

**HP 9000 Networking**  
**NetWare® 4.1/9000**  
**Print Services**

**HP Part No. J2771-90011**  
**Printed in U.S.A. 12/96**

**Edition 1**



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## Printing History

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**Planning Your Printing Environment**

## Understanding Network Printing

The key benefit of network printing is that it allows many users, working on diverse platforms, to share expensive print resources.

In a local printing environment, a user can only print to a printer cabled directly to one of the printer ports on the user's workstation. However, in a network printing environment, printers can be conveniently located anywhere on the network and shared by all network users.

NetWare Services for HP-UX adds the robust network print services of NetWare to the existing set of HP-UX print services, providing greater integration between the NetWare and HP-UX network printing environments.

### Overview of NetWare Services Printing

The printing capabilities of NetWare Services allow you to share print resources among NetWare clients, including DOS and Windows clients. Implemented on the HP-UX platform and integrated with the UNIX lp system, these print services provide nearly the same level of printing functionality found in the native NetWare printing environment. (NetWare Services supports AppleTalk network printers but does not provide the underlying protocol stacks necessary for AppleTalk printing.)

NetWare Services provides the connectivity between NetWare clients and network printers through a series of steps.

- 1 A user sends a print job from an application on a NetWare workstation.

When a user sends a print job from an application on a NetWare client workstation, the application compiles the data entered by the user and passes it on to a print driver. The print driver generates the data and sends it along to default printer port on the workstation.

- 2 The print job travels from the NetWare workstation to the NetWare Services server.

The print job travels across the network and arrives at the NetWare Services server, where it is stored as a file in a designated NetWare directory. This directory is called a print queue. Print queues are assigned to network printers.

3 The print queue temporarily stores the print job.

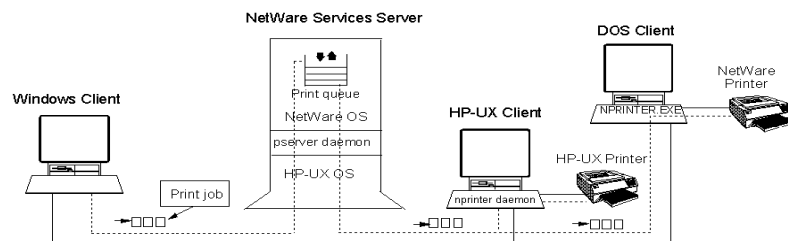
The print job resides as a file in the print queue until the network printer is ready. Each network printer has a designated print server assigned to it. The print server monitors the print queues and transfers pending print jobs from the queues to the printer.

4 The print server transfers the print job to the network printer.

Network printers can be defined as local or remote and can be UNIX or NetWare printers. A local printer is a printer attached directly to the NetWare Services server; a remote printer is a printer attached to a UNIX or NetWare client workstation on the network, or directly to the network itself.

Most network printers require a port driver to print network print jobs. NetWare Services provides two types of port drivers: NPRINTER.EXE and the NPRINTER daemon. Network printers attached to DOS, Windows, WIn 95 or NT client workstations require NPRINTER.EXE running on the workstation. Network printers attached to NetWare Services servers or UNIX servers require the NPRINTER daemon running on the server.

The following figure illustrates these steps.



**Figure 1-1** A typical path of a NetWare Services print job

For more information on PSERVER daemon, see “Using the PSERVER Daemon” in Chapter 5. For more information on NPRINTER, see Chapter 6, “Setting Up Printers Attached to Workstations or Servers.”

Planning Your Printing Environment  
**Understanding Network Printing**

**Print Objects**

Print queues, printers, and print servers are all defined as objects in NetWare Services and can be configured to run in either a NetWare 4 Directory Services environment or in a NetWare 2 or 3 bindery services environment.

NetWare Services provides two main utilities for creating and configuring these objects: NetWare Administrator (available on Windows clients) and PCONSOLE (available on DOS workstations).

**Planning Your Printing Configuration**

Deciding where to position your network printers is a crucial step in planning and configuring your printing environment. The following sections provide information on locating and managing output of network printers.

**Locating Your Printers**

Attaching all printers directly to servers may yield security and administrative advantages. However, attaching printers to workstations may yield increased flexibility and accessibility. The ideal mix for each installation is different and will change as your needs change.

The number of printers that can be attached to each server or workstation is limited first by the port hardware. Most Intel-based PCs have a maximum of three parallel and four serial ports.

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**CAUTION:**

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The type of port used must match the type of port on the printer. The printer must be set up and cabled properly as described in the printer's documentation.

**Improving Output By Adding Resources**

In some situations, you can increase the printing output on your network by using additional resources.

More than one printer may service a single queue. This can be useful when you have similar printers in close proximity by providing increased throughput and avoiding work stoppage if one printer fails.

More than one queue may be assigned to a single printer. Among other things, this allows a full queue attached to a failed printer to be assigned to a running printer, which will then print jobs from both the original and the newly added queue.

While only one print server can run on a server at a given time, that single print server can service up to 255 printers. Performance factors, however, may limit the number of printers that one print server can service effectively.

### Network Printing Examples

The examples in this section illustrate how the three printing objects (print queue, printer, and print server) can be arranged as you require. It also demonstrates how the NetWare printing processes interact with the NetWare print objects and the HP-UX print service.

#### Simple Printing Setup

In this setup, a UNIX lp system printer is cabled to the printer port of a NetWare Services server running the PSERVER daemon. NetWare clients can select a printer by name or they can specify a print queue when sending print jobs to the network printer. The PSERVER daemon sends the print job from the queue to the network printer. HP-UX clients can still access the same network printer through the UNIX lp system.

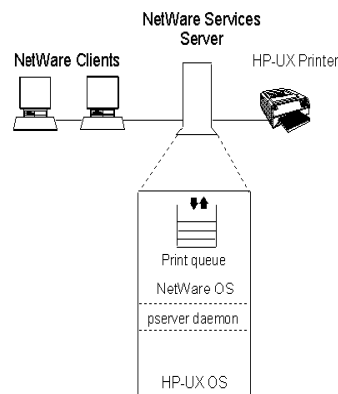


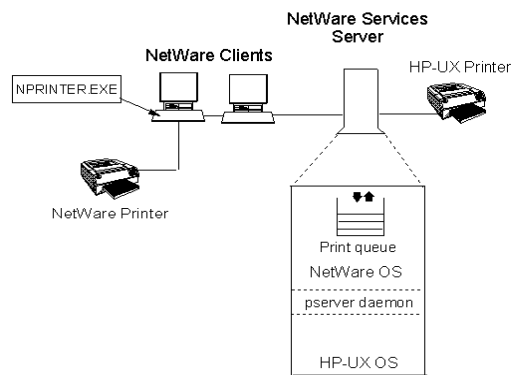
Figure 1-2

Simple Printing Setup

Planning Your Printing Environment  
Understanding Network Printing

**Mid-Range Printing Setup**

NetWare Services allow some printers to be cabled to DOS or Windows client workstations. In this scenario, the printer is directly attached to a workstation running either Windows or DOS. The NetWare utility NPRINTER.EXE is running on the workstation.



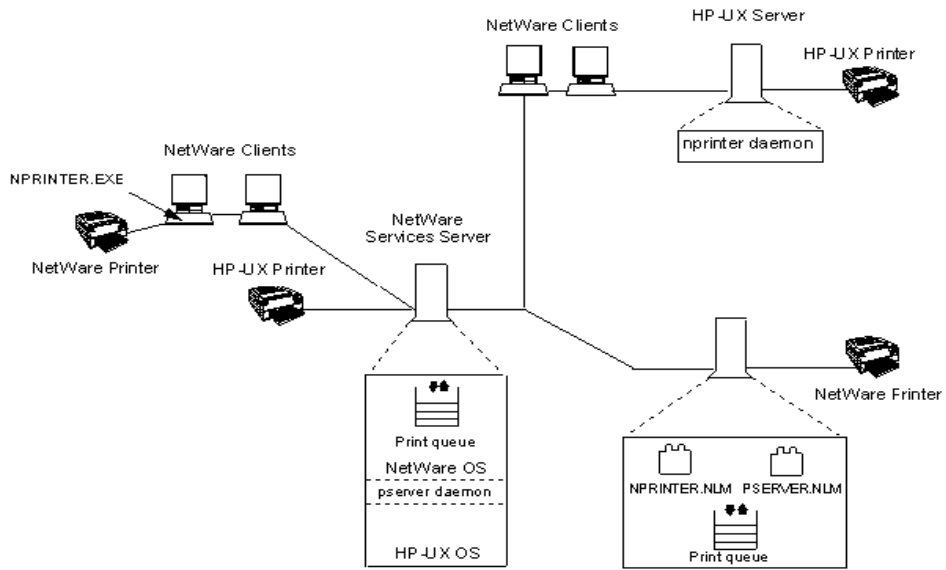
**Figure 1-3**

**Mid-Range Printing**

**Complex Printing Setup**

A complex printing environment may use any combination of these features:

- One printer assigned to service multiple print queues
- Multiple printers assigned to service one print queue
- Multiple printing environments (such as DOS, Windows, Win 95, or NT printers, or printers attached directly to the network cabling)
- Multiple print servers



**Figure 1-4**      **Complex Printing**

## Deciding on Your Configuration Method

NetWare Services provides two core utilities for configuring and managing your network print services: NetWare Administrator and PCONSOLE. NetWare Administrator is a graphical utility available on Windows workstations and PCONSOLE is a NetWare menu utility available from the DOS prompt. The utility you select depends primarily on your printing environment needs and your own software preferences. In addition, several supplemental utilities are provided for managing specific printing needs; these are described in the following sections.

If you are most comfortable with Windows applications, you can use NetWare Administrator on a Windows system. And, if you're accustomed to NetWare printing utilities, you may want to use the DOS utility PCONSOLE.

The following table describes each utility and points you to the relevant chapter in this book.

**Table 1-1**

**NetWare Services Print Configuration Utilities**

Utility/Location	Tasks
NetWare Administrator/ Windows desktop	Creates, assigns, modifies, deletes, and monitors print queues, print servers, and printers. Monitors, inserts, modifies, pauses, and deletes print jobs.  To use NetWare Administrator, go to chapter 2.
PCONSOLE/ DOS menu utility	Creates, assigns, modifies, deletes, and monitors print queues, print servers, and printers. Sends, monitors, inserts, modifies, pauses, resumes, and deletes print jobs.  To use PCONSOLE, go to chapter 3.



### Supplemental Printing Utilities

In addition to the three core printing utilities, NetWare Services provides several supplemental utilities, designed to meet specific printing needs for users on DOS, Windows, Win 95, or NT workstations. These utilities are not available for HP-UX clients.

The following table describes these utilities.

**Table 1-2**

**Supplemental Printing Utilities**

Utility	Tasks
NetWare User Tools (Windows, Win 95, NT)	Enables users to access network resources, map drives, set up printing, and send messages. Printing tasks include setting printer options, connecting and disconnecting print queues, and making print queue connections permanent.  For information on the NetWare Tools, see <i>NetWare Client for DOS and Windows User Guide</i> .
CAPTURE (DOS )	Redirects workstation output to a network printer or file.  For information on CAPTURE, see “Using CAPTURE” in Chapter 4.
NPRINT (DOS)	Prints files from outside applications.  For information on NPRINT, see “Using NPRINT” in Chapter 4.
NETUSER (DOS)	Captures workstation output to a network printer, prints files from outside an application, and monitors print queues. Sends, redirects, monitors, modifies, or deletes print jobs.  For information on NETUSER, see “Using NETUSER” in Chapter 9.

Planning Your Printing Environment  
Deciding on Your Configuration Method

**Table 1-2**      **Supplemental Printing Utilities**

Utility	Tasks
PRINTCON (DOS)	Creates, modifies, and deletes print job configurations to simplify using the CAPTURE, NPRINT, and PCONSOLE utilities.  For information on PRINTCON, see “Printing Tasks Handled through PRINTCON” in Chapter 7.
PRINTDEF (DOS)	Defines printer forms for use in CAPTURE, NPRINT, and print job configurations. Defines print devices in a database for use in print job configurations.  For information on PRINTDEF, see “Printing Tasks Handled through PRINTDEF” in Chapter 8.

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**Managing Print Services with the  
NetWare Administrator Utility**

## **Overview**

With NetWare® Administrator, you can perform the administrative tasks available in PCONSOLE, but on a Windows workstation.

This chapter explains how to set up and manage your printing environment in NetWare Services using the NetWare Administrator graphical utility.

## Requirements

Before completing tasks in this chapter, you need the following:

- NetWare 4.1/9000 NetWare Services server
- Windows or network workstation running NetWare Administrator
- At least one printer functioning properly in its current environment.

If your printer is not functioning properly, see Appendix D, “Troubleshooting Printing Problems.”

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## Printing Tasks Handled through NetWare Administrator

The following table lists the printing tasks you can accomplish in NetWare Directory Services™ software with NetWare Administrator.

**Table 2-1**      **Printing Tasks Performed with NetWare Administrator**

Object Class	Task	Procedure Location
Print Queue	Assign a print queue to a printer	“Assigning Print Queues to Printers”
	Assign queue operator flags	“Assigning Queue Operator Flags”
	Create a print job configuration	“Working with Print Job Configurations”
	Create a print queue	“Creating Print Queues”
	Delete a print queue	“Viewing the Assignments for Printing Objects”
	View or modify print jobs	“Viewing or Modifying Print Jobs”
	View or modify a print queue	“Print Queue Options”
	View print queue assignments	“Viewing the Assignments for Printing Objects”
Printer	Assign a print queue to a printer	“Assigning Print Queues to Printers”
	Move a printer	“Moving Printing Objects”
	Rename a printer	“Viewing the Assignments for Printing Objects”
	View or modify a printer	“Printer Options”
	View printer status	“Printer Options”

**Table 2-1                      Printing Tasks Performed with NetWare Administrator**

<b>Object Class</b>	<b>Task</b>	<b>Procedure Location</b>
Print Server	Assign a printer to a print server	“Assigning Printers to Print Servers”
	Audit a print server	“Enabling and Viewing the Print Server Auditing Log”
	Create a print server	“Creating Print Servers”
	Delete a print server	“Viewing the Assignments for Printing Objects”
	Move a print server	“Moving Printing Objects”
	Unload a print server	“Unloading Print Servers”
	View print server assignments	“Viewing the Assignments for Printing Objects”
	Modify a print server	“Enabling and Viewing the Print Server Auditing Log”
Container object	Create print job configurations to simplify using CAPTURE and NPRINT.	“Working with Print Job Configurations”
	Create or modify printer forms	“Mounting Printer Forms”
	Import a print device definition for use in print job configurations	“Importing Print Device Definitions”
	Modify a print device definition for use in print job configurations	“Viewing or Modifying Print Device Definitions”
User	Create print job configurations to simplify using CAPTURE and NPRINT	“Working with Print Job Configurations”

## Using the Browser

The browser is the initial screen that appears when you open NetWare Administrator. All basic administrative functions are initiated here.

The browser is where you work with NetWare Directory Service™ (NDS) objects, with files, and with directories.

### Parts of the Browser

The browser displays the NDS™ objects in your current context. You select objects in order to perform administrative tasks for the network.

You can open as many as nine browser windows to display the contents of individual containers. The following figure shows three tiled browser windows.

To open another browser window, select a container, go to the “Tools” menu, then select the “Browser” option.



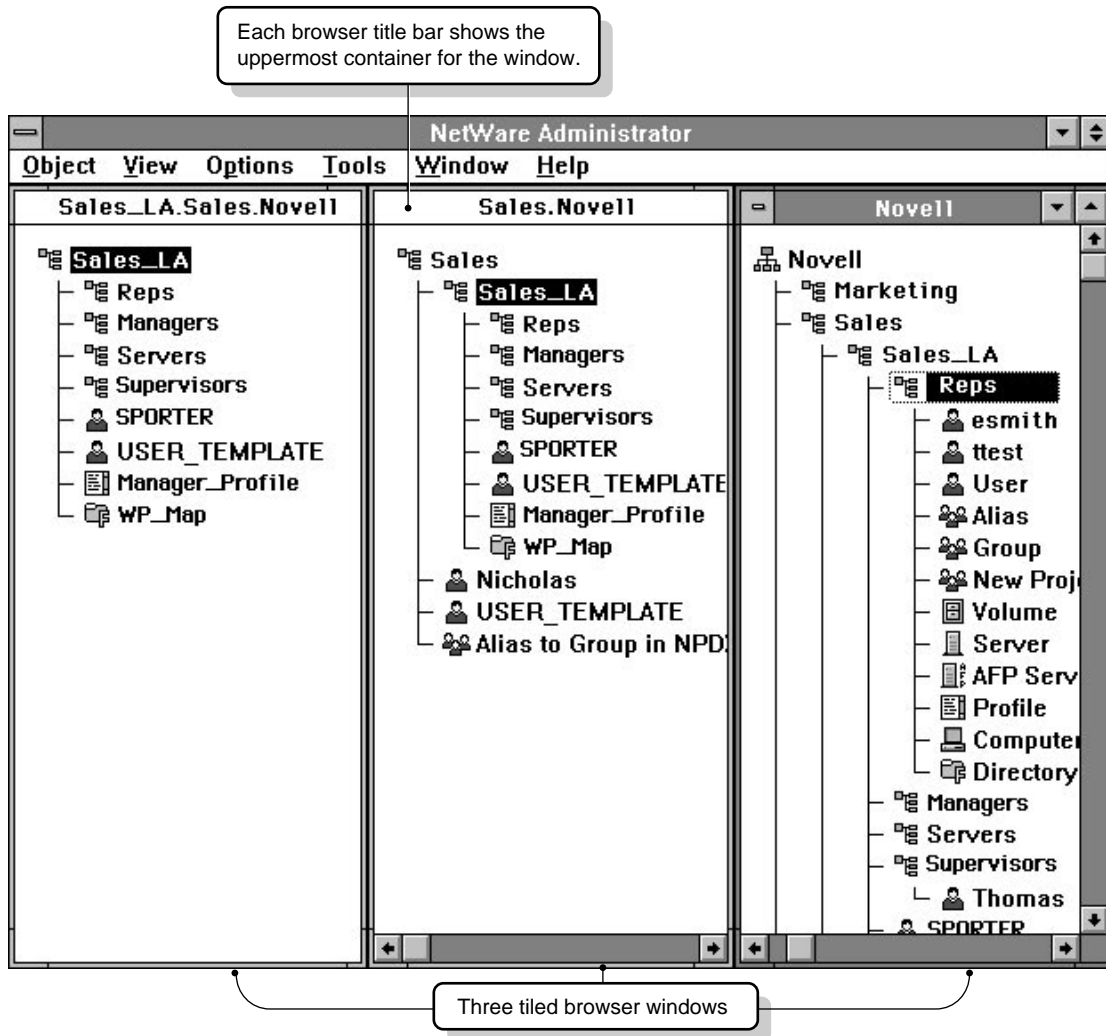


Figure 2-1 Browser Window with Multiple Tiles

### Browser Context

The title bar displays the browser context, which is the name of the container object that the browser window starts browsing from.

## Managing Print Services with the NetWare Administrator Utility Using the Browser

To view multiple browser windows at the same time, open the windows, then select “Tile” from the “Window” menu.

### How Objects Appear

The browser displays the following when you expand a container object to view its contents:

- The container that holds the object
- An icon representing the class of the object
- The name of the object
- The object’s hierarchical location in relation to other objects in the Directory tree

For example, this is how a printer object named COLOR PRINTER would appear when it is created in an Organizational Unit called GRAPHICS DEPARTMENT:

 **Graphics Department**  
└─  **Color Printer**

## Using the Printing Object Dialogs

NetWare Administrator is set up so you can view or edit all information about an object in one place: the object dialog. NetWare Services printing requires three printing objects: print server, printer, and print queue.

Every printing object has its own object dialog. Each object dialog is titled by the class of object and the object name. You can enter additional information about the object in this dialog to help you manage network resources and to store information for searches.

You can open dialogs for objects in several ways:

- Double-click on leaf objects in the Directory tree. (Double-clicking on a container object displays the objects it holds.)
- Single-click on objects in the Directory tree and choose “Details” from the “Object” menu.
- Right-click the mouse on the object in the Directory tree; then select “Details” from the menu that appears.

### Parts of the Object Dialogs

The following figure illustrates some of the fields and controls found in the “Identification” page of a Print Queue object.

Managing Print Services with the NetWare Administrator Utility  
Using the Printing Object Dialogs

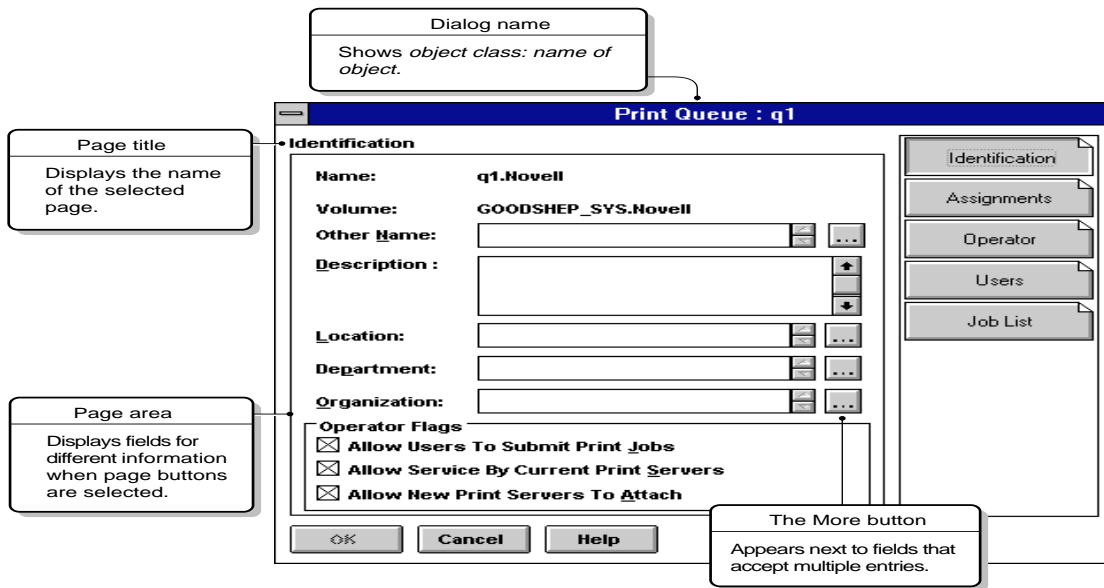


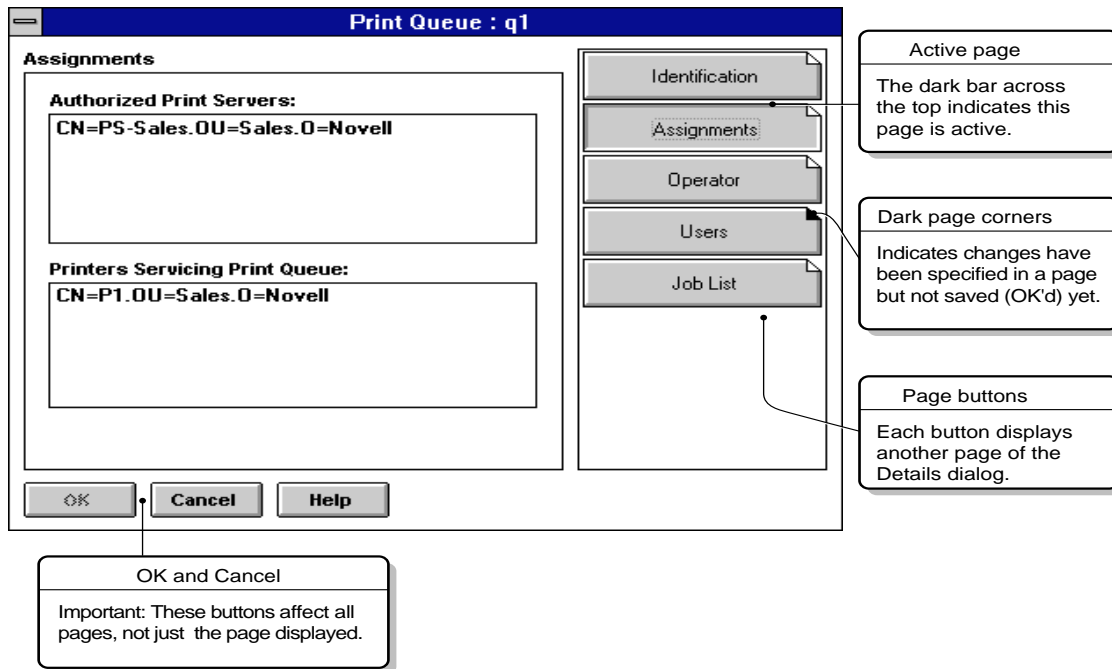
Figure 2-2 Object Dialog for a Print Queue Object

### Pages of the Object Dialogs

Information in object dialogs is divided into “pages” that you view one at a time. To see the kind of information you want, select the appropriate page from the right-hand side of the dialog.

The pages are part of one object dialog. When you select a different page, you are still in the same dialog.

The following figure illustrates the “Assignments” page of an Object dialog.



**Figure 2-3** Assignments Page of an Object Dialog

### Using OK and Cancel

“OK” and “Cancel” affect the entire dialog, not just individual pages.

To return to the browser without changing any page, select “Cancel.” To save the changes entered to every page, select “OK.” A confirmation box allows you to verify your choice.

### Using the Dark Page Corners in the Page Buttons

As you work from page to page making changes, the buttons for those pages display a black corner to remind you that you have entered changes that have not been saved.

If you specify changes in several pages and decide you do not want to keep some of the changes, remember the following:

- You can delete unwanted information from the pages or fields.
- If you choose “Cancel,” you can choose whether you want to save changes or not.

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If you choose not to save changes, you'll lose the changes you want to keep in the other pages.

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**NOTE:**

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Changes made in print job configurations and print device definitions take effect immediately. The "Cancel" option is grayed on these dialogs.

Choose "Help" in any dialog for further information about the object class you are creating.

## Setting Up Print Services with NetWare Administrator

This section describes how to set up a basic printing environment using the NetWare Administrator graphical utility.

### Procedure

- 1 Connect printers to the network in any of the following ways:
  - To the network cable (network-attached printers)
  - To the parallel or serial port of a workstation
  - To the parallel or serial port of a NetWare server
- 2 Enter NetWare Administrator and select the container object that you want to create printing objects in.

The following steps use the Organizational Unit “Sales” under Organization “Novell.” After completing these steps, the printing objects appear in the NetWare Administrator browser.

### Creating Print Queues

The following procedure lets you create a Print Queue object to represent a physical print queue on the NetWare server.

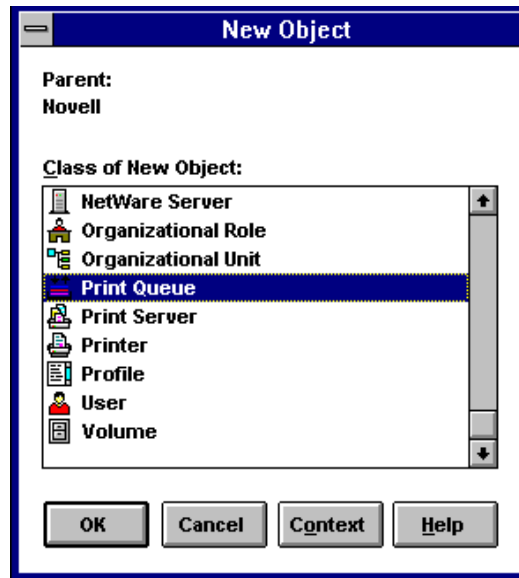
You must have a print queue, along with a print server and a printer, in order for network users to share printers.

### Procedure

- 1 From the browser’s “Object” menu for the Organization or Organizational unit, choose “Create.”

The “New Object” dialog appears similar to that shown in the following figure.

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2 Choose “Print Queue.”

The “Create Print Queue” dialog appears similar to the following figure.

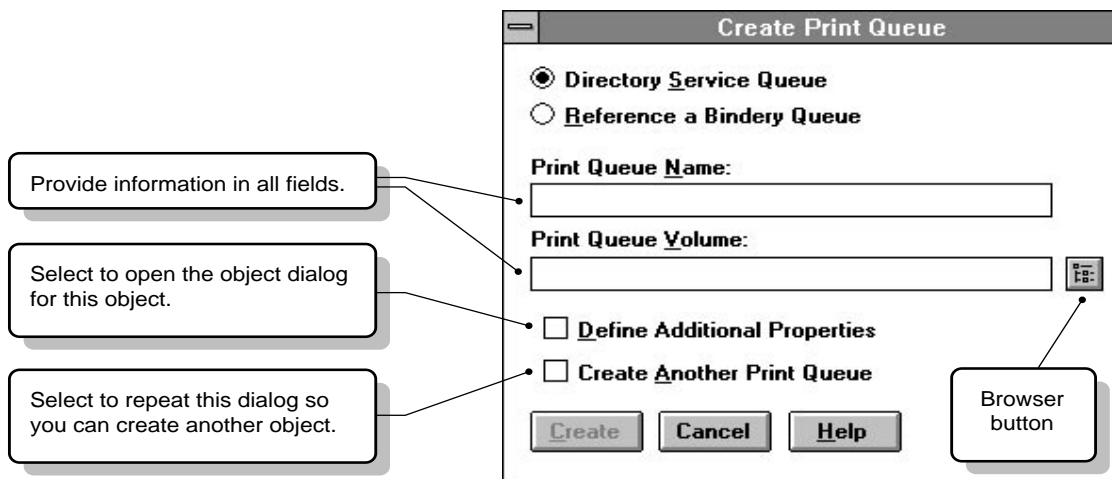


Figure 2-4 Create Print Queue Dialog

- “Directory Service Queue” allows you to create both a print queue object in



your Directory tree and a physical directory for that print queue on a server.

- “Reference a Bindery Queue” allows you to create a print queue object for a print queue that already exists outside your Directory tree. This queue is a previously defined directory on a native NetWare Server or a NetWare Services server in another Directory tree. Creating a print queue object for this queue allows you to manage printing outside of your current Directory tree.
- “Print Queue Name” shows the name of the print queue.
- “Print Queue Volume” shows the name of the object representing the volume on which the print jobs sent to this print queue are stored.
- “Define Additional Properties” lets you define more information about this print queue immediately after creating it.
- “Create another Print Queue” repeats this dialog rather than returning to the browser.
- “Create” creates the new Print Queue.
- “Cancel” returns to the browser without creating a Print Queue.

**3** Select “Directory Service Queue.”

This is the default.

**4** Type a name in “Print Queue Name.”

For example, type “Q1.”

**5** Choose the browser button to select a print queue volume.

You cannot create a queue until you have selected a volume.

The “Select Object” dialog appears, similar to that shown in the following figure.

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Setting Up Print Services with NetWare Administrator

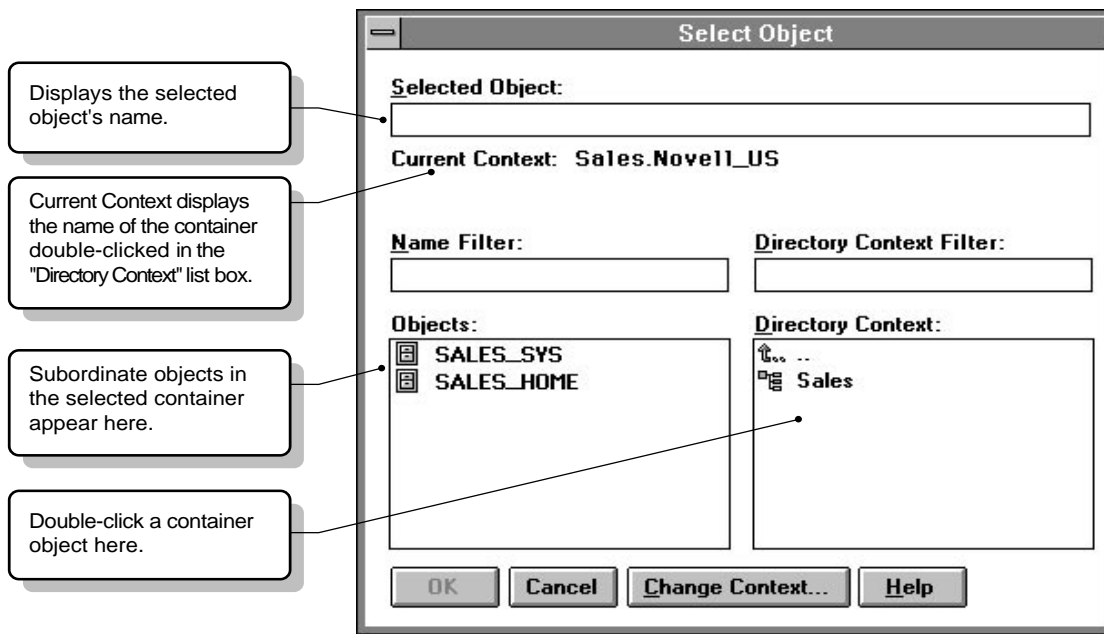


Figure 2-5 Select Object Dialog

- 6 In the “Directory Context” field, browse until the volume you want is listed in the “Objects” field.

When you are creating a print queue, only volumes appear in the “Objects” field.

To limit the range of volumes listed, you can use the optional “Name Filter” and “Directory Context Filter” fields. These fields allow you to use the wildcard delimiter (\*) in the same way it is used in DOS. For example, to list only containers beginning with “BR” in the “Directory Context Filter” field, you would type “BR\*”.

Because the number of simultaneous print jobs in the print queue is limited only by disk space, be sure to choose a volume with sufficient disk space.

- 7 Select the volume in the “Objects” field. Then choose “OK.”

You are returned to the “Create Print Queue” field.

- 8 At the “Create Print Queue” dialog, select “Create.”

Novell recommends one print queue for each printer.

## Creating Printers

The following procedure lets you create a Printer object to represent a physical printer on the network.

You must have a printer, along with a print server and a print queue, in order for network users to share printers.

### Procedure

- 1 From the browser's "Object" menu for the Organization or Organizational unit, choose "Create."

The "New Object" dialog appears.

- 2 Select "Printer."

The "Create Printer" dialog appears.

- 3 Type a name of your choice in the "Printer Name" field.

For example, type "P1".

This is both the name of the Printer object as it appears in the Directory tree and as it is loaded at the NetWare for HP-UX server console or workstation. Object naming conventions must be followed.

- 4 (Optional) Mark the "Define Additional Properties" box.

This allows you to define additional information about this printer immediately after you create it.

- 5 Select "Create."

The object dialog for Printer P1 appears, similar to that shown in the following figure.

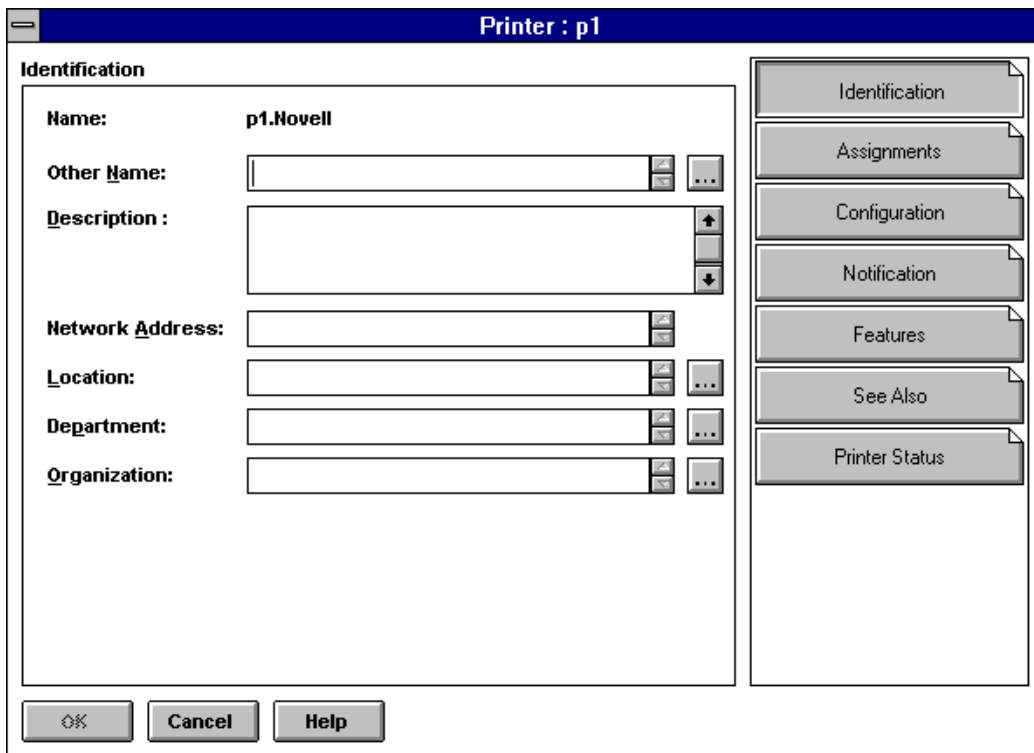


Figure 2-6 Printer Identification Page

For context-sensitive help in adding information to this dialog, select “Help.”

### Assigning Print Queues to Printers

A print queue must be assigned to a printer before the printer can take print jobs from the network.

#### Procedure

- 1 From the browser, select the object “Details” dialog by double-clicking on the printer object.
- 2 From the “Printer” dialog, select the “Assignments” page.

The “Assignments” page appears, similar to the following figure.

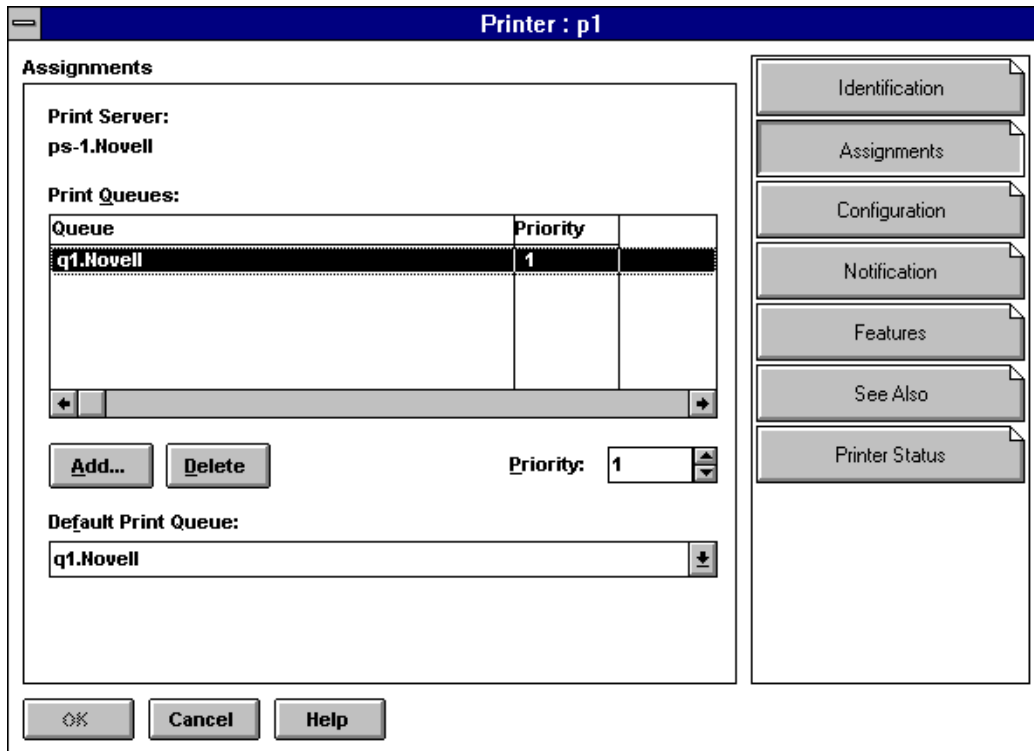


Figure 2-7 Printer Assignments Page

**3** Select “Add.”

The “Select Object” dialog appears, similar to that shown in Figure 2-5. Only print queue objects appear in the list of objects.

**4** In the “Directory Context” field, browse until the queue you want is listed in the “Objects” field.

When you are assigning print queue to a printer, only print queues appear in the “Objects” field.

To limit the range of print queues listed, you can use the optional “Name Filter” and “Directory Context Filter” fields. These fields allow you to use the wildcard delimiter (\*) in the same way it is used in DOS. For example, to list only containers beginning with “BR” in the “Directory Context Filter” field, you would type “BR\*”.

**5** Select the print queue in the “Objects” field. Then choose “OK.”

## Managing Print Services with the NetWare Administrator Utility

### Setting Up Print Services with NetWare Administrator

You are returned to the “Printer” dialog.

- 6 Select the “Configuration” page and make any necessary changes, including parameters available after selecting “Communication.”

See “Configuring Printers.”

### Creating Print Servers

The following procedure lets you create a print server.

You must have a print server, along with a printer and a print queue, in order for network users to share printers.

#### Procedure

- 1 From the browser’s “Object” menu for the Organization or Organizational unit, select “Create.”

The “New Object” dialog appears.

- 2 Select “Print Server.”

The “Create Print Server” dialog appears.

- 3 Type a name of your choice in the “Print Server Name” field.

Not all print server names will be valid Service Advertising Protocol (SAP) names. For example, SAP names may not exceed 47 characters, they cannot contain spaces, and they must be in all-caps. In addition, many double-byte characters used on certain code pages are not valid SAP characters. For more information, see “Service Advertising Protocol (SAP)” in Concepts.

- 4 Mark the “Define Additional Properties” box.
- 5 Select “Create.”
- 6 Enter information in the “Print Server” dialog.

The “Print Server” dialog for the print server you created appears, similar to the one shown here. The information you enter can later help you search for and manage network resources.

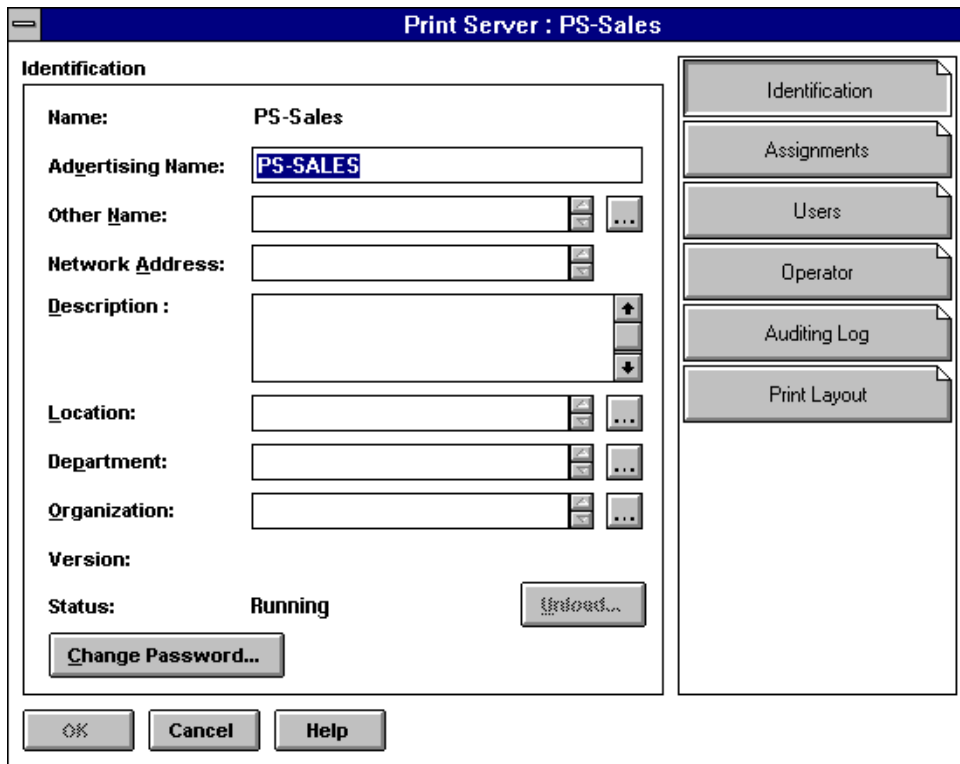


Figure 2-8 Print Server Identification Page

For context-sensitive help in adding information to this dialog, select “Help.”

### Assigning Printers to Print Servers

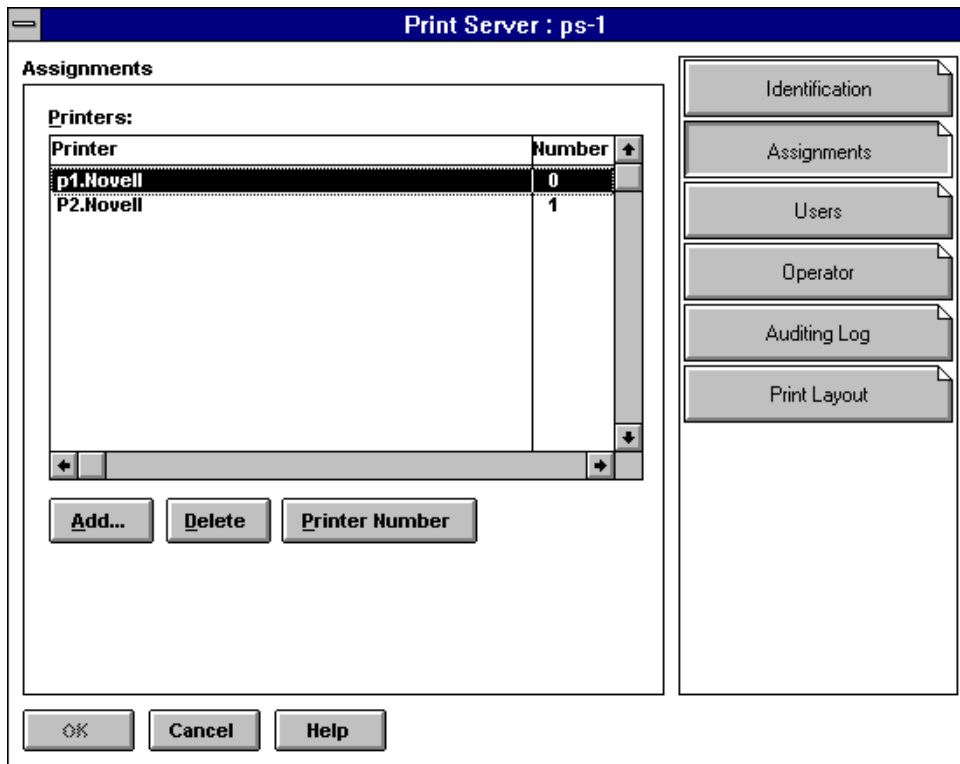
A network printer must be assigned to a print server before you can perform network printing.

#### Procedure

- 1 From the “Print Server” dialog, select the “Assignments” page.

The “Assignments” page appears, similar to that shown in the following figure.

Managing Print Services with the NetWare Administrator Utility  
Setting Up Print Services with NetWare Administrator



**Figure 2-9** Print Server Assignments Page

Remember that print queues are assigned to printers, not to print servers. See “Assigning Print Queues to Printers.”

- 2 Select “Add”, and select the Printer object you want to assign.  
The “Select Object” dialog appears.
- 3 In the “Directory Context” field, browse until the printer you want is listed in the “Objects” field.

When you are assigning a printer to a print server, only printers appear in the “Objects” field.



To limit the range of printers listed, you can use the optional “Name Filter” and “Directory Context Filter” fields. These fields allow you to use the wildcard delimiter (\*) in the same way it is used in DOS. For example, to list only containers beginning with “BR” in the “Directory Context Filter” field, you would type “BR\*”.

- 4 Select the printer in the “Objects” field. Then select “OK.”  
You are returned to the “Print Server” dialog.
- 5 Select “OK.”

### Adding Printing Objects

If you followed the instructions, you have now created and properly assigned the three necessary printing objects (at least one print server, printer, and print queue).

Each print server can service up to 255 printers (0-254).

When you are finished, your NetWare Administrator browser could resemble the following figure.

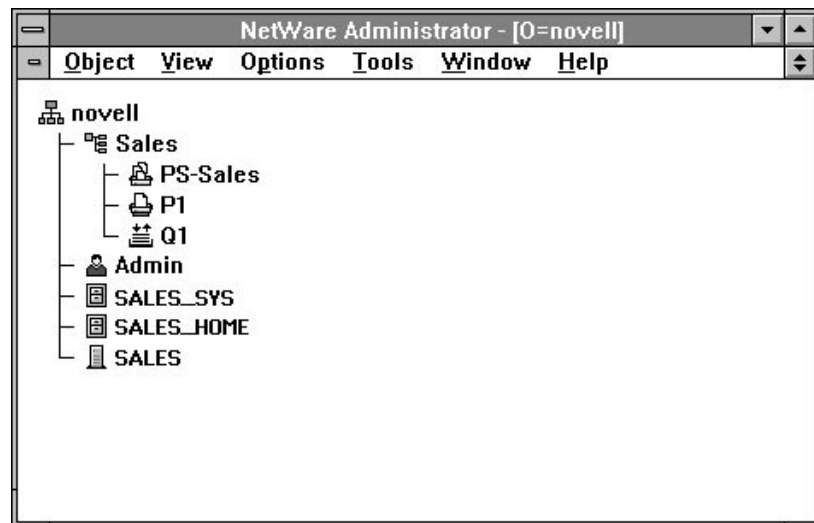


Figure 3-10

Browser Showing Print Server

Repeat this process for each additional printer you want to add to your setup.

Managing Print Services with the NetWare Administrator Utility

**Setting Up Print Services with NetWare Administrator**

You do not need to create a print server for each printer, but you must assign each printer to an existing print server.

When you have created and assigned all of your queues and printers, start the print server software (pserver) on a server.

## **Modifying NetWare Print Services**

NetWare print services has a dialog for each of the three types of printing objects: Print Queue, Printer, and Print Server.

You access printing objects using the same method used for other objects in the browser.

If you specify changes in several pages and decide you do not want to keep some of the changes, remember the following:

- 1 You must manually delete unwanted information from the fields.
- 2 If you choose “Cancel,” you can choose whether you want to save changes. If you choose not to save changes, you’ll lose the changes you want to keep in the other pages.

---

**WARNING:**

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**Because the pages are all part of one dialog, do not choose “OK” or “Cancel” until you are finished with all pages and are ready to close the object dialog.**

Like other NetWare Directory Services leaf objects, you can move, delete, or rename printing objects.

You cannot copy NetWare Directory Services objects, but you can create aliases to reference objects in other contexts. See “Creating Leaf Objects” in Chapter 1 of *Supervising the Network* or “Alias Object” in *Concepts*.

### **Moving Printing Objects**

To move an object, select the object in the browser and choose “Move” from the “Object” menu, or hold down <Ctrl> while dragging a leaf object and dropping it onto another container.

When an object is moved, the name is changed to reflect the new context.

Moving an object is like changing part of the object’s complete name or like changing its context.

When you move an object, all references and assignments to the object are automatically changed as well.

## Viewing the Assignments for Printing Objects

The “Assignments” pages for the Print Queue, Printer, and Print Server object dialogs show the current assignments for those printing objects. Use the following steps to view printing assignments.

### Procedure

- 1 Select the printing object you want to view in the browser.  
The dialog for that object appears.
- 2 Select the “Assignments” page, as shown in the following figure.

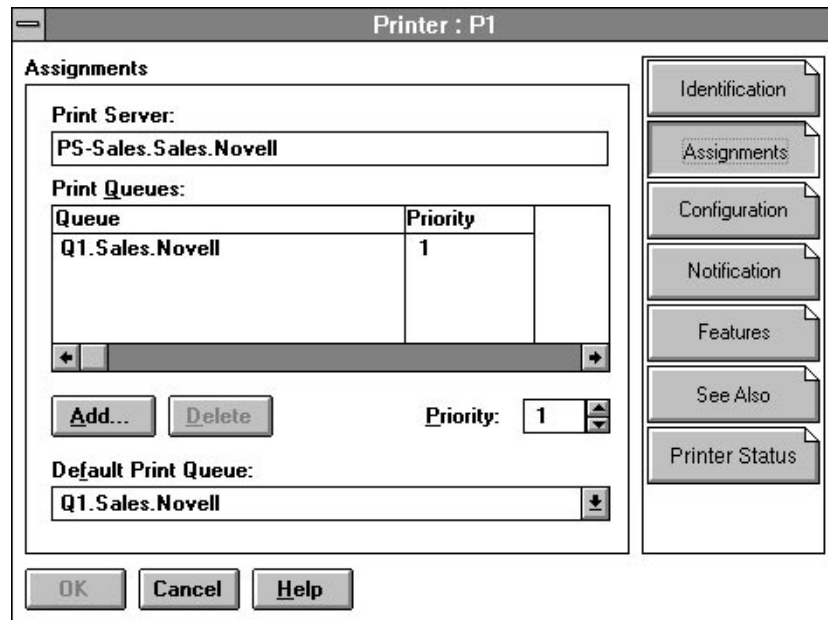


Figure 2-11 Typical Printing Object Assignments Page

## Renaming Printing Objects

When you rename an object, all references and assignments to the object are automatically changed as well.

To use rename, select an object in the browser and choose “Rename” from the “Object” menu. If you select the option to “save the old name,” it is stored as a value in the “Other Names” property.

### **Deleting Printing Objects**

When you delete an object, all references and assignments to the object are automatically deleted as well. Delete cannot be undone.

To use delete, select an object in the browser and choose “Delete” from the “Object” menu.

## Print Queue Options

### Assigning Queue Operator Flags

By selecting the “Details” page from the “Print Queue” object dialogue, a print queue operator with appropriate rights can set flags that limit access to the selected print queue:

- “Allow Users To Submit Print Jobs” allows queue users to submit print jobs to the queue if the option is set to Yes.
- “Allow Service By Current Print Servers” allows assigned print servers to service print jobs in the queue if the option is set to Yes.
- “Allow New Print Servers To Attach” allows print servers to attach to the queue if the option is set to Yes.

### Viewing or Modifying Print Jobs

Use the following steps to view or modify print jobs.

#### Procedure

- 1 From the browser, select a print queue object.  
The “Print Queue” object dialog appears.
- 2 Select “Job List.”  
A list of print jobs in the print queue appears.
- 3 Do one of the following:
  - To view information about a print job, select it. Then see the next section.
  - To hold a print job in the queue without printing it, highlight it and select “Hold.”
  - To activate a print job currently on “Hold” status in the queue so that it can be printed, highlight it and select “Resume.”
  - To delete a print job, highlight it and select “Delete.”

---

**NOTE:**

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Most applications can send print jobs to a network printer or print queue. This is usually the easiest way to create print jobs with the correct format for your printer, etc. If your application can print only to a local port, use the NetWare User Tools to redirect your workstation port to the network. See *NetWare Client for DOS and MS Windows User Guide*.

### Viewing Details of Print Jobs

You must be an operator of this Print Queue to change a print job that you did not submit.

#### Procedure

- 1 From the browser, select a Print Queue object.

The “Print Queue” object dialog appears.

- 2 Select the “Job List” page.

A list of print jobs in the print queue appears.

- 3 Select the print job you want to view details about.

If you are an operator, or you submitted the print job that you are viewing, you can change any of the fields that are not grayed.

- “Print Job” shows the job number of this print job.
- “File Size” shows the file size, in bytes, of this print job.
- “Client” shows the name of the User that submitted this print job.
- “Description” shows a description that was entered for this print job.
- “Status” shows the status of this print job. For example: “Ready,” “Held,” or “Active.”
- “User Hold” indicates that the print job has been put on hold by the User who submitted the print job.
- “Operator Hold” indicates that the print job has been put on hold by the Queue operator.
- “Service Sequence” shows this print job's position in line to be printed.
- “Number of Copies” shows how many copies of this print job the print server

## Print Queue Options

will sent to the printer.

- “File Contents” shows the type of file that was sent for this print job.
- “Byte Stream” indicates that this print job consists of a byte stream file, such as a graphic, or PostScript\* file.
- “Text” indicates that this print job consists of a text file, containing only ASCII characters.
- “Tab Size” is used only with text files, and indicates how many spaces are sent to the printer each time a Tab character is received as part of the print job.
- “Form Feed” shows whether or not a form feed character is sent to the printer at the end of this print job.
- “Notify When Job is Printed” shows whether Users are notified when this print job has been completed.
- “Entry Date” shows the date that this print job was submitted to the Queue.
- “Entry Time” shows the time that this print job was submitted to the Queue.
- “Form” shows which printer form will be used to print this print job. You can select from available printer forms using the drop-down box.
- “Print Banner” shows whether or not a banner page with identification information will be printed as the first page of this print job.
- “Name” indicates what will be printed as the name of the User who sent this print job. This is only valid if a banner page is printed.
- “Banner Name” indicates what will be printed as the name of the print job. This is only valid if a banner page is printed.
- “Defer Printing” indicates that the printing of this job is to be delayed until a later date and time.
- “Target Date” shows the date that this print job will be printed. This field is valid only if “Defer Printing” is selected.
- “Target Time” shows the time that this print job will be printed. This field is only valid if “Defer Printing” is selected.

## Viewing or Changing the List of Users for a Print Queue

Objects that are listed as users of a print queue are allowed to submit print jobs to that print queue and to manage jobs that they submit.



The “Users” page lists users of the print queue. This list is created and maintained by the network supervisor.

### **Viewing or Changing the List of Operators for a Print Queue**

Operators of a print queue are allowed to manage the print jobs in the print queue. This includes activities such as deleting print jobs or changing their order. Use the “Operators” page to record operators of a print queue.

## Printer Options

### Configuring Printers

The default printer configuration uses polled mode and LPT1 of the NetWare server running the print server.

#### Procedure

- 1 From the browser, select the “Details” dialog for the printer you want to configure by double-clicking on the printer object.

The printer “Identification” page appears.

- 2 Complete or modify the fields as needed.

These fields are optional.

- “Other name” lists identification information associated with this printer that helps you search for and identify specific printers.
- “Description” describes the function the printer performs (such as print Sales documents).
- “Network Address” lists the 16-digit (8-byte) number associated with the NetWare Server or workstation that this printer is cabled to.
- “Location” specifies the printer's physical location (such as a person's office).
- “Department” shows the department or division that generally uses the printer.
- “Organization” lists the organization that can use the printer.

- 3 Select the “Configuration” page.

A printer “Configuration” page appears similar to the following shown for a parallel printer. This page allows you to store or define information about the hardware configuration of this printer and how it is used in the network.

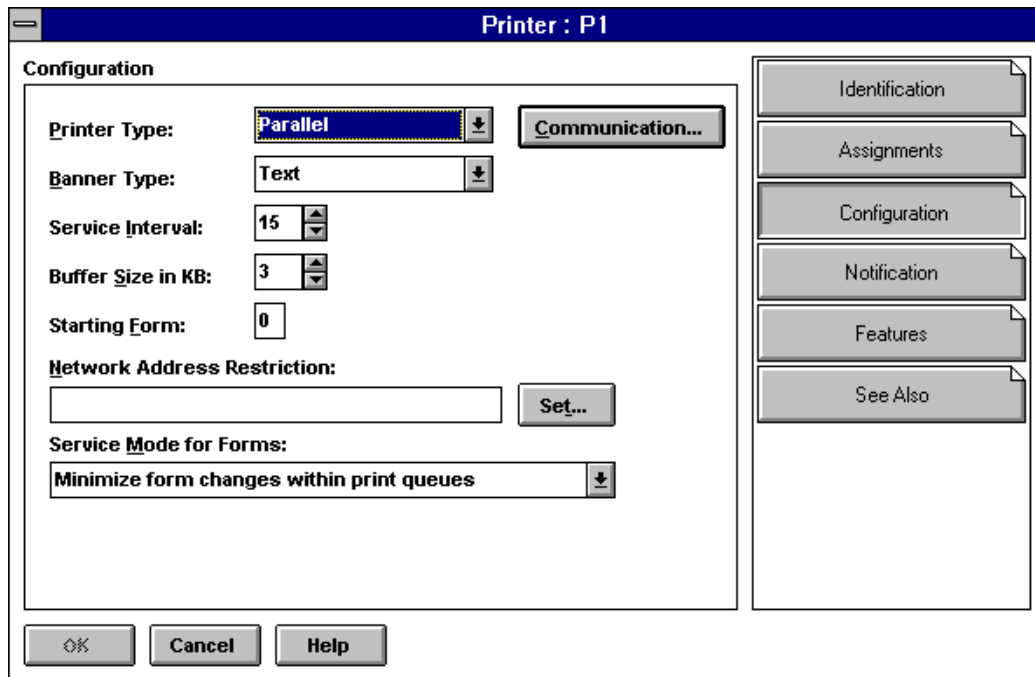


Figure 2-12 Printer Configuration Page

- 4 Complete the configuration fields as required by your printer type.
    - “Printer Type” displays the printer type. Selecting this field displays the list of types from which you can select. Types of printers currently appearing in this menu are
      - Parallel
      - Serial
      - UNIX Printer
      - AppleTalk Printer
      - Other/Unknown (for example, configured by NPRINT)
      - XNP
      - AIO
- Parallel, serial, XNP (eXtended NetWare Printer protocol) AppleTalk, UNIX and AIO printers require unique settings.

## Printer Options

The default values are for a parallel printer that is cabled to the LPT1 port of a NetWare Server running PSERVER.

- The “Communication” parameter windows allow you to view and modify the values defined for the selected printer type. Different dialogs are used depending on which printer type is selected. The appropriate window appears automatically whenever you change the printer type except when “Other/Unknown” or “XNP” (eXtended NetWare Printer protocol) is selected.

“Communication” can be used to access these parameter windows.

- “Banner Type” shows whether the printer produces banner pages in text or PostScript mode. The banner type must match the default printer type.
- “Service Interval” shows how often the print server checks the print queue for print jobs going to this printer. The default is every 5 seconds. Values from 1 to 255 are allowed.
- “Buffer Size in KB” shows how large each piece of data sent to this printer can be. The default is 3 KB (3,072 bytes). Values from 1 to 20 are allowed.
- “Starting Form” shows the number of the printer forms that this printer will service when the NetWare port driver is loaded. Printer forms are defined in the Organization or Organizational Unit object above this printer. Any Form Number defined there can be used here (values from 0 to 254 are possible).
- “Network Address Restrictions” shows the network addresses that this printer can use. “Set” is used to add an IPX network address to this field.
- “Service Mode for Forms” determines how forms needed for print jobs affect the order in which the print server processes those jobs. Selecting this field displays the list of service modes from which you can select.

When a print job requests a printer form other than the form currently mounted in the printer, the print server does not service the job until a print server operator reports that the new form is mounted. A print server operator can use PCONSOLE, PSC, or NetWare Administrator to mount the new form.

The following service mode options determine how often the print server requires you to change printer forms:

- “Change forms as needed”

The priority of each print queue and the order of print jobs in the print queue determine which print job to service next. You might have to change forms often.

- “Minimize form changes within print queues”

The print server requires you to mount a new form for a print job before servicing print jobs with the currently mounted form in a print queue with a lower priority.

- “Minimize form changes across print queues”

The print server services all print jobs requiring the currently mounted form before requesting a form change. Print jobs in lower priority print queues that require the mounted form are serviced before print jobs in a high priority print queue that require a different form.

- “Service only currently mounted form”

The print server never requests a form change. If no print job requiring the current form is available, nothing is printed.

- 5 When you are finished, select “OK.”

### **Viewing and Modifying a Printer’s Status**

You must be an operator or user of a print server that services a printer to be able to see the printer’s status.

Use the following procedure to view a printer’s status.

#### **Procedure**

- 1 From the browser, select the “Details” dialog for the printer you want to view or modify.

The printer “Identification” dialog appears.

- 2 Select “Printer Status.”

A dialog appears similar to the following showing the various status elements for printers.

If the printer status option does not appear, the printer is not connected.

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Printer Options

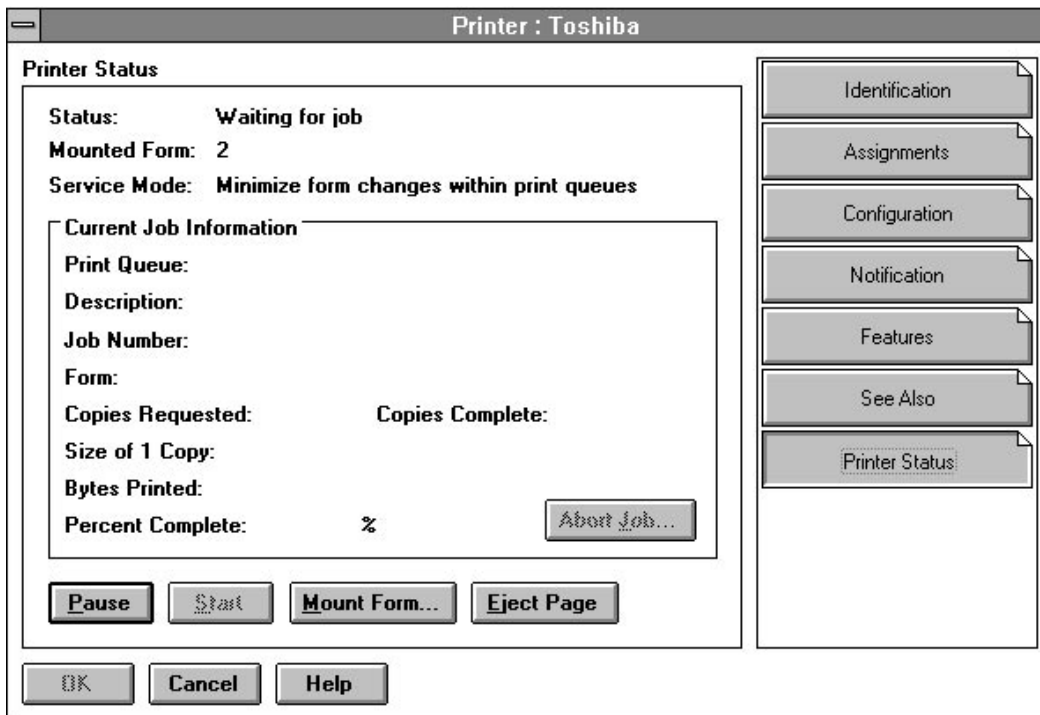


Figure 2-13 Printer Status Dialog

- 3 Modify this printer's status as necessary.
  - “Status” Status shows the current status of this port driver and printer. Possible statuses include the following:
    - Not connected
    - Waiting for form
    - Out of paper
    - Printing
    - Paused
    - Stopped
    - Off-line
    - Private
    - Ready
    - Waiting for job
    - Ready to go down

---

**NOTE:**

The port driver (NPRINTER) status for a defined but unattached serial printer is “Waiting for job” even though the printer is not attached, and the printer status is “Running.” If a print job is put into the queue for this printer, the port driver status changes to “Ready (Waiting for printer)” or “Printing job” but the printer status changes to “Offline.”

Defined but unattached parallel printers show a status of “Not connected.”

- “Mounted Form” shows the number of the form that is currently mounted in the printer. Only print jobs that specify this printer form number can be printed until a new printer form is mounted by selecting “Mount Form.”
- “Service Mode” shows which service mode is being used by this printer and its associated print queue. The Service Mode determines how jobs within a print queue are organized for the most efficient use of the printer.
- “Current Job Information” includes all of the information about the print job that is currently being printed on this printer. Most of this information can only be changed by going to the print queue and selecting this print job from the list of jobs.

“Print Queue” indicates the print queue that is submitting this print job.

“Description” indicates the banner name. By default, the banner name with CAPTURE is the port and with NPRINT it is the filename.

“Job Number” is the print job ID.

“Form” shows which printer form this print job is using. This print job cannot be printed unless this Form matches the “Mounted Form” field above the “Current Job Information.”

“Copies Requested” indicates the number of copies of this print job that the User who submitted it requested to be printed.

“Copies Complete” indicates how many of those copies requested have been printed so far.

“Size of 1 Copy” indicates the size of each copy of this print job. This is like the “File Size” field when you see the details of a print job within the print queue.

“Bytes Printed” indicates the total number of bytes in one copy of a print job that have been printed.

“Percent Complete” indicates how much of this print job is completed, which is determined both by the size of one copy and the number of

## Printer Options

copies requested for this print job.

- “Abort Job” allows you to cancel this print job and immediately stop printing.
  - “Pause” changes the status of this printer to Paused. If no jobs are printing and Paused is used, the status is changed to Stopped. Only a print queue operator can perform this action.
  - “Start” changes the status of this printer from Paused to Printing, Stopped to Printing, or Stopped to Waiting for Job.
  - “Mount Form” allows you to specify a new printer form that you have mounted on this printer. When you use this option, the “Mounted Form” field will change to reflect the newly mounted form. Only print jobs that specified the new form can be printed.
  - “Eject Page” sends a command to this printer to eject the page that is being printed. This is like a Form Feed command.
  - “Close” closes this dialog and returns to the “Identification” page of the Printer object dialog.
- 4 Choose “Close” to return to the “Identification” page of the Printer object dialog.

## Changing Printer Type

### Procedure

- 1 From the browser, select the “Details” dialog for the printer you want to configure by double-clicking on the printer object.  

The printer “Identification” page appears.
- 2 Choose “Configuration.”  

The printer “Configuration” page appears.
- 3 Using the down arrow to the right of the “Printer Type” field, choose the correct printer type from the list.  

For printers that attach directly to the network, select type “Other/Unknown.” (For example, HP\* IIIsi or 4si, COMPAQ\* PageMarq 20, GENICOM 7170, or Talaris 1794 Printstation.)

A dialog appears where you must check the communication values for the selected printer type. (Other/Unknown and XNP do not have a dialog; they are configured elsewhere.)
- 4 Make any necessary changes in the communication parameters dialog for this



printer type.

See “Configuring Printers” for information on these parameters.

**5** Choose “OK.”

You return to the “Configuration” page.

### **Setting Up Printer Event Notifications**

The “Notification” page controls the objects that are notified when the printer requires servicing (for example, when it is out of paper or jammed). You can do the following:

- Add or delete User or container objects that receive printer error messages
- Specify how soon and how frequently printer error messages arrive
- Specify that the print job owner receive the printer status messages

#### **Procedure**

**1** From the “Printer: printername” dialog box, select the “Notification” page.

A page similar to the following is displayed:

Managing Print Services with the NetWare Administrator Utility  
Printer Options

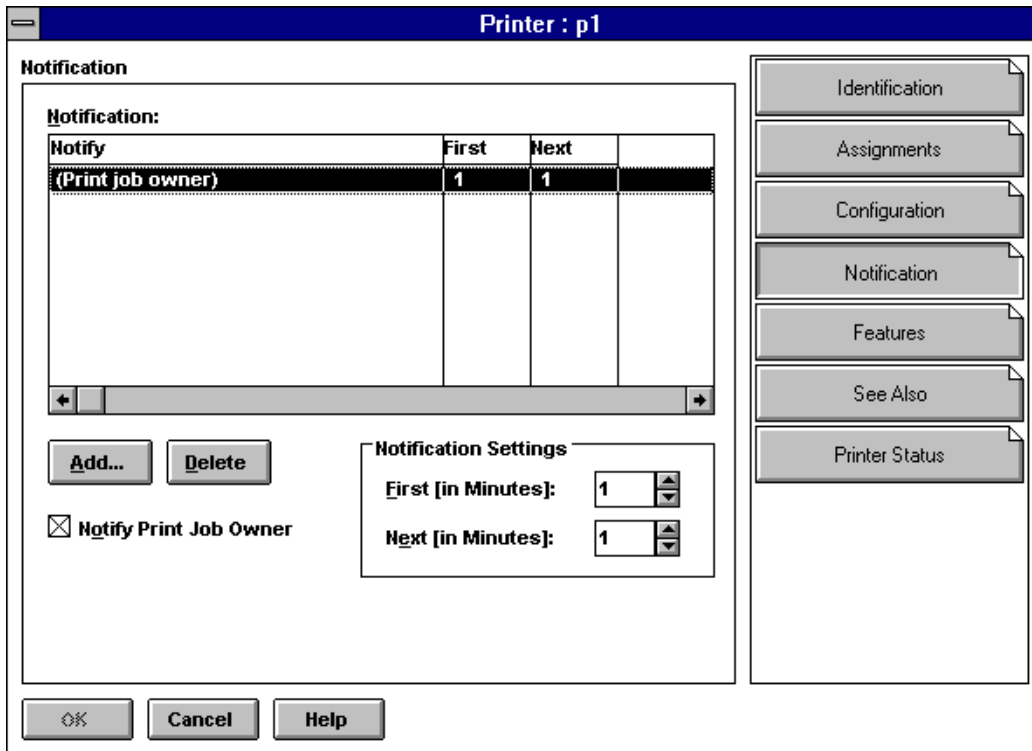


Figure 2-14 Printer Notification Page

- 2 On this page, configure your notification options.

The “Notification” list box shows objects that are notified about this printer.

- “Add” allows you to add objects to the “Notify” list.
- “Notification Settings” allow you to specify how long (in minutes) after an event that a first notice is sent to the objects in the Notify field and how long (in minutes) after the first notification of an event that subsequent notices are sent to the objects.
- “Delete” lets you delete the selected object from the Notification list box. If you delete the (Print job owner) entry, you can add it to the list by selecting the Notify Print Job Owner check box.)
- “Notify Print Job Owner” enters the print job owner as an object in the Notification list, so that the object that sends the print job receives

notifications. By default, this object is included in the Notification list.

- “OK” saves changes in all pages of this dialog.
- “Cancel” closes this dialog without saving changes in any page.

### **Changing a Print Queue's Priority**

A print queue's priority determines whether the print server will send print jobs from that print queue to the printer before or after print jobs in other print queues assigned to the printer.

Use the following procedure to modify a print queue's priority.

#### **Procedure**

- 1** Select a Printer object from the browser and go to the “Assignments” page.  
The priority of the selected print queue is shown in the “Priority” field.
- 2** Enter the new priority for the selected print queue in the “Priority” field.  
You can select a number from 1 to 10, inclusive. Print queues with lower priority numbers will be serviced before print queues with higher numbers.
- 3** Choose “OK.”  
The priority is changed, and you return to the browser.

### **Designating a New Default Print Queue**

#### **Procedure**

- 1** Choose the arrow to the right of the “Default Print Queue” field.  
The print queues listed above in the “Print Queues” list appear in the drop-down list box.
- 2** Select a print queue from the list.  
The selected print queue appears in the “Default Print Queue” field.

The default print queue will be used for print jobs that specify a printer but do not specify a print queue (for example, with the CAPTURE command).

### **Specifying Printer Features**

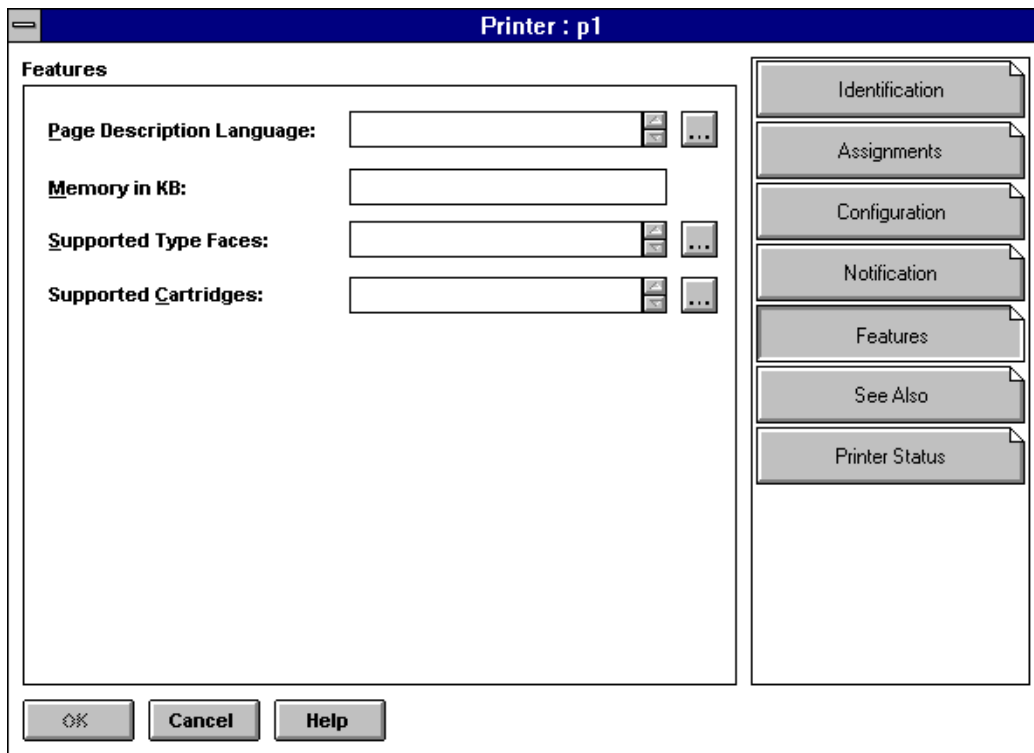
The printer “Features” page allows you to store information about your printer, including the following:

- Printer language
- Amount of memory
- Supported typefaces
- Supported cartridges

You can access this information through searches. For example, you can search for printers with at least 4 MB (4096 KB) of memory and the Futura font.

#### **Procedure**

- 1 From the “Printer: printername” dialog box, select the “Features” page.  
A page similar to Figure 2-15 appears.



**Figure 2-15**      **Printer Features Page**

- 2 On this page, specify the information you want to store:
  - “Page Description Language” shows the languages supported by the printer. To add a language, choose the button to the right of the “Page Description Language” field and then choose “Add” for each language the printer supports.

A printer language is a protocol or type of printing that this printer can receive (for example, PCL, PCL-V, or PostScript).

Enter the main printer languages that this printer supports so that users can search for printers that support the language they need.

## Managing Print Services with the NetWare Administrator Utility

### Printer Options

To enter other printer languages for this printer, choose the button to the right of the “Page Description Language” field. Add other descriptions in the “Add Value” dialog that appears.

- “Memory in KB” shows the amount of RAM installed in the printer.
- “Supported Type Faces” shows the fonts that the printer can use. You must enter the correct typefaces; they are not read from the printer.

A typeface is a collection of fonts in different stroke weights and sizes that this printer can produce (for example, Helvetica and Times Roman).

Enter the typefaces that this printer supports so that users can search for printers that support a typeface they need.

- “Supported Cartridges” lists the font cartridges that the printer can use. You must enter the correct cartridges; they are not read from the printer.
- “OK” saves changes in all pages of this dialog.
- “Cancel” closes this dialog without saving changes in any page.

## Enabling and Viewing the Print Server Auditing Log

The print server auditing log provides information about all jobs that have been printed. Auditing records are retained as ASCII files so that they can be read with any text editor.

By default, no audit log is created. When you enable the audit log feature you can do the following:

- View the log. Use PCONSOLE to view the log.
- Limit the log size. By default, the log has no size limitations. The log's current size is displayed in the dialog.
- Delete the log. Deleting an audit log destroys the current log and, if auditing is enabled, starts a new log by the same name in the same directory.

In designing the auditing log, Hewlett-Packard has recognized that companies do accounting in a variety of ways. For this reason, the auditing log provides a basic default format based on ASCII text and a fixed record length. Both characteristics are designed to make it as easy as possible to write a customized program to retrieve the information it needs in a format determined by a particular company.

The auditing log is sufficiently flexible to record whatever information a printer sends to it. Regardless of printer type, the log will record how many bytes a job took to print, the user who submitted the job, when the job entered the print queue, when the job was printed, and what printer serviced the job.

If the printer is an XNP type used by UNIX, the log might also indicate how long it took to print the job, how many pages were printed, when the job was printed, and when the job was submitted.

## Adding, Changing, and Removing Print Server Passwords

For added security, you can limit access to your print server by assigning a password to it. Use the following procedure to do this with NetWare Administrator.

### Procedure

### Enabling and Viewing the Print Server Auditing Log

- 1 From the browser, choose the Print Server object you want to modify, and, from the “Object” menu, select “Details.”

The print server “Identification” page appears.

- 2 Select “Change Password.”

The “Change Password” window appears.(The “Old Password” field is permanently grayed.)

- 3 Complete the fields as needed.

- a To assign a new password, type the new password in both the “New Password” and “Retype New Password” fields. Then select “OK.”

Only alphanumeric characters and underscores are valid. Passwords are not case sensitive.

- b To remove a password, make sure that the fields are blank, then select “OK.” When prompted, confirm that you want to remove the password assignment by selecting “Yes.” (“Cancel” is the default.)

### Unloading Print Servers

A print server can be created in NetWare Administrator, but it must be loaded, or started, at the NetWare Services server using the System Administration Manager (SAM). However, an active (Status: running) print server can be unloaded, or stopped, in NetWare Administrator with the following procedure.

If “Unload” is not activated, the print server may not be running. If it is running, you are not designated as an operator for that print server. In order to proceed, a designated print server operator must be logged in to the workstation you are using

#### Procedure

- 1 From the browser, choose the Print Server object you want to unload and, from the “Object” menu, select “Details.”
- 2 Select “Unload.”
- 3 Do one of the following:
  - Select “Unload Print Server Immediately” if you want the print server to go down without completing any current print jobs.



Managing Print Services with the NetWare Administrator Utility  
**Enabling and Viewing the Print Server Auditing Log**

Print jobs in the queue will remain in the queue until the print server is reloaded or they are manually deleted.

- Select “Unload Print Server After Current Jobs” if you want a print job already being printed to be completed before the print server goes down.

Other jobs in the queue will remain in the queue until the print server is reloaded or they are manually deleted.

## Working with Print Job Configurations

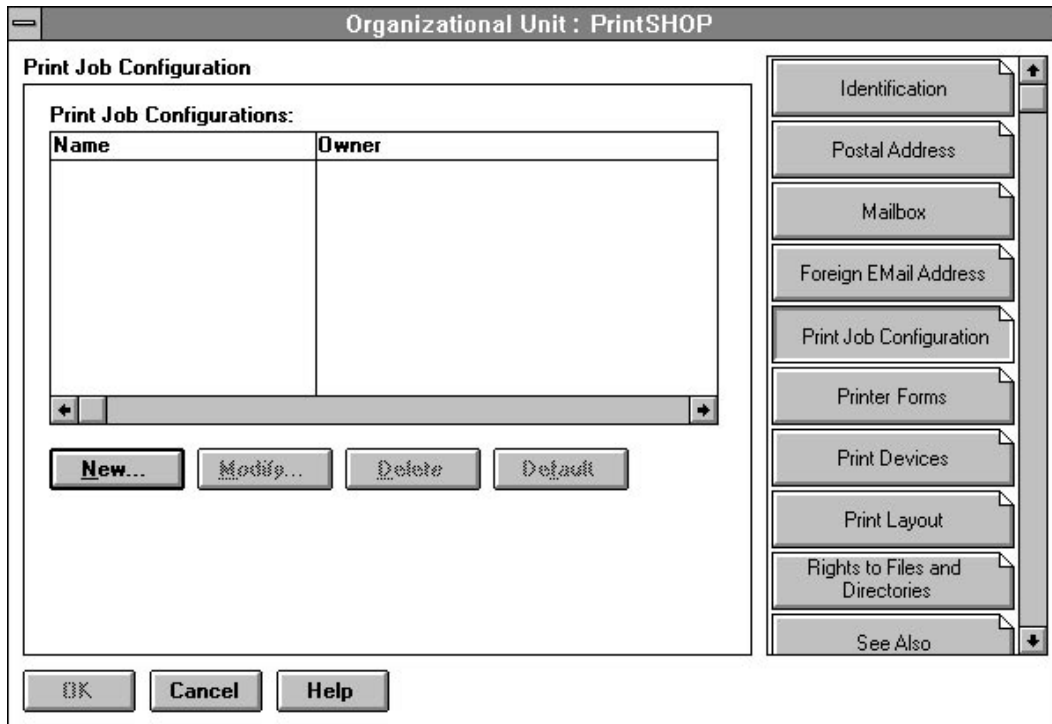
Print job configurations are groups of print job options that simplify the use of CAPTURE and NPRINT. You can use NetWare Administrator to create or modify print job configurations. These configurations may specify a default printer or other options for users who use CAPTURE, NPRINT, NETUSER, or PCONSOLE to send print jobs to a network printer or print queue.

### Creating Print Job Configurations

#### Procedure

- 1 Choose the “Print Job Configuration” page of a “User: <name>,” “Organization” or “Organizational Unit” dialog.

The “Print Job Configuration” dialog appears, similar to the following figure.



**Figure 2-16** Print Job Configuration Dialog

- “Name” lists the names of the print job configurations that can be used. Print job configurations that were defined in any Organization or Organizational Unit above this object are included in this list.
- “Owner” lists the object where each configurations was defined.
- “New” opens the “Print Job Configuration” page, where you can enter a name and parameters for a new print job configuration.
- “Modify” opens the “Print Job Configuration” page for a highlighted print job configuration, where you can view and modify the parameters of the configuration.
- “Delete” removes the selected print job configuration from the list. It can no longer be used.
- “Default” marks the selected print job configuration as the default

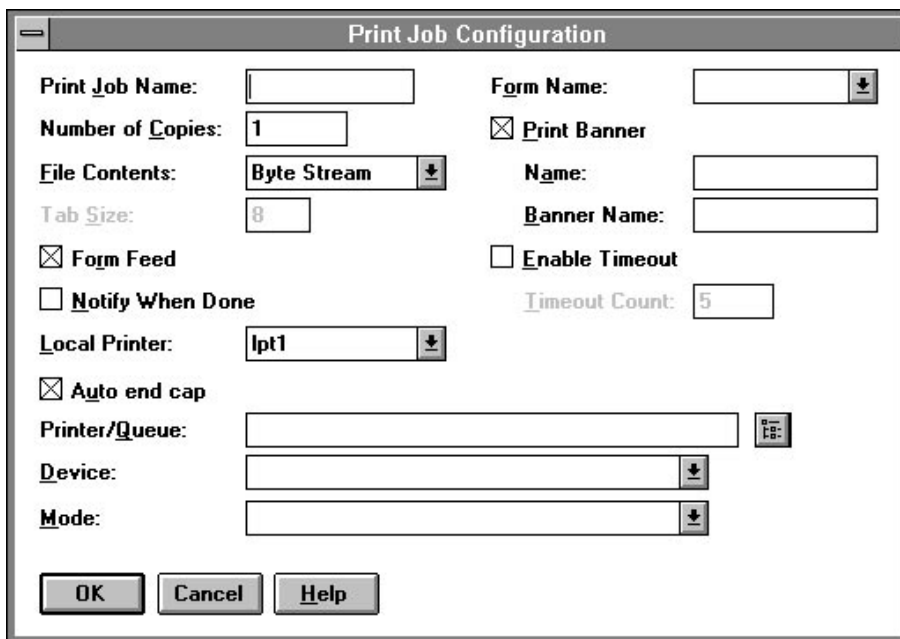
## Managing Print Services with the NetWare Administrator Utility Working with Print Job Configurations

configuration, as noted by the printer icon.

- “OK” saves changes in all pages of this dialog.
- “Cancel” closes this dialog without saving changes in any page.

### 2 Select “New.”

The “Print Job Configuration” page appears, similar to the following figure.



The screenshot shows a dialog box titled "Print Job Configuration". It contains several fields and checkboxes:

- Print Job Name:** A text input field.
- Form Name:** A dropdown menu.
- Number of Copies:** A text input field with the value "1".
- File Contents:** A dropdown menu with "Byte Stream" selected.
- Tab Size:** A text input field with the value "8".
- Form Feed:** A checked checkbox.
- Notify When Done:** An unchecked checkbox.
- Local Printer:** A dropdown menu with "lpt1" selected.
- Auto end cap:** A checked checkbox.
- Printer/Queue:** A text input field with a printer icon button to its right.
- Device:** A dropdown menu.
- Mode:** A dropdown menu.
- Print Banner:** A checked checkbox.
- Name:** A text input field.
- Banner Name:** A text input field.
- Enable Timeout:** An unchecked checkbox.
- Timeout Count:** A text input field with the value "5".

At the bottom of the dialog are three buttons: "OK", "Cancel", and "Help".

Figure 2-17

### Print Job Configuration Page

### 3 Select and complete the fields appearing on this page.

The following fields are on this page:

- “Print Job Name” lists the name of this print job configuration (as listed in the “Job Configuration” list box) that you specify to be used for a printing job. This field cannot be changed when you modify other fields later.
- “Number of Copies” indicates how many copies of the file to print. The number of copies can range from 1 to 65,000.
- “File Contents” allows you to choose either “Text” or “Byte stream” (the default).

Choose “Text” when you want tabs to be converted to spaces. Also choose “Text” to print ASCII text.

Choose “Byte stream” if you are printing from within an application and you want the application to handle the formatting commands. Also choose “Byte stream” if you will be downloading fonts on a laser printer.

- “Tab Size” is the width in characters that each tab character should be expanded to. This field is only available if you select “Text” in “File contents.”
- “Form Feed” determines whether a form feed is sent when a job is completed.
- “Notify When Done” determines whether a message is sent to the workstation of the print job originator when the job has finished printing.
- “Local Printer” specifies which of your computer’s parallel ports will be captured. The values listed are LPT1 through LPT9.
- “Auto end cap” determines if the CAPTURE command automatically ends when a print job is completed.
- “Printer/Queue” allows you to select the Printer or Queue object that the print job configuration should use. The “Select Object” dialog appears when the browser button is selected.
- “Device” allows you to select which print device definition this print job configuration uses.
- “Mode” allows you to select the mode this print job configuration uses. The modes listed are defined by the device definition you selected.
- “Form Name” allows you to select which printer form this print job configuration uses.
- “Print Banner” determines if this print job configuration includes a banner page at the beginning of each print job. If this check box is selected, the next two fields are available.
  - “Name” identifies the user who sent this print job. This is only valid if a banner page is printed.
  - “Banner Name” indicates the name of the print job. This is only valid if a banner page is printed.
- “Enable timeout” determines if each print job will time out after a specified period of time. If this is selected, “Timeout Count” can be set.
  - “Timeout Count” field is the number of seconds that must pass without data being sent to the queue before the print job is closed. You must select

## Managing Print Services with the NetWare Administrator Utility

### Working with Print Job Configurations

“Enable timeout” to enter a value here. Timeout can range from 1 to 1000 seconds.

- 4 Choose “OK.”

---

**NOTE:**

The NET.CFG file now includes a network “PRINTERS=number” option that you may specify if you choose. This option allows you to specify the number of logical ports (0-9) you would like to be able to capture. The default is 3.

If you specify a print job configuration that has a complex printer mode, you may need to increase the bytes (default 64, range 0 to 255) in the “PRINTER HEADER=number” option.

See Appendix B, “NET.CFG Options,” in *NetWare Workstation for DOS* and Chapter 8, “Creating and Managing Print Job Configurations” for more information.

---

### Viewing or Modifying Print Job Configurations

The “Print Job Configuration” page lists the names of different print job configurations you can use. You can add new job configurations or modify the parameters of existing configurations.

#### Procedure

- 1 Choose the “Print Job Configuration” page of a user “Organization” or “Organizational Unit” dialog.  
The “Print Job Configuration” page appears.
- 2 Select the name of the print job configuration you wish to modify and choose “Modify.”  
The “Print Job Configuration” dialog appears.
- 3 Follow the procedures described in the previous section, “Creating Print Job Configurations,” starting at Step 3.
- 4 To delete a configuration, choose the “Delete” option.

### Selecting a Default Print Job Configuration

You can select a default print job configuration from the “Print Job Configuration” page to have your most frequently used print job configuration automatically used in CAPTURE and NPRINT.

The default configuration is identified by a printer icon in the margin to left of the print job.

Use the following procedure to change to a new default print job configuration.

**Procedure**

- 1 Select the print job configuration that you want to make the default configuration from the “Print Job Configurations” list box.
- 2 Choose “Default.”

The printer icon to the left of the configuration names moves to the selected configuration. That configuration is now the default.

## **Working with Printer Forms**

Printer forms affect the order in which the print server processes print jobs.

Printer forms include information about the length and width of different types of paper used in your printer. You can designate printer forms to prevent your print jobs from printing on the wrong paper. The print server operator is notified when a form change is needed. Printer forms are configured in PRINTDEF or NetWare Administrator.

When a print job requests a printer form other than the form currently mounted in the printer, the print server does not service the job until a print server operator reports that the new form is mounted. A print server operator can use PCONSOLE or NetWare Administrator to mount the new form. For information on mounting a printer form, see “Mounting Printer Forms.”

Printer form names must begin with an alphabetic character and can have up to 12 alpha-numeric characters. Numbers can range from 0 to 254. Length can range from 1 to 255. Width can range from 1 to 999. These numbers are for your reference only.

---

**NOTE:**

---

Printer forms are stored in the Directory Services database. In bindery mode, printer forms are stored in a file named PRINTDEF.DAT in SYS:PUBLIC.

## **Creating Printer Forms**

- 1 From the browser’s “Object” menu, select a container object and then choose “Details.”
- 2 At the “Object” dialog, press the “Printer Forms” page.  
The “Printer Forms” page appears.
- 3 Choose “Create.”  
The “Create New Form” dialog appears.
- 4 Enter a name for the form in the “Name” field.  
The name must begin with a letter and must be unique. It can be up to 12 characters long. Spaces are converted to underscores (\_).
- 5 Enter a number from 0 to 255 for the form in the “Number” field.



- 6 Enter a number from 1 to 255 for the form in the “Length” field.

This is the length of the printer form you are defining, measured in lines of text.

## Mounting Printer Forms

Printer forms can be designated in an effort to prevent your printer from printing a print job on the wrong paper. When the print server detects a print job in the queue, and that print job calls for a form different from the one currently mounted in the intended printer, the print job will not be serviced until a new form is mounted. Each printer form has a unique name and number.

Mounting a printer form consists of two elements:

- Changing the paper. NetWare has no way of determining whether the paper was actually changed or not. It relies on information it receives from the operator.
- Mounting the form through the software. This is the information that NetWare receives from the operator and that is required in order for printing to continue.

To mount a printer form, you need the following prerequisites:

- The print server must be loaded and accessible.
- The printer must be installed, assigned to the print server, and connected.
- A queue must be created and assigned to the printer.
- At least one printer form must have been created.

To mount a printer form with NetWare Administrator, use the following procedure.

### Procedure

- 1 From the browser, select the “Details” dialog for the printer you want to configure by double-clicking on the printer object.

The printer “Identification” page appears.

- 2 Select “Printer Status.”

The “Printer Status” page appears similar to that shown in Figure 2-13.

If Printer Status does not appear, the printer is not connected.

- 3 Select “Mount Form.”

## Working with Printer Forms

The “Mount Form” window appears. A list of existing forms appears in the “Defined Forms” field.

- 4 Select the form you want to mount.

The form number appears in the box below.

- 5 Select “OK.”

You can also mount printer forms from PCONSOLE or at the print server console. See “Mounting Printer Forms” in Chapter 4 (PCONSOLE) or “Viewing a List of Forms” in Chapter 9 (PSERVER).

## Viewing or Modifying Printer Forms

### Procedure

- 1 From the browser’s “Object” menu, select a container object and then choose “Details.”

- 2 At the “Object” dialog, press the “Printer Forms” page.

The “Printer Forms” page appears, listing all current forms in that container.

- 3 Highlight the form you wish to modify and select “Modify.”

The “Modify Printer Form” dialog appears. The values for the printer form that you selected appear in the fields of the dialog. You can change any of the fields.

- 4 (Optional) Enter a new name in the “Name” field.

The name must begin with a letter, and must be unique. It can be up to 8 characters long. Spaces are converted to underscores (\_).

- 5 (Optional) Enter a number from 0 to 255 in the “Number” field.

- 6 (Optional) Enter a number from 1 to 255 in the “Length” field.

This is the length of the printer form you are redefining, measured in lines of text.

- 7 (Optional) Enter a number from 1 to 999 in the “Width” field.

This is the width of the printer form, measured in characters.

- 8 Choose “OK.”

The form is now modified. You do not have to choose “OK” in the object dialog to complete the action.

You return to the “Printer Forms” list. The printer form that you selected in Step 1 is still selected. It may appear with a different name if you changed the “Name” field in Step 2.

## **Deleting Printer Forms**

### **Procedure**

- 1** Select a printer form from the “Printer Forms” list box.
- 2** Choose “Delete.”

The “Delete Printer Form” dialog appears. The values for the printer form that you selected appear in the fields, but they are grayed. You can see what values you are deleting as part of this printer form, but you cannot change them here.

- 3** Choose “OK.”

You return to the “Printer Forms” list box. The printer form that you selected is deleted from the list of printer forms. You do not have to choose “OK” in the object dialog to complete the action.

The “Delete” operation cannot be undone. You must “Add” a new printer form with the deleted values.

## Working with Print Device Definitions

If your application does not have the print driver for your printer, NetWare supplies print device definitions for many common printers.

### Purpose of Print Device Definitions

Print device definitions are sets of functions and modes found in files with .PDF extensions that correspond to printers, plotters, and other peripherals.

The major functions of these definitions is to ensure that the job is printed properly and that the printer is left in a known state after completing a print job.

Printer functions (also referred to as control sequences, escape sequences or printer commands) give instructions to the printer. Print device definitions contain the necessary control sequences for such items as boldface type, underlining, rest, and other printer controls.

To define a printer's functions, you enter control sequences or printer commands into the print device database. To do this, you need the technical reference manual that came with your printer.

Print device definitions do not necessarily represent the full functionality of the printer. A print device definition can be modified to change the functions the machine will actually perform.

---

**NOTE:**

Print device definitions are used by print job configurations. You must create and use a print job configuration to specify a print device mode for print jobs. See "Working with Print Job Configurations."

---

Figure 2-18 shows a partial list of print device definitions included in NetWare. New definitions are added periodically.

<b>APLASER2.PDF</b> -Apple* LaserWriter* Plus/II/IINT/ IINTX/Personal NTR	<b>EPLX800.PDF</b> -EPSON LX-800
<b>APPIMAGE.PDF</b> -Apple ImageWriter* I/II	<b>HP2.PDF</b> -Hewlett-Packard* LaserJet* II/IIID
<b>APPLASER.PDF</b> -Apple LaserWriter	<b>HP2PS.PDF</b> -Hewlett-Packard LaserJet II PostScript
<b>APPLW2FG.PDF</b> -Apple LaserWriter II/IIg/ Personal NTR	<b>HP3.PDF</b> -Hewlett-Packard LaserJet III
<b>CIT120D.PDF</b> -Citizen* 120-D	<b>HP3SIPCL.PDF</b> -Hewlett-Packard LaserJet IIIsi PCL
<b>CIT20.PDF</b> -Citizen 20	<b>HP3SIPS.PDF</b> -Hewlett-Packard LaserJet IIIsi PostScript
<b>CIT224.PDF</b> -Citizen 224	<b>HPLJ4.PDF</b> -Hewlett-Packard LaserJet 4
<b>CITOH310.PDF</b> -Citoh 310/315	<b>HP4SIPCL.PDF</b> -Hewlett-Packard LaserJet 4si PCL
<b>CITOH600.PDF</b> -Citoh 600	<b>HP4SIPS.PDF</b> -Hewlett-Packard LaserJet 4si PostScript
<b>DEC1100.PDF</b> -DEC* Laser 1100	<b>IBM4201.PDF</b> -IBM* ProPrinter* 4201
<b>DEC1150.PDF</b> -DEC Laser 1150	<b>IBMPRO2.PDF</b> -IBM ProPrinter II/XL
<b>DEC2100.PDF</b> -DEC Laser 2100	<b>KXP4410.PDF</b> -Panasonic* 4410
<b>DEC2100P.PDF</b> -DEC Laser 2100p	<b>KXP4420.PDF</b> -Panasonic 4420
<b>DEC2150.PDF</b> -DEC Laser 2150	<b>KXP4430.PDF</b> -Panasonic 4430
<b>DEC2150P.PDF</b> -DEC Laser 2150p	<b>KXP4450I.PDF</b> -Panasonic 4450i
<b>DEC2200.PDF</b> -DEC Laser 2200	<b>KXP4451.PDF</b> -Panasonic 4451
<b>DEC2200P.PDF</b> -DEC Laser 2200p	<b>NEC2050.PDF</b> -NEC* Spinwriter* 2050/3050
<b>DEC2250.PDF</b> -DEC Laser 2250	<b>NEC8810.PDF</b> -NEC Spinwriter 8810/8830
<b>DEC2250P.PDF</b> -DEC Laser 2250p	<b>NECP6.PDF</b> -NEC Pinwriter* P-6
<b>DEC3200.PDF</b> -DEC Laser 3200	<b>OKI192.PDF</b> -OKIDATA* Microliner* 192/193
<b>DEC3250.PDF</b> -DEC Laser 3250	<b>OKI290.PDF</b> -OKIDATA 290
<b>DECCOLOR.PDF</b> -DEC Color Thermal	<b>OKI390.PDF</b> -OKIDATA 390
<b>DIAB630.PDF</b> -Diablo* 630	<b>OKILASER.PDF</b> -OKIDATA Laserline 6
<b>EPEX80.PDF</b> -EPSON* FX-80/FX-100	<b>PAN1080.PDF</b> -Panasonic 1080/1080i
<b>EPEX800.PDF</b> -EPSON FX-800	<b>PAN1091.PDF</b> -Panasonic 1091/1091i
<b>EPEX86.PDF</b> -EPSON FX-86e/FX-286e	<b>PSTSCRIPT.PDF</b> -Any PostScript* printer
<b>EPLD2500.PDF</b> -EPSON LD-2500	<b>STAR1000.PDF</b> -Star NX-1000
<b>EPLQ800.PDF</b> -EPSON LQ-800/LQ-1000	<b>STAR10X.PDF</b> -Star Gemini 10X
<b>EPLX80.PDF</b> -EPSON LX-80	<b>TOSH321.PDF</b> -Toshiba P321

Figure 2-18

### Partial List of Print Device Definitions Included in NetWare

## Creating Print Device Definitions

If your printers are not included among the definitions provided with your application or with NetWare, you need to create your own definitions consisting of functions and modes for each printer you will be using.

You can use the “Print Devices” page for the “Organization” or “Organizational Unit” dialog to create a new print device definition. The correct escape sequences are normally found in your printer’s documentation.

Managing Print Services with the NetWare Administrator Utility  
Working with Print Device Definitions

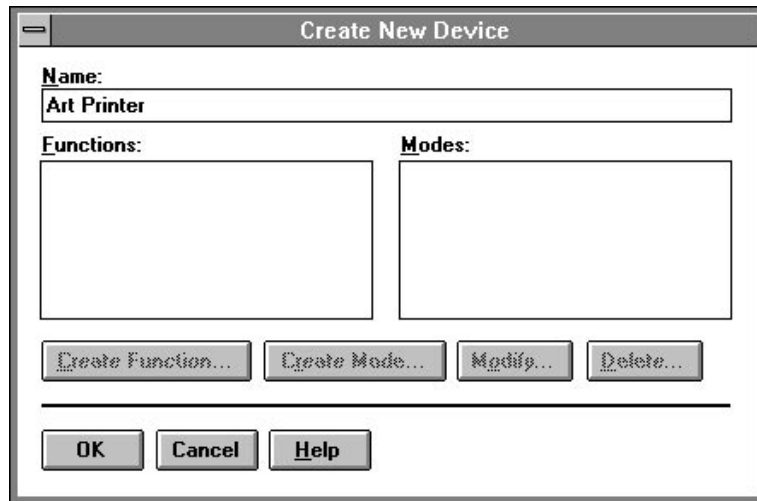
**Procedure**

- 1 From the browser's "Object" menu for the Organization or Organizational unit, choose "Details."
- 2 At the "Object" dialog, select the "Print Devices" page.

The "Print Devices" page appears.

- 3 Choose "Create."

The "Create New Device" window appears similar to the following figure.



**Figure 2-19**

**Create New Device Window**

- 4 Enter a device name in the "Name" field.  
You can use up to 32 characters. The name must begin with alphabetic character. Spaces are allowed in the name.
- 5 Choose "OK."  
The name of the print device you entered is added to the list. You will need to use "Modify" to define functions and modes for this print device before using it.

## Viewing or Modifying Print Device Definitions

The following procedure is used to modify an existing print device definition that was previously created. You can add, change, or delete the existing functions and modes that are defined for this print device.

You can also change the name of the print device, and the name of any of the print device's functions or modes.

A function is an action that the printer can perform, such as creating bold text or using proportional spacing.

A mode is a combination of functions that you define to prepare the printer for specific printing needs. For example, you might define a print mode called "Title" that includes functions for bold, double-wide, and letter-quality printing.

### Procedure

- 1 From the browser's "Object" menu for the Organization or Organizational unit, choose "Details."
- 2 At the "Object" dialog, select the "Print Devices" page.  
The "Print Devices" page appears. A list of existing print device definitions is displayed in the "Name" field.
- 3 Select "Modify."

The "Modify Existing Device" page appears similar to the following figure.

Managing Print Services with the NetWare Administrator Utility  
Working with Print Device Definitions

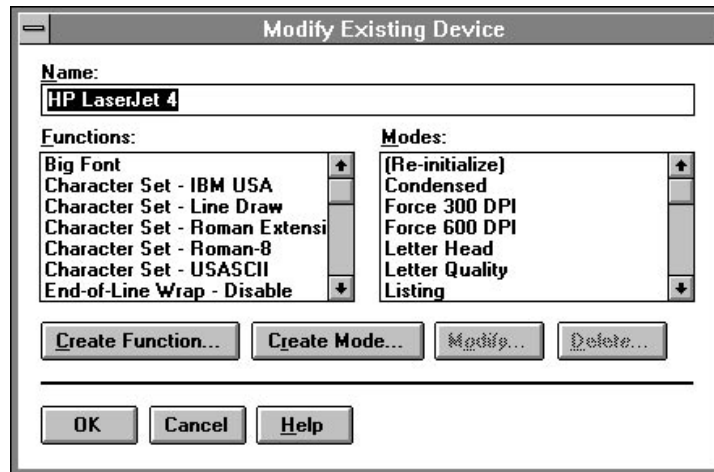


Figure 2-20 Modify Existing Device Page

- 4 Complete the fields and options as needed:
  - “Name” shows the name of this print device.
  - “Functions” shows the functions that have been entered for this print device. These include all of the capabilities of this print device, such as compressed or letter-quality printing.
  - “Modes” shows the modes that have been entered for this print device. A mode is a combination of functions that you define to serve a specific printing need.
  - “Create Function” allows you to add a function to the “Functions” list. See “Creating or Modifying Print Device Functions” in the next section.
  - “Create Mode” allows you to define a new mode and add it to the “Modes” list.
  - “Modify” allows you to change the selected mode or function by adding or removing functions or control sequences, respectively, from its definition.
  - “Delete” deletes the selected mode or function. The functions that were a part of a selected mode are not affected; they are still part of the print device definition.
- 5 Make the desired changes and select “OK.”



## Creating or Modifying Print Device Functions

This feature allows you to enter a name and the necessary control sequences to define or modify a print device function. The necessary control sequences (also called control codes or escape sequences) are described in the operator's manual of your printer.

A function is an action that the print device can perform, such as bold text or proportional spacing. You cause the print device to perform the function by sending control codes to the print device.

When you select the “Create Function” page of the “Modify Print Device” dialog, the name of the print device is at the top of the page.

### Procedure

- 1 Enter a name for the function you wish to modify or create in the “Function Name” field.

You can use any name that you want to, but you should choose names that represent the printer's actions. Function names must be unique (no two names can be the same) and no longer than 32 characters. Function names are not case sensitive. You can use both letters and numbers.

For detailed information on naming and defining print device functions, use online Help.

- 2 Enter the characters used by this printer as a control sequence to engage this function.

If a character in the control sequence has an ASCII value less than 33 or equal to 127, the character is displayed as a delimited acronym, as listed below. If the character's ASCII value is greater than 127, it is displayed as a delimited ASCII value. The value is a decimal number.

The space character can be entered as a space or as a delimited token. A space is displayed as a delimited token.

Except for delimited tokens, characters in a function follow the “used as is” rule. This means that the characters you see displayed are the actual characters that make up the function.

Detailed information on creating and modifying functions can be found in Help.

- 3 Choose “OK.”

You return to the “Modify Existing Device” dialog. The function that you entered is listed in the “Functions” list.

## Importing Print Device Definitions

The print device definition “Import” feature allows you to import a definition for a new print device into the device database so that can be used by objects in this container. A definition consists of a name, functions, and modes.

With NetWare, Hewlett-Packard ships a set of commonly used .PDF files, which are found in the SYS:PUBLIC directory. In order to use these definitions in your job configurations, they must be imported.

“Import” allows you to use an existing definition without re-entering all of the functions and modes. You may import a definition that was provided with NetWare or that was created for another container.

You can import a print device definition by using the following procedure.

### Procedure

- 1 From the browser’s “Object” menu for the Organization or Organizational unit, choose “Details.”
- 2 At the “Object” dialog, select the “Print Devices” page.

The “Print Devices” page appears, similar to the following figure.

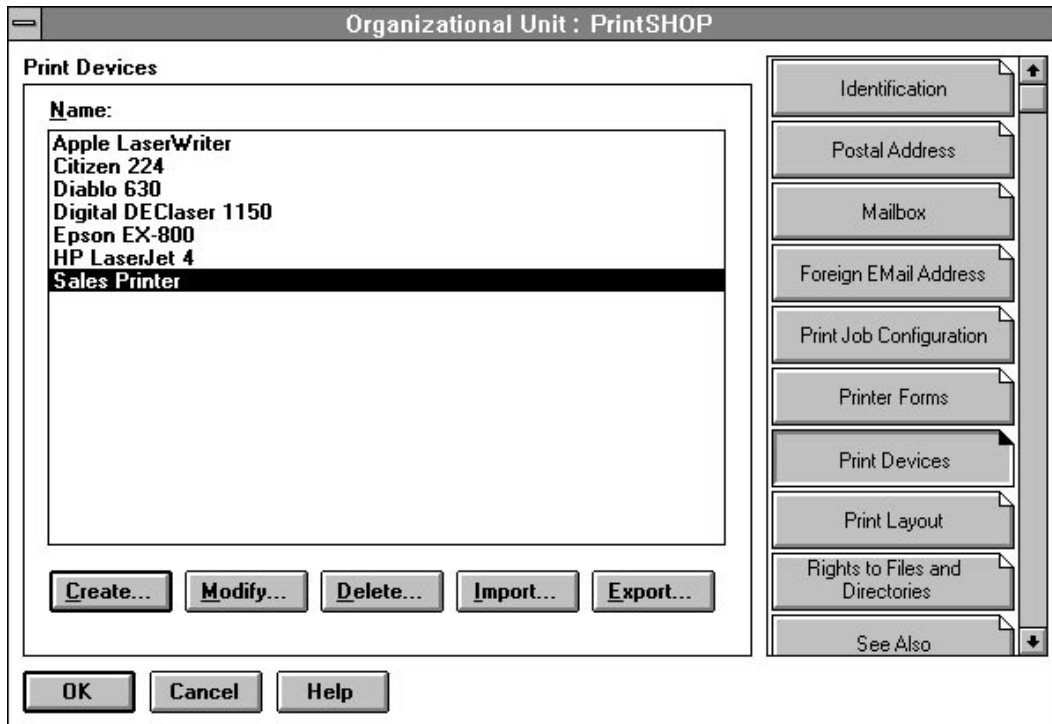


Figure 2-21 Print Devices Page

3 Choose “Import.”

The print device definition “File Open” dialog, similar to the following figure, appears with a list of print device definitions (.PDF files) available in your current directory.

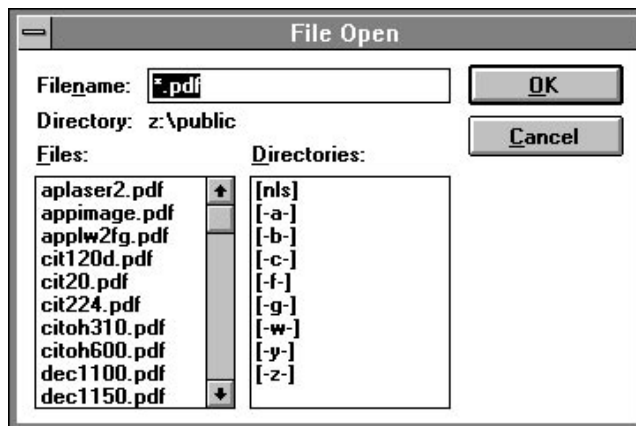


Figure 2-22

#### File Open Dialog

- 4 Use the “Files” selection list to locate the file for the print device definition that you want to import.

The file extension .PDF is used for print device definition files.

- 5 Select the filename that corresponds to the printer you want to import into the device database, and then press “OK.”

The print device definition is added to the “Print Devices” list box, and the definition contained in the file can now be used by objects in this container.

### Exporting Print Device Definitions

This feature allows you to export a definition for a print device from a database in one container so that it can be imported for use in databases in other containers without re-entering all functions and modes.

Use the following procedure to export a print device definition.

#### Procedure

- 1 Select a print device definition from the “Print Devices” window.
- 2 Choose “Export.”

The “File Save As” window appears.

- 3 Find the directory where you want to create a file containing this print device definition.

The file extension .PDF is used for print device definition files.

The name of the print device is used as the filename when you export a definition. All spaces are removed and the first eight characters of the print device are used.

**4** Choose “OK.”

The print device definition is saved with the same filename as the definition that is listed. All functions and modes are included in the definition.

The definition can now be imported to a database in another container.

## Working with Print Device Modes

After you define the functions for a print device definition, you can combine these functions into modes.

A mode is a combination of functions that you define to allow the print device to meet specific printing needs.

For example, you could create a “Final Printout” mode for the HP LaserJet that would include the functions for 10 cpi, Emphasized printing, and Near-letter quality printing.

As a network supervisor, you must determine what your printing needs are and then define the modes you will need.

---

**NOTE:**

---

In most printers, the order of the functions is important. See your printer’s documentation for more details.

## Creating Print Device Modes

Use the following procedure to create a new mode.

### Procedure

- 1 From the “Modify Existing Device” page, select “Create Mode.”  
The “Create New Mode” page appears.
- 2 Enter a name for the new mode in the “Mode Name” field.  
You can choose any 8-character name that begins with a letter. You should use names that reflect the purpose of the print device mode.  
For example, you might have modes for different types of documents like memos or reports, or for different user’s preferred settings, or for the requirements of different papers or forms that you use.
- 3 Select the function that you want to be executed first from the “Device Functions” list; then choose “Add Below.”
- 4 Select the function that you want to be executed next from the “Device Functions” list; then select “Add Below.”  
You can select the same function more than once if the mode requires it.

- 5 Repeat Step 4 until all of the functions that you want as part of this mode are listed in the correct order in the “Mode Functions” list box.

If you make a mistake, use “Delete” or “Add Above” to rearrange the functions listed in “Mode Functions.”

- 6 Choose “OK.”

You return to the “Modify Existing Device” dialog.

### **Viewing or Modifying Print Device Modes**

This feature allows you to modify a print device mode that you previously entered.

You can change the name of the mode or change the functions executed from this mode.

A mode is a combination of functions that you define to allow the print device to meet specific printing needs. For example, you might define a print device mode called “Title” that includes functions for bold, double wide, and letter-quality printing.

Use the following procedure to modify an existing print device mode.

#### **Procedure**

- 1 From the “Modify Existing Device” dialog, select the mode you want to modify and choose “Modify.”
- 2 (Optional) Enter a new name for the mode in the “Mode Name” field.
- 3 Select the function that you want to add to the mode from the “Device Functions” list.
- 4 Select the function in the “Mode Functions” list next to where you want to insert the new function.
- 5 Choose “Add Below” or “Add Above” to insert the selected device function in the correct place in the “Mode Functions” list.
- 6 (Optional) Select any mode function that you want to delete from the definition of this mode; then choose “Delete.”  

The selected function is no longer part of this mode. The function is still a part of this print device definition, but is not used for this mode.
- 7 Repeat Steps 2 through 5 as needed.

Managing Print Services with the NetWare Administrator Utility  
**Working with Print Device Modes**

**8** Choose “OK.”

You return to the “Modify Print Device” dialog.



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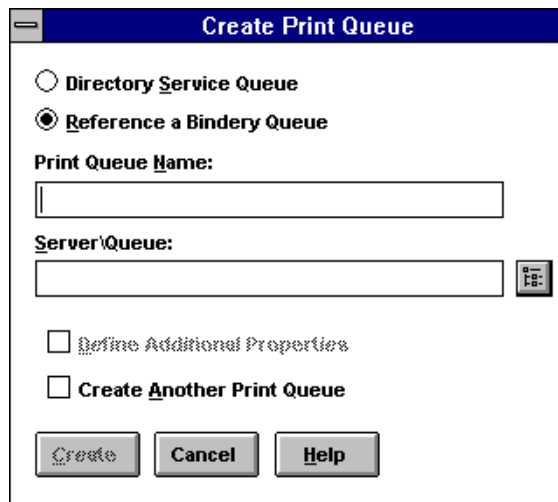
## Referencing Bindery Queues

The following procedure lets you reference a bindery queue and add it to your list of print queues available for printing.

### Procedure

- 1 At the “Create Print Queue” screen, shown in the following figure, select “Reference a Bindery Queue.”

Notice that the screen changes when this option is selected.



The screenshot shows a dialog box titled "Create Print Queue". It has two radio buttons: "Directory Service Queue" (unselected) and "Reference a Bindery Queue" (selected). Below the radio buttons are two text input fields: "Print Queue Name:" and "Server Queue:". The "Server Queue:" field has a small browser icon to its right. There are two checkboxes: "Define Additional Properties" and "Create Another Print Queue", both of which are unchecked. At the bottom of the dialog are three buttons: "Create", "Cancel", and "Help".

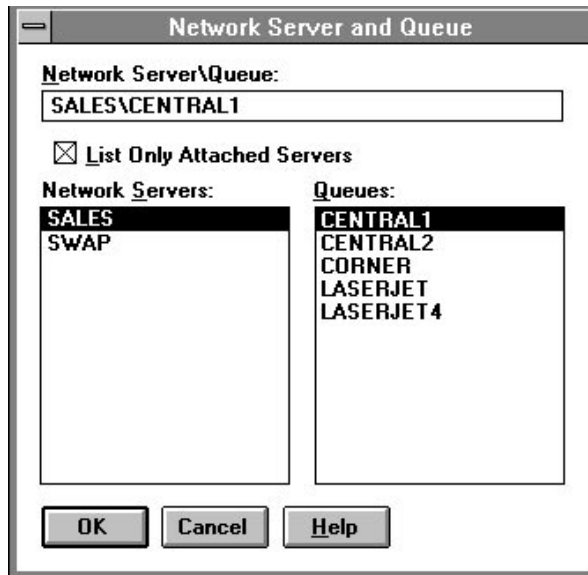
- 2 (Optional) If you want to assign a bindery reference queue name different from the queue’s name on the NetWare 3 server, enter the reference name into the “Print Queue Name” field.

If you do not want to assign a reference name, leave the field blank.

- 3 Click on the browser button to select a bindery server and queue.

The “Network Server and Queue” window appears, similar to the following figure.

Managing Print Services with the NetWare Administrator Utility  
Referencing Bindery Queues



- “Network Server\Queue” displays the queue that will appear in the directory tree and the queue’s bindery server.
  - “List Only Attached Servers” allows you to limit the list of bindery servers to only those you are currently attached to or expand the list to all bindery servers in the network. If your network is large, building a list of all servers can take some time.
  - “Network Servers” lists servers outside of your Directory tree from which you may want to access queues.
  - “Queues” lists queues available on the server highlighted in the Network Servers list.
- 4 Select “List Only Attached Servers” to select whether you want this option turned on or off.  
To see a list of all available servers, turn off this option. Select the name of the server you want to attach to. Log in to this server at the prompt.
  - 5 At the list of print queues that appears, select the queue you want to reference.  
If no queue names appear, no queues have been defined on that server. Select “OK.”
  - 6 At the “Create Print Queue” dialog, select “Create.”

---

**Managing Print Services with  
PCONSOLE**

## Overview

This chapter explains how to set up and administer print services with the PCONSOLE utility. You can use the “Quick Setup” option in PCONSOLE to set up default print objects. Instructions for customizing those objects follow.

### Using Quick Setup in PCONSOLE

The “Quick Setup” option allows you to get your default print objects (print queue, printer, print server) up and running quickly.

The following quick setup procedure will assume two laser printers, called PR\_Far and PR\_Near. They will be serviced by a print server called PS\_1 through two queues called Q\_Far and Q\_Near, both located on a single NetWare server which will be called NWFS\_1.

Printer PR\_Far will be connected to the parallel port LPT1 on the NetWare server, and printer PR\_Near will be connected to parallel port LPT1 on a client workstation.

### Procedure

- 1 Connect your printer to the parallel (LPT) port of the server.
- 2 From a workstation, log in to the NetWare server as ADMIN.

For example:

```
LOGIN NWUFS_1/.ADMIN.HP
```

- 3 Type PCONSOLE at the command line.

The “Available Options” menu appears.

- 4 If the current context is the desired one, skip to Step 5. If not,
  - a Select the “Change Context” option.
  - b Enter the desired context or press <Insert> to browse.

Being in the correct context is critical to the success of your setup; therefore, you must change to the context in which the print related objects are to reside.

- 5 Use Quick Setup to define PS\_1, PR\_Far, and Q\_Far.
  - a Select the “Quick Setup” option.
  - b At the “Print server:” prompt, type in the name of your print server.

To select from a list of print servers, press <Enter>. If no print servers are in that context, PCONSOLE will select a name based on your current context.
  - c Press <Insert>; then enter the name “PS\_1”.
  - d Select “New printer:” and enter “PR\_FAR”.
  - e Select “New print queue:” and enter “Q\_FAR”.

This is the name that users will see when choosing a print queue.
  - f Press <F10> to save the changes.

---

**NOTE:**

---

If you accept the default names for the printing objects, you need only to press <F10>. To select a different volume, press <Insert> to browse for a volume to hold the print queue. Change the names and printer configuration as you wish.

- 6 Use Quick Setup to add PR\_Near and Q\_Near.
  - a Select the “Quick Setup” option.
  - b Select print server PS\_1.
  - c Select “New printer:” and enter “PR\_NEAR”.
  - d Select “New print queue:” and enter “Q\_NEAR”.
  - e Select the “Location” field; then select “Manual Load.”
  - f Press <Esc>; then select “Yes” to save the changes.
- 7 Press <F10> to save the changes.

You are finished using PCONSOLE for now.
- 8 Press <Esc> until you get a confirmation box; then select “Yes” to get to the workstation command line.
- 9 At the NetWare Services server, load (or start) the print server.

You can start the print server using pconsole located on the client.
- 10 (Conditional) If you are running NPRINTER on a workstation, load port driver NPRINTER.EXE or nprinter daemon.

To load NPRINTER.EXE on a DOS, Windows, Win 95 or NT station, type

## Managing Print Services with PCONSOLE

### Overview

```
NPRINTER printservername printernumber
```

For example, the following command connects printer PR\_NEAR to the print server, since PR\_NEAR was assigned the number 1 as the print number:

```
NPRINTER PS_1 1
```

To start the nprinter daemon on HP-UX, run the *pserver* and *nprinter* commands from the client system.

After the NetWare port driver is loaded, workstations can send print jobs to the printer.

---

**NOTE:**

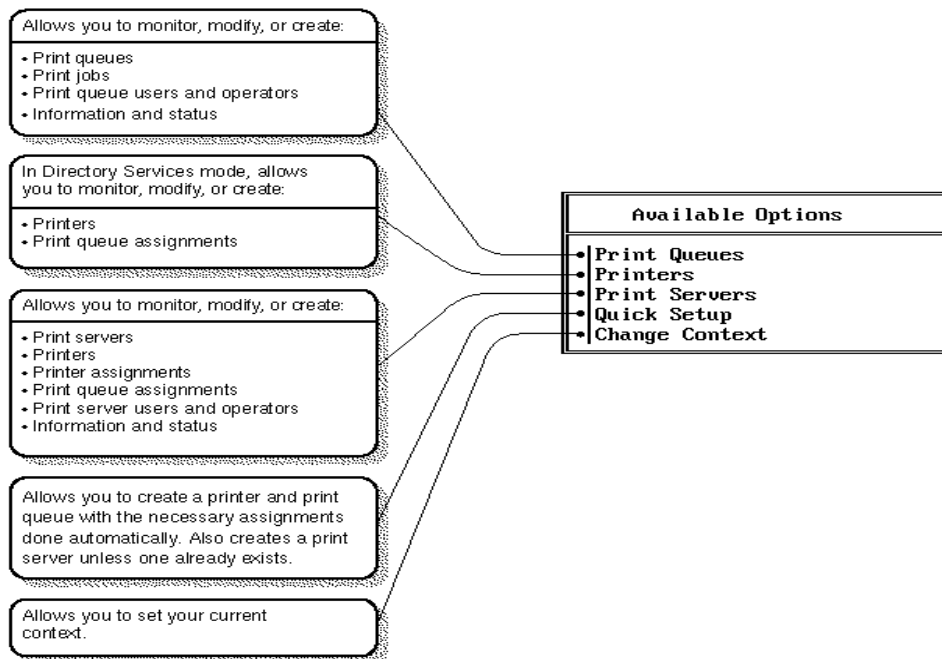
---

Each printer that is attached to a workstation requires a network port driver (NPRINTER.EXE).

---

## Printing Tasks Handled through PCONSOLE

The following figure lists the administrative tasks you can perform with PCONSOLE.



**Figure 3-1** PCONSOLE Tasks

---

**NOTE:** You must be running in Directory Services mode to make use of the full functionality of PCONSOLE.

---

Managing Print Services with PCONSOLE  
 Printing Tasks Handled through PCONSOLE

**Table 3-1**                      **Navigation Procedures for Common PCONSOLE Tasks**

Task	Procedure
Audit printing	See “Adding, Changing, and Removing Print Server Passwords.”
Change your printer type	See “Changing Printer Type.”
Create a print queue, printer, and print queue with all of the necessary assignments done automatically	See “Using Quick Setup in PCONSOLE.”
Create or modify a print queue	See “Print Queue Options.”
Create or configure a printer	See “Creating or Modifying Printers.”
Create or modify a print server	See “Creating or Modifying Print Servers.”
Create, modify, or view print jobs	“Creating or Manipulating Print Jobs”
Print a file already formatted for the printer (ASCII or otherwise)	<ol style="list-style-type: none"> <li><b>1</b> From PCONSOLE’s “Available Options” menu, choose a print queue under “Print Queues,” and then choose the “Print Jobs” option.</li> <li><b>2</b> Press &lt;Insert&gt; and follow the instructions in the information lines.</li> <li><b>3</b> When you are finished with the screen “New Print Job to be Submitted,” press &lt;F10&gt; or &lt;Escape&gt; and choose “Yes” to save changes and print.</li> </ol>
View printer status	See “Viewing or Modifying a Printer’s Status.”
View print server status	See “Viewing a Print Server’s Status.”



## Modifying NetWare Print Services

After you have created your initial printing setup with Quick Setup, you will undoubtedly want to expand or modify that setup as your printing needs change.

### Creating or Modifying Print Queues

This section describes how to use PCONSOLE to create or modify print queues.

#### Procedure

- 1 From PCONSOLE's main menu, select "Print Queues."

A list of print queues appears.

- a To add a queue, press <Insert>. To change a name, highlight the name; then press <F3>.
- b To delete a queue, highlight the queue and press <Del>.
- c To (re)configure a queue, select the desired queue name.

Changes can be made to users, operators, and print servers for the selected queue.

Keep in mind that queue users can submit jobs to that queue (via CAPTURE and NPRINT). Operators can manipulate all queue jobs.

Adding print server names to the list of "Print Servers" will authorize the servicing of remote print queues.

### Creating or Modifying Printers

The following procedures explain how to use PCONSOLE to create a printer and match NetWare to your hardware configuration.

#### Procedure

- 1 From PCONSOLE's main menu select the "Printers" option.

## Managing Print Services with PCONSOLE

### Modifying NetWare Print Services

The “Printers” list box appears.

- a To add a printer, press <Insert>.
- b To delete a printer, press <Del>.
- c To change a name, highlight the name then press <F3>.
- d To (re)configure a printer, select the desired printer name.

The fields most likely to need changes are “Printer Type,” “Configuration,” and “Print Queues Assigned.”

For new printers to work, all three of these fields must be properly set up.

- 2 Select the printer to be configured.

The “Printer Configuration” window appears.

- 3 Select “Printer Type”; then select the type of printer you are using.
- 4 Select “Configuration.”

The window for the printer type you selected appears.

- 5 Complete the configuration fields on the screen.

See “Configuring Printers” for a table explaining each of these fields.

- 6 Press <Esc> and select “Yes” to save your changes.
- 7 To assign a new printer, use PCONSOLE to associate it to a print server
  - a Select the “Print Servers” option on PCONSOLE's main screen.
  - b Select the desired print server name.
  - c Select “Printers”; then press <Insert> and browse to the desired printer.

If the desired printer has not yet been created, press <Insert> to create a new printer.

### Creating or Modifying Print Servers

This section describes the procedure when using PCONSOLE.

#### Procedure

- 1 From PCONSOLE's main menu, select “Print Servers.”

A list of print servers appears.

- a** To add a print server, press <Insert>.
- b** To delete a server, press <Del>.
- c** To change a name, highlight the name; then press <F3>.

Not all print server names will be valid Service Advertising Protocol (SAP) names. For example, SAP names may not exceed 47 characters, they cannot contain spaces, and they must be in all-caps. In addition, many double-byte characters used on certain code pages are not valid SAP characters. For more information, see “Service Advertising Protocol (SAP)” in Concepts.

- d** To (re)configure a print server, select the desired name.

Changes can be made to operators, users, and properties for the selected print server.

- 2** To assign a printer to a print server, use the “Print Servers” option to select the desired print server name; then select “Printers,” press <Insert>, and browse to the desired printer.

Keep in mind that print server users can read that print server's status and active configuration, but only operators can manipulate those items.

## Print Queue Options

### Assigning Queue Operator Flags

By selecting “Status” from the “Print Queue Information” menu, a print queue operator with appropriate rights can set flags that limit access to the selected print queue:

- “Allow users to submit print jobs” allows queue users to submit print jobs to the queue if the option is set to Yes (the default).
- “Allow service by current print servers” allows assigned print servers to service print jobs in the queue if the option is set to Yes (the default).
- “Allow new print servers to attach” allows print servers to attach to the queue if the option is set to Yes (the default).

### Creating or Manipulating Print Jobs

NPRINT, CAPTURE, NETUSER, and PCONSOLE can be used to create print jobs. Print jobs also may be manipulated using PCONSOLE and NETUSER. The following procedure can be used with PCONSOLE.

#### Procedure

- 1 From PCONSOLE’s “Available Options” menu, select “Print Queues.”
- 2 Select the queue in which the job resides or is to be submitted; then select “Print Jobs.”

This brings up a screen which lists the print jobs in the queue.

- 3 To submit a file for printing from this screen,
  - a Press <Insert>.
  - b Enter the directory path to the desired file (or press <Insert> again to browse).
  - c Select the desired file and press <Enter>.

The “Print Job Information” screen appears.

- d Modify the configuration parameters as desired. Then press <Esc>.

See Table 3-2, “Print Job Parameters in PCONSOLE,” for information on each of these parameters.

- 4 To change an existing print job’s configuration from the “Print Jobs” screen, select the job and alter its configuration parameters as desired.

See Table 3-2, “Print Job Parameters in PCONSOLE,” for information on each of these parameters.

- 5 To delete a print job from the “Print Jobs” list, press <Del>.

### Setting Print Job Parameters

You can change or set the following parameters for print jobs. Many of these parameters are also command line options for NPRINT and CAPTURE.

**Table 3-2 Print Job Parameters in PCONSOLE**

Parameter	Description
Print job	The ID number of the job to be printed.
Client	The name and station number of the object that submitted or is submitting the job.
Description	You can enter a description of the file you are printing for identification purposes. The default is the filename.
Status	The status of the print job.
User hold	You can put your print job on hold. If you do, the file is not printed until you remove the hold. The “User Hold” parameter can be changed by either the owner of the print job (the person who submitted it) or a print queue operator.  Type “Y” (for “Yes”) to place a hold on the job; type “N” (for “No”) to remove the “User Hold” parameter.
Operator hold	The “Operator Hold” parameter can be changed only by a print queue operator. If the “Operator Hold” parameter is set to “Yes,” the job is not printed until the operator resets the parameter to “No.”
Service sequence	If you are a print queue operator, you can change the “Service sequence” parameter. The service sequence is the position of the print job in the print queue.

Managing Print Services with PCONSOLE  
**Print Queue Options**

**Table 3-2 Print Job Parameters in PCONSOLE**

<b>Parameter</b>	<b>Description</b>
Number of copies	You can choose the number of copies you want printed.
File contents	<p>You can choose either “Text” or “Byte stream” (the default).</p> <p>Choose “Text” when you want tabs to be converted to spaces. Also choose “Text” to print ASCII text.</p> <p>Choose “Byte stream” if you are printing from within an application and you want the application to handle the formatting commands. Also choose “Byte stream” if you will be downloading fonts on a laser printer.</p>
Tab size	If you chose “Text” (from the “File Contents” menu), use the Tab Size” field to specify the number of spaces you want the tabs in your file set to. Default is 8 spaces.
Form feed	<p>If you want the printer to advance to the top of the next page after your print job, choose “Yes.” If you don’t want the printer to advance to the top of the next page, choose “No.”</p> <p>Some applications have a form feed at the end of the file, so adding another causes an extra blank page to be fed through.</p>
Notify when done	If you select “Yes,” you will receive a screen message telling you when the job has printed.
Form	You can choose the form number or form name you want the job printed on. (Form names are defined in PRINTDEF.)
Print banner	If you want a banner page printed before the file, choose “Yes.” If not, choose “No.” Default is Yes.
Name	If you choose to print a banner page, you can enter text up to 12 characters long in the “Name” field. It is printed in the first large print area of the banner. The default is your username.
Banner name	The default is the filename of the print job, but it can be another name you specify.
Defer printing	If you want the job to be printed as soon as possible, choose “No.” If you want to print the job later, choose “Yes.” If you choose “Yes,” you can enter a target date and time for printing. (See the following explanations for “Target date” and “Target time”)

**Table 3-2**                      **Print Job Parameters in PCONSOLE**

<b>Parameter</b>	<b>Description</b>
Target date	Enter the date you want your job printed on. (You can set this option only if you chose “Yes” for “Defer Printing.”)
Target time	Set the time at which you want your job printed. (You can set this option only if you chose “Yes” for “Defer Printing.”)  The job entry date and time, print job number, file size, and client name cannot be changed.

---

**NOTE:** If extra (blank) pages are coming out at the end of print jobs, the extra form feed should have been suppressed for those jobs. If the final page of a job requires a form feed to be pressed at the printer or is tacked on to the start of the next job, the form feed should have been specified in the job configuration.

---

A job will not start until any defer date and time have been satisfied and any operator and user holds have been removed. The owner of a job can set and remove a user hold, but only a queue operator can set or remove an operator hold.

---

## Printer Options

### Configuring Printers

The following table lists the parameters for configuring a printer from PCONSOLE.

**Table 3-3** Printer Configuration Parameters in PCONSOLE

Parameter	Options	Description
Print server		The print server the printer is assigned to. If no print server is assigned, the field will say "(None)".
Printer number		The logical number assigned to the printer (0-254).
Printer status		Indicates whether the printer is printing, paused, stopped, or waiting for a job.
?Printer type	Parallel, Serial, UNIX, AppleTalk, Other/Unknown, XNP, or AIO	You must select one of the listed types of printers. When the "Other/Unknown" option is used, the print server is provided with information about the printer when you run NPRINT. This allows you to set up a printing slot for a printer without specifying which port the printer is attached to.



**Table 3-3 Printer Configuration Parameters in PCONSOLE**

<b>Parameter</b>	<b>Options</b>	<b>Description</b>
Configuration	The options shown below are for parallel printers. For information pertaining to other printer types, use Help.	This option takes you to a screen listing configuration options for the type of printer you have selected. For example, the configuration options for a parallel printer are listed here. Options for other printer types are available in online Help.
	Port	LPT1, LPT2, LPT3. This specifies the port to which the parallel printer is cabled (workstation or server). Default is LPT1.
	Location	“Manual Load” (remote) or “Auto Load (Local).” Only printers cabled directly to the print server can autoloading. The default is “Manual Load (Local).”  Note: This field is not used by the nprinter daemon.
	Interrupt	Lists available interrupt settings along with “None (polled mode).” Most devices in the computer are configured to use a particular interrupt. You should have recorded the interrupts your printing ports use. Polled mode eliminates the potential for interrupt conflicts and is the recommended option.
	Address restriction	If you have selected the “Manual Load” option, allows you to set address restrictions for a remote printer so that it can be loaded only on a specified workstation or network. Default is No.
	Network address	Lists the address of the network the printer can be loaded on. Default is all.
	Node address	Lists the address of the workstation or server (node) the printer can be loaded on. Default is all.

Managing Print Services with PCONSOLE  
Printer Options

**Table 3-3 Printer Configuration Parameters in PCONSOLE**

Parameter	Options	Description
Starting form	0-254	Indicates the form that the printer will use most often.
Buffer size in KB	3KB-20KB	Indicates the size of the buffer to be used with this printer. The buffer size directly affects the amount of memory used by NPRINT and PSERVER. The default is 3KB. Range is 3KB through 20KB.
Banner type	Text or PostScript	Indicates the mode to be used for printing banner pages. The mode specified must match the default mode for your printer type.
Service mode for forms	Change forms as needed, Minimize form changes within print queues, Service only currently mounted form, Minimize form changes across print queues	Determines the mode in which multiple print jobs in a queue will be serviced by the printer based on their forms.
Sampling interval	Default: 5 seconds	Specifies the interval, in seconds, at which the print server will look for print jobs in the print queue. Values from 1 to 255 are allowed.
Print queues assigned	NA	Lists the print queues currently assigned to be serviced by the printer. To assign a queue to this printer, highlight this field and press <Enter>.
Notification	NA	Indicates the printing objects (including users) to be notified in case of printer problems.

### Viewing or Modifying a Printer's Status

You must be an operator or user of a print server that services a printer to be able to see the printer's status.

Use the following procedure to view a printer's status.

### Procedure

- 1 From the “Available Options” menu, select “Printers.”

The “Printers” window appears with a list of active printers.

- 2 Select the desired printer from the list.

The “Printer <name> Configuration” window appears.

- 3 Choose “Printer Status: (See Form).”

A “Status” window appears showing the various status elements for printers.

- 4 Modify the printer’s status as needed.

Here are the status fields shown in the “Status” window:

- “Status” shows the current status of this port driver and printer. Possible statuses include the following:

Not connected  
Waiting for form  
Out of paper  
Printing job  
Paused  
Stopped  
Off-line  
Private  
Waiting for job  
Running  
Ready to go down

---

**NOTE:**

The port driver (NPRINTER) status for a defined but unattached serial printer is “Waiting for job” even though the printer is not attached, and the printer status is “Running.” If a print job is put into the queue for this printer, the port driver status changes to “Printing job” but the printer status changes to “Offline.”

---

Defined but unattached parallel printers show a status of “Not connected.”

- “Printer control” introduces a window with the following options:
  - “Pause printer” places the current print job on hold. Only a print queue operator can perform this action. The printer will remain idle until it receives a “Start printer” command.
  - “Stop printer” stops the printer and returns the print job to the print queue.

## Managing Print Services with PCONSOLE

### Printer Options

The printer will remain idle until it receives a “Start printer” command.

- “Start printer” changes the status of this print job from “On hold” to “Active,” which will start printing again if the correct form is mounted and the printer is active.
- “Form feed” causes the printer to advance to the top of the next page.
- “Mark top of form” causes a line of asterisks (\*) to be printed across the page. This option is useful when you are trying to align the page on a printer.
- “Abort print job” allows you to cancel this print job and immediately stop printing.
- “Rewind printer” pauses the printer and sets the print job to start printing at the beginning after you start the printer.
- “Service mode” determines how forms needed for print jobs affect the order in which the print server processes those jobs. Selecting this field displays the list of modes from which you can select.

Printer forms include information about the length and width of different types of paper used in your printer. You can designate printer forms to prevent your print jobs from printing on the wrong paper. The print server operator is notified when a form change is needed. Printer forms are configured in PRINTDEF.

When a print job requests a printer form other than the form currently mounted in the printer, the print server does not service the job until a print server operator reports that the new form is mounted. A print server operator can use PCONSOLE, PSC, or NetWare Administrator to mount the new form.

The following service mode options determine how often the print server requires you to change printer forms:

- “Change forms as needed”

The priority of each print queue and the order of print jobs in the print queue determine which print job to service next. You might have to change forms often.

- “Minimize form changes within print queues”

The print server requires you to mount a new form for a print job before servicing print jobs with the currently mounted form in a print queue with a lower priority.

- “Minimize form changes across print queues”

The print server services all print jobs requiring the currently mounted form before requesting a form change. Print jobs in lower priority print queues that require the mounted form are serviced before print jobs in a high priority print queue that require a different form.

- “Service only currently mounted form”

The print server never requests a form change. If no print job requiring the current form is available, nothing is printed.

- “Mounted form” shows the number of the form that is currently mounted in the printer. Only print jobs that specify this printer form number can be printed until a new printer form is mounted with the “Mount Form” button.

The remaining fields include information about the print job currently being printed on this printer. Most of this information can only be changed by going to the print queue and selecting this print job from the list of jobs.

- “NetWare server” indicates the server on which the print queue holding the job resides.
- “Print queue” indicates the print queue from which this print job is being serviced.
- “Description” indicates the name of the file being printed unless a different name was assigned to the job.
- “Print job number” is the print job ID.
- “Form” shows which printer form this print job is using. This print job cannot be printed unless this Form matches the “Mounted Form” field above the “Current Job Information.”
- “Copies requested” indicates the number of copies of this print job that the User who submitted it requested to be printed.
- “Finished” indicates how many bytes of this copy have been printed.
- “Size of one copy” indicates the size of each copy of this print job.
- “Percent complete” indicates how much of this print job is completed, which is determined both by the size of one copy and the number of copies requested for this print job.

## Changing Printer Type

You must be an operator or user of a print server that services a printer to be able to change the type of printer you are using.

### Procedure

- 1 From the “Available Options” menu, select “Printers.”  
The “Printers” window appears with a list of active printers.
- 2 Select the desired printer from the list.  
The “Printer <name> Configuration” window appears.
- 3 Choose “Printer Type.”  
A window appears showing the connection types available.
- 4 Choose the correct printer type from the connection types listed.  
For printers that attach directly to the network, see the network configuration documentation for your printer. (For example, HP IIIsi or 4si, COMPAQ PageMarq 20, GENICOM 7170, or Talaris 1794 Printstation.)
- 5 Modify the configuration for the type of printer you have selected.  
See “Configuring Printers” for information on parameters for parallel printers. For detailed information on other printer types, use Help.

## Assigning Multiple Print Queues and Printers

This section explains how to assign multiple print queues and printers on NetWare Directory Services™ servers. You can use PCONSOLE to do the following:

- Assign multiple print queues to service a single printer
- Assign a single print queue to service multiple printers
- Assign multiple print queues to service multiple printers
- Assign printers to service print servers in available containers

### Procedure

- 1 From the “Available Options” menu, select “Printers.”  
The “Printers” window appears with a list of active printers.
- 2 Select the first printer you want a queue assigned to, highlight “Print queues

assigned,” and press <Enter>.

A list of print queues currently assigned to this printer appears.

- To assign a print queue not appearing on this list to the printer, press <Ins> to browse, and select a print queue. Repeat for each print queue you want to assign to this printer.
  - You can also choose another printer and assign the same print queues to it, if you wish.
- 3 To assign a printer to a print server, choose a print server under “Print Servers,” highlight “Printers,” and press <Enter>.

A list of printers currently assigned to this print server appears. Press <Insert> to browse and select a printer from available container objects.

---

**NOTE:**

---

You will need to unload and then load the print server before the printer configurations you have just assigned will take effect. See “Using the PSERVER Daemon.”

### Mounting Printer Forms

Printer forms can be designated in an effort to prevent your printer from printing a print job on the wrong paper. When the print server detects a print job in the queue, and that print job calls for a form different from the one currently mounted in the intended printer, the print job will not be serviced until a new form is mounted. Each printer form has a unique name and number.

Mounting a printer form consists of two elements:

- Changing the paper. NetWare has no way of determining whether the paper was actually changed or not. It relies on information it receives from the operator.
- Mounting the form through the software. This is the information that NetWare receives from the operator and that is required in order for printing to continue.

To mount a printer form, you need to meet the following prerequisites.

## Managing Print Services with PCONSOLE

### Printer Options

#### Prerequisites

- The print server must be loaded and accessible.
- The printer must be installed and assigned to the print server.
- A queue must be created and assigned to the printer.
- At least one print form must have been created.

For information on creating printer forms with PRINTDEF, see “Creating or Modifying Printer Forms.”

For information on creating printer forms with NetWare Administrator, see “Creating Printer Forms.”

To mount a printer form with PCONSOLE, use the following procedure.

#### Procedure

- 1 Enter PCONSOLE and choose a specific printer from the “Printers” option of the “Available Options” menu.
- 2 Highlight the “Printer status” field and press <Enter>.
- 3 Highlight the “Mounted form” field in the printer information screen and type the number of the form you wish the printer to service. Then press <Enter>.

Print jobs using that form in the print queue will now print.

Printer forms also can be mounted in NetWare Administrator, at the print server console, and from the command line using PSC. Procedures for each method are described in Chapter 8, “Working with Print Device Definitions and Printer Forms.”



## Print Server Options

### Viewing a Print Server's Status

To determine the status of a print server, use the following procedure.

#### Procedure

- 1 From the "Available Options" menu, select "Print Servers."

The "Print Servers" window appears.

- 2 Select the print server you want information about.

- 3 At the "Print Server Information" window, select "Information and Status."

The "Information and Status" window gives you information on the following:

- "Print server type." If it is not running, the type is shown as Unavailable.
- "Print server version." The version of this print server.
- "Number of printers." The number of printers that are assigned to this print server.
- "Current server status." Can be one of the following. If the status is "Running," you may select one of the other two options to bring down the print server.

"Running." The print server is currently running.

"Going down after current jobs." The print server finishes any print jobs currently in progress; then it goes down.

"Down." The print server is going down; current print jobs are returned to their print queues.

- "Advertising name." The name the print server uses to advertise itself on the network. The default is the same name as the Print Server object. If you want to change it, the new name must be from 2 through 47 characters in length, including spaces and underscores. It must be different from all other advertising print server names.

### **Changing a Print Queue's Priority**

A print queue's priority determines whether the print server will send print jobs from that print queue to the printer before or after print jobs in other print queues assigned to the printer.

Use the following procedure to assign or modify a print queue's priority.

#### **Procedure**

- 1** From the "Available Options" menu, select "Print Servers."  
A list of active print servers appears.
- 2** Select the print server servicing the queue you want to modify.  
The "Print Server Information" window appears.
- 3** Select "Printers."  
A list of printers assigned to this print server appears.
- 4** Select the printer the queue is assigned to.  
The "Printer name Configuration" form appears.
- 5** Select "Print queues assigned: (See List)."  
The print queue list appears.
- 6** Highlight the queue you want to modify, and press <Enter>.
- 7** From the "Choose Desired Action" window, select "Change the priority of this print queue."
- 8** Delete the current priority number and type in the new priority.

### **Designating a New Default Print Queue**

Use the following procedure to designate a default print queue.

#### **Procedure**

- 1** From the "Available Options" menu, select "Print Servers."  
A list of active print servers appears.
- 2** Select the print server servicing the queue you want to modify.  
The "Print Server Information" window appears.
- 3** Select "Printers."

- 4 From the list, select the printer the queue is assigned to.  
The “Printer name Configuration” form appears.
- 5 Select “Print queues assigned: (See List).”
- 6 Highlight the appropriate queue, and press <Enter>.
- 7 From the “Choose Desired Action” window, select “Make this the default print queue.”

The default print queue will be used for print jobs that specify a printer but do not specify a print queue (for example, with the CAPTURE command).

### **Adding, Changing, and Removing Print Server Passwords**

For added security, you can limit access to your print server by assigning a password to it. Use the following procedure to do this with PCONSOLE.

#### **Procedure**

- 1 From the “Available Options” menu, select “Print Servers.”  
The “Print Servers” window appears.
- 2 Select the print server you want to modify.  
The “Print Server Information” window appears.
- 3 Select “Password.”
- 4 At the prompt, type the new password you want to assign. Then retype it at the confirmation prompt.  
Your new password is now in effect.
- 5 (Optional) To remove a password entirely, press <Enter> at the “Enter new password” prompt and the confirmation prompt.

## Enabling and Viewing the Print Server Auditing Log

The print server auditing log provides information about all jobs that have been printed. Auditing records are retained as ASCII files so that they can be read with any text editor. The log can be viewed in PCONSOLE as well as NetWare Administrator.

```
Printing Log
Printer: CN=printer1.0=Novell

client: CN=Admin.0=Novell
print job: SALES.RPT   job id: 00704001   form: 00000
print queue: MKTNG/CN=RQ2.0=NOVELL

submitted: 3-16-94 4:47:29pm   printed: 3-16-94 4:48:39pm
pages: 00000000   bytes: 00000262   duration: 000 minutes
```

**Figure 4-2** Typical Entry in the Auditing Log

In designing the auditing log, Hewlett-Packard has recognized that companies do accounting in a variety of ways. For this reason, the auditing log provides a basic default format based on ASCII and a fixed record length. Both characteristics are designed to make it as easy as possible to write a customized program to retrieve the information it needs in a format determined by a particular company.

The auditing log is sufficiently flexible to record whatever information a printer sends to it. Regardless of printer type, the log will record how many bytes a job took to print, the user who submitted the job, when the job entered the print queue, when the job was printed, and what printer serviced the job.

If the printer is an XNP type used by Macintosh or UNIX, the log might also indicate how long it took to print the job, how many pages were printed, when the job was printed, and when the job was submitted.

To enable the auditing log from PCONSOLE, use the following procedure.

### Procedure

- 1 From the “Available Options” menu, select “Print Servers” and select a print server.

The “Print Server Information” screen appears.

- 2 Select “Audit.”

At the “Print Services Auditing” menu, the following options are available:

- Configuration
- View Auditing Log
- Delete Auditing Log

- 3 Select “Configuration.”

The “Auditing Information” screen appears.

- 4 Specify “Yes” in the “Enable auditing” field.

If you enable auditing, the print server maintains a log of the operations it performs. If the print server is already running, it needs to be brought down and loaded again for this change to take effect.

If you do not enable auditing, the print server will not write to the log. If the print server is already running, it needs to be brought down and loaded again for this change to take effect.

If the auditing log file becomes full, either by using all available disk space or by reaching the size limit set with the “Limit Size” option, the print server ceases storing auditing information. To avoid losing valuable accounting information, process or archive the information and delete the auditing log file on a regular basis.

- 5 Specify whether you want to “Limit size of log file.”

If you select Yes, a field appears for the maximum size (in kilobytes) that the auditing log file can reach before the print server stops appending auditing information. In this field, you should specify the maximum size (in kilobytes)

## Managing Print Services with PCONSOLE

### Enabling and Viewing the Print Server Auditing Log

that the auditing log file can reach before the print server stops appending auditing information. Without this limit it is possible for the file to grow until all available disk space is used.

- 6 After auditing has been enabled, unload and then reload the print server.
- 7 (Optional) Submit a print job to ensure that the log is recording information on print jobs properly.
- 8 To view the Auditing Log, select “View Auditing Log” from the “Print Services Auditing” menu.
- 9 To delete the Auditing Log, select “Delete Auditing Log” from the “Print Services Auditing” menu.

### Unloading Print Servers

A print server can be created in PCONSOLE, but it must be started at the NetWare Services server. However, an active (Status: Running) print server can be downed, or unloaded, from PCONSOLE with the following procedure.

If the “Unload” option is not activated, the print server may not be running. If it is running, you are not designated as an operator for that print server. In order to proceed, a designated print server operator must be logged in to the workstation you are using.

#### Procedure

- 1 From the “Available Options” menu, select “Print Servers.”  
A list of available print servers is displayed.
- 2 Select the name of the print server you want to unload.  
The “Print Server Information” menu is displayed.
- 3 Select “Information and Status.”  
The “Current server status:” field should indicate that the print server is “Running.” If it is not, you cannot unload it.
- 4 Select the “Running” status field.
- 5 Do one of the following:
  - Select “Going down after current print jobs” if you want a print job already being printed to be completed before the print server goes down.

Managing Print Services with PCONSOLE  
**Enabling and Viewing the Print Server Auditing Log**

Other jobs in the queue will remain in the queue until the print server is reloaded or they are manually deleted.

- Select “Down” if you want the print server to go down immediately.

Any jobs in the queue will remain in the queue until the print server is reloaded or they are manually deleted.

## Using PCONSOLE in Bindery Mode

You can add a NetWare Services server and NetWare Services clients to your network and still retain your existing NetWare 3x PSERVER.EXE and NetWare 3x environment.

- If you use PCONSOLE from NetWare Services and use bindery mode, you define objects that a bindery-based print server knows how to access for configuration information upon loading.
- If you use the Directory Services mode to configure the information, you define objects that a Directory Services-based print server knows how to access for configuration information when loading.

To change between Directory Services and bindery modes, press <F4> at the “Available Options” menu. The last menu option in bindery mode changes to “Change Current NetWare Server” from “Change Context.”

## Using Quick Setup to Create Bindery Printing Objects

The “Quick Setup” option can be used to create printing objects in bindery mode as well as Directory Services mode. For instructions on setting up network printing in Directory Services mode with this option, see “Using Quick Setup in PCONSOLE” in this chapter.

When you use “Quick Setup” in bindery mode, you can attach to a bindery-based server or get a bindery attachment to a NetWare Services server. Either way, you get the following items created and tied together:

- A print server created in SYS:SYSTEM directory of the current server, with a hexadecimal directory (such as SYS:SYSTEM\FA010002), that contains the following four hidden files:
  - PRINT.000 (printer configuration information)
  - DESCRIPT (description information)
  - NOTIFY.000 (Notify list)
  - QUEUE.000 (queue serviced by printer information)
- A printer created in the print server subdirectory (such as, the PRINT.000 file in



SYS:SYSTEM\FA010002) (Non-D.S. object).

- A queue created in SYS:SYSTEM directory of the current server, with a hexadecimal directory (such as, SYS:SYSTEM\7701000F.QDR), that has two “Hidden” files in it. In the example above, the files would be named Q\_0177.SRV and Q\_0177.SYS.

Use Bindery mode on a NetWare Services server if you want to load a bindery-based print server (such as pserver on a NetWare 3x file server) that is servicing queues on a NetWare Services server. This means the NetWare 3x pserver or other bindery based print server has to access the queue and the notification information on each server that it is servicing queues from.

If you need to load pserver on a NetWare Services server, use only the Directory Services mode when defining printing objects.

See “Using Quick Setup in PCONSOLE” for instructions on using this Quick Setup feature.

---

**NOTE:**

If you use bindery mode to configure the print server, printer, and queue (such as with Quick Setup), and then try to view the printer information in Directory Services mode, you will not see the printer because no Directory Services Printer object was created. You must switch PCONSOLE into the mode in which the Printer object was created in order to view or manage that object.

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Managing Print Services with PCONSOLE  
Using PCONSOLE in Bindery Mode

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**Sending Jobs to Network Printers  
Using CAPTURE and NPRINT**

## Overview

Many applications are designed for network printing. For example, WordPerfect® submits print jobs directly to the print queue. Because you can specify the number of copies, a banner page, and so forth from inside such applications, you do not need specialized NetWare® utilities to send network print jobs. Such applications usually supply the necessary print driver (control sequences, functions, etc.) and include it with each network print job.

However, there are many applications that are not designed for network printing. CAPTURE is a command line utility that allows NetWare clients (such as DOS clients) to print from applications not designed for NetWare print services. It sets up redirection parameters for printing output from your workstation; the NetWare DOS Requester™ then redirects the workstation output from an LPT port to the specified network printer or file.

The primary function of NPRINT is to print files from outside an application.

## Using CAPTURE

### Printing Tasks Handled through CAPTURE

You can use CAPTURE to perform the following tasks:

- Set flags to redirect DOS print jobs to a network printer (or file) from an application designed to print to workstation parallel (LPT) ports.

---

**NOTE:**

In order to redirect print jobs from a default parallel (LPT) port to a serial (COM) port, you must use the MODE command in DOS. CAPTURE cannot be used to redirect jobs to a serial port.

- Redirect print screen text to a network printer or file.

### Command Syntax

The following example represents a typical CAPTURE command:

```
CAPTURE [P=printername | Q=queueName] [L=1 or LPT1] [options]
```

For example, to redirect the LPT1 port to printer P\_1 with no banner or form feed, type

```
CAPTURE P=P_1 L=1 NB NFF
```

If you are using a print job configuration, you do not need to specify other options except to override options in your job configuration:

```
CAPTURE J=JOB1
```

Material sent to the LPT1 port (for example, print screens or DOS piping.) will now print at printer P1. To end the capture, type

```
CAPTURE L=1 EC
```

Sending Jobs to Network Printers Using CAPTURE and NPRINT  
Using CAPTURE

**Table 4-1**                      **Syntax for Common CAPTURE Tasks**

Task	Syntax
Capture to network printer P1.	CAPTURE P=P1 <Enter>
Capture to print queue Q1.	CAPTURE Q=Q1 <Enter>
End a capture.	CAPTURE EC <Enter>
Hold the print job in the queue.	CAPTURE HOLD <Enter>
List the printing parameters for the job to be printed.	CAPTURE D <Enter>
Redirect printer output to a file.	CAPTURE CR=filename <Enter>
Redirect printer output to a printer.	CAPTURE P=printername <Enter>
Use print job configuration “Charts.”	CAPTURE J=CHARTS <Enter>
View online help.	CAPTURE /? <Enter>
View all online help screens.	CAPTURE /? ALL <Enter>
View help for the “Banner” option.	CAPTURE /? B <Enter>
View current capture settings.	CAPTURE SH <Enter>

### Command Parameters

Replace option with one or more of the following. The options help you define how a job is printed. Separate options with a space or forward slash (/) Options are not case-sensitive.

**Table 4-2 CAPTURE Options**

Option	Syntax	Description
All	ALL	When used with the End Capture (EC) option, it ends the capture of all LPT ports. Used with the /? option, it displays all online help screens.
Autoendcap (End capture automatically)	AU	Specifies that the captured data be closed and sent to the printer when you exit an application.  Default: Autoendcap enabled
Banner	B=text	Indicates what will appear in the lower half of the banner page. Limit is 12 characters. Replace text with any word or phrase up to 12 characters long. To allow spaces in a banner name, enclose the name in quotation marks (for example, "ON THE GO")  Default: The captured port (for example, LPT1)
Cancel	CA	Used in conjunction with the EC option. Ends the capture of data to LPT ports and discards the data that was being captured.
Cancel and end capture	ECCA	Ends the capture of data to LPT ports and discards the data that was being captured. If the CReate (CR=) option was used in the original Capture statement, the file is closed but not discarded.
Copies	C=number (1-65,000)	Specifies the number of copies. CAPTURE allows up to 65,000 copies in NetWare Services™ software. Default is 1 copy.
Create (not available in OS/2)	CR=path and filename	Creates a file in which to store printed data. This option can be used only with the TI=, AU, or NA options.

Sending Jobs to Network Printers Using CAPTURE and NPRINT  
Using CAPTURE

**Table 4-2**                    **CAPTURE Options**

Option	Syntax	Description
Details	D	Lists the printing parameters for a capture. It also indicates whether a print job configuration was used.
End capture	EC	<p>Ends the capture of data to an LPT port. When used in conjunction with the L=number option, it ends the capture to the port number specified. When used without the L=number option, it defaults to the LPT1 port. When used with the ALL option, it ends the capture for all LPT ports. If data was being captured to a network file, the file is closed.</p> <p>The CA option can be used with this option to end the capture of data to LPT ports and discard the data that was being captured.</p> <p>Running CAPTURE again will end the current capture and assign new values.</p>
Form	F=name or number	Specifies the form that the printer will use. (You must define forms using PRINTDEF or NetWare Administrator before users can use form names or numbers.) With an invalid name or number, CAPTURE gives a warning message.
Form feed	FF	<p>Enables form feed after your print job has been printed. "FormFeed enabled" means that the printer starts printing the next job at the top of the next sheet of paper. However, if an application automatically enables form feed at the end of a file, adding this option causes an extra blank page to be fed through.</p> <p>Default: FormFeed enabled</p>
Help	/? or /H	Displays general help information. Specific options are displayed for certain utilities on the initial help screen.
Hold	HOLD	Allows you to send a print job to a queue without having it print. To release the hold on the job, you can use either PCONSOLE or NetWare Administrator.



**Table 4-2**                      **CAPTURE Options**

Option	Syntax	Description
Job configuration	J=name	<p>Indicates the print job configuration to use; does not require other options except to override print job configuration options. If no job configuration is specified and a default job configuration exists, it will be used. (Use the “Details” option to see what job configuration is being used.)</p> <p>If no default print job is used, you will need to specify either a printer or queue in the command line.</p> <p>You can also use this option to specify the context in which to look for a print job configuration if it is outside the current search path by identifying the container or user owning the configuration. (See “Printing with Print Job Configurations in a Different Context.”))</p>
Keep	K	<p>Ensures that the NetWare server keeps all data it receives from your workstation if your workstation hangs or loses power while you are capturing data to the server. When the server notices your workstation is no longer connected, it sends the data it received from your workstation to a print queue for printing. Use this option if you plan to capture data over several hours.</p> <p>If you do not include the “Keep” option and your workstation hangs while sending data to the captured port, the NetWare server discards the data it has received.</p>
LPT port	L=number (1-9) or LPT<number>	<p>Indicates the local LPT port you want captured. You can set network printers in your NET.CFG file by using the command NETWORK PRINTERS=number (1-9).</p> <p>You can specify LPTn instead of L=n.</p>
Name	NAM=text	<p>Indicates what will appear in the upper half of the banner page. Limit = 12 characters.</p> <p>Default: The username you used to log in</p>

Sending Jobs to Network Printers Using CAPTURE and NPRINT  
Using CAPTURE

**Table 4-2**                      **CAPTURE Options**

Option	Syntax	Description
No autoendcap (Continue capture)	NA	Specifies that the captured data not be closed and sent to the printer when you exit an application. This allows more information to be added to the print job.  When this option is used, the capture will not close unless you also specify TI= in the command. Otherwise, you must issue an EC command to close the capture.
No banner	NB	Suppresses banner page.
No form feed	NFF	Suppresses form feed at the end of a print job.
No notify	NNOTI	Specifies that the user not get a message after the print job prints. Do not confuse this option with the notification option in PCONSOLE that informs designated users when the printer is having problems.  Default: NoNOTIfy enabled
No tabs	NT	Specifies that tabs are not converted to spaces in a print job. This is also called "byte stream." This option ensures that all the tab characters in your print job arrive at the printer unchanged. Use this option for most network printing situations, especially when printing graphics. Default is NT (byte stream).
Notify	NOTI	Specifies that the user get a message after the print job prints. This option does not notify you if the printer has a problem or if your job cannot be printed.
Printer	P=name	Indicates to which printer the print job should be sent; you may set a default in a print job configuration. Do not use this option with the Q= option.
Queue	Q=name	Indicates to which print queue the print job should be sent; you may set a default in a print job configuration. Do not use this option with the P= option.
Server	S=name	Specifies the NetWare server if you want the print job sent to a bindery print queue. Not used for Directory Services print queues. Default = current tree or server.

**Table 4-2**                      **CAPTURE Options**

Option	Syntax	Description
Show	SH	Shows the current status of LPT (parallel) ports. Do not use with other options.
Tabs	T=number (1-18)	Specifies the number of spaces to be substituted for each tab in a print job (default=8). Specify NT (No tabs) for byte stream print jobs.
Timeout	TI=number (0-1000)	Specifies the number of seconds to wait after the last data is received before closing the print job.  If your timeout is not long enough, you may have problems printing some files, especially files with graphics. Increase the timeout if only parts of files are being printed or if the files do not print at all.  Default: TI=0 (TImeout disabled)

### Printing to a Network Printer

To print to a network printer from an application that is not designed to run on a network, follow these steps.

#### Procedure

**1** Type

```
CAPTURE P=printername TI=number LPT1
```

**2** Enter your application.

**3** Either open or create the files you want to print.

**4** Print your data using the print keys for your application.

Your application sends the print job to the parallel ports. Before the print job arrives at the port, CAPTURE sets flags that redirects the job to the appropriate queue.

**5** When you have finished printing the files you need, exit the application.

In most applications, printing begins immediately after you send the job.

- If “Autoendcap” (AU) is enabled, your job is queued when you exit the

## Sending Jobs to Network Printers Using CAPTURE and NPRINT Using CAPTURE

application.

- If “Timeout” (TI) is enabled, the job is sent to the print queue in the specified number of seconds.

### Printing Data without Exiting an Application

In most applications, printing begins immediately after you send the job.

- You can use the “Timeout” (TI) option to delay printing for a specified number of seconds without closing the print job and exiting the application.

If your timeout is not long enough, you may have problems printing some files, especially files with graphics. Increase the timeout if only parts of files are being printed or if the files do not print at all. The default is TI=0 (Timeout disabled).

- You can use the “Notify” (NOTI) option if you want to know when your job has been printed. For example, if a default print job configuration is being used, type

```
CAPTURE P=prntername TI=2 NOTI
```

Two seconds after the application last writes to the file, CAPTURE sends your print job to the print queue. A message appears across the bottom of your screen indicating that your job has been printed.

### Printing Data to Different Parallel Ports

Suppose you often use CAPTURE to print from two different applications: AppA and AppB. AppA does not allow you to designate which parallel port to send print jobs to; therefore, its print jobs are sent to LPT1. However, AppB has a SETUP program that allows you to designate a parallel port.

Suppose also that AppA requires a different form than AppB and that you want to put form A (for AppA) in printer P\_1 and form B (for AppB) in printer P\_2.

Use the SETUP program in AppB to send your data through LPT2 to printer P\_2. When you capture data from AppA, type

```
CAPTURE LPT1 P=P_1
```

When you capture data from AppB, type

```
CAPTURE LPT2 P=P_2 <Enter>
```

You can add other options to these commands.

### Printing Screen Displays

To print information displayed on your screen, follow these steps.

#### Procedure

- 1 Before you access the screen you want to print, type  

```
CAPTURE P=printername TI=number LPT1
```

You can include any of the CAPTURE options except SHOW.
- 2 Access the screen you want to print.
- 3 Press <Shift><Print Screen>.

---

**NOTE:**

DOS redirects print jobs to the port. If no printer is attached or port captured, your machine may hang. To prevent this, include the following line in the NET.CFG file on your workstation boot diskette:

```
LOCAL PRINTERS = 0
```

---

### Saving Data from Several Applications or Files to a Single File

Suppose you want to move in and out of applications or files, saving data from each, and store all the data in one file called TEST on a network drive.

Use the “Create” (CR) and the “No autoendcap” (NA) options. Specifying “No autoendcap” allows you to move in and out of applications or files without prematurely closing the file you are creating.

To save data to a file to your current directory, type

```
CAPTURE CR=TEST NA TI=0
```

To save data to a file called TEST that is located in the REPORTS directory, type

```
CAPTURE CR=COUNT_SYS:SALES\REPORTS\TEST NA TI=0
```

To end the capture, type

```
CAPTURE EC
```

## Sending Jobs to Network Printers Using CAPTURE and NPRINT Using CAPTURE

### **Saving Data to a NetWare Server You are Not Attached To**

If you specify a NetWare server you are not attached to in your CAPTURE command, CAPTURE attaches you as user GUEST unless GUEST requires a password. In this case, you are prompted to enter both a username and a password before you continue with the capture.

### **Printing to a Different Directory Services Context**

If you want to print to a printer or print queue in a NetWare Directory Services™ context different from your current context, you can accomplish this in one of the following ways:

- If the printer or print queue you want to use is in a different context from your current context in the Directory tree, you can specify the location of the printer in your CAPTURE or NPRINT command.

Note that the example shows the CAPTURE command. You can do the same thing with NPRINT.

For example:

```
CAPTURE P=.P_1.DALLAS.SWRGN.HP
```

(The period at the beginning indicates that the entire context is being specified.)

To view all container objects in the tree below your current context, type

```
CX /T
```

- Change your context to the one containing the printer or print queue object you want to access. You can use CX to change to the correct context.

To view the names of all printers or print queues in and below the current context, type whichever one of the following commands is applicable:

```
NLIST PRINTER /N /S
```

```
NLIST QUEUE /N /S
```

### **Printing with Print Job Configurations in a Different Context**

Occasionally, you may want to send print jobs using a print job configuration in another context.

In releases prior to NetWare Services, searches for print job configurations were limited to your current context and the context immediately above it in the Directory tree.

A new feature was added to the J= flag in CAPTURE and NPRINT that allows you to use a print job configuration anywhere in your Directory tree, so long as you have the rights to do this.

By using this feature, you can limit your search for the specified job configuration to a specific context or to the owner of the database that contains the configuration.

Note that the examples show only the CAPTURE command. You can do the same thing with NPRINT.

The syntax for this feature is as follows:

```
CAPTURE J=jobname:context
```

For example, to use printer P\_1 to print a document using print job configuration RPT located in container object .DALLAS.SWRGN.HP, your command would be as follows:

```
CAPTURE P=P_1 LPT1 J=RPT: .DALLAS.SWRGN.HP
```

---

**NOTE:**

Placing the period in front of the container name indicates that you are specifying an absolute context path; that is, you are showing the context all the way up to the root. If you want to specify only a relative context path (one that does not go all the way to the root) you should not use the period. For more information, see Introduction to NetWare Directory Services.

You can specify any context anywhere in the tree, so long as you have rights to the context or user you specify.

If you specify a user rather than a context, the command syntax is as follows:

```
CAPTURE J=JOB1:CN=username.SALES.HP
```

If you do not know the job configuration's name, select the "Change Current Object" option from the PRINTCON "Available Options" menu. From the "Enter Object" field, you can press <Insert> to browse the tree. At the context you want, you can view the configurations you have rights to see.

### **Adding CAPTURE to Login Scripts**

You can add a CAPTURE command to the container login script or to a user login script. For example, in the login script, type

## Sending Jobs to Network Printers Using CAPTURE and NPRINT Using CAPTURE

```
#CAPTURE Q=queueName TI=n
```

or

```
#CAPTURE Q=queueName AU
```

You can include any other command options you want. If you include the Timeout or Autoendcap option in the login script, to print a screen display for example, you only need to press <Shift><Print Scrn>.

If you type a CAPTURE command at the DOS prompt, it overrides the command in your login script if you capture the same port.

### Container Login Script

Suppose you want to include a CAPTURE command in the container login script for group SALES so they can use printer P\_0. Add the following lines to the container login script:

```
IF MEMBER OF "SALES" THEN BEGIN  
#CAPTURE P=P_0 options  
END
```

Note that in the above example, if you are using a bindery queue, you would have to add a server name to your parameters (for example, S=SALES-PRINT).

### User Login Script

Suppose a user often prints from a non-network application by using CAPTURE. The user wants to send a file to printer P\_1, which is servicing queue Q\_1. The user wants to print the file without a banner or a form feed and releases this job to the print queue five seconds after the application last writes to the file.

Add the following lines to the user login script:

```
#CAPTURE P=P_1 NB NFF TI=5
```

### Tips on Using CAPTURE

- You do not need to use CAPTURE if you use a NetWare-aware application that is configured to send print jobs to printers or print queues.
- When setting up your Directory structure, keep printers, print job configurations, and users as close together in the tree as possible. CAPTURE is normally a very



## Sending Jobs to Network Printers Using CAPTURE and NPRINT Using CAPTURE

fast utility, but performance slows considerably if it is searching all around the network for objects and databases.

- For optimal performance, use the Q=queue option instead of the P=printer option. If you specify the printer name, CAPTURE will still have to find the queue.
- Use the S=servername option only if you are going out of your current Directory tree, not if you are capturing within your current tree. This option is intended primarily for use with NetWare for UNIX 3™ (bindery) servers.
- If a print job is defined, CAPTURE will use all of the options in that job except those in the command line. The command line options override all other configuration options.
- Default options include a banner page, automatic endcap, one copy, no tabs, and form feed. You can set options by specifying a print job configuration or options at the command line.
- All options function with a preceding forward slash (“/”), but none require it except /VER and /?. No options are needed if a default printer or print queue is specified in a default print job configuration.
- Because CAPTURE settings must be reset each time you reboot your computer, consider placing the command in the system or individual login scripts. See “Login Script Commands and Variables,” in Chapter 3 of *Supervising the Network*.
- NetWare Services allows you to specify the printer name instead of a print queue. You can still capture to print queues.
- CAPTURE only sets up redirection from parallel (LPT) ports; you cannot specify a serial (COM) port in CAPTURE.
- The NET.CFG file now includes a NETWORK PRINTERS=number option. Replace number with the number of printers (logical ports) you would like to capture at the same time (0-9). The default is 3.

For example, if you set

```
NETWORK PRINTERS=9
```

the CAPTURE command can be CAPTURE L=9 even though the physical port doesn't exist.

- If you specify a print job configuration that has a large printer mode, you may need to increase the bytes (default 64, range 0 to 254) in the PRINTER HEADER=number option. See Chapter 2, “NET.CFG Options Reference,” in *NetWare Client for DOS and MS Windows Technical Reference*.

## Using NPRINT

### Printing Tasks Handled through NPRINT

NPRINT is used to send a file to a printer. This would include plain text (ASCII) files such as AUTOEXEC.BAT and any application software output already formatted for a printer.

### Command Syntax

Unlike CAPTURE, where options may be entered in any order, NPRINT requires that the filename be specified immediately after you type “NPRINT” according to the following format:

```
NPRINT filename [P=printername | Q=queue name]
[/option...]
```

For example, to print file JANUARY.RPT in the current directory to printer P\_1 with no banner or form feed, type

```
NPRINT JANUARY.RPT P=P_1 NB NFF
```

Multiple filenames can be entered in the same command by separating them with commas.

```
NPRINT JANUARY.RPT, FEBRUARY.RPT P=P_1 NB NFF
```

**Table 4-3**                      **Syntax for common NPRINT tasks**

Task	Syntax
Print file MARCH.PRJ using print job configuration REPORTS.	NPRINT MARCH.PRJ J=REPORTS <Enter>
Print five copies of file MARCH.PRJ on printer P1 with no banner.	NPRINT MARCH.PRJ P=P1 C=5 NB <Enter>
Print all files beginning with MA with extension .PRJ.	NPRINT MA*.PRJ <Enter>
Hold the print job MARCH.PRJ in the queue.	NPRINT MARCH.PRJ HOLD <Enter>
List the printing parameters for the print job MARCH.PRJ.	NPRINT MARCH.PRJ J=REPORTS D <Enter>
Send file MARCH.PRJ to network printer P1 in the same context.	NPRINT MARCH.PRJ P=P1 <Enter>
Send file MARCH.PRJ to print queue Q1 in the same context.	NPRINT MARCH.PRJ Q=Q1 <Enter>
View online help.	NPRINT /? <Enter>
View all online help screens.	NPRINT /? ALL <Enter>
View specific help for the Banner option.	NPRINT /? B <Enter>
View the version number of this utility	NPRINT /VER <Enter>

### Command Parameters

Replace filename with the name of the file you want to print. Include wildcard characters, drive letters, and directory paths if necessary.

Replace option with any of the options listed in the following table. You do not need to use options if a default print job configuration specifies a printer or print queue.

Sending Jobs to Network Printers Using CAPTURE and NPRINT  
Using NPRINT

**Table 4-4**                      **NPRINT Options**

Option	Syntax	Description
All	ALL	Used after the /? option, it displays all online help screens.
Banner	B=name	Indicates what will appear in the lower half of the banner page. Limit = 12 characters. Replace name with any word or phrase up to 12 characters long. To allow spaces in a banner name, enclose the name in quotation marks (for example, "ON THE GO").  Default: The print job file name
Copies	C=number (1-65,000)	Specifies the number of copies. NPRINT allows up to 65,000 copies. The default is 1.
Delete	DEL	Automatically deletes the file after it is printed. The default is not to delete the file of files.
Details	D	Lists the printing parameters for the job to be printed. It also indicates whether a print job configuration was used.
Form	F=name or number	Specifies the form that the printer will use. (You must define forms using PRINTDEF or NetWare Administrator before users can use form names.) Default: 0.
Form feed	FF	Enables form feed after your print job has been printed. "FormFeed enabled" means that the printer starts printing the next job at the top of the next sheet of paper. However, if an application automatically enables form feed at the end of a file, adding this option causes an extra blank page to be fed through.  Default: FormFeed enabled
Help	/? or /H	Displays context-sensitive online help.
Hold	HOLD	Allows you to send a print job to a queue without having it print. To release the hold on the job, you can use either PCONSOLE or NetWare Administrator.

**Table 4-4**                      **NPRINT Options**

Option	Syntax	Description
Print job configuration	J=name	<p>Indicates the print job configuration to use; does not require other options except to override print job configuration options. If no job configuration is specified and a default job configuration exists, it will be used. (Use the “Details” option to see what job configuration is being used.)</p> <p>If no default print job is used, you will need to specify either a printer or queue in the command line.</p> <p>You can also use this option to specify the context in which to look for a print job configuration if it is outside the current search path by identifying the container or user owning the configuration. (See “Printing with Print Job Configurations in a Different Context” for a discussion of this option as it pertains to CAPTURE, and modify the command syntax accordingly.)</p>
Name	NAM=text	<p>Indicates what will appear in the upper half of the banner page. Limit = 12 characters.</p> <p>Default: The username you used to log in</p>
No banner	NB	Suppresses banner page.
No form feed	NFF	Suppresses form feed at the end of a print job.
No notify	NNOTI	<p>Specifies that the user not get a message after the print job prints. Do not confuse this option with the notification option in PCONSOLE that informs designated users when the printer is having problems.</p> <p>Default: NoNOTIfy enabled</p>
No tabs	NT	<p>Specifies that tabs are not converted to spaces in a print job. This is also called “byte stream.” This option ensures that all the tab characters in your print job arrive at the printer unchanged. Use this option for most network printing situations, especially when printing graphics. Default is NT (byte stream).</p>
Print queue	Q=name	Indicates to which print queue the print job should be sent; you may set a default in a print job configuration.

Sending Jobs to Network Printers Using CAPTURE and NPRINT  
Using NPRINT

**Table 4-4** NPRINT Options

Option	Syntax	Description
Printer	P=name	Indicates to which printer the print job should be sent; you may specify a default in a print job configuration.
Server	S=name	Specifies the NetWare server if you want the print job sent to a bindery print queue. Not used for Directory Services print queues. Default = current tree or server.
Tabs	T=number (1-18)	Specifies the number of spaces to be substituted for each tab in a print job (default=8). Specify NT (No tabs) for byte stream print jobs.
Version	/VER	Displays version information for this utility. Also lists the names and version number of all files required to run this utility.

### Tips on Using NPRINT

- Default options include a banner page, no tabs, and form feed. You can override the default options by specifying options at the command line.
- If you use an application that does not format print jobs for your printer, NetWare supplies 58 printer definitions for printers. Import one of these or create your own using NetWare Administrator or PRINTDEF. Each printer definition contains the functions and modes for the printer.  
  
Printer definitions can only be referenced in print job configurations. To print a non-ASCII file that is not formatted for the printer, NPRINT must use the J=name option to specify the print job configuration that includes the printer definition unless the correct job configuration is the default.
- If you specify a print job configuration that has a large printer mode, you can increase the bytes (default 64, range 0 to 255) in the PRINTER HEADER=number option. See Chapter 2, “NET.CFG Options Reference” in NetWare Client for DOS and MS Windows Technical Reference.
- Options with no filename specified require a preceding forward slash (“/”), including /D, /H, /?, and /VER.
- No options are needed if a default printer or print queue is specified in a default print job configuration.
- NetWare Services now allows you to specify the printer name instead of a print

queue. You can still print to print queues.

- If you print to a print queue on the same NetWare server, an asterisk (instead of a whirligig) will appear with “Please Wait” and will remain until all the data is transferred. For example, 12MB of information may take some time. The whirligig appears if the source file and the destination queue are on different NetWare servers. In this case, the data does not transfer as quickly.

If you have multiple printers assigned to one print queue, the printer and print queue options will not guarantee what printer services your print job. Hewlett-Packard recommends that you have one print queue assigned to each printer unless all the printers are the same.

Sending Jobs to Network Printers Using CAPTURE and NPRINT  
Using NPRINT



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**Setting Up and Servicing Print Servers**

## Overview

A print server is a software program that monitors and manages printers and print queues. In NetWare Services, the print server runs as a daemon called PSERVER. You can create print servers in NetWare Administrator and PCONSOLE, but you can only start the print server at the NetWare Services server.

Once you've started the print server, you must load a port driver for each network printer attached to a workstation. If the printer is attached to a DOS, Windows, load NPRINTER.EXE.

---

**NOTE:**

---

The print server must be started before the NPRINTER software can be loaded. See Chapter 6, "Setting Up Printers Attached to Workstations or Servers."

Third party print devices that connect directly to the network are also available. These products, when operated in either remote printer or queue server mode, provide similar functionality to PSERVER.

## Print Server Features

The following list briefly describes the key features of the print server software available in NetWare Services.

- Support for 255 Printers

The print server in NetWare Services supports up to 255 printers. How effectively it can support a large number of printers depends primarily on the speed of your printers. The faster your printer, the greater the likelihood you will notice that performance has been affected by a large number of printers. For example, network-attached printers running in remote printer mode are usually capable of high printing speeds if the print server is not heavily loaded.

- Configurable Queue Sampling Interval

In NetWare Services, the default queue sampling interval is 5 seconds. As long as there are jobs in the queue, continual queries are made. This interval is configurable for up to 255 seconds, but the lower default setting will increase printer performance in most cases, especially when using a fast printer.

- Address Restrictions for Remote Printers

When you configure a print server, you have the option of putting an address restriction specifying that a printer must run from a specified address (a node address and network segment) in order to connect to the print server. If you retain the unrestricted option (which is the default), the print server will allow the remote printer to connect to it from any address.

- Support for PostScript Banner

You can configure a printer so that PostScript banners will be generated for that printer. When using this option, you must be sure to select a banner type that matches your default printer type.

- Auditing Log

The auditing log provides tighter security and billing information about all jobs that have been printed. It can be read through PCONSOLE.

In designing the auditing log, Hewlett-Packard recognized that companies do accounting in a variety of ways. For this reason, the auditing log provides a basic default format based on ASCII and a fixed record length. Both characteristics are designed to make it as easy as possible to write a customized program to retrieve the information it needs in a format determined by a particular company.

## Setting Up and Servicing Print Servers

### Print Server Features

The auditing log is sufficiently flexible to record whatever information a printer sends to it. Regardless of printer type, the log will record how many bytes a job took to print, the user who submitted the job, when the job entered the print queue, when the job was printed, and what printer serviced the job.

## Requirements

Before completing any tasks in this chapter, you need the following:

- NetWare 4.1/9000 NetWare Services server.
- Printer(s) functioning properly in their current environment. If a printer functions properly in its current environment (non-network or otherwise), it will work with NetWare print services. If your printer is not functioning properly, see Appendix B, “Cabling Printers” or Appendix D, “Troubleshooting Printing Problems.”
- Print server, print queue, and printer that have been created and assigned using one of the following:
  - NetWare Administrator (graphical utility; see Chapter 3, “Managing Print Services with the NetWare Administrator Utility”)
  - PCONSOLE.EXE (text utility; see Chapter 4, “Managing Print Services with PCONSOLE”)

---

**NOTE:**

If a print server is running, you must stop it and restart it for certain changes to take effect, for example, when creating a new printer, assigning a printer to another print server, or enabling auditing. However, you do not have to stop the print server if you change print queue assignments for printers, create a print queue, and so on.

---

## Using the PSERVER Daemon

The NetWare Services print server is implemented as a UNIX daemon called PSERVER. It runs as a UNIX process and can only be started at the NetWare Services server. You can use the console command `pserver` to start the daemon. Only one PSERVER daemon can be running at any given time on a NetWare 4.1/9000 machine and it must be started by a user with root privileges.

### Services Provided by the PSERVER Daemon

The PSERVER daemon provided with NetWare Services has all of the components necessary to service print jobs in NetWare and HP-UX environments. The components needed to accomplish this are built into the PSERVER daemon so no additional drivers or components need to be added for compatibility.

In the NetWare environment, the PSERVER daemon communicates with NetWare printers using the NPRINT driver (NPRINT.EXE on a DOS, Windows, Win 95 or NT workstation, NPRINT.NLM on a native NetWare server.). NetWare Services provides NPRINT.EXE and the NPRINT daemon.

Printers using NPRINT software should be configured as Parallel, Serial, or Other/Unknown using PCONSOLE, or NetWare Administrator. The communication between the PSERVER daemon and a remote NPRINT process will use the standard NetWare protocols (IPX/SPX).

In a UNIX environment, the PSERVER daemon communicates with remote UNIX print systems using the line printer daemon (lpd) protocol. This communication occurs using BSD sockets over the TCP/IP protocol. Remote UNIX print systems should have an lpd configured or an emulation package that can accept print requests using this protocol. Print job status is also updated by communicating with the remote print system using this same protocol. Printers using this protocol should be configured as “UNIX Printer” type using PCONSOLE, or NetWare Administrator.

**CAUTION:**

For each of the supported printers to work correctly, the underlying protocols must be present. You must load the following stacks for each printer specified: IPX/SPX stack for NetWare printers, TCP/IP for UNIX printer, and AppleTalk stack for AppleTalk printers.

**Starting PSERVER (Advanced UNIX Users)**

You must start the PSERVER daemon at the NetWare Services server using the PSERVER command. Only one print server can be running on a NetWare Services server at any given time. If you need to service more than 255 printers, you can load a print server on another NetWare Services server.

The following sections describe how to start PSERVER from the NetWare Services console and are intended for experienced UNIX users.

**Command Syntax**

The PSERVER command line utility has the following syntax:

```
pserver -[bh?] -[c|f|s|t] printserver
```

For example:

```
pserver -b -c ps-marketing
```

**PSERVER Options**

The following table describes the options available with the pserver command. The first three options can be grouped together on the command line; all of the other options must be entered individually with the appropriate value.

**Table 5-1**

**PSERVER options**

Option	Description
-b	Forces PSERVER to work in bindery mode. The authentication to the designated file server will be done through the bindery. Print objects such as print server definitions and queue definitions will be searched for in the bindery. The default is to authenticate and look for print objects using Directory Services.

Setting Up and Servicing Print Servers  
Using the PSERVER Daemon

**Table 5-1**

**PSERVER options**

Option	Description
-h	Causes the PSERVER process to display all the available command line options.
-?	Same as -h.
-c default_context	A default context is used when authenticating through Directory Services. This option is overridden by the "pserver_name_context" definition in the nwconfig file.  For example: -c O=HP
-f file_server_name	Works similar to the -b option, except that you can specify a file server as part of the option. Using this option forces PSERVER to work in bindery mode as described for option -b.  For example: -f market_server
-s preferred_file_server_name	Specifies the file server to use when making the initial requester connection or performing the initial authentication. This option is overridden by the "pserver_preferred_server" definition in the nwconfig file.  For example: -s sales_server
-t default_directory_services_tree	Defines a default Directory tree to be used during authentication. This option is overridden by the "pserver_preferred_tree" definition in the nwconfig file.  For example: -t marketing
-p password	Specifies print server password. For example, -p print

If the print server was defined with a password, then the user sees the following prompt when starting the PSERVER daemon from the command line:



Enter the password for user `print_server_object_name` on server `file_server_name`:

A system file, usually called `password`, can be used to automate this process. It is found in the PSERVER log directory. In general, this will be the `directory`. To automate the process, enter the PSERVER object password into the password file or pass `password` as a parameter to the `pserver` command.

### Checking PSERVER Status

You can use PCONSOLE, and NetWare Administrator to determine the current status of the PSERVER daemon.

#### Determine Current Status Using PCONSOLE

##### Procedure

- 1 From a DOS workstation, run PCONSOLE.EXE
- 2 From the “Available Options” menu, select the desired print server.
- 3 From the “Print Server Information” menu, select “Information and Status.”

#### Determine Current Status Using NetWare Administrator

##### Procedure

- 1 From a Windows, Win95 or NT workstation, run NetWare Administrator.
- 2 Browse the tree and select the container object in which the print server is defined.
- 3 Choose the print server
- 4 From the “Object” menu, choose “Details...” to display the print server information.

### Stopping PSERVER

You can stop PSERVER with PCONSOLE, or NetWare Administrator (see Table 6-2) or by typing the following at the NetWare Services console:

```
stopprint
```

You must have root or NetWare Admin privileges to issue this command.

Setting Up and Servicing Print Servers  
Using the PSERVER Daemon

Table 5-2

**Stopping PSERVER**

<b>To stop PSERVER using</b>	<b>Refer to</b>
PCONSOLE	“Unloading Print Servers”
NetWare Administrator	“Unloading Print Servers”

**Using Print Servers in Bindery Mode**

You can create print servers to service queues and clients in a bindery services environment (including NetWare 3 servers and NetWare 4 servers running bindery emulation). PCONSOLE, and NetWare Administrator all provide information about creating and configuring print servers in a bindery services environment (see Table 6-2).

Table 5-3

**Configuring Print Servers for Bindery Services**

<b>To configure print servers for bindery services with</b>	<b>Refer to</b>
PCONSOLE	“Using PCONSOLE in Bindery Mode”
NetWare Administrator	“Referencing Bindery Queues”

## **Using Third-Party Network-Direct Print Devices with NetWare Services**

NetWare Services supports existing network-direct printers and hardware queue servers produced by various manufacturers. These devices either connect to a printer and then to the network or are installed in a port at the printer.

In many cases, these devices offer a fast, effective, low-cost printing solution in NetWare Services as well as NetWare 3 environments.

Typically, these print devices are shipped with their own installation utilities. The manufacturer's utilities configure the device to recognize network print components and to communicate with the network. To effectively use network-direct print devices in a NetWare Services environment, you will need to know the manufacturer's procedures for installing the specific device that you are using.

Many of these devices can be configured to run in either queue server mode or remote printer mode, as described in the following sections.

Figure 6-1 illustrates a representative native NetWare 4 network printing setup incorporating network-direct print devices used in both queue server and remote printer modes.

Setting Up and Servicing Print Servers  
Using Third-Party Network-Direct Print Devices with NetWare Services

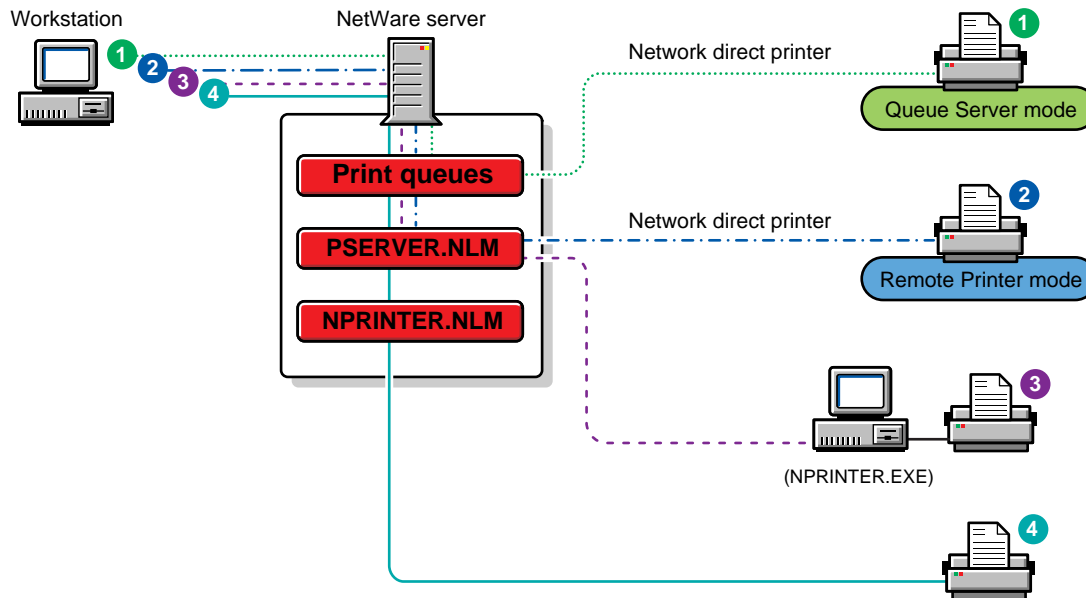


Figure 5-1 Network-Direct Print Devices Running on Same Network with Printers Attached to a Workstation and a NetWare Server

### Remote Printer Mode

In this mode, the device functions in a way similar to a workstation running the NetWare Services NPRINTR or the NetWare 3 RPRINTR. Devices configured for remote printer mode are controlled by a NetWare print server.

By using this mode, your systems are Directory Services aware and will also get notification and other functionality available through PCONSOLE. These advantages are generally not available in queue server mode described in the next section.

Devices running in this mode under NetWare Services run considerably faster than they did under NetWare 3. The increased speed and flexibility offered with NetWare Services makes remote printer mode a very effective way of providing network printing with these devices.

## Queue Server Mode

In this mode, the hardware print server directly accesses the print queue using NetWare Core Protocol™ calls. In NetWare 3, this mode was faster than remote printer mode, but the improved performance of the NetWare Services PSERVER has minimized this distinction.

Queues created in the bindery context can be seen by both NetWare Directory Services™ and bindery users, so both types of users can access these hardware print servers.

Network-direct print devices developed before NetWare Services are designed to work well with the NetWare bindery. When used in queue service mode, some of these products present the following set of common issues of concern to the network supervisor within a NetWare Services environment.

- Some network-direct print devices and their installation programs are designed to look in the bindery for network printing information. In order for these devices to see binderies and queues, they must be in the same bindery context as these printers and queues.
- The queue's volume must be located on the same server as the queue.
- Queues serviced by network-direct printers must be created in the bindery context where the queue server is defined. The bindery context tells the NetWare server which Directory Services objects should be visible as bindery information.
- Queue users should be in the same bindery context as the queue.
- In NetWare 3, print server configuration files for bindery printers are located in the SYS:SYSTEM directory. In NetWare Services, these files have been replaced by attributes of the print server. Because most network-direct print devices are designed to access information from the bindery and are not Directory Services aware, you must create print device configurations in the bindery emulation mode of PCONSOLE in order for the configuration files these devices require to be created.
- Some of these direct-connect devices need to be configured within the 16 printer limitation for NetWare 3 print servers.

When using these devices in remote printer mode, you should reserve printer numbers 0-15 for them.

- NetWare 3 created the group EVERYONE by default. Some of the network-

## Setting Up and Servicing Print Servers

### Using Third-Party Network-Direct Print Devices with NetWare Services

direct print devices assume that this group exists in NetWare Services. For these devices, make sure that group EVERYONE is a user of the affected queue. You may need to create this group in the context where the printer is defined before the device will be able to communicate with the network.

- Some network-direct devices require a running print server before you can configure for remote-printer mode.

Because the communication protocol between print servers and network-direct devices running in remote printer mode did not change in NetWare Services, the running print server can be a NetWare for UNIX 3 print server.

- Some of the utilities provided with these print devices can only be operated with the SUPERVISOR right and do not recognize Supervisor equivalents. You will need to log in as SUPERVISOR in bindery mode rather than logging in as ADMIN in Directory Services mode.
- Some devices include a remote printer configuration utility that requires you to complete duplicate configuration steps. In such cases, you should first define the remote printer in the NetWare Services PCONSOLE utility, and then define the printer again using the third party utility.

As a result of these duplicate steps, you may end up with unused NetWare 3 printer configuration files on the NetWare Services server.

## **Troubleshooting Print Server Problems**

The first step in troubleshooting print server-related printing problems is to use PCONSOLE or NetWare Administrator to monitor your printers and print server.

- For information on using PCONSOLE, see “Creating or Modifying Print Servers” in Chapter 4.
- For information on NetWare Administrator, see “Viewing and Modifying a Printer’s Status” in Chapter 3.

For a comprehensive discussion of printing troubleshooting strategies, see Appendix D, “Troubleshooting Printing Problems.”

---

## Additional Information

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For more information about	Refer to
Creating, modifying, or deleting print servers	“Creating Print Servers” in Chapter 2 (NetWare Administrator) “Creating or Modifying Print Servers” in Chapter 3 (PCONSOLE)

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**Setting Up Printers Attached to  
Workstations or Servers**

## Overview

This chapter explains how to use Hewlett Packard network printer software. Most network printers require a software program called a port driver to print network print jobs. NetWare Services provides two types of port drivers: NPRINTER.EXE and the NPRINTER daemon. Network printers attached to DOS, Windows, Win 95 or NT client workstations require NPRINTER.EXE running on the workstation. Remote network printers attached to HP-UX servers rely on the NPRINTER daemon.

A NetWare Services environment could include printers cabled in any of the following ways:

- To a DOS, Windows, Win 95, or NT workstation (NPRINTER.EXE). For standard systems, you can attach up to 3 parallel and 4 serial printers to a workstation.
- To a NetWare Services server (NPRINTER daemon). Since NPRINTER daemon directs NetWare print jobs into the UNIX LP print system, the cabling configuration is determined by the LP print system. Nprinter daemon can support up to 50 printers.
- To a native NetWare server (NPRINTER.NLM). This configuration requires a native NetWare server in your systems environment. You must load NPRINTER.NLM once for every printer running directly off a NetWare server. Refer to the native NetWare documentation for specific information about NLMs.
- Directly to the network cabling. See “Using Third-Party Network-Direct Print Devices with NetWare Services” option in Chapter 6.

## Requirements

Before completing tasks in this chapter, you need the following:

- NetWare 4.1/9000 NetWare Services server.
- Print server, print queue, and printer that have been created and assigned using one of the following:
  - NetWare Administrator (See “Setting Up Print Services with NetWare Administrator” in Chapter 3.)
  - PCONSOLE (See “Using Quick Setup in PCONSOLE” in Chapter 4.)
- Print server started on a NetWare Services server (pserver).
- Printer cabled in one of the following ways: to a network workstation running DOS, Windows, Win 95 or NT; to a NetWare Services server; to a native NetWare server; or directly to the network.

---

**NOTE:**

Make sure each printer functions properly in its current environment. If a printer functions properly in its current environment (non-network or otherwise), it will work with NetWare print services. If your printer is not functioning properly, see Appendix D, “Troubleshooting Printing Problems” or Appendix B, “Cabling Printers.”

---

---

## Using NPRINT.EXE

The NetWare port driver portion of NPRINT.EXE for a DOS or Windows workstation is a terminate-and-stay-resident program that can be loaded either from the NPRINT menu or from the command line.

### Printing Tasks Handled through NPRINT.EXE

Use the information in the following table to initiate NPRINT tasks.

**Table 6-1** NPRINT.EXE Tasks

To get to the screen where you can	Do the following
Load a printer configured as manual load or type "Other/Unknown."	<ol style="list-style-type: none"><li>1 Type NPRINT &lt;Enter&gt;.</li><li>2 Select a print server then a printer, or press &lt;F4&gt; and &lt;Enter&gt; to browse and select a printer.</li><li>3 Press &lt;F1&gt; for help from here.</li></ol>
Load port driver for printer P_1 for organizational unit Sales in organization ACME.	NPRINT .P_1.SALES.ACME <Enter>
Load port driver for printer P_1 (logical number 0) for print server PS-SALES (NetWare 3 syntax).	NPRINT PS-SALES 0 <Enter>
View the status of all loaded port drivers.	NPRINT /S <Enter>
Unload the port driver that was loaded last.	NPRINT /U <Enter>
View Help for the command line NPRINT.	NPRINT /? <Enter>

### Command Syntax

NPRINT [printer|printserver printernumber] option

NPRINT.EXE can be loaded up to seven times on the same workstation. This is because you can load NetWare port drivers for up to three LPT and four COM workstation ports with NPRINT.EXE (menu or command-line).

The following table shows you options available with NPRINT.EXE at a DOS workstation.

**Table 6-2**                      **NPRINT.EXE Options**

Parameter	Syntax or variable	Description
Buffer	B=number	Overrides defined buffer size (3-60 KB). The default is 3.
Printer	printername	Indicates a Printer object for which to load the NetWare port driver. Syntax requires either the printer name or the print server name plus the printer number.
Print server	printserver name	Indicates the print server assigned to the printer you want to load. Syntax requires either the printer name or the print server name plus the printer number.
Printer number	printer number	Indicates the logical printer number of the printer you want to load. Syntax requires either the printer name or the print server name plus the printer number.
Show	/S	Shows the current status of all loaded NetWare port drivers.
Timing	T=<1-9>	Controls the duration of the strobe signal. The default is 1 (allowed range is 1-9). Assigning a higher number gives more priority to the machine's foreground tasks, which will in turn slow down printing but improve overall workstation performance.
Unload	/U	Unloads the most recently loaded NetWare port driver.
Help	/? or /H	Displays online help.

Setting Up Printers Attached to Workstations or Servers  
Using NPRINTER.EXE

### Running Port Drivers from Local Drives

If you want to avoid logging in to the network before running NPRINTER.EXE, it is possible to run the program from a local drive. However, to ensure the proper execution of the program, you must copy all associated files to the same directory as the one containing the executable file on your local drive.

### Running Port Drivers on DOS or Windows Workstations

The NetWare port driver portion of NPRINTER.EXE for a DOS or MS Windows workstation is a TSR (terminate-and-stay-resident) program that can be loaded either from the NPRINTER menu or from the command line.

NPRINTER.EXE can run any printer configured in NetWare Administrator, or PCONSOLE as “Manual Load.”

---

**NOTE:**

Each loaded NPRINTER.EXE occupies 2 KB more of workstation RAM than the buffer size defined for that printer. Buffer sizes can be set in PCONSOLE, or NetWare Administrator, or at the command line. You can load NPRINTER.EXE up to seven times per workstation.

Buffer sizes can also be changed in PCONSOLE and NetWare Administrator. NPRINTER options loaded from the command line override these configuration settings.

---

### Loading Port Drivers on MS Windows Workstations

If your workstation uses Windows 3.0 or 3.1, you must load NPRINTER.EXE before you load Windows and you must use one of the following options:

- In PCONSOLE or NetWare Administrator, configure the printers to use polled mode instead of a specific interrupt number. (After selecting a printer, select the printer type at the “Printer Configuration” screen and then select “Interrupt: None” at the “Configuration” field.)
- If you want to use a specific interrupt, place the following lines in the Windows SYSTEM.INI file under the heading “[386Enh]”:

```
LPT1AutoAssign=0  
LPT1irq=-1
```

Replace LPT1 with the port that the printer is cabled to (for example: LPT2, COM1, COM2).

### **Loading Port Drivers from the NPRINT Menu**

The NPRINT menu allows you to load printers configured as “Manual Load” and printers of type “Other/Unknown.” This menu also allows you to view available print servers or printers before selecting which printer to load. Printers configured as type “Other/Unknown” can be configured at load time as parallel or serial with the interrupt you select.

### **Procedure**

**1** (Optional) Log in.

**2** Type the following:

NPRINT <Enter>

A list of available print servers appears.

---

**NOTE:**

Press <F4> to switch to Directory Services mode and then press <Insert> to browse for a printer and skip the remaining steps. Press <F1> for help. Switching to Directory Services mode only determines how you find a printer. You will still have the advantages of Directory Services without using Directory Services mode to find a printer.

**3** Choose a print server.

A list of printers assigned to the print server appears.

For example, to load a printer that is assigned to PS-SALES, choose PS-SALES. A list of printers not in use that are assigned to PS-SALES appears.

**4** Choose a printer.

For example, to load network printer P\_1, choose P\_1 from the list of available printers on PS-SALES.

## Setting Up Printers Attached to Workstations or Servers Using NPRINT.EXE

---

**NOTE:**

---

If you choose a printer of type “Other/Unknown,” you will be asked to specify the printer type (parallel or serial), the port, the interrupt, and so forth.

### Loading Port Drivers from the Command Line

The command line option of NPRINTER allows you to quickly load a port driver without entering a menu. We recommend that you use the command line option in the workstation’s AUTOEXEC.BAT file to load the network port driver each time the workstation boots.

### Procedure

- 1 Log in and type the following at the command line:

```
NPRINTER printername <Enter>
```

Depending on the default context for the workstation, you may need to specify the full name that includes the directory context. For example, to load the port driver for printer P\_1, type one of the following:

```
NPRINTER .P_1.SALES.ACME <Enter>
```

or

```
NPRINTER printservername printernumber <Enter>
```

For example, to load printer P1, which has printer number 0 and is assigned to PS-Sales, type:

```
NPRINTER PS-SALES 0
```

(The printer number can be determined in NetWare Administrator or PCONSOLE utilities.)

Place this line in AUTOEXEC.BAT following your network login command for automatic execution.

---

**NOTE:**

---

NPRINTER.EXE can be executed without logging in if you copy all necessary NPRINTER files to a local workstation drive.

### Unloading Port Drivers from the Command Line

You must unload port drivers one at a time, beginning with the one most recently loaded. To unload a port driver, type:

```
NPRINTER /U <Enter>
```



## Using Nprinter Daemon

The NPRINTER daemon is a UNIX process that allows printers defined through the UNIX print system to service the print server. It can be loaded on any UNIX machine.

Unlike NPRINTER.EXE, the NPRINTER daemon does not contain its own port driver, but relies instead on the UNIX print system for configuring and maintaining the actual printer information. The NPRINTER daemon can only be loaded once on a machine, but can service up to 50 separate printers.

You can set up the NPRINTER daemon by using the System Administration Manager (SAM). Refer to the NetWare 4.1/9000 Installation and Administration Guide for information about setting up nprinter configuration files.

For advanced UNIX users, the following sections explain how to configure and run NPRINTER from the UNIX command line.

### Configuring the NPRINTER Daemon (Advanced UNIX Users)

The NPRINTER configuration files PRTConfig, RPCControl, and RPConfig provide the necessary information to the NPRINTER daemon for attaching the specific print server to the specified UNIX printer. These files can be set up or modified using SAM.

The PRTConfig file and the RPCControl file must be configured for your specific environment. The defaults in the RPConfig file are adequate for most environments, but can be fine tuned if necessary.

---

**NOTE:**

---

The RPConfig file contains run-time configuration parameters for NPRINTER. These parameters control items like the time interval between status checks and how many tries should be made before logging an error or a warning.

These files are by default located in the `/etc/netware4/nprinter` path on the NetWare Services server. The NPRINTER daemon polls these files, so you can add and delete printers while NPRINTER is running.

Setting Up Printers Attached to Workstations or Servers  
Using Nprinter Daemon

---

**CAUTION:**

---

Changes made to these files while NPRINTERR is running should always be made to PRTConfig first, and then to RPCControl.

**PRTConfig File Parameters**

The PRTConfig file allows users to set up the host printer configuration that gives NPRINTERR access to the host printers. This file is configurable with a text editor.

Be aware that the # symbol marks a heading (or comment line) and the characters hq mark the beginning of an entry.

The PRTConfig file has the following format:

---

#hq	printer_name	host_queue_name	priority	[form_name]
hq	hp	lp	1	
hq	lw_apple	lp1	1	purple

---

This file is platform dependent, requiring you to modify this file to fit your platform. The first three parameters must have values. The fourth parameter (“form\_name”) can be left blank.

**printer\_name**

Uniquely describes the printer or queue. The name can be up to 20 characters long. This name is not the host’s name for the printer; it is the name NPRINTERR uses to map an entry in RPCControl to an entry in PRTConfig.

**host\_queue\_name**

The name assigned to the host printer queue that you want NPRINTERR to spool print jobs to. The NPRINTERR daemon uses this name to find and open the host printer queue.

**priority**

Allows you to assign a priority level to the printer. In the reference port version, you can assign a value from 0 to 39, with the highest priority being 0.

This field is platform specific. If the platform differs from the reference platform, modifications to NPrinter may be necessary.

### **form\_name**

Identifies the form name to be used with this print queue. It is platform specific. This field can be left blank.

The information in the PRTConfig file is not updated dynamically. You can have multiple entries in this file which define different forms or priorities for the same "host\_queue\_name." Each entry must be given a unique printer name.

### **RPCControl File Parameters**

The RPCControl file contains the remote printer assignments. This file should be platform independent. This file ties the printer number with the printer configuration information in the PRTConfig file.

This file is configurable with a text editor. Be aware that the # symbol marks a heading (or comment line) and the characters rp mark the beginning of an entry.

The RPCControl file has the following format:

<b>#rp</b>	<b>print_server_name</b>	<b>printer_slot</b>	<b>printer_name</b>
rp	PS-LOGAN	0	hp
rp	PS-ARES	8	lw_apple

### **print\_server\_name**

Identifies the print server that NPrinter attaches the printer defined in this file to. The NPrinter daemon does not validate the print server name when the name is entered into the file. It validates the name when it tries to initialize the printer.

During the initialization, NPrinter sends out a SAP packet to find the print server's address. If the print server name is not in the SAP agent's table, NPrinter cannot initialize the printer. There are two main reasons for a print server's name not being in the SAP agent's table:

- The print server is down and, therefore, is not advertising its presence on the

## Setting Up Printers Attached to Workstations or Servers Using Nprinter Daemon

network.

- The print server's name has been incorrectly entered in the RPCControl file.

### **printer\_slot**

Identifies the printer number that corresponds to the printer object that was created. The slot number must be from 0 to 255.

The NPRINTTER daemon does not validate the printer number until it has established a connection with the print server. It will return an error if either of the following conditions occurs:

- Another printer is already using the printer number
- The printer number has not been configured

### **printer\_name**

Identifies the host printer queue that NPRINTTER is supposed to use for this printer. This name must be the same name that was entered as the "printer\_name" in the PRTConfig file.

### **RPCConfig File Parameters**

This file allows you to configure NPRINTTER to work efficiently with your particular implementation of your platform. It is configurable with a text editor.

The RPCConfig file has the following syntax:

RPCConfig Syntax with Default Setting	Supported Settings
Max_Wait_Packet_Time = 2000	100 to 3200 milliseconds
Status_Check_Interval = 5	1 to 3600 seconds
Idle_Before_Job_End = 2	1 to 60
Idle_Before_Prt_Status = 20	1 to 3200
Error_Before_Inform = 5	1 to 3200
Warn_Before_Inform = 5	1 to 3200

The parameters are global, applying to all printers attached to NPRINTER. All of the parameters except “Max\_Wait\_Packet\_Time” and “Status\_Check\_Interval” set initial values for the printer processes.

### **Max\_Wait\_Packet\_Time**

Specifies the maximum time NPRINTER waits to receive packets before going on to other processes.

### **Status\_Check\_Interval**

Specifies the basic interval that NPRINTER waits between doing status checks on all printers. The NPRINTER daemon adds this parameter value to the last time it did a status check to determine the time for the next status check and then compares the next status check time to the current time. It checks the status when the next status check time is equal to, or greater than, the current time.

The NPRINTER daemon waits at least the specified interval between status checks. The actual interval might be slightly longer. For example, NPRINTER does not do a status check if the next status check time is 10:10:05 and the current time is 10:10:04. It waits and loops through the program one more time. When NPRINTER returns to the status check routine, the current time might be 10:10:06 or later.

### **Idle\_Before\_Job\_End**

Sets the threshold value for determining when a job ends if the printer does not immediately receive another job. The value of this parameter is multiplied by the “Status\_Check\_Interval” parameter to determine the actual time.

If both parameters are at the default value, NPRINTER waits 10 seconds after receiving the last packet of a job before signaling an end-of-job.

You should increase this parameter if NPRINTER incorrectly assumes a job has ended when it hasn't.

### **Idle\_Before\_Prt\_Status**

Sets the threshold value for determining when NPRINTER does a status check on an idle printer and then notifies the print server if the status has changed. The value of this parameter is multiplied by the “Status\_Check\_Interval” to determine the actual time.

## Setting Up Printers Attached to Workstations or Servers Using Nprinter Daemon

If both parameters are at the default value, NPRINTER waits 100 seconds before doing a status check.

### **Error\_Before\_Inform**

Prevents the scrolling of error messages that occur in rapid succession. The first occurrence of a message is always displayed. This parameter sets the maximum number of times NPRINTER skips displaying the second or subsequent occurrence of an error message for a particular printer while the printer is in a given state.

### **Warn\_Before\_Inform**

Prevents the scrolling of warning messages that occur in rapid succession. The parameter sets the maximum number of times NPRINTER skips displaying the second or subsequent occurrence of a warning message for a particular printer while the printer is in a given state.

### **Adding a Printer Entry**

#### **Procedure**

- 1 Edit the PRTConfig file.

The PRTConfig file has the following format. Syntax examples are provided within the file itself.

---

#hq	printer_name	host_queue_name	priority	[form_name]
hq	hp	lp	1	
hq	lw_apple	lp1	1	purple

---

- a On a new line under the “hq” column, type “hq”.
- b Under the “printer\_name” column, type the name of the printer.  
This can be any identifying name. It is used as a tag to identify the printer in both the PRTConfig file and the RPCControl file, so it must be the same name in both files.
- c Under the “host\_queue\_name” column, type in the name of the UNIX printer that you want the NetWare print jobs to be sent to.
- d Under the “priority column,” type in the UNIX print system priority level of the print jobs that NPRINTER will submit.

## Setting Up Printers Attached to Workstations or Servers Using Nprinter Daemon

The supported levels are 0 to 39, where 0 is the highest priority.

- e (Optional) Under the “form\_name” column, enter any predefined form.

Forms are predefined in the UNIX print system. If forms are not being used, this column should be left blank.

### 2 Edit the RPControl file.

The RPControl file has the following format. Syntax examples are provided within the file itself.

#rp	print_server_name	printer_slot	printer_name
rp	LOGAN	0	hp
rp	ARES	8	lp_apple

- a On a new line under the “rp” column, type “rp”.
- b Under the “print\_server\_name” column, type (in all caps) the name of the NetWare print server that will be servicing this printer.
- c Under the “printer\_slot” column, type in the printer number that was assigned to the printer when it was created.
- d Under the “printer\_name” column, type in the name of the printer that was entered in the PRTConfig file.

### 3 (Optional) Edit the RPConfig file.

RPConfig Syntax with Default Setting	Supported Settings
Max_Wait_Packet_Time = 2000	100 to 3200 milliseconds
Status_Check_Interval = 5	1 to 3600 seconds
Idle_Before_Job_End = 2	1 to 60
Idle_Before_Prt_Status = 20	1 to 3200
Error_Before_Inform = 5	1 to 3200
Warn_Before_Inform = 5	1 to 3200

## Deleting a Printer Entry

### Procedure

## Setting Up Printers Attached to Workstations or Servers Using Nprinter Daemon

- 1** Edit the PRTConfig file.
  - a** Note the printer\_name value that is associated with the printer you want to delete.  
You need to know the printer\_name value to complete Step 2.
  - b** Delete the printer line.
- 2** Edit the RPControl file.
  - a** Locate the line with the printer\_name value from Step 1.
  - b** Delete the printer line.

### **Starting the NPRINTER Daemon at the UNIX command line**

Before NPRINTER daemon can be started, ensure the following:

- A NetWare print server (the NetWare Services print server or any native NetWare print server) is running
- A printer object is defined for use with NPRINTER
- A UNIX printer is defined through the UNIX print system
- A printer entry exists in the NPRINTER PRTConfig and RPControl configuration files that link the NetWare print server to the UNIX printer

To start the NPRINTER daemon, as root user on the UNIX console, type

```
nprinter <Enter>
```

Under normal operation, all error and warning messages are displayed on the UNIX console (/dev/console). If you want to see more output or if you prefer to have NPRINTER write all output to a log file, there are additional command line parameters that can be specified.

To start NPRINTER and display more verbose output to the UNIX console, type

```
nprinter -x name_of_log_file <Enter>
```

### **Stopping the NPRINTER Daemon at the UNIX Command Line**

To stop NPRINTER daemon, as root user on the UNIX console, type

```
stopnp <Enter>
```



Setting Up Printers Attached to Workstations or Servers  
**Using Nprinter Daemon**

The NPrinter daemon will stop and all of the printers being serviced by the NPrinter daemon will no longer be accessible from NetWare.

## **Using Network-Attached Printers**

For information on using port drivers for printers attached directly to the network, see “Using Third-Party Network-Direct Print Devices with NetWare Services” in Chapter 6.

## **Troubleshooting Tips for Administering Printer Stations**

For a comprehensive discussion of strategies for troubleshooting network printing, see Appendix D, “Troubleshooting Printing Problems.”

### **Printing is Slow Using NPRINT.EXE as a Remote Network Station**

The following are possible reasons why printing might be substantially slower using NPRINT.EXE as a remote network station than using the same printer locally from DOS:

- You may have an IRQ conflict.  
Change to polled mode.
- Your port may not support hardware interrupts.  
If this is the problem, use polled mode. (You can get the ability to use interrupts by installing an I/O board that supports them.)
- You may be using the wrong type of cable or a defective cable.  
Try a new cable. Some printers require a non-standard parallel cable. They will work with a standard cable, but not effectively. Examples: IBM 4019 and 4029.

### **The Message “Printer is not connected” Appears on the Console Screen**

This message may indicate that NPRINT has not yet been loaded to activate a printer that has been previously defined in PCONSOLE.

### **Remote Serial Printer Self-Tests Successfully But is Not Working as Network Device**

Serial printers must be configured the same way as they are configured in PCONSOLE or NetWare Administrator. The printer must be configured through its DIP switches or through menus. See your printer’s documentation for details.

The printer configurations must agree on baud rate, data bits, stop bits, XON/XOFF, and parity.

### **NPRINT.EXE Does Not Initialize or Hangs Periodically at Random**

Sometimes the presence of a router between the NPRINT station and the print server can cause problems for NPRINT, causing the printer to hang.

## Setting Up Printers Attached to Workstations or Servers

### Troubleshooting Tips for Administering Printer Stations

A similar problem may occur when you reboot the workstation to re-establish a lost connection. In this case, you sometimes get a message telling you the printer is still in use. You see this message when the previous SPX connection has not timed out, which usually takes at least 30 seconds.

If you have increased the SPX™ abort and IPX™ Retry counts, the time-out sequence is even longer.

To resolve either of these problems, first make sure the following conditions have been met:

- Your machine has sufficient memory.
- You are running current versions of software such as NPRINTER and NetWare VLM™ programs.
- The PSERVER is running.

Attempts to start NPRINTER when PSERVER is not running will cause an error.

If none of these is the cause of the problem, try increasing the following two parameters in your NET.CFG file:

```
SPX ABORT TIMEOUT= retry_number
IPX RETRY COUNT= retry_number
```

SPX ABORT TIMEOUT defaults to 540 ticks or approximately 30 seconds. IPX RETRY COUNT defaults to 20 ticks, or slightly more than 1 second.

You can also try loading NPRINTER through a batch file at the workstation. That file can include an IF statement to retry NPRINTER until PSERVER is functioning. For example:

```
:LOOP
NPRINTER pserver printernumber
IF ERRORLEVEL 1 GOTO :LOOP
ECHO Port driver loaded successfully.
```

### **Workstation Hangs When NPRINTER Loads**

Sometimes NPRINTER conflicts with the network interface board settings and hangs. This problem may be caused by conflicting settings on the LAN adapter board.

Either change to polled mode or change the board settings to avoid the conflict.

### **Print Jobs are Ruined When Printing Locally**

A print job on a printer may be ruined if the user on the station to which the printer is physically attached does not have a CAPTURE invoked and attempts to print locally. To prevent this, capture LPT1 on this workstation so that NetWare handles the job.

Another method is to reverse the “Private” and “Shared” printer options so that the printer is designated as “Private.” This can be done at the print server console from the “Printer Control” option window or from the PSC command line utility.

PSC provides the quickest way to do this. Issue the PSC “Private” (PRI) command from the DOS prompt. You can then issue the PSC “Shared” (SHA) command to reverse the status for shared network printing again.

### **NPRINTER Cannot Reconnect to Print Server that was Downed and Loaded on Different NetWare Server**

If you bring down PSERVER and bring it up on a different NetWare server from the one it was originally loaded on, port drivers that were connected to that print server initially lose their connection.

When NPRINTER is connected to PSERVER, the port driver stores the network address of the NetWare server where the print server was loaded. If the print server is then loaded on a different NetWare server, the port driver cannot attach to the print server again unless it is reattached to the new server running the print server.

If you do not reattach the port driver, and later reload the print server on the original NetWare server, the port driver will connect as before because the network address of the NetWare server and the information stored by the port driver once again match.

### **Port Driver Status is “Waiting for Job” But Printer is Not Attached**

The port driver (NPRINTER) status for a defined but unattached serial printer is “Waiting for job” even though the printer is not attached, and the printer status is “Running.” If a print job is put into the queue for this printer, the port driver status changes to “Ready (Waiting for printer)” or “Printing job” but the printer status changes to “Offline.”

Setting Up Printers Attached to Workstations or Servers  
**Troubleshooting Tips for Administering Printer Stations**

Defined but unattached parallel printers show a status of “Not connected.”

**NPRINTER.EXE Does Not Run from Local Drive**

If you want to run NPRINTER.EXE from your local drive, be sure to copy all the necessary files.

An alternative is to put them in the LOGIN directory on the network, which is the directory that is accessible prior to logging in. This will eliminate the security risk and user error problems that can occur from leaving a workstation logged in and not supervised.

---

## Additional Information

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For more information about	Refer to
Creating, modifying, or deleting print servers or printers	“Setting Up Print Services with NetWare Administrator” in Chapter 3 (NetWare Administrator) “Modifying NetWare Print Services” in Chapter 3 (NetWare Administrator) “Creating or Modifying Print Servers” in Chapter 4 (PCONSOLE) “Creating or Modifying Printers” in Chapter 4 (PCONSOLE) “Using PCONSOLE in Bindery Mode” in Chapter 4 (PCONSOLE)
Modifying a workstation’s AUTOEXEC.BAT file	Chapter 5, “Installing or Upgrading NetWare Client Software,” in <i>NetWare Client for DOS and MS Windows User Guide</i>

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Setting Up Printers Attached to Workstations or Servers  
**Additional Information**



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**Creating and Managing Print Job  
Configurations**

## Overview

You may find yourself repeatedly using certain sets of configuration parameters when printing with NPRINT or CAPTURE. Setting these parameters whenever you add a job to PCONSOLE's queue job list can also be redundant. Creating print job configurations can simplify this process.

Print job configurations are used to associate a name with a common set of parameters, including destination queue names or printer names (in NetWare® 4™ software).

You can create print job configurations with PRINTCON or NetWare Administrator. This chapter will deal only with PRINTCON.

Refer to “Working with Print Job Configurations” in Chapter 2 for information on using NetWare Administrator.

---

## Printing Tasks Handled through PRINTCON

The following figure illustrates the tasks you can perform with PRINTCON.

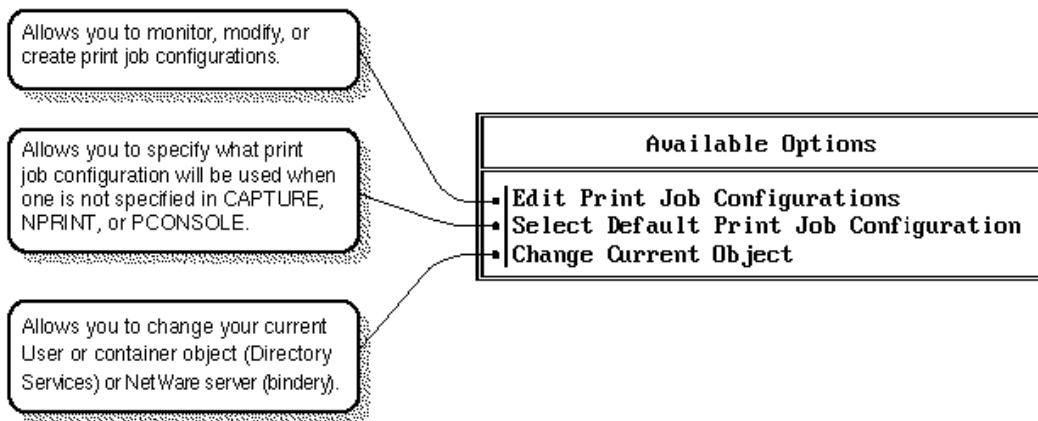


Figure 7-1 PRINTCON Tasks

## Working with Print Job Configurations

Print job configurations are groups of print job options that simplify the use of CAPTURE and NPRINT. You can use PRINTCON to create or modify print job configurations and to specify a default print job configuration for users who use CAPTURE, NPRINT, NETUSER, or PCONSOLE to send print jobs to a network printer or print queue.

### Location of Print Job Configuration Databases

In the NetWare Services, the database is an attribute of a container object or User object. Configurations can be modified through the “Print Job Configurations” option of PRINTCON or the “Print Job Configurations” dialog for the container object in NetWare Administrator.

In NetWare Services bindery mode, the public database is SYS:PUBLIC\PRINTJOB.DAT.

The private database is SYS:MAIL\\PRINTJOB.DAT

## Creating Print Job Configurations

### Procedure

- 1 From PRINTCON, select “Edit Print Job Configurations” from the “Available Options” menu.
- 2 Press <Insert> from the “Print Job Configurations” list.
- 3 Type the name (up to 31 characters) of the configuration you want to create in the “Enter New Name” entry box and press <Enter>.
- 4 Select the new print job from the “Print Job Configurations” list.

The “Edit Print Job Configuration” form is displayed.

- 5 Use the arrow keys to highlight the item you want to modify.

Make the change by typing a new value and pressing <Enter>, or by selecting an item from the menu provided. The configuration parameters are explained in “Print Job Configuration Parameters.”

Press <F10> to save changes.

## Creating Bindery Print Job Configurations

### Procedure

- 1 Load PRINTCON and press <F4> to switch to bindery mode.

You may receive a warning message at this point telling you that you must have a SYS:MAIL directory before you can create a private bindery print job database. To do this you must log into this server in bindery mode.

If you are not attached to a bindery server, a list of servers you are already attached to is displayed.

- a Press <Insert> and browse through the “Other NetWare Servers” list until you select the bindery server you want to attach to.
- b Log in to the bindery server you selected by entering your username and password at the prompts.

You then return to the list of attached servers, which now includes the bindery server you logged in to.

- c Select the bindery server to make it the current server.

You are returned to the “Available Options” menu.

- 2 Select the “Edit print job configurations” option.

The “Print Job Configurations” list appears.

- 3 At the “Print Job Configurations” list, press <Insert> to create a new configuration.

If you are logged in to the bindery server as a Supervisor or equivalent user, the options of “Private Database” or “Public Database” will appear. Print jobs created for the private database are stored in the users MAIL directory, and public database jobs are stored in SYS:PUBLIC directory.

When a user goes into PRINTCON to edit print jobs, all job configurations from both the user’s print job database (in the MAIL directory) and those in the PUBLIC database are shown. If the job configuration is a public job, it will have “(Public)” listed next to the configuration name.

Here are some additional points to keep in mind:

- Bindery-based users will have access only to print job configurations created by a bindery based user.
- Directory Services based users will have access only to print job configurations

## Creating and Managing Print Job Configurations

### Working with Print Job Configurations

created in Directory Services mode.

- Only users defined in the bindery context will have access to bindery-based print job configurations.
- Bindery-based users (users in the bindery context) have a MAIL directory created for them. Private print jobs are stored in PRINTJOB.DAT in the users MAIL directory. (Notice the name has been changed from PRINTCON.DAT to PRINTJOB.DAT.)
- Public print job configurations for bindery-based users are stored in SYS:PUBLIC\PRINTJOB.DAT file.

---

**NOTE:**

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For Directory Services users, the print job configurations are an attribute in the Directory and are replicated wherever a partition in which they are defined is replicated.

### Deleting Print Job Configurations

#### Procedure

- 1 From PRINTCON, select “Edit Print Job Configurations” from the “Available Options” menu.
- 2 Highlight the configuration you want to delete from the “Print Job Configurations” list; then press <Del>.
- 3 Select “Yes” in the “Delete Current Print Job Configuration” confirmation box.

### Renaming Print Job Configurations

#### Procedure

- 1 From PRINTCON, select “Edit Print Job Configurations” from the “Available Options” menu.
- 2 Highlight the configuration you want to rename in the “Print Job Configurations” list, and press <F3> (the Modify key).
- 3 Type the new name in the “Change name to” entry box, and then press <Enter>.

### Viewing or Modifying Print Job Configurations

#### Procedure

- 1 From PRINTCON, select “Edit Print Job Configurations” from the “Available
-

Options” menu.

- 2 Highlight the configuration you want to edit from the “Print Job Configurations” list. Press <Enter>.
- 3 Make the change by typing a new value in the desired field and pressing <Enter>, or by selecting an item from the list provided.

The configuration parameters are explained in “Print Job Configuration Parameters.”

- 4 To save the changes you have made, press <F10>.

### Print Job Configuration Parameters

The following parameters can be set or changed.

**Table 7-1** PRINTCON Configuration Parameters

Parameter	Explanation
Number of copies	Type a number from 1 to 65,000. Default: 1
File contents	You can choose either “Text” or “Byte stream” (the default). Choose “Text” when you want tabs to be converted to spaces. Also choose “Text” to print ASCII text. Choose “Byte stream” if you are printing from within an application and you want the application to handle the formatting commands. Also choose “Byte stream” if you will be downloading fonts on a laser printer.
Tab size	This parameter applies only if you choose “Text” as the “File contents” setting. Type a number from 1 to 18. The number of spaces you specify replaces all tab characters in your print job. If “File contents” is set to “Byte stream,” this field is blank. Default: 8

Creating and Managing Print Job Configurations  
**Working with Print Job Configurations**

**Table 7-1 PRINTCON Configuration Parameters**

Parameter	Explanation
Form feed	<p>Type “Y” for “Yes” or “N” for “No.”</p> <p>Choose “Yes” if you want the printer to advance to the top of the next page after your print job.</p> <p>Choose “No” if you do not want the printer to advance to the top of the next page. Some applications already have a form feed at the end of the file, so setting this parameter can cause an extra blank page to be fed through.</p> <p>Default: Yes</p>
Notify when done	<p>Type “Y” for “Yes” or “N” for “No.” If you choose “Yes,” you are notified that your data has been printed. A message appears across the bottom of your screen.</p> <p>Default: No notification</p>
Form name	<p>Specifies the form that the printer will use. If an invalid form name is used, CAPTURE will use the default value, “(None).” (You must define forms using PRINTDEF or NetWare Administrator before users can use form names or numbers.) With an invalid name or number, CAPTURE gives a warning message but still redirects the port using default form values.</p> <p>Default is None.</p>
Print banner	<p>Type “Y” for “Yes” or “N” for “No.” Choose “Yes” if you want a banner to be printed before the file is printed.</p> <p>Default: Yes</p>
Name	<p>If you print a banner, you can specify the username that appears on the upper part of the banner page. You can use the default username, or you can type any text (up to 12 characters long).</p> <p>Default: Your username</p>
Banner name	<p>Indicates what will appear in the lower half of the banner page. Limit is 12 characters. Use any word or phrase up to 12 characters long. To allow spaces in a banner name, enclose the name in quotation marks (for example, “ON THE GO”)</p> <p>Default: The captured port (for example, LPT1) or, when using NPRINT, the filename.</p>



**Table 7-1 PRINTCON Configuration Parameters**

<b>Parameter</b>	<b>Explanation</b>
Local printer	This parameter is used only with CAPTURE. You can specify which local parallel printer port (LPT1, LPT2, or LPT3) you want to capture.  Default: LPT1
Auto endcap	This parameter is used only with CAPTURE. Type “Y” for “Yes” or “N” for “No.”  Choose “Yes” if you want the captured data to be printed when you exit an application or when the application closes the printer.  Choose “No” if you don’t want the captured data to be printed until you issue a CAPTURE EC command. An alternative is to add TI=number to your CAPTURE command.  Default: Yes
Enable timeout	This parameter is used only with CAPTURE. Type “Y” for “Yes” or “N” for “No.”  Choose “Yes” if you want the captured data to be sent to the queue after the number of seconds you define as the “Timeout count” has elapsed since receiving data.  Default: No
Timeout count	Specifies the number of seconds the operating system should wait after the last data is received before closing the print job.  If your timeout is not long enough, you may have problems printing some files, especially files with graphics. Increase the timeout if only parts of files are being printed or if the files do not print at all.  Default: 5
Printer/Queue	Indicates to which printer or print queue the print job should be sent. Bindery mode uses only queue names.
Device	Press <Enter> to see a list of print devices defined in PRINTDEF you can use.
Mode	Press <Enter> to see a list of the modes for the print devices you chose. A mode is a set of control sequences defined in PRINTDEF.

## Additional Information

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For more information about	Refer to
Creating print job configurations with NetWare Administrator	“Working with Print Job Configurations” in Chapter 2 (NetWare Administrator)

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**Working with Print Device Definitions  
and Printer Forms**

## Overview

If your application does not have the print driver for your printer, NetWare® supplies print device definitions for many common printers.

### Purpose of Print Device Definitions

Print device definitions are sets of functions and modes found in files with .PDF extensions that correspond to printers, plotters, and other peripherals.

The two primary purposes of these definitions are to set the printer up so that the job is printed properly and to ensure that the printer is left in a known state after completing a print job.

Printer functions (also referred to as control sequences, escape sequences, or printer commands) give instructions to the printer. Print device definitions contain the necessary control sequences for such items as boldface type, underlining, and other printer controls.

To define a printer's functions, you enter control sequences or printer commands into the print device database. To do this, you need the technical reference manual that came with your printer.

Print device definitions do not necessarily represent the full functionality of the printer. A print device definition can be modified to change the functions the machine will actually perform.

---

**NOTE:**

Print device definitions are used by print job configurations. You must create and use a print job configuration to specify a print device mode for print jobs. See “Working with Print Job Configurations” in Chapter 7.

---

### Location of Print Device Databases

The print device definitions (.PDF files) supplied in NetWare Services software are copied to the SYS:PUBLIC directory during installation. Additional device definitions that you create are also stored in this directory unless you specify another location.

Figure 3-18 shows a partial list of print device definitions included in NetWare. New definitions are added periodically.

Print device definitions can be created and modified in the graphical NetWare Administrator utility and in PRINTDEF. This chapter describes the procedures for using PRINTDEF. For information on using NetWare Administrator, see “Working with Print Device Definitions” in Chapter 2.

## Printing Tasks Handled through PRINTDEF

The following figure shows you the tasks you can perform with PRINTDEF.

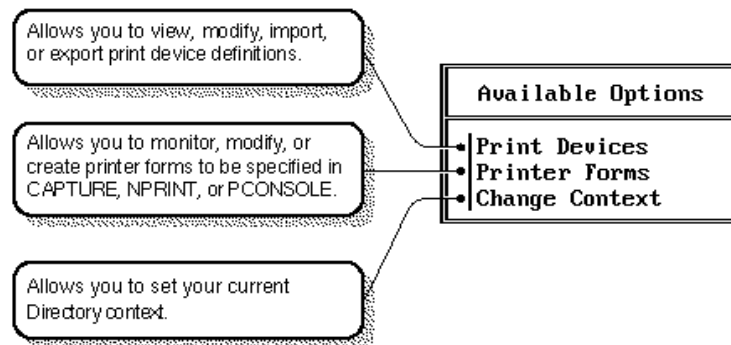


Figure 8-1

Available Options Menu

## Working with Print Device Definitions

If your application does not have the print driver for your printer, NetWare supplies print device definitions for many common printers. If your print driver is not included among those provided in your application or in NetWare, you can use PRINTDEF to create a new print device definition and to specify the correct control sequences according to your printer's documentation.

### Viewing Print Device Definitions

#### Procedure

- 1 From the PRINTDEF "Available Options" menu, select "Print Devices."
- 2 Select "Edit Print Devices" from the "Print Device Options" menu.

A list of the print device definitions appears. If the "Defined Print Devices" list is empty, none have been defined in or imported to the database.

### Viewing Functions for Print Device Definitions

A device function is a control sequence (a string of control code characters) that controls a printing characteristic for a printer.

To view the functions and control sequences for a print device definition, complete the following steps.

#### Procedure

- 1 From the PRINTDEF "Available Options" menu, select "Print Devices."  
The "Print Device Options" menu is displayed.
- 2 Select "Edit Print Devices"  
The "Defined Print Devices" list is displayed.
- 3 Select the print device definition corresponding to the printer whose device functions you want to view.  
The "Device Options" menu is displayed.
- 4 Select "Device Functions."

## Working with Print Device Definitions and Printer Forms

### Working with Print Device Definitions

The functions and corresponding control sequences that have been defined for the selected printer appear.

If the control sequence for a function is too long to be displayed in the “Printer Functions” list (longer than 32 characters), select that control sequence and press <Enter>. The control sequence appears in the “Function Definition” entry box.

### Creating or Modifying Print Device Definitions

If a device definition for your printer is not included among those provided with your application or with NetWare, you need to create your own definition. Each print device definition consists of functions and modes.

Printer functions (also referred to as control sequences, escape sequences or printer commands) give instructions to the printer. To define a printer’s functions, you enter control sequences or printer commands into the PRINTDEF database. To do this, you need the technical reference manual that came with your printer.

As a network supervisor, you can define or modify a printer’s functions by completing the following steps.

#### Procedure

- 1 From the PRINTDEF “Available Options” menu, select “Print Devices.”  
The “Print Device Options” menu is displayed.
- 2 Select “Edit Print Devices”  
The “Defined Print Devices” list is displayed.
- 3 (Optional) To delete an existing definition, highlight the definition and press <Del>.
- 4 (Optional) To modify an existing definition, highlight the definition and press <Enter>.
- 5 (Optional) To create a new device definition, press <Insert>. Type the name you want to assign to the new print device definition in the “New Device Name” entry box.

The name should be recognizable to users (for example, a brand name such as IBM ProPrinter), and it cannot be more than 32 characters in length.

The name of the printer you just typed is highlighted.



- 6 If you are creating or modifying a definition, press <Enter>.
- 7 Select “Device Functions” from the “Device Options” menu.  
The “Functions for Device printername” list is displayed.
- 8 To add a new print function, press <Insert>
- 9 Type a name to identify the printer command in the “Function Definition” entry box and press <Enter>.

Function names must be unique (no two names can be the same) and no longer than 32 characters. Function names are not case sensitive. You can use both letters and numbers.

For example if you are defining the HP LaserJet and you want to include the print function for resetting the printer, you would type

```
Reset <Enter>
```

The “Control Sequence” option is highlighted.

For detailed information on naming and defining print functions, use online Help.

- 10 Enter the control sequences or printer commands for the specified print device.

The documentation that came with the printer should have a chapter or section explaining printer commands. Consult that documentation.

Press <F1> for Help to see syntax used in creating definitions.

For example, to enter the HP LaserJet print function for reset, you would type

```
<Esc>E <Enter>
```

- 11 To save and insert the new control sequence into the “Functions” list, press <F10>.

---

**CAUTION:**

---

When you enter the print functions for a device, be sure to create a reset control function. This control sequence needs to be used to return the printer to a known state.

- 12 Repeat Steps 7 through 10 for each function or control sequence you want to enter.
- 13 (Optional) You may edit any of the device functions or control sequences. Press <Enter> to access the “Function Definition” screen, and modify as needed.
- 14 (Optional) To delete a function, highlight the function and press <Del>.
- 15 Press <F10> to save the modified function.

---

**NOTE:**

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Because NetWare can place the functions only at the beginning or end of a print job, the best functions to use are those that affect the entire document (such as Condensed or Landscape).

### **Importing Print Device Definitions**

Use the following steps to import a print device definition from a .PDF file into the print device database.

#### **Procedure**

- 1 Log in as user Admin or equivalent at a workstation and type the following at the command line:

```
PRINTDEF <Enter>
```

The “Available Options” menu appears.

- 2 Select “Print Devices.”
- 3 Select “Import Print Device” from the “Print Device Options” menu.

The Source Directory appears with the default SYS:PUBLIC if PRINTDEF was started from a network drive.

- 4 Press <Enter>.

The “Available .PDFs” window appears.

- 5 Select the .PDF file you want to add to your database from the “Available .PDFs” list.

If you try to import a print device definition that has the same name as an existing print device definition, the “New Device Name” entry box appears, prompting you to rename the new definition. Type the revised name and press <Enter>.

The new print device definition is added to the print device definition database. You are returned to the “Print Device Options” menu.

### Importing Print Device Definitions from another NetWare Server

If you want to use another NetWare server's print device definition, you must import the definition from that server. First export the print device definition from the original server into a .PDF (Print Definition) file. You can then import the .PDF file to the database on your server. You can copy only one definition at a time.

You must have the Supervisor right (user Admin or equivalent) on both NetWare servers (or the Admin of the other server will need to help you).

Figure 9-2 illustrates the steps in copying a print device definition. This example shows how to copy a typical print device definition from NetWare server **MARKETING** to NetWare server **SALES**.

First, export the definition from the **PRINTDEF** database on **MARKETING** to the **SYS:PUBLIC** directory on **MARKETING**. Then import the definition from the **SYS:PUBLIC** directory on **MARKETING** to the **PRINTDEF** database on **SALES**.

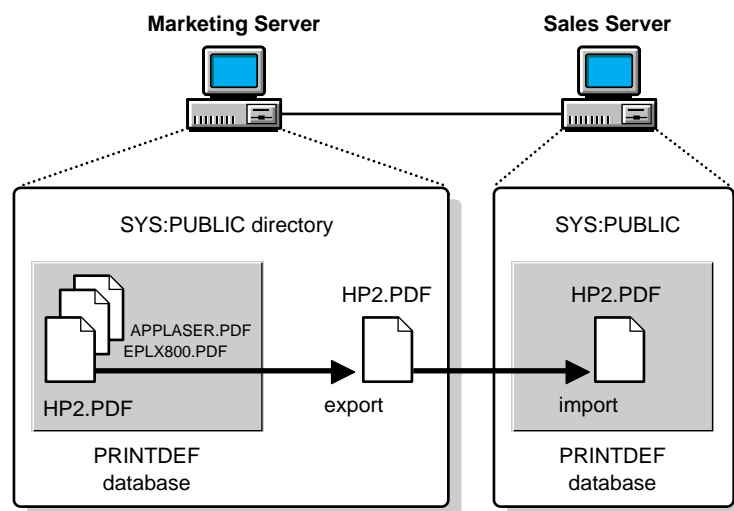


Figure 8-2

Importing .PDF Files from another Server

## Exporting Print Device Definitions

You can export a print device definition from a database to your current directory, to another directory on the current NetWare server, or to a directory on another server. Decide where you want to export the definition, and complete one of the following sections.

### Exporting to a Directory

#### Procedure

- 1 From the PRINTDEF “Available Options” menu, select “Print Devices.”  
The “Print Device Options” menu is displayed.
- 2 Select “Export Print Device”  
The “Defined Print Devices” list is displayed.
- 3 Select the device definition you want to export from the “Defined Print Devices” list.  
The “Destination Directory” window appears. The SYS:PUBLIC directory is the default if PRINTDEF was started from a network drive.  
When exporting and importing .PDF files, press <Insert> to browse directories.
- 4 After specifying the destination directory, press <Enter>, then type the name you want to give the file in the “Export File Name” entry box. Press <Enter>.  
The name can be up to eight characters long but cannot include an extension. You will probably want to use the name of the printer so the file is easily recognizable (for example, HP\_LASER).  
The file is created with a .PDF extension and is placed in the specified directory.  
You are returned to the “Print Device Options” menu.

### Exporting to a Directory on another Server

If you want to export the file to a directory on another server, you must have the Supervisor right on the other server.

#### Procedure

- 1 From the PRINTDEF “Available Options” menu, select “Print Devices.”  
The “Print Device Options” menu is displayed.
- 2 Select “Export Print Device”

The “Defined Print Devices” list is displayed.

- 3 Select the device definition you want to export from the “Defined Print Devices” list.

The “Destination Directory” window appears. The SYS:PUBLIC directory is the default if PRINTDEF was started from a network drive.

- 4 Press <Insert>.

The “Network Directories” list box appears.

- 5 Select the “..” entry at the top of the list. Continue pressing <Enter> until the “Volumes” window appears.

This window lists the servers and volumes you are currently attached to, and provides the username through which you made the attachment.

- 6 Select the NetWare server you want to export to.

A list of volumes for the destination NetWare server appears.

- 7 Select the volume and continue selecting directories to complete the path.

- 8 After you have selected the complete directory path, press <Esc> and then <Enter>.

- 9 Type the name you want to give the file in the “Export File Name” box and press <Enter>.

The name can be up to eight characters long but cannot include an extension. You will probably want to use the name of the printer so the file is easily recognizable (for example, HP\_LASER).

The file is created with a .PDF extension and is placed in the specified directory.

## Working with Print Device Modes

After you define the functions for a print device definition, you can combine these functions into modes.

A mode is a combination of functions that you define to allow the print device to meet specific printing needs.

For example, you could create a “Final Printout” mode for the HP LaserJet that would include the functions for 10 cpi, Emphasized printing, and Near-letter quality printing.

As a network supervisor, you must determine what your printing needs are and then define the modes you will need.

---

**NOTE:**

---

In most printers, the order of the functions is important. See your printer’s documentation for more details.

## Creating Print Device Modes

Use the following procedure to create a new mode.

### Procedure

- 1 From the PRINTDEF “Available Options” menu, select “Print Devices.”
- 2 Select “Edit Print Devices” from the “Print Device Options” menu.  
The “Defined Print Devices” window appears.
- 3 Select the name of the device you want to create a mode for, then press <Enter>.  
The “Device Options” menu appears.
- 4 Select “Device Modes.”  
The “Modes for Device devicename” window appears.

For previously created print devices, a list of modes may already exist in this window. For newly created devices, the only mode to appear is the “(Re-initialize)” mode, which exists by default. However, the appropriate printer commands are not yet assigned to this mode.

The “(Re-initialize)” mode contains the functions that are appended to the beginning and end of a print job to ensure that the printer starts in a known state and returns to a known state. It is the only mode that does this.

- a** To set up the “(Re-initialize mode),” highlight the mode and press <Enter>.
- b** To see a list of all defined functions for the print device, press <Insert>.

Most printers have a single control sequence for reset.

- c** Select the function or control sequence for resetting the printer.

If your printer does not have a single reset function, you must enter all your printer’s “Cancel” functions into the Re-initialize mode. Mark multiple functions by highlighting each and pressing <F5> (the Mark key).

- d** Press <Esc> to return to the “Modes for Device <devicename>” window.

**5** Create additional modes as needed.

- a** At the “Modes for Device <devicename>” window, press <Insert>.
- b** Type the name of the mode you want to create (for example, “Final Printout”) in the “New Mode Name” entry box and press <Enter>.

- c** Select the new mode name.

The “Functions for Mode <modename>” window appears.

- d** Enter the functions for the new mode in the list.

- To see the list of all defined functions for that print device, press <Insert>.
- To highlight the functions you want to include in the new mode, use <F5> (the Mark key). Then press <Enter>.

For example, if you want to create a Final Printout mode for “My Printer” and include 10 cpi, Emphasized printing, and Near-letter quality printing, highlight and mark each of these options. Then press <Enter>.

The order of the functions in the functions list may be important to the printer.

Normally, any function you add is placed at the end of the “Functions for Mode <modename>” list. However, you can insert a new function anywhere in the list:

- Highlight the function following the line where you want the new function added.
- Press <F5> (the Mark key) and then press <Insert> to go to the “Available

## Working with Print Device Definitions and Printer Forms

### Working with Print Device Modes

Functions...” list.

- Highlight the function you want to include at the marked location in the new mode and press <F5> (the Mark key).
- Press <Enter>.

The functions you choose appear in the “Functions for Mode modename” list.

When you have completed the “Functions” list, press <Escape> to return to the “Modes” list.

- 6 To delete an item from the modes list, highlight that mode and press <Delete>. Then press <Enter>.
- 7 Repeat Steps 1 through 5 for each mode or combination of functions you want to create.
- 8 When you are finished entering modes for one print device, press <Esc> to return to the “Defined Print Devices” list.

### Viewing Print Device Modes

If one or more print device definitions have been created or imported, you can view their associated modes by following these steps.

#### Procedure

- 1 From the PRINTDEF “Available Options” menu, select “Print Devices.”  
The “Print Device Options” menu is displayed.
- 2 Select “Edit Print Devices.”  
The “Defined Print Devices” list is displayed.
- 3 Select the device you wish to view and press <Enter>.  
The “Device Options” menu appears.
- 4 Select “Device Modes.”  
The “Modes for Device devicename” window appears.
- 5 Select the desired mode. The list of functions associated with that mode appear.



## **Modifying Print Device Modes**

This feature allows you to modify a print device mode that you previously entered.

You can change the name of the mode or change the functions executed from this mode.

Use the following procedure to view or modify an existing print device mode.

### **Procedure**

- 1** From the PRINTDEF “Available Options” menu, select “Print Devices.”
- 2** Select “Edit Print Devices” from the “Print Device Options” menu.  
The “Defined Print Devices” window appears.
- 3** Select the name of the device you want to create a mode for, then press <Enter>.

The “Device Options” menu appears.

- 4** Select “Device Modes.”

The “Modes for Device devicename” window appears.

For previously created print devices, a list of modes may already exist in this window.

For newly created devices, the only mode to appear is the “(Re-initialize)” mode, which exists by default. However, the appropriate printer commands are not yet assigned to this mode.

- 5** Highlight the mode you wish to modify. Press <F3> if you wish to change the name of the mode. Press <Del> if you wish to delete the mode. Otherwise, press <Enter>.

The “Functions for Mode name” is appears.

- 6** Add or delete any functions you wish from the list.

- To view the functions already used in an existing mode, press <Enter>.

You cannot modify these functions from this screen. To edit print device functions, return to the “Device Options” menu and select “Device Functions.”

- To add new functions to the mode, place your cursor in the list at the location you want the first new function to appear, and then press <Ins>.

## Working with Print Device Definitions and Printer Forms

### Working with Print Device Modes

The “Available Functions for Device name” list appears. Mark the functions you want to use with <F5>, then press <Enter> to place them in the mode function list.

Functions will be added in the order they were marked.

- To delete functions from the mode, press <Del>.

---

## Working with Printer Forms

Printer forms can be designated in an effort to prevent your printer from printing a print job on the wrong paper. The printer forms you define are used as you set up print job configurations. For example, you might want some jobs to be printed on letter-size sheets of paper and others on green-bar continuous-feed paper.

Printer forms include information about the length and width of different types of paper used in your printer. The print server operator is notified when a form change is needed. Printer forms are configured in PRINTDEF or NetWare Administrator.

When a print job requests a printer form other than the form currently mounted in the printer, the print server does not service the job until a print server operator reports that the new form is mounted. A print server operator can use PCONSOLE, PSC, or NetWare Administrator to mount the new form.

Printer form names must begin with an alphabetic character and can have up to 12 alpha-numeric characters. Numbers can range from 0 to 254. Length can range from 1 to 255. Width can range from 1 to 999. These numbers are for your reference only.

---

**NOTE:**

---

Printer forms are stored in the Directory Services database. In bindery mode, printer forms are stored in a file named PRINTDEF.DAT in SYS:PUBLIC.

## Creating or Modifying Printer Forms

### Procedure

- 1 From the PRINTDEF “Available Options” menu, select “Printer Forms.”  
A list of the forms that have been defined for printing appears.
- 2 Press <Insert>, then type the name of the new form you want to define in the “Forms Definition Form” entry box and press <Enter>.

The first character of the form name must be alphabetic, and the form name cannot exceed 12 characters. Examples of form names include White\_8x11, Continuous, Checks, Green\_Bar, and Standard.

## Working with Print Device Definitions and Printer Forms

### Working with Printer Forms

- 3 Type the number you want to assign to the form and press <Enter>. You should probably assign the most commonly used form as form 0, because 0 is the default form. Form numbers must fall between 0 and 255.
- 4 Type the length of the form in lines per page and press <Enter>. The number must fall between 1 and 255. This number is for your reference only. Use a number that makes sense to you. For example, if your printer is set to 6 lines per inch and your paper measures 8.5 by 11 inches, you might select 66.
- 5 Type the width of the form in characters per line and press <Enter>. The number must fall between 1 and 999. This number is for your reference only. Use a number that makes sense to you. For example, if your printer is set to 10 characters per inch and your paper measures 8.5 by 11 inches, you might select 85.
- 6 To save changes, press <F10>.
  - Repeat Steps 2 through 8 for each form you want to define.
  - To edit a form, highlight it in the “Forms” list and press <Enter>. Then follow Steps 2 through 8 to make any necessary changes.
  - To delete a form from the “Forms” list, highlight that form and press <Delete>. Then select Yes in the confirmation box.

### Viewing a List of Forms

To see which forms have been defined for your printers in PRINTDEF, select “Printer Forms” from the “Available Options” menu.

A list of the forms that have been defined for printing appears.

### Viewing Form Definitions

To see what parameters have been set for a specified form, complete the following steps.

#### Procedure

- 1 From the PRINTDEF “Available Options” menu, select “Printer Forms.”

A list of the forms that have been defined for printing appears.
- 2 Select the form whose definition you want to view.

The “Forms Definition” window appears. It contains the form’s name, the number you assigned to it, and the form’s length and width.

While both a form name and form number are specified when the form is created or modified, only the number can be specified when you are mounting a form.

### **Mounting Printer Forms**

After a printer form has been created, it must be mounted before the print server will recognize it. Printer forms can be mounted from the Print Server Console, from PCONSOLE, from NetWare Administrator, or from the command line using PSC.

Mounting a printer form consists of two elements:

- Changing the paper. NetWare has no way of determining whether the paper was actually changed or not. It relies in information it receives from the operator.
- Mounting the form through the software. This is the information that NetWare receives from the operator and that is required in order for printing to continue.

To mount a printer form, you need the following prerequisites:

- The print server must be loaded and accessible.
- The printer must be installed and assigned to the print server.
- A queue must be created and assigned to the printer.
- At least one print form must have been created.

The following paragraphs explain the different ways a a form can be mounted through the software.

#### **Mounting a Printer Form from the Print Server Console**

At the NetWare Services console, use <Alt><Esc> to toggle to the Print Server screen. Choose a specific printer from the “Printer Status” option of the “Available Options” menu. Highlight the “Mounted form” field in the printer information screen and type the number of the form you wish the printer to service. Print jobs using that form in the print queue will now print.

Working with Print Device Definitions and Printer Forms

### **Working with Printer Forms**

#### **Mounting a Printer Form with PCONSOLE**

Enter PCONSOLE and choose a specific printer from the “Printers” option of the “Available Options” menu. Highlight the “Printer Status” field and press <Enter>. Highlight the “Mounted form” field in the printer information screen and type the number of the form you wish the printer to service. Print jobs in the print queue using that form will now print.

#### **Mounting a Printer Form with NetWare Administrator**

See “Mounting Printer Forms” in Chapter 2.

#### **Mounting a Printer Form with PSC**

From the command line, issue the following:

```
PSC PS=printserver P=printernumber MO F=formnumber
```

For example:

```
PSC PS=.DALLAS.SALES.HP P=2 MO F=1
```

---

**Using NETUSER and PSC**

## Using NETUSER

NETUSER is a workstation utility used to perform a variety of network tasks, as shown in the following illustration.

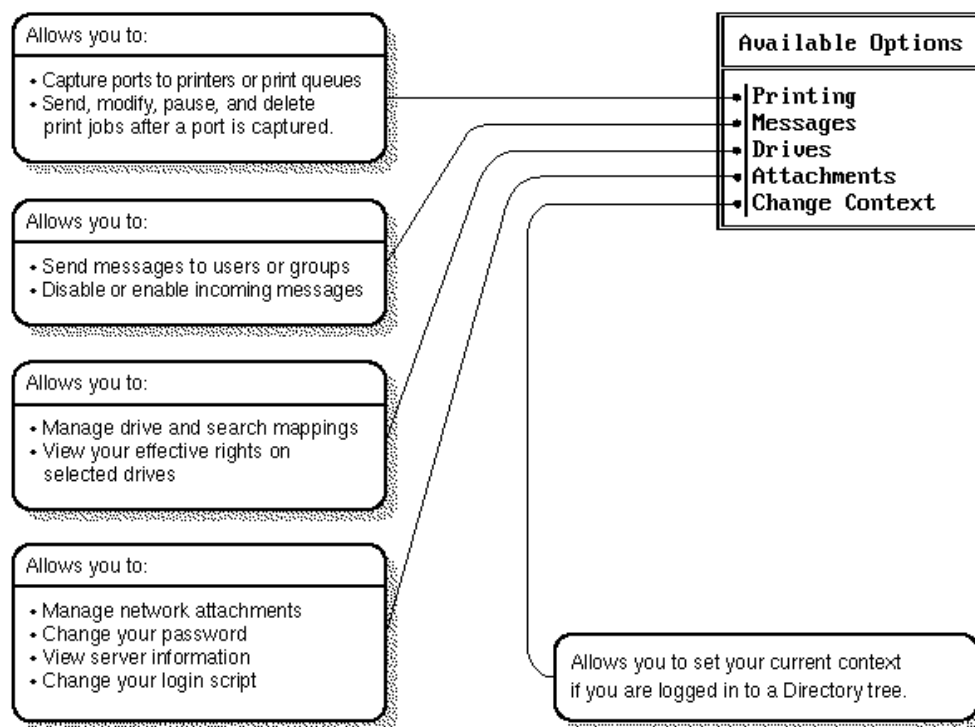


Figure 10-1 NETUSER Tasks



## Printing Tasks Handled through NETUSER

Table 9-1 NETUSER Tasks

To perform the following task	Do the following
Capture a printer	<ol style="list-style-type: none"><li>1 At the NETUSER "Available Options" menu, choose an LPT port under "Printing." (Press &lt;F4&gt; to toggle between NetWare® Directory Services™ and bindery modes.)</li><li>2 Select "Change Printers"; then choose a printer or print queue from the "Printers/Print Queues" menu.</li></ol>
Print a job	<ol style="list-style-type: none"><li>1 At the NETUSER "Available Options" menu, select a port that has been redirected to a network printer or print queue under "Printing."</li><li>2 Select the "Print Jobs" option. Press &lt;Insert&gt; and follow the instructions in the information lines.</li><li>3 When you are finished with the screen "New Print Job to be Submitted," press &lt;F10&gt; or &lt;Esc&gt; and choose "Yes" to save changes and print.</li></ol>
Attach to a NetWare server	<ol style="list-style-type: none"><li>1 At the NETUSER "Available Options" menu, select "Attachments"; then press &lt;Alt&gt;+&lt;F1&gt; to display more options at the bottom of the screen.</li><li>2 Press &lt;Insert&gt; to display a list of available servers.</li><li>3 Press &lt;F1&gt; for help from here.</li></ol>

## Using PSC

PSC is a command line utility that allows you to do many of the tasks you might otherwise perform in PCONSOLE or NetWare Administrator.

### Printing Tasks Handled through PSC

Tasks you can perform with PSC include the following:

- View network printer information
- Control network printers
- Control the print server

### Command Syntax

PSC PS=printserver P=printernumber [option ...]

**Table 9-2** Syntax for Common PSC Tasks

Task	Syntax
Cancel downing of Sales Print Server	PSC PS=PS-SALES CD <Enter>
Remove printer from the list of network printers	PSC PS=printserver PP=printernumber PRI <Enter>
Stop printer 1 on PS-SALES	PSC PS=PS-SALES P=1 STO <Enter>
View all online help screens	PSC /? ALL <Enter>
View your current print layout in list format	PSC L <Enter>
View online help	PSC /? <Enter>
View specific online help for the STARt option	PSC /? STAR <Enter>
View status of all printers for PS-Sales	PSC PS=PS-SALES P=ALL STAT <Enter>

## Command Parameters

Replace printserver with the context, if necessary. The printer must be a printer number. Replace option with one option from the following table.

**Table 9-3** PSC Options

Option	Syntax	Description
Abort	AB	Stops the current print job and deletes it from the print queue. The print server and printer must be specified.
Cancel down	CD	Cancel the “Going down after current jobs” option available in PCONSOLE, NetWare Administrator, and the print server console. The print server and printer must be specified.
Form feed	FF	Advances the printer to the top of the next page. The printer must be paused, stopped, or waiting for a print job. The print server and printer must be specified.
Help	/? or /H	Displays online help.
List	L	Displays a tree layout of the current printing setup.
Mark	M [character]	Prints a line of whatever character you indicate so that you can see which line the printer will start printing on. Default: *
Mount form	MO F=number	Tells the print server that you have mounted a new form on the printer. Specify the form number (form names are referenced only in NetWare Administrator and PRINTDEF).
Pause	PAU	Stops the printer temporarily. The START option continues printing the print job from the point that the print job was paused. The print server and printer must be specified.
Private	PRI	Removes the printer from the list of network printers. Use if you don’t want other network users to print on the specified printer. The print server and printer must be specified.

Using NETUSER and PSC  
Using PSC

**Table 9-3**            **PSC Options**

<b>Option</b>	<b>Syntax</b>	<b>Description</b>
Shared	SHA	Removes the Private flag and makes the network printer available to the print server. The print server and printer must be specified.
Start	STAR	Restarts the printer after you have stopped or paused it. The print server and printer must be specified.
Status	STAT	Displays the status (print job name, ID, and percent complete) on one or more printers on the specified print server. The print server must be specified.
Stop	STO	Stops the printer and returns the print job to the print queue. The STARt option prints the print job from the beginning.
Server	S=name	Indicates which NetWare server contains the print server you want to manage. Default = current server (bindery-based). This option is not needed when specifying a print server in the same Directory tree.

**Tips on Using PSC**

- You can use PCONSOLE to accomplish many of the same tasks, but PSC can be placed in batch files or typed quickly at the DOS prompt.
- The “Server” option will require you to attach to the specified server with a bindery connection.

### Additional Information

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<b>For more information about</b>	<b>Refer to</b>
Creating, modifying, or deleting print servers or printers	“Creating Print Servers” in Chapter 2 (NetWare Administrator) “Creating Printers” in Chapter 2 (NetWare Administrator) “Creating or Modifying Print Servers” in Chapter 3 (PCONSOLE) “Creating or Modifying Printers” in Chapter 3 (PCONSOLE) “Using PCONSOLE in Bindery Mode” in Chapter 3

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Using NETUSER and PSC  
Using PSC

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**A**

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## **Setting Up and Servicing Printers**

Regardless of the architecture of your network, and the mix of workstations from other platforms, printing requires that somewhere across the network an accessible printer is cabled to a server or workstation. That connection is based on a particular type of communication channel, the pathway which

## Setting Up and Servicing Printers

dictates the signals used and the methods employed to control the transfer of print data to the printer. This appendix discusses the primary communication channels in use, including serial and parallel connections, Hewlett-Packard Remote Printer connections, and AppleTalk connections.



## Printer Characteristics

A printer converts print data to dot patterns and physically manipulates paper and ink to produce a printed image.

The purpose of this chapter is to help you determine the type of printers you need and to configure your printer setup for optimal performance.

Several types of printers are in common use today:

- Impact printers (usually dot matrix)
- Ink-jet (including bubble-jet and paint-jet) printers
- Laser printers
- Electrostatic printers
- Thermal wax transfer and dye sublimation printers

Of these, the laser printer is the most common in network environments.

## Selecting the Best Type of Printer for Your Setup

The following information compares parallel and serial printers.

### Parallel Printers

Parallel port speeds vary greatly, but are mostly much better than serial port speeds. Here are some characteristics of parallel printing:

- Much faster than serial
- Ten feet maximum standard distance; some cables guarantee 150 feet
- Limited error checking but relatively error-free
- Interrupts set by the installer
- Universally compatible

Laser printers that seem otherwise similar may have varying maximum parallel port speeds. Consult with your printer vendor if this is a major issue for you.

### Serial Printers

Here are some characteristics of serial printing:

- Transmits data more slowly than parallel
- Standard maximum distance 25 feet; some cables guarantee 500 feet
- Has better error checking capability
- May require less expensive cabling
- The installer sets interrupt, XON/XOFF, parity, baud rate, data bits and stop bits

See Appendix B, “Cabling Printers,” for more information.

## Printer Languages

In the printer, a “formatter” converts the print data to dot patterns, storing enough dots to make a complete physical cycle, usually a single pass of a print head or a single page. The formatter accepts print data in one or more forms, sometimes called printer languages. Formatters that handle more than one such language may include commands to switch between languages, or they may switch automatically by analyzing the data stream.

Such languages fall into two general categories:

Printer languages such as PCL, HPGL, and ESC-P. These languages use data streams in which the data consists of (1) text bytes, (2) 2-5 byte command strings for horizontal and vertical spacing and line- image (vector) graphics, and (3) strings of bit-image (raster) graphics. This data is easily and quickly converted.

Page description languages (PDLs), such as PostScript (PS) and PCL-V. These languages are actually a subset of the printer languages group, but they use much more complex data streams. Consisting largely of verbose English phrases and programmatic constructions, PDLs allow more complex data manipulations than the simpler printer languages, but require more time to convert.

Choosing the right printers for your network involves more than determining a printer's output speed. PostScript printers can accommodate most inconsistencies that PCL printers cannot, so if possible, make sure your printers are PostScript compatible.

## Printing with PostScript

PostScript is a page description language by Adobe\* Systems Incorporated. It is a popular way for applications to interface with high quality printers when sharp graphics and many printing fonts are required. It is interpreted by built-in hardware or an add-on cartridge or system board chip at the printer.

The PostScript language handles information differently than ordinary printing. You must be aware of PostScript's unique characteristics to avoid problems when using it.

The PostScript language is what the printer uses to guide the printing processes. Therefore, the printer must be capable of understanding the PostScript language. We refer to such printers as “true PostScript printers.” An interesting feature of the PostScript printer is that it will flush the entire print job if there is anything about the print job that it does not understand, with no error messages whatsoever. The printer will blink as if everything were just fine and then it just stops. Because of this feature, it is very difficult to diagnose the problem.

Since the printer needs this language for its printing processes, it must have a driver that generates the code for each file that is sent to the printer. These drivers are provided by each application that supports PostScript printing. If the application does not provide this driver, it will be impossible to print in PostScript mode. Examples of two applications that support PostScript are WordPerfect® and Ventura Publisher\*.

Most PostScript printers are capable of printing in PostScript mode or in regular text mode. This is done by the flip of a switch. Each printer will be different, so you will need to refer the user to your printer manual for instructions.

Here are some guidelines for PostScript printing on a network:

- Use the “No Tabs” (NT) parameter for all PostScript print jobs sent with CAPTURE or NPRINT.

The “No Tabs” setting sends the file as a byte stream. This means that the control characters will not be interpreted by the server but will instead be sent directly to the printer to be interpreted.

- You should also use the “No Form Feed” (NFF) parameter in NPRINT and CAPTURE commands when sending jobs to PostScript printers.
- Some PostScript printing problems can be resolved by updating the PostScript drivers for applications (including MS Windows).
- Make sure that print jobs going to PostScript printers are properly configured for PostScript. You must use byte stream mode when sending PostScript jobs to the printer.
- Make sure there is enough buffer space, using NET.CFG to increase it if necessary.
- If using a PostScript cartridge on an HP LaserJet or similar printer, make sure that the cartridge is completely installed in the bay. There will be an audible click as the cartridge snaps tight. If the cartridge is not completely installed, PostScript is not available at the printer. This means the incoming PostScript code from the application is unintelligible and garbage will print.
- Some printers, such as the HP 3Si models, require a switch to be set to use PostScript. Check that the SYS SWITCH is “on” if PostScript printing is not working.
- A problem can occur when PRINTDEF is used to create PostScript PDFs (Printer Definition Files) which include modes that are larger than the default shell header buffer size of 64 bytes. This print header defines a space for printer setup codes once the job is completed.

You can expand the print header buffer using the “print header” parameter in your workstation’s NET.CFG file. The simple solution is to set its size to the maximum of 255 bytes. (This applies to CAPTURE, but not to NPRINT.)

Setting Up and Servicing Printers  
Printing with PostScript

```
cache buffers = 10  
file handles = 50  
long machine type = compaq  
print header = 72  
print tail = 24  
show dots on  
spx connections = 60
```

Figure A-1

**Sample Workstation NET.CFG File with Print Header and Print Tail Parameters**

## **Improving Printer Performance**

For hints on improving printer performance, see Appendix C, “Optimizing Network Printing Performance.”

## Preventing Printer Problems

The following suggestions are not intended to be prescriptive or comprehensive. Always refer to the documentation accompanying your printer before attempting any preventive maintenance on the machine.

- Vacuum around inside occasionally to prevent a build-up of loose paper particles.
- Make sure that any belts used are at the proper tension.
- Clean the paper and ribbon paths periodically. Use a dry lint-free cloth. Plastic gloves will protect your hands from ink residue build-up.
- Clean the corona wires and rollers on a laser.
- Do not lubricate any moving parts, except as directed by your owner's manual.
- Try to maintain a narrow range of temperature and humidity around printers. Some printer components may be sensitive to environmental changes.

## Preventing Problems with Laser Printers

- Toner cartridges can open in transit and create a mess. Always ship them in their protective sealed packaging and separately from the printer.
- Be sure to take the time to clean the corona wire and the roller every time you change the print cartridge.
- Laser printers need to dissipate a lot of heat. Give them adequate ventilation.
- Refilled toner cartridges work fine and save money, as long as they have only been refilled once. After that, they can become unreliable. Patronize only reputable vendors that you know refill them only once.
- Be careful when using envelopes and address labels in laser printers that are not intended for laser use. If the glue melts during fusion, there could be expensive damage.

## Preventing Problems with Dot Matrix Printers

- Make sure the print head has enough free air around it to dissipate heat. Do not place other electronics too close to it.
- Use good quality ribbons. The cheap ones may use ink that lacks needed



lubricants or uses an acid that can hurt your print head over time.

- Do not turn the platen head using the knob when the printer is on. This can damage the stepper motor. A system administrator may wish to use the knob when first loading a new box of paper and then remove it from the machine.
- Dot matrix printer ribbons will dry out eventually if they are not used.
- Some dot matrix printers do not have the strength of impact to deal effectively with multi-part forms.
- Check with the Seiko Epson Corporation before trying to replace the print head on its older dot matrix models. Some of these routinely burned out the main circuit board when the print head failed.
- It is often cheaper to get a standard stepper motor from a local electronics store than to order it by part number from the printer's manufacturer.
- A dot matrix printer has more control of its dot placement up-and-down than right-to-left. Its right-to-left motion is precise to 1/216th of an inch. Vertical spacing is accurate to 1/240th. This will effect the appearance of detailed graphics.

## Troubleshooting Printers

For a comprehensive discussion of strategies for troubleshooting printing problems, see Appendix D, “Troubleshooting Printing Problems.”

### General Printer Troubleshooting

- Make sure the printer has power and is on-line. If you are using a manual printer sharing device, make sure the switch is set to activate the correct printer.
- Turn it off and on again to reinitialize any internal settings that may have gone astray.
- Use the printer's own self-test, according to the manufacturer's recommendation. If it fails, you have verified that the problem is within the printer. If the print head is not moving at all, the transport motor may have failed.
- If the printer passes the self-test, try a test print using the Print Screen capability within DOS. If the Print Screen fails, you know the problem is in the relationship between the printer and the computer. Inspect the cable and the cable connections. Replacing the cable with a known good cable is worth trying since cables are so frequently the source of printer problems. Cables can fail with broken wires, loose or broken pins, or incorrect pin-outs.
- The message “out of paper” is sometimes erroneously reported when there is plenty of paper, and can indicate a physical problem with the printer.
- If the Print Screen succeeds, the problem may be with your application or its configuration. For example, your application may be set up to direct output to a file instead of the printer, or you might be directing the output to the wrong communications port.

---

**WARNING:**

---

**Some printers differ from computers in that they do not have shielded power supplies. That means that a plugged-in printer can expose you to full outlet power, which is enough to kill you. Never open a printer case unless it is unplugged!**

### Troubleshooting Laser Printers

- Be sure all dip switches are properly set for your configuration. Laser configuration is sometimes done by a control panel of buttons with an LED display that permits you to alter configuration memory. Be sure that the

application being used is properly configured for the printer as set up.

- Fuzzy laser output could mean you have a dirty corona wire or you are running out of toner. Horizontal lines or splotches indicate possible damaged or dirty print drums or rollers. Since some of these components are part of the cartridge, a useful quick fix is simply to change the cartridge.
- If laser images seem disproportionately long or short, the drive motor may not be moving the paper through at the correct speed.
- Failure of a laser printer to go on-line might be a communication interface problem. It could also indicate a faulty control panel. Try powering up the printer with the cable removed. If it now goes to “ONLINE” (or “READY”), suspect the cable or its connector.
- If you are printing totally black pages, suspect a broken or fouled corona wire. If that is not the case, replace the toner cartridge.
- If the print appears speckled, it is probably the fault of the primary corona grid which is part of the toner cartridge. Replace the toner cartridge.
- If white streaks appear in your printing, shake the toner cartridge to insure an equal distribution of powder. If that doesn't work, clean the transfer corona assembly. Contamination on the assembly will prevent it from holding the electrical charge needed to attract toner from the drum.
- A repetitive pattern of printing defects, such as an identical smudge every 2 inches may indicate a defective fusing roller. Try cleaning it according to your hardware vendor's instructions. If that does not work, you may need to replace the fusing roller assembly.

### **Troubleshooting Dot Matrix Printers**

- If the printer self-tests OK but will not print jobs from the computer, check the following:
  - Dip switch settings
  - Proper driver for your application software
  - Bad or disconnected cable
- Some printers have both serial and parallel connections. If one doesn't work, change cables and try the other. Be sure to change any dip switch settings needed by the printer to acknowledge the change. If this works, you may have had a physical problem with the output port on the computer or the input port of the

## Setting Up and Servicing Printers

### Troubleshooting Printers

printer that you tried the first time.

- If a dot matrix printer shuts down and recovers frequently, it may be having problems with its “thermistor”. A thermistor is a device used to keep the printer from overheating. Try replacing this part before you replace the entire print head.
- Some printers can be set by dip switches for unidirectional or bidirectional printing. Bidirectional is normally faster, but might cause problems with graphic output for some combinations of applications and printers. If you suspect this problem, reset your dip switches for unidirectional printing.
- If your output is double-spaced when you expect single-spaced, you may be getting an extra Carriage Return and Line Feed at the end of every line. Reset the dip switch(es) controlling this.
- If your print quality is poor, first check the ribbon for wear. Also examine the print head spacing. Your head may be too far away from the platen for your current paper thickness. If adjusting the spacing doesn't solve the problem, clean the print head itself with a cotton swab dipped lightly in alcohol.

### Troubleshooting Network-Related Printer Problems

The following information may be helpful in resolving printer problems. For a comprehensive discussion of printing troubleshooting, see Appendix D, “Troubleshooting Printing Problems.”

- If a network printer sometimes goes off-line for no apparent reason and works fine when it is reinitialized, you may have a static problem. Large amounts of static can be generated by certain special papers, such as carbonless forms. Make sure your printer is properly grounded.
- Plotters need to function much as printers in order to accept a job to plot, but plotters can have no direct interaction between themselves and the application.

For example, the AutoCAD application talks directly to a COM port, then waits for a reply from that port. Since NetWare® software only redirects printing to LPT ports, AutoCAD ends up waiting for COM port activity when there won't be any.

You can handle this problem by saving a print job to a file and then using NPRINT or PCONSOLE to print the job. An alternative would be to plot to a file named “LPT1” after capturing the device LPT1 with the CAPTURE command.

## **Serial Communications Channel**

Serial (RS-232) communication channels usually depend on certain control codes, such as X-On/X-Off, being sent as part of the data stream. A PostScript job on an RS-232 channel may include additional control characters to perform these tasks:

- Request printer status (0x14)
- Interrupt the PostScript interpreter (0x3)
- Signal the end of a job (0x4)

Other control codes may also appear, such as 0x1, 0x11, 0x13, and 0x16, which perform similar functions.

When a serial printer receives a data stream containing control codes, the printer's communications interface traps and removes the control codes. When this is the case, it means that the serial channel is not binary-capable.

If you direct binary data to this type of communication interface, some data values will be misinterpreted as control characters and erroneously stripped out. This, obviously, will affect the printer output, and cause distorted or garbled printing.

Also, a serial channel may be configured to use less than 8 bits of data per character, as described in the next section.

## **Parallel or Hewlett-Packard Remote Printer Communications Channel**

Centronics Parallel and Hewlett-Packard Remote Printer communications channels use 0x4 (Control-D) to signal the end of a job to the PostScript interpreter, or 0x3 (Control-C) to interrupt the interpreter, primarily because of the precedent set by the serial channel. This means that parallel and Remote Printer connections are also not binary capable.

## **DOS PostScript Applications Generating Control-D**

Many DOS and Windows applications generate PostScript to be sent to a printer across a serial or parallel interface. These applications include the Control-D (0x4) character to signal the end of the job. If this data is sent to a queue serviced by an AppleTalk printer, the Control-D character will be

Setting Up and Servicing Printers  
**Troubleshooting Printers**

passed to the printer's PostScript interpreter instead of being intercepted by the printer's serial or parallel interface. This can cause PostScript errors or job failures from these applications. ATPS solves this problem by filtering jobs for Control-D characters and replacing them with Printer Access Protocol (PAP) EOFs.

---

***NOTE:***

Other DOS and Windows applications may generate binary PostScript data, which could use Control-D as data rather than to signal the end of a job. For these applications, you should create a print job configuration using the "PostScript (Binary Graphics)" mode in PRINTCON.

---

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**B**

**Cabling Printers**

---

## Overview

This chapter contains general rules and standard specifications for parallel and serial printing. For more specific information on your printer, see the printer's documentation or owner's manual.

The majority of printers use parallel cabling because both installation and operation are fast and trouble-free. Serial printers offer greater cabling distances, but these distances are usually not needed because network printers can attach to any DOS workstation or NetWare® server.

The following chart illustrates the basic differences between parallel and serial printers.

**Table B-1**      **Parallel Versus Serial Printers**

Item	Parallel	Serial
Speed	Potentially much faster than serial	Slower than parallel
Distance	10 feet standard maximum. Some cables guarantee 150 feet	25 feet standard maximum. Some cables guarantee 500 feet or more
Error checking	Limited because relatively error-free	Parity (reduces speed by about 10 percent)
Software	Installer sets interrupt	Installer sets interrupt, XON/XOFF, parity, baud rate, data bits, and stop bits
Hardware	Universally compatible	Installer may need to check and set pin settings

---

**NOTE:** Hewlett-Packard recommends that you use parallel printing instead of serial whenever possible. This greatly reduces your risk of having printing problems.

---



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## Parallel Printers

PCs generally have a female 25-pin parallel port. Parallel printers generally have a Centronics 36-pin parallel port. A cable with a male 25-pin connector and a Centronics 36-pin connector connects the hardware. See Figure B-1.

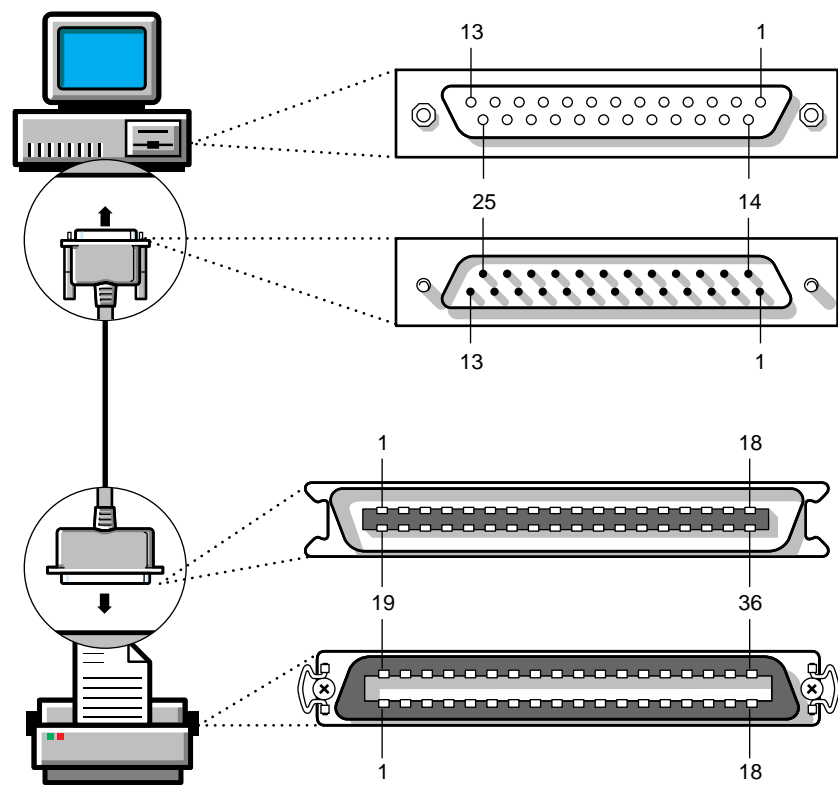


Figure B-1

Parallel Interface

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## Serial Printers

PCs generally have either a male 9-pin or 25-pin serial port. Serial printers generally have a female 25-pin serial port.

Three different cabling scenarios connect most PCs and serial printers. Figures B-2, B-3, and B-4 cover each scenario.

**Table B-2**

**Cabling Serial Printers**

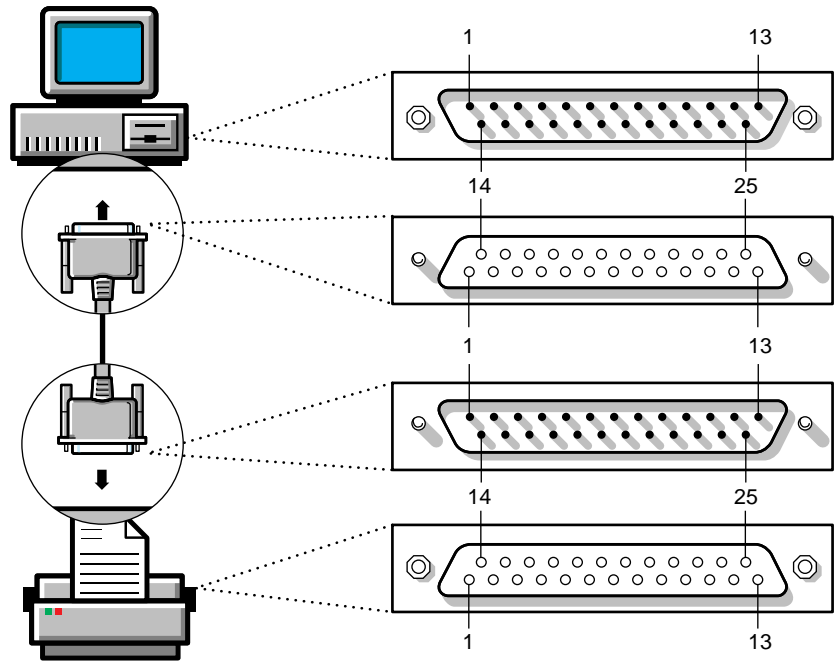
<b>If you have these types of connectors</b>	<b>Do this</b>
Male 25-pin serial port on PC Female and male 25-pin connectors on cable	See Figure B-2.
Male 9-pin serial port on PC Female 9-pin and male 25-pin connectors on cable	See Figure B-3.
Male 9-pin serial port on PC Female 9-pin and 25-pin connectors on a converter Female and male 25-pin connectors on cable	See Figure B-4.

Most serial cables have 25-pin connectors on each end. A standard serial cable is called “straight-through.” This is used for modems and does not work for printing. “No-modem” or “null-modem” cables work for the majority of serial printers.

You need to buy a 25-pin to 9-pin adaptor if you have a 9-pin port on your PC. Printers generally have 25-pin male ports.

NetWare serial printing parameters default to the most common settings: polled interrupt, no XON/XOFF, no parity, 9600 baud rate, 8 data bits, and 1 stop bit. These settings function with most serial printers.

When XON/XOFF is enabled, the software controls the flow of data between the PC and the printer. When XON/XOFF is disabled, the hardware controls the data flow.



**Figure B-2** Serial Cable with Two 25-Pin Connectors

Cabling Printers  
Serial Printers

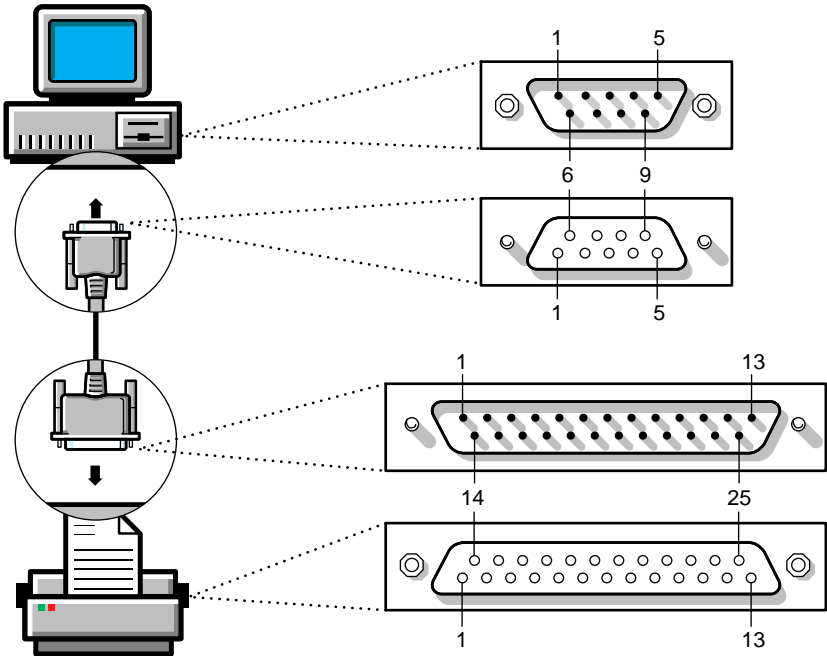


Figure B-3 Serial Cable with 9-Pin and 25-Pin Connectors

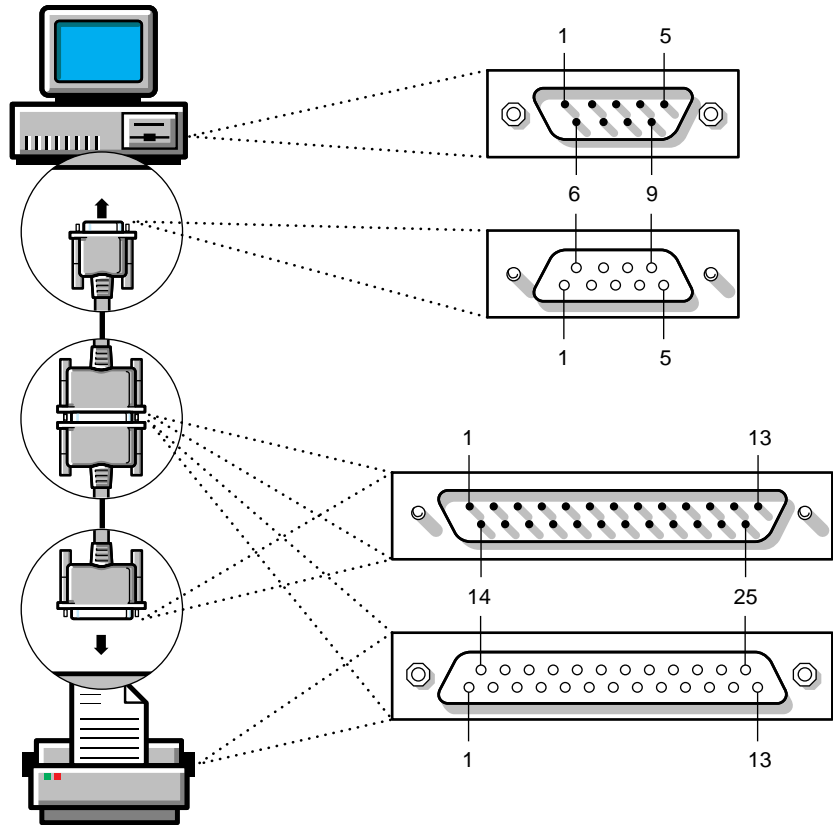


Figure B-4

Serial Cable with Two 25-Pin Connectors and a 9-Pin to 25-Pin Converter

## Optimal Serial Cabling

This section explains how Hewlett-Packard uses RS-232-C serial communication for printing.

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**NOTE:**

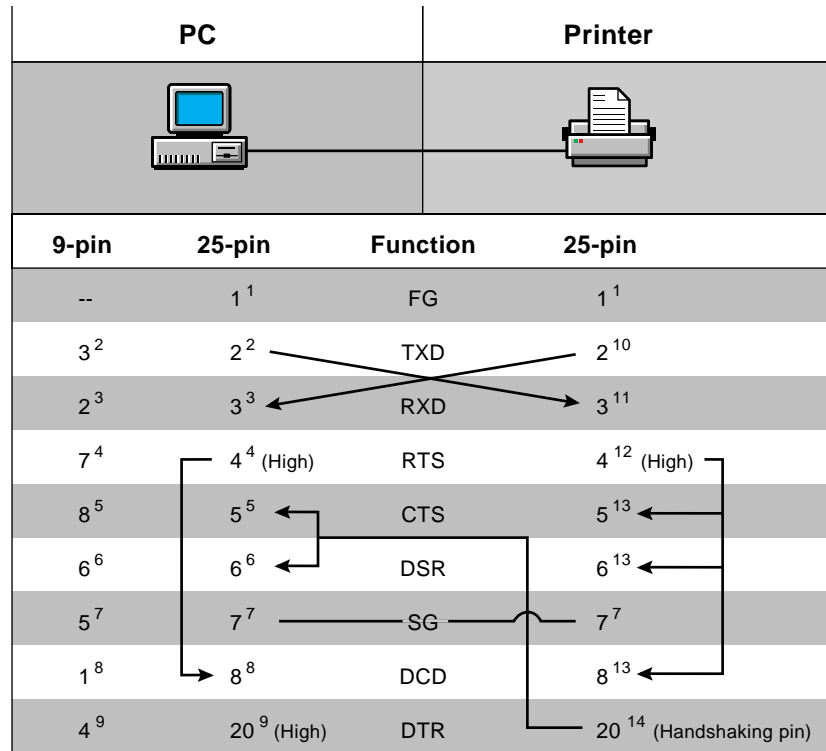
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Anyone making changes to their cabling pin configurations should be familiar with soldering techniques and with tracing wires using a multimeter or color-coding.

Serial printers cabled to PCs generally use the RS-232-C interface, which was developed specifically for terminal-to-modem communications, or communication between Data Terminal Equipment (DTE) and Data Communications Equipment (DCE). Proper handshaking, the exchange of signals to control the flow of data between hardware devices, allows data to flow correctly between DTE and DCE devices.

Since PCs and printer are both DTE, they must send signals as DTE. However, they must be cabled so that they receive signals as if from DCE. Because PC and printer vendors implement this serial handshaking in different ways, many problems occur when the signals are not correctly routed between them.

The following chart shows optimal cabling between 9 and 25-pin PC connectors and a 25-pin printer connector for NetWare print services. Each pin handles certain functionality, as explained in the following sections.



**Figure B-5** Optimal Serial Pin Connections

**NOTE:**

Superscript numbers in the graphic correspond to notes on the next couple of pages. In parallel communication, a “high” signal level ranges around 5 volts. A “low” signal level ranges around 0 volts. In serial communication, the “low” range is -3 to 3 volts, the “high” ranges are -15 to -3 and 3 to 15.

In the following sections, the conventions “input” and “output” determine what controls the signal. “Input” means the signal is controlling the device; “output” means the device is controlling the signal.

**Functions on the PC Side of Serial Printer Cables**

- 1 FG (Frame Ground reference pin)

## Cabling Printers

### Optimal Serial Cabling

It is not necessary for you to use this pin, and using the pin can cause ground loop problems if the PC and printer are connected to different power sources. You have a Frame Ground pin only on a 25-pin connector, and it uses Pin 1.

#### 2 TXD (Transmit Data output pin)

The PC sends data (the print job) through this pin which connects to Pin 3 on the printer. The PC uses Pin 3 on a 9-pin connector and Pin 2 on a 25-pin connector. This attaches the PC's transmit pin to the printer's receive pin.

#### 3 RXD (Receive Data input pin)

The PC receives XON/XOFF characters through this pin, which connects to Pin 2 on the printer. The PC uses Pin 2 on a 9-pin connector and Pin 3 on a 25-pin connector. This attaches the printer's transmit pin to the PC's receive pin.

#### 4 RTS (Request To Send output pin)

NetWare print services sets the signal level high for this pin (and the DTR pin) on the PC and keeps it in that state. The PC uses Pin 7 on a 9-pin connector and Pin 4 on a 25-pin connector. This signal can be used as a source for a high signal level to enable certain functions on some printers. If your printer cable connects this pin to a pin on the printer that requires a high signal level, printing will function properly. You can achieve the same results by following the steps in note 12.

---

**NOTE:**

Early versions of NetWare print services set the signal level high on this pin when sending data and set the signal level low when not sending data. The timing of the signal changes caused many problems with printers that require a high signal level for data input. Beginning with version 1.22R, NetWare Print Services constantly maintains a high signal level for this pin.

#### 5 CTS (Clear To Send input pin)

NetWare print services uses this pin for its hardware handshaking. The PC uses Pin 8 on a 9-pin connector and Pin 5 on a 25-pin connector. This pin connects to the pin on the printer that controls the flow of data. This is generally pin 20 on the printer, but some printer vendors use other pins (see note 14). If the signal level is high for this pin, data will be sent to the printer. Data is not sent when the signal level is low.

---

**NOTE:**

If this signal level stays low for about 10 seconds while servicing a print job, NetWare print services reports an "off-line" condition.

#### 6 DSR (Data Set Ready input pin)



NetWare print services does not use this pin. Other print services may require a high signal level for both Pins 5 and 6 on the PC for proper data flow control. Hewlett-Packard recommends that you tie (solder) Pins 5 and 6 together to provide printing compatibility for other print services.

**7 SG (Signal Ground reference pin)**

NetWare print services uses this pin to provide a reference for signal levels. The PC uses Pin 5 on a 9-pin connector and Pin 7 on a 25-pin connector. The printer uses Pin 7.

**8 DCD (Data Carrier Detect input pin)**

Some PCs may require a high signal level on this pin to enable the PC to receive data from the printer. The XON/XOFF protocol will not function correctly with a low signal level. If you do not use the XON/XOFF protocol, the signal level on this pin can be high or low. The PC uses Pin 1 on a 9-pin connector and Pin 8 on a 25-pin connector.

Hewlett-Packard recommends that you maintain a high signal level on this pin by tying (soldering) it to another pin that has a high signal level. Tie Pin 1 on a 9-pin connector to either Pin 7 or Pin 4. Tie Pin 8 on a 25-pin connector to Pin 4 or Pin 20.

**9 DTR (Data Terminal Ready output pin)**

NetWare print services sets the signal level high for this pin (and the RTS pin) on the PC and keeps it in that state. The PC uses Pin 4 on a 9-pin connector and Pin 20 on a 25-pin connector. This signal can be used as a source for a high signal level to enable certain functions on some printers. If your printer cable connects this pin to a pin on the printer that requires a high signal level, printing will function properly. You can achieve the same results by following the steps in note 12.

---

**NOTE:**

Early versions of NetWare print services set the signal level high on this pin when sending data and set the signal level low when not sending data. The timing of the signal changes caused many problems with printers that require a high signal level for data input. Beginning with version 1.22R, NetWare Print Services constantly maintains a high signal level for this pin.

---

## Functions on the Printer Side of Serial Printer Cables

**1 TXD (Transmit Data output pin)**

## Cabling Printers

### Optimal Serial Cabling

The printer sends XON/XOFF data through this pin which connects to Pin 2 on a 9-pin connector and Pin 3 on a 25-pin connector on the PC. The printer uses Pin 2. This attaches the printer's transmit pin to the PC's receive pin.

#### 2 RXD (Receive Data input pin)

The printer receives data (the print job) through this pin which connects to Pin 3 on a 9-pin connector and Pin 2 on a 25-pin connector on the PC. The printer uses Pin 3. This attaches the PC's transmit pin to the printer's receive pin.

#### 3 RTS (Request To Send output pin)

The signal level for Pin 4 is always high as long as the printer is on. This signal can be used as a source of a high signal level to enable certain functions on some printers. We recommend that you tie (solder) Pin 4 to Pins 5, 6, and 8 on the printer; however, this may not work if your printer uses these pins differently.

#### 4 CTS, DSR, and DCD (Clear To Send, Data Set Ready, and Data Carrier Detect input pins, respectively)

One or more of these pins may be used to enable certain functionality on the printer. We recommend that you tie (solder) these pins to Pin 4 on the printer to maintain a high signal level (see note 12).

#### 5 DTR (Data Terminal Ready output pin)

The printer often uses this pin for the hardware handshaking signal. If the printer supports DTR handshaking, it should use Pin 20. However, some printers use Pins 11 or 19 (or other pins besides Pin 20) to implement their handshaking.

The handshaking pin should be connected to Pin 8 on a 9-pin connector and Pin 5 on a 25-pin connector on the PC (and also Pin 6 on either connector if you followed the recommendation in note 5).

## Pin Connectors

Use the following four illustrations to learn pin locations in 25-pin and 9-pin male or female connectors. Parallel and serial printers only use 25-pin connectors. PCs use 25-pin connectors for parallel ports and either 25-pin or 9-pin connectors for serial ports.

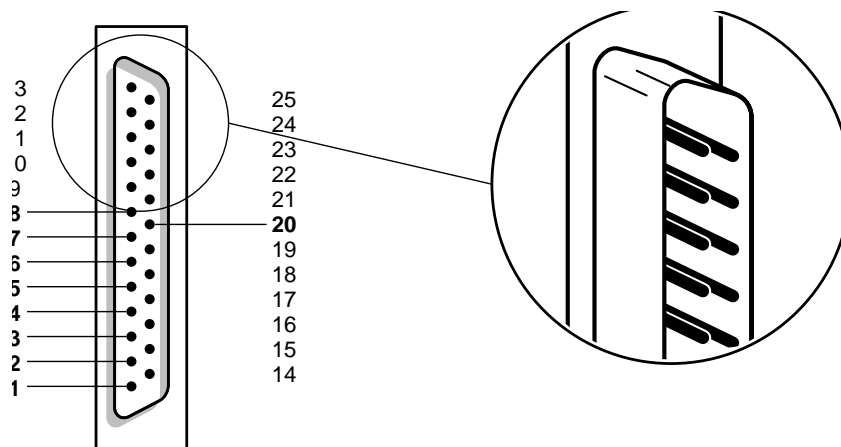


Figure B-6

25-Pin Male Interface

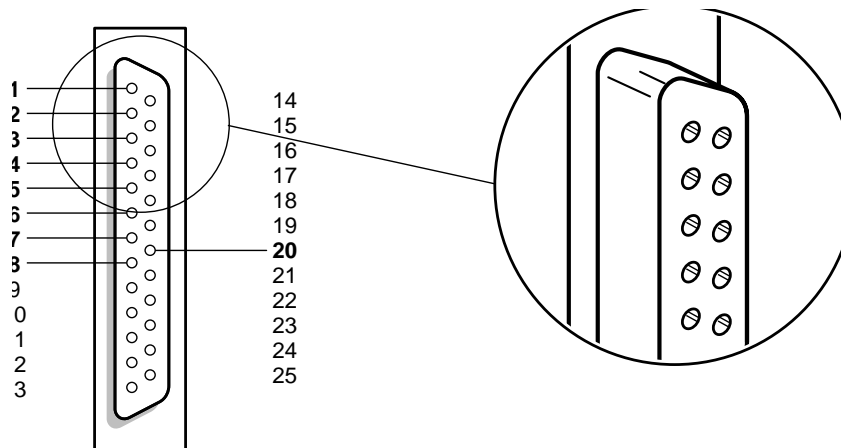
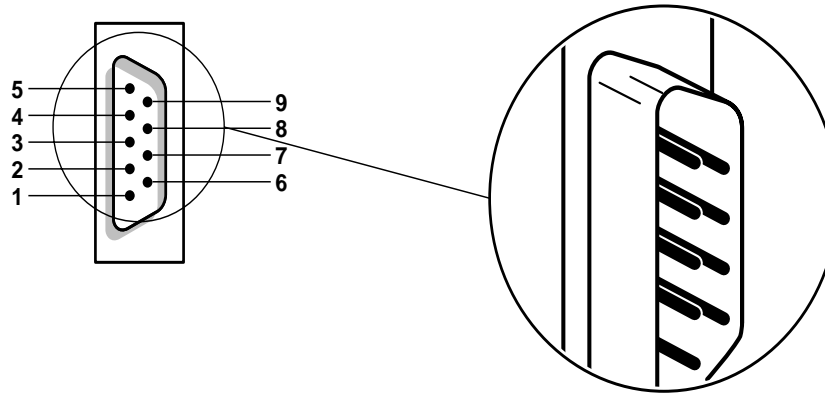


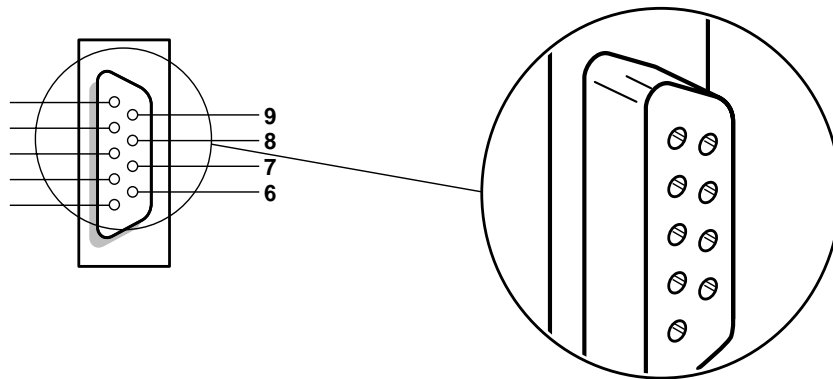
Figure B-7

25-Pin Female Interface

Cabling Printers  
Pin Connectors



**Figure B-8**      **9-Pin Male Interface**



**Figure B-9**      **9-Pin Female Interface**

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## Handshaking for Local Serial PostScript Printers

The following table lists common PostScript compatible printers and the type of handshaking they use for data exchange, XON/XOFF (software) or DSR/DTR (hardware). Use these tables as a guide when planning a network printing configuration.

**Table B-3**                      **Handshaking for Printers**

Printer Type	Serial XOn/ XOff	Serial DSR/ DTR	Parallel
LaserWriter	Yes	No	N/A
LaserWriter Plus	Yes	No	N/A
LaserWriter II NT	Yes	Yes	N/A
Personal LaserWriter II NT	Yes	Yes	Yes
LaserWriter II NTX	Yes	Yes	N/A
LaserWriter II f	Yes	Yes	N/A
LaserWriter II g	Yes	Yes	N/A
HP LaserJet II, IID	Yes	Yes	Yes
HP LaserJet IIp, IIIP, III, IIID	Yes	Yes	Yes
HP LaserJet IIIsi	Yes	Yes	Yes
HP PaintJet, HP PaintJet XL300	No	No	Yes

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**NOTE:** The LaserWriter and LaserWriter Plus can only use XOn/XOff (software) handshaking, not DSR/DTR (hardware) handshaking. The LaserWriter II NT must be set to DSR/DTR. This is done by downloading a PostScript program to the printer.

---

## Preparing Serial Cables

This section recommends some techniques for connecting serial printers to NetWare queues. For more information about serial printing, refer to Appendix D of the NetWare Print Services guide, Part No. 100-001419-001. That appendix contains some general rules and standard limitations of parallel and serial printing.

Generally, personal computers have either a male 9-pin (DB9) or male 25-pin (DB25) serial port. Serial printers generally have a female 25-pin serial port. Pinouts for both DB9 and DB25 ports are listed in the tables below.

### Printers Using Software (XOn/XOff) Handshaking

---

Computer with DB25 port	Printer with DB25 port
2	3
3	2
7	7
	4-5-6-8

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Computer with DB9 port	Printer with DB25 port
2	2
3	2
5	7
	4-5-6-8

---

### Printers Using Hardware (DSR/DTR) Handshaking

Computer with DB25 port	Printer with DB25 port
2	3
3	2
5-6	20
7	7
	4-5-6-8

Computer with DB9 port	Printer with DB25 port
2	2
3	3
6-8	20
5	7
	4-5-6-8

### Suggestions on Using Ready-Made Cables

If you cannot find cables that exactly fit the specifications in the above tables, follow these suggestions for adapting ready-made cables.

- The cable must have at least one ground pin. Use pin 7 for ground, rather than pin 1, when possible, but you can also use both. Often people solder pin 1 to the cable's aluminum sheathing, or to the hood itself.
- The cable must have lines for both CTS and RTS. These are pins 2 and 3 in most cables. This cable will be set up as a null modem cable, requiring pins 2 and 3 to be reversed.
- The cable needs only a ground pin (1 or 7) and CTS/RTS (2 and 3) in a null modem configuration, for an XOn/XOff (software handshaking) cable. For this type of cabling, standard two-pair 22 gauge untwisted pair will work. However, it is better to use at least a four-pair cable (in case you snag or crimp wires or decide you need a second printer). Check each newly made cable with an Ohm meter to detect any problems in its construction (bad crimp, crossover of signals

## Cabling Printers

### Preparing Serial Cables

on pins, and so on).

- A DSR/DTR (hardware handshaking) cable is essentially the same as XOn/XOff cable, but also requires the DSR and DTR pins (usually pins 6 and 20 on a DB25). These signals must be crossed in a null modem configuration.
- Hewlett-Packard's PSERVER and NPrinter programs query the status of pin 5. However, if you are printing directly, you will be using DOS, which generally queries pin 6. In order to use both of these pins, their signals must be "pulled high" (the voltage must be up for both pins). To pull these pins' signal high, we strongly recommend you tie pins 4-5-6-8 together at the printer end (but not the PC end). If you do not tie these pins together, you may find the printer mysteriously going off-line on the PSERVER console.
- If a cable that you purchase has additional live pins, find out what they are by using an Ohm meter or similar device. If none of the additional pins are using the pins mentioned above (ground, CTS, RTS, DSR, and DTR), then there is a good chance the cable will work. However, the only sure way to find out if a cable works is to test it in the actual configuration. A serial-diagnostic device, such as a breakout box, can be useful if you will be working with serial cables frequently.



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**C**

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**Optimizing Network Printing  
Performance**

## Overview

NetWare Services™ print services represent substantial performance gains over the performance of previous NetWare releases. However, network printing can be complex; printing performance on any network can be no faster than the throughput of the slowest component of the system.

Most performance problems you may encounter in a NetWare Services printing environment will result from causes unrelated to NetWare software. The following discussion identifies many of these causes and offers some recommendations for alleviating them.

## Parallel Versus Serial Ports

The primary factor that affects network printing speed is whether you connect the printers to parallel ports or serial ports. Parallel ports normally are about two times faster than serial ports at 9,600 baud, and up to four times faster than serial ports at 4,800 baud. Unless distance requires the use of a serial port, use the parallel port for best performance.

NPRINTER.EXE software for NetWare Services and RPRINTER for releases after NetWare 3.11 can send data to a printer's parallel port as fast as most laser printers can receive it. The current limit is about 35KB per second and will increase as new versions take advantage of new hardware that is likely to appear.

Serial ports are essentially limited by the baud rate used. In general, the data rate in bytes per second will approximate the baud rate divided by ten. At 9600 baud, the maximum data throughput is about 0.96K bytes per second. NPRINTER.EXE for 4.0 and RPRINTER for releases after NetWare 3.11 support 19.2K baud and 38.4K baud, which yield maximum data throughputs of about 1.92K bytes and 3.84K bytes per second, respectively.

## Estimating Data Transmission Rates

With bit-mapped graphic images, including text output from many word processing configurations, printer speed may be limited solely by how fast the data can pass through the workstation's print port to the printer.

Choose an interface that is fast enough to keep up with the bulk of the print jobs to be run on a particular printer. To do this, you will need to estimate the data transmission rate for that printer.

- For printers rated in characters-per-second (CPS), use the CPS rating for the preferred font and point size as the estimated data transmission rate. Assume that only print engine limitations will limit printer output.
- For page-per-second rated printers, estimate print data transmission this way:
  - For a representative print job, count the number of pages to be printed.
  - Print the job to a file and record the finished file size in bytes.
  - Divide the total pages (pages-per-job) by the pages-per-minute and multiply

## Optimizing Network Printing Performance

### Parallel Versus Serial Ports

by 60 to yield seconds-per-job.

- Divide the total bytes (bytes-per-job) by seconds-per-job to yield the bytes-per-second needed to keep up with the print engine.

For example, a six-page job would take a minimum of 60 seconds on a 6-page-per-minute laser printer. If the job “printed” 12,000 bytes (a likely low end for plain text), the target throughput is 0.2KB per second. The same job on a 17-page-per-minute printer would yield a target throughput of 0.6KB per second.

For another example, a one-page graphic of 1 million bytes would target the 6-page-per-minute printer at 100KB per second and would target the 17-page-per-minute printer at 283KB per second.

This method of estimating data transmission is not useful for PostScript or other page description language printing which requires print job formatting at the printer.

If possible, use an interface that can provide print data transmission rates as fast as the target throughput calculated above.

## Software Version Incompatibilities

The factor having the next greatest impact on printing performance after port type is the application and print driver version. To avoid difficulties with either, you should maintain a record of all versions, configurations, and type of applications for each of your installations.

Many printing problems can be resolved by updating to the latest print services files. These files are available on NetWire® services in NOVLIB Library 06. They are called PU4xXX.EXE and PS4xXX.EXE. The XX in the filename represents a number that increments each time the files are updated.

Test all updates and note changes in performance before distributing new versions to end users.

## **Document Type**

The third most important factor affecting printing performance is the type of documents you are printing. Files containing graphics require considerably more time to print than files consisting of straight text.

## Printer Configuration

### Polled versus Interrupt Mode

When configuring printers in NetWare Services, the default is polled mode. Polled mode, while theoretically not as fast as interrupt mode, still sends data faster than most printers can process it.

The advantage of polled mode is that it eliminates any possibility for interrupt conflicts with different hardware configurations. However, on complex printing setups with multiple printers running off a single workstation, polled mode may noticeably slow the execution of other tasks running on that workstation.

On a workstation that is running only NPRINT with no other operations assigned to it, interrupt mode should be faster than polled mode.

On a non-dedicated workstation, polled mode usually provides the best performance.

### Buffer Size

On workstations running NPRINT, throughput is affected by the buffer size defined for the printer. On dedicated workstations, no non-printing resources require memory on the machine, so larger buffers will speed up your printing without degrading the performance of other workstation tasks.

With no load on the network, maximum data rate can be achieved with any buffer size larger than 5KB. The default buffer size is 3KB. As network traffic increases, packet delays decrease throughput for any buffer size. For very busy networks, a buffer size of 20KB may be desirable to ensure having enough data stored to carry over long packet delays. The buffer size needed for maximum data throughput will range from 6KB to 20KB depending on the traffic load on any particular network.

On non-dedicated workstations, you should normally use the default buffer size of 3 KB. A high buffer size may slow down your workstation because it requires more memory, even though printing speed may increase.

## Printer Configuration

Try different settings to get best performance from your own setup. For example, if the printer is printing a lot of graphics data, you may want to increase the buffer size.

### Timer Tick Values

If your workstation is bogging down due to printing, increase the timing interval when you load NPRINT. This is done by adding the /T=<1-9> option to the NPRINT command.

The higher the tick setting, the faster the overall workstation performance, but with this increase in overall performance comes a decrease in printing performance.

A timer tick value of 2 takes twice as long to service a job as a timer tick value of 1. The allowable range is 1–9.

The timer tick value in polled mode is proportional to the length of time a job will take to print, assuming that the printer is capable of printing at the data throughput speed.

### Queue Sampling (Polling) Interval

Set the queue sampling (polling) interval in your printer configuration to fit your network's usage patterns

The delay between the time a job enters an empty queue and when it starts printing is determined by the printer's Sampling Interval setting. In NetWare Services, this parameter can be set in PCONSOLE or the NetWare Administrator. The default is 5 seconds. The maximum is 255 seconds.

When a printer is idle, the print server assigned to that printer queries the assigned queue at regular intervals. The sampling interval is the number of seconds between each query.

This interval also represents the maximum wait-to-start time for a print job once it enters an empty queue (assuming no other queues are involved and the printer is ready). On average, the wait will be half of the maximum time. For single-page, text-only jobs, this delay may be the bulk of the total wait time.



If such jobs are common, try lowering this setting. However, many idle printers making frequent queries can add noticeably to network traffic. A reasonable compromise must be reached, based on your network's configuration and usage characteristics.

## Network-Direct Print Devices

Most network-direct print devices have two modes: a queue-server mode (also called print-server mode) and remote-printer mode:

In NetWare 3™ software, queue server mode was often up to 20% faster than remote printer mode. However, in NetWare Services versions and releases after NetWare 3.11, remote printer modes are nearly as fast as queue server modes, making the trade-offs fairly even between the two modes.

Remote printer mode allows additional flexibility in controlling printer forms and in monitoring printers via PCONSOLE and the NetWare Administrator utility.

---

**NOTE:**

Using external network-direct hardware that still connects to the printer's parallel port will provide little improvement in printing speed over NPRINT on printers that cannot accept data faster than 35KB per second through the parallel port. This includes most current printers.

---

## Computer Type

Performance may be limited by slower computers. Use faster Pentium, 486 and 386 machines whenever possible on your system, especially for servers that will be handling the most traffic and workstations tied to fast printers.

NPRINTER for NetWare Services is a fast print utility. Using older, slower machines with fast printers can result in situations where printer data throughput is so high as to impose noticeable delays on foreground tasks.

These delays will be more noticeable on a 286 machine than on a 386 machine, and more noticeable on an 8086 machine than on a 286 machine. Slower clock speeds also make these delays more noticeable.

In such situations, these delays can be reduced or eliminated by setting the buffer size to 3KB to limit throughput. (This the default setting.) This can be done in PCONSOLE at the "Printer Configuration" screen. You can also do this in the NetWare Administrator.

The least influential factors for low-end network systems are the type of hardware you use (for the file server, print server, and workstation) and the NetWare print service configuration you select. By low-end, we mean a network where the print queue typically contains only one job at a time. You can increase printing speed by increasing the speed of the workstation CPU. However, remember that printing one job in a queue requires the application to finish before the print service takes over and sends the job to a printer.

Make sure that file server and workstation hardware are appropriate for the tasks to be performed. Upgrading any component, such as replacing a slow hard drive with a faster hard drive, can usually increase performance, but may not if the upgraded component is limited by some other bottleneck in the system.

The performance of NetWare servers can be degraded by excessive file activity. Adding random access memory (RAM) to a server for use by NetWare file caching may increase performance on busy servers.

## **Overburdened Servers or High Network Traffic**

Performance may be limited by too few servers or an excessive amount of traffic on the network itself. Additional servers may reduce the load on an overburdened server.

As network use increases, delays in delivery of data packets may increase.

- Increased Ethernet traffic increases packet-start delays and the possibility of packet collisions.
- Packet collisions require data to be retransmitted, possibly slowing delivery of print job data to the printer.
- On a token-ring network, traffic directly increases the delay in receiving tokens and the start of data transmission.

Proper planning of the total network using individual segments separated by routers and bridges can keep localized network traffic at reasonable levels.

Effective network administration, including the careful division of print resources among file servers and workstations to reduce multi-hop links on common paths, also can help reduce print job delays.

## Application and Driver Software

Generating print data is often the most time-consuming stage of the printing process. In the simplest situations, such as printing directly from DOS, data generation is essentially instantaneous. However, word processors may take from several seconds to several minutes per page to generate data, with delays increasing with the addition of graphics and complex fonts or formatting. Generating graphical data using AutoCAD software or other types of visualization applications may take from several seconds to many hours per page.

Using different drivers can result in dramatic differences in both the speed at which data is generated and the quality of the data generated. While sometimes these differences are a trade-off between speed and quality, there are other cases where one driver will supply both better quality and faster performance than another.

For example, AutoCAD output using an HPGL driver is usually several times faster than output using a PCL driver. If the target printer can use either driver, using the HPGL driver will increase data generation speed while providing output of equal or superior quality.

Be sure to match application and driver for best performance. When possible, choose application software and print drivers that are efficient for the tasks to be performed.

- Install the applications that take the most time and are used the most often on the fastest workstations available.
- Investigate the driver/application options available for a particular task. Be sure to consider drivers produced by third-party manufacturers.
- Test the efficiency of each option with one or two representative tasks.

Select the best possible combination from your tests.

## Printer and Data Type

Another important printing bottleneck is in the printer itself and the type of data being sent to the printer.

For most jobs on non-laser (head-pass cycle) printers and for printing plain text jobs on laser (page cycle) printers, the physical printer engine is usually the limiting factor. The speed of the printer is rated in pages per minute for page cycle (such as laser) printers and characters per second for head cycle printers.

When a page description language (PDL) such as PostScript is used, the formatter in the printer may be the limiting factor. The speed of PDL formatting varies greatly between printers. Unfortunately, the technical specifications for most printers seldom address this parameter.

Non-PDL print jobs that include a lot of graphics or formatting may send so many bytes per page that the interface may become the limiting factor. This is discussed in the following section.

It matters little whether you connect network printers directly to the NetWare server, to an external queue server, or to a workstation. One notable exception to avoid is running NetWare 2 core print services on a loaded 286 NetWare server.

Printing to a local printer from a network workstation is not much faster than printing to a network printer. The reason for this is that once printing port limitations are equalized, the application controls speed more than the network does. More precisely, in many instances the lag time between the print request and transmission on the network is greater than the transmission time on the network.

### Suggestions

Use a printer that is appropriate for your needs.

- Make sure laser, thermal transfer, and other advanced printers have NetWare print device definition (a .PDF file) available prior to purchase, unless one comes with the printer.
- If printing is frequent and if time and quality are paramount, a fast laser printer

may be necessary.

- If you use PostScript or another high-level PDL for the majority of your print jobs, the speed of the printer's formatter becomes more important.
- If the mix of your print jobs contains mostly plain text, the speed of the print engine (as described in pages per second or characters per second) is of primary importance.
- Advanced printers, such as laser and thermal transfer printers, may require complex drivers to handle printer control information. Since software is now available to drive most of these printers, there should be no problem.

Optimizing Network Printing Performance  
**Printer and Data Type**



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**D**

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**Troubleshooting Printing Problems**

## Overview

This appendix will assist you in resolving printing problems, which may exist on three levels:

**Hardware problems.** These problems involve hardware configurations or malfunctions. The printer might be out of paper, jammed, off-line, broken, or not cabled correctly.

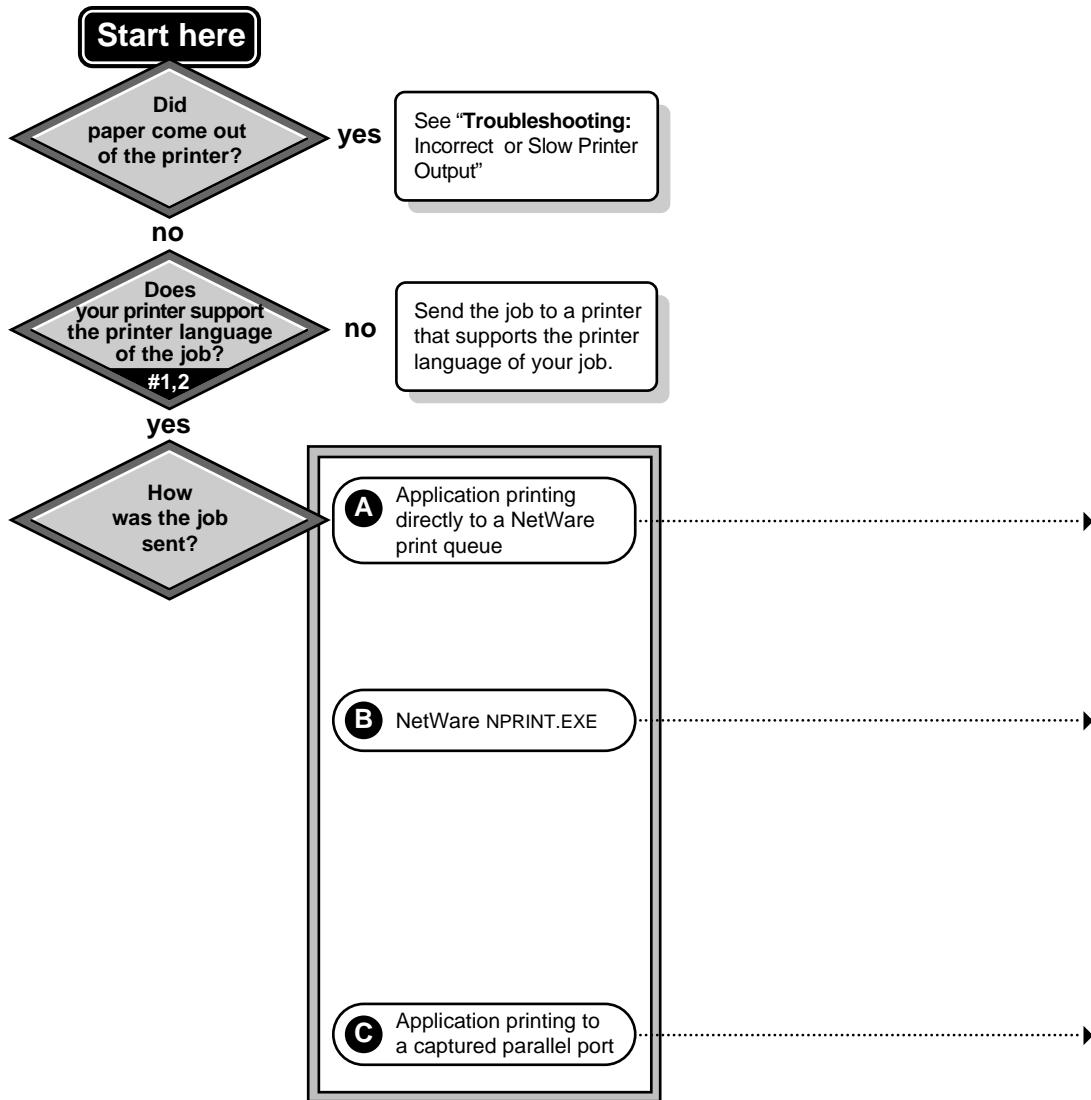
**Logical problems.** These problems involve improper or incomplete configurations or corrupted software. The queue might be assigned to the wrong printer, the queue might not be serviced by a print server, or the wrong printer number is used when loading NPRINTERR.

**Procedural problems.** These problems usually result from typing errors or unfamiliarity with the printing environment. The wrong port may be captured, the wrong queue may be specified, or the print job parameters may be taken from a different object than expected.

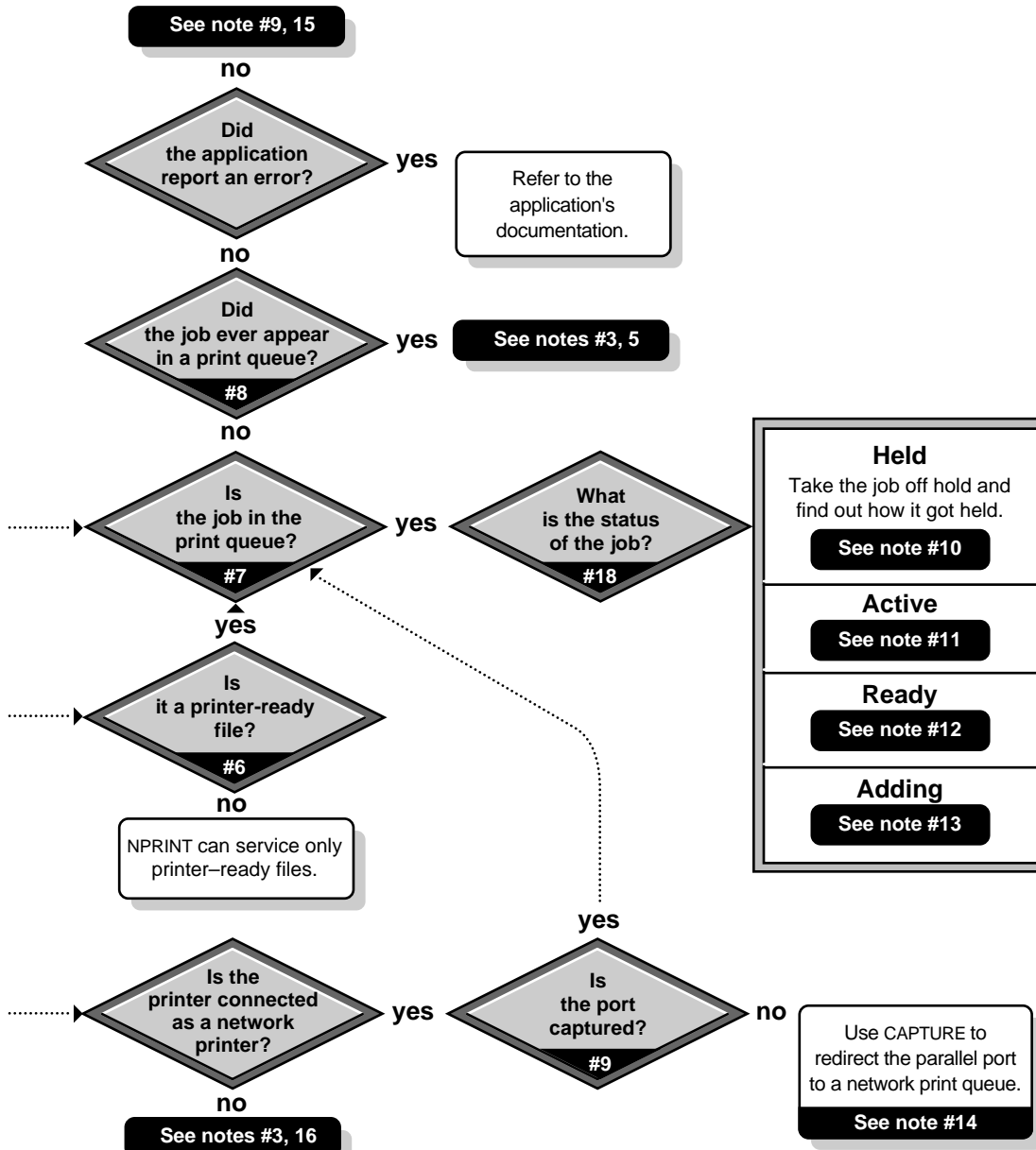
Regardless of the type of problem, the following information should help you isolate and resolve it. The flow charts and notes on the following pages provide a basic approach to resolving network printing problems.

If you cannot solve your printing problem and you decide to call your support representative, write down details such as error messages, procedure to reproduce the failure, configuration, etc. before you call. Referring to these notes should help technical support personnel solve your problem faster.

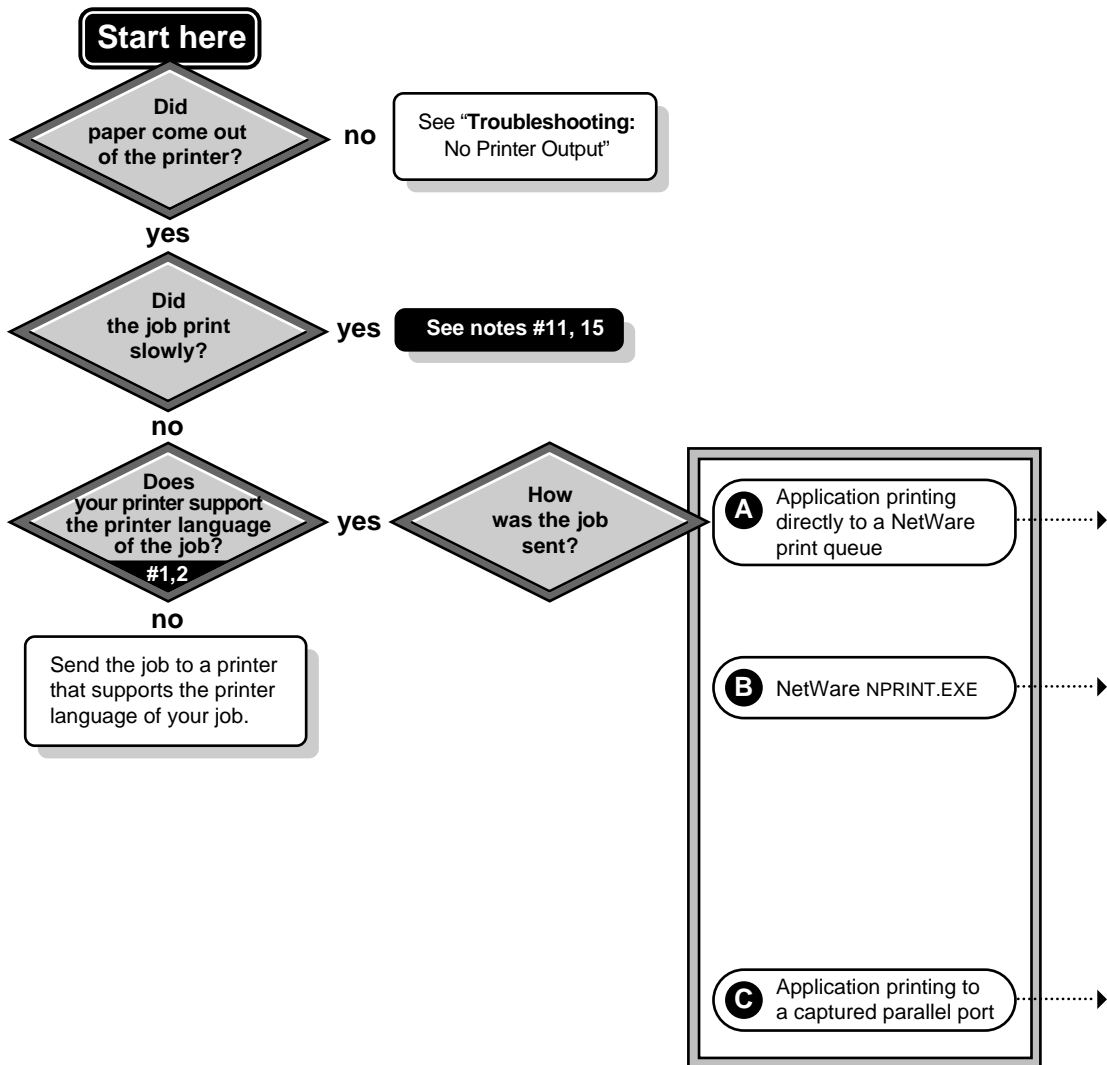
## Troubleshooting: No Printer Output



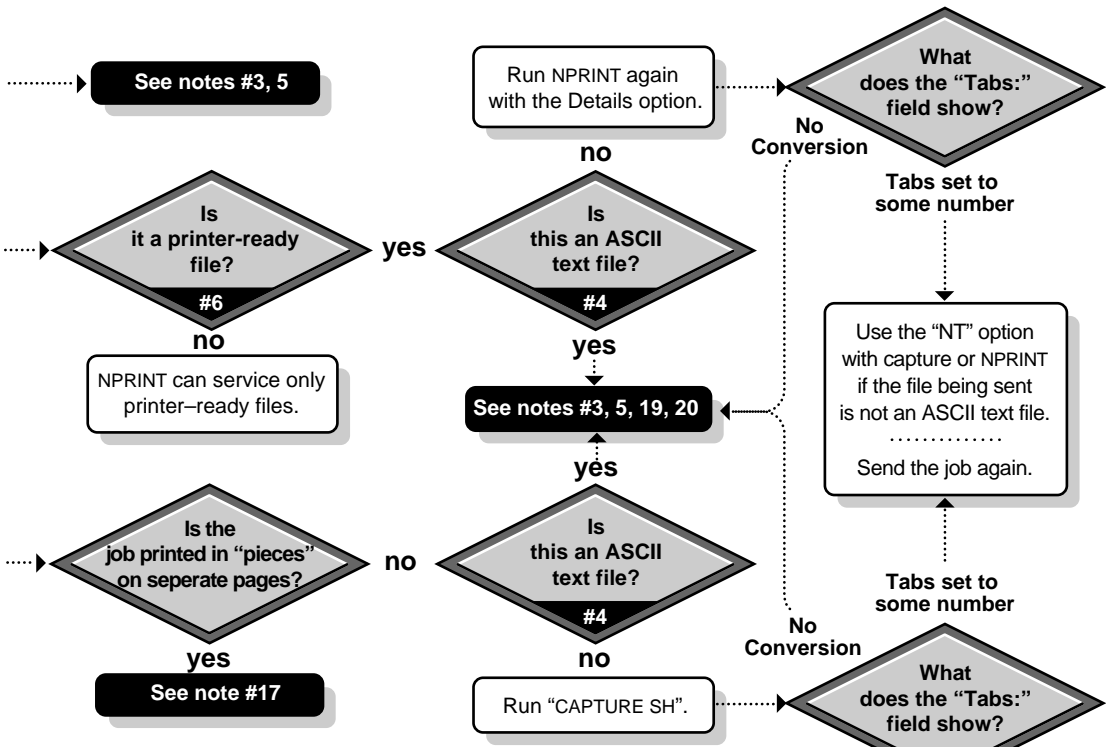
Troubleshooting Printing Problems  
Overview



## Troubleshooting: Incorrect or Slow Printer Output



Troubleshooting Printing Problems  
 Overview



## Troubleshooting Notes

### 1. Determining the Printer Language of Your Print Job

Print jobs can be generated in a variety of printer languages. See “Printer Languages” in Appendix A for a discussion of the various types. Different applications with printing capability will generate print jobs using different languages. Similarly, certain printers support some languages but not others. For example, many PCL printers do not support PostScript printing. (See Note 2 for more information.)

To be sure you are sending your print job to a printer that can support the language used by your application, you must determine the language used by your print job. Sending a print job to a printer that does not support the printer language used in that print job will produce unexpected results varying from no printer output to incorrect printer output.

In Windows and DOS applications, the print driver you are using in a specific application can provide information about the type of job the application creates when the document is printed. The name of the print driver can be seen in many applications by choosing the “Select Printer” option from the file menu.

- Print drivers that generate PostScript print jobs usually have either the word “PostScript” or the letters “PS” in their names.
- Print drivers that generate PCL print jobs occasionally have the letters “PCL” in their names but usually make no reference to the printer language they are using.

If your application does not allow you to select a print driver, it generates an ASCII text print job. In DOS, copying or redirecting a text file to an LPT port “prints” an ASCII text job. For example, `TYPE <filename> LPT1` or `DIR > LPT1`.

A large family of printer languages, the “page description languages” (PDLs), including PostScript, do not support printing this type of job. However, ASCII text files can be printed by non-PDL languages such as PCL.

The language of a print job can also be determined by examining the print job data. However, an understanding of the characteristics of printer languages is necessary in order to determine the language type. See Note 5 for information on examining print job data.

## **2. Determining the Printer Languages Your Printer Supports**

The printer languages your printer supports can be determined by reading your printer's documentation. Many printers can support multiple languages. For example, many printers now support both PCL and PostScript print jobs.

Commands can be sent to these printers to cause them to switch languages. For example, to print a PostScript job on a printer that supports both PostScript and PCL jobs, a command sequence may need to be sent with the job that tells the printer to "SwitchToPostScript." This command sequence can be referenced in a print job configuration and implemented by using the J= option with CAPTURE or NPRINT using the following syntax:

```
CAPTURE J=SWITCHPS
```

or

```
NPRINT J=SWITCHPS
```

Some printers can detect the language used by a print job and switch to the appropriate language automatically.

## **3. Checking Your Non-Network (Local) Printer Setup**

A printer will not function with NetWare print services if it does not function without NetWare print services.

To determine whether your printer is functioning properly, first print the job to the printer locally. If the printer is connected to a server, issue the server DOWN command and bring the machine up as a workstation so you can print the job to a local printer. This will determine whether the problem exists within network printing.

Check for the following problems:



### **Insufficient Printer Memory**

During printing, the printer must have sufficient memory to hold the entire page to be printed. If it does not, it will print the part of the page it has in memory and continue printing on the next page. This problem occurs when printing large graphics jobs.

- Add more memory to the printer, if possible.
- If your application allows, configure it for the amount of memory that your printer has. This will allow the application to send data to the printer in a more manageable format.

### **Incompatible Printer Language Versions**

If unexpected strings or characters appear in your printer output, and you are sure that the printer language in your print job is the same as the language supported by your printer (see Notes 1 and 2), you may have different language versions.

If the language version used by the print driver in your application is newer than the version your printer can interpret, some commands may not be recognized by your printer. This can cause unexpected strings or characters to appear randomly throughout your print job.

Try using an older language version to create your job. For example, if this symptom occurs while printing to an HP LaserJet IIIsi and the print driver you are using is for an HP LaserJet 4si, try using a printer driver for an HP LaserJet IIIsi.

### **Interrupt Conflicts**

If your print job is printing slowly, you may have an interrupt conflict between the port and another device.

Reconfigure your printer to run in polled mode. Polled mode is the default in NetWare Services software. If printing performance improves, either continue using polled mode or configure your printer to use a unique interrupt. See “Polled versus Interrupt Mode” in Appendix C for more information.

### **Cabling Problems**

If random, unexpected characters appear in your printer output, your printer cables may be too long or improperly attached. Make sure that everything is connected properly and that the cabling is within specified lengths and in good condition.

For more information on cabling, see Appendix B, “Cabling Printers.”

### **Incorrect Printer Configuration**

Run the configuration program supplied with the printer, or use DOS commands like `MODE` or `PRINT` to check that the printer settings are accurate. For example, if the printer is cabled to `LPT2`, make sure to send print jobs to `LPT2`. Use the documentation supplied with the printer to check other necessary settings.

If you cannot get a printer cabled to a workstation to print locally, check the workstation's `NET.CFG` file to see if it contains the following line:

```
LOCAL PRINTERS=0
```

If `NET.CFG` contains this line, temporarily remark it so it is not executed (place a pound sign `#` in front of it) or change the line to read as follows:

```
LOCAL PRINTERS=number
```

(The number should be the number of printers attached to the machine).

### **Faulty hardware**

The printer may be failing and need service or replacement. If necessary, have faulty hardware repaired. See Appendix A, “Setting Up and Servicing Printers” for more information.

## **4. Determining Whether Your Job is an ASCII Text File**

Print jobs that are not ASCII text files should be printed as “Byte Stream” files. ASCII text files may be printed as “Text” files. The difference between these two types is whether tab conversion is enabled.

Tab conversion means that as a job is printed, a tab character is replaced by a specified number of spaces. Tab conversion takes place if “File contents” is set to “Text” in the print job configuration or if “Tabs” is set in the `CAPTURE` command.

If the jobs to be printed are ASCII text files, the “File contents” should be set to “Text.” “Tab size” can then be set to 1 through 18. This is the number of spaces that will be substituted for each full tab that is encountered. This is set in the CAPTURE command using the T= parameter.

For example, to set the tab conversion to 6 spaces, the command is as follows:

```
CAPTURE T=6
```

Any job that is not an ASCII text file should be printed with “File contents” set to “Byte Stream.” This is because tab conversion usually causes graphics to be printed incorrectly. Text from most word processors is printed as graphics.

“Byte Stream” is the default setting. It can be manually set in the CAPTURE command using the NT (No Tabs) parameter. The command is as follow:

```
CAPTURE NT
```

To determine if a file is an ASCII text file, the DOS TYPE command can be used to look at it. For example, the syntax for checking the AUTOEXEC.BAT file is as follows:

```
TYPE AUTOEXEC.BAT
```

If the file can be read properly when it is displayed, it is probably an ASCII text file.

Another way to determine this is to try printing the file. If the file contains tabs, yet prints out legibly and in the proper format, it is an ASCII text file.

If you have determined that the job is text, yet it will not print properly with “File contents: Text” (or T=<1 through 18> in the CAPTURE command), change the setting to “File contents: Byte Stream” (or NT in the CAPTURE command.)

## **5. Checking the Contents of Your Job for Incorrect Control Sequences**

Your print job may contain incorrect functions or control sequences. The following procedure explains how to view the contents of your job using PCONSOLE.

Use a text editor to view the print job.

## Troubleshooting Printing Problems

### Troubleshooting Notes

#### Procedure

- 1 Send the print job to a print queue using CAPTURE or NPRINT with the HOLD option.
- 2 At PCONSOLE's "Available Options" menu, select "Print Queues." Select the print queue servicing the print job.
- 3 At the "Print Queue Information" menu, select "Information." Write down the "Object ID" number. This is your print queue number.
- 4 Exit PCONSOLE and return to DOS.
- 5 Go to the QUEUES directory. The default location is SYS:QUEUES.
- 6 Change to the queue directory. The name of the queue directory is the Object ID followed by .QDR.
- 7 Type DIR to see a list of the print jobs in the queue.

Print jobs are listed by ID number in the queue.

- 8 Using FILER or a standard text editor, bring up the print job so that you can view all data and control sequences in the job.

If there are multiple jobs in the queue, you will have to look at each one until you find the correct job.

Control sequences assigned to the job by NetWare are attached to the beginning and/or end of the job by the CAPTURE or NPRINT utilities. The control sequences to be attached to the print job are determined by the "Device" and "Mode" fields of the print job configuration that was used when CAPTURE or NPRINT were run.

The "Details" (D) option of CAPTURE or NPRINT will show which print job configuration is being used.

Print job configurations can be created or modified using PRINTCON or the NetWare Administrator utility. The print job configuration may reference a print device definition (Device definitions can be created or modified using PRINTDEF or the NetWare Administrator utility.)

- 9 Refer to the documentation for your printer to verify that the control sequences in your job are correct for the printer.

Some PostScript print device definitions include modes that are larger than the buffer size for the print header, which is 64 bytes. This buffer can be increased up to 255 bytes by adding PRINT HEADER=number to the NET.CFG file.

CAPTURE uses this buffer. NPRINT does not.

## **7. Determining Whether Your Job is Currently in the Print Queue**

In PCONSOLE, select the queue from the “Print Queues” list and then “Print Jobs.” The name of the user who sent the job is in the “Name” column.

If the job is not shown here, either it did not reach the queue or was sent to the printer and then removed from the queue.

## **8. Determining Whether Your Job Ever Reached the Print Queue**

If your print job was sent to the queue but nothing is currently in the queue, you must determine whether the job did not reach the queue or whether it reached the queue and then disappeared without printing.

In order to determine this, you must disable the operator flag for the print queue titled “Allow service by current print servers” using PCONSOLE or the NetWare Administrator utility.

To access the queue operator flags in PCONSOLE, select the “Status” option from the “Print Queue Information” menu. In the NetWare Administrator utility, the flags are on the “Details” page of the Queue object. Disabling this operator flag essentially puts the queue on hold.

Next, print the job again. You can now look to see if the job is in the queue by selecting “Print Jobs” from the “Print Queue Information” menu in PCONSOLE or by selecting the “Job List” page of the Queue object in the NetWare Administrator utility.

If the job does not show up here, it never reached the queue.

## **9. Determining Where Your Job Was Sent**

If the job was printed to a captured port, type `CAPTURE SH` at the command line. The name of the queue being captured to will be shown on the first line.

If the job was printed using `NPRINT`, type `NPRINT /D (Details)` at the command line. This will show the print job configuration being used. (Note that a slash must precede the “Details” option when using `NPRINT`. The slash is not necessary when using `CAPTURE`.)

You can determine which printer or queue is specified in this job configuration using PRINTCON or the NetWare Administrator utility.

In Windows, you can determine where the job is being sent by opening User Tools and clicking on the printer icon. The printer or queue will be shown next to the port you printed to from the application.

The parameters used by CAPTURE and NPRINT are determined by the default print job unless they are overridden in the command. The default print job is configured using PRINTCON or the NetWare Administrator utility.

## 10. Activating Jobs on “Hold” Status

To release jobs on operator or user hold using PCONSOLE, select the queue from the “Print Queues” list and then select “Print Jobs.” Select the job that is held and change the “User hold” and “Operator hold” fields to “No.”

To accomplish the same task using the NetWare Administrator utility, the “User hold” and “Operator hold” fields can be found by selecting “Job Details” in the “Print Queue” dialog.

To release jobs on operator or user hold using the NetWare Administrator utility, select “Job List” from the “Print Queue” dialog. Highlight the print job and select “Resume.”

The only way the print job could have been placed on operator hold is for a print queue operator to have manually placed the job on hold using PCONSOLE or the NetWare Administrator utility.

The print job could have been placed on user hold manually by the user or queue operator using PCONSOLE or the NetWare Administrator utility, but also could have been placed on hold automatically.

There are several ways a print job can be placed on hold automatically:

- User Tools. Under the NetWare Printer Connections window, select “LPT Settings....” The first parameter in the list is Hold.
- CAPTURE. Issue the CAPTURE command with a HOLD option.
- NPRINT. Issue the NPRINT command with a HOLD option.

## 11. Troubleshooting Jobs Stuck in “Active” Status

If your print job is stuck in “Active” status, one possibility is that the job is being sent slowly. You can usually determine this on a laser printer if the light is blinking to indicate that it is receiving data.

If you press the form feed button on the printer, the printer should print part of the page. (Some graphics jobs may be binary files, which require that the / B option be used with CAPTURE.)

If you are using a serial printer, some possible causes are as follows:

- The baud rate is low.
- The cable or port is bad.
- XON/XOFF needs to be enabled or disabled.
- The printer may have been turned offline.
- If the printer is configured to use interrupts, there may be a conflict. This will cause slow printing. The configuration of the printer may need to be changed to polled mode.

If you are using a parallel printer, some possible causes are as follows:

- The cable or port is bad.
- The printer may have been turned offline.
- If the printer is configured to use interrupts, there may be a conflict. This will cause slow printing. The configuration of the printer may need to be changed to polled mode.

Another possibility is that the printer has been paused or is out of paper. This can be determined in PCONSOLE or the print server console screen.

## 12. Troubleshooting Jobs Stuck in “Ready” Status

If your job is stuck in “Ready” status, the printing configuration may not be complete:

- The print server may not be set up to service the printer.
- The print server may not be assigned to the queue.
- The queue may not be assigned to the printer.
- An operator flag may be set for the queue in PCONSOLE to not allow service by

## Troubleshooting Printing Problems

### Troubleshooting Notes

current print servers. Select the queue and then “Status” from the “Print Queue Information” menu.

Other possibilities include the following:

- The job may be waiting for a new form to be mounted.
- Other jobs may be ahead of this job in the queue.
- The printer may be servicing another queue with a higher priority.
- The printer may have been stopped. Check the status of the printer in PCONSOLE or at the print server console.

### **13. Troubleshooting Jobs Stuck in “Adding” Status**

One reason for jobs to appear stuck while the status is “Adding” is that the application may be printing slowly. This is likely to happen when the application is generating graphics to be printed.

Another possible explanation is that the CAPTURE command includes the options NA (No Autoendcap) and TI=0 (No Timeout). If this is the case, status will remain “Adding” until an End Capture command (CAPTURE EC) is issued.

### **14. Using CAPTURE to Redirect Parallel Ports to Network Queues**

Many applications are not designed for network printing. CAPTURE is a command line utility that allows you to print from applications not designed for NetWare print services. It sets up redirection parameters for printing output from your workstation. The NetWare DOS Requester then redirects the workstation output from an LPT port to the specified network printer or file.

For complete information on using CAPTURE, see “Using CAPTURE” in Chapter 4.

### **15. Troubleshooting Jobs Printed Slowly**

There are several explanations for slow printing.

- The application may be generating the output for the printer. This can cause a long delay before the job is even sent to the queue. Look at the status of the



application to determine if this is the case.

- Interrupt conflicts may exist between the port and another device. Configure the printer for no interrupts (polled mode).
- The baud rate may be slow (serial printer).
- XON/XOFF may need to be enabled (serial printers).
- Your hardware (cable, port, printer) may be faulty.
- The /B parameter may be needed with CAPTURE if the job is a binary file.

## **16. Determining Whether a Printer is Connected as a Network Printer**

In order for a printer to be accessed by the network, ALL of the following must occur:

- The printer must be properly connected to a server or workstation (or to the network cabling with a network-direct device).
- The printer must be functional as a local printer (unless it is a network-direct printer). If a printer will not work locally, it will not work as a network printer. See Note 3 for more information.
- The printer must be configured and have a queue assigned to it (using Printer Setup, PCONSOLE, or NetWare Administrator).
- The server or workstation the printer is connected to must have the port driver loaded (NPRINTER).

## **17. Troubleshooting Jobs Printed in Pieces on Separate Pages**

A print job can be broken and printed on separate pages for several reasons:

- The CAPTURE timeout setting may be too short. If there is a pause in the flow of data between the application and the port, and it is long enough for the timeout to end the job, the next data that comes will be sent to the queue as a new job. The new job will be printed on a new page because a form feed is issued.
- Misinterpreted control characters in a job may also cause a form feed in the middle of a job. Sometimes this problem can be corrected by sending the job as Byte Stream (No Tabs).
- The printer may not have sufficient memory to hold the entire page to be printed. If it does not, it will print the part of the page it has in memory and continue

printing on the next page. This problem occurs when printing large graphics jobs.

### **18. Determining the Status of Your Print Job**

To determine the status of your print job using Printer Setup, click on the appropriate print queue icon in the window. Click on “NetWare” and select “Job List.”

To determine the status of your print job using PCONSOLE, select “Print Jobs” from the “Print Queue Information” menu. Look in the “Status” field for the job.

To determine the status of your job using the NetWare Administrator utility, click the “Job List” page in the “Print Queue” dialog and look in the “Status” field.

### **19. Solving NetWare Printing Problems When Running Windows**

Sometimes printing problems that occur when running Windows can be resolved by any combination of the following, which are set in the “Printers” option in the Windows Control Panel:

- Change the printer port connection to print to “LPT1.DOS” instead of “LPT1.” This can help to speed up printing.
- Disable “Fast Printing Direct to Port” if you get the error “Print device is already in use.” (This action may slow printing slightly.)
- Disable Print Manager. This can help to speed up printing but disables the Windows spooler.

Printing problems may be corrected with User Tools by one or both of the following techniques:

- Disable Tabs using User Tools.
- Match the banner type with the Windows printer driver type (PostScript or Text).

### **20. Isolating Bad Hardware or Corrupt Software**

If the previous notes do not yield a solution to your printing problem, you may have bad hardware or corrupted printing software.

The following suggestions will help you to isolate the specific location of the problem in your printing setup.

### Procedure

- 1 Use a different method to send the job to the queue.

If a different method works, there may be a problem with CAPTURE.EXE, NPRINT.EXE, or the options that are being used with them.

If you are currently using CAPTURE, try NPRINT. If you are currently using NPRINT, try a DOS COPY to a captured port. Make sure you use similar options with CAPTURE and NPRINT.

- 2 Print the job using CAPTURE or NPRINT using the HOLD option.

- 3 Find the print job name in the queue as described in Note 5.

- 4 If it is a text file, view the contents of it using FILER.

If the job is corrupt, the problem occurred before or while the job was written to the queue.

- 5 If the job is not corrupt or you cannot tell because it is graphics, make a reference file by copying the job file to a different name or directory.

- 6 Allow the job to print by removing it from hold status.

- 7 Print the reference file by using PCONSOLE or NPRINT, or by copying it to a captured port.

---

**WARNING:**

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**When printing the reference file, do not use a print job configuration that specifies a mode. This will cause the control codes to be duplicated in the job.**

- 8 Compare the printout of the reference file to the first printout.

If the two printouts are different, the job is being corrupted after it is written to the queue. There may be a problem with the printer hardware (port, cable, printer) or the print server (PSERVER), port driver (NPRINTER), or printer configuration.

- 9 If the printouts are the same, print the same job from the application again using the HOLD option.

- 10 Use DOS COMP, MS-DOS FC, or a similar utility to compare the reference file and the job that has been reprinted from the application.

If these files do not compare, the job is being corrupted before or during being written to the queue.

## Troubleshooting Printing Problems

### Troubleshooting Notes

- 11** If a NetWare utility appears to have a problem, recopy it to ensure that it is not corrupt.

If the problem persists, contact your support representative to see if there is an updated version of the utility.

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