." The HP LaserJet Utility has the ability to rename devices located in different zones, as well as the local zone (no zones need to be present in order to use the HP LaserJet Utility).

1. Select the **Settings** icon from the scrolling icon list. The *Please select a setting:* dialog appears.
2. Select **Printer Name** in the list.
3. Click **Edit**. The *Set Printer Name* dialog box appears.
4. Type the new name.

Note

The name may be up to 32 characters in length. A warning beep indicates that an illegal character was typed.

5. Click **OK**.

Note

If you try to name your printer the same name as another printer, an alert dialog box appears directing you to select another name. To select another name, repeat steps 4 and 5.

6. If your printer is on an EtherTalk network, continue with the next section, "[Selecting a Zone](#)."
7. To exit, select **Quit** from the *File* menu.

Notify everyone on your network of the new name for your printer so they can select the printer in the Chooser.

Selecting a Zone

The HP LaserJet Utility allows you to select a preferred zone for your printer on a Phase 2 EtherTalk network. Instead of your printer remaining on the default zone, which is set by the router, this utility lets you select the zone on which your printer appears. The zones on which your printer can reside are limited by your network configuration. **The HP LaserJet Utility only enables you to select a zone that is already configured for your network.**

Zones are groups of computers, printers, and other AppleTalk devices. They can be grouped by physical location (for example, Zone A may contain all the printers on the network in building A). They may also be grouped logically (for example, all printers used in the finance department).

1. Select the **Settings** icon from the scrolling icon list. The *Please Select a Setting:* dialog box appears.
2. Select **Printer Zone** in the list and click **Edit**. The *Select a Zone* dialog box appears.
3. Select your preferred network zone from the *Select a Zone:* list and click **Set Zone**.
4. To exit, select **Quit** from the *File* menu.

Notify everyone on your network of the new zone for your printer so they can select the printer in the Chooser.

Selecting Your Printer

1. Select the **Chooser** from the *Apple* menu.
2. Select the printer icon for use with your printer. If the appropriate printer icon does not appear in the Chooser, or you are not sure which icon to select for your printer, see “[Installing the Printer Software](#)” in this chapter.
3. If AppleTalk is not active, an alert dialog box appears on your screen. Select **OK**. The *Active* button turns on.

If your network is linked to other networks, the *AppleTalk Zones* list dialog box appears in the Chooser.

4. If applicable, select the zone in the *AppleTalk Zones* scrolling list where your printer is located.
5. Select the printer name you want to use from the list of printer names in the upper-right area of the Chooser. If the printer's name does not appear in the list, make sure the following tasks have been performed:
 - the printer is turned on and is online.
 - the print server is connected to the printer and to the network.
 - the printer cable connections are secure.

A `READY` message should appear if the printer has a control panel display. See the chapter on “[Troubleshooting the HP Jetdirect Print Server](#)” for more information.

Note

If your printer is the only name listed in the dialog box, you must still select it. Your printer remains selected until you select a different printer with the Chooser.

6. Click **Setup** or **Create** in the Chooser; then, if prompted, select the appropriate PostScript Printer Description file (PPD) for the printer. For more information, see the online documentation (*HP LaserJet Printing Guide*).
7. Set **Background Printing** to **ON** or **OFF**.

If background printing is turned **OFF** when you send a print job to the printer, status messages appear on your screen and you have to wait until the messages clear before continuing your work. If background printing is turned **ON**, the messages are redirected to the PrintMonitor and you can continue working while the printer is printing your job.

8. Exit the Chooser.

To display your user name on the network when you are printing documents, go into the Control Panel on your Mac OS computer, select **Sharing Setup**, then type your owner name.

Testing the Configuration

1. Select **Print Window** from the *File* menu, or if no window is open, select **Print Desktop**.

The *Print* dialog box appears.

2. Click **Print**.

If the printer prints the job, you have connected your printer to your network correctly. If your printer does not print, see the chapter on "[Troubleshooting the HP Jetdirect Print Server](#)."

TCP/IP Configuration

Introduction

To operate properly on a TCP/IP network, the HP Jetdirect print server must be configured with valid TCP/IP network configuration parameters, such as an IP address. Depending on your printer and system, this can be done in the following ways:

Note When shipped from the factory, the HP Jetdirect print server has no IP address. If the HP Jetdirect print server is not configured with a valid IP address within two minutes after power up, a factory default value of 192.0.0.192 will be automatically assigned. This address must be reconfigured with a valid address for use on your TCP/IP network. For more information on TCP/IP networks, see [Appendix A](#).

- Using your printer installation software or the HP Jetdirect print server installation software on supported systems. For more information see [Chapter 2](#), “[HP Software Solutions Summary](#)”.
- By downloading the data from a network-based server using BOOTP (Bootstrap Protocol) and TFTP (Trivial File Transfer Protocol) each time the printer is turned on. For more information, see “[Using BOOTP/TFTP](#)”.

Note The BOOTP daemon, `bootpd`, must be running on a BOOTP server that is accessible by the printer.

- By using Dynamic Host Configuration Protocol (DHCP). This protocol is supported in HP-UX, Solaris, Red Hat Linux, SuSE Linux, Windows NT/2000, NetWare and Mac OS systems. (Refer to your network operating system manuals to verify that your operating system supports DHCP.) For more information, see [“Using DHCP”](#).

Note

Linux and UNIX systems: For more information, see the `bootpd` man page.

On HP-UX systems, a sample DHCP configuration file (`dhcptab`) may be located in the `/etc` directory.

Since HP-UX presently does not provide Dynamic Domain Name Services (DDNS) for its DHCP implementations, HP recommends that you set all print server lease durations to *infinite*. This ensures that print server IP addresses remain static until such time as Dynamic Domain Name Services are provided.

-
- By a network-based server using RARP (Reverse Address Resolution Protocol) answering the print server's RARP request and supplying the print server with the IP address. The RARP method only allows you to configure the IP address. For more information, see [“Using RARP”](#).
 - By using the `arp` and `ping` commands from your system. For more information, see [“Using the arp and ping Commands”](#).
 - By setting configuration parameters using Telnet. In order to set configuration parameters, set up a Telnet connection from your system to the HP Jetdirect print server using the default IP address. The default IP address takes effect two minutes after the printer is turned on (if none of the other configuration methods have been used). (Older products may take longer for the IP address to take effect.) The default IP address is 192.0.0.192. If Telnet is used, the print server saves the configuration over power cycles. For more information, see [“Using Telnet”](#).

- By browsing to the embedded Web server on the HP Jetdirect print server and setting the configuration parameters. For more information, see [“Using the Embedded Web Server”](#) and [Appendix B](#).
- By manually entering the configuration data using the printer control panel keys. The control panel method allows you to configure only a limited subset of configuration parameters (IP address, subnet mask, default gateway address, and idle timeout). Therefore, control panel configuration is recommended only during troubleshooting or for simple installations. If control panel configuration is used, the print server saves the configuration over power cycles. For more information, see [“Using the Printer Control Panel”](#).

Using BOOTP/TFTP

BOOTP (Bootstrap Protocol) and TFTP (Trivial File Transfer Protocol) provide a convenient way to automatically configure the HP Jetdirect print server for TCP/IP network operation. When powered on, the Jetdirect print server sends a BOOTP request message onto the network. A properly configured BOOTP server on the network will respond with a message that contains basic network configuration data for the Jetdirect print server. The BOOTP server's response may also identify a file that contains extended configuration data for the print server. The Jetdirect print server downloads this file using TFTP. This TFTP configuration file may be located on the BOOTP server, or a separate TFTP server.

BOOTP/TFTP servers are typically UNIX or Linux systems. Windows NT/2000 and NetWare servers can respond to BOOTP requests. Windows NT/2000 servers are configured through Microsoft DHCP services (see [Using DHCP](#)). However, Windows NT/2000 systems may require third-party software for TFTP support. For setup of NetWare BOOTP servers, refer to your NetWare documentation.

Note If the Jetdirect print server and BOOTP/DHCP server are located on different subnets, IP configuration may fail unless the routing device supports "BOOTP Relay" (allows the transfer of BOOTP requests between subnets).

Why Use BOOTP/TFTP?

Using BOOTP/TFTP to download configuration data has the following benefits:

- Enhanced configuration control of the HP Jetdirect print server. Configuration by other methods, such as a printer control panel, are limited to select parameters.
- Ease of configuration management. Network configuration parameters for the entire network can be in one location.

- Ease of HP Jetdirect print server configuration. Complete network configuration can be automatically downloaded each time the print server is powered on.

Note BOOTP operation is similar to DHCP, but the resulting IP parameters will be the same over power cycles. In DHCP, IP configuration parameters are leased and may change over time.

When in its factory-default state and powered on, the HP Jetdirect print server will attempt to automatically configure itself using several dynamic methods, one of which is BOOTP.

BOOTP/TFTP on UNIX

This section describes how to configure the print server using BOOTP (Bootstrap Protocol) and TFTP (Trivial File Transfer Protocol) services on UNIX servers. BOOTP and TFTP are used to download network configuration data from a server to the HP Jetdirect print server over the network.

Systems That Use Network Information Service (NIS)

If your system uses NIS, you may need to rebuild the NIS map with the BOOTP service before performing the BOOTP configuration steps. Refer to your system documentation.

Configuring the BOOTP Server

For the HP Jetdirect print server to obtain its configuration data over the network, the BOOTP/TFTP servers must be set up with the appropriate configuration files. BOOTP is used by the print server to obtain entries in the `/etc/bootptab` file on a BOOTP server, while TFTP is used to obtain additional configuration information from a configuration file on a TFTP server.

When the HP Jetdirect print server is powered on, it broadcasts a BOOTP request that contains its MAC (hardware) address. A BOOTP server daemon searches the `/etc/bootptab` file for a matching MAC address, and if successful, sends the corresponding configuration data to the Jetdirect print server as a BOOTP reply. The configuration data in the `/etc/bootptab` file must be properly entered. For a description of entries, see [“Bootptab File Entries”](#).

The BOOTP reply may contain the name of a configuration file containing enhanced configuration parameters. If the HP Jetdirect print server finds such a file, it will use TFTP to download the file and configure itself with these parameters. For a description of entries, see “[TFTP Configuration File Entries](#)“. Configuration parameters retrieved via TFTP are optional.

Note HP recommends that the BOOTP server be located on the same subnet as the printers it serves. **BOOTP broadcast packets may not be forwarded by routers unless the routers are properly configured.**

CAUTION Community names (passwords) for your printer are not secure. If you specify a community name for your printer, select a name that is different from passwords used for other systems on your network.

Bootptab File Entries

An example of a /etc/bootptab file entry for an HP Jetdirect print server is provided below:

```
picasso:\
:hn:\
:ht=ether:\
:vm=rfc1048:\
:ha=0001E6123456:\
:ip=192.168.40.39:\
:sm=255.255.255.0\
:gw=192.168.40.1\
:lg=192.168.40.3\
:T144="hpn/picasso.cfg":
```

Note that the configuration data contains “tags” to identify the various HP Jetdirect parameters and their settings. Entries and tags supported by the HP Jetdirect print server (firmware version x.21.01 or greater) are listed in [Table 3.1](#).

Table 3.1 Tags Supported in a BOOTP/DHCP Boot file (1 of 3)

Item	RFC 2132 Option	Description
nodename	--	The name of the peripheral. This name identifies an entry point to a list of parameters for a specific peripheral. <i>nodename</i> must be the first field in an entry. (In the example above, <i>nodename</i> is “picasso”.)
ht	--	The hardware type tag. For the HP Jetdirect print server, set this to ether (for Ethernet) or token (for Token Ring). This tag must precede the ha tag.
vm	--	The BOOTP report format tag (required). Set this parameter to rfc1048 .
ha	--	The hardware address tag. The hardware (MAC) address is the link-level, or station address of the HP Jetdirect print server. It can be found on the HP Jetdirect configuration page as the HARDWARE ADDRESS . On HP Jetdirect external print servers, it is printed on a label attached to the print server.
ip	--	The IP address tag (required). This address will be the HP Jetdirect print server’s IP address.
sm	1	The subnet mask tag. The subnet mask will be used by the HP Jetdirect print server to identify the portions of an IP address that specify the network/subnetwork number and the host address.
gw	3	The gateway IP address tag. This address identifies the IP address of the default gateway (router) that the HP Jetdirect print server will use for communications with other subnets.
ds	6	DNS (Domain Name System) server’s IP address tag. Only a single name server can be specified.
lg	7	The syslog server’s IP address tag. It specifies the server that the HP Jetdirect print server sends syslog messages to. For more information, see Appendix A .

Table 3.1 Tags Supported in a BOOTP/DHCP Boot file (2 of 3)

Item	RFC 2132 Option	Description
hn	12	The host name tag. This tag does not take a value but causes the BOOTP daemon to download the host name to the HP Jetdirect print server. The host name will be printed on the Jetdirect configuration page, or returned on an SNMP sysName request by a network application.
dn	15	Domain name tag. Specifies the domain name for the HP Jetdirect print server (for example, support.hp.com). It does not include the host name--it is not the Fully Qualified Domain Name (such as printer1.support.hp.com).
ef	18	Extensions file tag that specifies the relative path name of the TFTP configuration file. Note: This tag is similar to the vendor-specific tag T144, described below.
na	44	Tag for IP addresses of the NetBIOS-over-TCP/IP Name Server (NBNS). A primary and secondary server may be specified in order of preference.
lease-time	51	DHCP IP address lease duration time (seconds).
tr	58	DHCP T1 timeout, specifying the DHCP lease renewal time (seconds).
tv	59	DHCP T2 timeout, specifying the DHCP lease rebind time (seconds).
T69	69	The IP address (in hexadecimal) of the preferred outgoing e-mail SMTP (Simple Mail Transport Protocol) server, for use with supported Scan devices.
T144	--	An HP-proprietary tag that specifies the relative path name of the TFTP configuration file. Long path names may be truncated. The path name must be in double quotes (for example, " <i>pathname</i> "). For file format information, refer to " TFTP Configuration File Entries ". Note: Standard BOOTP option 18 (extensions file path) also allows a standard tag (ef) to specify the relative path name of the TFTP configuration file.

Table 3.1 Tags Supported in a BOOTP/DHCP Boot file (3 of 3)

Item	RFC 2132 Option	Description
T145	--	Idle Timeout option. An HP-proprietary tag to set the idle timeout (seconds), which is the amount of time that a print data connection may remain idle before being closed. The range is 1 - 3600 seconds.
T146	--	Buffer Packing option. An HP-proprietary tag to set buffer packing for TCP/IP packets. 0 (default): Normal, data buffers are packed before sending to the printer. 1: Disable buffer packing. Data is sent to the printer when received.
T147	--	Write Mode option. An HP-proprietary tag that controls the TCP PSH flag setting for device-to-client data transfers. 0 (default): disables this option, flag not set. 1: all-push option. The push bit is set in all data packets. 2: eoi-push option. The push bit is set only for data packets that have an End-of-Information flag set.
T148	--	IP Gateway Disable option. An HP-proprietary tag to prevent configuration of a gateway IP address. 0 (default) allows an IP address. 1 prevents a Gateway IP address to be configured.
T149	--	Interlock Mode option. An HP-proprietary tag that specifies whether an acknowledgement (ACK) on all TCP packets is required before the printer is allowed to close a Port 9100 print connection. To accommodate multiport print servers, a Port Number and Option value are specified. Port Numbers can be 1 (default), 2, or 3. Option value 0 (default) disables interlock, 1 enables. Example: 2 1 specifies Port 2, interlock enabled
T150	--	TFTP server's IP address option. An HP-proprietary tag to specify the TFTP server's IP address where the TFTP configuration file is located.
T151	--	Network Configuration option. An HP-proprietary tag to specify either "BOOTP-ONLY" or "DHCP-ONLY" requests be sent.

A colon (:) indicates the end of a field, and a backslash (\) indicates that the entry is continued on the next line. Spaces are not allowed between the characters on a line. Names, such as host names, must begin with a letter and can contain only letters, numbers, periods (for domain names only), or hyphens. The underline character (_) is not allowed. Refer to your system documentation or online help for more information.

TFTP Configuration File Entries

To provide additional configuration parameters for your HP Jetdirect print server, such as SNMP (Simple Network Management Protocol) or non-default settings, an additional configuration file can be downloaded using TFTP. This TFTP configuration file's relative path name is specified in the BOOTP reply using the `/etc/bootptab` file's T144 vendor-specific tag (or the "ef" standard BOOTP tag) entry. An example of a TFTP configuration file is provided below (the symbol '#' denotes a remark and is not included in the file).

```
#
# Example of an HP Jetdirect TFTP Configuration File
#
# Allow only Subnet 192.168.10 access to peripheral.
# Up to 10 'allow' entries can be written via TFTP.
# Up to 10 'allow' entries can be written via Telnet
# or embedded web server.
# 'allow' may include single IP addresses.
#
allow: 192.168.10.0 255.255.255.0
#
#
# Disable Telnet
#
telnet: 0
#
# Enable the embedded web server
#
ews-config: 1
#
# Detect SNMP unauthorized usage
#
authentication-trap: on
#
# Send Traps to 192.168.10.1
#
trap-dest: 192.168.10.1
#
# Specify the Set Community Name
#
set-community-name: lhomer2
#
# End of file
```

[Table 3.2](#) lists the supported TFTP parameters (HP Jetdirect firmware version x.21.01 or greater).

[Table 3.3](#) describes the TFTP parameters.

Table 3.2 List of Supported TFTP Parameters (1 of 2)

General	
<ul style="list-style-type: none"> ● passwd: ● sys-location: ● sys-contact: 	
TCP/IP Main	
<ul style="list-style-type: none"> ● host-name: ● domain-name: ● dns-svr: ● pri-wins-svr: ● sec-wins-svr: ● smtp-svr: 	
TCP/IP Print Options	
<ul style="list-style-type: none"> ● 9100-printing: ● ftp-printing: ● ipp-printing: ● lpd-printing: ● banner: ● interlock: ● buffer-packing: ● write-mode: ● mult-tcp-conn: 	
TCP/IP Raw Print Ports	
<ul style="list-style-type: none"> ● raw-port: 	
TCP/IP Access Control	
<ul style="list-style-type: none"> ● allow: netnum [mask] 	
TCP/IP Other Settings	
<ul style="list-style-type: none"> ● syslog-config: ● syslog-svr: ● syslog-max: ● syslog-priority: ● syslog-facility: ● slp-config: ● ttl-slp: ● idle-timeout: ● telnet-timeout: ● ews-config: ● tcp-mss: ● tcp-msl: ● telnet-config: 	
SNMP	
<ul style="list-style-type: none"> ● snmp-config: ● get-community-name: ● set-community-name: ● auth-trap: ● trap-dest: ● trap-community-name: 	

Table 3.2 List of Supported TFTP Parameters (2 of 2)

IPX/SPX	
● ipx-config:	● ipx-nds-context:
● ipx-unit-name:	● ipx-job-poll:
● ipx-framesize:	● ipx-banner:
● ipx-sapinterval:	● ipx-eoj:
● ipx-nds-tree:	● ipx-toner-low:
AppleTalk	
● appletalk:	
DLC/LLC	
● dlc/llc:	
Other Settings	
● scan-config:	● MFP-config:
● scan-idle-timeout:	● usb-mode:
● scan-email-config:	● usb-statpg-lang:
Support	
● support-name:	● support-url:
● support-number:	● tech-support-url:

Table 3.3 TFTP Configuration File Parameters (1 of 8)

General	
passwd:	A password (up to 16 alphanumeric characters) that allows administrators to control changes of HP Jetdirect print server configuration parameters through Telnet or embedded web server.
sys-location:	Identifies the physical location of the printer (SNMP sysLocation object). Only printable ASCII characters are allowed. The maximum length is 64 characters. The default location is undefined. (Example: 1st floor, south wall)
sys-contact:	ASCII character string (up to 64 characters) that identifies the person who administers or services the printer (SNMP sysContact object). This may include how to contact this person. The default contact is undefined.
TCP/IP Main	
host-name:	Specifies the node name that will appear on the Jetdirect configuration page. Default is NPIxxxxxx, where xxxxxx is the last six digits of the LAN hardware address.
domain-name:	The domain name for the device (for example, support.hp.com). It does not include the host name--it is not the Fully Qualified Domain Name (such as printer1.support.hp.com).
dns-svr:	IP address of the DNS (Domain Name System) server.
pri-wins-svr:	The IP address of the primary Windows Internet Name Service (WINS) server.
sec-wins-svr:	The IP address of the secondary Windows Internet Name Service (WINS) server.
smtp-svr:	The IP address of the outgoing e-mail Simple Mail Transport Protocol (SMTP) server, for use with supported Scan devices.
TCP/IP Print Options	
9100-printing:	Enables or disables printing to TCP port 9100 on the print server. 0 disables, 1 (default) enables.
ftp-printing:	Enables or disables the ability to print via FTP: 0 disables, 1 (default) enables.

Table 3.3 TFTP Configuration File Parameters (2 of 8)

<p>ipp-printing:</p> <p>Enables or disables the ability to print via IPP: 0 disables, 1 (default) enables.</p>
<p>lpd-printing:</p> <p>Enables or disables LPD (Line Printer Daemon) printing services on the Jetdirect print server. 0 disables, 1 (default) enables.</p>
<p>banner:</p> <p>A port-specific parameter that specifies printing an LPD banner page. 0 disables banner pages. 1 (default) enables banner pages.</p>
<p>interlock:</p> <p>Specifies whether an acknowledgement (ACK) on all TCP packets is required before the printer is allowed to close a Port 9100 print connection. To accommodate multiport print servers, a Port Number and Option value are specified. Port Numbers can be 1 (default), 2, or 3. Option value 0 (default) disables interlock, 1 enables. For example, "interlock 2 1" specifies Port 2, interlock enabled</p>
<p>buffer-packing:</p> <p>Enables or disables buffer packing for TCP/IP packets. 0 (default) is normal, the data buffer is packed before sending to the printer. 1 disables buffer packing, data is sent to the printer as it is received.</p>
<p>write-mode:</p> <p>Controls the setting of the TCP PSH flag for device-to-client data transfers. 0 (default): disables this option, flag is not set. 1: all-push option. The push bit is set in all data packets. 2: eoi-push option. The push bit is set only for data packets that have an End-of-Information flag set.</p>
<p>mult-tcp-conn:</p> <p>Enables or disables multiple TCP connections. 0 (default) allows multiple connections. 1 disables multiple connections.</p>
<p>TCP/IP Raw Print Ports</p>
<p>raw-port:</p> <p>Specifies additional ports for printing to TCP port 9100. Valid ports are 3000 to 9000, which are application dependent.</p>

Table 3.3 TFTP Configuration File Parameters (3 of 8)

TCP/IP Access Control
<p>allow: netnum [mask]</p> <p>Makes an entry into the host access list stored on the HP Jetdirect print server. Each entry specifies a host or network of hosts that are allowed to connect to the printer. The format is “allow: netnum [mask]” where netnum is a network number or host IP address, and mask is an address mask of bits applied to the network number and host address to verify access. Up to 10 access list entries are allowed. If there are no entries, all hosts are permitted access. For example,</p> <p>allow: 192.0.0.0 255.0.0.0 allows hosts on network 192.</p> <p>allow: 192.168.1.2 allows a single host. In this case, the default mask 255.255.255.255 is assumed and is not required.</p> <p>allow: 0 This entry clears the host access list.</p> <p>For additional information, see Chapter 6.</p>
TCP/IP Other Settings
<p>syslog-config:</p> <p>Enables or disables syslog server operation on the print server: 0 disables, 1 (default) enables.</p>
<p>syslog-svr:</p> <p>The syslog server’s IP address. It specifies the server that the HP Jetdirect print server sends syslog messages to. For more information, see Appendix A.</p>
<p>syslog-max:</p> <p>Specifies the maximum number of syslog messages that can be sent by the HP Jetdirect print server on a per-minute basis. This setting allows administrators to control the log file size. The default is 10 per minute. If it’s set to zero, the number of syslog messages is not restricted.</p>
<p>syslog-priority:</p> <p>Controls the filtering of syslog messages sent to the syslog server. The filter range is 0 to 8, with 0 being the most specific and 8 the most general. Only messages that are lower than the filter level specified (or higher in priority) are reported. The default is 8, messages of all priorities are sent. If 0, all syslog messages are disabled.</p>
<p>syslog-facility:</p> <p>A code used to identify the source facility of a message (for example, to identify the source of selected messages during troubleshooting). By default, the HP Jetdirect print server uses LPR as the source facility code, but local user values of local0 through local7 can be used to isolate individual or groups of print servers.</p>
<p>slp-config:</p> <p>Enables or disables the Service Location Protocol (SLP) operation on the print server: 0 disables, 1 (default) enables.</p>

Table 3.3 TFTP Configuration File Parameters (4 of 8)

<p>tll-slp:</p> <p>Specifies the IP multicast "Time To Live" (TTL) setting for Service Location Protocol (SLP) packets. The default value is 4 hops (the number of routers from the local network). The range is 1-15. When set to a -1, multicast capability is disabled.</p>
<p>idle-timeout:</p> <p>The number of seconds that an idle print data connection is allowed to remain open. Since the card supports only a single TCP connection, the idle timeout balances the opportunity of a host to recover or complete a print job against the ability of other hosts to access the printer. The acceptable values range from 0 to 3600 (1 hour). If "0" is typed, the timeout mechanism is disabled. The default is 270 seconds.</p>
<p>telnet-timeout:</p> <p>An integer (1..3600) that specifies the number of seconds that your Telnet or FTP session can be idle before it will be automatically disconnected. The default is 900 seconds. 0 disables the timeout.</p> <p>CAUTION: Small values, such as 1-5, may effectively disable the use of Telnet. A Telnet session may terminate before any changes can be made.</p>
<p>ews-config:</p> <p>Enables or disables the print server's embedded web server to change configuration values: 0 disables, 1 (default) enables.</p>
<p>tcp-mss:</p> <p>Specifies the maximum segment size (MSS) that the HP Jetdirect print server will advertise for use when communicating with local subnets (Ethernet MSS=1460 bytes or more) or remote subnets (MSS=536 bytes):</p> <p>0 (default) All networks are assumed to be local (Ethernet MSS=1460 bytes or more).</p> <p>1 Use MSS=1460 bytes (or more) for subnets, and MSS=536 bytes for remote networks.</p> <p>2 All networks are assumed to be remote (MSS=536 bytes), except the local subnet.</p> <p>MSS affects performance by helping to prevent IP Fragmentation that may result in data retransmission.</p>
<p>tcp-msl:</p> <p>Specifies the maximum segment life (MSL) in seconds. The range is 5 - 120 seconds. The default is 15 seconds.</p>
<p>telnet-config:</p> <p>If set to 0, this parameter instructs the print server not to allow incoming Telnet connections. To regain access, change the setting in the TFTP configuration file and power cycle the print server, or cold reset the print server to factory default values. If this parameter is set to 1, incoming Telnet connections are allowed.</p>

Table 3.3 TFTP Configuration File Parameters (5 of 8)

SNMP
<p>snmp-config:</p> <p>Enables or disables SNMP operation on the print server. 0 disables, 1 (default) enables SNMP.</p>
<p>get-community-name:</p> <p>Specifies a password that determines which SNMP GetRequests the HP Jetdirect print server will respond to. This is optional. Specifies a password for SNMP GetRequests sent to the HP Jetdirect print server. This password is optional. If a user-specified get community name is set, the print server will respond to either a user-specified community name or the factory-default. The community name must be ASCII characters. The maximum length is 255 characters.</p>
<p>set-community-name:</p> <p>Specifies a password that determines which SNMP SetRequests (control functions) the HP Jetdirect print server will respond to. The community name of an incoming SNMP SetRequest must match the print server's "set community name" for the print server to respond. SetRequests must come from hosts that are configured in the print server's host access list. Community names must be ASCII characters. The maximum length is 255 characters.</p>
<p>auth-trap:</p> <p>Configures the print server to send (on) or not send (off) SNMP authentication traps. Authentication traps indicate that an SNMP request was received, but the community name check failed. The default is "on."</p>
<p>trap-dest:</p> <p>Enters a host's IP address into the HP Jetdirect print server's SNMP trap destination list. The command format is:</p> <p style="padding-left: 40px;">trap-dest: <i>ip-address</i> [community name] [port number]</p> <p>The default community name is 'public'; the default SNMP port number is '162'. The port number cannot be specified without a community name, otherwise the port number will become the community name.</p> <p>If a 'trap-community-name' command is followed by 'trap-dest' commands, the trap community name will be assigned to those entries unless a different community name is specified in each 'trap-dest' command.</p> <p>To delete the table, use 'trap-dest: 0'.</p> <p>If the list is empty, the print server does not send SNMP traps. The list may contain up to five entries. The default SNMP Trap Destination List is empty. To receive SNMP traps, the systems listed on the SNMP trap destination list must have a trap daemon to listen to those traps.</p>
<p>trap-community-name:</p> <p>Community name (password) included with SNMP traps that are sent by the HP Jetdirect print server to a host computer. The default community name is <code>public</code>. Community names must be ASCII characters. The maximum length is 255 characters.</p>

Table 3.3 TFTP Configuration File Parameters (6 of 8)

IPX/SPX
<p>ipx-config:</p> <p>Enables or disables IPX/SPX protocol operation on the print server: 0 disables, 1 (default) enables.</p>
<p>ipx-unit-name:</p> <p>A user-assigned alphanumeric name assigned to the print server (31 characters maximum). By default, the name will be NPIxxxxxx, where xxxxxx are the last six digits of the LAN hardware address.</p>
<p>ipx-framesize:</p> <p>Specify the IPX frame type setting: AUTO (default), EN_SNAP, EN_8022, EN_8023, EN_II, TR_8022, TR_SNAP.</p>
<p>ipx-sapinterval:</p> <p>Specifies the time interval (1 to 3600 seconds) that the HP Jetdirect print server waits between Service Advertising Protocol (SAP) broadcasts on the network. The default is 60 seconds. 0 disables SAP broadcasts.</p>
<p>ipx-nds-tree:</p> <p>Identifies the name of the Novell Directory Services (NDS) tree for this printer.</p>
<p>ipx-nds-context:</p> <p>An alphanumeric string, up to 256 characters, that specifies the NDS context for the HP Jetdirect print server.</p>
<p>ipx-job-poll:</p> <p>Specifies the time interval (seconds) that the HP Jetdirect print server will wait to check for print jobs in a print queue.</p>
<p>ipx-banner:</p> <p>Enables or disables printing an IPX banner page. 0 disables banner pages. 1 (default) enables banner pages.</p>
<p>ipx-eoj:</p> <p>Enables or disables IPX end-of-job notification. 0 disables, 1 (default) enables.</p>
<p>ipx-toner-low:</p> <p>Enables or disables IPX toner-low notification. 0 disables, 1 (default) enables.</p>
AppleTalk
<p>appletalk:</p> <p>Enables or disables AppleTalk (EtherTalk) protocol operation on the print server: 0 disables, 1 (default) enables.</p>

Table 3.3 TFTP Configuration File Parameters (7 of 8)

DLC/LLC
<p>dlc/llc:</p> <p>Enables or disables DLC/LLC protocol operation on the print server: 0 disables, 1 (default) enables.</p>
Other Settings
<p>scan-config:</p> <p>Enables or disables the Web Scan feature on the print server when connected to a supported device. 0 disables, 1 (default) enables.</p>
<p>scan-idle-timeout:</p> <p>Specifies the number of seconds (1 - 3600) that an idle scan connection is allowed to remain open. 0 disables the timeout. The default is 300 seconds.</p>
<p>scan-email-config:</p> <p>Enable or disable the scan-to-email feature in the Web Scan server. 0 disables, 1 (default) enables.</p>
<p>MFP-config:</p> <p>Enable or disable print server support of the client software provided with your multifunction or all-in-one peripheral.</p> <p>0 (default) disables client software support (allows printing only).</p> <p>1 enables client software support (allows printing and scanning).</p>
<p>usb-mode:</p> <p>Specifies the communication mode over the USB port on the HP Jetdirect print server.</p> <ul style="list-style-type: none">● Auto (default): Automatically negotiates and sets the the highest communication mode possible for the attached printer or device.● MLC: (Multiple Logical Channels) An HP-proprietary communication mode that allows multiple channels of simultaneous print, scan and status communications.● BIDIR: A standard connection that supports bi-directional communications between the printer and print server. The print server sends print data and receives status from the printer.● UNIDIR: A standard connection in which data is transferred in one direction only (to the printer).

Table 3.3 TFTP Configuration File Parameters (8 of 8)

<p>usb-statpg-lang:</p> <p>Specifies the page description language (PDL) that the print server will use to send the Jetdirect configuration/status page to the printer.</p> <ul style="list-style-type: none">● Auto (default): The PDL is auto-detected when the print server is powered on or after a cold-reset to factory defaults.● PCL: Hewlett-Packard Printer Control Language● ASCII: Standard ascii characters● HPGL2: Hewlett-Packard Graphics Language (v2)● PS: Postscript language
Support
<p>support-name:</p> <p>Typically used to identify the name of a person to contact for support of this device.</p>
<p>support-number:</p> <p>Typically used to specify a phone or extension number to call for support of this device.</p>
<p>support-url:</p> <p>A web URL address for product information on this device over the Internet or an intranet.</p>
<p>tech-support-url:</p> <p>A web URL address for technical support over the Internet or an intranet.</p>

Using DHCP

Dynamic Host Configuration Protocol (DHCP, RFC 2131/2132) is one of several auto configuration mechanisms that the HP Jetdirect print server uses. If you have a DHCP server on your network, the HP Jetdirect print server automatically obtains its IP address from that server and registers its name with any RFC 1001 and 1002-compliant dynamic name services as long as a WINS (Windows Internet Naming Service) server IP address has been specified.

A TFTP (Trivial File Transfer Protocol) configuration file may also be used with DHCP to configure extended parameters. For more information on TFTP parameters, see [“Using BOOTP/TFTP”](#).

Note DHCP services must be available on the server. Refer to your system documentation or online help to install or enable DHCP services.

Note If the Jetdirect print server and BOOTP/DHCP server are located on different subnets, IP configuration may fail unless the routing device allows the transfer of DHCP requests between subnets.

UNIX Systems

For more information on setting up DHCP on UNIX systems, see the `bootpd` man page.

On HP-UX systems, a sample DHCP configuration file (`dhcptab`) may be located in the `/etc` directory.

Since HP-UX presently does not provide Dynamic Domain Name Services (DDNS) for its DHCP implementations, HP recommends that you set all print server lease durations to *infinite*. This ensures that print server IP addresses remain static until dynamic domain name services are provided.

Windows Systems

HP Jetdirect print servers support IP configuration from a Windows NT or 2000 DHCP server. This section describes how to set up a pool, or “scope,” of IP addresses that the Windows server can assign or lease to any requester. When configured for BOOTP or DHCP operation and powered on, the HP Jetdirect print server automatically sends a BOOTP or DHCP request for its IP configuration. If properly set up, a Windows DHCP server will respond with the print server’s IP configuration data.

Note This information is provided as an overview. For specific information or for additional support, see the information supplied with your DHCP server software.

Note To avoid problems resulting from IP addresses that change, HP recommends that all printers be assigned IP addresses with infinite leases or reserved IP addresses.

Windows NT 4.0 Server

To set up a DHCP scope on a Windows NT 4.0 server, perform the following steps:

1. At the Windows NT server, open the *Program Manager* window and double-click the *Network Administrator* icon.
2. Double-click the **DHCP Manager** icon to open this window.
3. Select **Server** and select **Server Add**.
4. Type the server IP address, then click **OK** to return to the *DHCP Manager* window.
5. In the list of DHCP servers, click on the server you have just added, then select **Scope** and select **Create**.

6. Select **Set up the IP Address Pool**. In the *IP Address Pool* section, set up the IP address range by typing the beginning IP address in the *Start Address* box and the ending IP address in the *End Address* box. Also type the subnet mask for the subnet to which the IP address pool applies.

The starting and ending IP addresses define the end points of the address pool assigned to this scope.

Note If desired, you can exclude ranges of IP addresses within a “scope.”

7. In the *Lease Duration* section, select **Unlimited**, then select **OK**.

HP recommends that all printers be assigned infinite leases to avoid problems resulting from IP addresses that change. Be aware, however, that selecting an unlimited lease duration for the scope causes all clients in that scope to have infinite leases.

If you want clients on your network to have finite leases, you can set the duration to a finite time, but you should configure all printers as reserved clients for the scope.

8. Skip this step if you have assigned unlimited leases in the previous step. Otherwise, select **Scope** and select **Add Reservations** to set up your printers as reserved clients. For each printer, perform the following steps in the *Add Reserved Clients* window to set up a reservation for that printer:
 - a. Type the selected IP address.
 - b. Obtain the MAC address or hardware address from the configuration page, and type this address in the *Unique Identifier* box.
 - c. Type the client name (any name is acceptable).
 - d. Select **Add** to add the reserved client. To delete a reservation, in the *DHCP Manager* window, select **Scope** and select **Active Leases**. In the *Active Leases* window, click on the reservation you want to delete and select **Delete**.
9. Select **Close** to return to the *DHCP Manager* window.

10. Skip this step if you are not planning to use WINS (Windows Internet Naming Service). Otherwise perform the following steps when configuring your DHCP server:
 - a. From the *DHCP Manager* window, select **DHCP Options** and select one of the following:
 - Scope** — if you want Name Services only for the selected scope.
 - Global** — if you want Name Services for all scopes.
 - b. Add the server to the *Active Options* list. From the *DHCP Options* window, select **WINS/NBNS Servers (044)** from the *Unused Options* list. Select **Add**, then select **OK**.

A warning may appear requesting that you set the node type. You do this in step 10d.
 - c. You must now provide the IP address of the WINS server by doing the following:
 - d. Select **Value**, then **Edit Array**.
 - e. From the *IP Address Array Editor*, select **Remove** to delete any undesired addresses previously set. Then type in the IP address of the WINS server and select **Add**.
 - f. Once the address appears in the list of IP addresses, select **OK**. This returns you to the *DHCP Options* window. If the address you have just added appears in the list of IP addresses (near the bottom of the window) return to step 10d. Otherwise, repeat step 10c.
 - g. In the *DHCP Options* window, select **WINS/NBT Node Type (046)** from the *Unused Options* list. Select **Add** to add the node type to the *Active Options* list. In the *Byte* box, type 0x4 to indicate a mixed node, and select **OK**.
11. Click **Close** to exit to **Program Manager**.

Windows 2000 Server

To set up a DHCP scope on a Windows 2000 server, perform the following steps:

1. Run the Windows 2000 DHCP manager utility. Click **Start**, select **Settings** and **Control Panel**. Open the **Administrative Tools** folder and run the **DHCP** utility.
2. In the DHCP window, locate and select your Windows 2000 server in the DHCP tree.

If your server is not listed in the tree, select **DHCP** and click the **Action** menu to add the server.
3. After selecting your server in the DHCP tree, click the **Action** menu and select **New Scope**. This runs the **Add New Scope Wizard**.
4. In the **Add New Scope Wizard**, click **Next**.
5. Enter a Name and Description for this scope, then click **Next**.
6. Enter the range of IP addresses for this scope (beginning IP address and ending IP address). Also, enter the subnet mask. then click **Next**.

Note

If subnetting is used, the subnet mask defines which portion of an IP address specifies the subnet and which portion specifies the client device. For more information, see [Appendix A](#).

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7. If applicable, enter the range of IP addresses within the scope to be excluded by the server. Then click **Next**.
 8. Set the IP address lease duration for your DHCP clients. Then click **Next**.

HP recommends that all printers be assigned reserved IP addresses. This can be accomplished after you set up the scope (see step [11](#)).

9. Select **No** to configure DHCP options for this scope later. Then click **Next**.

To configure DHCP options now, select **Yes** and click **Next**.

- a. If desired, specify the IP address of the router (or default gateway) to be used by clients. Then click **Next**.
 - b. If desired, specify the Domain Name and DNS (Domain Name System) servers for clients. Click **Next**.
 - c. If desired, specify WINS server names and IP addresses. Click **Next**.
 - d. Select **Yes** to activate the DHCP options now, and click **Next**.
10. You have successfully set up the DHCP scope on this server. Click **Finish** to close the wizard.
 11. Configure your printer with a reserved IP address within the DHCP scope:
 - a. In the DHCP tree, open the folder for your scope and select **Reservations**.
 - b. Click the **Action** menu and select **New Reservation**.
 - c. Enter the appropriate information in each field, including the reserved IP address for your printer. (Note: the MAC address for your HP Jetdirect-connected printer is available on the HP Jetdirect configuration page.)
 - d. Under “Supported types”, select **DHCP only**, then click **Add**. (Note: Selecting **Both** or **BOOTP only** will result in a configuration via BOOTP due to the sequence in which HP Jetdirect print servers initiate configuration protocol requests.)
 - e. Specify another reserved client, or click **Close**. The reserved clients added will be displayed in the Reservations folder for this scope.
 12. Close the DHCP manager utility.

NetWare Systems

NetWare 5.x servers provide DHCP configuration services for network clients, including the HP Jetdirect print server. To set up DHCP services on a NetWare server, refer to Novell documentation and support.

To Discontinue DHCP Configuration

CAUTION Changes to an IP address on your HP Jetdirect print server may require updates to printer or system printing configurations for clients or servers.

If you do not want your HP Jetdirect print server configured via DHCP, you must choose a different configuration method.

1. (For EIO internal print servers) If you use the printer control panel to set Manual or BOOTP configuration, then DHCP will not be used.
2. You can use Telnet to set Manual (status indicates “User Specified”) or BOOTP configuration, then DHCP will not be used.
3. You can manually modify the TCP/IP parameters via a supported web browser using the Jetdirect embedded web server or HP Web JetAdmin.

If you change to BOOTP configuration, the DHCP-configured parameters are released and the TCP/IP protocol is initialized.

If you change to Manual configuration, the DHCP-configured IP address is released and the user-specified IP parameters are used.

Therefore, if you manually provide the IP address, you should also manually set all of the configuration parameters, such as subnet mask, default gateway, and idle timeout.

Note

If you choose to return to a DHCP configuration, the print server assumes it should acquire its configuration information from a DHCP server. This means that when you choose DHCP and complete your configuration session (using Telnet, for example), the TCP/IP protocol for the print server is re-initialized and all current configuration information is deleted. The print server then attempts to acquire new configuration information by sending DHCP requests on the network to a DHCP server.

For DHCP configuration via Telnet, refer to “[Using Telnet](#)” in this chapter.

Using RARP

This subsection describes how to configure the print server using the Reverse Address Resolution Protocol (RARP) on UNIX and Linux systems.

This setup procedure enables the RARP daemon running on your system to respond to a RARP request from the HP Jetdirect print server and to supply the IP address to the print server.

1. Turn the printer off.
2. Log onto your UNIX or Linux system as a superuser.
3. Make sure the RARP daemon is running on your system by typing the following command at the system prompt:

```
ps -ef | grep rarpd (Unix)
```

```
ps ax | grep rarpd (BSD or Linux)
```

4. The system response should be similar to the following:
861 0.00.2 24 72 5 14:03 0:00 rarpd -a
860 0.00.5 36 140 5 14:03 0:00 rarpd -a
5. If the system does not display a process number for the RARP daemon, see the *rarpd* man page for instructions on starting the RARP daemon.
6. Edit the `/etc/hosts` file to add your designated IP address and node name for the HP Jetdirect print server. For example:

```
192.168.45.39 laserjet1
```

7. Edit the `/etc/ethers` file (`/etc/rarpd.conf` file in HP-UX 10.20) to add the LAN hardware address/station address (from the configuration page) and the node name for the HP Jetdirect print server. For example:

```
00:01:E6:a8:b0:00 laserjet1
```

Note If your system uses Network Information Service (NIS), you need to incorporate changes to the NIS host and ethers databases.

8. Turn the printer on.
9. To verify that the card is configured with the correct IP address, use the ping utility. At the prompt, type:

```
ping <IP address>
```

where `<IP address>` is the assigned address from RARP. The default IP address is 192.0.0.192.

10. If ping does not respond, see the chapter “[Troubleshooting the HP Jetdirect Print Server.](#)”

Using the arp and ping Commands

You can configure an HP Jetdirect print server with an IP address using an ARP (Address Resolution Protocol) command from a supported system. The protocol is not routable, that is, the workstation from which the configuration is made must be located on the same network segment as the HP Jetdirect print server.

Using the arp and ping commands with HP Jetdirect print servers requires the following:

- Windows NT/2000 or UNIX system configured for TCP/IP operation
- HP Jetdirect firmware version x.08.03 or later
- The LAN hardware (MAC) address of the HP Jetdirect print server (specified on an HP Jetdirect configuration page, or on a label attached to HP Jetdirect external print servers)

Note On some systems, superuser rights may be required for the arp command.

After an IP address is assigned via arp and ping commands, use other tools (such as Telnet, embedded web server, or HP Web JetAdmin software) to configure other IP parameters.

To configure a Jetdirect print server, use the following commands:

```
arp -s <IP address> <LAN hardware address>
ping <IP address>
```

where <IP address> is the desired IP address to be assigned to the print server. The arp command writes the entries to the arp cache on the workstation, and the ping command configures the IP address on the print server.

Depending on the system, the LAN hardware address may require a specific format.

For example:

- In Windows NT 4.0 or Windows 2000

```
arp -s 192.168.45.39 00-01-E6-a2-31-98  
ping 192.168.45.39
```

- In UNIX

```
arp-s 192.168.45.39 00:01:E6:a2:31:98  
ping 192.168.45.39
```

Note

Once the IP address has been set on the print server, additional `arp` and `ping` commands will be ignored. Once the IP address is configured, `arp` and `ping` cannot be used unless the print server is reset to factory values (see [Chapter 7](#)).

On UNIX systems, the `arp -s` command may vary between different systems.

Some BSD-based systems expect the IP address (or host name) in reverse order. Other systems may require additional parameters. See your system documentation for specific command formats.

Using Telnet

This section describes how to configure the print server (firmware version x.21.01 or greater) using Telnet.

Note

To use Telnet commands with the HP Jetdirect print server, a route must be available from your workstation to the print server. This means that there must be a match between the network identification of your system to that of the HP Jetdirect print server. (For example, if the print server is configured with its default IP address, a route may not exist.)

On Windows 95/98 and NT/2000 systems, you can use the following `route` command at a DOS prompt to add a route to the print server:

```
route add <Jetdirect IP Address> <system IP Address>
```

where `<Jetdirect IP address>` is the IP address configured on the HP Jetdirect print server, and `<system IP address>` is the IP address of the workstation's network card that is attached to the same physical LAN as the print server.

Example:

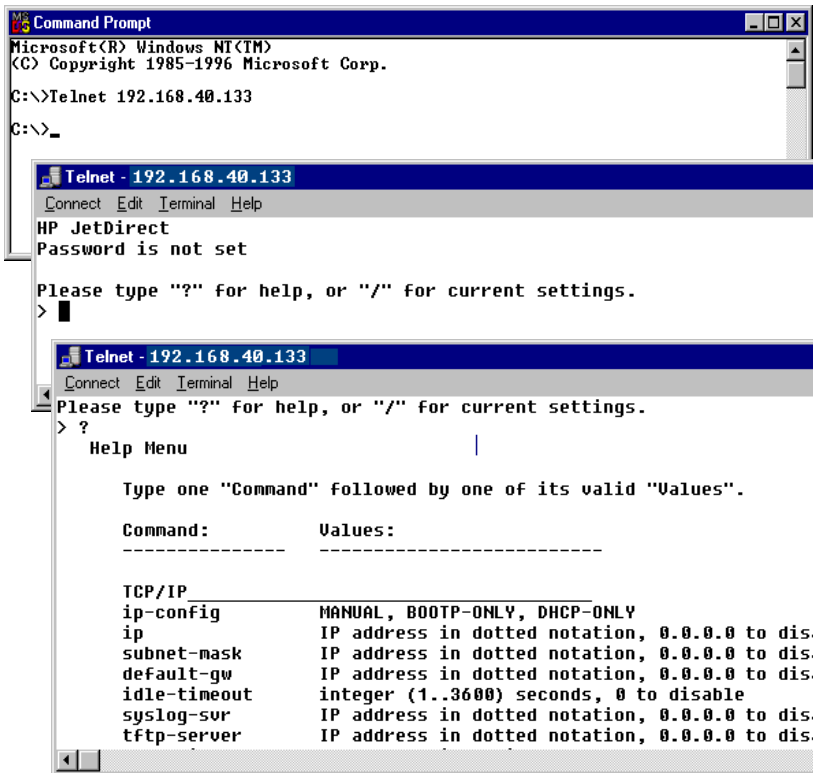
```
route add 192.168.45.39 192.170.1.2
```

CAUTION

Using Telnet to manually set an IP address will override dynamic IP configuration (such as BOOTP, DHCP, or RARP), resulting in a static configuration. In a static configuration, the IP values are fixed and the operation of BOOTP, DHCP, RARP and other dynamic configuration methods may no longer function.

Whenever you are manually changing an IP address, you should also reconfigure the subnet mask and default gateway at the same time.

Initiating a typical Telnet session is illustrated below



To set configuration parameters, you must set up a Telnet connection from your system to the HP Jetdirect print server.

1. Type the following at the system prompt:

```
telnet <IP address>
```

where <IP address> may be the assigned address from BOOTP, RARP, DHCP, the printer control panel, or the default IP address. The default IP address is 192.0.0.192. The <IP address> is listed on the Jetdirect configuration page (see [Chapter 8](#)).

2. A connection to the HP Jetdirect print server will be displayed. If the server responds with “connected to IP address”, press **Enter** twice to make sure that the Telnet connection is initialized.
3. If prompted for a user name and password, enter the correct values.

By default, the Telnet interface does not require a user name or password. If an administrative password has been set, you will be prompted for a user name and this password before you can enter and save Telnet commands.

4. By default, a Command Line interface is provided. To configure parameters using a Menu interface, enter **Menu**. For more information, see “[User Interface Options](#)”.

For a list of supported commands and parameters, see “[Telnet Commands and Parameters](#)”.

User Interface Options

The HP Jetdirect print server provides two interface options to enter Telnet commands: a [Command Line Interface \(Default\)](#) and a [Menu Interface](#).

Command Line Interface (Default)

Using the Telnet command line interface, you can set configuration parameters using the following procedures:

Note

Any time during the Telnet session you can type:?
then press **Enter** to view available configuration parameters, the correct command format, and a list of commands.

To list additional (or advanced) commands, enter the “advanced” command before entering “?”.

To display current configuration information, type / then press **Enter**.

1. At the Telnet prompt “>” type:

```
<parameter>: <value>
```

then press **Enter**, where <parameter> refers to the configuration parameter you are defining, and <value> refers to the definitions you are assigning to that parameter. Each parameter entry is followed by a carriage return.

See [Table 3.4](#) for configuration parameters.

2. Repeat the previous step to set any additional configuration parameters.
3. When you have finished typing the configuration parameters, type “save”, “exit”, or “quit” (depending on your system).

When prompted whether to save settings that you have changed, enter “Y” (default) for Yes, or “N” for No.

Telnet Commands and Parameters. [Table 3.4](#) lists the available Telnet commands and parameters.

Note

If a parameter is supplied dynamically (for example, from a BOOTP or DHCP server), its value cannot be changed using Telnet without first setting Manual configuration (see the “ip-config” command).

Whenever you are manually changing an IP address, you should also reconfigure the subnet mask and default gateway at the same time.

Table 3.4 Telnet Commands and Parameters (1 of 10)

User Control Commands	
?	Displays the Help and Telnet commands.
/	Displays current values.
menu	Displays the Menu Interface for access to configuration parameters.
advanced	Enables the Advanced commands. Help (?) will include the Advanced commands in the list.
general	Disables the Advanced commands. Help (?) will not include Advanced commands (default).
export	Export the settings to a file for editing, and importing via Telnet or TFTP (this command is only supported by systems, such as UNIX, that support input/output redirection).
save	Save the configuration values and exit the session.
exit	Exit the session.
General Settings	
passwd	Set the administrative password (shared with the embedded web server). For example, “passwd jd1234 jd1234” sets the password to jd1234. (entered twice for confirmation). Up to 16 alphanumeric characters may be used. When initiating the next Telnet session, you will be prompted for a user name and this password. To clear the password, enter the command without password and confirmation entries.
sys-location	Alpha-numeric string (up to 255 characters), typically used to identify a location.
sys-contact	Alpha-numeric string (up to 255 characters), typically used to identify the name of a network or device administrator.

Table 3.4 Telnet Commands and Parameters (2 of 10)

TCP/IP Main Settings	
host-name	Alpha-numeric string (up to 32 characters), to assign or change the name of the network device. For example, "host-name printer1" assigns the name "printer1" to the device.
ip-config	Specify the configuration method: manual: The print server will wait for IP parameters using manual tools (such as Telnet, embedded web server, control panel, installation/management software). Status will be "User Specified". bootp: The print server will send BOOTP requests on the network for dynamic IP configuration. dhcp: The print server will send DHCP requests on the network for dynamic IP configuration.
ip	IP address for the print server, in dotted notation. For example: "ip-config manual" "ip 192.168.45.39" where "ip-config" specifies manual configuration and "ip" manually sets the IP address 192.168.45.39 on the print server. Specifying 0.0.0.0 clears the IP address. If you exit and save a new IP address, it must be specified on the next Telnet connection.
subnet-mask	A value (in dotted notation) that identifies the network and host portions of an IP address in received messages. For example, "subnet-mask 255.255.255.0" stores the subnet mask value 255.255.255.0 on the print server. The value 0.0.0.0 disables the subnet mask. For more information see Appendix A .
default-gw	The IP address of a default gateway, in dotted notation. For example, "default-gw 192.168.40.1" assigns 192.168.40.1 as the IP address of the default gateway for the print server. Note: If the HP Jetdirect print server is configured by DHCP and you manually change the subnet mask or the default gateway address, you should manually change the print server's IP address. This will release the DHCP-assigned address back to the DHCP IP address pool.
Config Server	(Read-only parameter) The IP address of the server (such as a BOOTP or DHCP server) that last configured the IP address on the HP Jetdirect print server.

Table 3.4 Telnet Commands and Parameters (3 of 10)

TFTP Server	(Read-only parameter) The IP address of the TFTP server that provided TFTP parameters to the HP Jetdirect print server.
TFTP Filename	(Read-only parameter) The path and TFTP filename on the TFTP server. For example, hnpnp/printer1.cfg
domain-name	The domain name for the device. For example, "domain-name support.hp.com" assigns "support.hp.com" as the domain name. The domain name does not include the host name--it is not the Fully Qualified Domain Name (such as printer1.support.hp.com).
dns-svr	IP address of the DNS (Domain Name System) server.
pri-wins-svr	The IP address of the primary Windows Internet Name Service (WINS) server, in dotted notation.
sec-wins-svr	The IP address of the secondary Windows Internet Name Service (WINS) server, in dotted notation.
smtp-svr	(SMTP Mail Server) The IP address of the outgoing e-mail Simple Mail Transport Protocol (SMTP) server, for use with supported Scan devices.
TCP/IP Print Options	
9100-printing	Enables or disables printing to TCP port 9100 on the print server. 0 disables, 1 (default) enables.
ftp-printing	Enables or disables the ability to print via FTP. 0 disables, 1 (default) enables. (TCP ports 20, 21)
ipp-printing	Enables or disables the ability to print using IPP. 0 disables, 1 (default) enables. (TCP port 631)
lpd-printing	Enables or disables the ability to print using LPD. 0 disables, 1 (default) enables.(TCP port 515)
banner	Enables or disables printing an LPD banner page. 0 disables banner pages. 1 (default) enables banner pages.
interlock	Specifies whether an acknowledgement (ACK) on all TCP packets is required before the printer is allowed to close a Port 9100 print connection. To accommodate multiport print servers, a Port Number and Option value are specified. Port Numbers can be 1 (default), 2, or 3. Option value 0 (default) disables interlock, 1 enables. For example, "interlock 2 1" specifies Port 2, interlock enabled.
buffer-packing	Enables or disables buffer packing for TCP/IP packets. 0 (default) is normal, the data buffer is packed before sending to the printer. 1 disables buffer packing, data is sent to the printer as it is received.

Table 3.4 Telnet Commands and Parameters (4 of 10)

write-mode	Controls the setting of the TCP PSH flag for device-to-client data transfers. 0 (default): disables this option, flag is not set. 1: all-push option. The push bit is set in all data packets. 2: eoi-push option. The push bit is set only for data packets that have an End-of-Information flag set.
mult-tcp-conn	(Restrict Mult Prt) Enables or disables multiple TCP connections. 0 (default): allows multiple connections. 1: disables multiple connections.
TCP/IP Raw Print Ports	
raw-port	Specifies additional ports for printing to TCP port 9100. Valid ports are 3000 to 9000, which are application dependent.
TCP/IP Access Control	
allow	Makes an entry into the host access list stored on the HP Jetdirect print server. Each entry specifies a host or network of hosts that are allowed to connect to the printer. The format is "allow netnum [mask]" where netnum is a network number or host IP address, and mask is an address mask of bits applied to the network number and host address to verify access. Up to 10 access list entries are allowed. If there are no entries, all hosts are permitted access. For example, "allow 192.0.0.0 255.0.0.0" allows hosts on network 192. "allow 192.168.1.2" allows a single host. In this case, the default mask 255.255.255.255 is assumed and is not required. "allow 0" clears the host access list. For additional information, see Chapter 6 .
TCP/IP Other Settings	
syslog-config	Enables or disables syslog server operation on the print server: 0 disables, 1 (default) enables. (UDP port 514)
syslog-svr	The syslog server's IP address in dotted notation. It specifies the server that the HP Jetdirect print server sends syslog messages to. For example, "syslog-svr: 192.168.40.1" assigns 192.168.40.1 as the IP address of that server. For more information, see Appendix A .
syslog-max	Specifies the maximum number of syslog messages that can be sent by the HP Jetdirect print server on a per-minute basis. This setting allows administrators to control the log file size. The default is 10 per minute. If it's set to zero, the number of syslog messages is not restricted.

Table 3.4 Telnet Commands and Parameters (5 of 10)

syslog-priority	Controls the filtering of syslog messages sent to the syslog server. The filter range is 0 to 8, with 0 being the most specific and 8 the most general. Only messages that are lower than the filter level specified (or higher in priority) are reported. The default is 8, messages of all priorities are sent. If 0, all syslog messages are disabled.
syslog-facility	A code used to identify the source facility of a message (for example, to identify the source of selected messages during troubleshooting). By default, the HP Jetdirect print server uses LPR as the source facility code, but local user values of local0 through local7 can be used to isolate individual or groups of print servers.
slp-config	Enables or disables the Service Location Protocol (SLP) operation on the print server: 0 disables, 1 (default) enables. SLP is used by selected HP software applications to automate device discovery.
ttl-slp	Specifies the IP multicast "Time To Live" (TTL) setting for Service Location Protocol (SLP) packets. The default value is 4 hops (the number of routers from the local network). The range is 1-15. When set to a -1, multicast capability is disabled.
idle-timeout	An integer (1..3600) that specifies the number of seconds an idle print data connection is allowed to remain open. For example, "idle-timeout 120" assigns 120 seconds as the desired idle timeout value. The default is 270 seconds. If set to 0, the connection will not terminate and other hosts will not be able to make a connection.
telnet-timeout	An integer (1..3600) that specifies the number of seconds that your Telnet or FTP session can be idle before it will be automatically disconnected. The default is 900 seconds. 0 disables the timeout. CAUTION: Small values, such as 1-5, may effectively disable the use of Telnet. A Telnet session may terminate before any changes can be made.
cold-reset	Sets TCP/IP factory default settings. After a cold reset, power cycle the print server. Parameters for other subsystems, such as IPX/SPX or AppleTalk, are not affected.
ews-config	Enables or disables the print server's embedded web server. 0 disables, 1 (default) enables. For more information, see Appendix B .

Table 3.4 Telnet Commands and Parameters (6 of 10)

tcp-mss	<p>Specifies the maximum segment size (MSS) that the HP Jetdirect print server will advertise for use when communicating with local subnets (Ethernet MSS=1460 bytes or more) or remote subnets (MSS=536 bytes):</p> <p>0: (default) All networks are assumed to be local (Ethernet MSS=1460 bytes or more).</p> <p>1: Use MSS=1460 bytes (or more) for subnets, and MSS=536 bytes for remote networks.</p> <p>2: All networks are assumed to be remote (MSS=536 bytes), except the local subnet.</p> <p>MSS affects performance by helping to prevent IP Fragmentation that may result in data retransmission.</p>
tcp-msl	<p>Specifies the maximum segment life (MSL) in seconds. The range is 5 - 120 seconds. The default is 15 seconds.</p>
TCP/IP Diagnostics	
Last Config IP	<p>(Read-only parameter) The IP address of the system from which the HP Jetdirect print server's IP address was configured.</p>
TCP Conns Refused	<p>(Read-only parameter) The number of client TCP connections that are refused by the print server.</p>
TCP Access Denied	<p>(Read-only parameter) The number of times that client systems were denied access to the print server because there was no allowable entry in the print server's host access list.</p>
DHCP Lease Time	<p>(Read-only parameter) DHCP IP address lease duration time (seconds).</p>
DHCP Renew Time	<p>(Read-only parameter) DHCP T1 timeout, specifying the DHCP lease renewal time (seconds).</p>
DHCP Rebind Time	<p>(Read-only parameter) DHCP T2 timeout, specifying the DHCP lease rebind time (seconds).</p>
SNMP Main Settings	
snmp-config	<p>Enables or disables SNMP operation on the print server. 0 disables, 1 (default) enables SNMP.</p>
get-community-name	<p>Specifies a password that determines which SNMP GetRequests the HP Jetdirect print server will respond to. This is optional. Specifies a password for SNMP GetRequests sent to the HP Jetdirect print server. This password is optional. If a user-specified get community name is set, the print server will respond to either a user-specified community name or the factory-default. The community name must be ASCII characters. The maximum length is 255 characters.</p>

Table 3.4 Telnet Commands and Parameters (7 of 10)

set-community-name	Specifies a password that determines which SNMP SetRequests (control functions) the HP Jetdirect print server will respond to. The community name of an incoming SNMP SetRequest must match the print server's "set community name" for the print server to respond. SetRequests must come from hosts that are configured in the print server's host access list. Community names must be ASCII characters. The maximum length is 255 characters.
SNMP Traps	
auth-trap	Configures the print server to send (on) or not send (off) SNMP authentication traps. Authentication traps indicate that an SNMP request was received, but the community name check failed. 0 is off, 1 (default) is on.
trap-dest	Enters a host IP address into the HP Jetdirect print server's SNMP trap destination list. The command format is: trap-dest: <i>ip-address</i> [community name] [port number] The default community name is 'public'; the default SNMP port number is '162'. The port number cannot be specified without a community name, otherwise the port number will become the community name. To delete the table, use 'trap-dest: 0'. If the list is empty, the print server does not send SNMP traps. The list may contain up to five entries. The default SNMP Trap Destination List is empty. To receive SNMP traps, the systems listed on the SNMP trap destination list must have a trap daemon to listen to those traps.
IPX/SPX Settings	
ipx-config	Enables or disables IPX/SPX protocol operation on the print server. 0 disables, 1 (default) enables. For example, "ipx-config 0" will disable IPX/SPX operation.
ipx-unitname	A user-assigned alphanumeric name assigned to the print server (31 characters maximum). By default, the name will be NP1xxxxxx, where xxxxxx are the last six digits of the LAN hardware address.
Address	(Read-only parameter) Identifies the IPX network and node numbers detected on the network, in the form NNNNNNNN:hhhhhhh (hexadecimal), where NNNNNNNN is the network number and hhhhhhhh is the LAN hardware address of the print server.
ipx-framesize	Specifies the IPX frame type setting: AUTO (default), EN_SNAP, EN_8022, EN_8023, EN_II, TR_8022, TR_SNAP. For more information, see Chapter 8 .
ipx-sapinterval	Specifies the time interval (1 to 3600 seconds) that the HP Jetdirect print server waits between Service Advertising Protocol (SAP) broadcasts on the network. The default is 60 seconds. 0 disables SAP broadcasts.

Table 3.4 Telnet Commands and Parameters (8 of 10)

ipx-nds-tree	An alphanumeric string, up to 31 characters, that specifies the NDS tree name for the print server.
ipx-nds-context	An alphanumeric string, up to 256 characters, that specifies the NDS context for the HP Jetdirect print server.
ipx-job-poll	Specifies the time interval (1 to 255 seconds) that the HP Jetdirect print server will wait to check for print jobs in a print queue. The default is 2 seconds.
ipx-banner	Enables or disables printing an IPX banner page via Printer Job Language (PJL). 0 disables banner pages. 1 (default) enables banner pages.
ipx-eoj	Enables or disables IPX end-of-job notification via PJL. 0 disables, 1 (default) enables.
ipx-toner-low	Enables or disables IPX toner-low notification via PJL. 0 disables, 1 (default) enables.
source-route	(Token Ring only) Configures the HP Jetdirect print server with the IPX/SPX source routing used on the network. auto (default): Source routing is automatically sensed from the network. off: Packets are transmitted without source routing. The print server will only respond to stations on the same ring. single r: All packets are sent with source routing. The Single Route method is used for broadcasts and when the route is unknown. all rt: All packets are sent with source routing. The All Routes method is used for broadcasts and when the route is unknown.
AppleTalk Settings	
at-config	Enables or disables AppleTalk (EtherTalk) protocol operation on the print server. 0 disables, 1 (default) enables. For example, "at-config 0" will disable AppleTalk operation
Device Name	(Read-only parameter) The name of the printer on the AppleTalk network. A number after the name indicates that there are multiple devices with this name, and this is the Nth instance of the name.
Print Type	(Read-only parameter) Specifies the AppleTalk network printer type reported by the Jetdirect print server.
Zone	(Read-only parameter) The name of the AppleTalk network zone on which the printer is located.
Phase	(Read-only parameter) AppleTalk phase 2 (P2) is preconfigured on the HP Jetdirect print server.

Table 3.4 Telnet Commands and Parameters (9 of 10)

Status	(Read-only parameter) Indicates the current AppleTalk configuration status. READY: Indicates the HP Jetdirect print server is awaiting data. DISABLED: Indicates that AppleTalk was manually disabled. INITIALIZING: Indicates that the print server is registering the node address or name. An additional status message may also be displayed.
DLC/LLC Settings	
dlc/lc-config	Enables or disables DLC/LLC protocol operation on the print server. 0 disables, 1 (default) enables. For example, "dlc/lc-config 0" will disable DLC/LLC operation.
Other Settings	
scan-config	(Web Scan Config) Enables or disables the Web Scan feature on the print server when connected to a supported device. 0 disables, 1 (default) enables.
scan-idle-timeout	Specifies the number of seconds (1 - 3600) that an idle scan connection is allowed to remain open. 0 disables the timeout. The default is 300 seconds.
scan-email-config	(Email Scan Config) Enable or disable the scan-to-email feature in the Web Scan server. 0 disables, 1 (default) enables.
MFP-config	(MFP config) Enable or disable print server support of the client software provided with your multifunction or all-in-one peripheral. 0 (default) disables client software support (allows printing only). 1 enables client software support (allows printing and scanning).
usb-mode	Specifies the communication mode over the USB port on the HP Jetdirect print server. <ul style="list-style-type: none"> ● Auto (default): Automatically negotiates and sets the the highest communication mode possible for the attached printer or device. ● MLC: (Multiple Logical Channels) An HP-proprietary communication mode that allows multiple channels of simultaneous print, scan and status communications. ● BIDIR: A standard connection that supports bi-directional communications between the printer and print server. The print server sends print data and receives status from the printer. ● UNIDIR: A standard connection in which data is transferred in one direction only (to the printer).

Table 3.4 Telnet Commands and Parameters (10 of 10)

usb-statpg-lang	Specifies the printer job language (PJM) that the print server will use to send the Jetdirect configuration/status page to the printer. <ul style="list-style-type: none">● Auto (default): The PDL is auto-detected when the print server is powered on or after a cold-reset to factory defaults.● PCL: Hewlett-Packard Printer Control Language● ASCII: Standard ascii characters● HPGL2: Hewlett-Packard Graphics Language (v2)● PS: Postscript language
tr-iaa	Token Ring Locally Administered Address (LAA). Allows you to reassign the node address on a Token Ring print server. The default address is the print server's fixed LAN hardware address.
Support Settings	
Web JetAdmin URL	(Read-only parameter) If HP Web JetAdmin discovers this device, the URL to access HP Web JetAdmin will be specified.
Web JetAdmin Name	(Read-only parameter) If HP Web JetAdmin discovers this device, the name of the HP Web JetAdmin host will be specified (if known).
support-name	Typically used to identify the name of a person to contact for support of this device.
support-number	Typically used to specify a phone or extension number to call for support of this device.
support-url	A web URL address for product information on this device over the Internet or an intranet.
tech-support-url	A web URL address for technical support over the Internet or an intranet.

Menu Interface

An optional Menu interface is displayed when you type “menu” at the Telnet command prompt. The Menu interface eliminates the need to memorize commands, and provides structured menu lists for easy access to configuration parameters.

[Figure 3.1](#) illustrates the Menu interface, using the TCP/IP menus as an example.

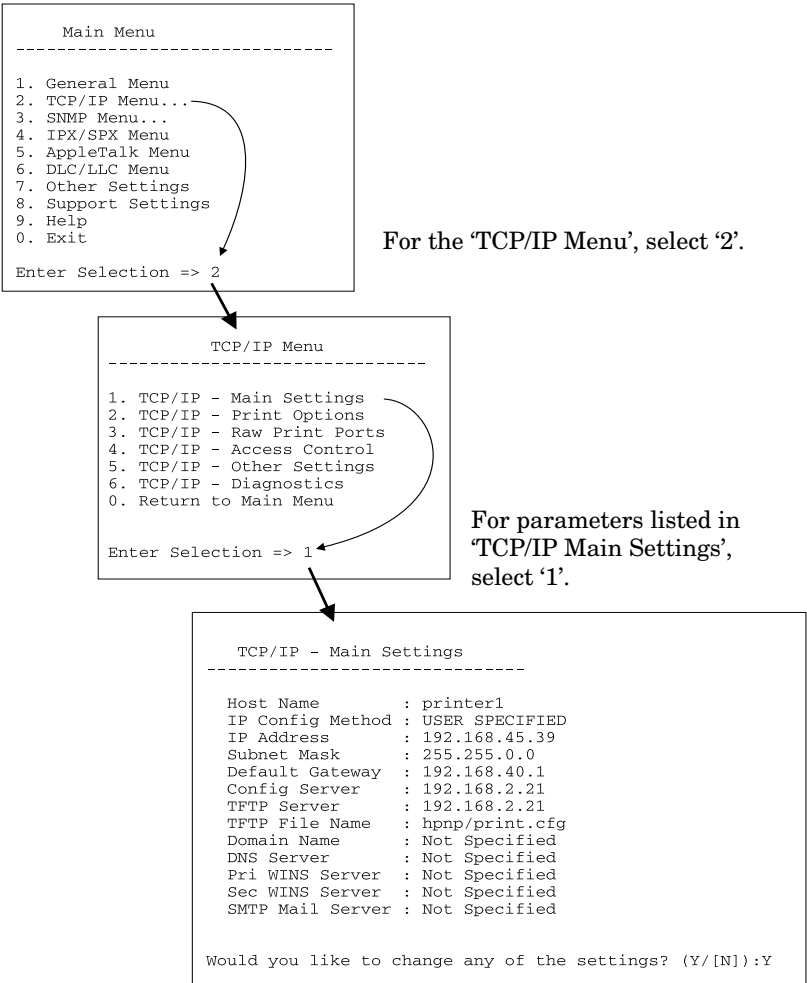
- From the Main Menu, select and enter a menu number. If there are submenus, select and enter a submenu number.
- If you want to change a parameter setting, enter “Y” (for “Yes”) when prompted.

Changes to parameters are made by editing the setting through the use of the **Backspace** key. If an unrecognized value is entered, the correct entry options will be displayed.

Note

Changes are not saved on the Jetdirect print server until you exit a menu and, when prompted, choose to save your changes.

Figure 3.1 Example: Using the Menu Interface



To edit these parameters, enter 'Y'. Use the Backspace key to edit the parameters.

Changes are not saved until you save them when you exit the session.

Using Telnet to Erase the Existing IP Address

To erase the IP address during a Telnet session, use the following command line entries:

1. Type `cold-reset`, then press **Enter**.
2. Type `quit`, then press **Enter** to exit Telnet.

Note

This procedure resets all TCP/IP parameters, but only affects the TCP/IP subsystem. After this has been done the print server should be power cycled. Parameters for other subsystems such as IPX/SPX (Novell NetWare) or AppleTalk are not affected.

To reset all parameters to factory default values, refer to [Chapter 7](#).

Using the Embedded Web Server

You can set IP parameters on HP Jetdirect print servers that support the embedded web server. For more information, refer to [Appendix B](#).

Using the Printer Control Panel

When supported by the printer, HP Jetdirect internal print servers provide a configuration menu that can be accessed from the printer's control panel. Using this menu, you can enable or disable network protocols and set basic network parameters. For a summary of the available menu items, see [Appendix C](#).

Note For instructions on using the control panel for your printer to access printer, refer to your printer User's Guide or related documentation.

When accessing the HP Jetdirect menu from the printer's control panel, you can set the following TCP/IP network configuration parameters:

- IP address of the print server
- Subnet mask
- Default gateway address
- Syslog server address
- Idle timeout period

If you need to configure more TCP/IP parameters than allowed by control panel configuration, you should use an alternate method (for example, see [Using Telnet](#) or [Using the Embedded Web Server](#)) as described in this chapter.

If the HP Jetdirect print server is configured to receive its TCP/IP configuration from the printer control panel, the configuration is saved on the print server over power cycles.

Moving to Another Network

When moving an HP Jetdirect print server that is configured with an IP address to a new network, make sure that the IP address does not conflict with addresses on the new network. You may change the IP address of the print server to one that can be used on the new network, or erase the current IP address and configure another address after you are installed on the new network. See [Chapter 7, “Troubleshooting the HP Jetdirect Print Server,”](#) for instructions to reset the print server to factory default settings.

If the current BOOTP server is not reachable, you may need to locate a different BOOTP server and configure the printer to this server.

If the print server was configured using BOOTP, DHCP or RARP, edit the appropriate system files with updated settings. If the IP address was manually set (for example, from the printer control panel or Telnet), reconfigure IP parameters as described in this chapter.

Configuring for LPD Printing

Introduction

The HP Jetdirect print server contains an LPD (Line Printer Daemon) Server module to support LPD printing. This chapter describes how to configure the HP Jetdirect print server for use with various systems that support LPD printing. These instructions include:

- [LPD on UNIX Systems](#)
 - Configuring BSD-based UNIX systems using LPD
 - Configuring print queues using the SAM utility (HP-UX systems)
- [LPD on Windows NT/2000 Systems](#)
- [LPD on Mac OS Systems](#)

Note

Recent versions of Novell NetWare (NetWare 5.x with NDPS 2.1 or greater) support LPD printing. For setup instructions and support, refer to the documentation supplied with NetWare. Also, refer to the Technical Information Documentation (TID) on Novell's support website.

About LPD

Line Printer Daemon (LPD) refers to the protocol and programs associated with line-printer spooling services that may be installed on various TCP/IP systems.

Some of the widely used systems in which the HP Jetdirect print server functionality supports LPD include:

- Berkeley-based (BSD) UNIX systems
- HP-UX
- Solaris
- IBM AIX
- Linux
- Windows NT/2000
- Mac OS

The UNIX configuration examples in this section show the syntax for BSD-based UNIX systems. The syntax for your system may vary. See your system documentation for the correct syntax.

Note

The LPD functionality can be used with any host implementation of LPD that complies with the RFC 1179 document. The process for configuring printer spoolers, however, may differ. See your system documentation for information on configuring these systems.

The LPD programs and protocol include the following:

Table 4.1 LPD Programs and Protocols

Program Name	Purpose of Program
lpr	Queues jobs for printing
lpq	Displays print queues
lprm	Removes jobs from print queues
lpc	Controls print queues
lpd	Scans and prints the files if the specified printer is connected to the system. If the specified printer is connected to another system, this process forwards the files to an lpd process on the remote system where the files are to be printed.

Requirements for Configuring LPD

Before you can use LPD printing, your printer must be properly connected to the network through the HP Jetdirect print server, and you must have print server status information. This information is listed on the HP Jetdirect printer configuration page. If you have not printed a configuration page from your printer, see the hardware installation guide for your print server or your printer's getting started guide for instructions. You must also have the following:

- An operating system that supports LPD printing.
- Superuser (root) or Administrator access to your system.

- The LAN hardware address (or station address) of the print server. This address is printed with print server status information on the HP Jetdirect configuration page and is of the form:

HARDWARE ADDRESS: xxxxxxxxxxxx

where x is a hexadecimal digit (for example, 0001E6123ABC).

- An IP address configured on the HP Jetdirect print server.

LPD Setup Overview

The following steps are necessary to configure the HP Jetdirect print server for LPD printing:

1. Setting up IP parameters.
2. Setting up print queues.
3. Printing a test file.

The following sections provide detailed descriptions for each step.

Step 1. Setting Up IP Parameters

To set up IP parameters on the HP Jetdirect print server, refer to [Chapter 3](#). For more information on TCP/IP networks, refer to [Appendix A](#).

Step 2. Setting Up Print Queues

You must set up a print queue for each printer or printer personality (PCL or PostScript) you use on your system. Also, different queues are required for formatted and unformatted files. The queue names `text` and `raw` in the following examples (see `rp` tag) have special meanings.

Table 4.2 Supported Queue Names

<code>raw</code> , <code>raw1</code> , <code>raw2</code> , <code>raw3</code>	no processing
<code>text</code> , <code>text1</code> , <code>text2</code> , <code>text3</code>	carriage return added
<code>auto</code> , <code>auto1</code> , <code>auto2</code> , <code>auto3</code>	automatic

The line printer daemon on the HP Jetdirect print server treats data in the `text` queue as unformatted text or ASCII, and adds a carriage return to each line before sending it to the printer. (Note that the actual observed behavior is that a PCL line termination command (value of 2) is issued at the beginning of the job.) The line printer daemon treats data in the `raw` queue as formatted files in PCL, PostScript, or HP-GL/2 languages and sends the data without change to the printer. Data in the `auto` queue will be automatically processed as `text` or `raw`, as appropriate. If the queue name is not one of the above, the HP Jetdirect print server assumes it to be `raw1`.

Step 3. Printing a Test File

Print a test file using the LPD commands. For instructions, see the information provided for your system.

LPD on UNIX Systems

Configuring Print Queues for BSD-based Systems

Edit the `/etc/printcap` file to include the following entries:

```
printer_name|short_printer_name:\
:lp=:\
:rm=node_name:\
:rp=remote_printer_name_argument:\ (this should be
text, raw, or auto)
:lf=/usr/spool/lpd/error_log_filename:\
:sd=/usr/spool/lpd/printer_name:
```

where `printer_name` identifies the printer to the user, `node_name` identifies the printer on the network, and `remote_printer_name_argument` is the print queue designation.

For more information on `printcap` see the **printcap** man page.

Example 1

(suggested name for an ASCII or text printer):

```
lj1_text|text1:\
:lp=:\
:rm=laserjet1:\
:rp=text:\
:lf=/usr/spool/lpd/lj1_text.log:\
:sd=/usr/spool/lpd/lj1_text:
```

Example 2

(suggested name for PostScript, PCL, or HP-GL/2 printers):

```
lj1_raw|raw1:\
:lp=:\
:rm=laserjet1:\
:rp=raw:\
:lf=/usr/spool/lpd/lj1_raw.log:\
:sd=/usr/spool/lpd/lj1_raw:
```

If your printer does not support automatic switching between PostScript, PCL, and HP-GL/2 languages, use the printer's control panel (if the printer has one) to select the printer language or rely on the application to select the printer language via commands embedded in the print data.

Make sure your users know the printer names for the printers, since they must type those names on the command line for printing.

Create the spooling directory by making the following entries. At the root directory, type:

```
mkdir /usr/spool/lpd
cd /usr/spool/lpd
mkdir printer_name_1 printer_name_2
chown daemon printer_name_1 printer_name_2
chgrp daemon printer_name_1 printer_name_2
chmod g+w printer_name_1 printer_name_2
```

where `printer_name_1` and `printer_name_2` refer to the printers to be spooled. You may spool several printers. The following example shows the command to create the spooling directories for printers used for text (or ASCII) printing and for PCL or PostScript printing.

Example:

```
mkdir /usr/spool/lpd
cd /usr/spool/lpd
mkdir lj1_text lj1_raw
chown daemon lj1_text lj1_raw
chgrp daemon lj1_text lj1_raw
chmod g+w lj1_text lj1_raw
```

Configuring Print Queues Using SAM (HP-UX systems)

On HP-UX systems you can use the SAM utility to configure remote print queues for printing “text” (ASCII) files or “raw” (PCL, PostScript, or other printer language) files.

Before you execute the SAM program, select an IP address for the HP Jetdirect print server and set up an entry for it in the `/etc/hosts` file on your system running HP-UX.

1. Start the SAM utility as a superuser.
2. Select **Peripheral Devices** from the *Main* menu.
3. Select **Printers/Plotters** from the *Peripheral Devices* menu.
4. Select **Printers/Plotters** from the *Printers/Plotters* menu.
5. Select **Add a Remote Printer** from the *Actions* list, then select a printer name.

Examples: `my_printer` or `printer1`

6. Select a remote system name.

Example: `jetdirect1` (node name of the HP Jetdirect print server)

7. Select a remote printer name.

Type `text` for ASCII or `raw` for PostScript, PCL, or HP-GL/2.

8. Check for a remote printer on a BSD system. You must type `Y`.
9. Click **OK** at the bottom of the menu. If the configuration is successful, the program prints the message:

The printer has been added and is ready to accept print requests.

10. Click **OK** and select **Exit** from the *List* menu.

11. Select **Exit Sam**.

Note By default, the lpsched is not running. Make sure you turn the scheduler on when you set up your print queues.

Printing a Test File

To verify that the printer and print server connections are correct, print a test file.

1. At the UNIX system prompt type:

```
lpr -Pprinter_name file_name
```

where `printer_name` is the designated printer and `file_name` refers to the file to be printed.

Examples (for BSD-based systems):

Text File: `lpr -Ptext1 textfile`

PCL File: `lpr -Praw1 pclfile.pcl`

PostScript File: `lpr -Praw1 psfile.ps`

HP-GL/2 File: `lpr -Praw1 hpglfile.hpg`

For HP-UX systems, substitute `lp -d` for `lpr -P`.

2. To get print status, type the following at the UNIX prompt:

```
lpq -Pprinter_name
```

where `printer_name` is the designated printer.

Examples (for BSD-based systems):

```
lpq -Ptext1
```

```
lpq -Praw1
```

For HP-UX systems, substitute `lpstat` for `lpq -P` to get print status.

This completes the process for configuring the HP Jetdirect print server to use LPD.

LPD on Windows NT/2000 Systems

This section describes how to configure Windows NT/2000 networks to use the HP Jetdirect LPD (Line Printer Daemon) services.

The process consists of two parts:

- Installing TCP/IP software (if not already installed).
- Configuring a network LPD printer.

Installing TCP/IP Software

This procedure lets you check whether you have TCP/IP installed on your Windows NT system, and to install the software if necessary.

Note You may need your Windows System distribution files or CD-ROMs to install TCP/IP components.

1. To check whether you have Microsoft TCP/IP Printing protocol and TCP/IP printing support:
 - Windows 2000—Click **Start, Settings, Control Panel**. Then double-click the **Network and Dial-up Connections** folder. Select the **Local Area Connection** for your network, then click the **File** menu and select **Properties**.

If Internet Protocol (TCP/IP) is listed and enabled in the list of components used by this connection, the necessary software is already installed. (Proceed to “[Configuring a Network Printer for Windows 2000 Systems](#)”). if not, go to step 2.

- NT 4.0—Click **Start, Settings, Control Panel**. Then double-click the **Network** option to display the *Network* dialog box.

If TCP/IP Protocol is listed in the Protocols tab, and Microsoft TCP/IP Printing is listed in the Services tab, you have already installed the necessary software. (Proceed to “[Configuring a Network Printer for Windows NT 4.0 Systems](#).”) If not, go to step 2.

2. If you have not previously installed the software:

- Windows 2000—In the *Local Area Connection Properties* window, click **Install**. In the *Select Network Component Type* window, select **Protocol** and click **Add** to add the **Internet Protocol (TCP/IP)**.

Follow the instructions on the screen.

- NT 4.0—Click the **Add** button for each tab and install the **TCP/IP Protocol** and the **Microsoft TCP/IP Printing** service.

Follow the instructions on the screen.

When prompted, type the full path to the Windows NT distribution files (you may need your Windows NT workstation or server CD-ROM).

3. Enter TCP/IP configuration values for the computer:

- Windows 2000—On the **General** tab in the *Local Area Connection Properties* window, select **Internet Protocol (TCP/IP)** and click **Properties**.
- NT 4.0—You may be automatically prompted for TCP/IP configuration values. If not, select the **Protocols** tab in the *Networks* window and select **TCP/IP Protocol**. Then click **Properties**.

If you are configuring a Windows server, type the IP address, default gateway address, and subnet mask in the appropriate spaces.

If you are configuring a client, check with your Network Administrator to learn whether you should enable automatic TCP/IP configuration or whether you should type a static IP address, default gateway address, and subnet mask in the appropriate spaces.

4. Click **OK** to exit

5. If prompted, exit Windows and restart your computer for the changes to take effect.

Configuring a Network Printer for Windows 2000 Systems

Set up the default printer by performing the following steps.

1. Verify that the Print Services for Unix is installed (required for LPR port availability):
 - a. Click **Start, Setup, and Control Panel**. Double-click the **Network and Dial-up Connections** folder.
 - b. Click the **Advanced** menu and select **Optional Networking Components**.
 - c. Select and enable **Other Network File and Print Services**.
 - d. Click **Details**, and verify that **Print Services for Unix** is enabled. If not, enable it.
 - e. Click **Okay**, and then **Next**.
2. Open the Printers folder (from the Desktop, click **Start, Settings, and Printers**).
3. Double-click **Add Printer**. From the Add Printer Wizard welcome screen, click **Next**.
4. Select **Local printer**, and disable automatic detection for Plug and Play printer installation. Click **Next**.
5. Choose **Create a new port**, and select **LPR Port**. Click **Next**.
6. In the *Add LPR compatible printer* window:
 - Enter the DNS name or IP address of the HP Jetdirect print server.
 - Enter (in lower case) **raw**, **text**, or **auto** for the name of the printer or print queue on the HP Jetdirect print server.Then click **OK**.

Note

The HP Jetdirect print server treats text files as unformatted text or ASCII files. Files that are raw are formatted files in PCL, PostScript, or HP-GL/2 printer languages.

For HP Jetdirect external print servers with three ports, use `raw1`, `raw2`, `raw3`, `text1`, `text2`, `text3` or `auto1`, `auto2`, `auto3` to specify the port.

7. Select the Manufacturer and Printer model. (If necessary, click **Have Disk** and follow the instructions to install the printer driver.) Click **Next**.
8. Choose to keep the existing driver, if prompted. Click **Next**.
9. Enter a printer name, and choose whether this printer will be the default printer. Click **Next**.
10. Choose whether this printer will be available to other computers. If shared, enter a share name that identifies the printer to other users. Click **Next**.
11. If desired, enter a location and other information for this printer. Click **Next**.
12. Choose whether to print a test page, and click **Next**.
13. Click **Finish** to close the wizard.

Configuring a Network Printer for Windows NT 4.0 Systems

At the Windows NT 4.0 system, set up the default printer by performing the following steps.

1. Click **Start**, select **Settings**, and click **Printers**. The *Printers* window opens.
2. Double-click **Add Printer**.
3. Select **My Computer**, then click **Next**.
4. Click **Add Port**.

5. Select **LPR Port**, and click **New Port**.
6. In the *Name or address of server providing lpd* box, type the IP address or name of the HP Jetdirect print server.

Note NT clients can enter the IP address or name of the NT server that is configured for LPD printing.

7. In the *Name of printer or print queue on that server* box, type (in lower case) *raw*, *text*, or *auto*. Then click **OK**.

The HP Jetdirect print server treats “text” files as unformatted text or ASCII files. Files that are “raw” are formatted files in PCL, PostScript, or HP-GL/2 printer languages.

Note For HP Jetdirect external print servers with three ports, use *raw1*, *raw2*, *raw3*, *text1*, *text2*, *text3* or *auto1*, *auto2*, *auto3* to specify the port.

8. Ensure that the port is selected in the *Add Printer* list of the available ports, then click **Next**.
9. Follow the remaining instructions on the screen to complete the configuration.

Verifying the Configuration

From within Windows NT, print a file from any application. If the file prints correctly, the configuration was successful.

If the print job is not successful, try printing directly from DOS using the following syntax:

```
lpr -S<ipaddress> -P<queuename> filename
```

where `ipaddress` is the IP address of the print server, `queuename` is the name “raw” or “text” and `filename` is the file you wish to print. If the file prints correctly, the configuration was successful. If the file does not print, or prints incorrectly, see the chapter [“Troubleshooting the HP Jetdirect Print Server.”](#)

Printing from Windows Clients

If the LPD printer on the NT/2000 server is shared, Windows clients can connect to the printer on the NT/2000 server using the Windows Add Printer utility in the Printers folder.

LPD on Mac OS Systems

LaserWriter 8 version 8.5.1 or higher is required in order to support IP printing on computers running any of the following:

- Mac OS 8.1 or higher
- Mac OS 7.5 through Mac OS 7.6.1
- Desktop Printer Utility 1.0 or later

Note IP printing in LaserWriter 8 is not available on Mac OS 8.0.

Assigning an IP Address

Before you can set up a printer for LPR printing, assign an IP address to the printer or print server. Use the HP LaserJet Utility to configure the printer IP address as follows:

1. Double-click **HP LaserJet Utility** in the HP LaserJet folder.
2. Click the **Settings** button.
3. Select **TCP/IP** from the scrolling list and then click **Edit**.
4. Select the desired option. You can automatically obtain the TCP/IP configuration from either the DHCP server or the BOOTP server, or you can manually specify the TCP/IP configuration.

Setting Up Mac OS

To configure a computer for LPR printing, do the following:

1. Launch the *Desktop Printer Utility*.
2. Select **Printer (LPR)** and click **OK**.
3. In the *PostScript Printer Description (PPD) File* section, click **Change...** and select the PPD for your printer.
4. In the *Internet Printer* or the *LPR Printer* section, depending on your version of the Desktop Printer Utility, click **Change...**
5. Enter the printer's IP address or domain name for *Printer Address*.
6. Enter the queue name, if used. Otherwise, leave it blank.

Note

The queue name is typically *raw*. For a three-port HP Jetdirect external print server, the name should be *raw1*, *raw2*, or *raw3* depending on the port to which the printer is attached.

7. Click **Verify** to verify that the printer was found.
8. Click **OK** or **Create**, depending on your version of the Desktop Printer Utility.
9. Go to the **File** menu and select **Save** or use the resulting save dialog, depending on your version of the Desktop Printer Utility.
10. Enter a name and location for the desktop printer icon and click **OK**. The default name is the printer's IP address, and the default location is on the desktop.
11. Exit the program.

For the latest information on using the HP Jetdirect LPD services from Mac OS systems, search for "LPR printing" at Apple Computer's Tech Info Library web site at <http://til.info.apple.com>.

FTP Printing

Introduction

FTP (File Transfer Protocol) is a basic TCP/IP connectivity utility to transfer data between systems. FTP printing is a way to use FTP to send print files from a client system to an HP Jetdirect-connected printer. In an FTP printing session, the client connects and sends a print file to the HP Jetdirect FTP server which in turn passes the print file to the printer.

The HP Jetdirect FTP server can be enabled or disabled through a configuration tool, such as Telnet (see [Chapter 3](#)) or the embedded web server (see [Appendix B](#)).

Requirements

FTP printing described here requires the following:

- HP Jetdirect print servers with firmware version x.20.01 or later.
- TCP/IP client systems with FTP that complies with RFC 959.

Note

For the most recent list of tested systems, visit the HP Customer Care Online at www.hp.com/support/net_printing.

Print Files

The HP Jetdirect FTP server transfers print files to the printer but does not interpret them. For proper printing, print files must be in a language recognized by the printer (such as PostScript, PCL, or unformatted text). For formatted print jobs, you must first print to a file from your application using the driver for the selected printer, then transfer the print file to the printer through an FTP session. For formatted print files, use binary (image) type transfers.

Using FTP Printing

FTP Connections

Similar to standard FTP file transfers, FTP printing uses two TCP connections: a control connection and a data connection.

Once an FTP session is opened, it remains active until either the client closes the connection or the data and control connections are idle for a time that exceeds the idle timeout period (default is 270 seconds). The idle timeout can be set through various TCP/IP configuration tools, such as BOOTP/TFTP, Telnet, printer's control panel (see [Chapter 3](#)), the embedded web server (see [Appendix B](#)), or management software.

Control Connection

Using standard FTP, a control connection is opened by the client to the FTP server on the HP Jetdirect print server. FTP control connections are used to exchange commands between the client and the FTP server. The HP Jetdirect print server supports up to four control connections (or FTP sessions) simultaneously. If the number of allowed connections is exceeded, a message indicating that service is not available will be displayed.

FTP control connections use TCP port 21.

Data Connection

A second connection, a data connection, is created each time a file is transferred between the client and the FTP server. The client controls the creation of a data connection by issuing the commands that require a data connection (such as FTP `ls`, `dir` or `put` commands).

Although the `ls` and `dir` commands are always accepted, the HP Jetdirect FTP server supports a single data connection for printing at a time.

The transmission mode for an FTP data connection with the HP Jetdirect print server is always in stream mode, which marks the end-of-file by closing the data connection.

Once a data connection is established, the file transfer type (ASCII or binary) can be specified. Clients may attempt to autonegotiate a transfer type, and the default transfer type depends on the client system (for example, Windows NT may default to ASCII, while UNIX may default to binary). To specify the transfer type, enter the `bin` or `ascii` command at the FTP prompt.

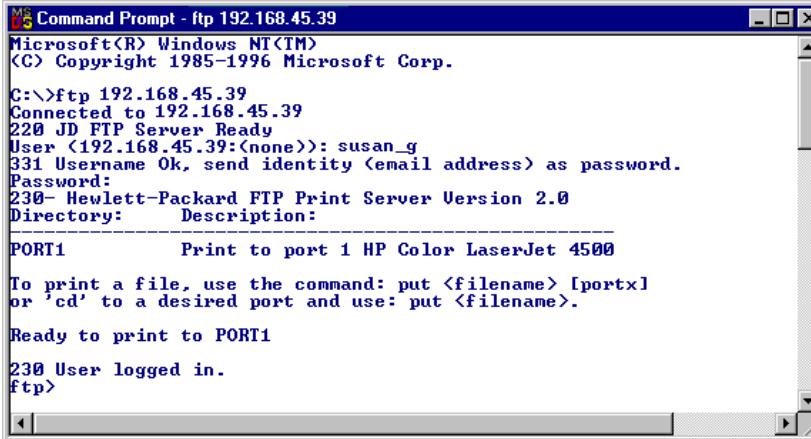
FTP Login

To start an FTP session, enter the following command from a MS-DOS or UNIX command prompt:

```
ftp <IP address>
```

where <IP address> is the valid IP address or node name configured for the HP Jetdirect print server. See [Figure 5.1](#)

Figure 5.1 FTP Login Example



```
Microsoft(R) Windows NT(TM)
(C) Copyright 1985-1996 Microsoft Corp.

C:\>ftp 192.168.45.39
Connected to 192.168.45.39
220 JD FTP Server Ready
User (192.168.45.39:(none)): susan_g
331 Username Ok, send identity (email address) as password.
Password:
230- Hewlett-Packard FTP Print Server Version 2.0
Directory:      Description:
-----
PORT1          Print to port 1 HP Color LaserJet 4500
To print a file, use the command: put <filename> [portx]
or 'cd' to a desired port and use: put <filename>.
Ready to print to PORT1
230 User logged in.
ftp>
```

If the connection is successful, a Ready message will be displayed.

After a successful connection, the user is prompted for a login name and password. The default is the client's login name. The Jetdirect FTP server will allow any user name. Passwords are ignored.

If login is successful, a message "230" will be displayed on the client system. In addition, the available HP Jetdirect ports for printing will be displayed. HP Jetdirect internal print server cards provide a single port (Port 1). HP Jetdirect external print servers with multiple ports will display all available ports, with Port1 the default port. To change ports, use the FTP `cd` (change directory) command. For a typical FTP printing session, see "[Example of an FTP Session.](#)"

Ending the FTP Session

To end an FTP session, type `quit` or `bye`.

Note Prior to ending an FTP session, a **Ctrl-C** command is recommended to ensure the data connection is closed.

Commands

[Table 5.1](#) summarizes commands available to the user during an FTP printing session.

Table 5.1 User Commands for HP Jetdirect FTP Server (1 of 2)

Command	Description
<code>user <username></code>	<code><username></code> specifies a user. Any user will be accepted and can print to the selected port.
<code>cd <port#></code>	<code><port#></code> selects a port number for printing. For HP Jetdirect single-port print servers, only port1 is available. For multiport print servers, specify port1 (default), port2, or port3.
<code>cd /</code>	<code>/</code> specifies the root directory of the HP Jetdirect FTP server.
<code>quit</code>	<code>quit</code> or <code>bye</code> terminates the FTP session with the HP Jetdirect print server.
<code>bye</code>	
<code>dir</code>	<code>dir</code> or <code>ls</code> displays the contents of the current directory. If this command is typed in the root directory, a list of available ports for printing is displayed. For multiport print servers, the available ports for printing are PORT1 (default), PORT2, and PORT3.
<code>ls</code>	
<code>pwd</code>	Displays the current directory or the current Jetdirect printing port.
<code>put <filename></code>	<code><filename></code> specifies the file to send to the selected HP Jetdirect print server port. For multiport print servers, a different port can be specified in the command: <code>put <filename> <port#></code>
<code>bin</code>	Configures an FTP binary (image) file transfer.

Table 5.1 User Commands for HP Jetdirect FTP Server (2 of 2)

Command	Description
ascii	Configures an FTP ASCII file transfer. HP Jetdirect print servers support only non-print format control for character transfers (standard values for spacing and margins are used).
Ctrl-C	Press the Ctrl and C keyboard keys simultaneously to abort the FTP service command and any transfer of data. The data connection is closed.
rhelp remotehelp	This command depends on your client system (use rhelp on UNIX, or remotehelp on Windows NT/2000) and displays a list of FTP system commands supported by the print server. (Note: the commands displayed are <i>not</i> user commands. User-accessible commands depend on the client's FTP system.)

Example of an FTP Session

This is an example of a typical FTP printing session:

```
C:\> ftp 192.168.45.39
Connected to 192.168.45.39.
220 JD FTP Server Ready
User <192.168.45.39:<none>>: susan_g
001 Username Ok, send identity <email address> as password
Password:
230- Hewlett-Packard FTP Print Server Version 2.0
Directory:      Description:
-----
PORT1          Print to port 1 HP color LaserJet 4500
```

To print a file, use the command: put <filename> [portx]
or cd to a desired port and use: put <filename>.

Ready to print to PORT1

```
230 User logged in.
ftp> pwd
257 "/" is current directory. <"default port is : /PORT1">
HP Color LaserJet 4500"
ftp> cd port1
250 Changed directory to "/PORT1"
ftp> pwd
257 "/PORT1" is current directory. "HP Color LaserJet 4500"
ftp> bin
200 Type set to I. Using binary mode to transfer files.
ftp> put d:\atlas\temp\ftp_test.ps
200 PORT command successful.
150 Opening BINARY mode data connection
226- Ready
226- Processing job
226 Transfer complete
31534 bytes sent in 0.04 seconds <788.35 Kbytes/sec>
ftp> quit
221 Goodbye

C:\>
```


Security Features

Introduction

Security features are provided that can help to minimize unauthorized access to network configuration parameters and other data stored on HP Jetdirect print servers. The features may differ depending on the version of firmware resident on the print server.

CAUTION Although these features can help to minimize unauthorized access to stored data and configuration parameters on HP Jetdirect print servers, the prevention of unauthorized access cannot be guaranteed.

For advanced security needs, contact HP Consulting services.

[Table 6.1](#) summarizes the basic security features provided with HP Jetdirect print servers (firmware version x.21.01 or greater).

Note For network management applications, HP Jetdirect print servers support SNMP v1 (Simple Network Management Protocol) and standard MIB-II (Management Information Base) objects.

Table 6.1 Summary of HP Jetdirect Security Features (1 of 2)

IP Administrative Password
<ul style="list-style-type: none">● Used by Telnet and the Embedded Web Server to control access to HP Jetdirect configuration parameters.● Up to 16 alphanumeric characters may be used.● Configured on the HP Jetdirect print server using TFTP (Chapter 3), Telnet (Chapter 3), or Embedded Web Server (Appendix B) services. Up to 16 alphanumeric characters are allowed.
IP Host Access List
<ul style="list-style-type: none">● Specifies up to 10 host systems, or networks of host systems, that are allowed access to the HP Jetdirect print server and the attached network device.● Access is generally limited to host systems specified in the list.● Host systems that use HTTP (for example, using the Embedded Web Server or IPP) are not checked against entries in the Access List and are allowed access.● If the list is empty, then all hosts are allowed access.● Configured on the HP Jetdirect print server using TFTP (Chapter 3), Telnet (Chapter 3), Embedded Web Server (Appendix B), or management software.
Network Protocol Control
<ul style="list-style-type: none">● Protocols on HP Jetdirect print servers can be enabled or disabled. By disabling unused network protocols, unauthorized access through applications that use these protocols can be prevented.
SNMP Set Community Name (IP/IPX)
<ul style="list-style-type: none">● A password on the HP Jetdirect print server that allows incoming SNMP Set commands (for example, from management software) to write (or set) HP Jetdirect configuration parameters.● The factory-default Set Community Name is "public" or "internal". For a user-assigned Set Community Name, SNMP Set commands must contain the user-assigned name, which is authenticated by the print server before the command is performed.● Authentication of SNMP Set commands are further restricted to systems identified on the host access list.● For multiport Jetdirect print servers, the port intended for SNMP Set commands can be specified by a digit after the community name (separators "." and ":" are accepted). For example, if the HP Jetdirect print server supports at least two ports, the following names would be used with port 2: password2, password.2, password:2. Names with no digit, or outside the range of ports, will default to port 1. For example, for an HP Jetdirect print server with two ports, the following names will default to port 1: password, password1, password8.● Configured on the HP Jetdirect print server using TFTP (Chapter 3), Telnet (Chapter 3), Embedded Web Server (Appendix B), or Management application services.

Table 6.1 Summary of HP Jetdirect Security Features (2 of 2)

HP Web JetAdmin Password and Profiles
<ul style="list-style-type: none">● Configured on the HP Jetdirect print server using HP Web JetAdmin and HP-proprietary SNMP MIB (Management Information Base) objects. For instructions, refer to the HP Web JetAdmin online help.● HP Web JetAdmin provides access control through User Profiles. User Profiles allow password protection for individual profiles and controlled access to HP Jetdirect and printer features. For more information, refer to the HP Web JetAdmin online help.
Printer Control Panel Lock
<ul style="list-style-type: none">● Selected HP printers provide a control panel lock that prevents access to HP Jetdirect internal print server configuration parameters. In many cases, this lock may be set remotely by management applications (such as HP Web JetAdmin). To determine whether your printer supports a control panel lock, refer to your printer documentation.

Using Security Features

Access to HP Jetdirect configuration parameters can be controlled through combined use of the available security features. [Table 6.2](#) provides examples of various settings and the associated level of access control.

Table 6.2 Settings for Access Control

Settings	Level of Access Control
<ul style="list-style-type: none">● Embedded Web Server or Telnet enabled● Administrative Password not set● Host Access List empty	No access control. If the Embedded Web Server or Telnet are enabled on the HP Jetdirect print server, any system can access the HP Jetdirect print server configuration parameters through the embedded web server or telnet.
<ul style="list-style-type: none">● HP Web JetAdmin password set● User-specified SNMP Set Community Name set	Limited access control. HP Web JetAdmin users may access the HP Jetdirect parameters with: <ul style="list-style-type: none">● HP Web JetAdmin password, and● the SNMP Set Community Name. But access via Embedded Web Server or Telnet may be unrestricted.
<ul style="list-style-type: none">● Administrative Password set● Host Access List contains entries	Limited access control. If the Administrative Password is known, access is limited to: <ul style="list-style-type: none">● systems specified in the Host Access List, or● systems that use HTTP (Embedded Web Werver or IPP)
<ul style="list-style-type: none">● Embedded Web Server and Telnet are disabled at power-on (for example, via a downloaded TFTP configuration file)● HP Web JetAdmin password set● User-specified SNMP Set Community Name set	Significant access control. With the Embedded Web Server and Telnet disabled, access to HP Jetdirect parameters requires the user-specified HP Web JetAdmin password and SNMP Set Community Name from a Web JetAdmin system.

Troubleshooting the HP Jetdirect Print Server

Introduction

This chapter describes how to diagnose and correct problems associated with the HP Jetdirect print server.

A flowchart guides you to the correct procedures for troubleshooting the following:

- Printer problems
- HP Jetdirect hardware installation and connection problems
- Network related problems

To troubleshoot your HP Jetdirect print server, you may need the following items:

- A Jetdirect Configuration Page (see [Chapter 8](#))
- A Printer Configuration or Diagnostic Page
- Documentation that came with your printer
- Documentation that came with your HP Jetdirect print server
- The diagnostics tools and utilities provided with your network software (for example, Novell NetWare utilities, TCP/IP utilities, or network printer management applications such as HP Web JetAdmin)

Note

Frequently asked questions about installing and configuring HP Jetdirect print servers can be found at HP Customer Care Online at http://www.hp.com/support/net_printing.

Resetting to Factory Defaults

Parameters on the HP Jetdirect print server (for example, the IP address) can be reset to factory default values using the following procedures:

- **HP LaserJet Printer with Internal EIO Print Server**

In most cases, the HP Jetdirect internal print server can be reset to factory defaults when a cold-reset is performed on the printer. For selected HP LaserJet printers, a cold-reset is performed by power cycling the printer while pressing the Go button. For other printers, refer to your printer manuals.

Note

Some printers provide a factory reset option for the printer through the printer's control panel. However, this reset option for the printer may not reset the HP Jetdirect print server. When you attempt to reset to factory default values, print a Jetdirect Configuration Page to confirm that factory-reset values have been assigned.

CAUTION

Resetting the printer will reset **all** printer settings to their factory defaults. After resetting the printer, you may need to use the printer's control panel to reconfigure printer settings that are required by users.

- **HP Jetdirect External Print Servers**

Reset the HP Jetdirect external print server by holding down the **Test** button on the print server while connecting the power cord.

After resetting the HP Jetdirect print server, you may need to reconfigure your computers for printing.

General Troubleshooting

Troubleshooting Chart - Assessing the Problem

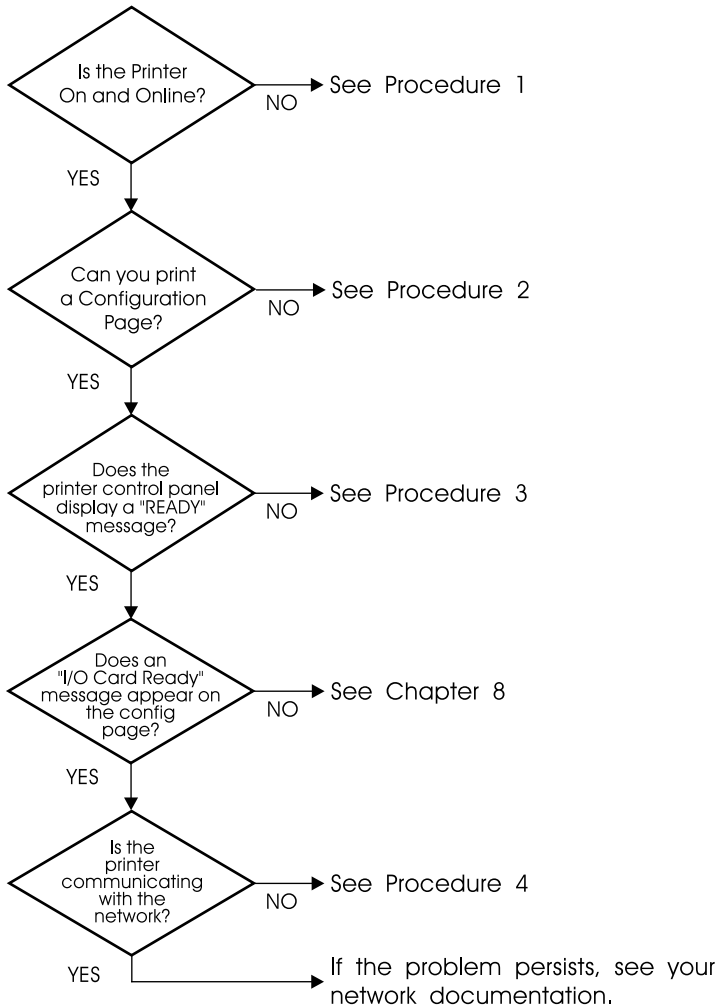


Figure 7.1 Assessing the Problem

Procedure 1: Verifying that the Printer is On and Online

Check the following items to make sure the printer is ready to print.

1. Is the printer plugged in and turned on?

Make sure the printer is plugged in and turned on. If the problem persists, you may have a defective power cable, power source, or printer.

2. Is the printer online?

The online light should be lit. If it is not, press the appropriate key (for example, **ON LINE** or **GO**) to place the printer online.

3. Is the printer's control panel display blank (on printers with displays)?

- Make sure the printer is turned on.
- Make sure the HP Jetdirect print server is installed correctly.

4. Is the form feed light on (where applicable)?

If the form feed light is on, it may indicate that a Form Feed was not sent with the print data, and that data is waiting for a Form Feed to print. Take the printer offline, press **Form Feed**, then put the printer back online.

5. Does a message other than **READY** appear on the printer control panel display?

- See Procedure 3 in this section for a list of network-related error messages and corrective actions.
- See your printer documentation for a complete list of control panel messages and corrective actions.

Procedure 2: Printing an HP Jetdirect Configuration Page

The HP Jetdirect configuration page is an important troubleshooting tool. The information on this page reveals the status of your network and the HP Jetdirect print server. The ability to print a configuration page provides an indication that the printer is operating correctly. See [Chapter 8](#) for information on the HP Jetdirect configuration page.

Note For a TCP/IP network, the Jetdirect configuration page can also be viewed from a browser by accessing the Jetdirect embedded web server. See [Appendix B](#) for more information.

Check the following items if the configuration page does not print.

1. Did you perform the correct steps on the printer to print the configuration page?

The steps required to print a configuration page vary between different printers. See your printer manual or the hardware installation guide for your HP Jetdirect print server for specific instructions on how to print a configuration page.

2. Is there a print job in process?

You cannot print an HP Jetdirect configuration page to the printer while a print job is in process. Wait until the print job is complete, then print the configuration page.

3. Does an error message appear on the printer control panel display?

- See Procedure 3 in this section for a list of network-related error messages and corrective actions.
- See your printer documentation for a complete list of control panel messages and corrective actions.

Procedure 3: Resolving Printer Display Error Messages

Check the following information to resolve network related error messages that appear on the printer control panel display. *This information assumes you have already printed a configuration page.*

1. Does the printer's control panel display messages similar to the following?

```
EIO X NOT FUNCTIONAL
```

```
SX.YYYY EIO ERROR
```

(where X is the EIO slot number and YYYY is an error code)

- Refer to your printer manuals to interpret the error message.
 - If you upgraded the Jetdirect firmware recently, power cycle the Jetdirect print server. For internal Jetdirect cards, turn the printer off and back on again.
 - Reinstall the HP Jetdirect print server to ensure it is installed correctly, and verify all connectors are fully mated.
 - If possible, print an HP Jetdirect configuration page and verify all configuration parameters. To interpret HP Jetdirect configuration page messages, see [Chapter 8](#).
 - If your printer contains multiple EIO slots, try using a different slot.
 - Turn off the printer, remove the HP Jetdirect print server, and turn the printer back on. If the error message disappears when the print server is removed, it is likely that the print server was causing the error. Replace the print server.
 - Record all error codes and contact your service provider. If you need to replace the HP Jetdirect print server under warranty service, include all diagnostic and configuration pages with the faulty print server.
2. Does EIOX INITIALIZING/DO NOT POWER OFF appear on the display?

Wait for ten minutes to see if it clears. If it does not, you may need to replace the HP Jetdirect print server.

3. Does a 40 ERROR appear on the printer's control panel display?

The HP Jetdirect print server detected a break in the data communications. When this error occurs, the printer goes offline.

A break in communications may result from the physical network connection being disrupted or the server going down. If your printer has "auto continue" and it is set to "OFF," you must press the appropriate key (**Continue** or **GO**, for example) on the printer after the communications problem is solved to put the printer back online. Setting auto continue to ON forces the printer to reconnect without user intervention. However, this does not solve the disconnect problem.

4. Does an initializing (INIT) message appear on the display?

This is a normal message. Wait about 3 minutes for the message to clear, or another message to appear. If another message appears, see the printer's documentation and configuration pages for additional information.

5. Does a message other than READY or the messages listed in this section appear on the display?

See your printer documentation for a complete list of control panel messages and corrective actions.

Procedure 4: Resolving Printer Communication Problems with the Network

Check the following items to verify that the printer is communicating with the network. *This information assumes you have already printed a Jetdirect configuration page.*

1. Is there any physical connection problems between the workstation or file server and the HP Jetdirect print server?

Verify network cabling, connections, and router configurations. Verify that network cable lengths meet network specifications.

2. Are your network cables connected properly?

Make sure that the printer is attached to the network using the appropriate HP Jetdirect print server port and cable. Check each cable connection to make sure it is secure and in the right place. If the problem continues, try a different cable or ports on the hub or transceiver.

3. For 10/100Base-TX print servers, is autonegotiation turned off?

The speed and communication mode on the print server must match the network for proper operation. Autonegotiation is configured through the EIO menu from the printer's control panel.

4. Have any software applications been added to the network?

Make sure they are compatible and that they are installed correctly with the correct printer drivers.

5. Are other users able to print?

The problem may be workstation specific. Check the workstation network drivers, printer drivers, and redirection (capture in Novell NetWare).

6. If other users are able to print, are they using the same network operating system?

Check your system for proper network operating system setup.

7. Is your protocol enabled on the HP Jetdirect print server?

Check the status of your protocol on the Jetdirect configuration page. See [Chapter 8](#) for information on the configuration page. (On TCP/IP networks, you can also use the embedded web server to check status of other protocols. See [Appendix B.](#))

8. Is there an error message in the protocol's section on the Jetdirect configuration page?

See [Chapter 8 “HP Jetdirect Configuration Page”](#) for a list of error messages.

9. If you are using Token Ring, is the data rate correct?

Check the Jetdirect configuration page for the current settings. If they are incorrect, refer to the Token Ring settings in the print server hardware installation guide.

10. If you are using Apple EtherTalk, does the printer appear in the Chooser?

- Verify network and HP Jetdirect settings on the Jetdirect configuration page. See [Chapter 8](#) for information on the configuration page.
- Confirm the network settings for the printer using the printer control panel (for printers with control panels).
- See the troubleshooting section in the online help for the HP LaserJet Utility.
- Verify the printer has the PostScript option installed.

11. If you are on a TCP/IP network, can you use Telnet to print directly to the printer?

- Use the following Telnet command:
`telnet <IP address> <port>`

where <IP address> is the IP address assigned to the HP Jetdirect print server and <port> is 9100. (HP Jetdirect data port 9101 or 9102 can also be used for ports 2 or 3 respectively, of a Jetdirect multiport external print server.)

- In the Telnet session, type in data and press **Enter**.
- The data should print to the printer (a manual form feed may be required).

12. Does the printer appear in HP Web JetAdmin or other management application?

- Verify network and HP Jetdirect settings on the Jetdirect configuration page. See [Chapter 8](#) for information on the configuration page.
- Confirm the network settings for the printer using the printer control panel (for printers with control panels).
- See the troubleshooting section in the online help included with the HP Web JetAdmin software.

13. If you are using Microsoft Windows NT 4.0 (DLC/LLC), does the printer appear in the *Add a Hewlett-Packard Network Peripheral Port* dialog box?
 - Verify network and HP Jetdirect settings on the Jetdirect configuration page. See [Chapter 8](#) for information on the configuration page.
 - Confirm the network settings for the printer using the printer control panel (for printers with control panels).
 - Ensure that the printer is on the same physical subnet and that it is not connected over a router.

14. If you are using HP-UX, Solaris, or Linux, does the printer respond to HP Web JetAdmin?
 - Verify network and HP Jetdirect settings on the Jetdirect configuration page. See [Chapter 8](#) for information on the configuration page.
 - Confirm the network settings for the printer using the printer control panel (for printers with control panels).
 - See the troubleshooting section in the online help included with the HP Web JetAdmin software.

Troubleshooting an LPD UNIX Configuration

The troubleshooting steps below describe how to troubleshoot printing problems you may have with the HP Jetdirect print server.

1. Print a Jetdirect configuration page.
2. Verify that the IP configuration values are correct. If they are not, reconfigure the HP Jetdirect print server.
3. Log onto the host system and type:

```
ping <IP address>
```

where <IP address> is the IP Address assigned to the printer.

4. If ping fails, make sure the IP Address on the configuration page is correct. If it is correct, the problem is in the network.
5. If the ping test passes, print a test file. At the UNIX prompt, type:

```
lpr -Pprinter_name test_file (BSD-based and Linux systems)
```

where `printer_name` is the name of your printer and `test_file` is an appropriate file (ASCII, PCL, PostScript, HP-GL/2, or text) for the printer defined in the `:rp` tag in the `printcap` file.

6. If the test file does not print, do the following:
 - Check `printcap` entries.
 - Check printer status (using `LPC` or a similar process).
 - Examine the contents of the logfile for this printer, such as `/usr/spool/lpd/error_log_filename`
 - Check other log files, such as
HP-UX: `/usr/adm/syslog`

7. If the test file prints but is formatted incorrectly, do the following:

- Check `:rp` tag in `printcap` file.

Example 1 (suggested name for an ASCII or text printer):

```
text | lj1_text:\
:lp=:\
:rm=laserjet1:\
:rp=text:\
:lf=/usr/spool/lpd/ERRORLOG:\
:sd=/usr/spool/lpd/lj1_text:
```

Example 2 (suggested name for PostScript, PCL, or HP-GL/2 printers):

```
raw | lj1_raw:\
:lp=:\
:rm=laserjet:\
:rp=raw:\
:lf=/usr/spool/lpd/ERRORLOG:\
:sd=/usr/spool/lpd/lj1_raw:
```

8. Check that the printer is set up to print the type of test file you specified: PCL, PostScript, HP-GL/2, or ASCII.
9. Check whether the printer was turned off or lost its LAN connection in the middle of a print job. LPD queues may become disabled or stop sending data if the printer is powered off or if the LAN connection is broken when the printer is in the middle of printing a job. (Example: power is turned off to fix a paper jam.)

Use the HP-UX command `lpstat -Pqname` to find out if the queue has been disabled after the printer has powered up again or the connection is reestablished.

The disabled queue can be restarted using the following command:

HP-UX: `enable qname`

HP Jetdirect Configuration Page

Introduction

The HP Jetdirect configuration page is an important tool for managing or troubleshooting HP Jetdirect print servers. This page provides identification information (such as the HP Jetdirect model, firmware version, and LAN hardware address), as well as status and configuration parameters of supported network protocols. Network statistics gathered by the print server are also provided.

The HP Jetdirect configuration page may be printed directly on the attached printer. The format of the Jetdirect configuration page depends on:

- the printer model
- the HP Jetdirect model and firmware version

For HP Enhanced I/O (EIO) printers with an HP Jetdirect EIO print server installed, a Jetdirect configuration page will automatically print after a *printer* configuration page is printed. For instructions, see your printer manuals.

An HP Jetdirect configuration page can also be viewed over the network from a management utility (such as HP Web JetAdmin), or by accessing the embedded web server on the HP Jetdirect print server (see [Appendix B](#)).

Status Field Error Messages


The HP Jetdirect configuration page contains several “Status” fields for the print server and the supported protocols. One or more error codes and related error messages may be displayed in a Status field. For information on each error message, see [Table 8.9](#).

Configuration Page Format

HP Jetdirect configuration pages for Ethernet and Token Ring print servers are illustrated in [Figure 8.1](#) and [Figure 8.2](#).

Figure 8.1 Typical Ethernet Configuration Page (HP J4169A)

HP LaserJet 4000 series printers



EIO 1 - JetDirect Page
1

HP JetDirect Configuration

Status:	I/O Card Ready	Port Config:	10BASE-T HALF
Model Number:	J4169A	Auto Negotiation:	On
Hardware Address:	00108356D0C6	Manufacturing ID:	40094009F00950
Firmware Version:	at70Lu	Date Manufactured:	03/2000
Port Select:	RJ45	SNMP Set Cmty Name:	Not Specified

Network Statistics

Total Packets Received:	262647	Total Packets Transmitted:	2453
Unicast Packets Received:	992	Unsendable Packets:	1
Bad Packets Received:	2	Transmit Collisions:	17
Framing Errors Received:	1	Transmit Late Collisions:	1

Protocol Information


<div style="border-bottom: 1px solid black; padding-bottom: 5px; margin-bottom: 5px;"> <p style="text-align: center; margin: 0;">TCP/IP</p> </div> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Status:</td> <td style="width: 30%;">40</td> <td style="width: 20%;">ARP DUPLICATE IP ADDRESS</td> <td style="width: 20%;"></td> </tr> <tr> <td>IP Address:</td> <td>192.0.0.192</td> <td>Subnet Mask:</td> <td>255.255.255.0</td> </tr> <tr> <td>Default Gateway:</td> <td>192.0.0.192</td> <td>Syslog Server:</td> <td>Not Specified</td> </tr> <tr> <td>Config By:</td> <td>Default IP</td> <td>TFTP Server:</td> <td>Not Specified</td> </tr> <tr> <td>Config File:</td> <td>Not Specified</td> <td>Host Name:</td> <td>NP156D0C6</td> </tr> <tr> <td>Domain Name:</td> <td>Not Specified</td> <td>DNS Server:</td> <td>Not Specified</td> </tr> <tr> <td>WINS Server:</td> <td>Not Specified</td> <td>Idle Timeout:</td> <td>90 sec</td> </tr> <tr> <td>SLP:</td> <td>Enabled</td> <td>Access Control List:</td> <td>Not Specified</td> </tr> <tr> <td>Web JetAdmin URL:</td> <td>Not Specified</td> <td></td> <td></td> </tr> </table> <div style="border-bottom: 1px solid black; padding-bottom: 5px; margin-bottom: 5px;"> <p style="text-align: center; margin: 0;">IPX/SPX</p> </div> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Status:</td> <td style="width: 30%;">Ready</td> <td style="width: 20%;">Primary Frame Type:</td> <td style="width: 20%;">Auto Select</td> </tr> <tr> <td>Network Frame Type:</td> <td>Rcvd</td> <td>Unknown EN_II</td> <td>135</td> </tr> <tr> <td>COFFE231 EN_B02.2</td> <td>166414</td> <td>Unknown EN_SNAP</td> <td>134</td> </tr> <tr> <td>Unknown EN_B02.3</td> <td>135</td> <td></td> <td></td> </tr> </table>	Status:	40	ARP DUPLICATE IP ADDRESS		IP Address:	192.0.0.192	Subnet Mask:	255.255.255.0	Default Gateway:	192.0.0.192	Syslog Server:	Not Specified	Config By:	Default IP	TFTP Server:	Not Specified	Config File:	Not Specified	Host Name:	NP156D0C6	Domain Name:	Not Specified	DNS Server:	Not Specified	WINS Server:	Not Specified	Idle Timeout:	90 sec	SLP:	Enabled	Access Control List:	Not Specified	Web JetAdmin URL:	Not Specified			Status:	Ready	Primary Frame Type:	Auto Select	Network Frame Type:	Rcvd	Unknown EN_II	135	COFFE231 EN_B02.2	166414	Unknown EN_SNAP	134	Unknown EN_B02.3	135			<div style="border-bottom: 1px solid black; padding-bottom: 5px; margin-bottom: 5px;"> <p style="text-align: center; margin: 0;">Novell/Netware</p> </div> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Status:</td> <td style="width: 30%;">16</td> <td style="width: 20%;">NOT CONFIGURED</td> <td style="width: 20%;"></td> </tr> <tr> <td>Node Name:</td> <td>NP156D0C6</td> <td>Netware Mode:</td> <td>Queue Server</td> </tr> <tr> <td>NDS Tree Name:</td> <td></td> <td>NDS Context:</td> <td></td> </tr> <tr> <td>Attached Server:</td> <td></td> <td>Queue Poll Interval:</td> <td>2 sec</td> </tr> <tr> <td>SAP Interval:</td> <td>60 sec</td> <td></td> <td></td> </tr> </table> <div style="border-bottom: 1px solid black; padding-bottom: 5px; margin-bottom: 5px;"> <p style="text-align: center; margin: 0;">AppleTalk</p> </div> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Status:</td> <td style="width: 30%;">Ready</td> <td style="width: 20%;">Name:</td> <td style="width: 20%;">HP LaserJet 4000 Series *</td> </tr> <tr> <td>Zone:</td> <td></td> <td>Type:</td> <td>HP LaserJet LaserWriter</td> </tr> <tr> <td>Network Number:</td> <td>65281</td> <td>Network Number:</td> <td>65281</td> </tr> <tr> <td>Node Number:</td> <td>24</td> <td></td> <td></td> </tr> </table> <div style="border-bottom: 1px solid black; padding-bottom: 5px; margin-bottom: 5px;"> <p style="text-align: center; margin: 0;">DLC/LLC</p> </div> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Status:</td> <td style="width: 30%;">Ready</td> <td></td> <td></td> </tr> </table>	Status:	16	NOT CONFIGURED		Node Name:	NP156D0C6	Netware Mode:	Queue Server	NDS Tree Name:		NDS Context:		Attached Server:		Queue Poll Interval:	2 sec	SAP Interval:	60 sec			Status:	Ready	Name:	HP LaserJet 4000 Series *	Zone:		Type:	HP LaserJet LaserWriter	Network Number:	65281	Network Number:	65281	Node Number:	24			Status:	Ready		
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Default Gateway:	192.0.0.192	Syslog Server:	Not Specified																																																																																										
Config By:	Default IP	TFTP Server:	Not Specified																																																																																										
Config File:	Not Specified	Host Name:	NP156D0C6																																																																																										
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Node Number:	24																																																																																												
Status:	Ready																																																																																												

128 HP Jetdirect Configuration Page

EN

Figure 8.2 Typical Token Ring Configuration Page (HP J4167A)

HP LaserJet 4000 series printers



EIO 2 - JetDirect Page
1

HP JetDirect Configuration

Status:	I/O Card Ready	LAA:	0030C16083C8
Model Number:	J4167A	Manufacturing ID:	40194019F00980
Hardware Address:	0030C16083C8	Date Manufactured:	05/2000
Firmware Version:	G.20.20	SNMP Set Cnty Name:	Specified
Data Rate:	16 Mbps		

Network Statistics

Total Packets Received:	42	Total Packets Transmitted:	45
Unicast Packets Received:	2	Frame Copied Received:	0
Bad Packets Received:	0	Bad Length Received:	0
Line Errors Received:	0	Lost Frames:	0
Burst Errors Received:	0	Token Errors:	0

Protocol Information

<p style="margin: 0; text-align: center;">TCP/IP</p> <p>Status: 50</p> <p>TFTP LOCAL ERROR 3: trap-community-name: public</p> <p>Host Name: mdh.gcal</p> <p>IP Address: 13.24.2.1</p> <p>Subnet Mask: 255.0.0.0</p> <p>Default Gateway: 13.29.43.99</p> <p>Config By: BOOTP/TFTP</p> <p>BOOTP Server: 13.29.42.77</p> <p>TFTP Server: 13.29.42.77</p> <p>Config File: mdh.tftp.cfg</p> <p>Domain Name: Not Specified</p> <p>DNS Server: Not Specified</p> <p>WINS Server: Not Specified</p> <p>Syslog Server: Not Specified</p> <p>Idle Timeout: 90 sec</p> <p>SLP: Enabled</p> <p>Access List: Not Specified</p> <p>Web JetAdmin URL: Not Specified</p>	<p style="margin: 0; text-align: center;">Novell/NetWare</p> <p>Status: 16</p> <p>NOT CONFIGURED</p> <p>Node Name: NPI6083C8</p> <p>NetWare Mode: Queue Server</p> <p>NDS Tree Name:</p> <p>NDS Context:</p> <p>Attached Server:</p> <p>Queue Poll Interval: 2 sec</p> <p>SAP Interval: 60 sec</p>
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

IPX/SPX

Status: Ready

Source Routing: Unknown

Primary Frame Type: Auto Select

Network	Frame Type	Rcvd
Unknown	TR_8022	18

DLC/LLC

Status: Ready

Token Ring Diagnostics

Status: Error

Code: Function Failure

Ring Status: Ring Recovery

EN

HP Jetdirect Configuration Page 129

Section	Description
①	General HP Jetdirect Configuration: provides general HP Jetdirect print server status and identification information. See Table 8.1 . (For Error Messages, see Table 8.9 .)
②	Network Statistics: provides the current values for various network parameters monitored by the HP Jetdirect print server. See Table 8.2 .
③	TCP/IP Protocol Information: provides the current status and parameter values for the TCP/IP network protocols. See Table 8.3 . (For Error Messages, see Table 8.9 .)
④	IPX/SPX Protocol Information: provides the current status and parameter values for the IPX/SPX network protocols. See Table 8.4 . (For Error Messages, see Table 8.9 .)
⑤	Novell NetWare information: provides the current status and parameter values for a Novell NetWare network. See Table 8.5 . (For Error Messages, see Table 8.9 .)
⑥	(Ethernet Only) AppleTalk Protocol Information: provides the current status and parameter values for the AppleTalk network protocols. See Table 8.6 . (For Error Messages, see Table 8.9 .)
⑦	DLC/LLC Protocol Information: provides the current status and parameter values for the DLC/LLC network protocols. See Table 8.7 . (For Error Messages, see Table 8.9 .)
⑧	(Token Ring Only) Token Ring Diagnostics information: provides additional diagnostic status detected by the Token Ring print server. See Table 8.8 . (For Error Messages, see Table 8.9 .)

Configuration Page Messages

❶ General HP Jetdirect Configuration

Information in this section of the Jetdirect configuration page is described in [Table 8.1](#). For error messages, see [Table 8.9](#).

Table 8.1 ❶ General HP Jetdirect Configuration (1 of 2)

Message	Description
STATUS:	Current state of the HP Jetdirect print server. I/O CARD READY: The HP Jetdirect print server has successfully connected to the network and is awaiting data. I/O CARD INITIALIZING: The HP Jetdirect print server is initializing the network protocols. For more information, see the status line for each protocol on the configuration page. I/O CARD NOT READY: There is a problem with the print server or its configuration. An Error Code and Message is displayed if the print server is not ready. For more information, see Table 8.9 .
MODEL NUMBER:	The model number of the HP Jetdirect print server (for example, J4169A)
HARDWARE ADDRESS:	The 12-digit hexadecimal network hardware (MAC) address of the HP Jetdirect print server installed in the printer or device. This address is assigned by the manufacturer.
FIRMWARE VERSION:	The firmware revision number of the HP Jetdirect print server currently installed in the printer. The format is X.NN.NN, where X is a letter that depends on the HP Jetdirect print server model.
PORT SELECT:	(Ethernet only) Specifies the port on the HP Jetdirect print server that has been detected for use: NONE: The print server is not connected to the network. RJ-45: The RJ-45 network port is connected.
DATA RATE:	Specifies the Token Ring data rate configured on the HP Jetdirect print server: 4 Mbps or 16 Mbps. The setting must match the data rate of the network. The data rate is configured through a switch on the print server (see the hardware installation guide).
LAA	(Token Ring only) The Locally Administered Address (LAA) identifies the user-specified node address of a Token Ring print server. The default address is the print server's fixed LAN hardware address.

Table 8.1 **1** **General HP Jetdirect Configuration (2 of 2)**

Message	Description
PORT CONFIG:	Identifies the link configuration of the RJ-45 port on the HP Jetdirect 10/100Base-TX print server: 10BASE-T HALF: 10 Mbps, half-duplex 10BASE-T FULL: 10 Mbps, full-duplex 100TX HALF: 100Mbps, half-duplex 100TX-FULL: 100Mbps, full-duplex UNKNOWN: The print server is in an initialization state. DISCONNECTED: A network connection has not been detected. Check network cables.
AUTONEGOTIATION	Identifies whether IEEE 802.3u Autonegotiation on the HP Jetdirect 10/100TX port is enabled (ON) or disabled (OFF). ON (default): the HP Jetdirect print server will attempt to automatically configure itself onto the network at the proper speed (10 or 100 Mbps) and mode (half or full duplex). Autonegotiation is enabled after a cold reset. OFF: you must manually configure the speed and mode using the EIO menu from the printer's control panel. If Autonegotiation is off, the settings must match those of the network for proper operation.
MANUFACTURING ID:	The manufacturing identification code for use by HP Customer Care personnel.
DATE MANUFACTURED:	Identifies the date of manufacture of the HP Jetdirect print server.
SNMP SET CMTY NAME:	Specifies whether an SNMP set community name has been configured on the HP Jetdirect print server. An SNMP set community name is a password for 'write' access to SNMP control functions (SNMP SetRequests) on the HP Jetdirect print server. NOT SPECIFIED: an SNMP set community name has not been set. SPECIFIED: a specific SNMP set community has been set.

2 Network Statistics

Information in this section of the Jetdirect configuration page is described in [Table 8.2](#).

Table 8.2 2 Network Statistics (1 of 2)

Message	Description
TOTAL PACKETS RECEIVED:	Total number of frames (packets) received by the HP Jetdirect print server without error. This includes broadcast, multicast packets, and packets specifically addressed to the print server. This number does not include packets specifically addressed to other nodes.
UNICAST PACKETS RECEIVED:	Number of frames specifically addressed to this HP Jetdirect print server. This does not include broadcasts or multicasts.
BAD PACKETS RECEIVED:	Total number of frames (packets) received with errors by the HP Jetdirect print server.
FRAMING ERRORS RECEIVED:	Maximum of CRC (Cyclic Redundancy Check) errors and framing errors. CRC errors are frames received with CRC errors. Framing errors are frames received with alignment errors. A large number of framing errors could indicate a cabling problem with your network.
TOTAL PACKETS TRANSMITTED:	Total number of frames (packets) transmitted without error.
UNSENDABLE PACKETS:	Total number of frames (packets) not successfully transmitted because of errors.
TRANSMIT COLLISIONS:	Number of frames not transmitted because of repeated collisions.
TRANSMIT LATE COLLISIONS:	Total number of frames not transmitted because a late collision occurred. Late collisions often occur when cable lengths exceed network specifications. A large number may indicate a cabling problem on the network.
LINE ERRORS RCVD:	Total number of Token Ring frames received by the HP Jetdirect print server with code violations or CRC (Cyclic Redundancy Check) errors. A large number may indicate faulty cabling on your network.
BURST ERRORS RCVD:	Number of times the HP Jetdirect Token Ring print server could detect no transitions for 5 half-bit times between the Start Delimiter (SD) and the End Delimiter (ED).

Table 8.2 **② Network Statistics (2 of 2)**

Message	Description
FRAME COPIED RCVD:	Total number of Token Ring frames received with the frame copy error indicated in the Frame Status (FS) field.
BAD LENGTH RCVD:	The number of Token Ring frames received with frame length errors.
LOST FRAMES:	The number of Token Ring frames lost.
TOKEN ERRORS:	Total number of times a violation of the token-passing protocol has been detected.

③ TCP/IP Protocol Information

Information in this section of the Jetdirect configuration page is described in [Table 8.3](#). For error messages, see [Table 8.9](#).

Table 8.3 ③ TCP/IP Configuration Information (1 of 4)

Message	Description
STATUS:	<p>Current TCP status.</p> <p>READY: Indicates the HP Jetdirect print server is awaiting data over TCP/IP.</p> <p>DISABLED: Indicates that TCP/IP was manually disabled.</p> <p>INITIALIZING: Indicates that the print server is searching for the BOOTP server, or trying to get the configuration file through TFTP. An additional status message may also be displayed.</p> <p>An Error Code and Message is displayed if the print server is not ready. For more information, see Table 8.9.</p>
HOST NAME:	<p>The host name configured on the print server. It may be truncated.</p> <p>NOT SPECIFIED indicates that no host name was specified in a BOOTP response or TFTP configuration file.</p> <p>NP xxxxxx: The default name is NP xxxxxx, where xxxxxx represents the last six digits of the LAN hardware (MAC) address.</p>
IP ADDRESS:	<p>The Internet Protocol (IP) address assigned to the HP Jetdirect print server. This is a required entry for operation of the print server on a TCP/IP network. During initialization, a temporary value 0.0.0.0 is displayed. After two minutes, a default IP address 192.0.0.192 is assigned, which may not be a valid IP address for your network.</p> <p>NOT SPECIFIED indicates that an IP address is not assigned or the value is zero.</p>
SUBNET MASK:	<p>The IP subnet mask configured on the HP Jetdirect print server. During initialization, a temporary value 0.0.0.0 is displayed. Depending on configuration parameters, the print server may automatically assign a usable default value.</p> <p>NOT SPECIFIED indicates that a subnet mask is not configured.</p>

Table 8.3 **③ TCP/IP Configuration Information (2 of 4)**

Message	Description
DEFAULT GATEWAY:	<p>The IP address of the gateway used when sending packets off the local network. Only one default gateway may be configured. During initialization, a temporary value 0.0.0.0 is displayed. If not provided, the IP address of the Jetdirect print server is used.</p> <p>NOT SPECIFIED indicates that a default gateway is not configured.</p>
CONFIG BY:	<p>Identifies how the HP Jetdirect print server obtained its IP configuration:</p> <p>BOOTP: automatic configuration via a BOOTP server.</p> <p>BOOTP/TFTP: automatic configuration via a BOOTP server and TFTP configuration file.</p> <p>DHCP: automatic configuration via a DHCP server</p> <p>DHCP/TFTP: automatic configuration via a DHCP server and TFTP configuration file.</p> <p>RARP: automatic configuration via the Reverse Address Resolution Protocol.</p> <p>USER SPECIFIED: manual configuration via Telnet, the printer's control panel, HP Web JetAdmin, embedded web server, or other method.</p> <p>DEFAULT IP: the default IP address was assigned. This address may not be a valid address for your network.</p> <p>NOT CONFIGURED: The print server was not configured with IP parameters. Verify that TCP/IP is enabled, or check for error status.</p>
BOOTP SERVER: or DHCP SERVER: or RARP SERVER:	<p>Displayed if BOOTP, DHCP, or RARP is used for TCP/IP configuration. It specifies the IP address of the system that responds to the HP Jetdirect print server's request for automatic TCP/IP configuration over the network.</p> <p>NOT SPECIFIED indicates that the configuration server's IP address could not be determined or was set to zero in the response packet.</p>
BOOTP/DHCP SERVER:	<p>Displayed during initialization while the HP Jetdirect print server attempts to obtain its TCP/IP configuration from a BOOTP or DHCP server. The temporary address displayed is 0.0.0.0.</p>
TFTP SERVER:	<p>The IP address of the system where the TFTP configuration file is located. During initialization, the temporary address 0.0.0.0 is displayed.</p> <p>NOT SPECIFIED indicates that a TFTP server has not been not been set.</p>

Table 8.3 **3 TCP/IP Configuration Information (3 of 4)**

Message	Description
CONFIG FILE:	<p>The name of the HP Jetdirect configuration file. The file pathname may be truncated to fit on two lines.</p> <p>NOT SPECIFIED indicates that a file was not specified in the BOOTP reply from the host.</p>
DOMAIN NAME:	<p>The Domain Name System (DNS) name of the domain in which the HP Jetdirect print server resides (for example, support.company.com). It is not the fully qualified DNS name (for example, printer1.support.company.com) because the host printer name is not included .</p> <p>NOT SPECIFIED indicates that a domain name has not been configured on the print server.</p>
DNS SERVER:	<p>The IP address of the Domain Name System (DNS) server.</p> <p>NOT SPECIFIED indicates that a DNS server's IP address has not been configured on the print server.</p>
WINS SERVER:	<p>The IP address of the Windows Internet Name Service (WINS) server.</p> <p>NOT SPECIFIED indicates that a WINS server's IP address has not been configured on the print server.</p>
SYSLOG SERVER:	<p>The IP address of the syslog server configured on the print server.</p> <p>NOT SPECIFIED indicates that a syslog server has not been configured.</p>
IDLE TIMEOUT:	<p>The timeout value expressed in seconds after which the print server closes an idle TCP print data connection. Acceptable values are integers between 0 and 3600. A value of zero turns off the timeout mechanism. The default value is 270 seconds.</p>
SLP:	<p>Specifies whether the HP Jetdirect print server sends Service Location Protocol (SLP) packets used by system applications for automated installation.</p> <p>ENABLED: The print server sends SLP packets.</p> <p>DISABLED: The print server does not send SLP packets.</p>

Table 8.3 **③ TCP/IP Configuration Information (4 of 4)**

Message	Description
ACCESS LIST:	Identifies whether a host access control list is configured on the HP Jetdirect print server. A host access control list specifies the IP address of individual systems, or IP network of systems, that are allowed access to the print server and device. SPECIFIED: A host access list is configured on the HP Jetdirect print server. NOT SPECIFIED: A host access list is not configured on the print server. All systems are allowed access.
WEB JETADMIN URL:	If the HP Jetdirect print server is found on the network by HP Web JetAdmin, the URL of the host system used for HP Web JetAdmin services is displayed. The URL is limited to two lines and may be truncated. NOT SPECIFIED indicates that the URL of the Web JetAdmin host system could not be identified or is not configured.

4 IPX/SPX Protocol Information

Information in this section of the Jetdirect configuration page is described in [Table 8.4](#). For error messages, see [Table 8.9](#).

Table 8.4 **4 IPX/SPX Configuration Information (1 of 2)**

Message	Description
STATUS:	<p>Indicates the current IPX/SPX protocol status.</p> <p>READY: Indicates the HP Jetdirect print server is awaiting data over IPX/SPX.</p> <p>DISABLED: Indicates that IPX/SPX was manually disabled.</p> <p>INITIALIZING: Indicates that the print server is registering the node address or name. An additional status message may also be displayed.</p> <p>An Error Code and Message is displayed if the print server is not ready. For more information, see Table 8.9.</p>
PRIMARY FRAME TYPE:	<p>Specifies the frame type selection on the Jetdirect print server.</p> <p>AUTO SELECT: The print server automatically senses and limits the frame type to the first one detected.</p> <p>EN_8023: Limits the frame type to IPX over IEEE 802.3 frames. All others will be counted and discarded.</p> <p>EN_II: Limits the frame type to IPX over Ethernet frames. All others will be counted and discarded.</p> <p>EN_8022: Limits the frame type to IPX over IEEE 802.2 with IEEE 802.3 frames. All others will be counted and discarded.</p> <p>EN_SNAP: Limits the frame type to IPX over SNAP with IEEE 802.3 frames. All others will be counted and discarded.</p> <p>TR_8022: Limits the frame type to IPX over IEEE 802.2 with IEEE 802.5 frames. All others will be counted and discarded.</p> <p>TR_SNAP: Limits the frame type to IPX over SNAP with IEEE 803.5 frsmes. All others will be counted and discarded.</p>

Table 8.4 ④ IPX/SPX Configuration Information (2 of 2)

Message	Description
<p>NETWORK XXXXXX XXXXXX XXXXXX XXXXXX</p>	<p>The first column (Network) indicates the network number associated with a protocol frame type used for communication between a server and the HP Jetdirect print server. UNKNOWN indicates that the HP Jetdirect print server is still trying to determine which network number to use.</p>
<p>FRAME TYPE XXXXX XXXXX XXXXX XXXXX</p>	<p>The second column (Frame Type) identifies the frame type used with the associated network number: EN_8023, EN_8022, EN_II, EN_SNAP, TR_8022, TR_SNAP. Unless a specific frame type has been manually configured, the print server automatically determines the protocol frame type by listening to the network data being transferred over the network. DISABLED indicates that a specific frame type for that network has been manually configured.</p>
<p>RCVD XXXX XXXX XXXX XXXX</p>	<p>The third column (RCVD) indicates how many packets have been received for each frame type.</p>

5 Novell NetWare Parameters

Information in this section of the Jetdirect configuration page is described in [Table 8.5](#). For error messages, see [Table 8.9](#).

Table 8.5 5 Novell NetWare Configuration Information (1 of 2)

Message	Description
STATUS:	<p>Indicates the current Novell NetWare configuration status.</p> <p>READY: Indicates the HP Jetdirect print server is awaiting data.</p> <p>DISABLED: Indicates that IPX/SPX was manually disabled.</p> <p>INITIALIZING: Indicates that the print server is registering the node address or name. An additional status message may also be displayed.</p> <p>An Error Code and Message is displayed if the print server is not ready. For more information, see Table 8.9.</p>
NODE NAME:	<p>Queue Server Mode: The print server name. This name must match a valid print server on the appropriate NetWare file server. The default name is NPIXXXXXX, where XXXXXX is the last six digits of the LAN hardware (MAC) address.</p> <p>Remote Printer Mode: The name you gave the network printer when you configured the network printer. The default name is NPIXXXXXX.</p>
NETWARE MODE:	<p>The mode used by the HP Jetdirect print server.</p> <p>QUEUE SERVER indicates that the print server receives data directly from the queue.</p> <p>REMOTE PRINTER, with the printer number following it, indicates that the print server emulates a Novell NetWare remote printer.</p> <p>If the printer is not configured, this field displays QUEUE SERVER.</p>
NDS TREE NAME:	<p>Displays the name of the Novell Directory Services (NDS) tree for this printer. NDS is a database of objects on a NetWare network organized in a hierarchical tree structure.</p> <p>NOT SPECIFIED or blank: NDS is disabled.</p>
NDS CONTEXT:	<p>Displays the fully qualified NDS name where the HP Jetdirect print server object resides in the NDS tree.</p> <p>For example:</p> <p>CN=lj_pserver.OU=support.OU=mycity.OU=mycompany</p> <p>NOT SPECIFIED or blank: NDS is disabled.</p>

Table 8.5 **5** **Novell NetWare Configuration Information (2 of 2)**

Message	Description
ATTACHED SERVER:	The Attached Server field identifies the Jetdirect discovery method [NSQ] (Nearest Service Query) or [GSQ] (General Service Query) and the name of the proxy file server used to locate the configured bindery servers. NOT SPECIFIED or blank: A NetWare server has not been configured.
QUEUE POLL INTERVAL	(Job Poll Interval) Specifies the time interval (seconds) that the HP Jetdirect print server waits to check for print jobs in a print queue. The default is 2 seconds.
SAP INTERVAL:	Specifies the time interval (seconds) that the HP Jetdirect print server waits between Service Advertising Protocol (SAP) broadcasts on the network. The default is 60 seconds.
SERVER x:	Identifies a NetWare file server to which the HP Jetdirect print server is attached.

⑥ AppleTalk Protocol Information

Information in this section of the Jetdirect configuration page (Ethernet Only) is described in [Table 8.6](#). For error messages, see [Table 8.9](#).

Table 8.6 ⑥ **AppleTalk Configuration Information**

Message	Description
STATUS:	Indicates the current AppleTalk configuration status. READY: Indicates the HP Jetdirect print server is awaiting data. DISABLED: Indicates that AppleTalk was manually disabled. INITIALIZING: Indicates that the print server is registering the node address or name. An additional status message may also be displayed. An Error Code and Message is displayed if the print server is not ready. For more information, see Table 8.9 .
NAME:	The name of the printer on the AppleTalk network. A number after the name indicates that there are multiple devices with this name, and this is the Nth instance of the name.
ZONE:	The name of the AppleTalk network zone on which the printer is located.
TYPE:	The type of the printer being advertised on the network. Two types can be displayed.
NETWORK NUMBER: NODE NUMBER:	NETWORK NUMBER: identifies the AppleTalk Network Number on which the HP Jetdirect print server is currently operating. NODE NUMBER: identifies the AppleTalk Node Number that the print server chose for itself as part of its initialization sequence. Note: The AppleTalk phase 2 (P2) parameter is preconfigured on the HP Jetdirect print server.

7 DLC/LLC Protocol Information

Information in this section of the Jetdirect configuration page is described in [Table 8.7](#).

Table 8.7 7 DLC/LLC Configuration Information

Message	Description
STATUS:	Indicates the current DLC/LLC protocol status. READY: Indicates the HP Jetdirect print server is awaiting data. DISABLED: Indicates that DLC/LLC was manually disabled. INITIALIZING: Indicates that the print server is registering the node address or name. An additional status message may also be displayed. An Error Code and Message is displayed if the print server is not ready. For more information, see Table 8.9 .

③ Token Ring Diagnostics

Information in this section of the Jetdirect configuration page (Token Ring Only) is described in [Table 8.8.](#)

Table 8.8 ③ **Token Ring Diagnostic Information (1 of 2)**

Message	Description
Status:	<p>Identifies a status condition.</p> <p>Ready: Indicates successful access to the Token Ring network .</p> <p>Error: Indicates an error condition. See the the error codes and ring status messages for more information.</p>
Code:	<p>The following Open command error codes may be detected:</p> <p>Function Failure: The HP Jetdirect print server is unable to transmit to itself while wrapped through its lobe at the Token Ring wiring concentrator. This message may also indicate that data frames were received before physical insertion.</p> <p>Signal Loss: Indicates one of the following:</p> <ul style="list-style-type: none">The HP Jetdirect print server has detected a loss of signal on the ring. Check the cable from the HP Jetdirect print server to the network and check the wiring concentrator, orA signal loss condition has been detected at the HP Jetdirect print server receiver input during the open process (either when wrapped or inserted onto the ring). <p>Timeout: The HP Jetdirect print server fails to logically insert onto the ring before the insertion timer expires. Each phase of the insertion process must complete before expiration of the 18-second insertion timer.</p> <p>Ring Failure: The HP Jetdirect print server times out when attempting a ring purge after becoming the active monitor; that is, the HP Jetdirect print server is unable to receive its own ring purge data frames.</p> <p>Ring Beaconsing: The HP Jetdirect print server receives a beacon data frame after physically inserting into the ring. This indicates a break in the ring.</p> <p>Dup Node Address: The HP Jetdirect print server found another station on the ring that already has the address which the HP Jetdirect print server wishes to use. Make sure that all addresses are unique.</p>

Table 8.8 **8 Token Ring Diagnostic Information (2 of 2)**

Message	Description
	<p>Request Param: The HP Jetdirect print server determines that a Ring Parameter Server (RPS) is present on the ring, but does not respond to a request initialization data frame.</p> <p>Remove Received: The HP Jetdirect print server has received a Remove Adapter data frame during the Token Ring insertion process, or has received a remove ring station data frame request, and has removed itself from the ring.</p>
<p>Ring Status:</p>	<p>The following Ring Status may be detected:</p> <p>Ring Recovery: The HP Jetdirect print server has received claim-token data frames on the ring. The HP Jetdirect print server may be transmitting the claim-token frames.</p> <p>Single Station: The HP Jetdirect print server has sensed that it is the only station on the ring.</p> <p>Remove Received: The HP Jetdirect print server has received a Remove Adapter data frame during the Token Ring insertion process, or has received a remove ring station data frame request, and has removed itself from the ring.</p> <p>Auto-Removal Error: The HP Jetdirect print server detected an internal hardware error following the Token Ring beacon auto-removal process and has removed itself from the ring.</p> <p>Lobe Wire Fault: The HP Jetdirect print server has detected an open or short circuit in the cable between the HP Jetdirect print server and the Token Ring wiring concentrator. Verify that this cable is functional and replace it if necessary.</p> <p>Transmit Beacon: The HP Jetdirect print server is transmitting beacon frames to the ring.</p> <p>Hard Error: The HP Jetdirect print server is transmitting or receiving beacon frames to or from the ring.</p> <p>Signal Loss: Indicates the following:</p> <p style="padding-left: 40px;">The HP Jetdirect print server has detected a loss of signal on the ring. Check the cable from the HP Jetdirect print server to the network and check the wiring concentrator, or</p> <p style="padding-left: 40px;">A signal loss condition has been detected at the HP Jetdirect print server receiver input during the open process (either when wrapped or inserted onto the ring).</p>

Error Messages

Error codes and messages that may appear in the Status sections of the Jetdirect configuration page are described in [Table 8.9](#).

Table 8.9 Error Messages (1 of 10)

Error Code and Message	Description
02 LAN ERROR - INTERNAL LOOPBACK	During self-test, the HP Jetdirect print server detected an internal loopback test error. The print server may be faulty. If the error persists, replace the HP Jetdirect print server.
03 LAN ERROR - EXTERNAL LOOPBACK	The HP Jetdirect print server is incorrectly connected to your network or is defective. Make sure your HP Jetdirect print server is correctly attached to your network. In addition, check the cabling and connectors.
07 LAN ERROR - CONTROLLER CHIP	Check the network connections. If the connections are intact, run the power-on self-test: turn the printer off, then on again. If the error persists, replace the HP Jetdirect print server.
08 LAN ERROR - INFINITE DEFERRAL	There is a network congestion problem. Note: If the print server is not connected to the network, this error cannot occur.
09 LAN ERROR - BABBLE	Check the network connections. If the connections are intact, run the power-on self-test: turn the printer off, then on again. If the error persists, replace the HP Jetdirect print server. For replacement instructions, see the hardware installation guide for your print server.
0A LAN ERROR - NO SQE	Check the network connections. If the connections are intact, run the power-on self-test: turn the printer off, then on again. If the error persists, replace the HP Jetdirect print server.
0C LAN ERROR - RECEIVER OFF	There may be a problem with your network cabling or the HP Jetdirect print server. Check the cabling and connectors on your Ethernet network. If you cannot find a problem with your network cabling, run the power-on self-test: turn the printer off, then on again. If the error persists after the printer is turned on again, there is a problem with the HP Jetdirect print server.
0D LAN ERROR - TRANSMITTER OFF	There may be a problem with your network cabling or the HP Jetdirect print server. Check the cabling and connectors on your Ethernet network. If you cannot find a problem with your network cabling, run the power-on self-test: turn the printer off, then on again. If the error persists, there is a problem with the HP Jetdirect print server.

Table 8.9 Error Messages (2 of 10)

Error Code and Message	Description
0E LAN ERROR - LOSS OF CARRIER	Check the network connections. If the connections are intact, run the power-on self-test: turn the printer off, then on again. If the error persists, replace the HP Jetdirect print server.
10 LAN ERROR - UNDERFLOW	(Ethernet) There may be a problem with your network cabling or the HP Jetdirect print server. Check the cabling and connectors on your network. If you cannot find a problem with your network cabling, run the power-on self-test: turn the printer off, then on again. If the error persists, there is a problem with the HP Jetdirect print server.
10 LAN ERROR-OPEN	(Token Ring) The HP Jetdirect print server could not insert into the ring and join the network. Check the data rate switch on the HP Jetdirect print server to make sure it is set correctly. For information on setting the data rate switch, see the HP Jetdirect internal print server hardware installation guides. In addition, check the cabling, external transceiver, wiring concentrator, and taps.
11 LAN ERROR - RETRY FAULTS	There is a problem with your network cabling or external network configuration. Verify operation of the hub or switch port.
12 LAN ERROR - NO LINKBEAT	With a 10/100 Base-TX port connected, this message is displayed if Link Beat is not sensed. Check the network cable, and verify that the concentrator/hub is providing Link Beat.
13 NETWORK RECONFIG - MUST REBOOT	Reset or power cycle the HP Jetdirect print server to enable new configuration values.
14 DISCONNECTED	The Novell NetWare protocol is disconnected. Check the server and the print server.
15 CONFIGURATION ERROR	(Ethernet) The configuration information for the NetWare functions is not stored correctly on the HP Jetdirect print server. Use the installation software, embedded web server, or other tools to reconfigure the print server. If this error persists, there may be a problem with the HP Jetdirect print server.
15 LAN ERROR - WIRE FAULT	(Token Ring) The HP Jetdirect print server has detected an open or short circuit in the cable between the HP Jetdirect print server and the Token Ring wiring concentrator. Verify that this cable is functional and replace it if necessary.

Table 8.9 Error Messages (3 of 10)

Error Code and Message	Description
16 NOT CONFIGURED	(Ethernet) The HP Jetdirect print server has not been configured for NetWare. Use the installation software, embedded web server, or other tools to configure the print server for NetWare networks.
16 LAN ERROR - AUTO REMOVAL	(Token Ring) The HP Jetdirect print server detected an internal hardware error following the Token Ring beacon auto-removal process and has removed itself from the ring.
17 UNABLE TO FIND SERVER	(Ethernet) The HP Jetdirect print server was unable to find the NetWare print server (Remote Printer mode) or file server (Queue Server mode). (There was no response to service queries for advertising print servers or file servers that matched the configured print server or file server name.) Make sure that the print server or file server is running and that the print server or file server name configured on the HP Jetdirect print server matches the actual name used by the print server or file server. Also make sure that all cables and routers are functioning correctly.
17 LAN ERROR - REMOVE RECEIVE	(Token Ring) The HP Jetdirect print server has received a Remove Adapter data frame during the Token Ring insertion process, or has received a remove ring station data frame request, and has removed itself from the ring.
18 PASSWORD ERROR	The HP Jetdirect print server detected that the password for the NetWare print server object is wrong. Use a NetWare utility (such as PCONSOLE) to erase the password for the print server object. When the HP Jetdirect print server logs on again, it sets a new password. Note: When multiple file servers are configured, the error is only displayed on the configuration page if none of the file servers are connected.
19 NO QUEUE ASSIGNED	The HP Jetdirect print server detected that the print server object has not been assigned any queues to service. Assign queues to the print server object using printer installation or NetWare utilities. Note: When multiple file servers are configured, the error is only displayed on the configuration page if none of the file servers were successfully connected.
1A PRINTER NUMBER NOT DEFINED	A NetWare printer number for this printer has not been configured. Assign a valid printer number to the HP Jetdirect print server. Use a NetWare utility (such as PCONSOLE), the Jetdirect embedded web server, or other tool to assign a printer number.

Table 8.9 Error Messages (4 of 10)

Error Code and Message	Description
1B PRINTER NUMBER IN USE	The NetWare printer number assigned to the printer is already in use by another printer. Assign an unused printer number. This may also occur when a printer is power cycled, in which case the error goes away after the print server times out and detects the lost connection.
1C PRINT SERVER NOT DEFINED	The file server does not have a print server object that corresponds to the specified NetWare node name. Use printer installation software, a NetWare utility (such as PCONSOLE), or other tool to create the print server object. When the HP Jetdirect print server is configured for multiple file servers, the error is only displayed on the configuration page if none of the file servers made the connection.
1D UNABLE TO CONNECT TO SERVER	Remote Printer mode error: The HP Jetdirect print server was unable to establish an SPX connection with the NetWare print server. Make sure that the NetWare print server is running and that all cables and routers are functioning correctly.
1E FAIL RESERVING PRINTER NUM	The SPX connection to the print server was lost when the HP Jetdirect print server attempted to reserve the printer number. This indicates a possible network problem, or a problem with the print server. Make sure all cables and routers are functioning correctly. Try restarting the print server.
1F ERR NEGOTIATING BUFFER SIZE	A failure was detected when selecting the buffer size to be used when reading print data from the file server. This may indicate a network problem. When the HP Jetdirect print server is configured for multiple file servers, the error is only displayed on the configuration page if none of the file servers was successfully connected.
20 UNABLE TO LOGIN	A failure was detected when the HP Jetdirect print server tried to log onto the file server. This could be caused by the print server object not existing on the file server, or by a security check that prevents the print server from logging in. Make sure the file server name and print server object name are correct. Use PCONSOLE to erase the password for the print server object. Create a new print server object. When the HP Jetdirect print server is configured for multiple file servers, the error is only displayed on the configuration page if none of the file servers made the connection.

Table 8.9 Error Messages (5 of 10)

Error Code and Message	Description
21 UNABLE TO SET PASSWORD	<p>A failure was detected when the HP Jetdirect print server tried to set the password for the print server object. (Whenever the HP Jetdirect print server is able to log in without a password, it sets the password automatically.) This indicates a networking or security problem. Create a new print server object.</p> <p>When multiple file servers are configured, the error is only displayed on the configuration page if none of the file servers were successfully connected.</p>
22 UNABLE TO CONNECT TO SERVER	<p>Queue Server mode error: The HP Jetdirect print server could not establish an NCP connection to the file server. Make sure that the correct file servers are connected.</p> <p>When multiple file servers are configured, the error is only displayed on the configuration page if none of the file servers were successfully connected.</p>
23 UNABLE TO ATTACH TO QUEUE	<p>A failure was detected when the HP Jetdirect print server tried to attach to one of the queues assigned to the print server object. This may be because no servers are allowed to attach to this queue. There may also be a networking or security problem. Use PCONSOLE to make sure that servers are allowed to attach to the queue, to delete the print server object from the list of queue servers if you want the HP Jetdirect print server to service other queues, or to delete the queue and create a new one (the print server object must be added to the list of queue servers).</p> <p>When the HP Jetdirect print server is configured for multiple file servers, the error is only displayed on the configuration page if none of the file servers made the connection.</p>
24 PSERVER CLOSED CONNECTION	<p>The NetWare print server requested a termination of the connection with the HP Jetdirect print server. No error exists or is indicated. Make sure the NetWare print server is running, and restart it if necessary.</p>
25 DISCONNECTING - SPX TIMEOUT	<p>The SPX connection to the print server was lost after the connection had been made. This indicates a possible network problem, or a problem with the print server. Make sure all cables and routers are functioning correctly. Try restarting the print server.</p>
26 UNKNOWN NCP RETURN CODE	<p>The HP Jetdirect print server encountered an unexpected fatal error after it had successfully connected to the file server. A wide variety of failures could produce this error message, including a downed file server or a network router failure.</p>

Table 8.9 Error Messages (6 of 10)

Error Code and Message	Description
27 UNEXPECTED PSERVER DATA RCVD	The print server sent some data when the HP Jetdirect print server had not given its permission to do so. This indicates a possible print server problem, possibly a software problem.
28 OUT OF BUFFERS	The HP Jetdirect print server was unable to allocate a buffer from its internal memory. This indicates all buffers are busy due possibly to heavy broadcast traffic or large amounts of network traffic directed to the print server.
29 UNABLE TO SENSE NET NUMBER	The HP Jetdirect print server has been trying for over 3 minutes to determine the NetWare protocol used on the network. Make sure that any file servers and routers are operating correctly. Make sure that the settings for NetWare frame type and source routing are correct.
2A NDS ERR: EXCEEDS MAX SERVERS	More queues were assigned than the HP Jetdirect print server can handle. Remove one or more print queues from the list to be serviced by Queue Server Mode.
2B NDS ERR: UNABLE TO LOGIN	Unable to log onto the NetWare directory tree. Make sure that the print server object is defined in the directory at the correct context. Clear the print server password using NWADMIN or similar NetWare tool.
2C NDS AUTHENTICATION ERROR	Unable to log onto the NetWare directory tree. Make sure that the print server object is defined in the directory at the correct context.
2D NDS ERR: CHANGE PSSWRD FAILED	Cannot modify the print server password to the value expected by the HP Jetdirect print server.
2E NDS SERVER PUBLIC KEY ERROR	Print Server Object Name mismatch. Unable to read the file server's public key. Verify object names, or contact the NDS administrator.
2F NDS ERR: SRVR NAME UNRESOLVD	The file server on the network cannot be located. The server may not be running at this time or a communications problem may exist.
30 NDS PRINT SERVER NAME ERROR	The HP Jetdirect print server object cannot be located in the specified NDS context.
31 NDS PS PRINTER LIST ERROR	Cannot locate a list of printers objects that should be assigned to the print server object.
32 NDS PRINTER OBJ NOTIFY ERR	The list of notification objects assigned to the printer object cannot be located.
33 NDS PRINT OBJ QUEUE LIST ERR	The list of print queues assigned to the printer objects cannot be located.

Table 8.9 Error Messages (7 of 10)

Error Code and Message	Description
34 NDS ERR: UNRESOLVD PRNTR OBJ	The printer object cannot be located in the NDS directory.
35 NDS ERR: INVALID SRVR VERS	The current version of the NetWare file server is not supported.
36 NDS ERR: NO PRINTER OBJECTS	No printer objects are assigned to the print server object configured to this HP Jetdirect print server.
37 NDS ERR: MAX PRINT OBJECTS	Too many printer objects are assigned to the print server object. Using NetWare utilities (such as NWADMIN), reduce the number of printer objects assigned to the print server.
38 NDS ERR: NO QUEUE OBJECTS	No print queue objects are assigned to the printer objects located in the NDS directory.
39 NDS ERR: MAX QUEUE OBJECTS	Too many print queue objects are assigned to the printer. Reduce the number of queues assigned.
3A NDS ERR: UNABLE TO FIND TREE	The NDS tree cannot be located. The message may occur when the file server is not running or when a network communications problem exists.
3B NDS CONNECTION STATE ERROR	The HP Jetdirect print server cannot change the NDS connection state. Check licenses on the spooling server.
3C NDS ERR: UNRESOLVED QUEUE	The print queue object cannot be located in the specified NDS context.
3D NDS ERR: CANNOT READ Q HOST	Cannot locate the file server on the network. The server may not be running at this time or a communications problem may exist.
3E NDS PRNT SRVR PUBLIC KEY ERR	Print Server Object Name mismatch. Unable to read the print server's public key. Verify object names. Verify that the object key assigned to the HP Jetdirect print server is a print server object and not a printer or other object.
3F UNABLE TO GET NDS SRVR ADDR	The NDS server address cannot be located or accessed.
40 ARP DUPLICATE IP ADDRESS	The ARP layer has detected another node on the network using the same IP address as the HP Jetdirect print server. Extended error information below this message shows the hardware address of the other node.
41 NOVDRAM ERROR	The HP Jetdirect print server cannot read the contents of its NOVDRAM.

Table 8.9 Error Messages (8 of 10)

Error Code and Message	Description
42 INVALID IP ADDRESS	The IP address specified for the HP Jetdirect print server (through BOOTP) is an invalid IP address for specifying a single node. Check your Bootptab file for proper entries.
43 INVALID SUBNET MASK	The IP subnet mask specified for the HP Jetdirect print server (through BOOTP) is an invalid subnet mask. Check your Bootptab file for proper entries.
44 INVALID GATEWAY ADDRESS	The default gateway IP address specified for the HP Jetdirect print server (through BOOTP) is an invalid IP address for specifying a single node. Check your Bootptab file for proper entries.
45 INVALID SYSLOG ADDRESS	The syslog server IP address specified for the HP Jetdirect print server (through BOOTP) is an invalid IP address for specifying a single node. Check your Bootptab file for proper entries.
46 INVALID SERVER ADDRESS	The TFTP server IP address specified for the HP Jetdirect print server (through BOOTP) is an invalid IP address for specifying a single node. Check your Bootptab file for proper entries.
47 INVALID TRAP DEST ADDRESS	One of the SNMP trap (Trap PDU) destination IP addresses specified for the HP Jetdirect print server (through TFTP) is an invalid IP address for specifying a single node. Check your TFTP configuration file.
48 CF ERR - FILE INCOMPLETE	The TFTP configuration file contained an incomplete last line that did not end in a newline character.
49 CF ERR - LINE TOO LONG	A line being processed in the TFTP configuration file was longer than the HP Jetdirect print server could accept.
4A CF ERR - UNKNOWN KEYWORD	A TFTP configuration file line contained an unknown keyword.
4B CF ERR - MISSING PARAMETER	A line in the TFTP configuration file was missing a required parameter.
4C CF ERR - INVALID PARAMETER	A line in the TFTP configuration file contained an invalid value for one of the parameters on that line.
4D CF ERR - ACCESS LIST EXCEEDED	The TFTP configuration file specified too many access list entries using the "allow:" keyword.
4E CF ERR - TRAP LIST EXCEEDED	The TFTP configuration file specified too many trap destination list entries using the "trap-destination:" keyword.
4F TFTP REMOTE ERROR	The TFTP transfer of the configuration file from the host to the HP Jetdirect print server failed with the remote host sending a TFTP ERROR packet to the print server.

Table 8.9 Error Messages (9 of 10)

Error Code and Message	Description
50 TFTP LOCAL ERROR	The TFTP transfer of the configuration file from the host to the HP Jetdirect print server failed with the local print server encountering some form of inactivity timeout, or excessive retransmissions situation.
51 TFTP RETRIES EXCEEDED	The overall retrying of the TFTP transfer of the configuration file from the host to the HP Jetdirect print server has exceeded a retry limit.
52 BAD BOOTP/DHCP REPLY	An error was detected in the BOOTP or DHCP reply that the HP Jetdirect print server received. The reply either had insufficient data in the UDP datagram to contain the minimum BOOTP/DHCP header of 236 bytes, had an operation field that was not BOOTPREPLY(0X02), had a header field that did not match the print servers hardware address, or had a UDP source port that was not the BOOTP/DHCP server port (67/udp).
53 BAD BOOTP TAG SIZE	The tag size in a vendor specific field in the BOOTP reply is either 0, or greater than the remaining number of unprocessed bytes in the vendor specified area.
54 BOOTP/RARP IN PROGRESS	The HP Jetdirect print server is currently in the process of obtaining its basic IP configuration information through BOOTP/RARP.
55 BOOTP/DHCP IN PROGRESS	The HP Jetdirect print server is currently in the process of obtaining its basic IP configuration information through BOOTP/DHCP, and has not detected any errors.
56 DHCP NAK	The HP Jetdirect print server received a negative acknowledgement message from the DHCP server in response to a configuration request.
57 UNABLE TO CONNECT DHCP SVR	The HP Jetdirect print server had received IP parameters from a DHCP server, but communication with the DHCP server has been lost. Check status of the DHCP server. If an infinite lease was assigned, the print server will use the IP address of the most recent DHCP server used, but operation may be degraded until a DHCP server responds.
58 POSTSCRIPT MODE NOT SELECTED	The printer does not support AppleTalk or AppleTalk extensions.
59 INCOMPLETE F/W - MUST DOWNLOAD	Firmware download message. Currently downloading firmware to the HP Jetdirect print server, or the download did not complete properly.
5A TURN PRINTER OFF / ON	Firmware download message. Download of firmware is complete. Power cycle the HP Jetdirect print server.

Table 8.9 Error Messages (10 of 10)

Error Code and Message	Description
83 DISCONNECTING FROM SERVER	The server has been shut down because of a configuration change or reset request. This message automatically clears after a few seconds, unless the printer is offline, is in an error state, or is servicing another I/O port or another network protocol.
F1 TRYING TO CONNECT TO SERVER	The HP Jetdirect print server is trying to connect to the NetWare server(s). This is a normal message. Wait until either the connection is established or another status message appears.

TCP/IP Overview

Introduction

This appendix is intended to provide information to help you gain a basic understanding of TCP/IP.

Similar to a common language that people use to communicate with each other, TCP/IP (Transmission Control Protocol/Internet Protocol) is a suite of protocols designed to define the way computers and other devices communicate with each other over a network.

TCP/IP is rapidly becoming the most used set of protocols. The main reason this is happening is the fact that the internet is based on TCP/IP. If you have a network that you wish to connect to the internet, you must be using TCP/IP to communicate.

Internet Protocol (IP)

When information is sent across the network, the data is broken down into small packets. Each packet is sent independently of one another. Each packet is encoded with IP information, such as the IP address of the sender and receiver. IP packets can be routed over routers and gateways, devices that connect a network with other networks.

IP communications is connectionless. When IP packets are sent, there is no guarantee that they arrive at their destination in the proper sequence. That task can be performed by higher level protocols and applications thereby allowing IP communications to be efficient.

Each node or device that will communicate directly onto the network requires an IP address, including HP Jetdirect-connected devices.

Transmission Control Protocol (TCP)

TCP handles breaking the data into packets and recombining the packets on the receiving end by providing a connection-oriented, reliable, and guaranteed delivery service to another node on the network. When data packets are received at their destination, TCP calculates a checksum for each packet to verify the data is not corrupt. If the data in the packet has been corrupted during transmission, TCP discards the packet and requests that the packet be resent.

User Datagram Protocol (UDP)

UDP provides similar services to TCP. However, UDP does not acknowledge data receipt and supports request/reply transactions with no added reliability or guarantee of delivery. UDP is used when acknowledgment and reliability are not required, such as during a “discovery broadcast.”

IP Address

Every host (workstation or node) on an IP network requires a unique IP address for each network interface. This address is a software address that is used to identify both the network and specific hosts located on that network. Each IP address can be divided into two separate parts: the network portion and the host portion. It is possible for a host to query a server for a dynamic IP address each time the device boots-up (see the section “[Dynamic Host Configuration Protocol \(DHCP\)](#).”)

Note

When assigning IP addresses, always consult the IP address administrator. Setting the wrong address can disable other equipment operating on the network or interfere with communications.

IP Address: (Network Portion)

Network addresses are managed by an organization in Norfolk, Virginia recognized as InterNIC. InterNIC has been contracted by the National Science Foundation to manage the Internet addresses and domains. Network addresses are distributed to organizations that are in turn responsible for making sure all attached devices or hosts on the network are properly numbered. For more information on the network portion of an IP address, see “[IP Address Structure and Class](#)” and “[Subnets](#)” later in this appendix.

IP Address: (Host Portion)

Host addresses numerically identify specific network interfaces on an IP network. Usually a host has only one network interface; thus, only one IP address. Because no two devices can share the same number at the same time, administrators typically maintain address tables to assure correct assignment of addresses in the host network.

IP Address Structure and Class

An IP address is comprised of 32 bits of information and divided into 4 sections containing 1 byte each section or 4 bytes total:

xxx . xxx . xxx . xxx

For efficiency in routing, networks were broken down into three classes, so routing can begin simply by identifying the leading byte of information in the IP address. The three IP addresses that InterNIC assigns are class A, B, and C. The network class determines what each of the four IP address sections identify as shown in Table A.1:

Table A.1 IP Address Class Format

Class	First Address Byte xxx.	Second Address Byte xxx.	Third Address Byte xxx.	Fourth Address Byte xxx
A	Network.	Host.	Host.	Host
B	Network.	Network.	Host.	Host
C	Network.	Network.	Network.	Host

Explained in more detail in the table “[Network Class Characteristics](#),” you will see how each network class differs further by the leading bit identifier, the address range, the number of each type available, and the maximum number of hosts each class allows.

Table A.2 Network Class Characteristics

Class	Leading Bit Identifier	Address Range	Maximum number of networks in the class	Maximum hosts in the network
A	0	0.0.0.0 to 127.255.255.255	126	Over 16 Million
B	10	128.0.0.0 to 191.255.255.255	16,382	65,534
C	110	192.0.0.0 to 223.255.255.255	Over 2 Million	254

Configuring IP Parameters

TCP/IP configuration parameters (such as IP address, subnet mask, default gateway) can be configured on the HP Jetdirect print server in a variety of ways. These values can be configured manually (for example, through Telnet, the embedded web server, the arp and ping commands, and HP management software), or they can be automatically downloaded using DHCP or BOOTP each time the print server is turned on. For configuration methods, see [Chapter 3](#).

Note

If the HP Jetdirect print server is not configured with an IP address within two minutes after power on, a default value of 192.0.0.192 will be assigned. Because this address is not valid, it should be reassigned with a valid IP address.

Dynamic Host Configuration Protocol (DHCP)

DHCP allows a group of devices to use a set of IP addresses that are maintained by a DHCP server. The device or host sends a request to the server, and if an IP address is available, the server assigns it to that device.

BOOTP

BOOTP is a bootstrap protocol used to download configuration parameters and host information from a network server. BOOTP uses UDP for its transport. In order for devices to boot and load configuration information into RAM, they must communicate through the bootstrap protocol BOOTP as a client with their server.

To configure the device, the client broadcasts a boot request packet containing at least the hardware address of the device (HP Jetdirect print server hardware address). The server answers with a boot reply packet containing the information the device needs to configure.

Subnets

When an IP network address for a particular network class is assigned to an organization, no provision is made for more than one network being present at that location. Local network administrators use subnets to partition a network into several different subnetworks. Splitting a network into subnets can result in better performance and improved use of limited network address space.

Subnet Mask

The subnet mask is a mechanism used to divide a single IP network into several different subnetworks. For a given network class, a portion of an IP address that would normally be used to identify a node is used, instead, to identify a subnetwork. A subnet mask is applied to each IP address to specify the portion used for subnetworks, and the portion used to identify the node. For example, see [Table A.3](#).

Table A.3 Example: Subnet Mask 255.255.0.0 Applied to Class A Network

Class A Network Address	15	xxx	xxx	xxx
Subnet Mask	255	255	0	0
IP Address fields with Subnet Mask applied	Network	Subnet	Host	Host
Example of a node's IP Address on Subnet 1	15	1	25	7
Example of a node's IP Address on Subnet 254	15	254	64	2

As illustrated in [Table A.3](#), the Class A IP network address “15” has been assigned to company ABC. To allow additional networks at company ABC’s site, the subnet mask of 255.255.0.0 is used. This subnet mask specifies that the second byte of the IP address will be used to identify up to 254 subnets. Using this designation, each device is uniquely identified on its own subnet, but company ABC can incorporate up to 254 subnetworks without violating their assigned address space.

Gateways

Gateways (routers) are used to connect networks together. Gateways are devices that act as translators between systems that do not use the same communication protocols, data formatting, structures, languages, or architectures. Gateways repackage the data packets and change the syntax to match that of the destination system. When networks are divided into subnets, gateways are required to connect one subnet to another.

Default Gateway

The Default Gateway is the gateway or router that, if not specified, will be used to move packets between networks. It is specified by an IP address.

If multiple gateways or routers exist, then the default gateway is typically the address of the first, or nearest, gateway or router. If no gateways or routers exist, then the default gateway will typically assume the IP address of the network node (such as the workstation or HP Jetdirect print server).

Syslog Server

A syslog server is a system on the network (typically a UNIX system) that can receive and log syslog messages from other devices on the network. Syslog messages allow administrators to monitor status or troubleshoot network devices.

A syslog server requires software that provides syslog capabilities running on the server. UNIX systems provide a daemon, *syslogd*, that monitors User Datagram Protocol (UDP) port 514 for incoming messages. The messages are processed depending their priority and on how *syslogd* is set up to operate.

You can configure the HP Jetdirect print server with the syslog server's IP address. When a syslog server is configured, both the HP Jetdirect print server and attached device (such as a printer or mopier) can send syslog messages using UDP.

The syslog server may not receive all syslog events from the HP Jetdirect print server:

- UDP does not guarantee delivery of messages
- The HP Jetdirect print server attempts to eliminate duplicate messages (to minimize unnecessary network traffic)
- The volume of messages sent by the HP Jetdirect print server is configurable

Methods to configure HP Jetdirect syslog parameters include BOOTP, DHCP, Telnet, the embedded web server, and management software. For selected printers, an EIO menu accessed through the printer control panel provides limited syslog configuration. The syslog configuration command or parameter entries may vary depending on the method used. For more information, see the applicable sections in this guide.

Selected syslog parameters on the HP Jetdirect print server are listed in [Table A.4](#).

Table A.4 HP Jetdirect Syslog Parameters

Item	Description
Syslog Server IP address	IP address of a syslog server to send syslog messages to. If zero (0.0.0.0) or not specified, syslog messages are disabled.
Syslog Maximum Messages	The number of syslog messages that can be sent by the HP Jetdirect print server on a per-minute basis, from 0 to 1000. This parameter helps to control the syslog file size. The default is 10 messages per minute. If 0, the number of syslog messages is not restricted.
Syslog Priority	A method for filtering syslog messages that are sent to the syslog server. The range is 0 through 8, with 0 the most specific and 8 the most general. Only messages that are lower than the specified filter level (or higher in priority) are reported. The default is 8, messages of all priorities are sent. If 0, all syslog messages are disabled.
Syslog Facility	A code used to identify the source facility of a message (for example, to identify the source of selected messages during troubleshooting). By default, the HP Jetdirect print server uses LPR as the source facility code, but local user values of local0 through local7 can be used to isolate individual or groups of print servers.

Typical logfile entries of syslog messages are illustrated below:

```
Oct 22 08:10:33 jd08 printer: error cleared
Oct 22 15:06:07 jd04 printer: powered up
Oct 22 15:07:56 jd04 printer: offline or intervention needed
Oct 22 15:08:58 jd04 printer: error cleared
Oct 24 17:52:27 jd37 printer: powered up
Oct 24 18:28:13 jd37 printer: printer is disconnected
Oct 24 18:37:46 jd07 printer: error cleared
Oct 24 18:38:42 jd37 printer: powered up
Oct 25 07:50:16 jd04 printer: toner/ink low
```


Using the Embedded Web Server

Introduction

HP Jetdirect print servers contain an embedded web server that can be accessed from a compatible web browser over an intranet. The embedded web server provides access to configuration and management pages for the HP Jetdirect print server and the attached network device (such as a printer or multifunction, all-in-one device).

Because the network device may also contain an embedded web server, the Home page initially displayed by the browser will depend on the device:

- If the device contains a supportable embedded web server, the device's Home page will be displayed.
- If the device does not contain a supportable embedded web server, the Home page of the HP Jetdirect print server is displayed. A typical Home page displayed by the HP Jetdirect print server (firmware version x.21.01 or greater) is illustrated in [Figure B.1](#). For more information on the HP Jetdirect Home page, see "[HP Jetdirect \[Home\] Tab](#)".

[HP Jetdirect \[Home\] Tab](#)

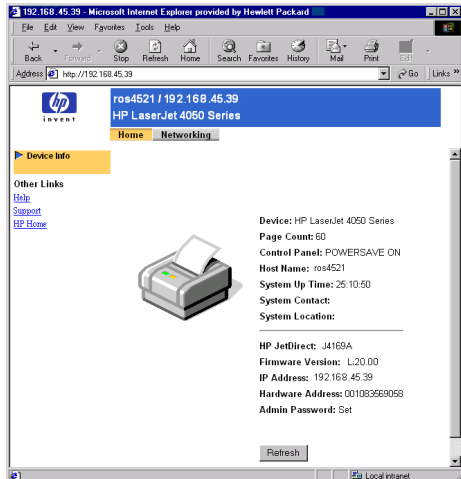


Figure B.1 Typical HP Jetdirect Home Page

A Networking tab, (see [Figure B.2](#)) provides access to network status and configuration pages on the HP Jetdirect print server.

HP Jetdirect [\[Networking\] Tab](#)

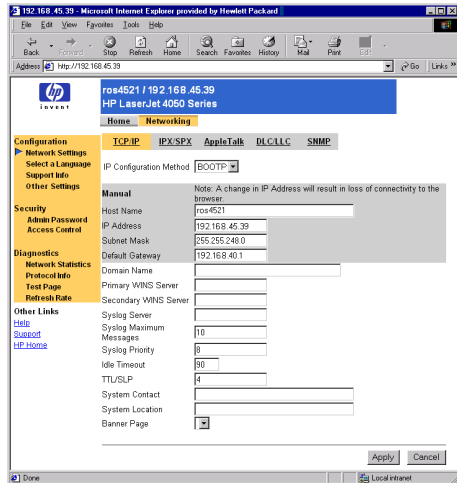


Figure B.2 HP Jetdirect [Networking] Tab Pages

For network parameter descriptions, see [“\[Networking\] Tab”](#).

Requirements

Compatible Web Browsers

The embedded web server has been tested with the following web browsers:

- Windows 95/98 and NT 4.0:
 - Netscape Navigator 4.6x, 4.7x, 6.0
 - Microsoft Internet Explorer 5.0, 5.01, 5.5
- Windows Me
 - Netscape Navigator 4.6x, 4.7x, 6.0
 - Microsoft Internet Explorer 5.0, 5.5
- Windows 2000:
 - Netscape Navigator 4.6x, 4.7x, 6.0
 - Microsoft Internet Explorer 5.0, 5.5
- Mac OS 8, 9
 - Netscape Navigator 4.6x, 4.7x, 6.0
- HP-UX 10.20 and Solaris 2.5x, 2.6, 7, 8
 - Netscape Navigator 4.7x, 6.0
- HP-UX 11.0
 - Netscape Navigator 4.72 - 4.75, 6.0
- Linux System
 - Netscape Navigator 4.6x, 4.7x, 6.0

For the latest list of compatible web browsers, visit HP's Customer Care Online (<http://www.hp.com/go/support>).

Supported HP Web JetAdmin Version

HP Web JetAdmin is a printer installation and management application for intranets and is available from HP Customer Care Online (http://www.hp.com/support/net_printing).

HP Web JetAdmin version 6.1 or greater is recommended for operation with the HP Jetdirect embedded web server.

Viewing the Embedded Web Server

Before you can use the embedded web server, the HP Jetdirect print server must be configured with an IP address. For a description of an IP address and an overview of TCP/IP networking, see [Appendix A](#).

There are many ways to configure an IP address on the print server. For example, you can automatically configure IP parameters over the network using BOOTP (Bootstrap Protocol) or DHCP (Dynamic Host Configuration Protocol) each time the printer is turned on. Or, you can manually configure IP parameters using the printer's control panel (for selected printers), Telnet, the "arp" and "ping" commands, HP Web JetAdmin or other management software. For more information on TCP/IP configuration options, see [Chapter 3](#).

If the HP Jetdirect print server does not receive its IP configuration within two minutes, a default IP address is automatically assigned: 192.0.0.192. This address is not a valid IP address for your network but can be used to initially access the HP Jetdirect print server. However, to use the default IP address, you must temporarily set up your system with the same IP network number or establish a route to the print server.

After an IP address is established on the print server, perform the following steps:

1. Run a supported web browser.
2. Enter the IP address of the print server as the URL.

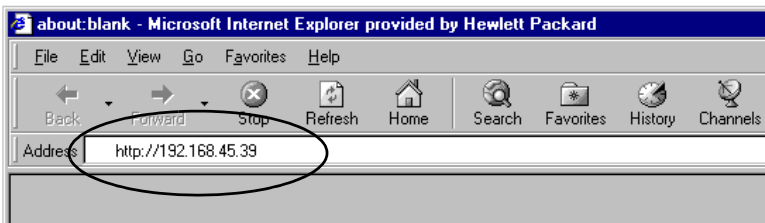


Figure B.3 Entering the IP Address

The embedded web server's Home page will be displayed.

Home, Device, and Networking Tabs

The embedded web server provides several tabs to access related features: [Home], [Device], and [Networking]. Each tab provides menu item links (on the left side of the page) to additional web pages.

- [Home] tab: As previously described, the [Home] tab displays the home page of either the HP Jetdirect print server or the attached device, depending on the capabilities of the attached device. For more information, see [HP Jetdirect \[Home\] Tab](#).
- [Device] tab: The [Device] tab is available only if the attached device contains its own embedded web server that is supported and accessible by the HP Jetdirect print server. Device page features are device dependent (see the Device page help system or related documentation).
- [Networking] tab: The [Networking] tab provides access to network configuration parameters. See [\[Networking\] Tab](#) for a description of the available networking menu pages.

These pages may also provide additional links. For more information, see [Other Links](#).

Operating Notes

- If you enter or change a configuration parameter value, click **Apply** to enable your change, or click **Cancel** to erase your change.
- Changes to the IP address will close the connection to the embedded web server. To re-establish a connection, use the new IP address.

CAUTION Changes to the IP address on the HP Jetdirect print server will result in printing failures for clients that have been configured to print through this print server.

-
- Novell NetWare networks: The embedded web server supports configuration parameters for Queue Server Mode under NDS (Novell Directory Services) only. NetWare Bindery and RPrinter Mode configuration are not supported. To access NetWare configuration parameters, click the **IPX/SPX** button on the Networking page.

Note For a Novell NetWare network, you cannot create the NDS print server, printer, and queue objects using the embedded web server. To create these objects, use other available tools or utilities.

HP Jetdirect [Home] Tab

The [Home] tab will display the HP Jetdirect Home page if the attached device's embedded web server cannot be accessed. The HP Jetdirect Home page displays a generic printer graphic to represent the attached device. The HP Jetdirect print server's product model, firmware version, and network addresses are displayed along with any device information that can be retrieved. [Table B.1](#) provides a summary of the items displayed on the HP Jetdirect Home page.

Table B.1 HP Jetdirect Home Page Items (1 of 2)

Item	Description
Home tab	Displays either the HP Jetdirect home page, or the home page of the attached network device if it can be accessed.
Device tab	Appears only if the attached network device (such as the printer or multifunction all-in-one device) contains a supported embedded web server. It provides access to the device's web pages and features.
Networking tab	Provides access to network configuration, security, and diagnostic parameters. For more information, see [Networking] Tab .
Device Info	Identifies the device (such as the model name of the printer or multifunction all-in-one device) connected to the network via the HP Jetdirect print server. Other information that can be retrieved from the device are also displayed (such as Page Count, or Control Panel status).
Select Language	Appears if the HP Jetdirect web pages support multiple languages. Supported languages may also be selected through language preference settings in your browser (see your browser's Help).
Web Scan	Runs the Web Scan server on the HP Jetdirect print server if it supports the attached network device and is enabled. Web Scan allows you to perform a simple scan from the device using your web browser. A scan-to-email configuration option is provided.
Host Name	Specifies the IP host name assigned to the device and stored on the HP Jetdirect print server. See TCP/IP on the [Networking] Tab .
System Up Time	The length of time since either the HP Jetdirect print server or the network device was last power cycled.

Table B.1 HP Jetdirect Home Page Items (2 of 2)

Item	Description
System Contact	A text string (stored on the HP Jetdirect print server) for the name of a person to contact for this device. See TCP/IP on the [Networking] Tab .
System Location	A text string (stored on the HP Jetdirect print server) that identifies the physical location of this device. See the Networking TCP/IP configuration pages.
HP Jetdirect	The product number of the HP Jetdirect print server (for example HP J4169A).
Firmware Version	The version of the operating instructions installed on the HP Jetdirect print server.
IP Address	The Internet Protocol address configured on the HP Jetdirect print server. For general information on IP addresses, see Appendix A .
Hardware Address	The LAN hardware (or MAC, Media Access Control) address of the HP Jetdirect print server. This unique address is assigned by Hewlett-Packard.
Admin Password	Specifies whether or not an administrative password has been set. This password may also be configured through a Telnet session with the HP Jetdirect print server. Use the "Admin Password" page to set or clear administrative passwords. If an administrative password has been set, you will be prompted for a User Name and Password to access network parameters. For more information, click Help, or see the Admin Password section in this guide.

[Networking] Tab

The Networking page provides access to HP Jetdirect network configuration parameters and status.

Network Settings

The Network Settings pages allow you to set or change configuration parameters for TCP/IP, IPX/SPX, AppleTalk, DLC/LLC, and SNMP protocols. To assign a parameter setting, enter the desired value and click **Apply**.

TCP/IP

The TCP/IP page provides configuration parameters summarized in [Table B.2](#).

Table B.2 TCP/IP Settings (1 of 3)

Item	Description
IP Configuration Method	Selects the method that the HP Jetdirect print server will receive its IP configuration parameters: BOOTP (default), DHCP, or Manual. For BOOTP or DHCP, the IP parameters will be automatically configured by a BOOTP or DHCP server each time the print server is powered on. If you select "Manual", then basic IP parameters can be manually entered using this web page, or using other available tools (see Chapter 3 .)
Host Name	Specifies a readable IP name (the SNMP SysName object) for the network device. The name must start with a letter and can end in a letter or number, up to 32 ASCII characters.
IP Address	Use this field to manually assign the Internet Protocol address on the HP Jetdirect print server. The IP address is a four byte (32-bit) address in the form "n.n.n.n", where 'n' is a number from 0 to 255. An IP address uniquely identifies a node on a TCP/IP network. Duplicate IP addresses on a TCP/IP network are not allowed. For more information on IP addresses, see Appendix A .

Table B.2 TCP/IP Settings (2 of 3)

Item	Description
Subnet Mask	<p>If subnetting is used, use this field to manually assign a subnet mask. A subnet mask is a 32-bit number that, when applied to an IP address, determines which bits specify the network and subnet, and which bits uniquely specify the node.</p> <p>For more information on subnet masks, see Appendix A.</p>
Default Gateway	<p>Identifies the IP address of a router or computer that is used to connect to other networks or subnetworks.</p>
Domain Name	<p>Specifies the name of the Domain Name System (DNS) domain that the HP Jetdirect print server resides in (for example, support.hp.com). It does not include the host name-it is not the Fully Qualified Domain Name (such as printer1.support.hp.com).</p>
Primary WINS Server	<p>Specifies the IP address of the primary Windows Internet Naming Service (WINS) server. The WINS server provides IP address and name resolution services for network computers and devices.</p>
Secondary WINS Server	<p>Specifies the IP Address to be used for WINS if the primary WINS Server is unavailable.</p>
Syslog Server	<p>Specifies the IP address of a host computer that is configured to receive syslog messages from the HP Jetdirect print server. If a Syslog Server is not specified, syslog messages are disabled.</p> <p>For more information, see Appendix A.</p>
Syslog Maximum Messages	<p>Specifies the maximum number of syslog messages that can be sent by the HP Jetdirect print server on a per-minute basis. This setting allows administrators to control the log file size. The default is 10 per minute. If set to zero, no maximum number is defined.</p>
Syslog Priority	<p>Controls the filtering of syslog messages that are sent to the syslog server. The filter range is 0 to 8, with 0 being the most specific and 8 being the most general. Only messages that are lower than the filter level specified (that is, higher in priority) are reported. The default value is 8 which reports all syslog messages. A value of zero effectively disables syslog reporting.</p>

Table B.2 TCP/IP Settings (3 of 3)

Item	Description
Idle Timeout	Specifies the number of seconds that an idle connection is allowed to remain open. Up to 3600 seconds can be set. 270 is the default value. If set to 0, the timeout is disabled and TCP/IP connections will remain open until closed by the device at the other end of the network (for example, a workstation).
TTL/SLP	Specifies the IP multicast Time To Live (TTL) discovery setting for Service Location Protocol (SLP) packets. The default value is 4 hops (the number of routers from the local network). The range is 1-15. If set to -1, multicast capability is disabled.
System Contact	Identifies a person who is assigned to administer or service this device. This field may include a phone number or similar information. When configured, this parameter will be displayed on the HP Jetdirect Home page.
System Location	Specifies the physical location of the device or related information. Only printable ASCII characters are allowed, up to 64 characters. When configured, this parameter will be displayed on the HP Jetdirect Home page.
Banner Page	Specifies whether to enable or disable printing of an LPD banner page for print jobs. For HP Jetdirect external print servers that provide multiple ports, you can configure each port. For internal print servers, only a single port is available (Port 1).

IPX/SPX

The IPX/SPX tab allows you to configure IPX/SPX (Internet Packet Exchange/Sequenced Packet Exchange) parameters on the HP Jetdirect print server for operation on a Novell NetWare or IPX/SPX-compatible network (such as a Microsoft network). See [Table B.3](#) for a description of items on this page.

CAUTION If you are using direct-mode printing over IPX/SPX on a Microsoft network, **do not** disable IPX/SPX.

Note

For a Novell NetWare network:

- The embedded web server supports Queue Server Mode in a Novell Directory Services (NDS) environment only,
 - You cannot create the NDS print server, printer, and queue objects using the embedded web server. To create these objects, use other available tools or utilities.
-

Table B.3 IPX/SPX Settings (1 of 2)

Item	Description
IPX/SPX Enable	Enables or disables the IPX/SPX protocols on the HP Jetdirect print server. If the checkbox is empty, IPX/SPX is disabled.
IPX/SPX Frame Type	<p>Specify the Novell NetWare frame type to be used by the HP Jetdirect print server on your network. After a frame type has been configured, all others will be counted and discarded.</p> <ul style="list-style-type: none"> ● AUTO (default) senses all frame types and configures the first one detected. ● EN_8023 limits the frame type to IPX over IEEE 802.3 frames. ● EN_II limits the frame type to IPX over Ethernet frames. ● EN_8022 limits the frame type to IPX over IEEE 802.2 with IEEE 802.3 frames. ● EN_SNAP limits the frame type to IPX over SNAP with IEEE 802.3 frames. ● TR_8022 limits the frame type to IPX over IEEE 802.2 LLC with IEEE 802.5 frames. ● TR_SNAP limits the frame type to IPX over SNAP with IEEE 802.5 frames.
SAP Interval	Specifies the time interval (in seconds) that the HP Jetdirect print server waits to send Service Advertising Protocol (SAP) messages, which are broadcast to advertise its service capabilities on a Novell NetWare network. To disable SAP messages, use the value "0".
Print Server Name	Specify a NetWare printer name for the HP Jetdirect print server (alphanumeric characters only). The default name is NP xxxxxx, where xxxxxx are the last six digits of the HP Jetdirect print server's LAN hardware (MAC) address.
NDS Tree Name	Specify the name of the NDS tree for this device. The NDS (Novell Directory Services) tree name refers to the name of the organizational tree used by your network. To disable NDS support, leave this field blank.

Table B.3 IPX/SPX Settings (2 of 2)

Item	Description
NDS Context	<p>To disable NDS support, leave this field blank.</p> <p>The print server's NDS context refers to the NDS container or organizational unit that contains the print server object. Print queue and device objects can be located anywhere within the NDS tree, but the HP Jetdirect print server must be configured with the fully-qualified print server object name.</p> <p>For example, if the print server object is found in the container "marketing.mytown.lj" and the print server object name is "lj_pserver", the fully qualified print server context name (CN) is: "CN=lj_pserver.OU=marketing.OU=mytown.O=lj" (where OU is an Organization Unit container and O is an Organization container within the NDS tree).</p> <p>Note: NDS objects cannot be created by the embedded web server.</p>
Job Poll Interval	Specifies the time interval (seconds) that the HP Jetdirect print server will wait to check for print jobs in a print queue.
PJL Configuration	<p>For Printer Job Language (PJL) parameters, enable (check) or disable (clear) the parameters provided:</p> <ul style="list-style-type: none">● Banner Pages (for printing separator pages between print jobs)● End-Of-Job Notification (if received from the printer, an end-of-job message will be forwarded to a client application)● Toner Low Notification (if received from the printer, the HP Jetdirect print server will forward a "toner low" message to a client application)

AppleTalk

Using the checkbox provided, you can enable (check) or disable (clear) the AppleTalk protocol on the HP Jetdirect print server. If AppleTalk is enabled, AppleTalk parameter settings stored on the print server are displayed.

Note

The AppleTalk parameters displayed include the AppleTalk printer types that are advertised on the network.

The HP Jetdirect print server supports AppleTalk Phase 2 only.

DLC/LLC

Using the checkbox provided, you can enable (check) or disable (clear) the DLC/LLC (Data Link Control/Logical Link Control) protocols on the HP Jetdirect print server. If the checkbox is clear, DLC/LLC protocols are disabled.

SNMP

You can specify or change the SNMP (Simple Network Management Protocol) parameters provided. See [Table B.4](#).

Table B.4 SNMP Settings

Item	Description
Set Community Name	An SNMP Set Community Name is a password to be able to configure (or “write” to) SNMP control functions on the HP Jetdirect print server. An incoming SNMP SetRequest must contain a community name that matches the one stored on the print server before the print server will respond. The community name must be ASCII characters and can be up to 255 characters long. The default community name is 'public'.
Get Community Name	An SNMP Get Community Name is a password that allows “read” access to SNMP information on the HP Jetdirect print server. The community name must be ASCII characters and can be up to 255 characters long. The default community name is 'public'.

Select Language

This link appears if the HP Jetdirect web pages support multiple languages. Supported languages may also be selected through language preference settings in your browser (see your browser’s Help).

Support Info

Use this page to configure links for Support assistance. You can designate a Support person and phone number of an administrator for this device, as well as URL addresses for web-based product and technical support.

USB Settings

If the HP Jetdirect print server provides a USB connection to the network device (such as a USB printer), a link to USB configuration parameters will be displayed.

Other Settings

Select “Other Settings” to enable or disable additional parameters for management and printing (see [Table B.5](#)).

Table B.5 TCP/IP Advanced Settings

Item	Description
SLP Config	Enable or disable SLP (Service Location Protocol), used by selected client application software to automatically discover and identify the HP Jetdirect print server.
Telnet Config	Enable or disable access to HP Jetdirect configuration parameters using Telnet. For more information, see Chapter 3 .
9100 Config	Enable or disable port 9100 services. Port 9100 is an HP-proprietary raw TCP/IP port on the HP Jetdirect print server and is the default port for printing. It is accessed by HP software (for example, the HP Standard Port).
FTP Printing	Enable or disable File Transfer Protocol services available on the HP Jetdirect print server for printing. For more information, see Chapter 5 .
LPD Printing	Enable or disable the Line Printer Daemon services on the HP Jetdirect print server. LPD on the HP Jetdirect print server provides line printer spooling services for TCP/IP systems. For more information, see Chapter 4 .
IPP Printing	Enable or disable the Internet Printing Protocol on the HP Jetdirect print server. If the printer is properly connected and accessible, IPP allows printing to this device over the Internet (or intranet). A properly configured IPP client system is also required (see Chapter 2).
Email (SMTP) Server	Specify the IP address of the preferred outgoing e-mail Simple Mail Transport Protocol (SMTP) server, for use with supported Scan devices.

Admin Password

For controlled access to configuration and status information through the embedded web server and Telnet, use this page to set an Administrative password. If a password is set, you will be prompted for a user name and this password to access the HP Jetdirect web pages.

Access Control

This page allows you to create a host access list on the HP Jetdirect print server. A host access list specifies individual host systems, or networks of host systems, that will be allowed to access the print server and the attached network device. Up to 10 entries can be included on the host access list. If the list is empty (no hosts are listed), any supported system can access the print server.

CAUTION Use caution when using this feature. You may lose your ability to communicate with the HP Jetdirect print server if your system is improperly specified in the list.

For use of the host access list as a security feature, see [Chapter 6](#).

Host systems are specified by their IP addresses or network number. If the network contains subnets, a “mask” may be used to identify whether the IP address designates an individual host system or a group of host systems.

Examples. See the table of sample entries below.:

IP Address	Mask	Description
192.0.0.0	255.0.0.0	Allow all hosts with network number 192.
192.1.0.0	255.1.0.0	Allow all hosts on network 192, subnet 1.
192.168.1.2		Allow the host with IP address 192.168.1.2. The Mask 255.255.255.255 is assumed and is not required.

To clear all entries in the host access list, enable the “Clear Allow Table” checkbox and click **Apply**.

To add an entry into the host access list, use the “IP address” and “Mask” fields to specify a host, then click **Apply**.

Network Statistics

This page is used to display counter values and other status information currently stored on the HP Jetdirect print server. This information is often useful to diagnose performance and operational problems associated with the network or network device.

Protocol Info

This page provides a list of various network configuration settings on the HP Jetdirect print server for each protocol. Use these lists to validate your desired settings.

Test Page

This page provides a view of the HP Jetdirect Configuration Page that contains a summary of HP Jetdirect status and configuration information. The contents of this page are described in [Chapter 8](#).

Refresh Rate

The refresh rate is the time period (in seconds) that the diagnostic pages will be automatically updated. The value '0' disables the refresh rate.

Other Links

Support

The information displayed on the Support page depends on the values configured in the [Support Info](#) page. Support information may include the name and telephone number of a Support person, or web links to Product and Technical Support pages. The default web links include HP Customer Care Online and HP Product information web pages (Internet access is required).

HP Web JetAdmin

HP Web JetAdmin is HP's premier network peripheral management software tool.

If the HP Jetdirect print server (and associated network device) has been discovered through HP Web JetAdmin, a link to HP Web JetAdmin will be provided. You can then use HP Web JetAdmin to provide enhanced management capabilities for this and other HP Jetdirect-connected devices on your network.

HP Home

HP Home provides a link to Hewlett-Packard's home page on the HP web site (Internet access is required). This link may also be accessed by clicking on the HP logo.

Help

The HP Jetdirect Help page provides a quick summary of the HP Jetdirect embedded web server features.

The HP Jetdirect EIO Control Panel Menu

Introduction

When supported by the printer, the HP Jetdirect EIO internal print server contains a configuration menu that can be accessed from the printer's control panel. The keystrokes to access this menu from the printer control panel depends on the printer. Refer to the printer manuals for more information.

Note On printer control panels that provide a graphical interface, the EIO menu items and network configuration parameters may not be accessible as described below. To access these parameters, you may need to refer to your printer control panel documentation.

As described in [Table C.1](#), the HP Jetdirect EIO control panel menu allows you to enable or disable network protocols, and configure selected network parameters. On the control panel display, an asterisk (*) is used to identify the selected value.

Table C.1 HP Jetdirect EIO Control Panel Menu (1 of 2)

Jetdirect Internal Print Server Menu Item	Description
CFG NETWORK=NO*	<p>Selects whether or not you want to access the Jetdirect menu.</p> <p>NO* (default): Bypass the HP Jetdirect menu.</p> <p>YES*: Access the HP Jetdirect menu. You must change this to YES* each time you want to access the menu.</p>
IPX/SPX=ON* DLC/LLC=ON* TCP/IP=ON* ATALK=ON*	<p>Identifies whether the protocol stack is enabled or disabled.</p> <p>ON* (default). The protocol is enabled.</p> <p>OFF*: The protocol is disabled.</p>
CFG IPX/SPX=NO*	<p>Selects whether you want to access the IPX/SPX menu and set IPX/SPX protocol parameters.</p> <p>NO* (default): Bypass the IPX/SPX menu items.</p> <p>YES*: Access the IPX/SPX menu items.</p> <p>In the IPX/SPX menu, you can specify the <i>Frame Type</i> parameter used on your network.</p> <ul style="list-style-type: none"> ■ AUTO (default) will automatically set and limit the frame type to the first one detected. ■ For Ethernet cards, frame type selections include EN_8023, EN_II, EN_8022, EN_SNAP. ■ For Token Ring cards, frame type selections include TR_8022, TR_SNAP. <p>In the IPX/SPX menu for Token Ring cards, you can also specify <i>NetWare Source Routing</i> parameters, which include SRC RT=AUTO (default), OFF, SINGLE R, or ALL RT.</p>

Table C.1 HP Jetdirect EIO Control Panel Menu (2 of 2)

Jetdirect Internal Print Server Menu Item	Description
CFG TCP/IP=NO*	<p>Selects whether you want to access the TCP/IP menu and set TCP/IP protocol parameters.</p> <p>NO* (default): Bypass the TCP/IP menu items. YES*: Access the TCP/IP menu items.</p> <p>In the TCP/IP menu, you can specify BOOTP=YES* or DHCP=YES* for TCP/IP parameters to be automatically configured by a BootP or DHCP server when the printer is turned on.</p> <p>If you specify BOOTP=NO* and DHCP=NO*, you can manually set the following TCP/IP parameters from the control panel:</p> <ul style="list-style-type: none"> ■ Each byte of the IP address (IP) ■ Subnet Mask (SM) ■ Syslog Server (LG) ■ Default Gateway (GW) ■ Idle Timeout period (default is 270 seconds, 0 disables the timeout) <p>Print a Jetdirect configuration page to verify your settings. However, note that the print server may overwrite selected parameters with values that ensure proper operation.</p>
CFG LINK=NO*	<p>Selects whether you want to manually configure the HP Jetdirect 10/100Base-TX print server's network link speed and communication mode. The Jetdirect settings must match the network.</p> <p>NO* (default): Bypass the link configuration menu items. YES*: Access the link configuration menu items.</p> <p>One of the following link configuration can be set:</p> <p>AUTO* (default): The print server will automatically configure itself to match the network's link speed and communication mode.</p> <p>10T HALF*: 10Mbps, half-duplex operation. 10T FULL*: 10 Mbps, full-duplex operation. 100T HALF*: 100 Mbps, half-duplex operation 100T FULL*: 100 Mbps, full-duplex operation</p>

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