PS Admin program

User's Guide

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About This Guide

This *User's Guide* describes the operation of the *PS Admin* program, which can be used to conveniently configure and manage your print server from any personal computer running the Windows 3.1x, Windows for Workgroups 3.11, Windows NT 3.51, Windows NT 4.0 or later, or Windows 95 or later operating systems. Once your print server is configured, you can use it for printing from any Novell NetWare, TCP/IP, AppleTalk, or Microsoft network.

This *Guide* also describes the `telnet` interface, which you can use to configure your print server without the use of a Windows-based PC.

What's Not Covered in This User's Guide

This User's Guide concentrates on the software setup and management of your print server. Information about how to connect the print server to the network, to power, and to your printer(s), is covered in the print server's hardware *User's Guide*.

Contents of the User's Guide

This User' s Guide is divided into three parts:

♦ Part I gives an overview of your print server and of the Windows-based *PS Admin* program you can use to manage it.

♦ Part II covers the initial steps you will need to take to set up your print server, configure it for printing from various network systems, and allow client workstations to use it to print documents.

♦ Part III covers daily administration tasks, how to troubleshoot problems with your print server, and how to use the telnet interface.

Introduction

This chapter introduces the printing and administration features of the print server products, and of the *PS Admin* program that you can use to set up and administer print server.

Background on Print Servers

Before personal computer networking became common, users who wanted to print from their personal computers needed to have a directly-connected printer. As laser printers became common, it became too expensive for each user to have a dedicated printer, and some form of print sharing became even more necessary.

The simplest form of print sharing involves a switch box:
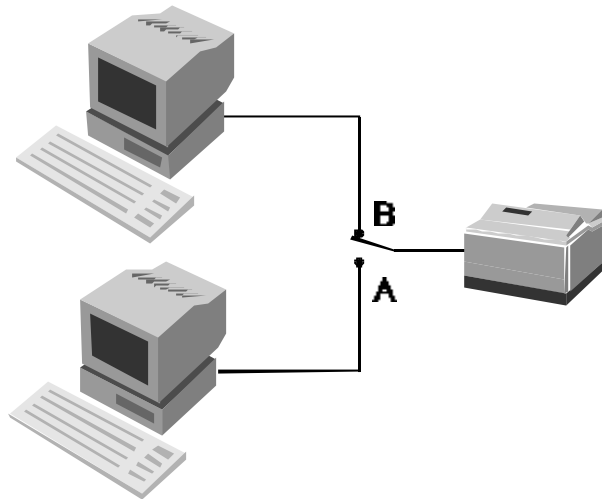
A switch box can make it more convenient for two or more users to share a single printer, but it requires long print cables unless the two users are close together. The users also have to coordinate their printing, which becomes difficult if more than two computers share a printer.

Server-based network operating systems (such as Novell NetWare) make it possible for a larger number of users to share printers. When a workstation user prints a document, network software on the workstation takes a file of instructions for the printer and stores them in a *print queue* on the server. The server takes each job in the print queue and sends it to the printer, which is either attached to the server itself or to one of the workstations on the network.
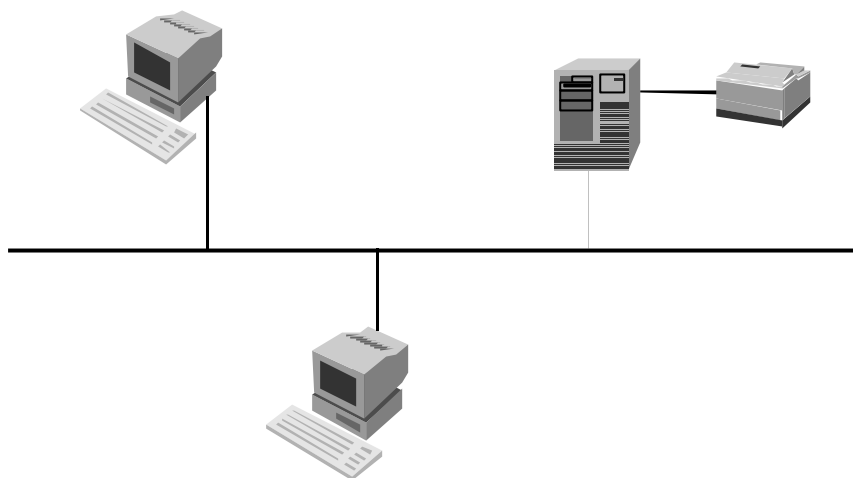
This arrangement allows a large number of people to share printers, and makes it possible to centrally manage the printers and their print queues.

This method has several disadvantages, however:

♦ It increases the load on the file server.

♦ The file server has a limited number of printer ports available.

♦ If printers are attached to the file server, then they have to be located near the server instead of near the users, which may be inconvenient.

♦ If printers are attached to user workstations, then print jobs will be delayed or printed more slowly as they are sent to the workstation. The remote printer software used on the workstation may also be incompatible with other software used on the workstation.

Print server devices such as the multi-protocol network print servers make network printing more practical, because:

♦ Network print servers can be located anywhere on the network, making it easy to place printers near the people who will be using them.

♦ It is easy to centrally manage network print servers.

♦ The load on network servers is reduced.

♦ Multi-protocol print servers make it possible for printers to be shared by people using different network operating systems.

Print Server Administration Features

The print servers can be centrally administered using the *PS Admin* program, making it convenient to manage all of your print servers from a single Windows-based interface. *PS Admin* features include:

♦ Allows setup and modification of parameters for the server's printer ports, the server itself and for the NetWare (IPX/SPX), Microsoft Networking (NetBEUI), TCP/IP, and AppleTalk protocols.

♦ Allows administrators to view the status of each of the server's printer ports, including the printer status display if the printer supports PJL (Printer Job Language).

♦ Can display server statistics and status for troubleshooting purposes.

♦ Provides a convenient interface for setting up Novell NetWare 3.*x* servers (and 4.*x* servers in Bindery Emulation mode).

♦ Allows the print server's internal software to be conveniently upgraded to a new version.

In addition to *PS Admin* server based administration, print servers also support a `telnet`-based interface for networks that do not use Windows-based personal computers. This interface supports viewing and modifying all server, port, TCP/IP, and AppleTalk-related settings.

Network administrators using the industry-standard SNMP network management protocol can also monitor the print server from any network management console.

Installing and Starting the PS Admin Program

This chapter lists the requirements that your computer system should meet before you can install *PS Admin*, tells how to install the program, and how to start it.

System Requirements

We recommend that your system meet the following requirements to be able to use the *PS Admin* program:

◆ A PC-compatible computer with a 486 or faster processor

◆ One of the following Windows operating systems:

◊ Microsoft Windows version 3.1*x*

◊ Microsoft Windows for Workgroups version 3.11

◊ Microsoft Windows 95 or later

◊ Microsoft Windows NT 3.51, 4.0 or later.

◆ 8 megabytes of main memory (RAM)

◆ At least 16 megabytes of free hard disk space

◆ A Windows-compatible mouse or other pointing device

◆ An Ethernet/Fast Ethernet network card with appropriate drivers (either NDIS or ODI)

You should also check your computer's settings:

♦ If you are using a screen resolution larger than 640 x 480 (standard VGA), the *PS Admin* display will look best if you use a "Small Fonts" setting.

♦ You need to have the IPX network protocol and the Novell NetWare client services enabled or TCP/IP network protocol enabled. *PS Admin* uses the IPX and/or TCP/IP protocol for communicating with the print server.

You only need to have one workstation that meets the above requirements. It is not necessary to run the *PS Admin* program on every workstation. Ordinary network stations will still be able to print to your print server.

If you will only be using TCP/IP (UNIX) and/or AppleTalk protocols, you can use the telnet interface instead of the Windows-based *PS Admin*. For more information about using the telnet interface, see the *Appendix: Telnet Interface Administration* section.

NOTE: *The following contains important information about what steps need to be taken to prepare your system before the PS Admin program can be installed for IPX protocol environment.*

Windows 95/98/Me

Make sure the Windows 95/98/Me desktop appears and no application programs are running. Then follow these steps:

*1. Click **Start**.*

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2. *Choose **Settings**.*

3. *Choose **Control Panel**.*

4. *Double-click **Network**.*

5. *Click the **Configuration** tabbed panel.*

6. *Click **Add**.*

7. *Choose **Protocol** if you have not already added the IPX network protocol from the **Select Network Component Type** window.*

8. *Click **Add**.*

9. *Select **Microsoft** from the list of Manufacturers in the **Select Network Protocol** window.*

10. *Select **IPX/SPX-compatible Protocol** from the list of Network Protocols in the **Select Network Protocol** window.*

11. *Click **OK** to enable the protocol.*

You also need to add the Novell NetWare client services if you have not done so already.

1. *Follow steps one through six above.*

2. *Select **Client** from the **Select Network Component Type** window.*

3. *Click **Add**.*

4. *Select **Microsoft** from the list of Manufacturers in the **Select Network Client** window.*

5. *Select **Client for NetWare Networks** from the list of Network Clients in the **Select Network Client** window.*

6. *Click **OK** to enable Novell NetWare client services.*

Windows NT 4.0 Server

Make sure the Windows NT desktop appears and no application programs are running. Then follow these steps:

1. *Click **Start**.*

2. *Choose **Settings**.*

3. *Choose **Control Panel**.*

4. *Double-click **Network**.*

5. *Click the **Services** tabbed panel.*

6. *Click **Add**.*

7. *Choose **Gateway (and Client) Services for NetWare** if you have not already added it from the **Select Network Service** window.*

8. *Click **OK**.*

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9. *Enter the NT source path in the* **Windows NT Setup** *dialog box.*

10. *Click* **Continue**.

It is also necessary to add the IPX network protocol before the PS Admin program can be installed.

1. *Follow steps one through six above.*

2. *Choose* **RIP for NWLink IPX/SPX compatible transport** *under Network Service in the* **Select Network Service** *window.*

3. *Click* **OK**.

4. *Enter the NT source path in the* **Windows NT Setup** *dialog box.*

5. *Click* **Continue**.

6. *Click* **No** *in the* **RIP for NWLink IPX Configuration** *window.*

7. *Click* **Close** *in the* **Network** *window.*

8. *Restart the computer by clicking* **Yes** *in the* **Network Settings Change** *window. This will allow your changes to take effect.*

Windows NT 4.0 Workstation

Make sure the Windows NT desktop appears and no application programs are running. Then follow these steps:

*1. Click **Start**.*

*2. Choose **Settings**.*

*3. Choose **Control Panel**.*

*4. Double-click **Network**.*

*5. Click the **Services** tabbed panel.*

*6. Click **Add**.*

*7. Choose **Client Services for NetWare** if you have not already added it from the **Select Network Services** window.*

*8. Click **OK**.*

*9. Enter the NT source path in the **Windows NT Setup** window.*

*10. Click **Continue**.*

*11. Click **Close**.*

*12. Restart the computer by clicking **Yes** in the **Network Settings Change** window. This will allow your settings to take effect.*

Windows NT 3.51 Workstation and Server

Go to the Windows NT main window by double-clicking the Main window icon. Make sure no application programs are running. Then follow these steps:

1. *Double-click **Control Panel**.*

2. *Double-click **Network**.*

3. *Click **Add Software** in the **Network Settings** window.*

4. *Select **Client Service for NetWare** from the Network Software list in the **Add Network Software** window if you have not already added Novell NetWare client services.*

5. *Click **Continue**.*

6. *Enter the NT source path in the **Windows NT Setup** dialog box.*

7. *Click **Continue**.*

8. *Click **Add Software** in the **Network Settings** window if you have not already added the IPX/SPX protocol.*

9. *Select **NWLink IPX/SPX Compatible Transport** from the Network Software list in the **Add Network Software** window.*

10. *Click **Continue**.*

11. *Click **OK** in the **Network Settings** window.*

12. *Click **Restart Now** in the **Network Settings Change** window to allow the new settings to take effect.*

Installing PS Admin

Follow the procedure outlined below to install *PS Admin*:

1. Insert the Print Server installation CD

2. Click **Install PS Admin Program**

3. The Setup program will begin by copying some files and ask for your confirmation. Click the **Next >** button to continue.

4. The Setup program will then ask you to select a directory on your hard disk where you want it to install the *PS Admin* program. If you want a destination directory path other than the one shown, click the **Browse...** button to select it.

Click the **Next >** button to continue the installation.

5. The setup program will copy *PS Admin* program files to the directory you selected, as well as create a PS Admin program group. Press the **Finish** button to complete the installation.

Once the installation is complete, you can begin using *PS Admin*.

Starting PS Admin

If you are using Windows 95/98/Me or Windows NT 4.0 (or a later version of Windows), to start the *PS Admin* program:

1. Press the **Start** button in the taskbar.

2. Within the Programs menu, select PS Admin.

3. Select the PS Admin program.

For Windows 3.1, Windows for Workgroups 3.1x, or Windows NT 3.51,

1. In the Program Manager, double-click on the PS Admin program group icon to open it.

2. Double-click the *PS Admin* program icon.

The *PS Admin* program will then be ready for use.

Instructions for using *PS Admin* to perform network print server "initial setup" tasks are found in the next chapter, *Getting Started Setting up Your Print Server*. For information about using *PS Admin* for other types of print server administration, see the PS *Admin* Administration chapter.

PRINT SERVER WIRELESS SETTING IN PS ADMIN PROGRAM

Installation procedure for wireless print server consists of two modes. Ad-hoc and infrastructure mode each with it's own setting. In the ad-hoc mode it provides direct communication between PC/Notebook and print server with setting to the same wireless channel and ESS-ID. In infrastructure mode communication between PC/Notebook and print server is through the Access Point acting as a bridge between wired and wireless network with ESS-ID setting matching the Access Point.

NOTE: *The following contains important information about what steps need to be taken to prepare for your wireless print server setting. If your print server is not a wireless print server please skip this chapter.*

Ad-Hoc Mode:

♦ Before initiating set-up procedure for the print server make sure your wireless PCMCIA card on your PC/Notebook is set to channel 6 with ESS-ID set as 'default' in ad-hoc mode.

♦ Make sure the DIP switch on the print server is positioned in the ad-hoc mode.

♦ Press the Reset button on the print server for three seconds until the LPT begins to light up initiating the factory reset.

♦ When factory reset is completed the print server will be set to default on channel 6 and ESS-ID is set as 'default'.

♦ Start-up PS Admin

The PS Admin main window will appear like the one below.
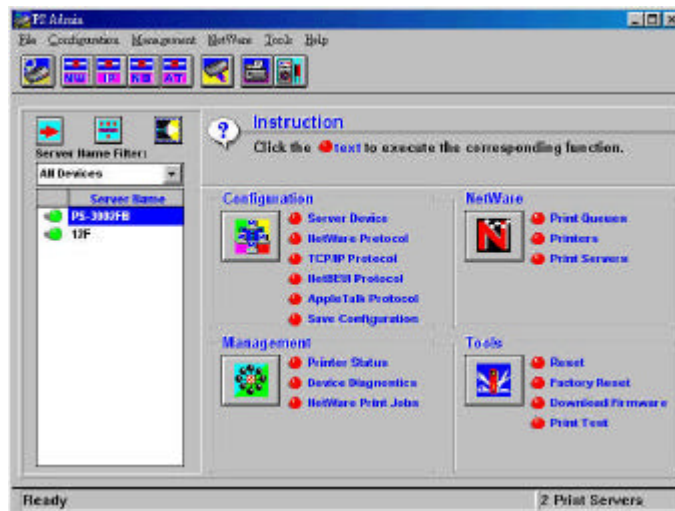
Select the print server and click on Server Device as illustrated.
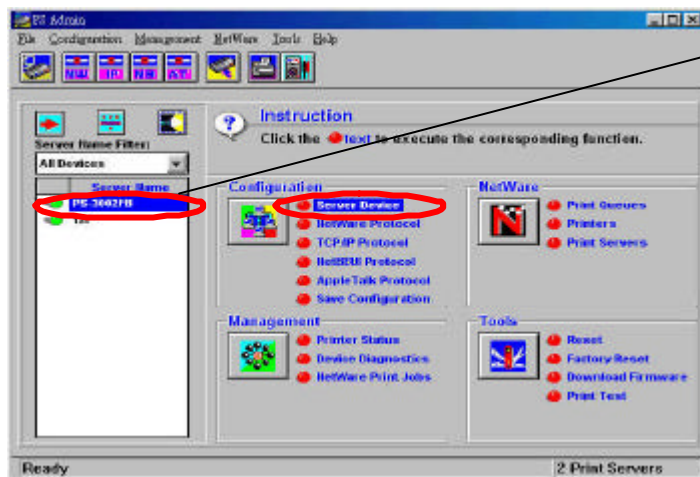
Print server selection

In the Server Device Configuration window click on Wireless button as indicated below.
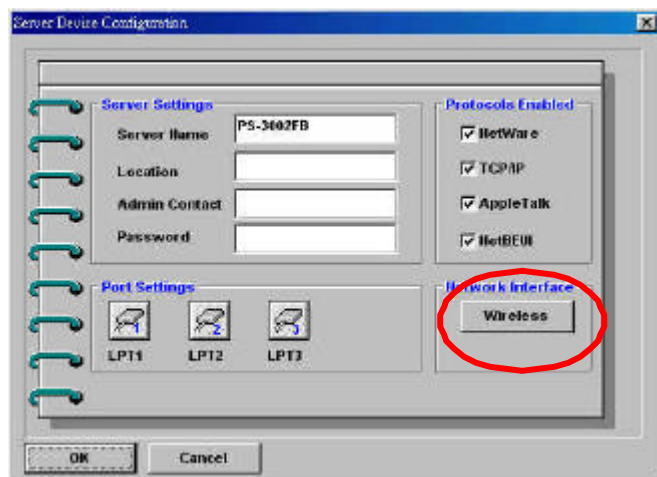
The Wireless Configuration window will appear. The default wireless channel is set to 6 and ESS-ID is set as 'default'. You can alter the channel and ESS-ID setting to your requirement, however keep in mind the PC/Notebook must also be set to the same channel and ESS-ID. Press the OK button to return to the PS Admin main window.

Click on Save Configuration to store your setting.

Note 1:

When changes are made on the print server's wireless channel and ESS-ID it must correspond to the PC/Notebook channel and ESS-ID for direct wireless communication.

Note 2:

The print server's ad-hoc mode supports two modes (802.11 ad-hoc mode and proprietary ad-hoc mode). You can position the DIP switch on the print server to the mode you want to operate. Please refer to your hardware manual on how to position the DIP switch as 802.11 ad-hoc or proprietary ad-hoc mode. Which option of the ad-hoc mode is required depends on the operation of your print server. It depends on which ad-hoc mode is supported by your wireless card

driver on the PC/Notebook. Some driver supports both modes, however, some driver support only one of the modes. The names of each ad-hoc mode may not be consistent between each wireless card vendor therefore you may need to try each of the ad-hoc mode (802.11 mode and proprietary mode) and select the mode that can communicate with each other.

Infrastructure Mode:

◆ Before initiating set-up procedure for the print server make sure your wireless PCMCIA card on your PC/Notebook is set to channel 6 with ESS-ID set as 'default' in ad-hoc mode

◆ Make sure the DIP switch on the print server is positioned in the ad-hoc mode.

◆ Press the Reset button on the print server for three seconds until the LTP begins to light up initiating the factory reset.

◆ When factory reset is completed the print server will be set to default on channel 6 and ESS-ID is set as 'default'.

◆ Start-up PS Admin

The PS Admin main window will appear like the one below.
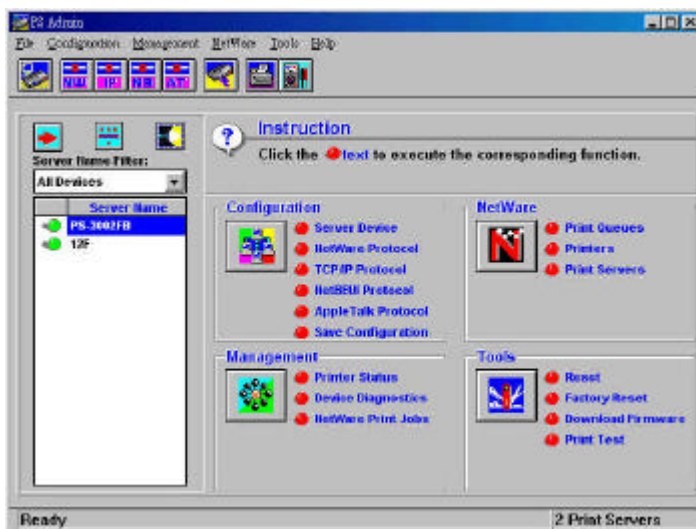
Select the print server and click on Server Device as illustrated.
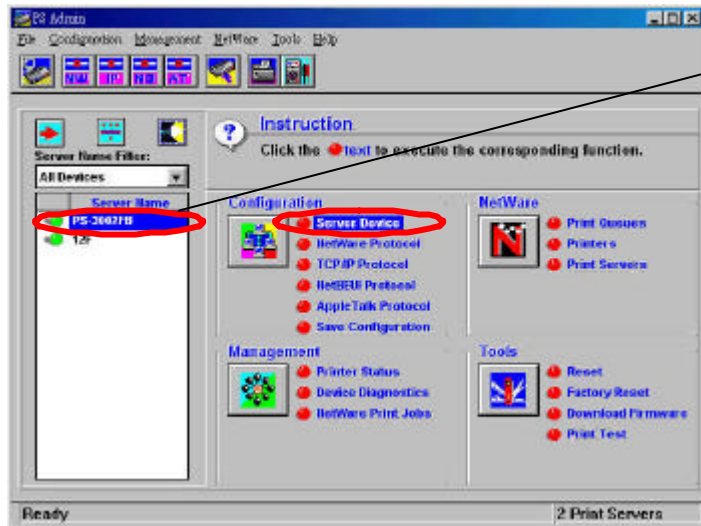
Print server selection

In the Server Device Configuration window click on Wireless button as indicated below.
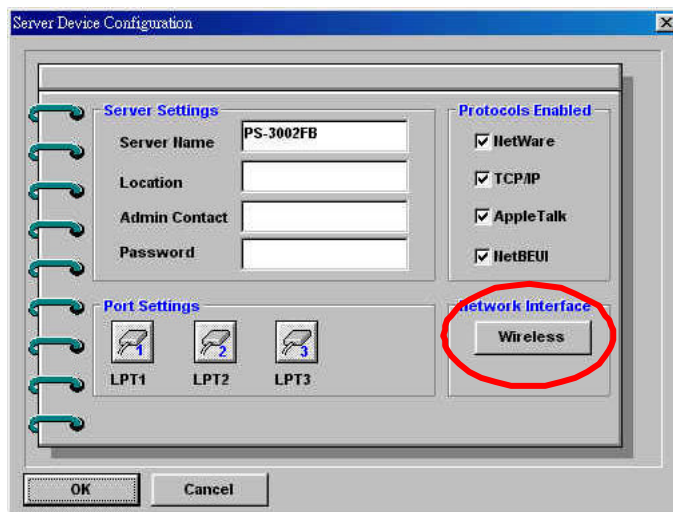
The Wireless Configuration window will appear. Make sure to set the
ESS-ID to match with Access Point' s ESS-ID. The default ESS-ID of
the print server is set as 'default'. Press on the OK button to return to
the PS Admin main window.
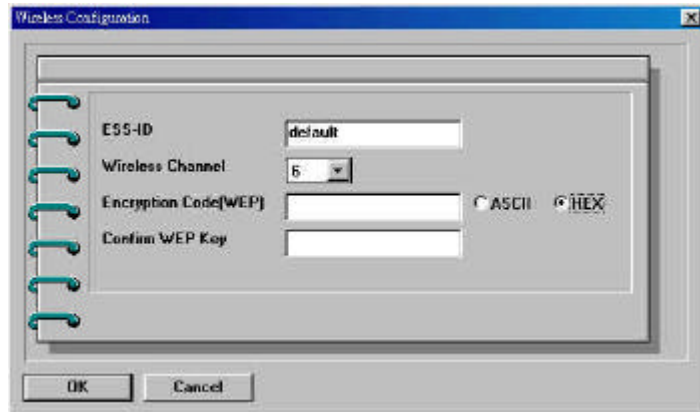
Click on Save Configuration to store your setting.
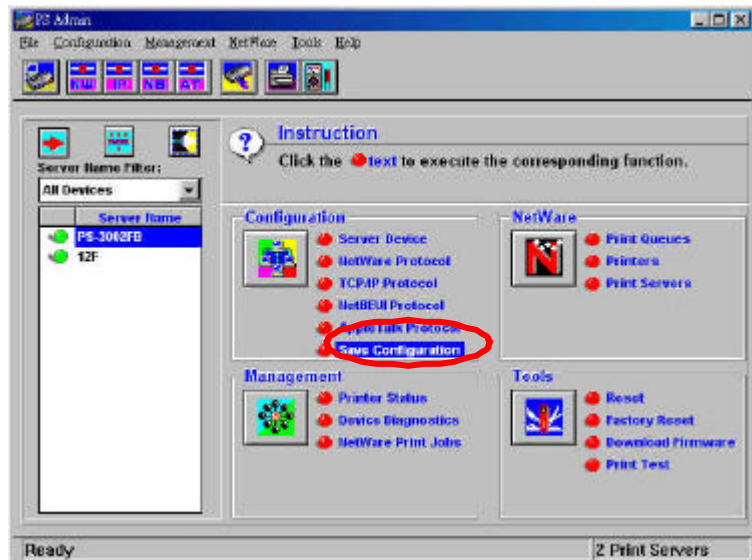
After setting up ESS-ID from the PS Admin, alter the DIP switch on the print server to infrastructure mode and the print server will re-start.

Note 1:

Please make sure to change your PC/Notebook to infrastructure mode. The ESS-ID on PC/Notebook and print server must match with the Access Point's ESS-ID.
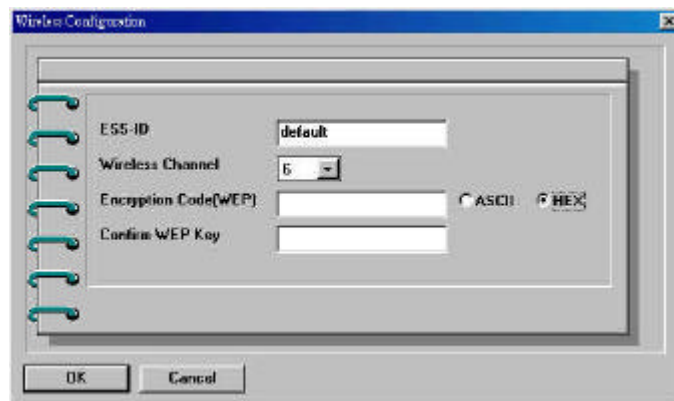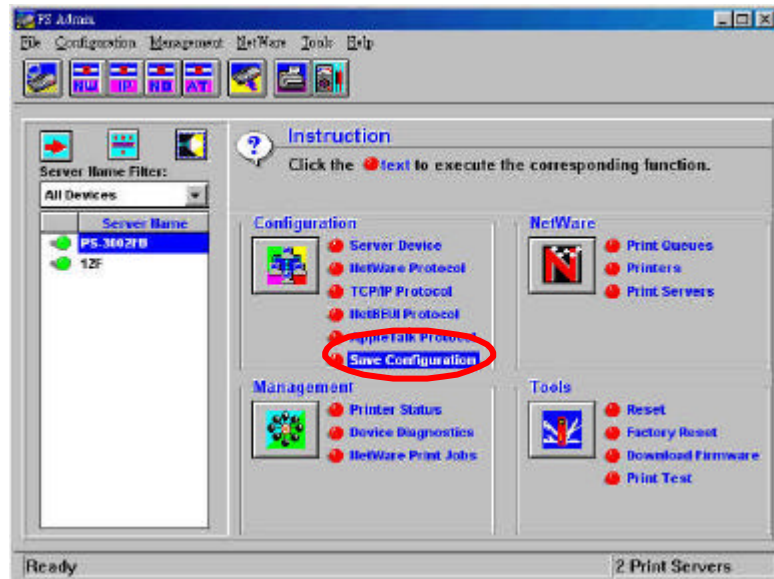
Note 2:

Print server supports two Infrastructure operation modes ('Cfg ESS-ID' mode and 'Any ESS-ID' mode).

'Cfg ESS-ID' mode: The print server will connect to the access point that have the same ESS-ID with the print server's configured ESS-ID.

'Any ESS-ID' mode: The print server will connect to any access point that the print server finds first, however, the ESS-ID may not be the same with each other. This is an easier way to connect to the access point if you only have one access point, but be careful, it may connect to your neighbor's access point. Regarding how to setup print server to these two operation modes, please refer to the DIP switch description on your Hardware manual.

WEP Encryption Key

WEP (Wired Equivalent Privacy) Encryption Key is used to secure communication data on the wireless communication. The print server support IEEE 802.11 64 bit WEP key and 128 bit WEP key.

To enable WEP encryption operation, follow setup procedure either Ad-hoc mode or Infrastructure mode, under Wireless Configuration windows, setup ESS-ID and wireless channel, also type in Encryption Code.
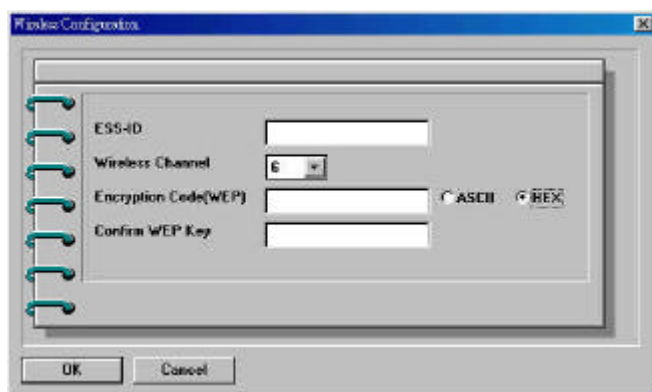
The factory default WEP encryption is disabled (Encryption Code field is blank).

To input Encryption Code, first Click on ASCII or HEX check box to select input format as ASCII format or HEX format.

ASCII input format:

To setup 64 bit WEP key, input 5 ASCII characters, for example, '12345'.

To setup 128 bit WEP key, input 13 ASCII characters, for example, '1234567890123'.

HEX input format:

To setup 64 bit WEP key, input 10 HEX code, for example, '3132333435', this is the same with ASCII input '12345'.

To setup 128 bit WEP key, input 26 HEX code, for example, '3132333435363738393031323 3', this is the same with ASCII input '1234567890123'.

On Confirm WEP Key field, input the same string input on the Encryption Code field.

Make sure the Encryption Code is the same with the access point' s encryption code that the print server is to be connected under Infrastructure mode. Your PC/Notebook' s encryption code also needs to be setup the same with the print server' s encryption code under either Infrastructure mode or Ad-hoc mode.

Note:

Carefully input Encryption Code, any error setting will cause communication link to fail. If failure occurs, please reset to factory-reset for the print server and follow the setup procedure (Ad-hoc or Infrastructure mode) again.

Getting Started Setting up Your Print Server

Before you can print over the network using your print server, you may need to perform some basic setup tasks. These include:

♦ Choosing a name for your print server.

♦ Setting a password to protect your print server's settings from unauthorized modifications.

♦ Choosing names for the print server's individual printer ports, and changing the port settings.

♦ Testing the operation of the print server and checking that the print server is connected properly.

Once you have finished with these tasks, you can proceed to set up network printing for Novell NetWare, Microsoft Networks, AppleTalk networks, and UNIX TCP/IP systems. Information about setting up printing on these network types is covered in the following chapters.

Choosing a Name for Your Print Server

Each network print server has a server name. When the print server is shipped from the factory, it has a default name of the form PS-*xxxxxx*, where *xxxxxx* represents the last six digits of the Ethernet address found on the print server's underside sticker.

You can choose any name you like for your print servers, provided that:

♦ The server name is less than 15 characters long.

♦ The server does not have the same name as any Novell NetWare fileserver on your network.

♦ The server does not have the same name as any of the print servers configured for your Novell network.

♦ The server does not have the same name as any Microsoft Networking client or server.

Uppercase and lowercase letters are not distinguished in print server names.

It is recommended that you limit your print server name to 15 characters, chosen from the letters A to Z, the digits 0 to 9, and the hyphen ("-") character. Names that violate this recommendation may not be usable with some networks.

To change your print server's name,

1. Select the print server in the *PS Admin* main window's server name display (or extended server display).

2. Choose **Server Device...** from the **Configuration** menu, or press the **Configure Server** button in the toolbar. (If you have already assigned a password to the server, you will have to enter it at this point.) *PS Admin* will display the Server Device Configuration window.

3. In the **Server Name** field, enter the name you have chosen for the server, and press **OK**.

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4. Choose **Save Configuration** from the **Configuration** menu, or press the **Save Configuration** button on the toolbar. This will store the new settings into the print server and restart it.

Your print server will now be accessible under the new name.

Setting a Password for Your Print Server

Unless you set a password, anyone on your network will be able to change your print server's settings. If your local network is connected to the Internet, then it may be possible to change your print server's configuration from anywhere in the world using the telnet interface. To protect your print server's integrity, you should set a password for your print server, and record it in a safe place.

To set the print server's password,

1. Select the print server in the *PS Admin* main window's server name display (or extended server display).

2. Choose **Server Device...** from the **Configuration** menu, or press the **Configure Server** button in the toolbar. (If you have already assigned a password to the server, you will have to enter it at this point.) *PS Admin* will display the Server Device Configuration window.

3. In the **Password** field, enter the password you have chosen for the server, and press **OK**.

4. *PS Admin* will ask you to confirm your new password. Enter the password a second time and press **OK**.

5. Choose **Save Configuration** from the **Configuration** menu, or press the **Save Configuration** button on the toolbar. This will store the new settings into the print server and restart it.

WARNING: *Do not forget or lose your print server password. If you forget it, you will have to contact your service representative to change the password.*

Changing Print Server Port Settings

Your network print server provides a number of parallel and/or serial printer ports. For each port, you can determine:

♦ The name of the port

♦ A comment describing the port

♦ For parallel ports,

◊ Whether or not data can be sent to the port at high speed

◊ Whether or not the attached printer supports HP's PJL (Printer Job Language) protocol.

♦ For serial ports,

◊ The serial port speed (baud rate), in bits per second.

◊ How many data bits are sent per byte

◊ How many stop bits are sent with each byte

◊ Whether or not a parity bit is sent, and if so what kind (even or odd parity)

◊ Whether or not software flow control is used (XON/XOFF)

◊ Whether or not hardware flow control should be used, and if so what kind (DTR, RTS, or DTR/RTS).

To set the parameters for a printer port,

1. Select the print server in the *PS Admin* main window's server name display (or extended server display).

2. Choose **Server Device...** from the **Configuration** menu, or press the **Configure Server** button in the toolbar. (If you have assigned a password to the server, you will have to enter it at this point.) *PS Admin* will display the Server Device Configuration window.

3. Press the button corresponding to the port you wish to change. For parallel ports, the following dialog will be displayed:
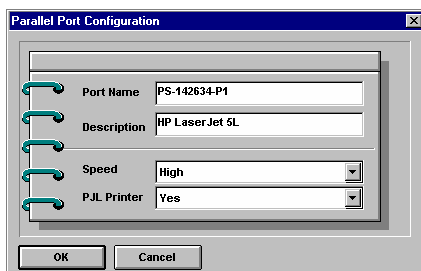
The fields that can be changed are:

◊ **Port Name** The name by which the port is known on various network systems. The port name should be at most 32 characters long and may consist of letters, numbers, and hyphens. Spaces are not allowed. (If the port will be used for LAN Manager clients, the port name can not exceed 8 characters.)

◊ **Description** A comment describing the port.

◊ **Speed** Determines whether or not the print server can send data to the printer at high speed. Most newer printers can accept high-speed data transmission; if your printer loses characters then you may need to choose the low-speed mode.

◊ **PJL Printer** Determines whether or not the printer accepts Hewlett Packard's PJL printer job control language commands. PJL allows users to get feedback on the printer's status. If the printer connected to the port supports PJL, set this field to Yes.

For serial ports, the following dialog will be displayed:
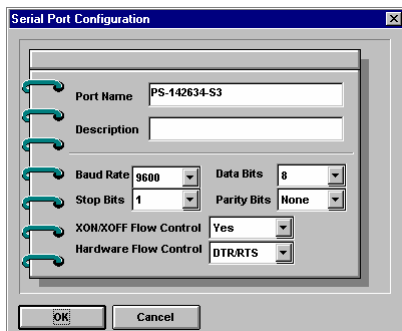
The fields that can be changed are:

◊ **Port Name** See above.

◊ **Description** See above.

◊ **Baud Rate** Sets the serial communications bit rate, in bits per second. Most printers default to 9600bps; rates from 300bps to 115200bps are available.

◊ **Data Bits** Sets the number of bits transmitted per byte on the serial port. Most modern printers use 8-bit data.

◊ **Stop Bits** Sets the number of stop bits transmitted per byte on the serial port. Most modern printers use serial protocol with 1 stop bit.

◊ **Parity Bits** Sets the type of parity check bit sent with each byte on the serial port. Most modern printers use a non-parity serial protocol.

◊ **XON/XOFF Flow Control** Determines whether or not the print server should respond to software flow control requests from the printer. When software flow control is used, the printer will send an XOFF character (Control-S) to the print server when its buffer is getting full, and an XON character (XON) when the buffer is no longer full.

◊ **Hardware Flow Control** Determines whether or not the print server should respond to hardware flow control requests from the printer. When hardware flow control is used, the printer will use the DTR, RTS, or both RS-232 control lines to control the print server' s transmission of data in order to prevent the printer' s buffers from getting full.

4. Click **OK** to exit the Port Configuration dialog.

5. Click **OK** to exit the Server Device Configuration dialog window.

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6. Choose **Save Configuration** from the **Configuration** menu, or press the **Save Configuration** button on the toolbar. This will store the new settings into the print server and restart it.

Testing Your Print Server

Once you have set all of the necessary parameters, and have finished connecting your printer(s) to the print server, you should test each of the printer ports using the Print Test function.

For each port you wish to test,

1. Select the print server in the *PS Admin* main window's server name display (or extended server display).

2. Choose **Print Test...** in the **Tools** menu. *PS Admin* will prompt you for which port you wish to test.

3. Choose a port and click OK. The print server should print out a "Print Server Test Page."

4. Repeat this procedure for each printer port with an attached printer.

NOTE: *The Print Test function may not work with PostScript printers that do not accept plain text files.*

Setting up Novell NetWare 3.x Printing

This chapter explains how you can set up your print server so that clients of your Novell NetWare 3.*x* server can print to attached printers. This chapter also applies if any workstations on your network are using a Novell NetWare 4.*x* server in bindery emulation mode. For information on setting up your print server for use with NetWare 4.*x* servers in NDS (NetWare Directory Services) mode, see the next chapter*, Setting up Novell NetWare 4.x Printing*.

NOTE: *Please check your hardware manual to confirm your print server supports NetWare IPX/SPX protocol. If it does not support NetWare IPX/SPX protocol please skip this chapter.*

Introduction to Novell NetWare Printing

On Novell NetWare networks, when a workstation user wants to print a document, the workstation network software sends a file containing commands for the printer to the NetWare file server, which places it in a print queue.

Some software may be written to send print jobs directly to NetWare print queues; Windows 3.1 using the NetWare network driver is an example of this type of software. Software written to print to a local

printer can print over the network if the printer port has been *captured*, using the CAPTURE command or a similar method.
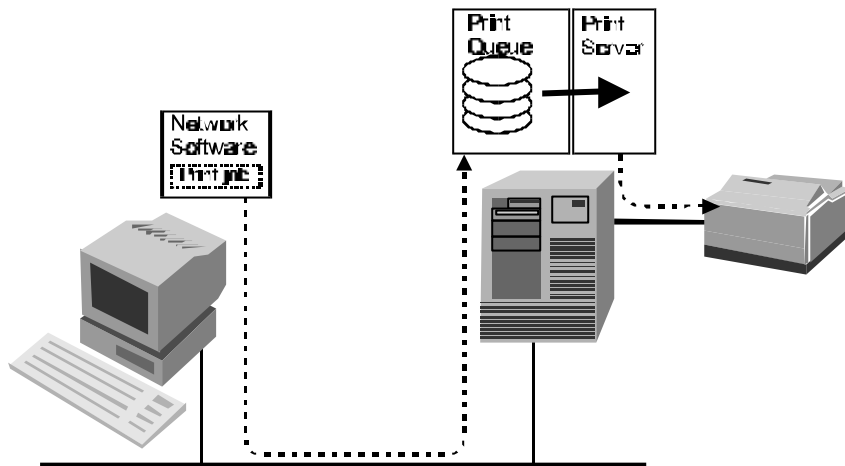
The file server makes its queues available to *print servers*, which may be located:

♦ on the same server,

♦ on a different server, or

♦ in a stand-alone print server device.

If a printer is directly attached to a NetWare file server, or if it is attached to a workstation on the network (using the RPRINTER program, as described below) then the print server needs to be run on the server itself.
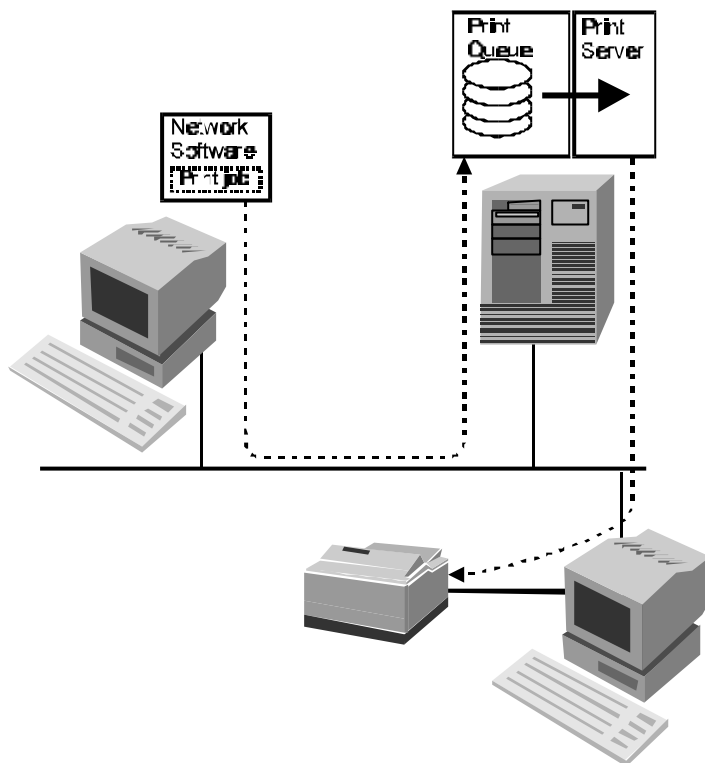
The PSERVER.NLM program is the NetWare Loadable Module (NLM) that runs on the file server and scans print queues both on the file server where it is running, and optionally on other servers. When PSERVER.NLM detects a new job, it directs it to the proper printer port.

If it is inconvenient to attach a printer directly to a file server, it may be desirable to connect it to a workstation using NetWare's remote printer facility and the RPRINTER.EXE program. When RPRINTER is used, the print server takes print jobs from the queue and sends them to the remote printer workstation, and the RPRINTER program then passes

the jobs to the locally connected printer. This method, however, introduces delays in printing, and the remote printer software may be incompatible with software used on the remote printer workstation.

Your print server acts as a NetWare print server, scanning the print queues on one or more NetWare servers and directing them to its attached printers. This reduces the load on the file server, while making it convenient for printers to be located anywhere.
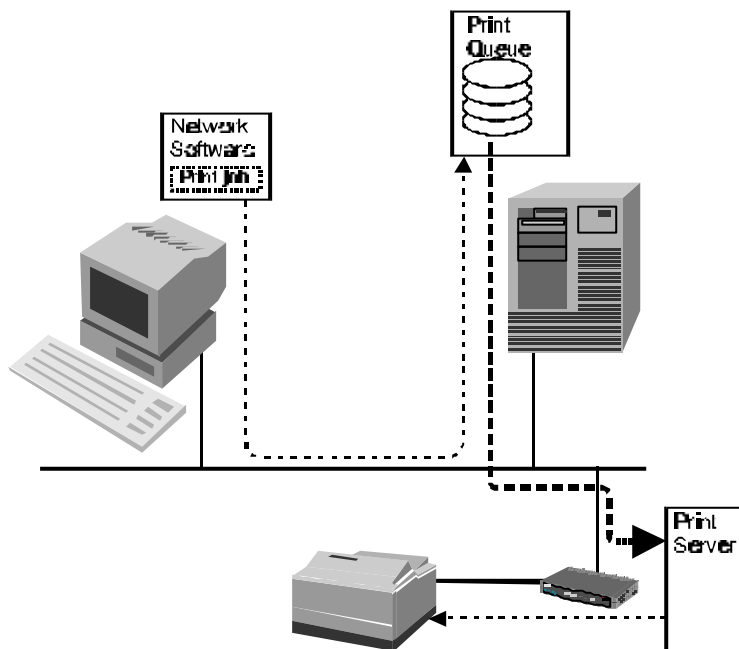
You can also use the print server for a remote printer connection instead of letting it scan the queues itself. This has the advantage of reducing the number of print servers in a large network, making management simpler. However, this causes the NetWare file server to be more heavily loaded, and increases delays in network printing.

Setting up as a NetWare Print Server

This section describes how to configure your print server to act as a NetWare print server, and how to set up a print server port to serve a print queue on the file server.

1. Make sure you are logged on to your NetWare server as SUPERVISOR, or that you have permissions equivalent to SUPERVISOR.

2. Make sure that the NetWare protocol is enabled in the server. This setting is found in the Server Device Configuration window, accessible by selecting the print server and choosing **Server Device...** from the **Configuration** window.

3. Choose **Netware Protocol...** from the **Configuration** menu, or click the Configure NetWare button in the toolbar. Click on the **Bindery Print Server** tab.

4. Click on the port button corresponding to the port you want to serve the print queue.

5. Click on the name of the NetWare file server where you wish the print queue to be stored. (Clicking on the ⊞ symbol to the left of the file server name will expand the list of print queues on the file server.)

6. Unless you want to use an existing print queue on the server, you will need to create a new print queue. Click the **Create Queue...** button, then type in the name of the new print queue and determine the file server volume where you want the print queue to be stored. Click **OK** to create the queue.
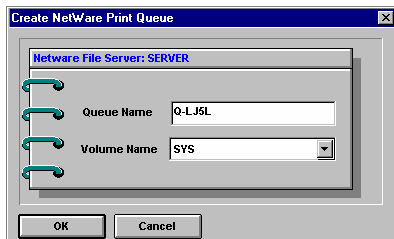
7. Click on the print queue name.

8. Click on the **Add >>** button to add the print queue to the Serviced Queues list for the port.
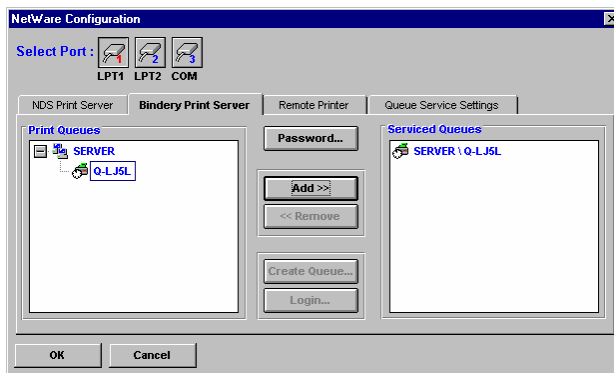
9. Click **OK**, then choose **Save Configuration** from the **Configuration** menu (or press the Save Configuration toolbar button) to change the settings in the print server and the NetWare server. The print server will restart itself and begin serving the specified print queue.

If you created the print queue in step 6, you may need to assign queue operators and queue users to the print queue using *PS Admin* or the NetWare `PCONSOLE` program. By default, SUPERVISOR is assigned as the print queue's operator, and all members of the group EVERYONE are allowed to use the print queue. For information

about assigning print queue users and operators using *PS Admin*, see the *Managing Print Queues* section.

Setting up as a NetWare Remote Printer

Your network print server can also be set up as NetWare remote printer. This allows slightly easier administration, but may increase printing delays. To set up a printer port as a remote printer port,

1. Make sure you are logged on to your NetWare server as SUPERVISOR, or that you have permissions equivalent to SUPERVISOR.

2. Make sure that the NetWare protocol is enabled in the server. This setting is found in the Server Device Configuration window, accessible by selecting the print server and choosing **Server Device...** from the **Configuration** window.

3. Make sure you have a NetWare print server created and running on your NetWare file server. Consult your NetWare documentation for instruction on how to do this.

4. Choose **Netware Protocol...** from the *PS Admin* **Configuration** menu, or click the Configure NetWare button in the toolbar. Click on the **Remote Printer** tab.

5. Click on the port number button corresponding to the port you will be using for remote printer service.

6. Click on the **Bindery Remote Printer** selection. *PS Admin* will display a list of NetWare servers accessible from your network.

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7. Click on the ⊞ symbol to the left of the server name to expand the list of print servers on the file server. Click on the name of the print server you will be using.

8. Determine what printer numbers are available on the given print server, and enter an unused printer number in the Printer Number field. Printer numbers can range from 0 to 15.

9. Click **OK**, then choose **Save Configuration** from the **Configuration** menu (or press the Save Configuration toolbar button) to change the settings in the print server and the NetWare server. The print server will restart itself and begin serving as a remote printer for the specified print server.

Printing from Client Workstations

Once your print server is set up for printing from the file server, your network's client workstations can connect to the file server's print queue.

Windows 95 (and later) Client Workstations

To enable your Windows 95 or later workstation to print to a NetWare print queue,

1. From the **Start** menu, choose the **Settings** submenu, then the **Printers** item within it. Windows will display the Printers folder.

2. Double-click on the **Add Printer** icon in the Printers folder.

Add Printer

Windows will start the Add Printer Wizard.

Press the **Next >** button to continue to the next screen.

3. Choose the **Network printer** selection and click the **Next >** button to continue.
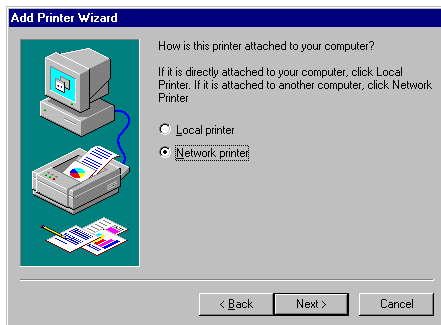
4. Enter the network path for the NetWare file server, specifying which print queue you want to connect to. For instance, to use the printer serving the queue named `Q-LJ5L` on the NetWare file server named `SERVER`, enter:

`\\SERVER\Q-LJ5L`

As an alternative to entering the network path, you can also use the **Browse...** button to locate the file server and print queue. Press the **Next >** button to continue.
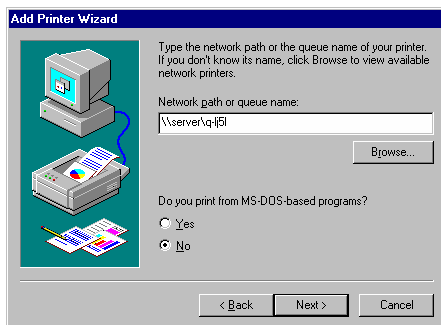
5. At this point Windows will ask you to choose the correct printer driver for the printer. Choose your printer's make and model from the list, or use the driver disk included with the printer. When you have chosen the correct printer, click **Next >** to continue.

6. Windows will then ask for a name for the new printer, and ask whether or not you want to set the printer as the Windows default printer. Click **Finish** to continue.
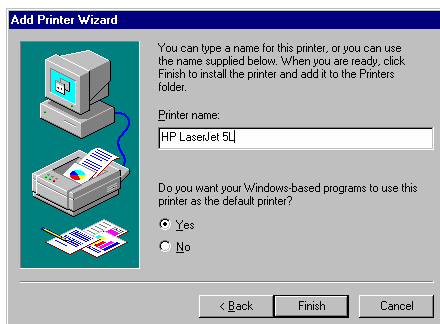
7. Windows may ask you whether or not you wish to print a test page to make sure that the printer will work correctly. When the test page is done printing, you will be asked whether or not the test page printed.

Windows NT 4.0 (and later) Client Workstations

To enable your Windows NT 4.0 or later workstation to print to a NetWare print queue,

1. From the **Start** menu, choose the **Settings** submenu, then the **Printers** item within it. Windows will display the Printers folder.

2. Double-click on the **Add Printer** icon in the Printers folder.

Add Printer

Windows will start the Add Printer Wizard.

3. Choose the **Network printer server** selection and click the **Next >** button to continue.

4. Enter the network path for the NetWare file server, specifying which print queue you want to connect to. For instance, to use the printer serving the queue named `Q-LJ5L` on the NetWare file server named `SERVER`, enter:

`\\SERVER\Q-LJ5L`

As an alternative to entering the network path, you can also browse the network to locate the file server and print queue. Press the **OK** button to continue.

5. Windows will display the following message. Press OK to continue.

6. At this point Windows will ask you to choose the correct printer driver for the printer. Choose your printer's make and model from the list, or use the driver disk included with the printer. When you have chosen the correct printer, click **OK** to continue.

7. If you already have a default printer, Windows will ask if you wish to use the newly installed printer as the default.

8. When installation is complete, Windows will display the following dialog. Press the **Finish** button to complete installation.

Windows NT 3.51 Client Workstations

To access a NetWare 3.*x* printer queue from your Windows NT 3.51 workstation,

1. Double-click on the Print Manager icon found in the Main program group.

2. In the Print Manager, choose **Connect to Printer...** from the **Printer** menu.

---

3. Enter the network path for the NetWare file server, specifying which print queue you want to connect to. For instance, to use the printer serving the queue named `Q-LJ5L` on the NetWare file server named `SERVER`, enter:

```
\\SERVER\Q-LJ5L
```

As an alternative to entering the network path, you can also browse the network to locate the file server and print queue. Press the **OK** button to continue.

4. Windows will display the following message. Press **OK** to continue.

5. Windows will ask you to choose the correct printer driver for the printer. Select a driver and press **OK**.

6. The printer should now be available for use.

Windows 3.x and Windows for Workgroups 3.11 Workstations

To access a NetWare 3.*x* printer queue from your Windows 3.x or Windows for Workgroups 3.11 workstation,

1. Double-click on the Print Manager icon found in the Main program group.

2. In the Print Manager, choose **Printer Setup...** from the **Options** menu. The Print Manager will display the Printers dialog window.

3. If necessary, click on the **Add >>** button. Choose the correct printer driver, and click **Install...**.
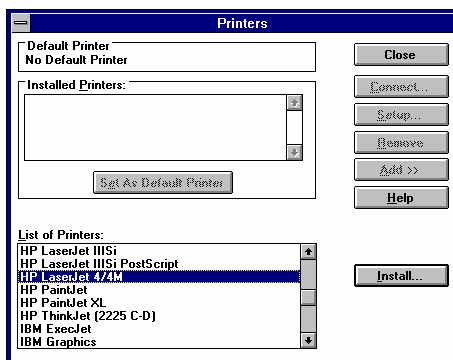
4. When the printer driver has been correctly installed, select the printer in the Installed Printers list and click the **Connect...** button.
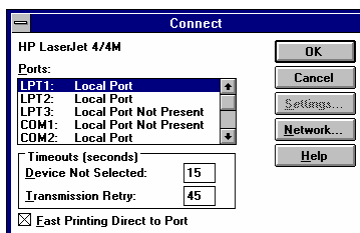
5. Click the **Network...** button to display the NetWare printer connections dialog. (If you are using Windows for Workgroups, you will also have to push the **NetWare...** button in the Connect Network Printer dialog.)

6. Click on the printer port you wish to capture and the printer queue you want it redirected to, and press **Capture**. Press **Permanent** to insure that the port will be redirected every time you start Windows. Click on the exit button when you are finished.
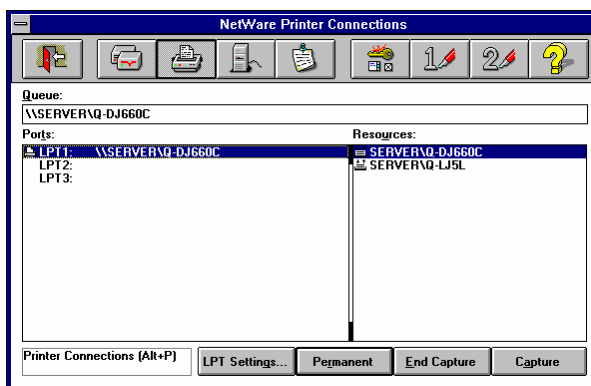
7. Exit the remaining dialogs by pressing OK. The printer should now be available for use.

MS-DOS/PC-DOS Workstations

For printing from DOS-based workstations, you can use the CAPTURE command to redirect one of the workstation's printer ports (LPT1, LPT2, or LPT3) to the network print queue. The syntax for the CAPTURE command is:

```
CAPTURE   L=n   S=server   Q=queue   TI=n   F=form
    B=bannername
```

Choose values for the options as follows:

- ♦ **L=*n*** Determines which local port will be redirected to the network print queue. `L=1` corresponds to LPT1, `L=2` corresponds to LPT2, and `L=3` corresponds to LPT3. By default, LPT1 is captured.

- ♦ **S=*server*** Determines which server the print queue is located on. By default, your login file server is used.

- ♦ **Q=*queue*** Determines which print queue your print jobs are redirected to.

- ♦ **TI=*n*** Sets the timeout for Autoendcap. After your application starts printing, if it goes for n seconds without any additional printer output, then NetWare assumes that the print job is finished and sends it to the printer. If your print jobs are becoming split up you may need to increase this setting.

- ♦ **F=*form*** Determines which form print jobs will use. Forms can be defined using PRINTDEF.

- ♦ **B=*bannername*** Sets the text that appears on the banner for the job. By default the banner text is `LST:`. You can disable the banner entirely using the **NB** option.

You can add the CAPTURE command to your network startup batch file, or add it to your login script preceded with a # symbol.

NetWare Settings

If necessary, you can use the **Queue Service Settings** tab of the NetWare Configuration dialog window to set several of the print server's parameters.

To access the **Queue Service Settings** tab,

1. Choose **Netware Protocol...** from the *PS Admin* **Configuration** menu, or click the Configure NetWare button in the toolbar. Click on the **Queue Service Settings** tab.

2. Click on the port number button corresponding to the port requiring a parameter change.
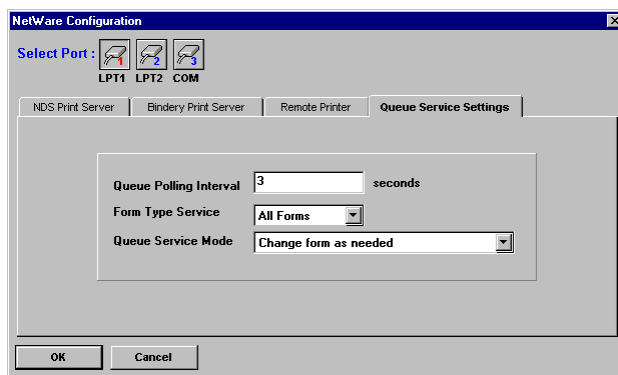
The parameters listed are:

♦ **Queue Polling Interval** This parameter determines how often the print server scans print queues on the file server(s), measured in seconds. A smaller number may mean that print jobs are printed with a smaller delay, but will also greatly increase the load on the server.

♦ **Form Type Service**   This parameter, along with the queue service mode described below, determines how the print server handles forms when it is serving print queues.

Using the PCONSOLE program, you can define different forms, which identify the different types of paper that the printer can use (e.g., plain, letterhead, legal, A4, B4, etc.). Print jobs may specify what print form they wish to use. If a job requests a form that isn't currently loaded, it may be necessary for the printer operator to manually change forms before printing can continue.

If the form type service is set to All Forms, then the print server ignores the job's form and immediately prints all jobs sent to it. If it is set to Current Form, then the printer uses the Queue Service Mode parameter to determine how to handle form changes.

♦ **Queue Service Mode**   Determines how the printer responds to changes in the current printing form:

◊ **Change as needed**   Serves print jobs in order, stopping to allow a forms change every time it becomes necessary.

◊ **Minimize form changes within print queues**   Reorders jobs within an individual print queue in order to minimize the number of form changes required. When a forms change is required, printing will stop to allow the change.

◊ **Service only currently mounted forms**   Only services printer queue jobs that use a form that the printer already has. Jobs using other forms will be left in the queue to be served by other printers.

◊ **Minimize form changes across print queues**   Reorders jobs across all of the print queues the printer serves in order to minimize the number of form changes required.

....

Setting up Novell NetWare 4.x Printing

Your print servers support both the Bindery server database used with NetWare 3.*x* networks, and the NetWare Directory Services (NDS) network-wide database used with NetWare 4.*x* networks. This chapter explains how to use the network print server in an NDS environment.

Additional information about NetWare printing may be found in the previous chapter.

NOTE: *Please check your hardware manual to confirm your print server supports NetWare IPX/SPX protocol. If it does not support NetWare IPX/SPX protocol please skip this chapter.*

NetWare Directory Services

NetWare version 3.*x* stores information about users, file server volumes, print servers, print queues, and other objects in a database called the Bindery. NetWare server administration programs (such as SYSCON, PCONSOLE, and so on) modify entries in the Bindery to manage the operation of the file server.

The main disadvantage of the Bindery database is that it is limited to a single server. Networks with a large number of servers can become

difficult to manage, because each server has to be configured separately. In large enterprises, this can result in disorganization as each department tries to administer its own NetWare servers, each in a different way. It can become troublesome or impossible to coordinate the administration of file servers across the entire enterprise.

For this reason, NetWare version 4.*x* introduced NetWare Directory Services, which allows administration on a global, as well as a local scale. NDS organizes objects not by file server, but by administrative domain.

The Network Directory Services database stores "objects" in a tree structure. Branches in the tree represent different regional offices, divisions, departments, or other ways of dividing administrative responsibility.

Objects, such as users, servers, server volumes, print servers, print queues, etc., can be placed anywhere within the tree structure. The whole tree structure is shared by all servers using the same tree. Changing a setting in the tree affects all servers, making it less necessary to manage servers individually.

For compatibility with existing NetWare 3.*x* clients and servers, NetWare 4.*x* provides Bindery emulation, which exposes objects in the server's context as Bindery objects.

Setting up as a NetWare Print Server

To set up your print server as a NetWare NDS print server, you will first need to create several NDS objects. You can do this using the DOS-based PCONSOLE or NETADMIN programs, or the

Windows-based NWADMIN NetWare Administrator program. In this example, NWADMIN is used; consult your NetWare documentation for information about using PCONSOLE or NETADMIN to perform the setup.

To configure your print server for NetWare NDS printing,

1. Start the NWADMIN program. Expand the tree to display the context in the tree where you want to place the print server, and select the context.

2. Choose **Create...** from the **Object** menu. Select the object class Print Queue and press OK.
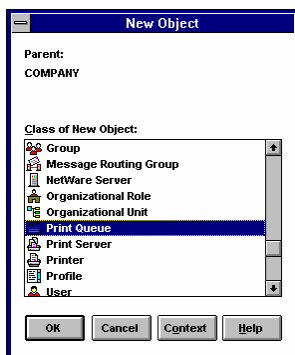
3. Enter a name for the print queue, and specify the NDS volume object of the file server volume where you want the print queue to be stored. Click the **Create** button.

---
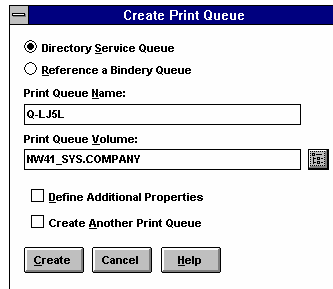
4. Select the NDS context again, and choose **Create...** from the **Object** menu. Choose the Printer object class and click OK.
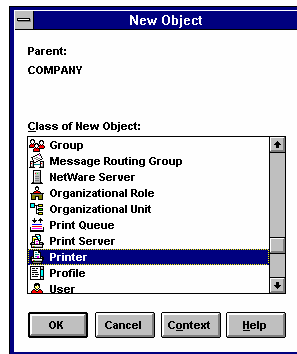
5. Enter a name for the printer object. The name should be the same as the print server's configured port name. Click **Create** to create the printer in your NDS context.
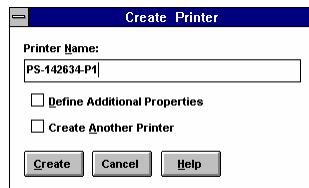
6. Double-click on the printer, then choose the Assignments tab. Click on the Add... button to select the print queue(s) you want

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the print server to serve, and optionally set their priority. Press OK to finish making print queue assignments for the printer.
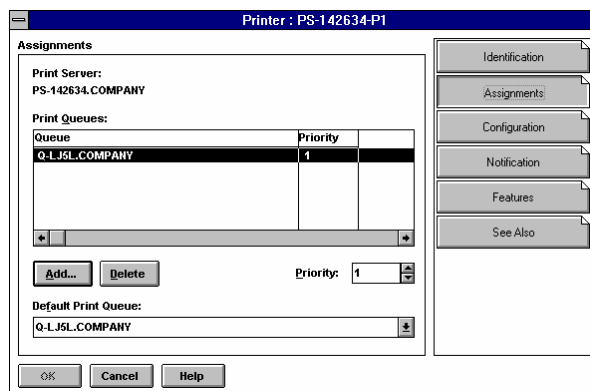
7. Repeat from step 4 for each print server port you will be using.

8. Select the context again, and choose **Create...** from the **Object** menu. Choose the **Print Server** object type and press OK. Enter a name for the print server, which must be the same as the network print server's name. Click the **Create** button to create the print server object.

9. Double-click on the newly created print server object, and click on the **Assignments** tab. Click the **Add...** button to add each of the printer objects you created to the print server. Make sure that the printer number corresponds properly to the port number; the first port should be printer number 0, the second port printer

number 1, and so on. Press OK to complete print server assignments for the print server.
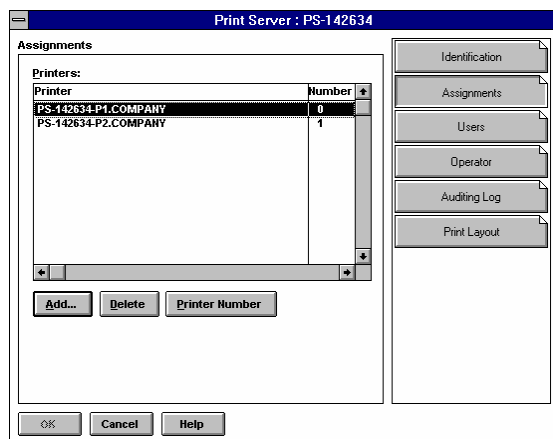
10. Start *PS Admin*, select the print server, and choose **NetWare Protocol...** from the **Configuration** menu. Click on the **NDS Print Server** tab.

11. Select the NDS tree and enter the context where you created the print server object, then press **OK**.
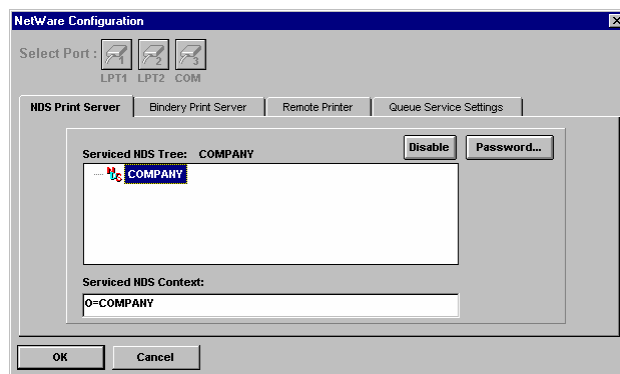
12. Choose **Save Configuration** from the **Configuration** menu (or press the Save Configuration toolbar button) to change the

---

settings in the print server. The print server will restart itself and begin serving the print queues assigned to its printer ports.

For more information about configuring print servers, printers, and print queues, consult your NetWare documentation.

Setting up as a NetWare Remote Printer

Your network print server can also be set up as NetWare remote printer. This allows slightly easier administration, but may increase printing delays. To set up a printer port as a remote printer port,

1. Make sure you are logged on to your NetWare server as Admin, or that you have permissions equivalent to Admin.

2. Make sure that the NetWare protocol is enabled in the server. This setting is found in the Server Device Configuration window, accessible by selecting the print server and choosing **Server Device...** from the **Configuration** window.

3. Make sure you have a NetWare print server created and running on your NetWare file server. Consult your NetWare documentation for instruction on how to do this.

4. Choose **NetWare Protocol...** from the *PS Admin* **Configuration** menu, or click the Configure NetWare button in the toolbar. Click on the **Remote Printer** tab.

5. Click on the port number button corresponding to the port you will be using for remote printer service.

6. Click on the **NDS Remote Printer** selection. *PS Admin* will display the tree structure of the NetWare NDS contexts accessible from your network.

7. Enter the name of the context you will be using, and enter the name of the print server in that context.
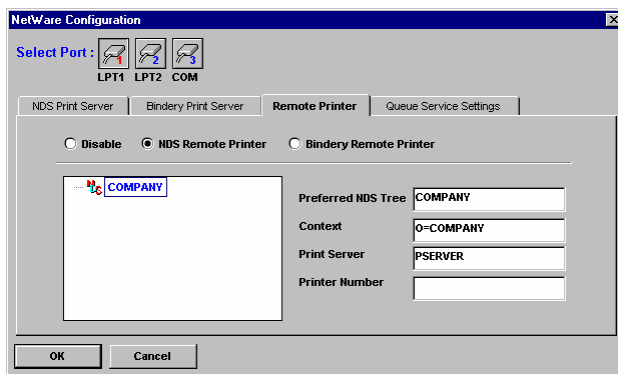
8. Determine what printer numbers are available on the given print server, and enter an unused printer number in the Printer Number field. Printer numbers can range from 0 to 15.

9. Click **OK**, then choose **Save Configuration** from the **Configuration** menu (or press the Save Configuration toolbar button) to change the settings in the print server. The print server will restart itself and begin serving as a remote printer for the specified print server.

Printing from Client Workstations

Once your print server is set up for printing from the file server, your network's client workstations can connect to the file server's print queue.

Windows 95 (and later) Workstations

> Unless you are using the 32-bit NetWare requester from Novell, Windows 95 or later does not directly support NDS access. You can access NetWare 4.*x* printer queues using bindery emulation, as described in the previous chapter.

Windows NT 4.0 (and later) Client Workstations

> To print to a NetWare 4.x print queue from Windows NT 4.0 or later,
>
> **1.** From the **Start** menu, choose the **Settings** submenu, then the **Printers** item within it. Windows will display the Printers folder.
>
> **2.** Double-click on the **Add Printer** icon in the Printers folder.
>
>
> Add Printer
>
> Windows will start the Add Printer Wizard.
>
> **3.** Choose the **Network printer server** selection and click the **Next >** button to continue.
>
>
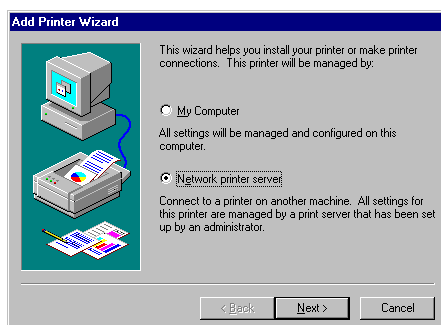
4. Locate the print queue you wish to attach to in the browser, and click **OK**. NetWare NDS contexts may be found beneath the "NetWare or Compatible Network" item.
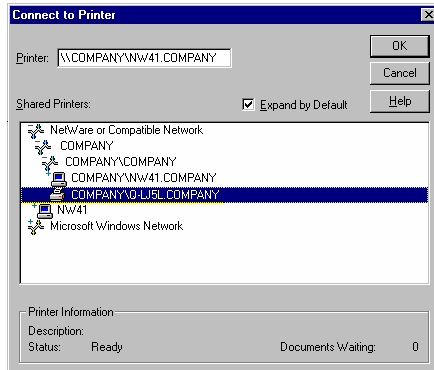
5. Windows will display the following message. Press **OK** to continue.
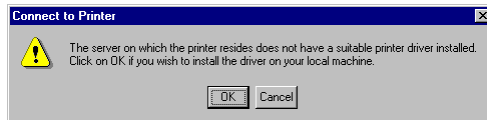
6. The Add Printer Wizard will ask you to choose the appropriate printer driver, and may ask you to insert your Windows NT installation diskettes to locate driver files.

7. When installation is complete, the Add Printer Wizard will display the following screen. Click **Finish** to complete printer installation.

Windows 3.1 and Windows for Workgroups 3.11 Workstations

To access a NetWare 4.*x* printer queue from your Windows 3.1 or Windows for Workgroups 3.11 workstation,

1. Double-click on the Print Manager icon found in the Main program group.

2. In the Print Manager, choose **Printer Setup...** from the **Options** menu. Print Manager will display the Printers dialog window.

3. If necessary, click on the **Add >>** button. Choose the correct printer driver, and click **Install...**.
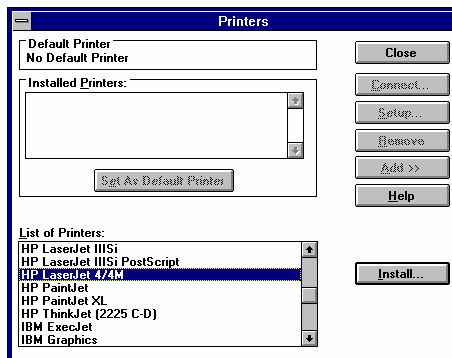
4. When the printer driver has been correctly installed, select the printer in the Installed Printers list and click the **Connect...** button.
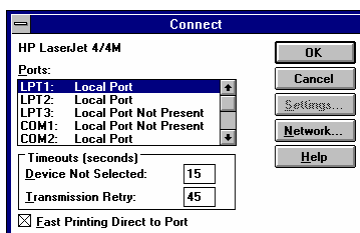
5. Click the **Network...** button to display the NetWare printer connections dialog. Click on the printer port you wish to capture and the printer queue you want it redirected to, and press **Capture**. Press **Permanent** to insure that the port will be redirected every time you start Windows. Click on the exit button when you are finished.
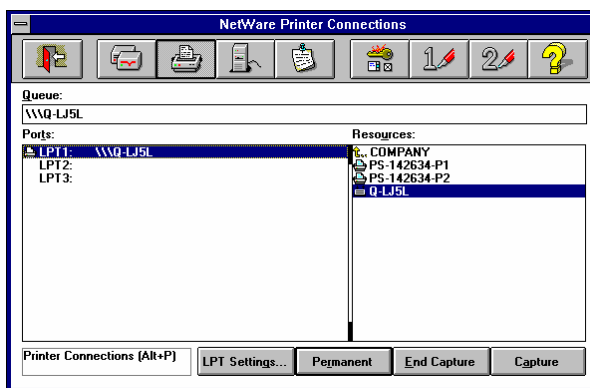
6. The printer should now be available for use.
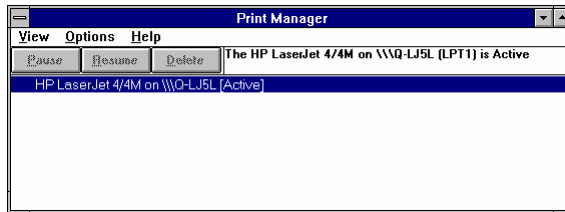
MS-DOS/PC-DOS Workstations

The use of the CAPTURE command on NetWare 4.*x* networks is the same as for NetWare 3.*x* networks. The CAPTURE command is described in the previous chapter of this manual, and in your NetWare documentation.

Setting up Microsoft Network Printing

Microsoft Networking services, based on the NetBEUI protocol, provide network users with peer-to-peer network services. In addition to accessing files and printers on a central server, any workstation can share its file directories and printer ports, making them accessible to other workstations.

Your print servers are also capable of making attached printers accessible to Microsoft Networking workstations running network operating systems such as:

♦ Microsoft Windows for Workgroups 3.x

♦ Microsoft Windows 95 (or later)

♦ Microsoft Windows NT 3.51, 4.0 or later

♦ Microsoft LAN Manager

♦ IBM LAN Server

To improve printing efficiency, Microsoft Networking services clients can choose to print to a print queue stored on a Windows NT server, which can then forward the print jobs to the print server.

Setting up the Print Server for Microsoft Networking

Little additional setup is necessary for the print server to be usable from Microsoft Networking clients. First, the NetBEUI check box in the Server Device Configuration window needs to be checked. Select the

---

print server and choose **Server Device...** from the **Configuration** menu to display this window.

You should also set the *workgroup name* and maximum allowed connections. These settings are accessible from the NetBEUI Configuration dialog window, which you can display by choosing **NetBEUI Protocol...** from the **Configuration** menu.

Each Microsoft Networking workstation or server has a workgroup name. The workgroup name determines what servers and resources will show up by default in lists of accessible resources. You should assign to the print server the same workgroup name as the users who will be accessing it most often.
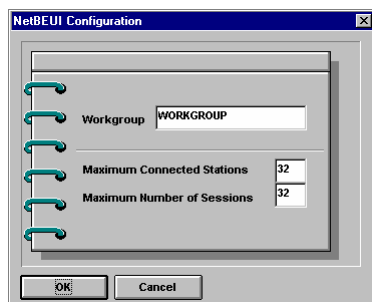
Network path names for printers on Microsoft Networking systems are of the form:

`\\`*computer name*`\`*printer name*

When the print server is used with Microsoft Networking, the Server Name (set from the Server Device Configuration window) is used for the `computer name` in the path, and the Port Name (set from the Parallel Port Configuration or Serial Port Configuration window) is used for the `printer name`.
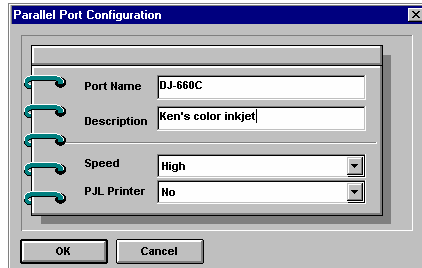
For example, the printer connected to the port named DJ-660C on server PS-142634 would be referred to by the path:

```
\\PS-142634\DJ-660C
```

Printing from Client Workstations

This section tells how to make it possible for your Microsoft Networking client workstations to access printers connected to your network print server.

Windows 95 (and later) Client Workstations

To allow your Windows 95 (or later) workstation to print over the network directly through your network print server,

1. From the **Start** menu, choose the **Settings** submenu, then the **Printers** item within it. Windows will display the Printers folder.

2. Double-click on the **Add Printer** icon in the Printers folder. Windows will start the Add Printer Wizard.

Add Printer

---

3. Press the **Next >** button to continue to the next screen.

4. Choose the **Network printer** selection and click the **Next >** button to continue.

5. Enter the network path for your network print server, specifying which port you want to connect to. For instance, to use the printer connected to the port named PS-142634-P2 on the print server named PS-142634, enter:

`\\PS-142634\PS-142634-P2`

As an alternative to entering the network path, you can also use the **Browse...** button to locate the print server and printer. Press the **Next >** button to continue.

6. At this point Windows will ask you to choose the correct printer driver for the printer. Choose your printer's make and model from the list, or use the driver disk included with the printer. When you have chosen the correct printer, click **Next >** to continue.
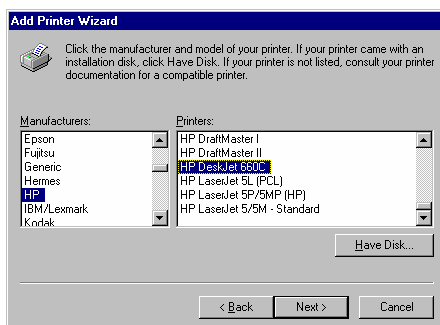
7. Windows will ask for a name for the printer. Enter a name, or accept the default. Press **Finish** to complete the installation.

Windows NT 4.0 (and later) Client Workstations

To allow your Windows NT 4.0 (or later) workstation to print over the network directly through your network print server,

1. From the **Start** menu, choose the **Settings** submenu, then the **Printers** item within it. Windows will display the Printers folder.

2. Double-click on the **Add Printer** icon in the Printers folder.

Add Printer

Windows will start the Add Printer Wizard.

3. Choose the **Network printer server** selection and click the **Next >** button to continue.

4. Enter the network path for your network print server, specifying which port you want to connect to. For instance, to use the printer connected to the port named PS-142634-P2 on the print server named PS-142634, enter:

```
\\PS-142634\PS-142634-P2
```

As an alternative to entering the network path, you can also browse the network to locate the print server and port. Press the **OK** button to continue.

5. Windows will display the following message. Press **OK** to continue.

6. At this point Windows will ask you to choose the correct printer driver for the printer. Choose your printer's make and model from the list, or use the driver disk included with the printer. When you have chosen the correct printer, click **OK** to continue.

7. If you already have a default printer, Windows will ask if you wish to use the newly installed printer as the new default.

---

8. When installation is complete, Windows will display the following dialog. Press the **Finish** button to complete installation.

Windows NT 3.51 Client Workstations

To allow your Windows NT 3.51 workstation to print over the network directly through your network print server,

1. Double-click on the Print Manager icon found in the Main program group.

2. In the Print Manager, choose **Connect to Printer...** from the **Printer** menu.

**3.** Enter the network path for the print server, specifying which printer port you want to connect to. For instance, to use the printer connected to the port named PS-142634-P2 on the print server named PS-142634, enter:
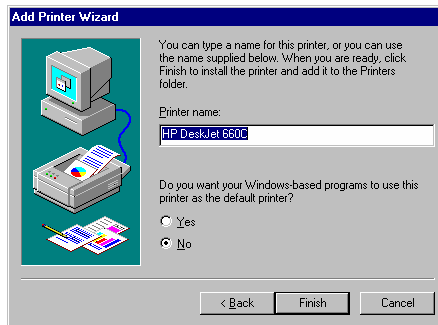
```
\\PS-142634\PS-142634-P2
```

As an alternative to entering the network path, you can also browse the network to locate the print server and port. Press the **OK** button to continue.
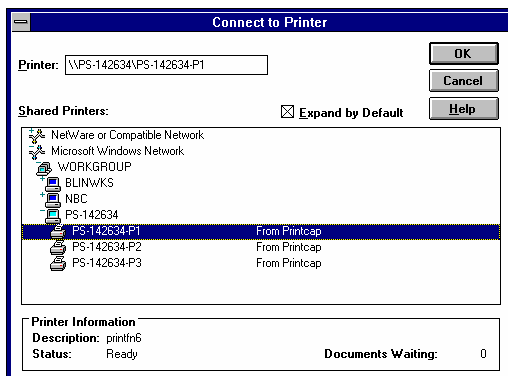
4. Windows will display the following message. Press **OK** to continue.
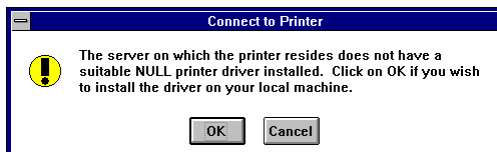
5. Windows will ask you to choose the correct printer driver for the printer. Select a driver and press **OK**.

6. The printer should now be available for use.

Windows for Workgroups Client Workstations

To enable network printing to your network print server from your Windows for Workgroups 3.11 workstation,

1. Start the Print Manager by double-clicking its icon in the Main program group.

2. From the Print Manager's **Options** menu, choose **Printer Setup…**. The Print Manager will display the Printers dialog window.

Setting up Microsoft Network Printing   **77**
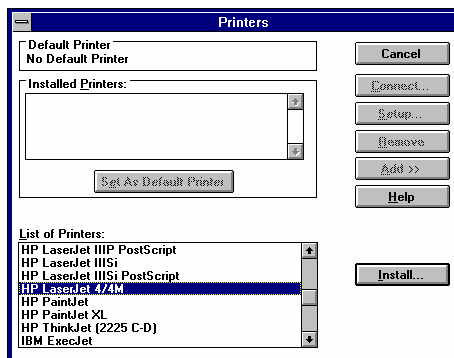
3. From the List of Printers, choose the appropriate printer type and click **Install**. If your printer type is not listed, you may have to choose "Install Unlisted or Updated Printer" and use a driver diskette provided by the printer manufacturer. The Print Manager program will install the printer's driver program, prompting you to insert diskettes as necessary. When driver installation is complete, the printer will show up in the Installed Printers list.
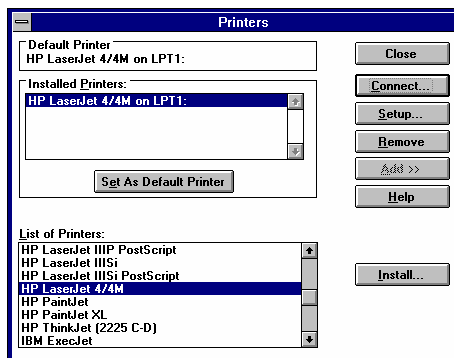
4. Select the printer in the Installed Printers list and click the **Connect...** button.

5. From the Connect dialog window, click **Network...**. The Connect Network Printer window will be displayed.

6. In the Device Name field, choose a free printer port to be assigned to the network printer. (Any free port name will do.) Once the connection is made, all requests to print to that printer port will be redirected to the network printer.
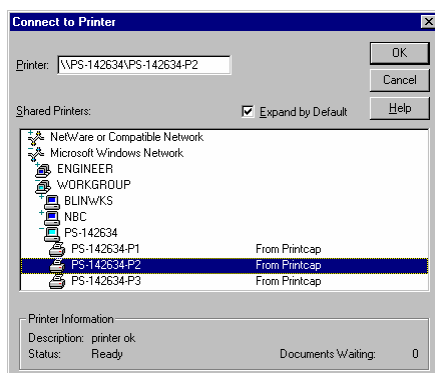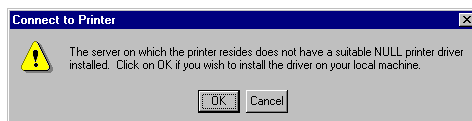
7. Enter the network path for your network print server in the Path field, specifying which port you want to connect to. For instance, to use the printer connected to the port named PS-142634-P1 on the print server named PS-142634, enter:

```
\\PS-142634\PS-142634-P1
```

As an alternative to entering the network path, you can also browse the network to locate the print server and printer. Press **OK** to continue.
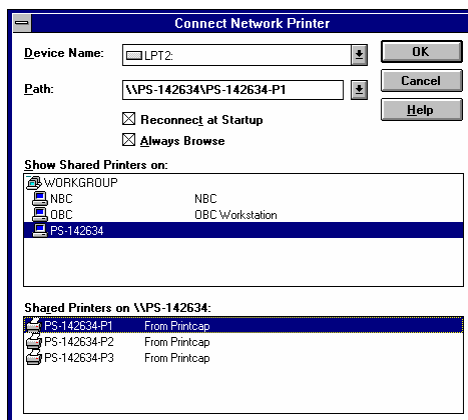
8. Select the newly connected printer port in the Connect dialog window, and click **OK**.

```
┌─────────────────────────────────────────────┐
│ ▭              Connect                        │
├─────────────────────────────────────────────┤
│ HP LaserJet 4/4M                  ┌─────────┐ │
│ Ports:                            │   OK    │ │
│ ┌─────────────────────────────┐▲  └─────────┘ │
│ │LPT1:    Local Port          │   ┌─────────┐ │
│ │LPT2:    \\PS-142634\PS-14263▒│   │ Cancel  │ │
│ │LPT3:    Local Port Not Pres.│   └─────────┘ │
│ │COM1:    Local Port Not Pres.│   ┌─────────┐ │
│ │COM2:    Local Port          │▼  │Settings.│ │
│ └─────────────────────────────┘   └─────────┘ │
│ ┌─Timeouts (seconds)──────────┐   ┌─────────┐ │
│ │ Device Not Selected:  [ 15 ]│   │Network..│ │
│ │                             │   └─────────┘ │
│ │ Transmission Retry:   [ 45 ]│   ┌─────────┐ │
│ └─────────────────────────────┘   │  Help   │ │
│ ☒ Fast Printing Direct to Port    └─────────┘ │
└─────────────────────────────────────────────┘
```
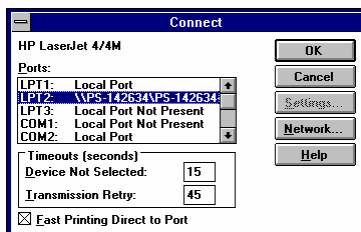
9. Click **Close** to close the Printers dialog window.

10. The printer will now appear in the Print Manager window, and will be accessible from all Windows applications, as well as for DOS applications executed from Windows.

```
┌──────────────────────────────────────────────────────────────────┐
│ ▭                     Print Manager                        ▼ ▲    │
├──────────────────────────────────────────────────────────────────┤
│ Printer  Document  View  Options  Help                            │
├──────────────────────────────────────────────────────────────────┤
│ [🖨][🖨] [🖨][🖨] [🖨][🖨] [🖨] [🖨][🖨] [🖨][🖨][🖨]               │
├──────────────────────────────────────────────────────────────────┤
│ Printer/Document Name                    │Status │Size  │Time      │
│ 🖨 HP LaserJet 4/4M on LPT2 (\\PS-142634\PS-142634-P1) │Idle │0 jobs│  │
│                                                                    │
│                                                                    │
│                                                                    │
│ The printer is idle.          printer ok                          │
└──────────────────────────────────────────────────────────────────┘
```
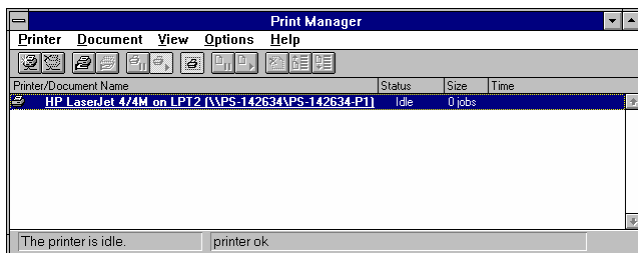
MS-DOS/PC-DOS Workstations

To connect your MS-DOS/PC-DOS workstation using client software such as

♦ Microsoft LAN Manager client

♦ Microsoft NT Server client

♦ Microsoft Windows for Workgroups (DOS client)

you will normally use the NET USE command. To connect a DOS-based NetBEUI client to a printer attached to your print server,

1. Choose a free printer port (LPT1, LPT2, or LPT3) not being used on the workstation. If you never connect a printer directly to the workstation's physical printer port, you should probably choose LPT1.

2. Type the command

```
NET USE port \\computer name\printer name
```

where *port* is the name of the free printer port, *computer name* is the name of the print server, and *printer name* is the name of the print server's port. For example, to connect LPT1 to the printer on port PS-142634-P1 on the print server PS-142634, use the command:

```
NET USE LPT1 \\PS-142634\PS-142634-P1
```

3. You can add the above line to your AUTOEXEC.BAT file if you always wish to be connected to the printer.

Keeping the Print Queue on a Windows NT Server

Because Microsoft Windows Networking is a peer-to-peer network, it is possible for clients workstations to connect directly to the network print server. However, because the print server's memory is limited, a client may have to wait for large print jobs to complete instead of letting the print server queue the entire job.

To reduce wait times for clients, you may wish to store the print queue on a Windows NT Server. For a Windows NT 4.0 server,

1. From the **Start** menu, choose the **Settings** submenu, then the **Printers** item within it. Windows will display the Printers folder.

---

2. Double-click on the **Add Printer** icon in the Printers folder.

Add Printer

Windows will start the Add Printer Wizard.

3. Choose the **My Computer** selection and click the **Next >** button to continue.
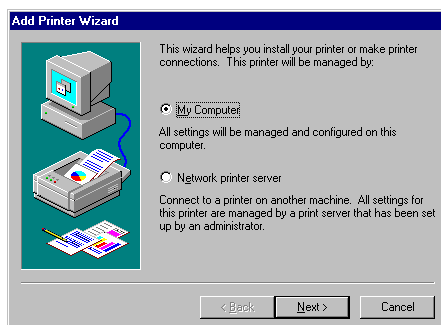
4. Check the box for an unused local port on your server, usually LPT2 or LPT3. Click the **Next >** button to continue.
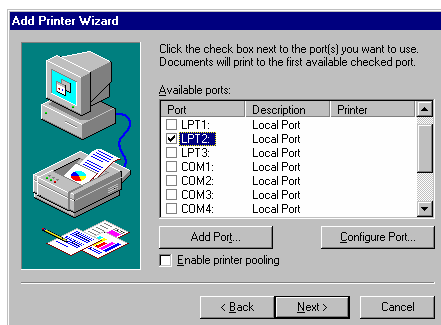
5. At this point Windows will ask you to choose the correct printer driver for the printer. Choose your printer's make and model from the list, or use the driver disk included with the printer. When you have chosen the correct printer, click **Next >** to continue.

6. Windows will give you opportunity to share the printer. Click the **Shared** selection, and give the printer a share name, then click **Next >** to continue.
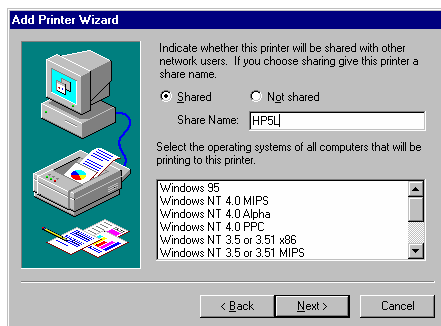
7. After you are finished adding the printer to the server, you need to redirect the local port to the print server using a `NET USE` command typed in from the Command Prompt:

`NET USE LPT2 \\PS-142634\PS-142634-P1`

You will need to execute this command every time the server is rebooted. You may wish to place it in a batch file, executed from the Startup program group.

For a Windows NT 3.51 server,

1. Double-click on the Print Manager icon found in the Main program group.

2. Choose **Create Printer...** from the **Printer** menu.

3. In the Create Printer dialog window, choose a name for the printer, select the proper driver, and choose an unused local printer port. Click the check box to allow the printer to be shared, and choose a share name (the name by which the printer will be known to network clients). Click **OK** to continue.
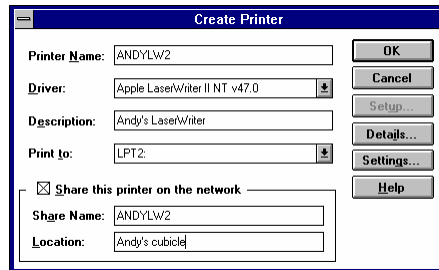
4. After you are finished adding the printer to the server, you need to redirect the local port to the print server using a `NET USE` command typed in from the Command Prompt:

`NET USE LPT2 \\PS-142634\PS-142634-P1`

You will need to execute this command every time the server is rebooted. You may wish to place it in a batch file, executed from the Startup program group.

Setting up AppleTalk Printing

The AppleTalk network protocol is used with computers using the MacOS operating system. It can be used for network communications over standard Ethernet or Fast Ethernet using the EtherTalk transport, or over a proprietary low-speed LocalTalk transport.

Your print server can be used for network printing to PostScript printers. You can print from any MacOS computer connected to your Ethernet network, either directly using an EtherTalk connection, or indirectly through a LocalTalk-to-EtherTalk router.

NOTE: *The Chooser name of a printer connected to one of the print server's ports is the same as its port name. If you are using AppleTalk printing, you will need to make sure that every port name is unique among all of the network printers in your AppleTalk zone.*

Setting up the Print Server for AppleTalk Printing

To set up your print server so that it can be used for AppleTalk printing:

1. Make sure the AppleTalk protocol is enabled. The AppleTalk check box in the Server Device Configuration window needs to be checked. Select the print server and choose **Server Device...** from the **Configuration** menu to display this window.

2. Choose **AppleTalk Protocol...** from the **Configuration** menu.

3. If your AppleTalk network is divided into *AppleTalk zones*, you will have to specify which zone the print server should be in. You should locate the print server in the same zone as most of the users who will be using it.

If your network is not divided into zones, the AppleTalk Zone field should contain a single asterisk "*".

4. For each printer port that will be used for AppleTalk printing, you may need to change the AppleTalk port settings. Press the appropriate Port Setting button to open the AppleTalk Port Configuration dialog window.
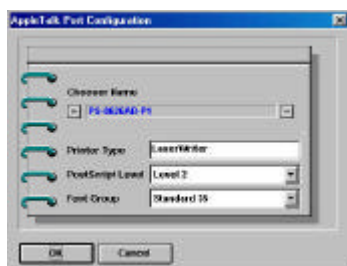
PS Admin will display the port's Chooser Name (which is the same as the port name) and allow you to change the port's settings:

◊ **Printer Type** Describes the type of printer. Most PostScript printers should use the LaserWriter type.

◊ **PostScript Level** Describes whether the printer supports Level 1 PostScript or Level 2 PostScript. This information can usually be found in the printer's documentation or on the printer test page.

◊ **Font Group** Describes the print font options supported by the printer such as No Font, All Font, Standard 35, and Standard 13.

5. Press **OK** to return to the AppleTalk Configuration dialog. Repeat these steps for as many ports as necessary.

6. Press **OK**, then choose **Save Configuration** from the **Configuration** menu (or press the Save Configuration toolbar button) to change the settings in the print server. The print server will restart itself and begin serving print jobs.

Printing from MacOS Client Workstations

The exact procedure for selecting a PostScript printer connected to your print server may vary slightly, depending on what printer driver version you are using. The procedure described below assumes you are using the LaserWriter 8 print driver, included with recent versions of the MacOS operating system.

To choose a printer connected to your print server as your MacOS workstation's default printer,

1. Open the Chooser by selecting **Chooser** from the Apple menu.

2. Select the LaserWriter 8 icon on the left. Make sure that AppleTalk is set to Active.

3. A list of all networked PostScript printers will be displayed:
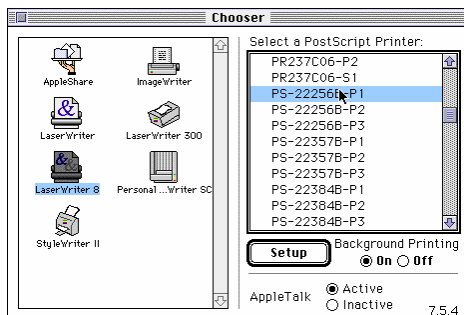
Click on the name of the printer (port) you wish to use.

4. If you previously have not set this printer as the default, your computer will prompt you for a PostScript Printer Description file. Choose the appropriate printer description file for your printer and click **Select**. If your printer is not listed, click **Use Generic** to use a generic printer description.
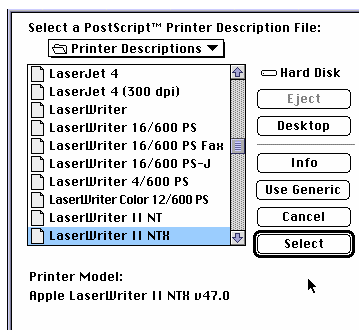
If you wish to access this setting in the future, you can use the **Setup** button in the Chooser window.

5. At this point the selected printer will become your computer's default printer. You may need to choose **Page Setup...** in any applications you might have open.

Setting up UNIX TCP/IP Printing

Your print servers can provide print services to systems using the lpr/lpd network printing protocol. Most UNIX systems are capable of supporting lpd.

This chapter explains how to use *PS Admin* to configure the print server for TCP/IP printing, and how to configure your Unix workstations to print to the print server.

For TCP/IP networks without a Windows-based workstation available, you can use the telnet interface to configure the print server. See *Appendix: Telnet Interface Administration* for more information about using the telnet interface.

Configuring TCP/IP Network Settings

To configure your print server to allow TCP/IP-based printing, as well as SNMP and telnet-based management,

1. Make sure the TCP/IP protocol is enabled. The TCP/IP check box in the Server Device Configuration window needs to be checked. Select the print server and choose **Server Device...** from the **Configuration** menu to display this window.

2. Choose **TCP/IP Protocol...** from the **Configuration** menu.

3. Configure the print server's IP address, local network subnet mask, and default gateway.

---
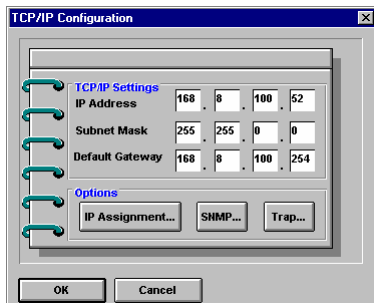
4. Press **OK**, then choose **Save Configuration** from the **Configuration** menu (or press the Save Configuration toolbar button) to change the settings in the print server.

The print server will restart itself and will be available for lpd-protocol printing, as well as management using the telnet protocol and SNMP-based centralized network management.

Printing Text Files from Unix

Text files on Unix systems contain lines that end with "newline" characters, as opposed to MS-DOS and the Windows-related operating systems that end with a carriage return followed by a linefeed. Most printers require a carriage return/linefeed pair at the end of each line, making it necessary for some translation to be done before Unix text files can be printed on most printers.

For this purpose, you can define two "printers" for the same printer port, one that prints to the port itself, and one that prints to the port name with _TEXT added to the name. Files printed to the second port will be translated so that the printer has the carriage return/linefeed pairs that it needs.

For example, you could define a printer hp5l that prints to port PS-142634-P1, and a printer hp5lt that prints to port PS-142634-P1_TEXT. Your graphics files could then be printed to the hp5l printer, and "raw" text files could be printed to the hp5lt printer.

Printing from BSD Unix Versions

For "flavors" of the Unix operating system derived from or related to the BSD releases, such as SunOS 4.x, Linux, BSD/OS, FreeBSD, or NetBSD, you can use the following procedure to enable users to print to a printer connected to your print server:

1. Log in as the superuser (root).

2. Add an entry for the print server in the host's /etc/hosts file, giving a hostname for the print server's IP address. A line in /etc/hosts contains an IP address and one or more aliases for the host. For example:

```
202.39.74.40  ps-142634 ps-142634.company.com
```

If you use DNS (the Domain Naming Services protocol), you can add an address record entry to your DNS database for the print server.

3. Create a spool directory for the printer:

◊ On SunOS systems, create the directory as a subdirectory of /var/spool, with the same name as the printer (e.g., /var/spool/hp5l).

◊ On Linux systems, create the directory as a subdirectory of /usr/spool/lp.

◊ On BSD/OS, FreeBSD, or NetBSD systems, create the directory as a subdirectory of /var/spool.

4. Change the owner and permissions of the directory so that it is owned and writable by group daemon, using the following commands:

```
chown bin.daemon /var/spool/hp5l
chmod 775 /var/spool/hp5l
```

5. Add an entry for the printer to /etc/printcap, similar to the following:

```
hp5l:\
    :lp=:sd=/var/spool/hp5l:mx#0:\
    :rm=ps-142634:rp=PS-142634-P1:
```

The meaning of each of the entries is described below. The directory path in the sd spool directory entry should match the directory name you created above. If your entry requires more than one line you can escape the newline with a backslash.

6. Issue the command

```
lpc start hp5l
```

to start a spool daemon for the printer. The printer will now be available for use.

7. Optionally, add another printcap entry (and issue another lpc start command) for a second printer, using the *port*_TEXT port. This second printer name can be used for printing text files.

Entries in /etc/printcap begin with a name for the printer or a list of names, separated by | (a vertical bar). The entries used above are:

♦ **lp=** The lp entry is used to specify a local printer device. Since the printer is a remote printer, this entry should be blank.

♦ **sd=*dir*** The location of the printer's local spool directory.

♦ **mx#*blocks*** The limit for print job files in the local spool directory; 0 means no limit.

♦ **rm=*address*** The host where the remote printer is located, in this case your print server.

♦ **rp=*printer*** The name of the printer on the remote host. For the print server, the port name should be used. **Note:** this entry is case-sensitive.

Printing from SCO Unix System V/386

To allow printing to a printer attached to your print server from a SCO Unix System V/386 host,

1. Login as the superuser (root).

2. Add an entry for the print server in the host's /etc/hosts file, giving a hostname for the print server's IP address. A line in /etc/hosts contains an IP address and one or more aliases for the host. For example:

```
202.39.74.40  ps-142634 ps-142634.company.com
```

If you use DNS (the Domain Naming Services protocol), you can add an address record entry to your DNS database for the print server.

3. Change to the /dev directory, and issue the command

```
mkdev rlp
```

4. The script will ask:

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

Answer `i` and press Enter to continue.

5. The script will ask:

```
Do you want to change the remote printer
description file /etc/printcap(y/n)?
```

Answer `y` and press Enter to continue.

6. The script will ask:

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

Enter an alias for the printer on the local machine and press Enter.
This name should be the same as the destination port name.

7. Answer `r` (remote printer) to the question

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

8. When prompted with the question:

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

then enter the address of the print server. You can use the name
you added to `/etc/hosts` in the step above.

9. Confirm that your entries are correct.

```
Is this correct? (y/n)
```

10. Answer the question:

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

11. When you are done adding remote printers, enter q for the printer name.

12. Answer y to the question

```
Do you want to start remote daemon now (y/n)?
```

Once remote printing is set up, you can use the lp command to print jobs to the new printer. For more information, consult your SCO Unix documentation.

Printing from Solaris

To allow printing from a Sun Solaris workstation,

1. Login as the superuser (root).

2. Add an entry for the print server in the host's /etc/hosts file, giving a hostname for the print server's IP address. A line in /etc/hosts contains an IP address and one or more aliases for the host. For example:

```
202.39.74.40  ps-142634 ps-142634.company.com
```

If you use DNS (the Domain Naming Services protocol), you can add an address record entry to your DNS database for the print server.

3. In OpenWindows, start the admintool program.

4. Click on the **Printer Manger** icon.

5. From the **Edit** menu, select **Add Printer**, then **Add Access to Remote Printer...**

6. Enter values for the fields as follows:

◊ **Printer Name** This field should contain the name of the printer port you wish to use. The field is case-sensitive.

◊ **Printer Server** This field should contain the IP address of the print server, or the alias name you added in step 2.

◊ **Printer Server OS** This field should be set to BSD.

7. Confirm the addition.

8. Optionally repeat the addition to add another printer for printing text files, with _TEXT appended to the port name.

Once you have added the new printer, you can use the `lp` command to print files to the printer. Consult your Solaris documentation for details.

Printing from Windows NT

Windows NT versions 3.51 and later support printing using the `lpd` protocol. To print to your print server from a Windows NT 4.0 workstation or server,

1. Make sure that you have installed the TCP/IP protocol and the Microsoft TCP/IP Printing service. You can install these from the Network control panel if necessary.

2. From the **Start** menu, choose the **Settings** submenu, then the **Printers** item within it. Windows will display the Printers folder.

3. Double-click on the **Add Printer** icon in the Printers folder.

Add Printer

Windows will start the Add Printer Wizard.

4. Choose the **My Computer** selection and click the **Next >** button to continue.
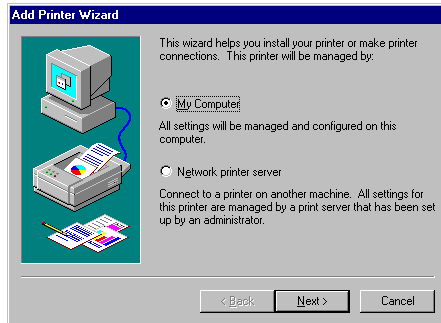
5. Click the **Add Port...** button to add the `lpd` print server to the list of ports.

6. Choose the LPR Port type and press **New Port...**.
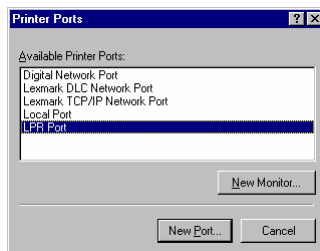
7. Enter the IP address of your print server, and the port name of the printer you wish to use.
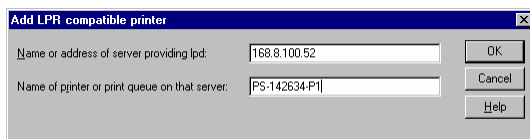
8. Click **OK** to return to the Printer Ports window, and then click **Close** to return to the Add Printer Wizard.

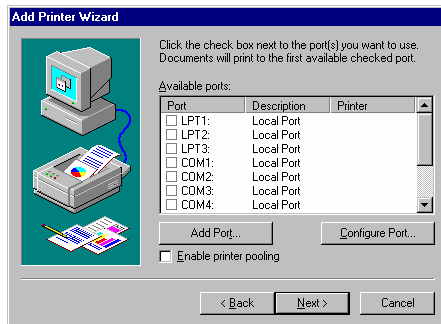**9.** Click **Next >** to continue installing the printer, following the on-screen instructions. The Add Printer Wizard will ask you to select the proper driver for the printer, and will ask you to give a name to the printer.

When you are done installing the printer, you will be able to use any of the usual printing commands to print to your printer.

Printing using TFTP

For testing purposes, you can also use the Trivial File Transfer Protocol (TFTP) to print to the print server. This is not a recommended method for ordinary printing, since it will not work if the print server is already printing.

On most systems, you can enter the command

```
tftp ip-address
```

to start the `tftp` client program. At the `tftp` prompt, you can type

```
put file dest-port
```

to print the local file named *file* to the print server port named *dest-port*. (Case is sensitive in the *dest-port* name.)

Printing using FTP

You can also use the Internet's standard File Transfer Protocol (FTP) to print to the print server. As with the TFTP method, this is recommended only for testing.

You can use any FTP client, including client programs with graphical interfaces. To use a command line version of FTP, on most systems you can enter the command

ftp *ip-address*

to start the ftp client program. At the ftp prompt, you can type

put *file dest-port*

to print the local file named *file* to the print server port named *dest-port*. (Case is sensitive in the *dest-port* name.)

PS Admin Administration

This chapter explains the *PS Admin* main window display, and tells how you can use *PS Admin* to perform common print server administration tasks, including:

♦ Monitoring the status of printers connected to the print server's ports.

♦ Checking the status of NetWare print jobs.

♦ Configuring NetWare print services, including print servers, print queues, and printers.

♦ Resetting the print server.

♦ Upgrading the print server's internal flash memory using an updated flash memory file.

The PS Admin Main Window

The main window of the *PS Admin* contains the following elements:

♦ **Toolbar buttons** The toolbar buttons are shortcuts for their corresponding menu choices. The buttons on the toolbar are, from left to right: Configure Server, Configure NetWare, Configure TCP/IP, Configure NetBEUI, Configure AppleTalk, Save Configuration, Printer Status, and Device Diagnostics.

♦ **Menu Shortcuts** There are four groups of menu shortcuts on the main window, corresponding to the **Configuration**, **Management**, **NetWare**, and **Tools** menus in the menu bar.

♦ **Expand Server List button** The expand server list button expands the **Server Name List** into an extended format.

The extended server list format contains additional information about each server. To shrink the list back to the abbreviated format, press the button again.

♦ **Server Name Filter** The server name filter pulldown list allows you to choose an already-defined filter for limiting the Server Name List to a smaller set. You can use the **Define Filter Strings** button to define new filters, as described below in the *Filtering the List of Print Servers* section.

♦ **Discover Print Servers button** When a new print server is added to the network, you need to press the Discover Print Servers button to update the *PS Admin* display. Pressing this button is the equivalent of choosing **Discover** from the **File** menu.

Filtering the List of Print Servers

In an environment with a large number of print servers, you may wish to set up filters to make it easier to find individual print servers or groups of print servers.

Filters are similar to wildcards in DOS or other operating systems. A filter wildcard uses the wildcard characters * and ? to select a set of print servers. The ? wildcard character matches any character in a print server name, and the * character represents zero or more characters.

For example, to limit the print server display to servers MKT-01, MKT-02, MKT-03, ..., you could use the filter MKT-??. To display all servers with names beginning with S, you can use the filter S*.

To establish and use a new filter:

1. Press the **Define Filter Strings** button.
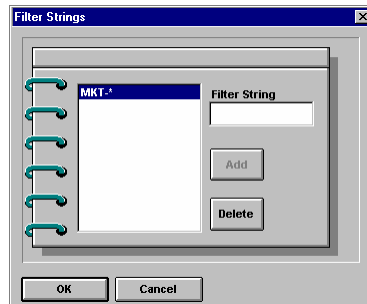
2. Enter a filter string and press the **Add** button.

3. Select the new filter string from the Server Name Filter pulldown list. The server list will be restricted to the list of servers that match the filter string.

4. To display all servers, choose All Devices from the Server Name Filter pulldown.

Working with Environment Files and Preferences

When *PS Admin* starts up, it first checks the network, looking for all network print servers. Since this may take awhile if you have a large network, you may want to use environment files to reduce the wait. An environment file stores the list of servers it has discovered, along with information about them.

To save an environment file,

1. Make sure that *PS Admin*'s list of servers is up-to-date. Press the **Discover Print Servers** button to update the list if necessary.

2. Choose **Save As...** from the **File** menu. Choose a file name for the file. By default the file will have a .ENV extension.

To tell *PS Admin* to open the environment file when it starts up instead of trying to discover all of the devices on the network,

1. Choose **Preferences...** from the **File** menu.

2. Click on the Load Environment File on Startup selection. Type in a filename, or use the **Browse...** button to locate the file on your hard disk.
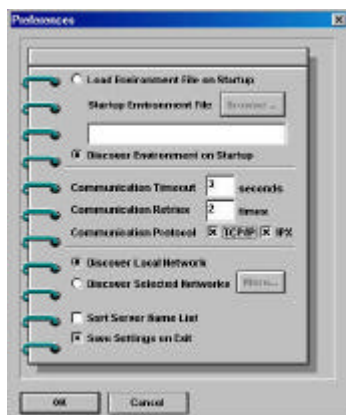
3. Click **OK**.

The settings accessible from the *PS Admin* Preferences dialog window are:

♦ **Load Environment File on Startup/Discover Environment on Startup** Determines whether *PS Admin* should load a file listing all of the print servers on the network and their addresses, or if it should search the network each time it starts.

♦ **Communication Timeout** Determines how long *PS Admin* will wait for a request sent to the print server to receive a response. You may have to increase this number if you have a large network.

♦ **Communication Retries** Determines how many times *PS Admin* will try again if it doesn't receive a response from a print sever.

♦ **Communication Protocol** Determines the communication protocol between *PS Admin* and the print server for configuration by either TCP/IP or IPX.

♦ **Discover Local Network/Discover Selected Networks** Determines whether *PS Admin* should discover print servers on your local IPX network only, or if it should also search other networks reachable from your workstation.

Pressing the **More...** button will display the IPX Network Segments window, which allows you to choose which networks will be searched. You can choose All Network Segments to discover servers on all reachable networks, or Selected Network Segments to select which networks you want to search in the displayed list.
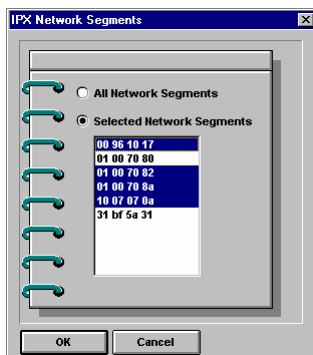
- ♦ **Sort Server Name List** Determines whether or not the list of servers should be sorted.

- ♦ **Save Settings on Exit** Determines whether or not *PS Admin* settings, for example filter definitions, should be saved when you exit *PS Admin*.

Monitoring Printer Status

By choosing **Printer Status** from the **Management** menu, you can monitor the status of each of the printers attached to the print server.

Pressing the Select Port buttons determines which port's status will be displayed.
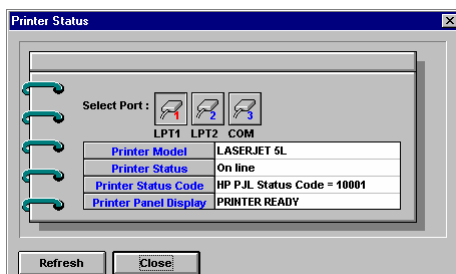
The Printer Status field shows whether the printer is on line, off line, is out of paper, or has an error. If the printer is compatible with HP' s PJL (Printer Job Lanaguage) protocol, and you have enabled the use of PJL on the port (see the *Changing Print Server Port Settings* section for instructions on how to do this), then the Printer Model, Printer Status Code, and Printer Panel Display fields will display information about the printer and its status.

Checking NetWare Print Jobs

The NetWare Print Jobs window, accessible from the **NetWare Print Jobs** selection of the **Management** menu, can be used to monitor NetWare bindery-based print queues being served by your print server, and to change the form type being used on a port. The NetWare Print Jobs window is a convenient substitute for the NetWare PCONSOLE program for everyday queue-management tasks.
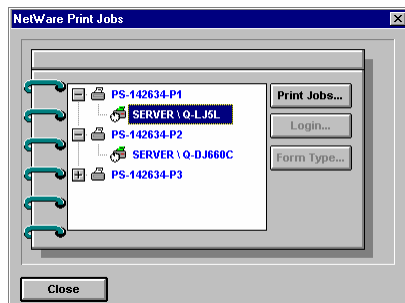
Selecting the ⊞ symbol to the left of the port name will expand the list of all of the queues served by the port. Selecting a print queue and pressing the **Print Jobs...** button will display the Manage Print Jobs window:
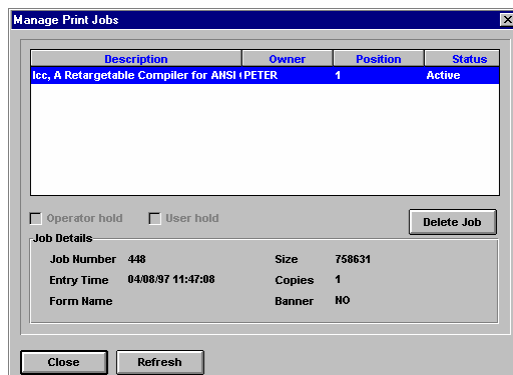
From this window you can view the list of jobs for the queue, and remove jobs if necessary by pressing the **Delete Job** button. Checking a job's **Operator Hold** box allows you to hold up the job in the print queue, leaving it in the queue until it is released (by un-checking the box). Similarly, if a print job user has placed a hold on a job, you can release the job to be printed by un-checking the **User Hold** box.

Selecting a port and pressing the **Form Type...** button will display the Form Type window, provided the port is not set to service All Forms (see the *NetWare Settings* section for more information about the Form Type setting). From the Form Type dialog window, you can change the current form type available on the printer.
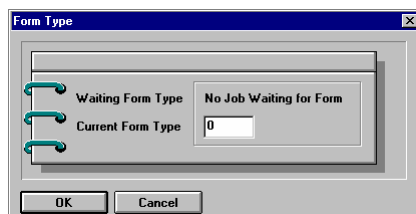
Form types can be defined with the NetWare PCONSOLE program. Each of the different kinds of paper that a printer might contain can be

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assigned a different form type, and print jobs can be configured to request the type of form they need. For more information about form types, consult your NetWare documentation.

Configuring NetWare Print Services

For convenience, the *PS Admin* program provides many of the same NetWare print services administration features as NetWare's PCONSOLE or the NetWare Windows-based administration tools. The *PS Admin* program allows you to conveniently manage NetWare Bindery-based print queues, printers, and print servers on any of your NetWare file servers.

Note that for managing print services on servers using NDS (NetWare Directory Services), you will need to use Novell-provided administration programs.

Managing Print Queues

Selecting **Print Queues...** from the *PS Admin* **NetWare** menu displays the NetWare Print Queues dialog window.
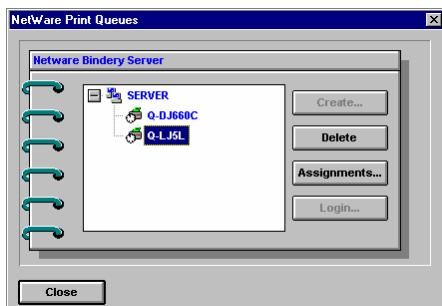
To create a new print queue, click on the name of the file server where you want to create the queue and press **Create...**. Enter a name for the queue and press **OK**.

To remove a print queue, select it and press **Delete**. To view and/or modify its list of assigned print servers, queue operators, or queue users, press **Assignments...**.

From the **Assign NetWare Print Servers** tab, you can assign already-defined print servers to the print queue you have selected, or remove print queue assignments. For information about defining print servers, see the *Managing Print Servers* section below.
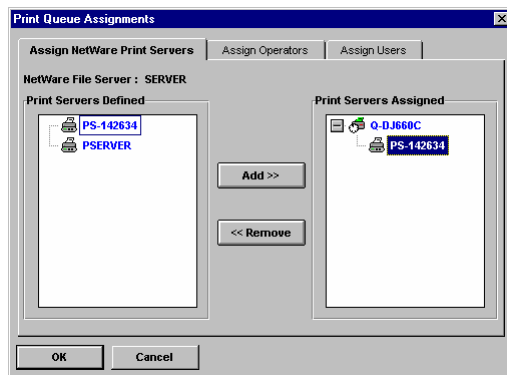
From the **Assign Operators** tab, you can determine what users are allowed to operate the queue. Queue operators are allowed to edit other user's print jobs, delete print jobs, change the order of print jobs, and modify the queue status.

From the **Assign Users** tab, you can determine who is allowed to use the printer. For NetWare 3.x servers, normally the group EVERYONE, of which all users are members, is assigned to the queue users list. This means that all users can send jobs to the queue. If you want to restrict the use of the print queue, you can remove the group EVERYONE and add a smaller group, or you can add individual users. For NetWare 4.*x* servers, you will need to create such a group manually.
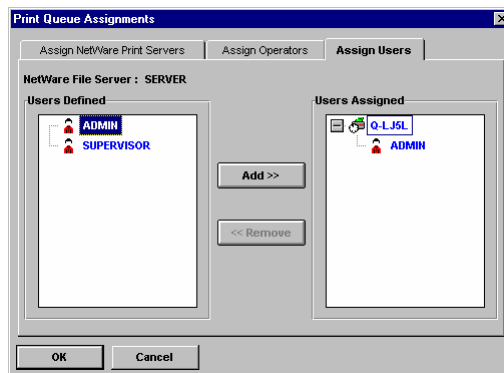
Managing Printers

Selecting **Printers...** from the *PS Admin* **NetWare** menu displays the NetWare Printers dialog window.

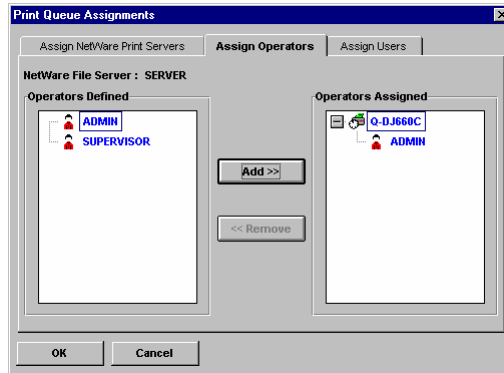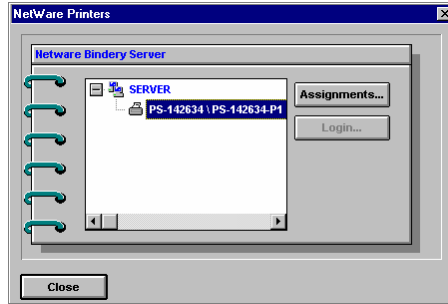Clicking on a printer and clicking Assignments displays the Printer Assignments dialog. From the **Assign NetWare Print Queues** tab, you can determine which print queues are served by the printer, adding or removing queues from the assigned list.
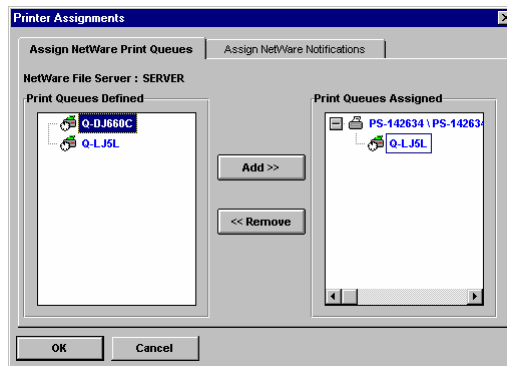
From the **Assign NetWare Notifications** tab, you can determine which users are notified if a problem occurs with the print job. By default, only the owner of the individual print job receives notification.
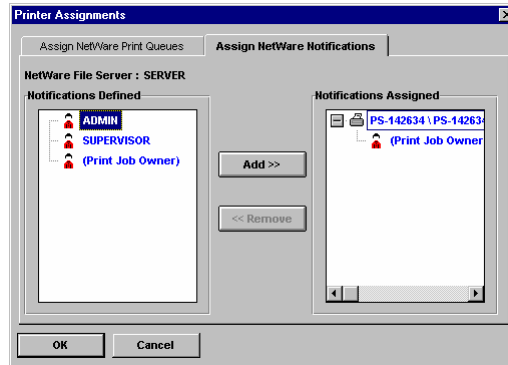
Managing Print Servers

Selecting **Print Servers...** from the *PS Admin* **NetWare** menu displays the NetWare Printers dialog window.
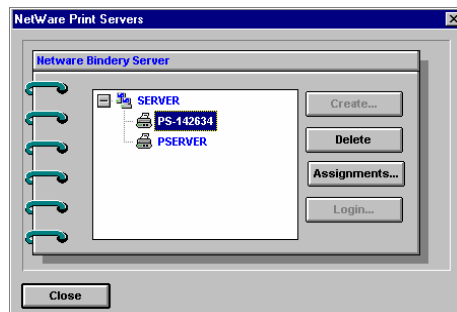
Selecting a file server and clicking **Create...** allows you to create a new print server. Selecting a print server and clicking **Delete** allows you to delete it, and clicking **Assignments...** displays the **Print Server Assignments** dialog window.

From the **Assign NetWare Printers** tab, you can define new printers in the selected print server, or remove printers from the server.
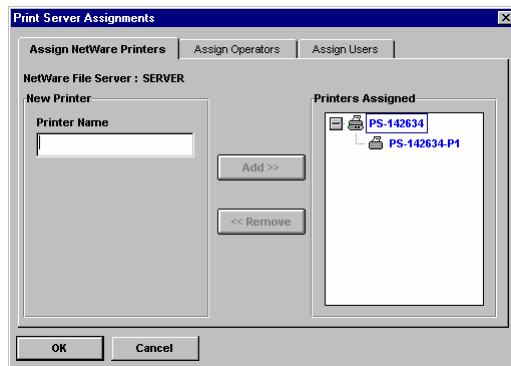
From the **Assign Operators** tab, you can add or remove users from the print server's operators list. Print server operators are allowed to attach the print server to other file servers, set printers' forms and notification lists, change the list of queues served and queue priorities, or down the print server.
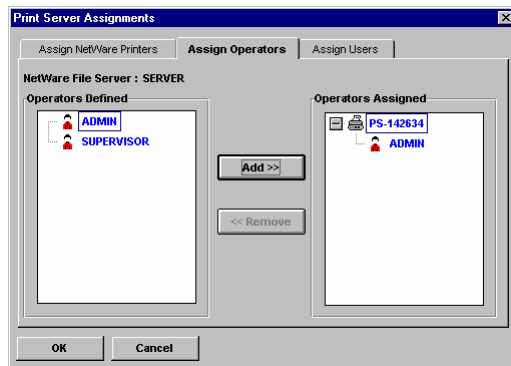
From the **Assign Users** tab, you can set the print server's user list. Print server users are allowed to monitor the print server's status. (It is not necessary to be a print server user to print to a queue served by the printer; one need only be a queue user.) By default on NetWare 3.x

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servers, the group EVERYONE is included, making it possible for all users on the file server to view the server's status.
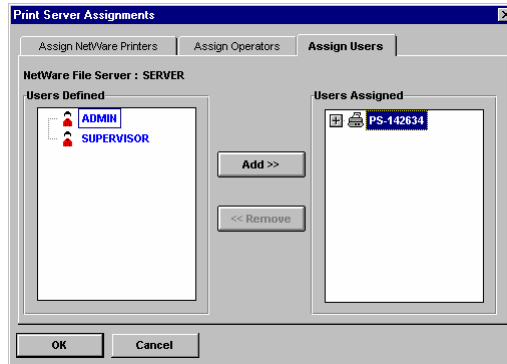
Resetting the Print Server

Sometimes it may be desirable to restart your network print server, in order to reset its internal statistics counters or to clear other status information.

There are two different ways to reset the print server:

♦ An ordinary reset has the same effect as powering off the print server and powering it back on again. Statistics counters will be cleared, but all of the print server's configuration settings will be retained.

♦ A factory reset not only restarts the print server, but changes all of its configuration settings back to their original values, as the print server was shipped from the factory.

WARNING: *Do not perform a factory reset unless you are absolutely sure this is what you want. All settings will be erased and replaced with their original values.*

To perform the reset:

1. Select **Reset** or **Factory Reset** from the **Tools** menu.

2. *PS Admin* will ask for confirmation for the reset.

3. Click **Yes** to confirm. The print server will reset itself. If you selected **Factory Reset**, all of the print server's default configuration values will be restored.

Upgrading the Print Server's Internal Firmware

The print server's internal software is stored in Flash memory, which allows you to upgrade it to an updated version without shipping the print server back to your distributor. Consult your dealer for information about when updated print server firmware versions are available.

You will also need to have copies of the updated firmware. Firmware updates are contained in to related files, a larger one with a .bin extension, and a smaller one having a .dwl extension. Both of these files are necessary for the download to be completed successfully.

To perform the download:

1. Make sure you have backup copies of the previous version of the firmware image files before overwriting them with the new ones.

2. Choose **Download Firmware...** from the *PS Admin* **Tools** menu. The print server will ask for the filename of the updated `.bin` image file.
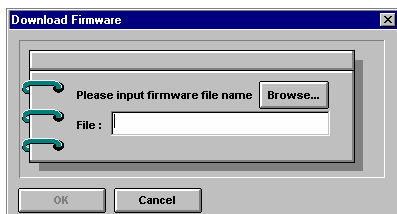
3. Type in the pathname of the `.bin` file, or click the **Browse...** button to locate the file using a standard dialog box.

4. Click **OK**. *PS Admin* will display an informational warning message.

5. Click **OK**. The download will begin. *PS Admin* will display the progress of the download.
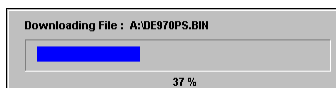
6. When downloading is complete, *PS Admin* will display an informational message.

WARNING: *When downloading the image file, be very careful not to interrupt the transfer by powering down the print server or disconnecting it from the network. The print server should be able to recover from an interrupted transfer in most cases, However, in some situations it may be necessary to return your print server for servicing in order to recover from an interrupted download.*

Troubleshooting Print Server Problems

This chapter gives advice for identifying problems with your print server.

Using the PS Admin Device Diagnostics Window

Choosing **Device Diagnostics...** from the *PS Admin* **Management** menu displays the Device Diagnostics window. From the Device Diagnostics window you can display many of the print server's settings and status items, allowing you to identify many types of print server problems.

The **Configuration** tab displays the print server's configuration settings, divided into different categories in a tree structure. You can expand branches of the tree to display entries beneath the branch.
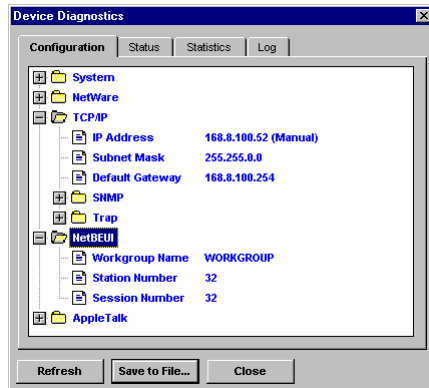
The **Status** tab shows the status of the print server's various subsystems.
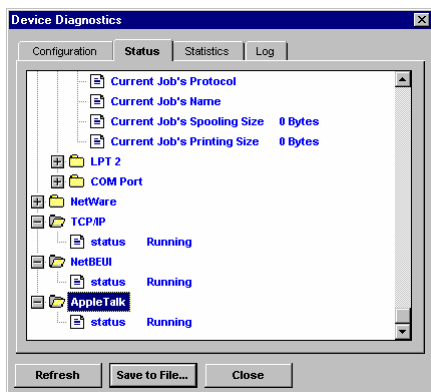
The **Statistics** tab shows collected statistics, also divided into various categories. (Many of these categories correspond to standard SNMP management information base categories.)
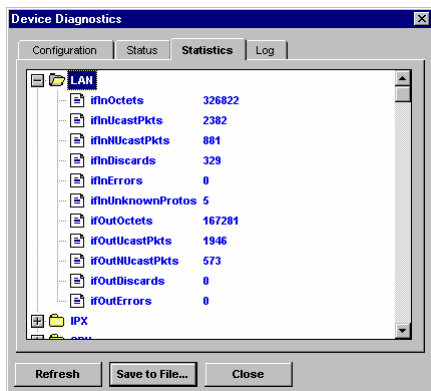
The **Log** tab contains a tree branch for each error that occurs. Error log entry branches contain detailed information about the problem,

which should be able to assist your or technical support representative to locate the problem.

The **Save to File...** button at the bottom of the dialog window allows you to save a text file listing all of the entries in the Device Diagnostic window. You can use this function to keep a record of your print server's settings for future reference. The contents of this file may also be useful to your technical support representative if you encounter problems you are unable to resolve.

Appendix: Telnet Interface Administration

This appendix describes the use the `telnet` interface for controlling and configuring print servers.

Setting an IP Address without PS Admin

The *PS Admin* program allows you to set your print server's IP address (and other TCP/IP parameters). If you don't have a Windows-based workstation and you need to set your print server's address, you can use a BOOTP (Boot Protocol) server, or the manual method described below.

If you want to use BOOTP, your local Ethernet network needs to have a BOOTP server. The BOOTP server table needs to have an entry listing the print server's Ethernet (MAC) address, the IP address you want to assign to the print server, the network's mask, and the default gateway (router) address. Consult your BOOTP server documentation for information about how to add an entry to the server table.

If you aren't using BOOTP, you can manually set the IP address using the following method:

1. Note your print server's Ethernet (MAC) address. The Ethernet address is a 12-digit hex number printed on a sticker on the bottom of your print server.

2. Use a host on the same local Ethernet network as the print server. Change your host's ARP (address resolution protocol) table to

add a mapping from the IP address you want to assign to the print server's Ethernet address. For many TCP/IP systems, this is done with a command of the form:

```
arp -s ip-address ethernet-address
```

For example, to assign the address 202.39.74.40 to the print server with MAC address 00 80 C8 14 26 34, use the command:

```
arp -s 202.39.74.40 0080C8142634
```

Note: on a UNIX-based system, you will need to have superuser (root) permission to execute the arp command.

3. From the host with the modified ARP table, send an ICMP echo request to the print server using the ping command:

```
ping 202.39.74.40
```

When the print server receives an ICMP request at its own Ethernet address, but with a different IP address than the one it was expecting, it changes its IP address setting.

4. The print server will now respond to the new IP address. At this point you can use the telnet interface (as described below) to change the host's other settings.

Accessing the Telnet Interface

You can access your print server's telnet interface using an ordinary telnet client program. On many systems, the command to invoke a telnet client is:

```
telnet ip-address
```

Where *ip-address* is the IP address you have assigned to the print server.

When you first telnet to the print server, it displays its log-in message. At this point you can enter the password you have assigned to your print server. If you have not yet assigned a password, just press Enter.

The print server will then display the telnet interface main menu.

Changing TCP/IP Settings

Once you have set the print server's IP address for the first time (using the method described above), you may wish to change the address or other TCP/IP configuration information such as the local network mask, or the default gateway. To change these TCP/IP settings,

1. From the main menu, choose TCP/IP Configuration. The print server will display the TCP/IP Configuration menu.

```
[TCP/IP Configuration]
1 - IP Address             <168.8.100.52>
2 - Subnet Mask            <255.255.0.0>
3 - Default Gateway        <168.8.100.254>
4 - SNMP Community
5 - SNMP Traps
6 - IP Assignment Method   <Manual>
0 - Return to Main Menu

Enter Selection:
```

2. To change the IP address, local subnet mask, or default gateway, choose the appropriate menu item. The print server will prompt you for a new value for the setting. Enter the new value and press Enter.

3. When you are done changing TCP/IP settings, choose 0 to return to the Main Menu.

4. Choose the Save Configuration menu item. The print server will ask for confirmation:

```
Do you really want to save the configuration?
(y/n)
```

Answer y to confirm the save. The telnet connection will drop, and the print server will reset itself, letting the new TCP/IP settings take effect.

Changing Server Settings

From the Server Configuration menu, you can change the server name, as well as the Location and Contact fields (used for identifying the location of the print server and the person responsible for maintaining it).

To change one of these settings,

1. From the main menu, choose Server Configuration. The print server will display the Server Configuration menu.

```
[Server Configuration]
1 - Server Name          <PS-142634>
2 - Location             <Central office>
3 - Admin Contact        <Benjamin Lin>
4 - Change Password
0 - Return to Main Menu

Enter Selection:
```

2. To change the server name, location, or admin contact, choose the appropriate menu item. The print server will prompt for the new value.

If you are setting the server name, be sure to follow the recommendations described in the *Choosing a Name for Your Print Server* section of this manual.

3. When you are done changing the server settings, choose 0 to return to the Main Menu.

4. Choose the Save Configuration menu item. The print server will ask for confirmation:

```
Do you really want to save the configuration?
(y/n)
```

Answer Y to confirm the save. The telnet connection will drop,
and the print server will reset itself, letting the new server
configuration take effect.

Changing the Print Server Password

The print server password is used to protect the print server's
configuration from changes, either through the *PS Admin* program, or
through the telnet interface.

To change the print server's password,

1. From the main menu, choose Server Configuration. The print
server will display the Server Configuration menu.

```
[Server Configuration]
1 - Server Name        <PS-142634>
2 - Location           <Central office>
3 - Admin Contact      <Benjamin Lin>
4 - Change Password
0 - Return to Main Menu

Enter Selection:
```

2. Choose the Change Password menu item. The print server will
prompt for the old password:

```
Input Old Password  :
```

If there is no password, just press Enter.

3. The print server will prompt you to enter the new password. All password characters will be displayed as asterisks (*). You will then be prompted a second time. Enter the same password as before to confirm that you have typed it correctly.

```
Input New Password  : *******
Confirm New Password: *******
```

4. Choose 0 to return to the Main Menu.

5. Choose the Save Configuration menu item. The print server will ask for confirmation:

```
Do you really want to save the configuration?
(y/n)
```

Answer Y to confirm the save. The telnet connection will drop, and the print server will reset itself, letting the new password setting take effect.

Changing Port Settings

Each port on the print server has several settings that you may need to change to suit your configuration and the printer you have attached to the port. Complete descriptions of each of these settings may be found in the *Changing Print Server Port Settings* section. To change one or more port settings,

1. Choose Port Configuration from the main menu. The print server will display the Port Configuration menu.

2. Select the port you wish to configure. The print server will display a menu appropriate to the port's type. For a parallel port, a menu similar to the following will be displayed:

```
[Port 1]
1 - Port Name            <PS-142634-P1>
2 - Description          <HP LaserJet 5L>
3 - Speed                <High>
4 - PJL Printer          <Yes>
0 - Return to Port Menu


Enter Selection:
```

For a serial port, the menu will be similar to the following:

```
[Port 3]
1 - Port Name            <PS-142634-S3>
2 - Description          <>
3 - Baud Rate            <9600>
4 - Data Bits            <8>
5 - Stop Bits            <1>
6 - Parity Bits          <None>
7 - S/W Flow Control     <XON/XOFF>
8 - H/W Flow Control     <DTR/RTS>
0 - Return to Port Menu


Enter Selection:
```

3. To change any of the displayed settings, choose the appropriate menu item. The print server will prompt for the new value.

4. When you are done changing settings for the port, choose 0 to return to the Port Configuration menu.

5. When you are done changing port settings, choose 0 to return to the main menu.

6. Choose the Save Configuration menu item. The print server will ask for confirmation:

```
Do you really want to save the configuration?
(y/n)
```

Answer Y to confirm the save. The telnet connection will drop, and the print server will reset itself, letting the new port settings take effect.

Changing AppleTalk Settings

You can also change AppleTalk network settings from the telnet interface. On Macintosh-only networks, you can use a telnet client such as NCSA Telnet to configure your print server without requiring a Windows-compatible machine.

Selecting AppleTalk Configuration displays the AppleTalk Configuration menu:

```
[AppleTalk Configuration]
1 - Zone Name               <*>
2 - Port 1 Printer Type     <LaserWriter>
3 - Port 1 PostScript Level <Level 2>
4 - Port 2 Printer Type     <LaserWriter>
5 - Port 2 PostScript Level <Level 2>
6 - Port 3 Printer Type     <LaserWriter>
7 - Port 3 PostScript Level <Level 2>
0 - Return to Main Menu

Enter Selection:
```

To modify a selection, select its menu item and enter a new value. The meanings of each of the AppleTalk settings is described in the *Setting up the Print Server for AppleTalk Printing* section.

Displaying Configuration Information

The print server telnet interface provides two menu selections for displaying information about the print server and about the printers connected to it. From the main menu, you can select the Display Information selection to display the Display Information menu:

```
[Display Information]
1 - Display Configuration
2 - Display Port Status
0 - Return to Main Menu

Enter Selection:
```

The Display Configuration selection displays several pages of information about the print server's hardware and internal software, as well as its configuration settings. Information about the port settings is also included.

The Display Port Status selection displays statistics and information about the jobs printed on each of the print server's ports.

```
Port Number      1               2               3
================================================================
[Total Status]
Jobs             45              1               0
Sizes (KBytes)   23179           0               0
Timeouts         0               0               0
----------------------------------------------------------------
[Current Job]
Printer Status   On Line         Off Line        On Line
Index            0               1               0
Protocol                         NETWARE
Name                             00C60001
Spooling Bytes   0               172032          0
Printing Bytes   0               153600          0
================================================================

1 - Refresh Port Status
0 - Return to Display Information Menu

Enter Selection:
```

Resetting the Print Server

Sometimes it may be desirable to restart the print server, in order to reset its internal statistics counters or to clear other status information.

The telnet interface provides two different types of reset:

♦ An ordinary reset has the same effect as powering off the print server and powering it back on again. Statistics counters will be cleared, but all of the print server's configuration settings will be retained.

♦ A factory reset not only restarts the print server, but changes all of its configuration settings back to their original values, as the print server was shipped from the factory.

WARNING: *Do not perform a factory reset unless you are absolutely sure this is what you want. All settings, including the print server's TCP/IP network address, will be erased and replaced with their original values.*

To reset the print server,

1. Choose Tools from the Main Menu.

```
[Tools]
1 - Reset
2 - Factory Reset
3 - Download Firmware
0 - Return to Main Menu

Enter Selection:
```

2. Choose the Reset or Factory Reset menu item, depending on the type of reset you wish to perform. The print server will ask for confirmation.

3. Confirm the reset by entering y and pressing Enter. The telnet connection will drop, and the print server will reset itself. If you

selected Factory Reset, all of the print server's default configuration values will be restored.

Upgrading Print Server Firmware

The print server's internal software is stored in Flash memory, which allows you to upgrade it to an updated version without shipping the print server back to your distributor. Consult your dealer for information about when updated print server firmware versions are available.

To upgrade your print server's firmware, you will need to have a TFTP server on your network. A TFTP (Trivial File Transfer Protocol) server is provided with most versions of the UNIX operating system, as well as with many other operating systems that support TCP/IP networking. Consult your system documentation for detailed information about establishing a TFTP server.

You will also need to have copies of the updated firmware. Firmware updates are contained in to related files, a larger one with a `.BIN` extension, and a smaller one having a `.DWL` extension. **Both** of these files are necessary for the download to be completed successfully. The files should be stored on your TFTP server with uppercase filenames.

To perform the download:

1. Make sure you have backup copies of the previous version of the firmware image files before overwriting them with the new ones.

2. Place the two firmware image files in the root of your TFTP server directory. (On some versions of the UNIX operating system, the TFTP server directory is found in `/tftpboot`.)

3. Connect to the print server using telnet, and select Tools from the Main Menu.

4. Choose Download Firmware. The print server will display the Download Firmware menu.

```
[Download Firmware]
1 - TFTP Server IP Address <0.0.0.0>
2 - Download
0 - Return to Tools Menu

Enter Selection:
```

5. Choose the TFTP Server IP Address selection. Enter the IP address of the system you have designated as the TFTP server.

```
Input TFTP Server IP Address: 203.69.140.234
```

6. Choose the Download selection. Provided all files are set up correctly, the print server will download the .DWL file, reset itself (closing the telnet connection), and begin downloading the .BIN file. When this is complete, the print server will restart, using the updated version of the firmware.

WARNING: *When downloading the image file, be very careful not to interrupt the transfer by powering down the print server or disconnecting it from the network. The print server should be able to recover from an interrupted transfer in most cases, provided the TFTP server remains available. However, in some situations it may be necessary to return your print server for servicing in order to recover from an interrupted download.*

—