

Contents

How to Use This Manual

Overview	xi
Command Syntax Conventions	xii
NET.CFG FileSection Headings and Parameter Settings.	xiii
User Comments.	xiv

1 Introduction to NetWare Print Services

Overview of Network Printing	1
Step 1: Print Data Is Generated and Transmitted	2
Step 2: Data Is Redirected to a Network Queue	3
Step 3: Data Is Stored in a Print Queue.	4
Step 4: Print Data Is Transmitted to a Printer Station	5
Step 5: Print Data Is Transmitted to the Printer	5
Step 6: The Printer Formats the Data and Completes the Print Job	6
Using the NetWare Printing Utilities.	7

2 Planning and Setting Up NetWare Print Services

Planning Your NetWare 4 Printing Setup	9
NetWare 4 Printing Enhancements	9
Other Changes You Must Plan For	11
Typical Network Printing Setups	14
Setting Up NetWare Print Services	18
Using Print Services Quick Setup in NetWare Administrator	18
Using Quick Setup in PCONSOLE	19
Additional Startup Tasks	21
Tailoring Your Printing Configuration	23
Printing Task List	25
Printing from Applications Not Designed for Network Printing	26
Additional Information.	28

3 Managing Print Services with the NetWare Administrator Utility

Overview	29
--------------------	----

Requirements	29
Printing Tasks Handled through NetWare Administrator.	30
Using the Browser	32
Parts of the Browser	32
How Objects Appear	34
Printing Your Directory Tree Layout	34
Using the Printing Object Dialogs	36
Parts of the Object Dialogs	37
Pages of the Object Dialogs	37
Setting Up Print Services with NetWare Administrator.	39
Creating Print Queues	40
Creating Printers	44
Assigning Print Queues to Printers.	46
Creating Print Servers	47
Assigning Printers to Print Servers.	50
Adding Printing Objects	51
Modifying NetWare Print Services	53
Moving Printing Objects	53
Viewing the Assignments for Printing Objects	54
Renaming Printing Objects	54
Deleting Printing Objects	55
Print Queue Options	55
Assigning Queue Operator Flags	55
Viewing or Modifying Print Jobs	55
Viewing Details of Print Jobs	56
Viewing or Changing the List of Users for a Print Queue	58
Viewing or Changing the List of Operators for a Print Queue	58
Printer Options	59
Configuring Printers	59
Viewing and Modifying a Printer's Status	63
Changing Printer Type	67
Setting Up Printer Event Notifications	68
Changing a Print Queue's Priority	70
Designating a New Default Print Queue	70
Specifying Printer Features	71
Print Server Options	74
Viewing Your Printing Layout and Status	74
Enabling and Viewing the Print Server Auditing Log	76
Adding, Changing, and Removing Print Server Passwords	79
Unloading Print Servers	79
Working with Print Job Configurations	80
Creating Print Job Configurations	80
Viewing or Modifying Print Job Configurations	85
Selecting a Default Print Job Configuration	85

Working with Printer Forms	86
Creating Printer Forms	87
Mounting Printer Forms	89
Viewing or Modifying Printer Forms	90
Deleting Printer Forms	91
Working with Print Device Definitions	92
Purpose of Print Device Definitions	92
Creating Print Device Definitions	93
Viewing or Modifying Print Device Definitions	94
Creating or Modifying Print Device Functions	96
Importing Print Device Definitions	97
Exporting Print Device Definitions	99
Working with Print Device Modes	100
Creating Print Device Modes	100
Viewing or Modifying Print Device Modes	102
Referencing Bindery Queues	103

4 Managing Print Services Using PCONSOLE

Overview	107
New PCONSOLE Features for NetWare 4	107
Printing Tasks Handled through PCONSOLE	108
Modifying NetWare Print Services	110
Creating or Modifying Print Queues	110
Creating or Modifying Printers	111
Creating or Modifying Print Servers	112
Print Queue Options	113
Assigning Queue Operator Flags	113
Creating or Manipulating Print Jobs	113
Setting Print Job Parameters	114
Printer Options	117
Configuring Printers	117
Viewing or Modifying a Printer's Status	119
Changing Printer Type	123
Assigning Multiple Print Queues and Printers	124
Mounting Printer Forms	125
Print Server Options	126
Viewing a Print Server's Status	126
Changing a Print Queue's Priority	127
Designating a New Default Print Queue	128
Adding, Changing, and Removing Print Server Passwords	129
Enabling and Viewing the Print Server Auditing Log	129
Unloading Print Servers	132
Using PCONSOLE in Bindery Mode	133

Using Quick Setup to Create Bindery Printing Objects.	133
Referencing Bindery Queues.	135
Understanding Bindery Reference Queues and Reference Print Servers . . .	136
Additional Information	137

5 Sending Jobs to Network Printers Using CAPTURE and NPRINT

Overview	139
Using CAPTURE.	140
Printing Tasks Handled through CAPTURE	140
Command Syntax	140
Command Parameters	142
Printing to a Network Printer	146
Printing to a Different Directory Services Context	149
Printing with Print Job Configurations in a Different Context	150
Adding CAPTURE to Login Scripts.	151
Tips on Using CAPTURE	153
Using NPRINT	154
Printing Tasks Handled through NPRINT	154
Command Syntax	154
Command Parameters	156
Tips on Using NPRINT	158

6 Setting Up and Servicing Print Servers

Overview	161
New Print Server Features for NetWare 4	162
Requirements	165
Using PSERVER.NLM	166
Printing Tasks Handled through PSERVER.NLM	166
Command Syntax	166
Managing the Print Server from the Console.	167
Managing Printers from the Print Server Console	170
Servicing NetWare 4 Clients and Queues with a NetWare 3 Print Server	175
Servicing NetWare 3 Clients and Queues with a NetWare 4 Print Server	175
Using Third-Party Network-Direct Print Devices with NetWare 4	177
Remote Printer Mode.	178
Queue Server Mode	179
Setting Up Printing on a Network Using SFT III	181
SFT III Printing Setup A (Most Fault Tolerant)	182
SFT III Printing Setup B (Less Fault Tolerant)	183
Troubleshooting Print Server Problems	185
Additional Information	185

7 Setting Up Printers Attached to Workstations or Servers

Overview	187
New NPRINTER Features for NetWare 4.	189
Requirements	190
Using NPRINTER.EXE	190
Printing Tasks Handled through NPRINTER.EXE	191
Command Syntax	192
Running Port Drivers from Local Drives	193
Running Port Drivers on DOS or MS Windows Workstations.	193
Loading Port Drivers on OS/2 Workstations	196
Unloading Port Drivers on OS/2 Workstations	199
Using NPRINTER (Windows 95)	199
Sharing a Printer Attached to a Windows 95 Workstation.	199
Managing NPRINTER (Windows 95) and the Shared Printer.	203
Running NPRINTER Manager from a Local Drive	204
Setting Up Network Printing on a Windows 95 Workstation	206
Using NPRINTER.NLM	207
Printing Tasks Handled Through NPRINTER.NLM	207
Loading NPRINTER.NLM	208
Using Network-Attached Printers	209
Troubleshooting Tips for Administering Printer Stations	210
Additional Information	214

8 Creating and Managing Print Job Configurations

Overview	215
New Print Job Configuration Features for NetWare 4.	215
Printing Tasks Handled through PRINTCON	216
Working with Print Job Configurations	217
Location of Print Job Configuration Databases	217
Creating Print Job Configurations	217
Creating Bindery Print Job Configurations	218
Deleting Print Job Configurations	220
Renaming Print Job Configurations	220
Viewing or Modifying Print Job Configurations	220
Print Job Configuration Parameters	221
Additional Information	223

9 Working With Print Device Definitions and Printer Forms

Overview	225
Printing Tasks Handled through PRINTDEF	227
Working with Print Device Definitions	227
Viewing Print Device Definitions.	227

Viewing Functions for Print Device Definitions	228
Creating or Modifying Print Device Definitions	229
Importing Print Device Definitions	231
Importing Print Device Definitions from Another NetWare Server	232
Exporting Print Device Definitions	233
Working with Print Device Modes	236
Creating Print Device Modes	236
Viewing Print Device Modes	239
Modifying Print Device Modes	239
Working with Printer Forms	241
Creating or Modifying Printer Forms	241
Viewing a List of Forms	243
Viewing Form Definitions	243
Mounting Printer Forms	244

10 Using NETUSER, PSC, and PUPGRADE

Using NETUSER	247
Printing Tasks Handled through NETUSER	248
Additional Information	248
Using PSC	249
Printing Tasks Handled through PSC	249
Command Syntax	249
Command Parameters	250
Tips on Using PSC	251
Using PUPGRADE.NLM	251
Printing Tasks Handled through PUPGRADE.NLM	252
Upgrading NetWare 3 Printing Objects with PUPGRADE	253
Additional Information	255

A Setting Up and Servicing Printers

Printer Characteristics	257
Selecting the Best Type of Printer for Your Setup	258
Parallel Printers	258
Serial Printers	258
Printer Languages	259
Printing with PostScript	260
Improving Printer Performance	262
Preventing Printer Problems	262
Preventing Problems with Laser Printers	263
Preventing Problems with Dot Matrix Printers	263
Troubleshooting Printers	264
General Printer Troubleshooting	264

Troubleshooting Laser Printers . . . . .	.265
Troubleshooting Dot Matrix Printers. . . . .	.266
Troubleshooting Network-Related Printer Problems . . . . .	.267

B Cabling Printers

Overview . . . . .	.269
Parallel Printers . . . . .	.270
Serial Printers . . . . .	.271
Optimal Serial Cabling . . . . .	.274
Functions on the PC Side of Serial Printer Cables . . . . .	.275
Functions on the Printer Side of Serial Printer Cables . . . . .	.278
Pin Connectors . . . . .	.279

C Optimizing Network Printing Performance

Overview . . . . .	.281
Parallel Versus Serial Ports . . . . .	.281
Software Version Incompatibilities. . . . .	.283
Document Type . . . . .	.283
Printer Configuration . . . . .	.284
Polled versus Interrupt Mode . . . . .	.284
Buffer Size. . . . .	.284
Timer Tick Values . . . . .	.285
Queue Sampling (Polling) Interval. . . . .	.285
Network-Direct Print Devices . . . . .	.286
Computer Type . . . . .	.286
Overburdened Servers or High Network Traffic. . . . .	.287
Application and Driver Software. . . . .	.288
Printer and Data Type. . . . .	.289

D Troubleshooting Printing Problems

Overview . . . . .	.291
Troubleshooting Flow Charts . . . . .	.291
Troubleshooting Notes . . . . .	.296
1. Determining the Printer Language of Your Print Job . . . . .	.296
2. Determining the Printer Languages Your Printer Supports. . . . .	.297
3. Checking Your Non-Network (Local) Printer Setup. . . . .	.298
4. Determining Whether Your Job is an ASCII Text File . . . . .	.300
5. Checking the Contents of Your Job for Incorrect Control Sequences . . . . .	.301
6. Determining Whether Your Job is Currently in the Print Queue . . . . .	.303
7. Determining Whether Your Job Ever Reached the Print Queue . . . . .	.303
8. Determining Where Your Job Was Sent . . . . .	.304
9. Activating Jobs on “Hold” Status . . . . .	.304

10. Troubleshooting Jobs Stuck in “Active” Status	305
11. Troubleshooting Jobs Stuck in “Ready” Status.	306
12. Troubleshooting Jobs Stuck in “Adding” Status	307
13. Using CAPTURE to Redirect Parallel Ports to Network Queues.	307
14. Troubleshooting Jobs Printed Slowly.	307
15. Determining Whether a Printer is Connected as a Network Printer . . .	308
16. Troubleshooting Jobs Printed in Pieces on Separate Pages.	308
17. Determining the Status of Your Print Job	309
18. Solving NetWare Printing Problems When Running MS Windows. . . .	309
19. Isolating Bad Hardware or Corrupt Software.	310

Trademarks

Novell Trademarks	313
Third-Party Trademarks	314

Index

How to Use This Manual

Overview

This manual represents a major revision of the previous version of *Print Services*. Major differences between this manual and the NetWare 4.0 print manual include the following:

- ◆ Expanded overview and conceptual information
- ◆ Information about printing in mixed NetWare 4™ and NetWare 3™ environments
- ◆ Complete reorganization of the material in the manual
- ◆ Greatly expanded optimizing and troubleshooting discussions
- ◆ Step-by-step examples for performing the most common tasks
- ◆ Information on new functionality in the product



In Novell documentation, an asterisk denotes a trademarked name belonging to a third-party company. Novell trademarks are denoted with specific trademark symbols, such as ™.



To set up or maintain a network in the NetWare Enhanced Security configuration (the Class C2 evaluated configuration), you must supplement the information in this manual with the information in *NetWare Enhanced Security Server*, *NetWare Enhanced Security Administration*, *Auditing the Network*, and *Security Features User Guide*.

Command Syntax Conventions

This section explains the command syntax used in NetWare documentation. The following example illustrates several command line syntax conventions.

```
MAP [P | NP] [options ...] drive:= [drive: | path]
```

After typing the command, press Enter to execute the command.

Convention	Explanation
Boldface characters	Boldface characters indicate items that you type at the prompt, such as commands.
<i>Italicized</i> characters	Italicized characters indicate variables that you replace with information pertinent to your task.
... (ellipses)	Ellipses indicate that parameters, options, or settings can be repeated.
[]	An item enclosed in square brackets is optional. You can enter the command with or without the item.
[[]]	Items enclosed by nested square brackets are optional, but if you use the items within the innermost brackets, you must also use the items within the outer brackets.
|	When items are separated by a delimiter bar, you can use either item, but not both.
{ }	Curly braces indicate that you must choose one of the enclosed options.

NET.CFG FileSection Headings and Parameter Settings

NET.CFG section headings and parameter settings are shown in uppercase when used as a reference item and lower case when used in syntax or working examples.

For example:

NETBIOS VERIFY TIMEOUT specifies how often in (ticks) NetBIOS sends a keep-alive packet to the other side of a session to preserve the session.

If no packets are being exchanged on the NetBIOS session by the software that established the session, NetBIOS sends packets at regular intervals to make sure that the session is still valid.

Syntax `netbios verify timeout number`

Replace *number* with a number of ticks.

Default 54 (approximately 3 seconds)

Range 4 to 65,535

Example To make NetBIOS wait longer before sending a request-for-acknowledgment packet, you could place the following lines in your NET.CFG file:

```
netbios
netbios verify timeout 1350
```

Because interpretation of this file is not case-sensitive, you can type its contents in uppercase or lowercase letters.

User Comments

We are continually looking for ways to make our products and our documentation as easy to use as possible.

You can help us by sharing your comments and suggestions about how our documentation could be made more useful to you and about inaccuracies or information gaps it might contain.

Submit your comments by using the User Comments form provided or by writing to us directly at the following address:

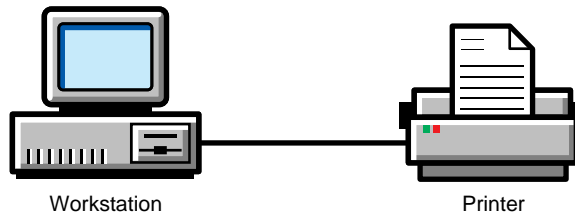
Novell, Inc.
Documentation Development PRV-C231
122 East 1700 South
Provo, UT 84606 USA
e-mail: commentdoc@novell.com

We appreciate your comments.

Introduction to NetWare Print Services

Overview of Network Printing

To users not familiar with network printing, the printing process may seem fairly simple. In non-network printing, data is generated on a stand-alone computer and then sent to a printer cabled directly to the computer.



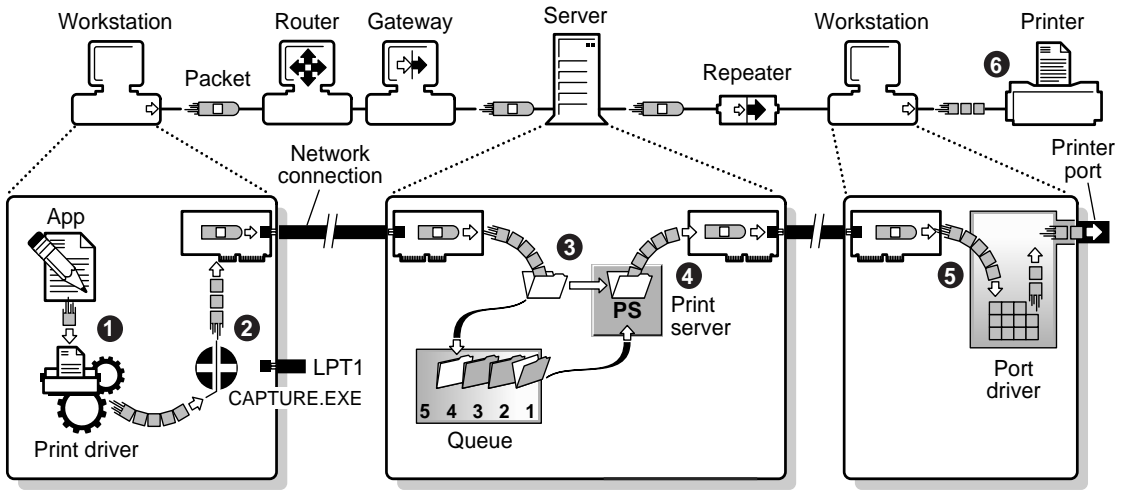
In network printing, printers are often shared and several intervening steps must take place (see Figure 1-1):

- ◆ Storage
- ◆ Intermediate processing
- ◆ Transmission between various processing locations

These steps can greatly affect the complexity of the print job's journey and the time it takes for a print job to arrive at the printer.

Each step in the printing process affects the time necessary for a print job to be completed at the printer. The following scenario describes a typical path print data might follow during this process.

Figure 1-1
A Typical Network Printing Setup



Step 1: Print Data Is Generated and Transmitted

1. The application compiles the data entered by the user and passes it on to a print driver.

Initially, there is only an application data file or possibly a document file with imbedded image definition data. No print data yet exists.

2. A print driver generates the actual printer data and passes it toward LPT1.

The driver may be part of the application software, or may have been supplied with the operating system, or may have come from a third party. Print data now exists in one of the formats described in “Printer Languages” on page 259.

The speed at which print data can be generated varies greatly. As complexity increases with additional formatting and graphical requirements, the time required to generate print data increases. Streams of simple text characters are created almost instantaneously on modern systems. Formatted text, which requires precise alignment of varying fonts and sizes, produces higher quality output but is more complex and takes longer to

generate. Some types of graphics are so complex that they may require hours for a single image to be generated.

Step 2: Data Is Redirected to a Network Queue

In non-network printing, data generation and transmission can be nearly simultaneous on a single computer. However, during network printing, data is not sent directly to a printer as it is in non-network printing. Instead, the data is redirected to a file in a print queue where it is stored while waiting to be sent to a printer.

Redirection of print data and storage in a queue has several advantages for network users:

- ◆ The application and the user can resume work without waiting for the printer to complete a print job.
- ◆ Multiple users can share a single printer.
- ◆ Users can send jobs to printers at different locations.
- ◆ Print jobs can be sequenced so that high priority jobs are sent to the printer first.
- ◆ Large print jobs can be stored until they can be printed at a time (such as after normal work hours) that does not disrupt other printing.

With NetWare[®], sending a print job to a queue can be accomplished in two ways:

- ◆ Manually via the NPRINT utility
 - ◆ Automatically via the CAPTURE utility, which intercepts the data headed toward LPT1 or other parallel ports.
1. In either case, the data is assembled into small packets, which are labeled and passed to a network interface board and the associated driver software.
 2. At the network interface, each packet is transmitted toward the destination file server that will store the data.

3. The individual packets travel over the network medium, possibly having to traverse repeaters, routers, gateways, and bridges along the way.
4. Upon the data's arrival at the destination NetWare server, another network interface (board and software) receives each packet of data, and may also check the packets for transmission errors and/or send acknowledgments back to the sending interface.

Step 3: Data Is Stored in a Print Queue

1. Each packet of data is then passed to the file storage area. At the NetWare server, the data packets are stripped of their labeling information and stored as a file on the server's hard drive.

It is important that any data storage area be large enough to hold both the largest print job likely to be stored and all the print jobs likely to be queued up at any one time on a busy day.

2. When the data for a complete job has all been received and stored, the file is closed and the filename is added to the queue associated with the printer.

At this point, the application and user are able to resume work.

3. The stored print job waits in the queue until the print server is able to transmit it to a printer.

If a print job is behind another job in the queue, the associated print server will request and receive the data file information immediately upon completion of the preceding job. The delay can be long if there are many other print jobs waiting in the print queue, or if the user stipulated that this job should print at some particular time in the future.

However, if the queue was empty when the completed data file name was passed to NetWare queue management system, the associated print server requests the data file information after the next predefined sampling interval. The default sampling interval is 15 seconds, but can be altered in NetWare 4™ software with PCONSOLE.

Step 4: Print Data Is Transmitted to a Printer Station

1. After the print server receives the print job information, it begins reading the print data from the queue.
2. The print server assembles the data into small packets, labeling each and passing them to a network interface board and associated software.
3. The individual packets are transmitted over the network to the printer station, possibly traversing repeaters, routers, and bridges along the way.

As the packets are sent, the print server gets packets back from the printer station containing information about the status of the printer, the amount of data that has actually been sent to the printer, and how many packets the print station currently has room to receive.

Step 5: Print Data Is Transmitted to the Printer

The following discussion describes one of several printer configurations.

1. At the workstation the printer is attached to, a network interface board (and associated driver software) receives each packet of data, possibly checking the packets for transmission errors and sending acknowledgments back to the sending interface.
 2. The packet labels are removed, the workstation's foreground task is interrupted, and the print data is passed to the port driver (NPRINTER).
 3. When NPRINTER is loaded, the printer port is initialized and the interrupts are enabled. If the printer is not busy, one character is printed. Control is returned to the workstation's foreground task.
 4. After each character is accepted by the printer, a hardware interrupt returns control to the port driver long enough to send one more byte.
- ◆ If configured not to use interrupts (polled mode), NPRINTER instead gets control once each clock tick (18.2 ticks per second) and makes a fixed number of attempts to send bytes before

relinquishing control to the foreground task for the remainder of the clock tick period.

- ◆ If the byte is sent through a parallel port, it is put on the port and a strobe signal is sent. Later, a corresponding return signal notifies the hardware that the printer is ready for more, generating the hardware interrupt mentioned in the preceding paragraph.
- ◆ Bytes transmitted through a serial port are passed at a fixed rate, one bit at a time, until all bits have been sent (assuming that all handshaking has occurred properly). The serial port generates the interrupt mentioned earlier when all bits have been sent. Additional hardware signals or characters sent back from the printer are monitored by NPRINTERR to verify the printer's readiness for more data.

Ideally, the time that NPRINTERR is taking control of the workstation to transfer data to the printer is spread out and small enough that the interference is rarely noticed by the user.

Step 6: The Printer Formats the Data and Completes the Print Job

1. Data travels by cable to the printer, where it is stored until enough data has been accumulated and converted to complete a single physical cycle.

The cycle for a laser printer is a full page; the physical cycle for most other printers is one pass of a print head. The formatting process can be brief or lengthy depending on the type of data being processed.

Data is usually transmitted to a printer via a Centronics-type parallel port or an RS-232 type serial port, depending on the printer type used.

2. During this process, the computer communicates with the printer, waiting for a ready signal between each byte that is sent.

Usually the computer spends much more time waiting than sending. However, it is possible to take advantage of these delays. Allowing the CPU to handle the user's "foreground" tasks during these large delays is what makes it possible for the printer's "background" task to operate with little apparent interference.



If the printer has insufficient memory to store new data until the physical cycle has finished with the old data, the printer may signal NPRINTER to suspend transmission during each cycle.

3. When the last physical cycle of the printer is complete, the print job is done.

Using the NetWare Printing Utilities

NetWare 4 allows you to use graphical or text utilities to create or modify your network printing environment. The following table describes the tasks that each utility performs.

Table 1-1
NetWare 4 Printing Utilities

Utility type	Utility	Tasks
<i>Graphical</i>	NetWare Administrator	Creates, assigns, modifies, deletes, and monitors print queues, print servers, and printers. Monitors, modifies, pauses and deletes print jobs. Creates, modifies, and deletes print job configurations, printer forms, and print devices. (OS/2* compatible)
	NetWare User Tools	Enable user 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.
<i>Command Line</i>	CAPTURE	Redirects workstation output to a network printer or file. (OS/2 version available)
	NPRINT	Prints files from outside an application. (OS/2 version available)
	PSC	Monitors and controls printer and print server status from the command line. Provides layout of printing setup. (OS/2 version available)

Table 1-1 *continued*

NetWare 4 Printing Utilities

Utility type	Utility	Tasks
<i>Menu</i>	PCONSOLE	Creates, assigns, modifies, deletes, and monitors print queues, print servers, and printers. Sends, monitors, modifies, pauses, resumes, and deletes print jobs. Quickly installs basic print services.
	NPRINTER	Loads NetWare port driver (NLM on the NetWare server, EXE on the workstation). (OS/2 version available)
	NETUSER	Captures workstation output to a network printer, prints files from outside of an application, and monitors print queues. Sends, redirects, monitors, modifies, or deletes print jobs.
	PRINTCON	Creates, modifies, and deletes print job configurations to simplify using the CAPTURE, NPRINT, and PCONSOLE utilities.
	PRINTDEF	Defines printer forms for use in CAPTURE, NPRINT, and print job configurations. Defines print devices in a database for use in print job configurations.
<i>NLM</i>	PSERVER	Loads print server software. Monitors, modifies, pauses, resumes, and aborts print jobs.
	PUPGRADE	Upgrades NetWare 3™ printing objects, print job configurations, and printer definitions to NetWare 4.



If your application supports NetWare print services, you do not need CAPTURE and NPRINT to send network print jobs. If your application supports your printer, you do not need to define a print device through PRINTDEF.

Planning and Setting Up NetWare Print Services

Planning Your NetWare 4 Printing Setup

NetWare® 4™ print services represent a significant advancement in both performance and versatility from NetWare 3™ print services. This section describes some of the major changes that have been made.

For additional information about NetWare 4 printing enhancements, see the following discussions:

- ◆ “New PCONSOLE Features for NetWare 4” on page 107
- ◆ “New Print Server Features for NetWare 4” on page 162
- ◆ “New NPRINTERS Features for NetWare 4” on page 189
- ◆ “New Print Job Configuration Features for NetWare 4” on page 215

NetWare 4 Printing Enhancements

The following section describes major enhancements incorporated into NetWare 4 Print Services.

Directory Services

NetWare 4 establishes a new framework for handling network resources that is much different from previous versions of NetWare. A replicated and distributed database replaces the NetWare 3 bindery as the storage medium for network information.

This database, part of the Novell Directory Services™ technology, organizes network components, such as servers, printers, and network users, as objects within a hierarchical tree structure.

Individual Objects

In Novell Directory Services, the print server, print queue, and printer are individual objects. They can be created and modified in any order with text or graphical utilities.

One advantage this change provides is that network users never need to know about print queues or print servers in NetWare 4. Users can send their print jobs directly to a printer by specifying the printer name.

New Management Tools

NetWare 4 provides a wide variety of new tools to manage these network objects, including NetWare Administrator and NetWare Tools™ utilities that define objects and navigate through the tree structure using a graphical user interface.

Since network printing takes place through queues (regardless of the platform from which a print job originates), a number of these tools—such as PCONSOLE—involve queue creation and management.

A queue created with one of these tools can be used not only by PC and OS/2 clients, but also by Macintosh* and UNIX® clients, if certain conditions are met.

Cross-Platform Support

In addition to DOS and MS Windows, NetWare 4 print services are completely compatible with OS/2. NetWare 4 print servers also can support Macintosh and UNIX printers.

Bimodal Utilities

All text-based NetWare 4 printing utilities are bimodal, so that from the new set of utilities you can administer both NetWare 3 and NetWare 4 networks and servers.

Quick Setup

The “Print Services Quick Setup” option in NetWare Administrator and the “Quick Setup” option in PCONSOLE provide simple ways to get your initial printing setup running quickly.

Centralized Administration

You can create a NetWare 4 print server that replaces NetWare 3 print servers. NetWare 4 print servers can service queues on NetWare servers that have not yet been upgraded to NetWare 4.

In addition, remote printers and direct-connect printers configured in NetWare 3 can communicate with NetWare 4 print servers.

Polled Mode

Polled mode is now supported and is the default for printer configurations. Users can now get their printer running without having to worry about which interrupt the port is set to or whether the port supports interrupts. This means that you can now get your printers running much more quickly and easily. Then, if you want to find out whether interrupts will increase performance, you can reconfigure your system when time allows.

Other Changes You Must Plan For

Different Configuration Locations

The introduction of Directory Services affects the way configuration information is stored.

- ◆ In NetWare 3, the print server's configuration information was stored in SYS:SYSTEM. In NetWare 4, configuration data is stored as objects in the Directory. For example, in NetWare 3, printers were print server attributes; in NetWare 4, printers are Directory objects.
- ◆ In NetWare 3, print job configurations created with NetWare's PRINTCON utility were stored as database files in the users' subdirectories in SYS:MAIL. In NetWare 4, you can create both *public* (or *global*) and *private* databases. Private databases are still created by users and are stored as attributes of user objects. The public databases are created by the network supervisor to be used by all users, and are stored as attributes of container objects.
- ◆ In NetWare 3, database files created with NetWare's PRINTDEF database (containing print device definitions and printer form

definitions) were stored as a file in SYS:PUBLIC. In NetWare 4, the database is stored as an attribute of a container object.

New Database Formats

The format of PRINTCON and PRINTDEF databases has changed. In bindery mode, the new databases have new names so there is no confusion between them and the old databases. In Directory Services, the new databases are now attributes of objects.

For information on the name and location of these databases, see the following sections, “Relocated Print Job Configuration Databases” and “Relocated Print Device Databases.”

If you are not using UNIX or any third-party utilities that require the NetWare 3 databases, we recommend that you delete the old databases. But if you do have these third-party utilities, you will need to keep the old databases because the new ones have a new format that the utilities may not be able to read.

The old and new databases can coexist. If you want to maintain the old ones and have been using NetWare utilities to do it, you should use the NetWare 3 utilities to maintain them. Use the NetWare 4 utilities to maintain the NetWare 4 databases. However, there is little reason to maintain NetWare 3 databases.

Switching to bindery mode in the new utilities will not maintain the old databases. Bindery mode allows you to maintain a bindery version of the new databases.

Relocated Print Job Configuration Databases

Both the format and location of the database for print job configurations have changed for NetWare 4:

- ◆ In NetWare 3, the PRINTCON database was
SYS:MAIL*usernumber*\PRINTCON.DAT.
- ◆ In the NetWare 4 Directory, 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 4 bindery mode, the public database is
SYS:PUBLIC\PRINTJOB.DAT

The private database is

SYS:MAIL*<username>*\PRINTJOB.DAT

Relocated Print Device Databases

The print device definitions supplied in NetWare 4 are copied to the SYS:PUBLIC directory during installation. Additional device definitions imported or created are also stored in this directory unless you specify another location.

Both the format and location of the print device database have changed for NetWare 4.

- ◆ In NetWare 3, the database for print device definitions is
SYS:PUBLIC\NET\$PRN.DAT
- ◆ In the NetWare 4 Directory, this database is an attribute of a container object. Print device definitions can be accessed through the “Print Devices” option of PRINTDEF or the “Print Devices” dialog for the container object in NetWare Administrator.
- ◆ In NetWare 4 bindery mode, the database is
SYS:PUBLIC\PRINTDEF.DAT

Bindery Services

NetWare 4 maintains compatibility with previous versions of NetWare clients. NetWare’s bindery services provide access to NetWare 3 objects such as users and servers.

For example, all network objects in bindery mode must reside at levels defined by the bindery context that applies to the server. The bindery context of the server is set by an entry in its AUTOEXEC.NCF file (or by manually using the SET BINDERY CONTEXT command).

NetSync

The NetSync™ management utility converts NetWare 3 bindery information, including printing information, incorporating it into the Directory of NetWare 4.1. (NetSync does not support NetWare 4 releases prior to NetWare 4.1.)

NetSync is designed to solve many of the compatibility problems users currently encounter when operating in mixed NetWare 4.1 and NetWare 3 environments (NetSync is not compatible with NetWare 4.0x). Through NetSync, a single NetWare 4.1 print server can be used to service printers and queues for up to 12 NetWare 3 servers.

NetSync provides the following capabilities:

- ◆ Allows network supervisors of mixed NetWare 3.1x and NetWare 4.1 networks to use NetWare 4.1 utilities to manage objects from one point (the NetWare 4.1 bindery context).
- ◆ Allows centralized administration of mixed networks.

Complete documentation on NetSync is found in *Installing and Using NetSync*.

Typical Network Printing Setups

This section will stress general principles that can be of value for a variety of network printing configurations.

NetWare 4 print services requires that you create at least one of each of the three printing objects:

- ◆ Print queue
- ◆ Print server
- ◆ Printer

The following three examples show how the three printing objects can be arranged as you require.

To set up any of the layouts described in the following pages, you may use NetWare Administrator or PCONSOLE. The easiest way to get a

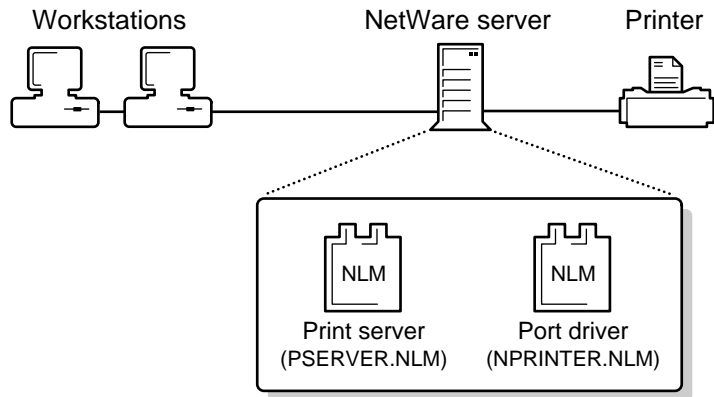
printing setup up and running is by using a quick setup feature in either NetWare Administrator (see “Using Print Services Quick Setup in NetWare Administrator” on page 18) or PCONSOLE (see “Using Quick Setup in PCONSOLE” on page 19).

For detailed information on setting up NetWare printing in a graphical environment, see “Setting Up Print Services with NetWare Administrator” on page 39.

Simple Printing Setup

In this setup, a printer is cabled to the printer port of a NetWare server running PSERVER.NLM. Users can select a printer by name, or they can specify a print queue, when sending a print job.

Figure 2-1
Simple Printing

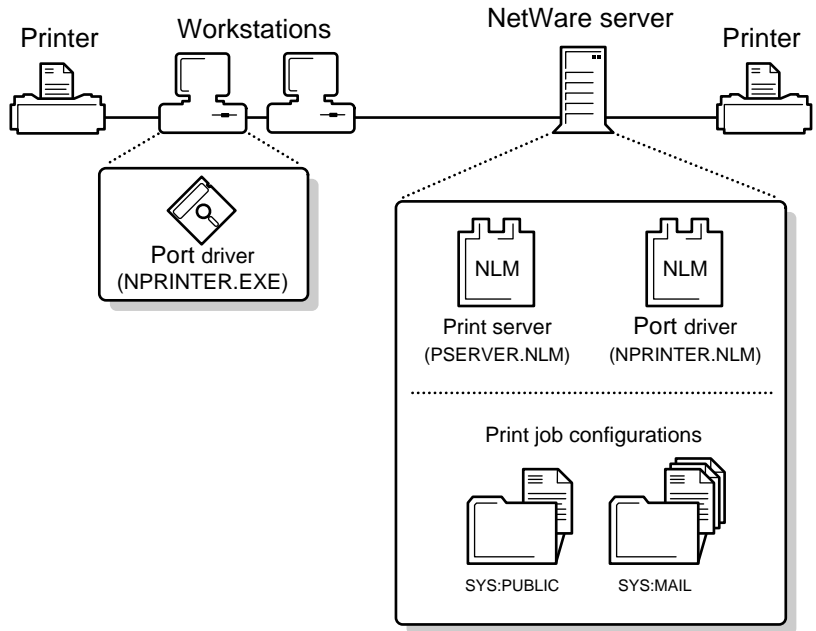


Mid-Range Printing Setup

NetWare print services allow some printers to be cabled to workstations and some to a NetWare server. To automate printing, users can specify printer, banner page, tabs, and other options by using print job configurations. Print job configurations are groups of print job options that simplify CAPTURE and NPRINT. Print job configuration information is stored for users (private) or container objects (public).

Information on creating print job configurations is found in Chapter 8. See “Additional Information” on page 28.

Figure 2-2
Mid-Range Printing



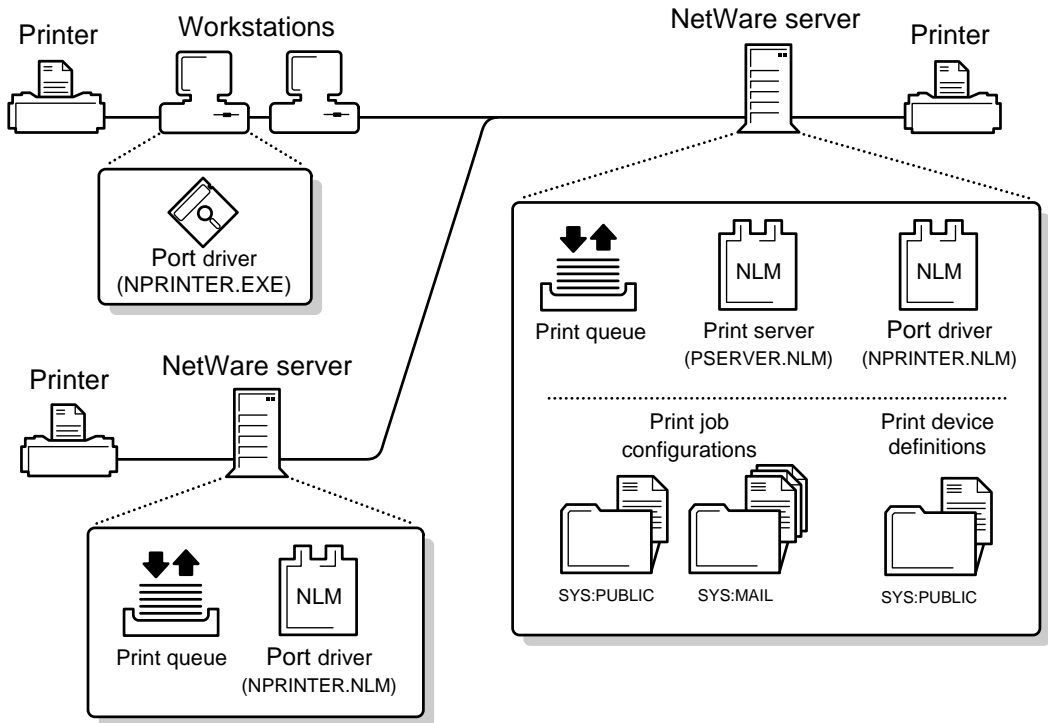
Advanced Printing Setup

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

- ◆ One printer assigned to service multiple print queues. Both NetWare 4 and NetWare 3 print queues may be used.
- ◆ Multiple printers assigned to service one print queue
- ◆ Various print job configurations
- ◆ Printer reset at the end of print jobs (defined in PRINTDEF)
- ◆ Printer definitions (If your application does not format print jobs for a specific printer, NetWare provides print device definitions for many common printers.)
- ◆ Multiple printing environments (such as AppleTalk* printers, UNIX printers, or printers attached directly to the network cabling)

◆ Multiple print servers

Figure 2-3
Complex Printing



Setting Up NetWare Print Services

NetWare Print Services requires a Print Server object, a Printer object, and a Print Queue object in order for network users to share printers.

You can use either NetWare Administrator or PCONSOLE to create your printing setup. Novell® recommends that you use NetWare Administrator's "Print Services Quick Setup" option or PCONSOLE's "Quick Setup" option to initially perform this task (as described in the next two sections), and then complete the tasks outlined in the "Additional Startup Tasks" section.

After experimenting with the resulting setup, you will probably want to tailor the configuration to match your specific needs.

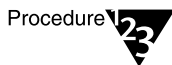


If you upgraded from a previous version of NetWare that used print services, your printing environment should already be installed. In this case, the procedures described here are unnecessary.

Using Print Services Quick Setup in NetWare Administrator

Use the Print Services Quick Setup option to define your initial Print Server, Printer, and Print Queue objects and assign a print queue to a printer.

Procedure



1. **Install your printer.**
2. **Log in to the NetWare server as user ADMIN or equivalent.**
3. **Run Windows*, and then run NetWare Administrator.**
4. **From the "Tools" menu, choose "Print Services Quick Setup."**
5. **In "Print Server Name," type a name for this Print Server object (or browse to an existing print server).**
6. **In "Printer Name," type a name for this Printer object.**
7. **In "Printer Type," type or select a printer type.**

When you choose a printer type, a dialog box specific to your printer type displays.

8. Complete the dialog box for your printer type.

- ◆ AIO
- ◆ AppleTalk
- ◆ Parallel
- ◆ Serial
- ◆ UNIX

9. In “Print Queue Name,” type a name for this Print Queue object.

10. In “Print Queue Volume,” type a name for this print queue volume (or browse to choose a volume).

11. Choose “Create.”

This completes the first part of setting up NetWare Print Services. But the Printer object you created is not yet associated with any physical printer.

12. Complete the setup tasks outlined in “Additional Startup Tasks” on page 21.

Using Quick Setup in PCONSOLE

Use the Quick Setup option to define your initial print server object, printer object, and print queue object and to assign a print queue to a printer.

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 printers to the parallel (LPT) port of the workstation.**
2. **Log in to the NetWare server as user ADMIN or equivalent.**
For example:

```
LOGIN NWFS_1 / .ADMIN.NOVELL
```
3. **Type PCONSOLE at the command line.**
This is normally found in volume SYS:PUBLIC.
The “Available Options” menu appears.
4. **If the current context is the desired one, skip to Step 5. If not,**
 - 4a. **Select the “Change Context” option.**
 - 4b. **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.**
 - 5a. **Select the “Quick Setup” option.**
 - 5b. **At the “Print server:” prompt, select the print server name.**
Press <Enter> to bring up a list of current print servers. If no print servers are in that context, PCONSOLE will select a name based on your current context.
 - 5c. **Press <Insert>; then enter the name “PS_1”.**
 - 5d. **Select “New printer:” and enter “PR_FAR”.**
 - 5e. **Select “New print queue:” and enter “Q_FAR”.**
 - 5f. **Press <F10> to save the changes.**



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.
 - 6a. Select the “Quick Setup” option.
 - 6b. Select print server PS_1.
 - 6c. Select “New printer:” and enter “PR_NEAR”.
 - 6d. Select “New print queue:” and enter “Q_NEAR”.
 - 6e. Select the “Location” field; then select “Manual Load.”
 - 6f. Press <Esc>; then select “Yes” to save the changes.
7. Press <F10> to save the changes.
8. Complete the setup tasks outlined in “Additional Startup Tasks” on page 21.

Additional Startup Tasks

Before you can make printers available for network users to capture and print to, you need to complete Task 1 described below. Complete the additional tasks that are applicable to your hardware configuration.

Task 1: At the Netware server console, load PSERVER.NLM.

Type `LOAD PSERVER`, then follow the prompts to browse for the name of the print server you want.

You can also include the print server name in your load command. For example:

```
LOAD PSERVER .PS_1.NOVELL <Enter>
```

This command can be placed in your AUTOEXEC.NCF file.

Specify the context if it is different from your server’s bindery context.

Where a printer is physically attached, an NPRINTERR must be loaded. If the printer is physically attached to the server, the printer is defined as auto load and PSERVER.NLM will automatically load NPRINTERR.NLM.



Note

You must load a network port driver for any printer configured as “Manual Load.” Printers cabled directly to the network use print driver software stored in the printer.

Task 2: At a DOS workstation with a printer attached, load NPRINT.EXE.

The port driver syntax is as follows:

```
NPRINT printservername printernumber
```

For example, the following command connects printer PR_NEAR to the print server:

```
NPRINT PS_1 1
```

Task 3: At a Windows 95 workstation running Novell NetWare Client 32 with a printer attached, run NPTWIN95.EXE.



Note

Each printer requires a network port driver (like NPRINT.EXE or NPRINT.NLM). For Windows 95* workstations, NPTWIN95.EXE serves this purpose. It automatically loads the port driver software (NPTR95.NLM and NPTDRV95.NLM) and NPRINT Manager (a printer setup and management utility in Windows 95).

After starting the Novell NetWare Client™ 32™ software, double-click NPTWIN95.EXE (the port driver executable, usually located in the SYS\PUBLIC\WIN95 folder on your server), and then complete the “Add Network Printer” dialog box.

After the NetWare port driver is loaded, network workstations can send print jobs to the printer. For more information, see “Using NPRINT (Windows 95)” on page 199.

Upon completion of these tasks, the printer should be available to network users, who can then capture the printer.

Tailoring Your Printing Configuration

After you have completed the Quick Setup process and gained some experience with that setup, you may want to modify it to better serve the needs of your network's users. This section explains some of the configuration options available to you.

Assigning Unique Object Names

Names for each object must be unique (per context in NetWare 4 and per server in NetWare 3). Names should be meaningful and unambiguous.

You may want to put a sign on each printer listing the NetWare context and printer name. If you are using a NetWare 3 setup, you may prefer to list names of the NetWare server and print queue(s) used instead.

Managing Security

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

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



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.

Managing Interrupts

NetWare supports both interrupt and polled mode operation in your printer configuration. Polled mode, the default, generally provides satisfactory performance. If optimal performance is important for you setup, interrupt mode with parallel port operation is often fastest; polled mode serial port operation is generally slower.

Polled mode avoids problems that may occur if interrupts conflict with one another. The interrupt to be used by each port must be configured properly in the hardware, must be unique, and must match the NetWare configuration set in PCONSOLE or NetWare Administrator in order to use that port properly in interrupt mode.

Polled mode also can be used for printers assigned to a specific port if all of the interrupts are already assigned.

Keep in mind, however, that multiple printers using polled mode on one workstation may adversely affect foreground operation on that workstation.

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 NetWare file server at a given time, that single print server can service up to 255 printers under NetWare 4.

Performance factors, however, may limit the number of printers that one print server can service effectively.

Printing Task List

The following table lists many of the major printing tasks you will need to perform on your network and indicates the NetWare utilities you can use to perform them.

Table 2-1
Printing Tasks

Task	Utility
Assign Print Queue objects to printers.	NetWare Administrator (Printer object), PCONSOLE ("Printers" or "Print Servers" options)
Assign Printer objects to print servers.	NetWare Administrator (Print Server object), PCONSOLE ("Print Servers" option)
Control printer and print server.	NetWare Administrator, PCONSOLE, PSC, PSERVER
Create, assign, modify, or delete Print Queue, Print Server, and Printer objects.	NetWare Administrator, PCONSOLE
Create print jobs.	CAPTURE, NETUSER, NPRINT, PCONSOLE
Customize print job characteristics with print job configurations.	NetWare Administrator (User, Organization, and Organizational Unit objects), PRINTCON
Customize printer characteristics with printer forms and print devices (printer definition files).	NetWare Administrator (Organization and Organizational Unit objects), PRINTDEF
Delete, modify, or reorder print jobs.	NetWare Administrator, NETUSER, PCONSOLE
Get configuration layout and status of printing.	NetWare Administrator, PCONSOLE, and PSC
Monitor printer and print server.	NetWare Administrator, PCONSOLE, PSC, PSERVER
Monitor print jobs.	NetWare Administrator, NETUSER, PCONSOLE, PSERVER
Print files.	CAPTURE, NETUSER, NPRINT, PCONSOLE
Run print server on NetWare server.	PSERVER

Table 2-1 *continued*

Printing Tasks

Task	Utility
Run network printer on NetWare server.	NPRINTER.NLM
Run network printer on a DOS or OS/2 workstation.	NPRINTER.EXE
Run network printer on a Windows 95 workstation.	NPRINTER (Windows 95)
Upgrade NetWare 3 printing.	PUPGRADE.NLM

Printing from Applications Not Designed for Network Printing

Many applications are designed for network printing. For example, WordPerfect submits print jobs directly to the print queue. Since you can specify the number of copies, a banner page, and so forth inside such applications, you do not need graphical NetWare Tools or the text utilities CAPTURE, NPRINT, NETUSER, or PCONSOLE to send network print jobs. Such applications usually supply the necessary print driver (escape sequences, etc.) and include it with each network print job.

However, there are many applications that are not designed for network printing. The following NetWare printing utilities can be used when printing with applications that are not designed for NetWare print services.

- ◆ Text utilities (CAPTURE, NPRINT, NETUSER, PCONSOLE, PRINTCON, PRINTDEF)
- ◆ GUI utilities (NetWare Administrator, NetWare User Tools for MS Windows, or NetWare Tools for OS/2)

If your application cannot send print jobs to a network printer or print queue, the text utilities NETUSER, NPRINT, or PCONSOLE allow you to send print-ready files to a printer.

CAPTURE is used to redirect workstation output from an LPT port to the network.

The graphical NetWare User Tools for MS Windows and NetWare Tools for OS/2 provide the same functionality. For information on the NetWare Tools, see *NetWare Client for DOS and MS Windows User Guide* and *IntranetWare Client for OS/2 User Guide*.

PRINTCON or the graphical NetWare Administrator can be used to create print job configurations.

PRINTDEF or the graphical NetWare Administrator can be used to create printer forms and print device definitions.

Additional Information

For more information about	See
Print queue	"Print queue" in <i>Concepts</i>
Print server	"Print server" in <i>Concepts</i>
Printer	"Printer" in <i>Concepts</i>
Print job configuration	"Print job" in <i>Concepts</i>
Print job configuration	Chapter 8, "Creating and Managing Print Job Configurations," on page 215 "Working with Print Job Configurations" on page 80 (NetWare Administrator)
Print device definition	"Working with Print Device Definitions" on page 227 (PRINTDEF) "Working with Print Device Definitions" on page 92 (NetWare Administrator)
Novell Directory Services objects	"Object" in <i>Concepts</i>
Multiple print queues servicing one printer or multiple printers servicing one print queue	"Setting Up Print Services with NetWare Administrator" on page 39 (NetWare Administrator) "Print Queue Options" on page 113 (PCONSOLE)
NetWare Administrator	Chapter 3, "Managing Print Services with the NetWare Administrator Utility," on page 29

Managing Print Services with the NetWare Administrator Utility

Overview

With NetWare® Administrator, you can perform the administrative tasks available in NETADMIN, FILER, PCONSOLE, PRINTCON, and PRINTDEF, but you use one utility with a graphical interface.

This chapter explains how to set up and manage NetWare print services using the NetWare Administrator graphical utility.

Requirements



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

- NetWare 4™ server.
- 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,” on page 291.

Printing Tasks Handled through NetWare Administrator

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

Table 3-1

Printing Tasks Performed with NetWare Administrator

Object Class	Task	Procedure Location
All	Print browser display of Directory tree	"Printing Your Directory Tree Layout" on page 34
Print Queue	Assign a print queue to a printer	"Assigning Print Queues to Printers" on page 46
	Assign queue operator flags	"Assigning Queue Operator Flags" on page 55
	Create a print job configuration	"Working with Print Job Configurations" on page 80
	Create a print queue	"Creating Print Queues" on page 40
	Reference a bindery queue	"Referencing Bindery Queues" on page 103
	Delete a print queue	"Viewing the Assignments for Printing Objects" on page 54
	View or modify print jobs	"Viewing or Modifying Print Jobs" on page 55
	View or modify a print queue	"Print Queue Options" on page 55
	View print queue assignments	"Viewing the Assignments for Printing Objects" on page 54

Table 3-1 *continued*

Printing Tasks Performed with NetWare Administrator

Object Class	Task	Procedure Location
Printer	Assign a print queue to a printer	“Assigning Print Queues to Printers” on page 46
	Move a printer	“Moving Printing Objects” on page 53
	Rename a printer	“Viewing the Assignments for Printing Objects” on page 54
	View or modify a printer	“Printer Options” on page 59
	View printer status	“Printer Options” on page 59
Print Server	Assign a printer to a print server	“Assigning Printers to Print Servers” on page 50
	Audit a print server	“Enabling and Viewing the Print Server Auditing Log” on page 76
	Create a print server	“Creating Print Servers” on page 47
	Delete a print server	“Viewing the Assignments for Printing Objects” on page 54
	View status of a print server	“Viewing Your Printing Layout and Status” on page 74
	Move a print server	“Moving Printing Objects” on page 53
	Unload a print server	“Unloading Print Servers” on page 79
	View print server assignments	“Viewing the Assignments for Printing Objects” on page 54
	View your current printing layout	“Printer Options” on page 59
	Modify a print server	“Print Server Options” on page 74

Table 3-1 *continued*

Printing Tasks Performed with NetWare Administrator

Object Class	Task	Procedure Location
Container object	Create print job configurations to simplify using CAPTURE and NPRINT.	"Working with Print Job Configurations" on page 80
	Create a print device definition for use in print job configurations	"Referencing Bindery Queues" on page 103
	Create or modify printer forms	"Creating Printer Forms" on page 87
	Import a print device definition for use in print job configurations	"Importing Print Device Definitions" on page 97
	Modify a print device definition for use in print job configurations	"Viewing or Modifying Print Device Definitions" on page 94
	View your current printing layout	"Viewing Your Printing Layout and Status" on page 74
User	Create print job configurations to simplify using CAPTURE and NPRINT	"Working with Print Job Configurations" on page 80

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 Novell Directory Services (NDS) objects, with files, and with directories.

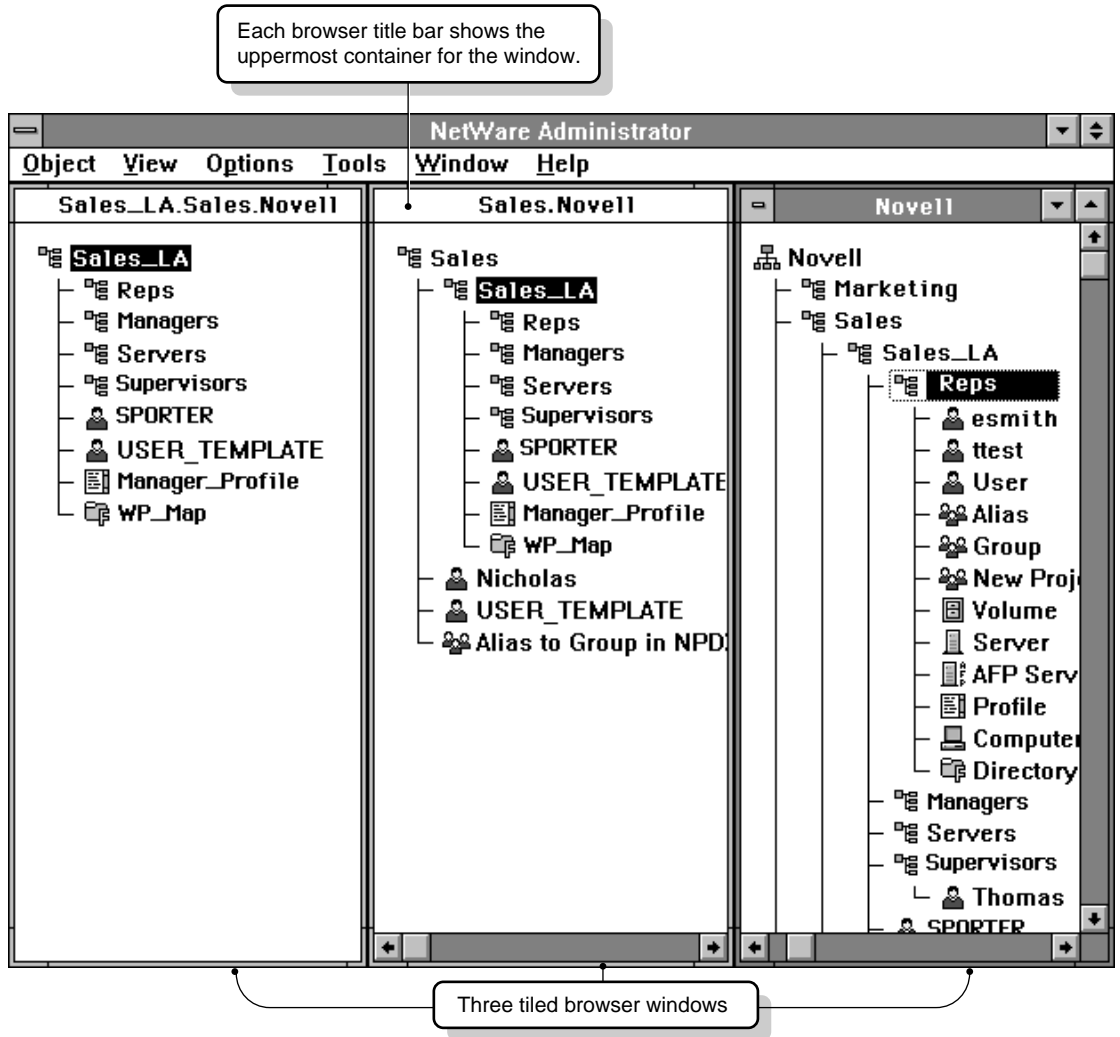
Parts of the Browser

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 3-1
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.

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
```

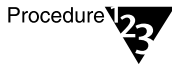
Printing Your Directory Tree Layout

After you have completed modifications to your Directory tree structure, you may find it useful to have a printout of the entire tree or of expanded sections of that tree. The following procedure allows you to generate a printed version of the layout shown on your browser screen.

You can print the objects listed in the browser as a one item per line list, in a two column format, or as a file that you can manipulate or print later.

Before beginning the following procedures, be sure you have set up your printing environment in the MS Windows Print Manager “Options” menu.

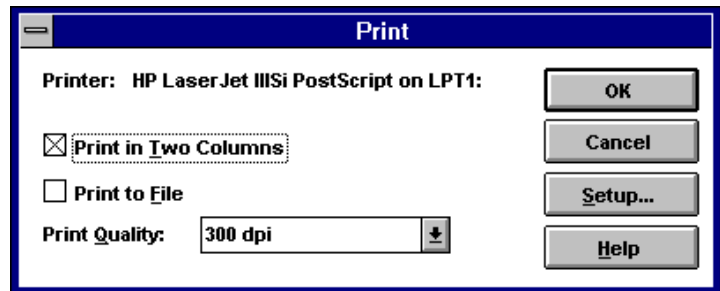
Procedure



1. **At the main browser screen, expand all container objects you want displayed in the printout. Then choose the “Object” menu.**
2. **Select the “Print...” option.**

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

Figure 3-2
Print Dialog



3. **Select the options you want to use.**
 - ◆ “**Print in Two Columns**” allows you to choose the format of the printed objects, either as a list with each object on a separate line, or in two columns if you want to use fewer pages for your printout. The default is two columns.
 - ◆ “**Print to File**” allows you to save the objects listed in the browser to a file.
 - ◆ “**Print Quality**” allows you to elect the dots per inch for the print job.
 - ◆ “**OK**” saves all changes and returns you to the browser.
 - ◆ “**Cancel**” closes this dialog without making any changes.
 - ◆ “**Setup**” allows you to select the way the information prints on the page, the paper size and source, and the printer.

4. Use **“Setup”** to select the page layout, if needed.
 - ◆ **“Printer”** allows you to choose the printer to print to.
 - ◆ **“Orientation”** allows you to choose layout of the information on the page.
 - ◆ **“Paper”** allows you to choose the paper size and source for the print job.
 - ◆ **“OK”** saves all changes and returns you to the browser.
 - ◆ **“Cancel”** closes this dialog without making any changes.
 - ◆ **“Options”** allows you to choose to print to the printer or to a file, change the margins, set the scaling, or send a header.

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 Print Services has 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.

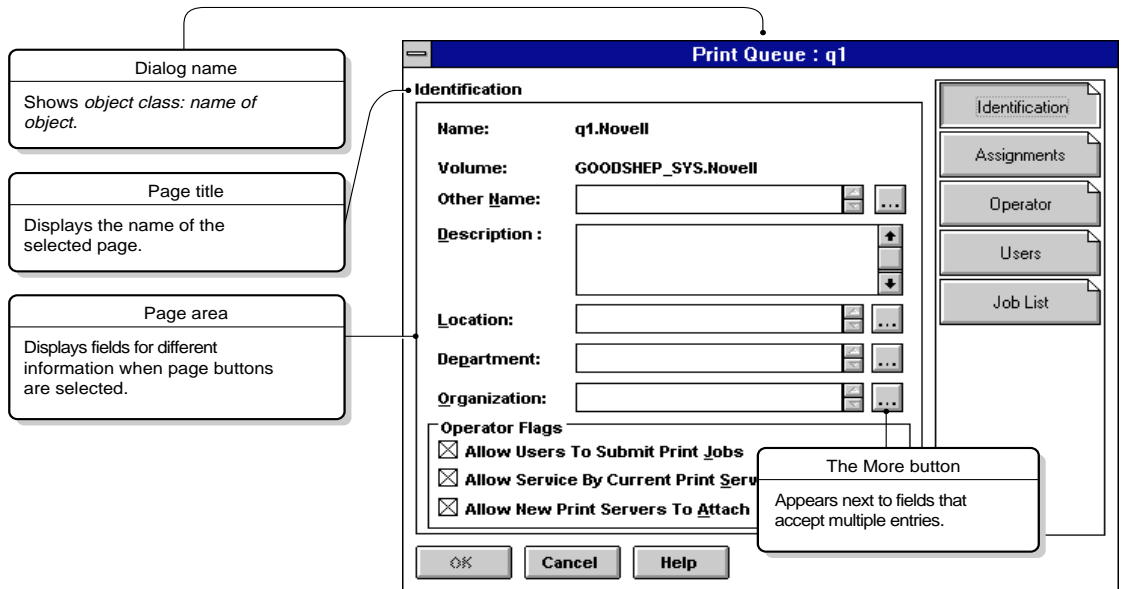
You can open dialogs for objects in several ways:

- ◆ 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.

Figure 3-3
Object Dialog for a Print Queue Object



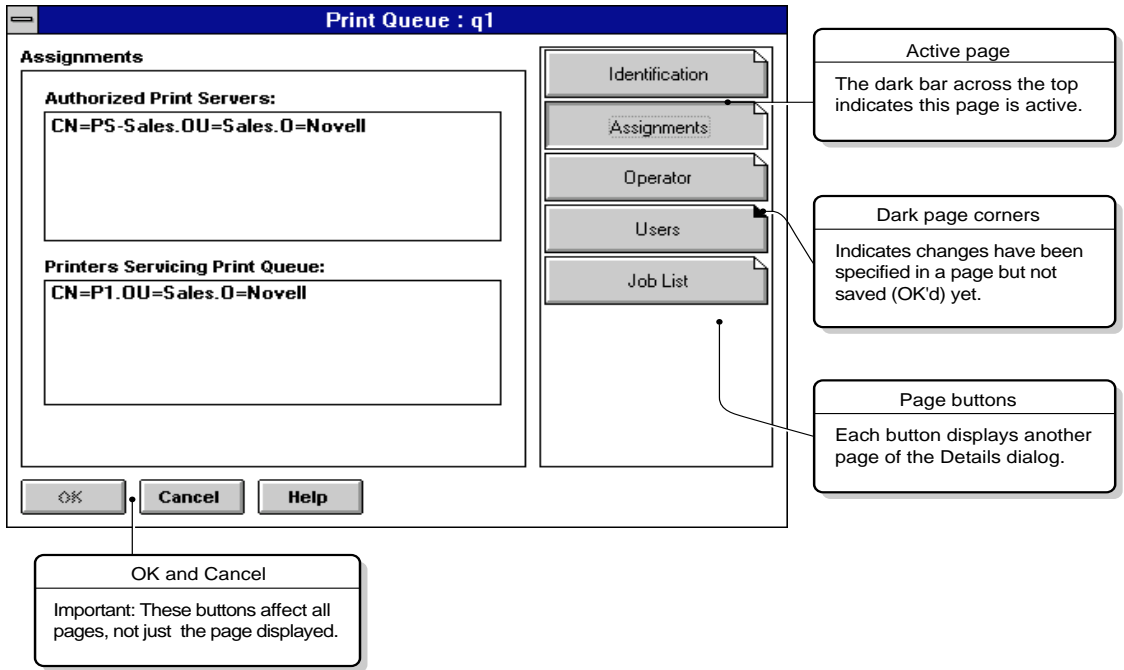
Pages of the Object Dialogs

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 3-4
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. If you choose not to save changes, you’ll lose the changes you *want* to keep in the other pages.



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.

The Print Services Quick Setup feature in NetWare Administrator can automatically create the following printing objects with default settings and assignments. (See “Using Print Services Quick Setup in NetWare Administrator” on page 18.)



Print Server



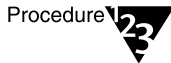
Printer



Print Queue

The following procedure will enable you to create these objects with NetWare Administrator.

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.

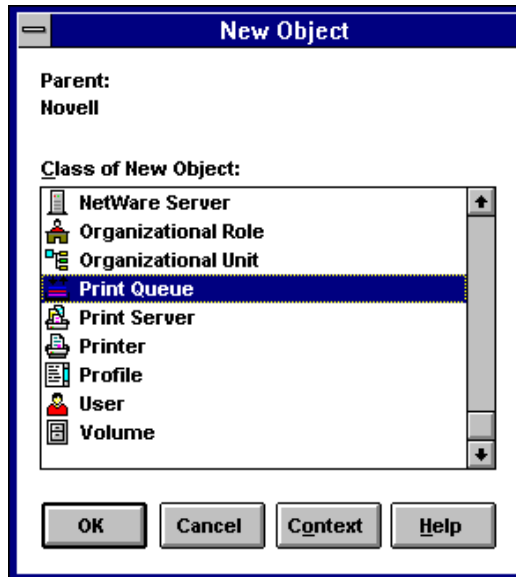
You must have a print queue, along with a print server and a printer, in order for network users to share printers.

Procedure



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

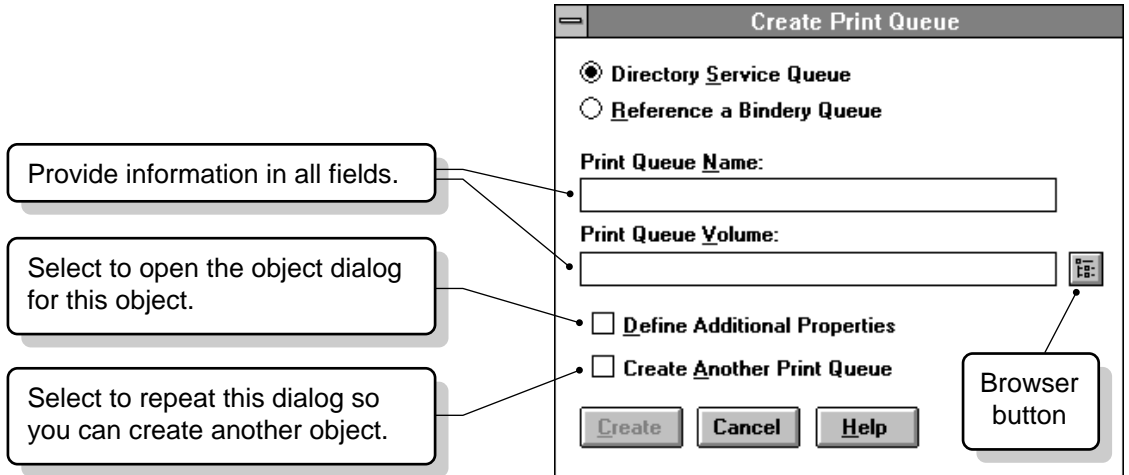
The “New Object” dialog appears similar to that shown in the following figure.



2. Choose “Print Queue.”

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

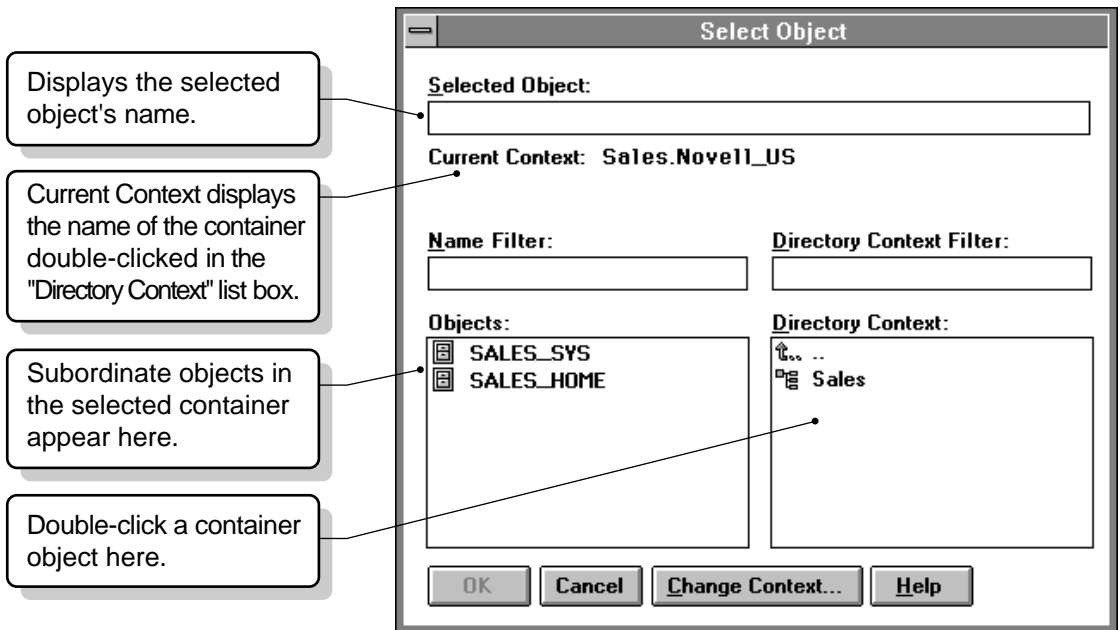
Figure 3-5
Create Print Queue Dialog



- ◆ “**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 NetWare 3™ server or a NetWare 4 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.

Figure 3-6
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.

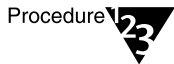
7. **Select the volume in the “Objects” field. Then choose “OK.”**
You are returned to the “Create Print Queue” field.
8. **At the “Create Print Queue” dialog, select “Create.”**
Novell recommends one print queue for each printer.

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 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 3-7
Printer Identification Page

The screenshot shows a dialog box titled "Printer : p1". The main content area is labeled "Identification" and contains the following fields:

- Name:** p1.Novell
- Other Name:** [Empty text box]
- Description :** [Empty text box]
- Network Address:** [Empty text box]
- Location:** [Empty text box]
- Department:** [Empty text box]
- Organization:** [Empty text box]

Each field has a small "OK" button and a "..." button. To the right of the main area is a vertical stack of buttons: "Identification", "Assignments", "Configuration", "Notification", "Features", "See Also", and "Printer Status". At the bottom of the dialog are three buttons: "OK", "Cancel", and "Help".

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 3-8
Printer Assignments Page

Printer : p1

Assignments

Print Server:
ps-1.Novell

Print Queues:

Queue	Priority
q1.Novell	1

Add... **Delete** **Priority:** 1

Default Print Queue:
q1.Novell

Identification
Assignments
Configuration
Notification
Features
See Also
Printer Status

OK **Cancel** **Help**

3. Select “Add.”

The “Select Object” dialog appears, similar to that shown on Figure 3-6 on page 42. 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 a 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.”

You are returned to the “Printer” dialog.

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

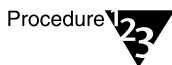
See “Configuring Printers” on page 59.

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*.

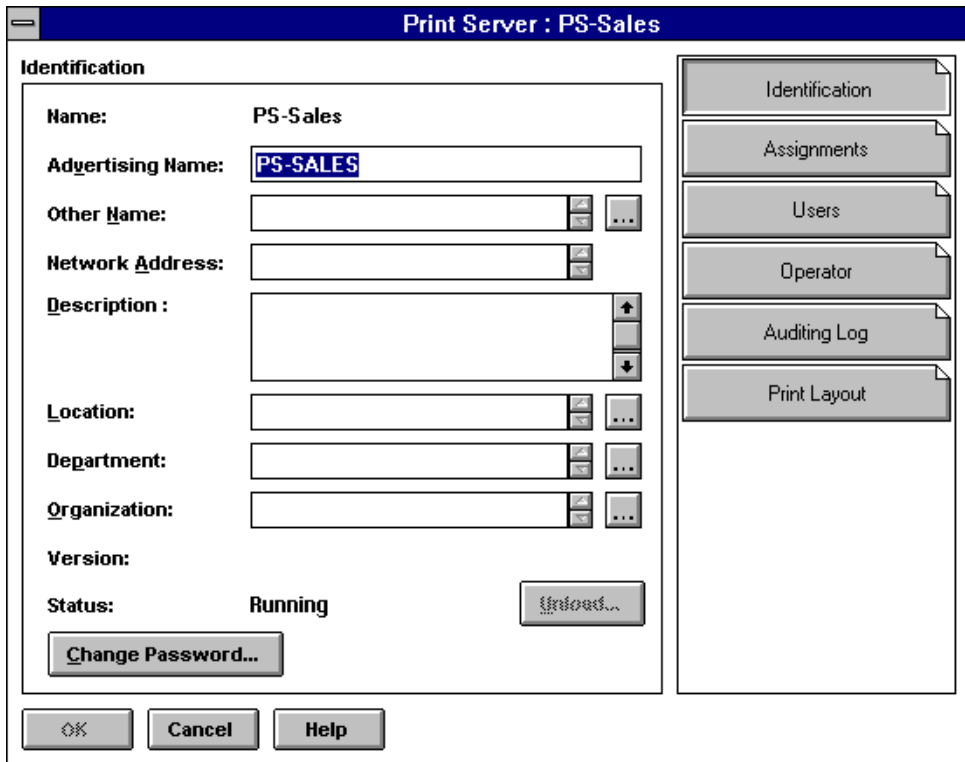
4. Mark the “Define Additional Properties” box.

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 3-9
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.

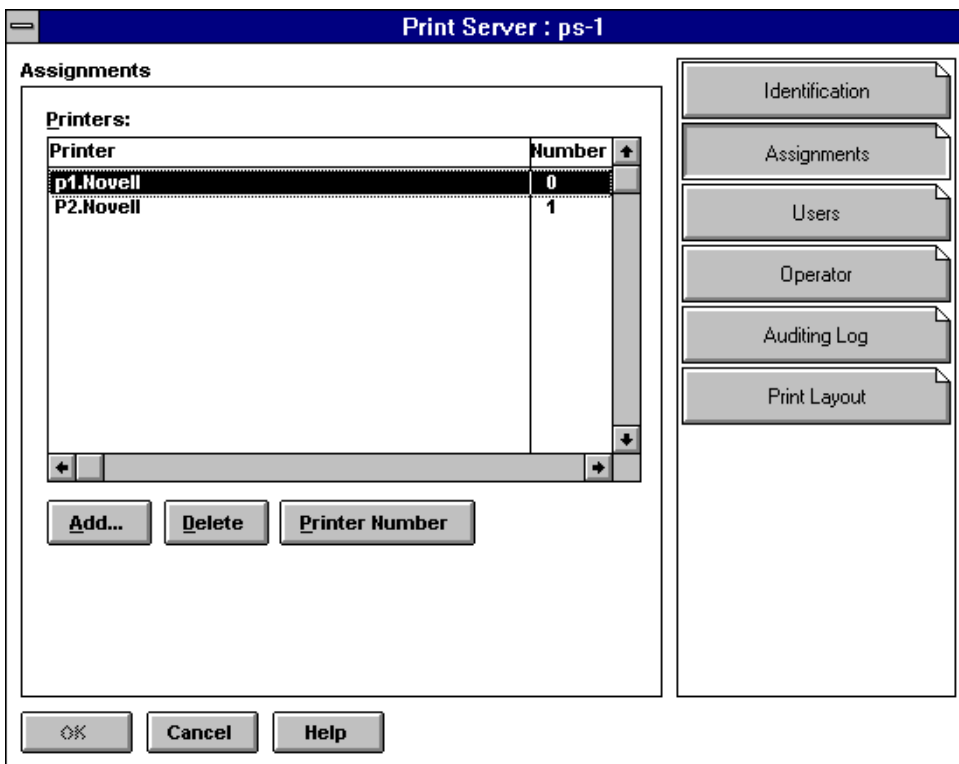
Procedure



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

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

Figure 3-10
Print Server Assignments Page



Remember that print queues are assigned to printers, not to print servers. See “Assigning Print Queues to Printers” on page 46.

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.”**

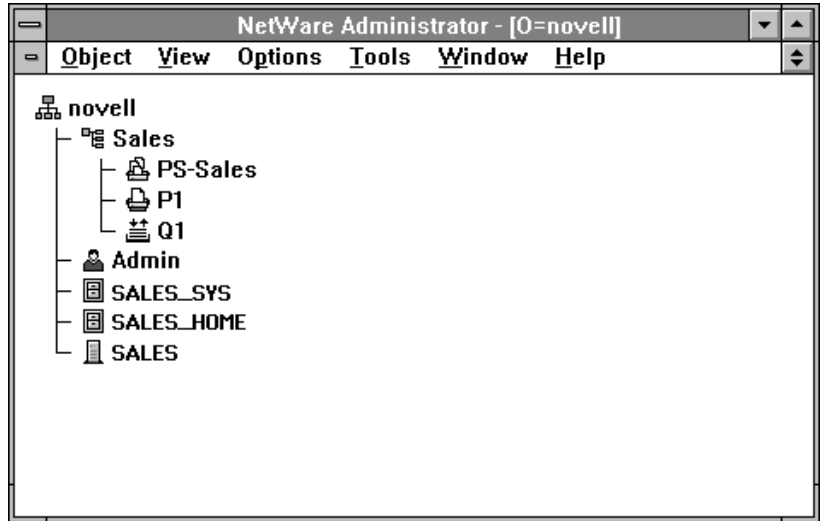
Adding Printing Objects

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 3-11
Browser Showing
Print Server



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

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, load the print server software (PSERVER.NLM) on a NetWare 4 server.

For information on loading the print server, see "Using PSERVER.NLM" on page 166.

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.



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

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

You cannot copy Novell 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.

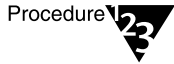
Moving an object is like changing part of the object’s complete name or like changing its context.

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 3-12
Typical Printing
Object Assignments
Page

Queue	Priority
Q1.Sales.Novell	1



A complete graphical representation of your printing setup can be obtained by viewing the “Printing Layout” page available from the “Organizational Unit” or Print Server dialog accessed from the browser.

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

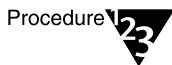
By selecting the “Details” page from the “Print Queue” object dialogue, a print queue operator with appropriate rights can set flags that limit access to the selected print queue:

- ◆ **“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.”

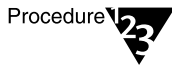


Most applications can send print jobs to a network printer or print queue. This is usually the easiest way to create print jobs with the correct format for your printer, etc. If your application can print only to a local port, use the NetWare User Tools to redirect your workstation port to the network.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

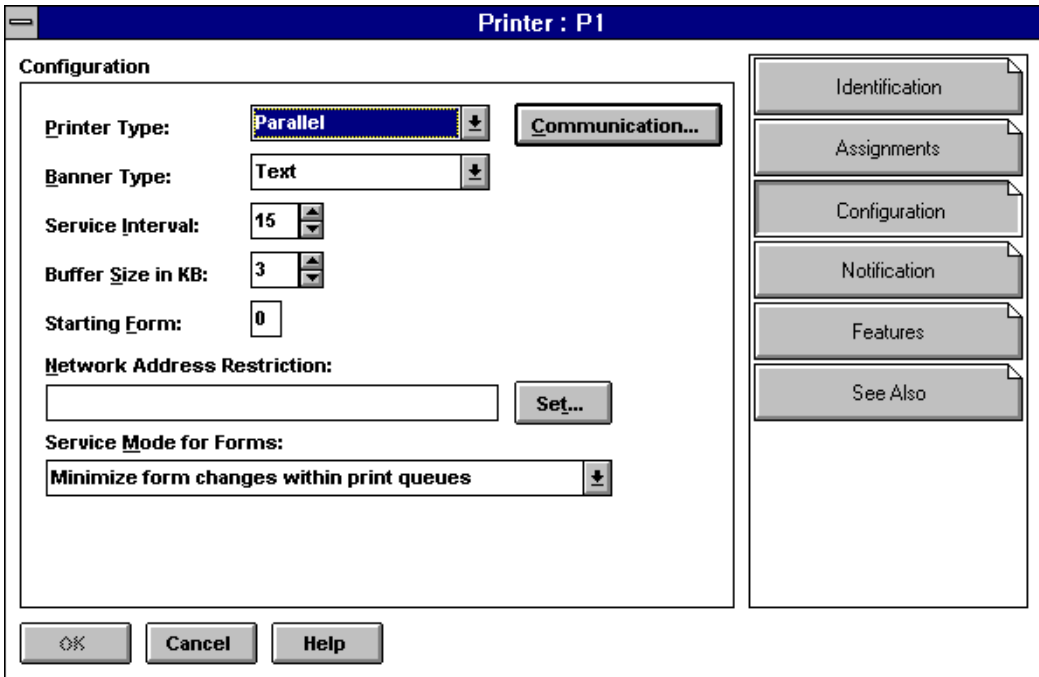
These fields are optional.

- ◆ “**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 3-13
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, OS/2 or configured by NPRINTERR)

XNP

AIO

Parallel, serial, XNP (eXtended NetWare Printer protocol)
AppleTalk, UNIX and AIO printers require unique settings.

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

Printers cabled to an OS/2 workstation should use type “Other/Unknown.”

- ◆ **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 3 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.



If you are running OS/2, you should select printer type “Unknown/Other” to ensure that print jobs are directed to an OS/2 queue instead of to a print server. For more information, select “Unknown/Other” and then select Help. If you select another printer type (Parallel or Serial) while running OS/2, be sure it is set up for “Manual Load.”

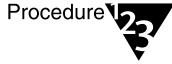
5. **When you are finished, select “OK.”**

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 configure.**

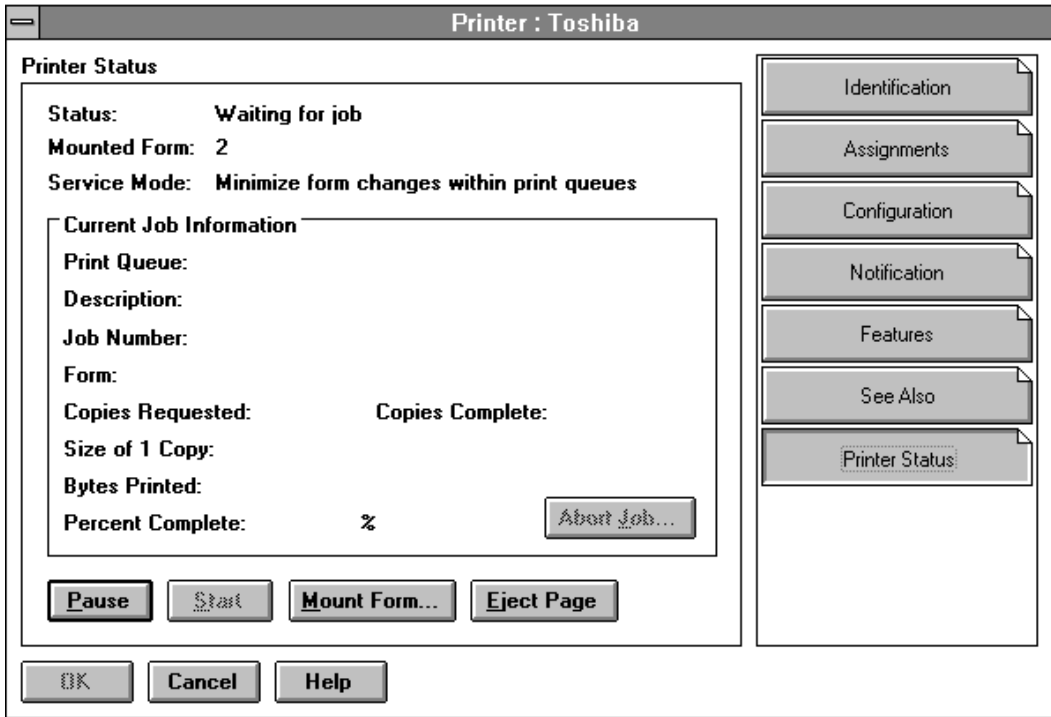
The printer “Identification” dialog appears.

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.

Figure 3-14
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



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

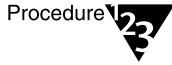
“Percent Complete” indicates how much of this print job is completed, which is determined both by the size of one copy and the number of copies requested for this print job.

- ◆ **“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

Use the following procedure to change your 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” on page 59 for information on these parameters.

5. **Choose “OK.”**

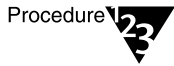
You return to the “Configuration” page.

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

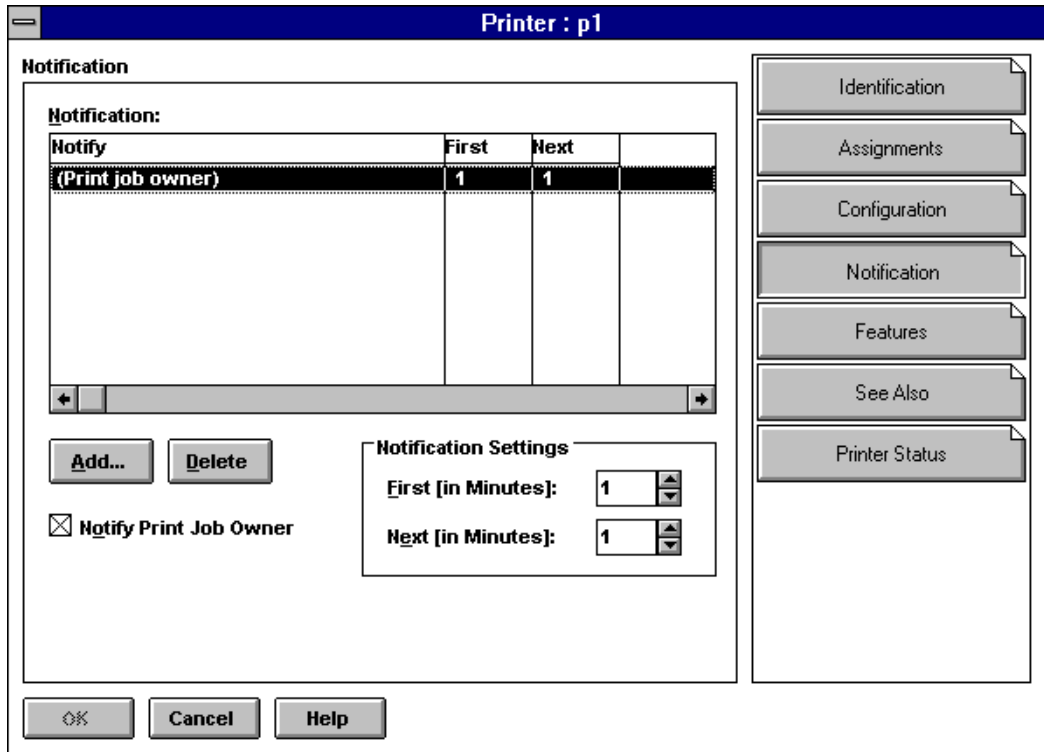
Procedure



1. **From the printer’s “Identification” dialog, select the “Notification” page.**

A page similar to the following is displayed:

Figure 3-15
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).

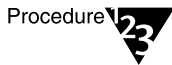
Specifying Printer Features

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.

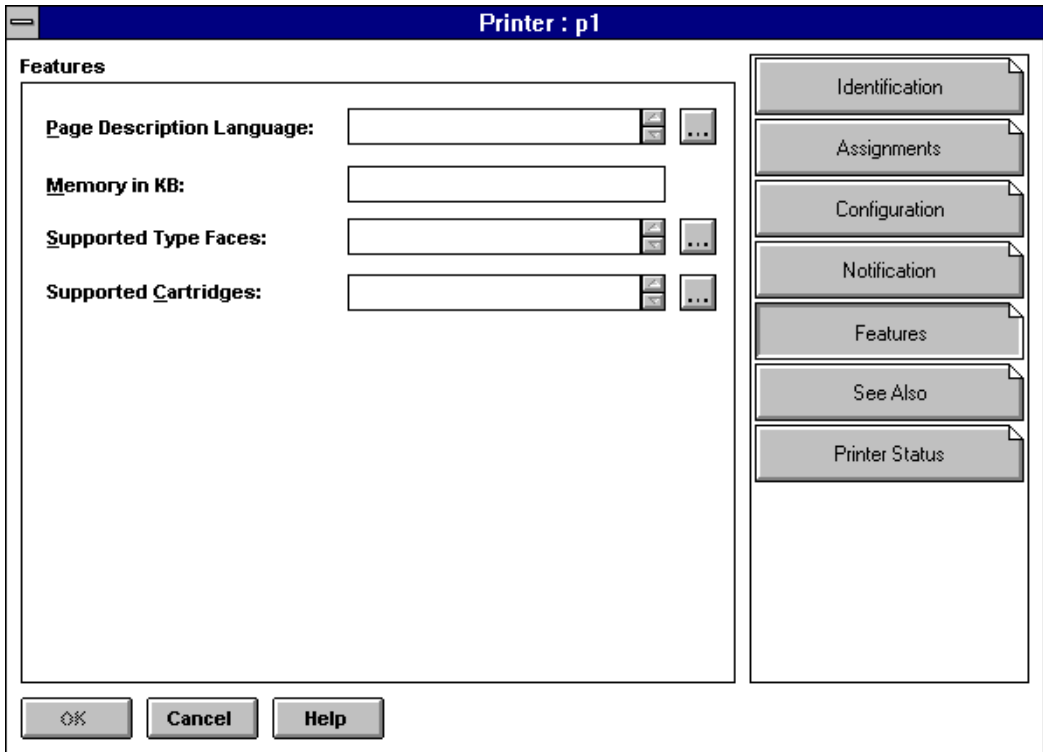
Procedure



- 1. From the printer’s “Identification” dialog, select the “Features” page.**

A page similar to the following is displayed:

Figure 3-16
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.

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.

Print Server Options

Viewing Your Printing Layout and Status

The “Print Layout” page in NetWare Administrator shows a map of your printing setup. You can see which print objects are assigned to each other and the status of each object. This information can help you quickly determine if printing is operational or which print objects may have problems.

The “Print Layout” page can be accessed from two locations in NetWare Administrator.

- ◆ The “Details” or object dialog box for a container object
- ◆ The “Details” or object dialog box for a print server

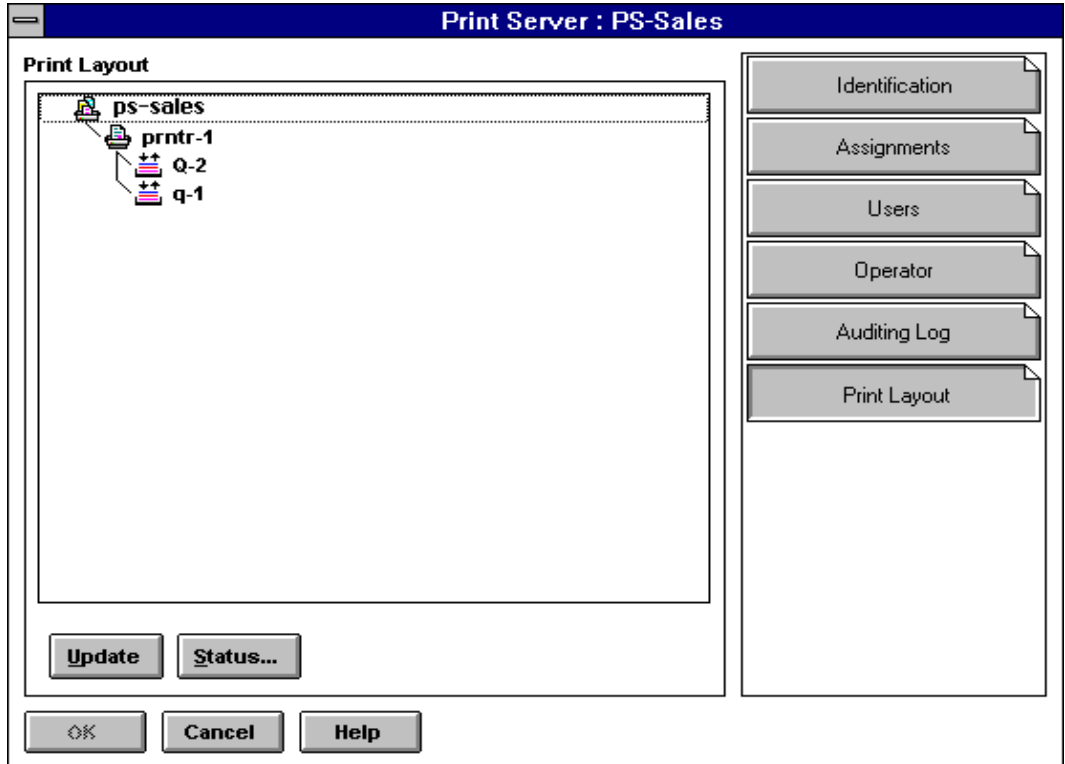
Print Layout Features

- ◆ A dashed line between objects means the connection is established for the current print server session only rather than configured to connect every time the print server is loaded.
- ◆ The status of the print server and each element on the display is represented visually through trouble icons along the left margin.
- ◆ You can invoke information about each object by highlighting the object and clicking on the right-hand mouse button.
- ◆ You can view print jobs in a queue by double-clicking on that queue’s icon.
- ◆ You can expand and collapse an object by double-clicking on the left-hand mouse button.
- ◆ “Update” refreshes the print layout tree to reflect any changes with the print objects.
- ◆ “Status” provides a brief summary of the selected print object's details. For complete detail information, select the object in the browser and choose “Details.”

Status for print jobs is not available in the Print Layout page. You must manage print jobs from the Queue object the job is stored in.

The following figure shows a typical “Print Layout” page for a Print Server object.

Figure 3-17
Print Layout Page for Print Server



Enabling and Viewing the Print Server Auditing Log

The PSERVER 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 the scroll bars to browse through the current 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.

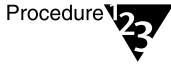
In designing the auditing log, Novell® has recognized that companies do accounting in a variety of ways. For this reason, the auditing log provides a basic default format based on ASCII text and a fixed record length. Both characteristics are designed to make it as easy as possible to write a customized 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 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 NetWare Administrator or to modify the log, use the following procedure.

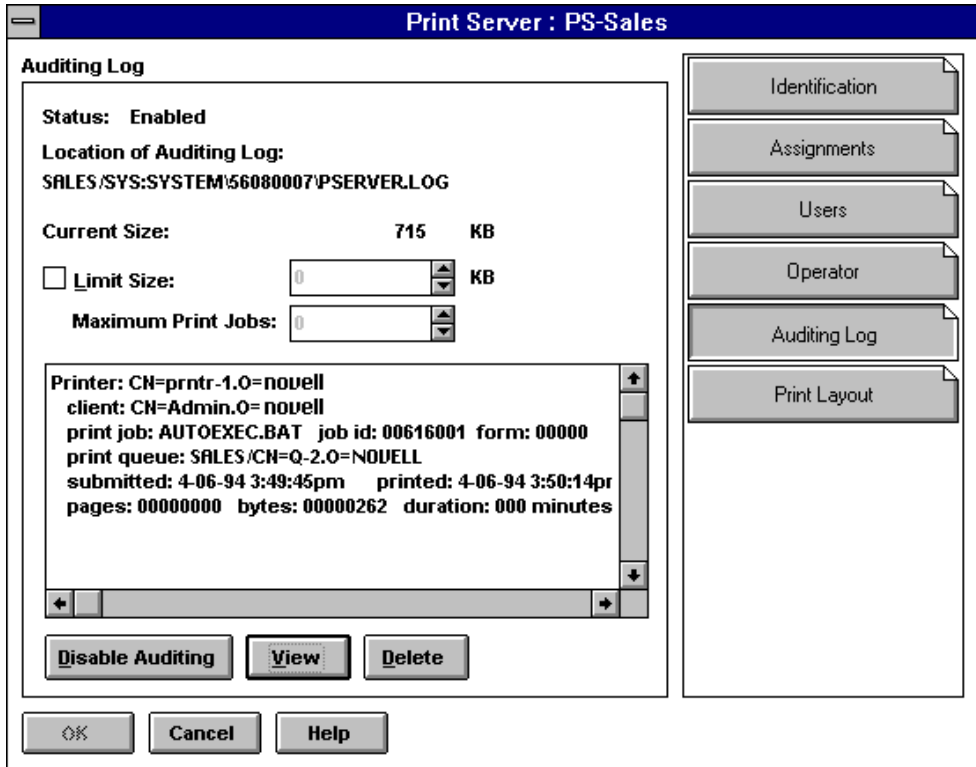
Procedure



1. From the browser, choose the Print Server object you want to audit and, from the “Object” menu, select “Details.”
2. Select “Auditing Log.”

An “Auditing Log” dialog similar to the following appears.

Figure 3-18
Print Server Auditing Log



3. Select “Enable Auditing.”

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.

4. Specify whether you want to “Limit Size” of the log file.

In this field, you should specify the maximum size (in kilobytes) 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.

5. After auditing has been enabled, unload and then reload the print server

6. (Optional) Submit a print job to ensure that the log is recording information on print jobs properly.

7. To view the auditing log, select “View.”

8. To delete the auditing log, select “Disable Auditing.”

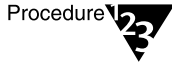
9. Select “OK.”

You can also view the auditing log from PCONSOLE.

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



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.**

- 3a. **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.

- 3b. **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 at the server console. However, an active (Status: running) print server can be unloaded 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.

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.

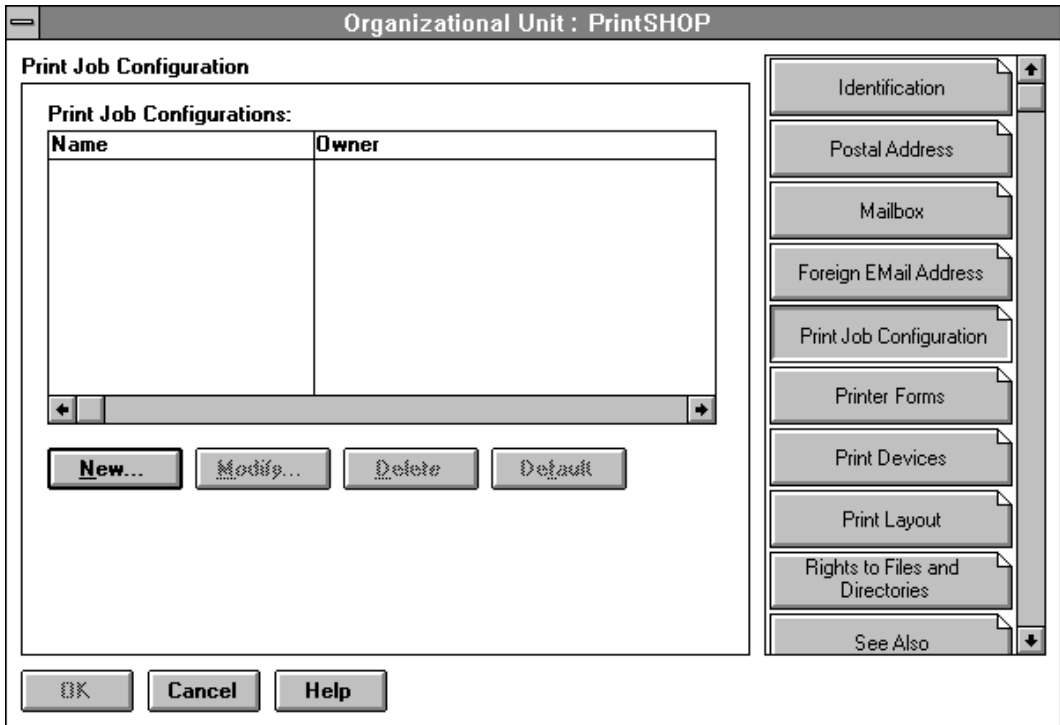
Creating Print Job Configurations

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 3-19
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 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.

Figure 3-20
Print Job Configuration Page

The screenshot shows the "Print Job Configuration" dialog box with the following fields and options:

- Print Job Name:** [Empty text box]
- Form Name:** [Empty text box with a dropdown arrow]
- Number of Copies:** [1]
- Print Banner**
- File Contents:** [Byte Stream with a dropdown arrow]
- Name:** [Empty text box]
- Tab Size:** [8]
- Banner Name:** [Empty text box]
- Form Feed**
- Enable Timeout**
- Notify When Done**
- Timeout Count:** [5]
- Local Printer:** [lpt1 with a dropdown arrow]
- Auto end cap**
- Printer/Queue:** [Empty text box with a printer icon button]
- Device:** [Empty text box with a dropdown arrow]
- Mode:** [Empty text box with a dropdown arrow]

Buttons at the bottom: **OK**, **Cancel**, **Help**

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

4. Choose “OK.”



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.

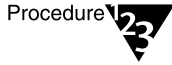
If you specify a print job configuration that has a complex printer mode, you may need to increase the bytes (default 64, range 0 to 255) in the “PRINTER HEADER=*number*” option.

See Chapter 2, “NET.CFG Options Reference ” in *NetWare Client for DOS and MS Windows Technical Reference* and Chapter 8, “Creating and Managing Print Job Configurations,” on page 215 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.**

The “Print Job Configuration” page appears.

3. **Follow the procedures described in the previous section, “Creating Print Job Configurations” on page 80, starting at Step 3.**

4. **To delete a configuration, choose the “Delete” option.**

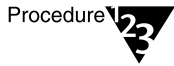
Selecting a Default Print Job Configuration

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, PSC, or NetWare Administrator to mount the new form. For information on mounting a printer form, see “Working with Printer Forms” on page 86.

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



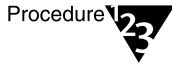
Note

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

To create a printer form, use the following procedure:

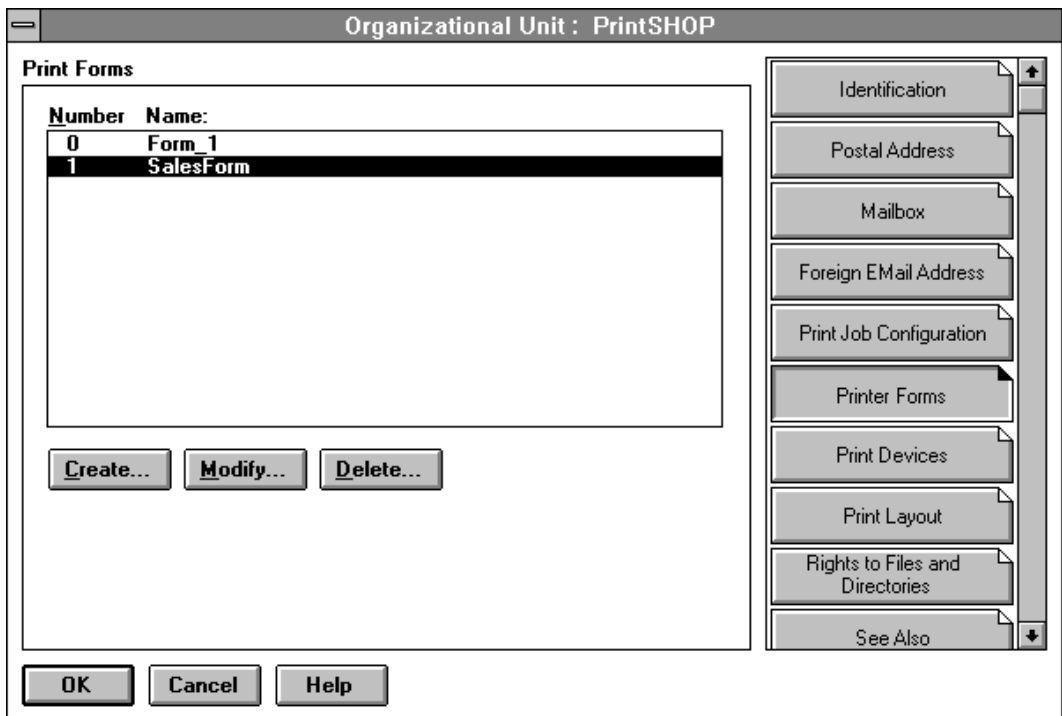
Procedure



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, similar to the following figure.

Figure 3-21
Printer Forms Page



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.

7. Enter a number from 1 to 999 in the “Width” field.

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

8. Choose “OK.”

A printer form with the name that you entered is listed in the “Printer Forms:” list box.



The width field of the printer form is for information only. The length field is primarily for information only, also, but the information is also used by the rewind function for the printer. The primary functionality forms provide is to notify the operator when a different form is required (that is, different paper should be loaded in the printer).

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:

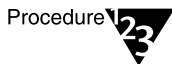
- ◆ **Changing the paper.** NetWare has no way of determining whether the paper was actually changed or not. It relies on information it receives from the operator.
- ◆ **Mounting the form through the software.** This is the information that NetWare receives from the operator and that is required in 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 3-14.

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

3. Select “Mount Form.”

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” on page 125 (PCONSOLE) or “Viewing a List of Forms” on page 243 (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 12 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.

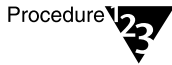
8. **Choose “OK.”**

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 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.



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" on page 80.

To see the print device definitions included in NetWare, change to the SYS:PUBLIC directory and type

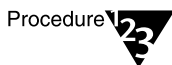
```
NDIR *.pdf <Enter>
```


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.

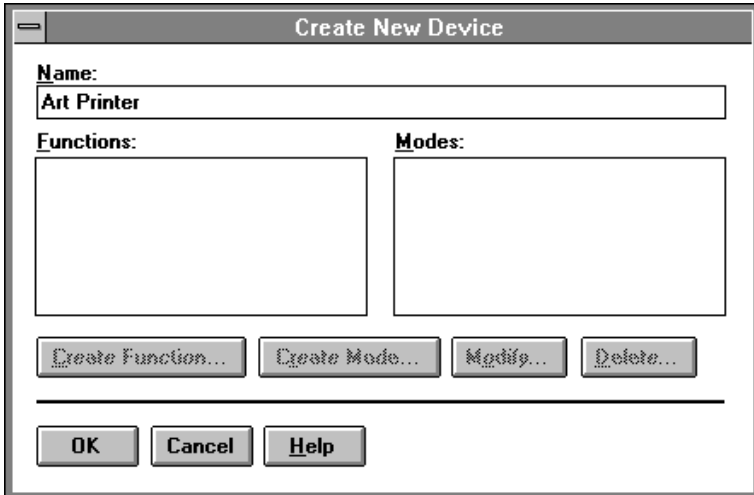
Procedure



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 3-22
Create New Device
Window



The screenshot shows a window titled "Create New Device". At the top, there is a "Name:" label followed by a text input field containing "Art Printer". Below this, there are two empty text areas: "Functions:" on the left and "Modes:" on the right. At the bottom of the window, there are four buttons: "Create Function...", "Create Mode...", "Modify...", and "Delete...". At the very bottom, there are three buttons: "OK", "Cancel", and "Help".

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.

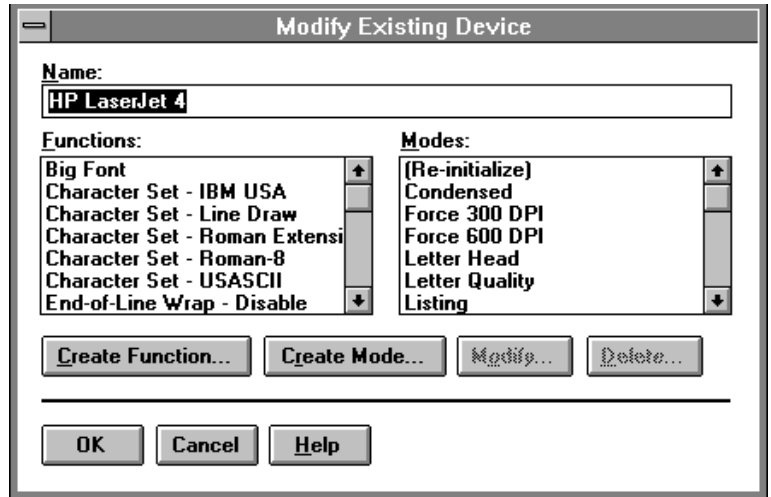
The “Print Devices” page appears. A list of existing print device definitions is displayed in the “Name” field.

3. Highlight the print device definition you want to modify.

4. Select “Modify.”

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

Figure 3-23
Modify Existing
Device Page



5. 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.

6. Make the desired changes and select “OK.”

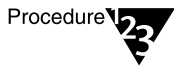
Creating or Modifying Print Device Functions

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 onlineHelp.

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

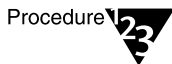
The print device definition “Import” feature allows you to import a definition for a new print device into the device database so that can be used by objects in this container. A definition consists of a name, functions, and modes.

With NetWare, Novell 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.

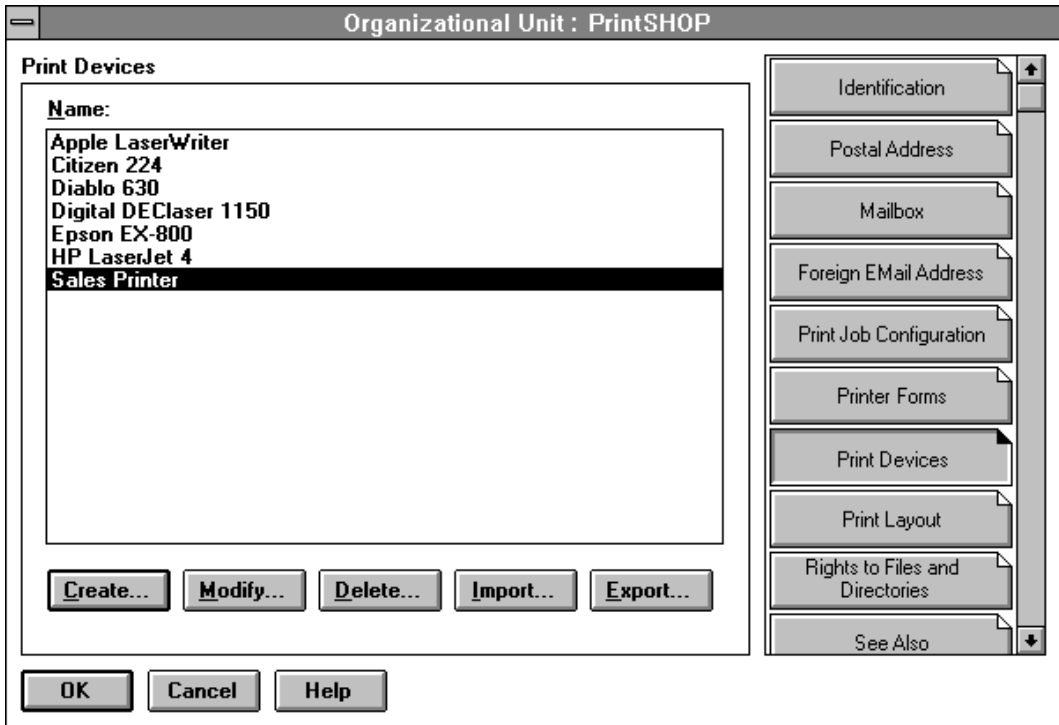
Procedure



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.

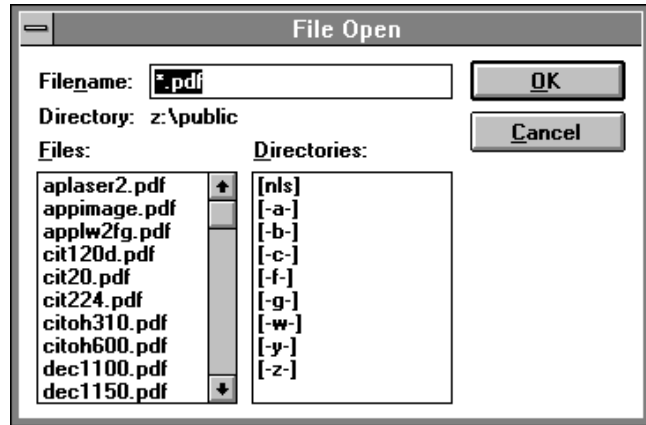
Figure 3-24
Print Devices Page



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 3-25
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.”

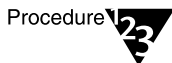
The print device definition is added to the “Print Devices” list box, and the definition contained in the file can now be used by objects in this container.

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



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.

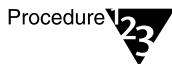


In most printers, the order of the functions is important. See your printer’s documentation for more details.

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.

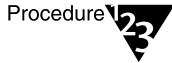
7. Repeat Steps 2 through 5 as needed.
8. Choose “OK.”

You return to the “Modify Print Device” dialog.

Referencing Bindery Queues

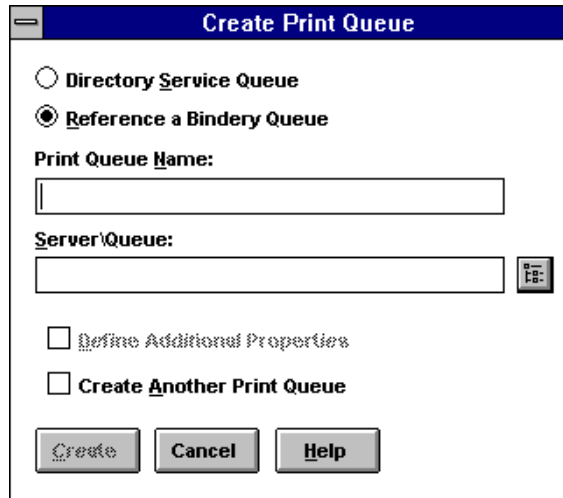
The following procedure lets you reference a bindery queue and add it to your list of print queues available for printing.

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.

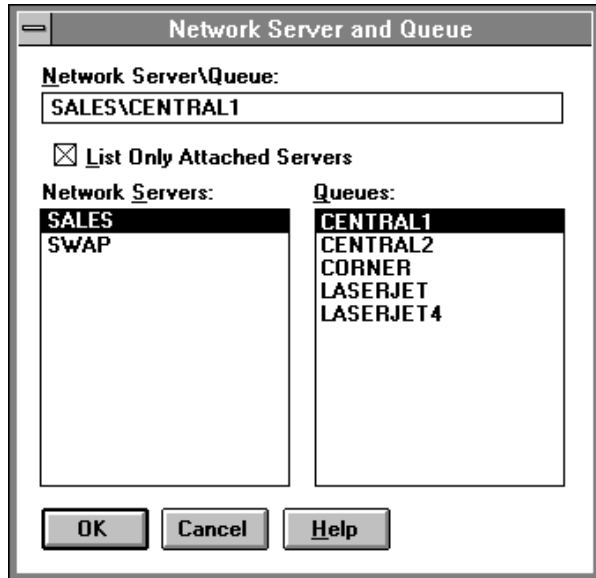


2. (Optional) If you want to assign a bindery reference queue name different from the queue’s name on the NetWare 3 server, enter the reference name into the “Print Queue Name” field.

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.



- ◆ “**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 Using PCONSOLE

Overview

This chapter explains how to set up and administer print services with the PCONSOLE utility.

The graphical NetWare® Administrator utility provides similar functionality to that provided in PCONSOLE. See Chapter 3, “Managing Print Services with the NetWare Administrator Utility,” on page 29.

New PCONSOLE Features for NetWare 4

Quick Setup Feature

The “Print Services Quick Setup” option in NetWare Administrator and the “Quick Setup” option in PCONSOLE both provide simple ways to get a printing setup.

Integrated Setup

You are now able to use PCONSOLE to configure Macintosh and UNIX® printers. Before, a separate utility was required to do that.

Simplified Navigation

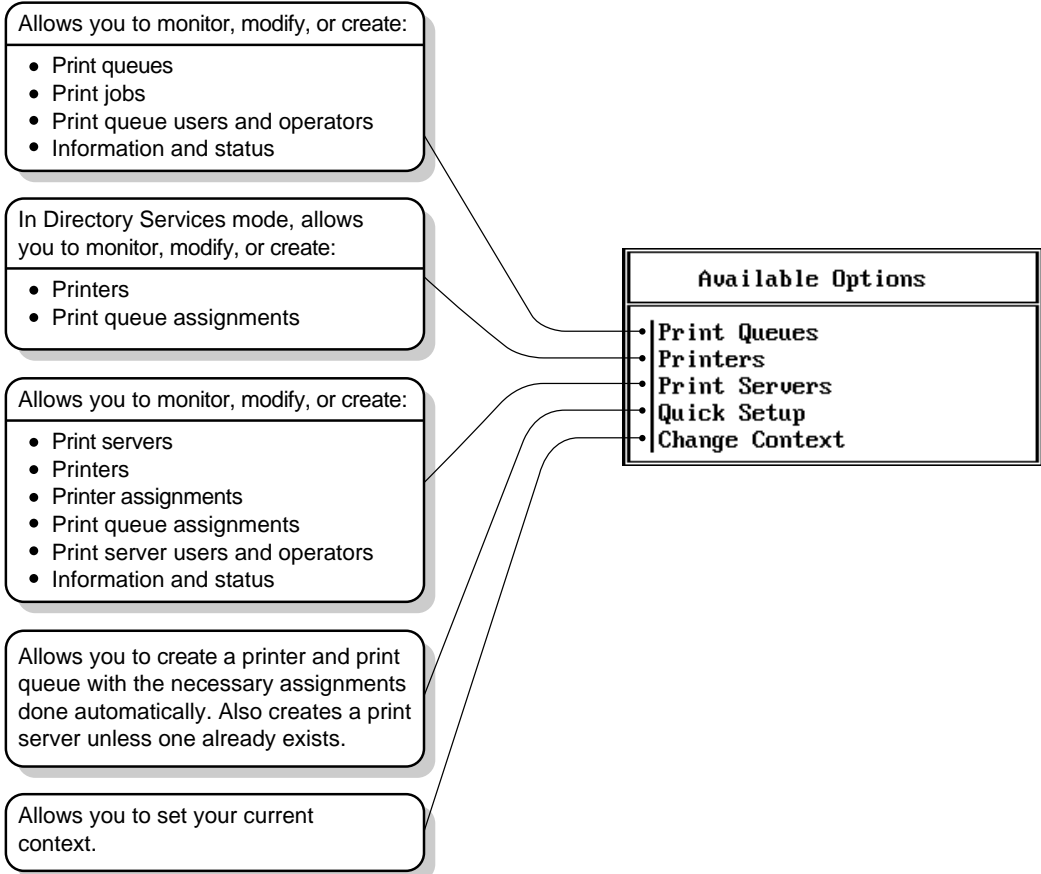
In PCONSOLE for NetWare 4™ software, the same functionality can be accessed from multiple menus.

For example, when you select a printer and bring up a list of queues to add to it, if the queue that you want hasn’t been created yet, you can create it from there.

Printing Tasks Handled through PCONSOLE

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

Figure 4-1
PCONSOLE Tasks



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

Table 4-1

Navigation Procedures for Common PCONSOLE Tasks

Task	Procedure
Audit printing.	See “Adding, Changing, and Removing Print Server Passwords” on page 129.
Changing your printer type.	See “Creating or Modifying Printers” on page 111.
Create a print queue, printer, and print queue with all of the necessary assignments done automatically.	See “Setting Up NetWare Print Services” on page 18.
Create or modify a print queue.	See “Print Queue Options” on page 113.
Create or configure a printer.	See “Creating or Modifying Printers” on page 111.
Create or modify a print server.	See “Creating or Modifying Print Servers” on page 112.
Create, modify, or view print jobs.	“Creating or Manipulating Print Jobs” on page 113.
Print a file already formatted for the printer (ASCII or otherwise).	<ol style="list-style-type: none"> 1. From PCONSOLE 's “Available Options” menu, choose a print queue under “Print Queues,” and then choose the “Print Jobs” option. 2. Press <Insert> and follow the instructions in the information lines. 3. When you are finished with the screen “New Print Job to be Submitted,” press <F10> or <Escape> and choose Yes to save changes and print.
View printer status.	See “Viewing or Modifying a Printer’s Status” on page 119.
View print server status.	See “Viewing a Print Server’s Status” on page 126.
View version information for this utility. Also view the names and version number of all files required to run this utility.	Type <code>PCONSOLE /VER <Enter></code> .

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. You can also perform this procedure with NetWare Administrator. See “Creating Print Queues” on page 40.

Procedure



1. **From PCONSOLE's main menu, select “Print Queues.”**

A list of print queues appears.

2. **To add a queue, press <Insert>. To change a name, highlight the name; then press <F3>.**
3. **To delete a queue, highlight the queue and press .**
4. **To (re)configure a queue, select the desired queue name.**

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

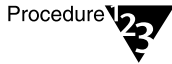
Keep in mind that queue users can submit jobs to that queue (via CAPTURE and NPRINT). Operators can manipulate all queue jobs.

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. You can also use NetWare Administrator to create and configure printers. See “Creating Printers” on page 44.

Procedure



- 1. From PCONSOLE's main menu select the “Printers” option.**

The “Printers” list box appears.

- 1a. To add a printer, press <Insert>.**
- 1b. To delete a printer, press .**
- 1c. To change a name, highlight the name then press <F3>.**
- 1d. 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” on page 117 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**

- 7a. Select the “Print Servers” option on PCONSOLE’s main screen.
- 7b. Select the desired print server name.
- 7c. 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. You can also perform this procedure with NetWare Administrator. See “Setting Up Print Services with NetWare Administrator” on page 39 and “Modifying NetWare Print Services” on page 110.

Procedure



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

A list of print servers appears.

- 1a. To add a print server, press <Insert>.
- 1b. To delete a server, press .

- 1c. 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*.

- 1d. 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

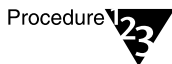
By selecting “Status” from the “Print Queue Information” menu, a print queue operator with appropriate rights can set flags that limit access to the selected print queue:

- ◆ “**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.”**

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.

2. **To submit a file for printing from this screen,**
 - 2a. **Press <Insert>.**

- 2b. **Enter the directory path to the desired file (or press <Insert> again to browse).**
 - 2c. **Select the desired file and press <Enter>.**
The “Print Job Information” screen appears.
 - 2d. **Modify the configuration parameters as desired. Then press <Esc>.**
See Table 4-2 on page 114 for information on each of these parameters.
3. **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 4-2 on page 114 for information on each of these parameters.
 4. **To delete a print job from the “Print Jobs” list, press .**

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 4-2
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.

Table 4-2 *continued*

Print Job Parameters in PCONSOLE

Parameter	Description
User hold	<p>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.</p> <p>Type "Y" (for "Yes") to place a hold on the job; type "N" (for "No") to remove the "User Hold" parameter.</p>
Operator hold	<p>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."</p>
Service sequence	<p>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.</p>
Number of copies	<p>You can choose the number of copies you want printed.</p>
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	<p>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.</p>
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 <i>don't</i> 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	<p>If you select "Yes," you will receive a screen message telling you when the job has printed.</p>
Form	<p>You can choose the form number or form name you want the job printed on. (Form names are defined in PRINTDEF.)</p>

Table 4-2 *continued*

Print Job Parameters in PCONSOLE

Parameter	Description
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")
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.



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 4-3
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.
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 "Auto Load (Local)."

Table 4-3 *continued*

Printer Configuration Parameters in PCONSOLE

Parameter	Options	Description
	Interrupt	Lists available interrupt settings along with "None (polled mode)." Polled mode is the default in NetWare 4. Interrupts are used to signal the processor of some event that needs attention. 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.
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.

Table 4-3 *continued*

Printer Configuration Parameters in PCONSOLE

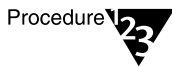
Parameter	Options	Description
Sampling interval	Default: 5 seconds	Specifies the interval, in seconds, at which the print server will look for print jobs in the print queue. Values from 1 to 255 are allowed.
Print queues assigned	NA	Lists the print queues currently assigned to be serviced by the printer. 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
Printer is waiting for a print job
Running
Ready to go down



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. 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.

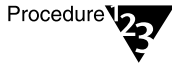
The remaining fields include information about the print job currently being printed on this printer. Most of this information can only be changed by going to the print queue and selecting this print job from the list of jobs.

- ◆ **“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, select type “Other/Unknown.” (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” on page 117 for information on parameters for parallel printers. For detailed information on other printer types, use Help.



If you are running OS/2, you should select printer type “Unknown/Other” to ensure that print jobs are directed to an OS/2 queue instead of to a print server. For more information, select “Unknown/Other” and then select Help. If you select another printer type (Parallel or Serial) while running OS/2, be sure it is set up for “Manual Load.”

Assigning Multiple Print Queues and Printers

This section explains how to assign multiple print queues and printers on Novell 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.



You will need to unload and then load the print server before the printer configurations you have just assigned will take effect. See “Using PSERVER.NLM” on page 166.

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.

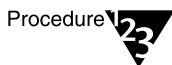
To mount a printer form, you need the following prerequisites:

- ◆ The print server must be loaded and accessible.
- ◆ The printer must be installed 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” on page 241. For information on creating printer forms with NetWare Administrator, see “Creating Printer Forms” on page 87.

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 9, “Working With Print Device Definitions and Printer Forms,” on page 225.

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. A print server running on a NetWare 4 file server is of type NetWare Loadable Module™. NetWare 3™ print servers might be either NetWare Loadable Module or Dedicated DOS types. NetWare 2 print servers might be NetWare Server VAP or Bridge VAP.
- ◆ “**Print server version.**” The version of this print server.
- ◆ “**Number of printers.**” The number of printers that are assigned to this print server.

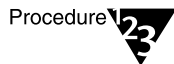
- ◆ **“Current server status.”** Can be one of the following. If the status is “Running,” you may select one of the other two options to bring down the print server.
 - “Running.”** The print server is currently running.
 - “Going down after current jobs.”** The print server finishes any print jobs currently 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.**

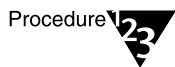
The “Printer name Configuration” form appears.

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



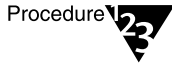
1. **From the “Available Options” menu, select “Print Servers.”**
A list of active print servers appears.
2. **Select the print server servicing the queue you want to modify.**
The “Print Server Information” window appears.
3. **Select “Printers.”**
4. **From the list, select the printer the queue is 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 PSERVER audit 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.

Figure 4-2

Typical Entry in the Auditing Log

```
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
```

In designing the auditing log, Novell 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) 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 loaded at the server console. However, an active (Status: Running) print server can be 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.

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 4 server and NetWare 4 clients to your network and still retain your existing PSERVER.EXE and NetWare 3 environment.

- ◆ If you use PCONSOLE from NetWare 4 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, new in PCONSOLE for NetWare 4, 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” on page 19.

When you use “Quick Setup” in bindery mode, you can attach to a bindery-based server or get a bindery attachment to a NetWare 4 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.

You would use Bindery mode on a NetWare 4 server if you want to load a bindery-based print server (such as PSERVER.NLM on a NetWare 3 file server) that is servicing queues on a NetWare 4 server. This means the NetWare 3 PSERVER.NLM 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.NLM on a NetWare 4 server, use only the Directory Services mode when defining printing objects.

See “Using Quick Setup in PCONSOLE” on page 19 for instructions on using this Quick Setup feature.



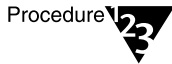
If you use bindery mode to configure the print server, printer, and queue (such as with Quick Setup), and then try to view the printer information in Directory Services mode, you will not see the printer because no Directory Services Printer object was created. You must switch PCONSOLE into the mode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

Referencing Bindery Queues

The following procedure allows a NetWare 3 print server to service NetWare 4 clients so that your NetWare 4 users can print to the existing NetWare 3 setup. For information on performing this task with NetWare Administrator, see “Referencing Bindery Queues” on page 103.

NetWare 3 references NetWare 4 servers outside your Directory tree as well as bindery print queues in your current tree.

Procedure



1. **Select “Print Queues” from PCONSOLE’s “Available Options” menu.**
2. **Press <F6> (“Add Bindery-Ref Queue”).**

The bindery <F6> option allows you to choose a NetWare 3 server and to select queues from that server. A queue object is created on the NetWare 4 server that points to the queue on the NetWare 3 server.

- ◆ If prompted, insert the name of the NetWare 3 server.
- ◆ If prompted, type in a username and password.

3. **Select the server name. If the server you want is not on the list, press <Insert>.**

A list of available servers appears.

After you have selected the server and entered the username and password, the “Bindery Print Queues” list appears.

4. Select the name of the bindery queue to be imported.

The imported print queue will now be shown on your NetWare 4 server's "Print Queues" list.

5. Using the CAPTURE utility, capture to the new bindery reference queue on the NetWare 4 clients.

You can set CAPTURE using the command line, or you can insert the CAPTURE command in the container login script or in individual user login scripts.

You can now use NetWare 4 utilities to print to queues serviced by a NetWare 3 print server.

Understanding Bindery Reference Queues and Reference Print Servers

When you reference a bindery queue on a NetWare 3 server, a "bindery reference queue" is created on the NetWare 4 server to represent the NetWare 3 queue. This reference queue is actually a pointer to the real NetWare 3 queue.

A print server is also created on the NetWare 3 server with the same name as the print server on the NetWare 4 server that is referencing that queue.

This new NetWare 3 print server will not know the password for the NetWare 4 print server, and will not have a password when it is created. This means that the new print server can log into the Directory Services database without a password even though the NetWare 4 print server of that name requires a password.

As a network supervisor, you may wish to address this issue in one of the following ways:

- ◆ Leave the new print server as is (no password)
- ◆ Assign the same password to the new print server as is used by the NetWare 4 print server
- ◆ Assign a different password to the new print server, which will limit access to the bindery queue being referenced.

Additional Information

For more information about	See
Creating, modifying, or deleting print queues, printers, and print servers with NetWare Administrator utility	“Setting Up Print Services with NetWare Administrator” on page 39 (NetWare Administrator)
Referencing NetWare 3 print queues	“Referencing Bindery Queues” on page 103 “NetSync” on page 14

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 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™ or NetWare Requester™ for OS/2 software 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 and OS/2 print jobs to a network printer (or file) from an application designed to print to workstation parallel (LPT) ports.



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
```


Table 5-1

Syntax for Common CAPTURE Tasks

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

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 5-2
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=<i>text</i>	Indicates what will appear in the lower half of the banner page. Limit is 12 characters. Replace <i>text</i> 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=<i>number</i> (1-65,000)	Specifies the number of copies. CAPTURE allows up to 65,000 copies in NetWare 4™ software. Default is 1 copy.
Create (not available in OS/2)	CR=<i>path and filename</i>	Creates a file in which to store printed data. This option can be used only with the TI=, AU, or NA options.
Details	D	Lists the printing parameters for a capture. It also indicates whether a print job configuration was used.

Table 5-2 *continued*

CAPTURE Options

Option	Syntax	Description
End capture	EC	<p>Ends the capture of data to an LPT port. When used in conjunction with the <i>L=number</i> option, it ends the capture to the port number specified. When used without the <i>L= number</i> 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	<i>F=name or number</i>	<p>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.</p> <p>Default: F=0</p>
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	<i>/? or /H</i>	<p>Displays general help information. Specific options are displayed for certain utilities on the initial help screen.</p>
Hold	HOLD	<p>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.</p>

Table 5-2 *continued*
CAPTURE Options

Option	Syntax	Description
Job configuration	J= <i>name</i>	<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 “Beginning with NetWare 4.02, 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.” on page 150.)</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= <i>number</i> (1-9) or LPT< <i>number</i> >	<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=<i>number</i> (1-9).</p> <p>You can specify LPT<i>n</i> instead of L=<i>n</i>.</p>
Name	NAM= <i>text</i>	<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>

Table 5-2 *continued*

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.
Show	SH	Shows the current status of LPT (parallel) ports. Do not use with other options.

Table 5-2 continued

CAPTURE Options

Option	Syntax	Description
Tabs	T= <i>number</i> (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= <i>number</i> (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)
Version	/VER	Displays version information for this utility. Also lists the names and version number of all files required to run this utility.

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 the following at the command line:**

```
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 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=printername 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>.**



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
```

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 Novell 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.NOVELL
```

(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 4.02, searches for print job configurations were limited to your current context and the context immediately above it in the Directory tree.

Beginning with NetWare 4.02, 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.NOVELL, your command would be as follows:

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



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 *Guide to NetWare 4 Networks*.

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.NOVELL
```

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

```
#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 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 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 4 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.

Table 5-3

Syntax for common NPRINT tasks

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

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.

Table 5-4
NPRINT Options

Option	Syntax	Description
All	ALL	Used after the <i>/?</i> 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 <i>name</i> 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.

Table 5-4 *continued*
NPRINT Options

Option	Syntax	Description
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.
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 “Beginning with NetWare 4.02, 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.” on page 150 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>

Table 5-4 *continued*

NPRINT Options

Option	Syntax	Description
Print queue	Q= <i>name</i>	Indicates to which print queue the print job should be sent; you may set a default in a print job configuration.
Printer	P= <i>name</i>	Indicates to which printer the print job should be sent; you may specify a default in a print job configuration.
Server	S= <i>name</i>	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= <i>number</i> (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 contain 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 4 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. Novell recommends that you have one print queue assigned to each printer unless all the printers are the same.

Setting Up and Servicing Print Servers

Overview

A print server is a *software* program that monitors and manages printers and print queues. PSERVER is the native NetWare print server that takes jobs from a NetWare® print queue and directs them (via NPRINT) to the assigned printer. In NetWare 4™ software, PSERVER is available only as a NetWare Loadable Module™ (NLM) program that can be loaded on a NetWare server.

Multiple print servers (PSERVER.NLMs) cannot run concurrently on the same NetWare server.

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. For more information, see “Using Third-Party Network-Direct Print Devices with NetWare 4” on page 177.

PSERVER typically uses about 27 KB of NetWare server RAM for each configured printer, depending on your buffer configurations.

After the print server is loaded, a port driver (NPRINT.EXE, NPTWIN95.EXE, or NPRINT.NLM) must be loaded for each network printer. The print server (PSERVER.NLM) must be loaded before an NPRINT can be loaded. See Chapter 7, “Setting Up Printers Attached to Workstations or Servers,” on page 187.

New Print Server Features for NetWare 4

PSERVER.NLM for NetWare 4 represents a significant advancement over previous versions. This section describes the most important changes that have occurred.

Support for 255 Printers

The print server in NetWare 4 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.

If the print server cannot service multiple fast printers without falling behind, you may notice that printing has slowed down. The print server is more capable of keeping up with multiple slower printers; therefore, you would probably not notice a difference except with the faster printers.

Another factor that may affect performance is how heavily loaded the NetWare server is to begin with, and how often the printers are required to perform. If most of your printers are frequently idle, you can support more printers than would be possible if the printers are constantly in use.

Increased Performance

In NetWare 4, the communication between PSERVER.NLM and remote printers is considerably faster than it was in NetWare 3™ software.

In most cases, the speed of the communication even in NetWare 3 was faster than data could travel through a parallel or serial port. So if you have a printer running that is attached to a workstation (using NPRINT or RPRINT), you probably will not notice much change. But the change should be noticeable with network-connect printers running in remote printer mode.

This improved communication means that network-connect printers can now be run in remote printer mode with little or no negative effect

on performance. In NetWare 3, these printers had to be configured in queue server mode for highest efficiency.

An additional performance enhancement is the configurable queue polling interval feature described in the following section.

Configurable Queue Sampling Interval

Previously, queue sampling (polling) always occurred at 15 second intervals. If a query was made and no job was in the queue, the queue would not be queried again for 15 seconds. (As long as there were jobs in the queue, continual queries would be made.)

In NetWare 4, the default queue sampling interval has been reduced to 5 seconds. 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.

Support for Macintosh and UNIX

In NetWare 4, Macintosh and UNIX[®] printers can be serviced by PSERVER.NLM.

PSERVER Console

There is now a console on the print server that allows you to administer printers and print jobs. Previously, these tasks could only be performed from PCONSOLE. See “Managing Printers from the Print Server Console” on page 170.

Auto-Reconnect

In previous NetWare releases, if the print server was servicing queues on a file server that went down, the queue list was lost.

Now, if a queue resides on a remote NetWare server and that server goes down for any reason, service for that queue resumes automatically when the server comes back up.

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 now 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 and through the NetWare 4.1 version of NetWare Administrator.

In designing the auditing log, Novell® 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, and how many pages were printed.

Requirements

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



- NetWare 4 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,” on page 269 or Appendix D, “Troubleshooting Printing Problems,” on page 291.
- Print server, print queue, and printer that have been created and assigned using one of the following:
 - ◆ NetWare Administrator (graphical utility; see “Managing Print Services with the NetWare Administrator Utility” on page 29)
 - ◆ PCONSOLE.EXE (text utility; see Chapter 4, “Managing Print Services Using PCONSOLE,” on page 107)



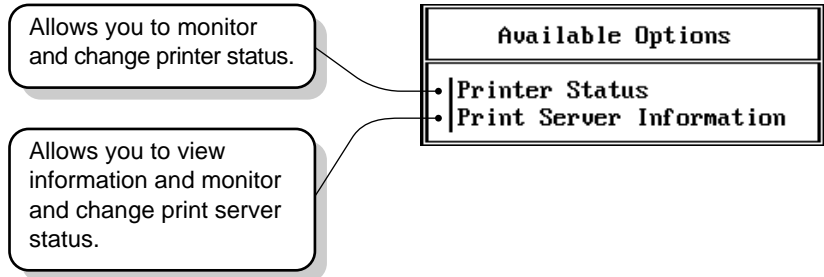
If a print server is running, you must bring it down and up again in order for certain changes to take effect, for example, when creating a new printer, assigning a printer to another print server, or enabling auditing. However, you do not have to reload the print server if you change print queue assignments for printers, create a print queue, etc.

Using PSERVER.NLM

Printing Tasks Handled through PSERVER.NLM

The following figure shows you the tasks you can do with PSERVER.NLM.

Figure 6-1
Available Options
Menu



Keep in mind that only one print server (PSERVER.NLM) can be loaded on a NetWare server. If you need to service more than 255 printers, you can also load PSERVER.NLM at another NetWare server.

Command Syntax

To load PSERVER.NLM, type the following at the NetWare server console:

```
LOAD PSERVER <Enter>
```

The “Enter print server name” window appears. Press <Enter> to browse the directory tree for existing print servers in the “Contents of current context” window. Select the print server.



If you have a bindery context set, it will be shown in the window. If the print server is in the bindery context, insert the print server name at the beginning of the bindery context. If the print server is not in the bindery context, use <Backspace> to clear the window, and then press <Enter> to browse.

If you know the name of your print server, provide the name in your command line. You may need to include the context path:

```
LOAD PSERVER [ .CN=printservername.  
OU=container.O=container]
```

For example, to load print server PS-SALES in the Sales context of organization Novell, type

```
LOAD PSERVER .PS-SALES.SALES.NOVELL <Enter>
```

For automatic execution, place this command in your AUTOEXEC.NCF file.

To unload a print server at the command line of your console, type the following at the DOS prompt:

```
UNLOAD PSERVER
```

Managing the Print Server from the Console

When you load PSERVER.NLM, the “Available Options” menu appears:

Available Options	
|	Printer Status
|	Print Server Information

The “Print Server Information” option brings up a window similar to the following:

Print Server Information and Status	
Version:	4.10
Type:	Netware Loadable Module
Advertising name:	SALES_PS
Number of printers:	1
Queue service modes:	4
Current status:	Running

Only the “Current status” field can be modified from this window.

Figure 6-2
Print Server
Information and
Status Window

Version

This field shows the version of PSERVER.NLM being used with this Print Server object to control Print Services.

Type

The type of this print server. If it is not running, the type is shown as Unavailable.

A print server running on a NetWare 4 file server is of type NetWare Loadable Module (NLM).

NetWare 3 print servers might be either NLM™ or Dedicated DOS types.

NetWare 2 print servers might be NetWare Server VAP or Bridge VAP.

Advertising name

This field shows the name the print server uses in network communications.

Number of printers

This field shows the number of printers serviced by this print server.

Queue service mode

This field shows the number of the current mode that controls the order in which the print server services print jobs in the queue according to the printer forms the jobs are to be printed on. You can change this mode in either PCONSOLE or NetWare Administrator.

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, PSC, or NetWare Administrator to mount the new form.

The following service modes 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.

Current status

Pressing <Enter> at the “Current status” field produces a menu from which you can unload the print server if you wish. You can either unload the print server immediately or unload it after active print jobs have been completed.



Do not change the status from Running unless you really want to bring down the print server. You do not receive a confirmation prompt.

- ◆ **“Running”**

The print server is currently running.

- ◆ **“Unload after active print jobs”**

The print server finishes any print jobs currently being printed; then it goes down.

- ◆ **“Unload”**

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

Managing Printers from the Print Server Console

The “Printer Status” option provides a list of printers that can be serviced by this print server. When you select the printer you want to monitor, the Print Server Console screen appears similar to the following.

Figure 6-3

Print Server Console Screen

```
NetWare Print Server  v4.10                               NetWare Loadable Module
Print server: SALES_PS.Novell
                                           Status: Running

Printer:  printer1.Novell
Type:     Automatic load (Local), LPT1
                                           Printer control

Current status:  Waiting for job

Queues serviced:  (See list)
Service mode:     Minimize form changes within print queues
Mounted form:     0

NetWare server:
Print queue:
Print job ID:
Description:
Print job form:

Copies requested:                               Finished:
Size of 1 copy:                               Finished:
Percent complete:
```

In addition to monitoring the configuration and status of your printers, you can perform a number of administrative tasks from the Print Server Console as well.

On the following pages, some of the items in Figure 6-3 are explained.

Printer

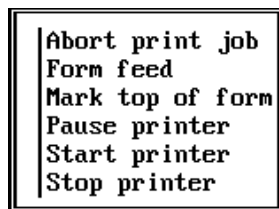
Shows the name and context of the printer being serviced.

Type

Indicates whether the printer is configured for automatic or manual loading, and shows the port number.

Printer Control

Provides access to a menu of printer functions. The following figure shows the menu that appears when the printer is attached to a server.



When you select the option you want, the change is reflected in the “Current status” field of the Print Server Console.

- ◆ “**Abort print job**” allows you to stop the current print job and remove it from the print queue.
- ◆ “**Form feed**” ejects a page from a paused or stopped printer.
- ◆ “**Mark top of form**” allows you to print a line of asterisks (*) across a row of continuous paper in a paused or stopped printer to help you align the paper in the printer.
- ◆ “**Pause printer**” allows you to temporarily stop a printer, but it will continue to service the active print job where it left off when the printer is restarted.
- ◆ “**Start printer**” allows a stopped or paused printer to be restarted.
- ◆ “**Stop printer**” stops the printer and returns the current print job to the queue.

If your printer is attached to a workstation or directly to the network running in remote printer mode, a “Private/Shared” option is also displayed. This option indicates whether remote (manually loaded) printers attached to workstations can be used by network users (Shared) or by the workstation user only (Private).

Current 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



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.”

Queues Serviced

Selecting this option takes you to a list of print queues the printer you selected can service. If you want to add a queue to the list and you have the proper rights, press <Ins>. At the “Enter Queue Name” window, press <Ins> again to browse for the queue you want to add. Select the queue you want to add and press <Enter>.

You can also delete queues from this list.

Service Mode

This field allows you to access the following menu of service modes.

```
Change forms as needed
Minimize form changes across print queues
Minimize form changes within print queues
Service only currently mounted form
```

This menu allows you to specify how form changes will be handled by the printer.

- ◆ **“Change forms as needed”** indicates that all print jobs will be serviced as they arrive, without considering how the printer form currently in use compares with the printer form of the next print job. You may have to change printer forms often.
- ◆ **“Minimize form changes across print queues”** indicates that the print server will service print jobs in print queues with lower priorities before it will require you to mount a new form for a print job in a higher priority print queue.
- ◆ **“Minimize form changes within print queues”** indicates that the print server will require 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.
- ◆ **“Service only currently mounted forms”** holds any print jobs that specify a printer form other than the one currently in use on this printer. In this mode, the printer will never request a form change. If no print job requiring the current form is available, it will not print anything.

Mounted Form

This option allows you to change the number of the form the printer is currently using.

Nonconfigurable Information

The following information is displayed on the print server console “Printer Status” screen, but cannot be modified from this location.

- ◆ “**NetWare server**” identifies the server where the volume resides that stores all data for the queue currently submitting print jobs.
- ◆ “**Print queue**” identifies the print queue currently submitting print jobs.
- ◆ “**Print job ID**” indicates the number assigned to 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.
- ◆ “**Print job 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 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.
- ◆ “**Finished**” 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 copies requested for this print job.

Servicing NetWare 4 Clients and Queues with a NetWare 3 Print Server

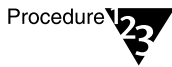
A NetWare 3 print server can service queues on a NetWare 4 server. Queues to be serviced must be created in the context designated as the

bindery context. (See the “Novell Directory Services Parameters” listing for the SET utility in *Utilities Reference* for a discussion of the SET BINDERY CONTEXT parameter.) These queues are then visible to the bindery.

Servicing NetWare 3 Clients and Queues with a NetWare 4 Print Server

The following procedure explains how to use PCONSOLE to allow a NetWare 4 print server to service NetWare 3 print queues and NetWare 3 clients.

Procedure



1. **Log in to the NetWare 4 server as Admin or equivalent.**
2. **Run PCONSOLE and select “Print Queues” from the “Available Options” menu.**
3. **Press <F6> (“Add Bindery-Ref Queue”).**

The “Add Bindery-Ref Queue” option allows you to choose a NetWare 3 server and to select queues from that server. A queue object is created on the NetWare 4 server that points to the queue on the NetWare 3 server.

- 3a. **If prompted, insert the name of the NetWare 3 server.**
- 3b. **If prompted, type in a username and password.**
4. **Select the server name.**
If you were prompted for Steps 3a and 3b, this step is omitted.
5. **Select the name of the bindery queue to be serviced.**
6. **Return to the “Available Options” menu and select “Printers.”**
7. **Select a printer.**
 - 7a. **If the printer you want is not listed, press <Insert>, type in a new printer name, and press <Enter>.**
 - 7b. **Select the new printer.**

7c. At the “Printer Configuration” window, specify the printer type.

8. Move the cursor to “Print queues assigned” and press <Enter>.

9. Press <Insert> for a list of queues in the “Object, Class” window. Select the queue you want and press <Enter>.

You return to the “Print Queue” list. Press <Esc> until you return to the “Available Options” menu.

10. Select “Print Servers” to assign the printer to the print server.

11. Load the print server that services the selected printer.

See “Using PSERVER.NLM” on page 166.

Jobs submitted to NetWare 3 queues will now be serviced.

You can set CAPTURE or NPRINT using the command line, or you can insert the CAPTURE command in the system login script or in individual user login scripts.

Using Third-Party Network-Direct Print Devices with NetWare 4

NetWare 4 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.

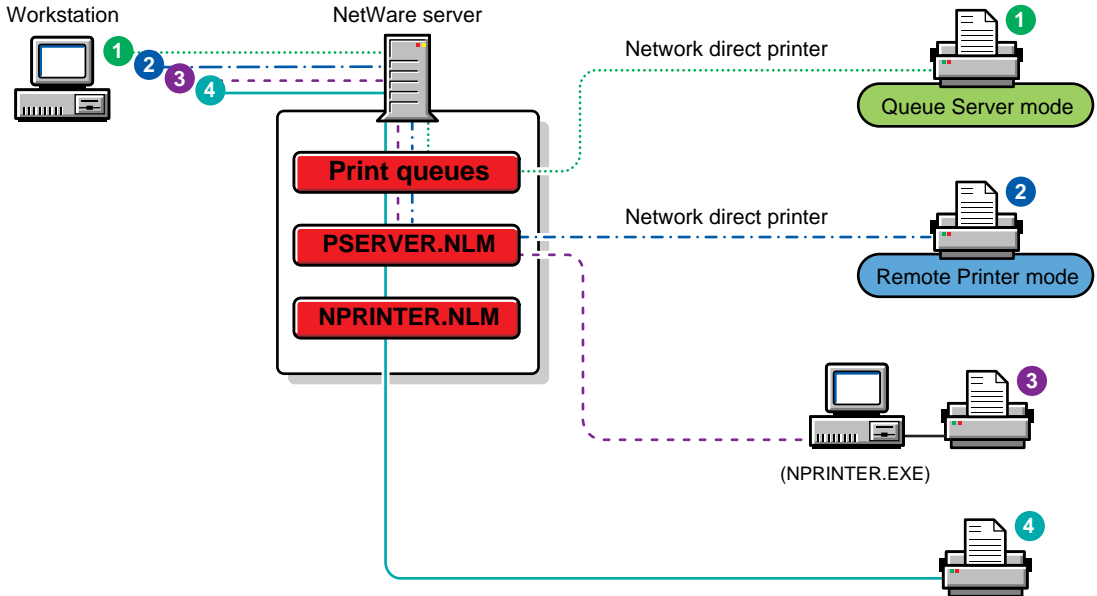
In many cases, these devices offer a fast, effective, low-cost printing solution in NetWare 4 as well as NetWare 3 environments.

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 4 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 6-4 illustrates representative network printing setups incorporating network-direct print devices used in both queue server and remote printer modes.

Figure 6-4
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 4 `NPRINTER` or the NetWare 3 `RPRINTER`. Devices configured for remote printer mode are controlled by a NetWare print server.

By using this mode, you 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 4 run considerably faster than they did under NetWare 3. The increased speed and flexibility offered with NetWare 4 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 4 PSERVER has minimized this distinction.

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

Network-direct print devices developed before NetWare 4 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 4 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 4, 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 slots 0-15 for them.

- ◆ NetWare 3 created the group EVERYONE by default. Some of the network-direct print devices assume that this group exists in NetWare 4. 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 4, the running print server can be a NetWare 4 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 4 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 4 server.

Setting Up Printing on a Network Using SFT III

NetWare® 4.1 SFT™ III (System Fault Tolerant, level III) uses two mirrored NetWare servers to provide uninterrupted network services to clients. If one server fails, its mirrored partner automatically takes over. For more information, see “Server Mirroring” in *Concepts*. For information on installing NetWare 4.1 SFT III™, see *Installation*.

In situations where printing fault tolerance is not required, a single printer may be sufficient and the location of the printers on the network is flexible. Because routers can be a point of failure, for the most reliable printing on an SFT III network, printers should be located on the same local area network segment as *both* SFT III mirrored servers.

Where fault tolerant printing is important there must be at least two identical printers on the network. They need to be identical to insure proper functioning of printer device definitions. In both cases, the printers should be located near one another since they will be assigned the same print queues, and the user will not know in advance which will print a particular job.

The printers can be set up in one of two ways depending on user needs and the level of fault tolerance desired. The characteristics of each setup are described in the following table.

Setup A (Most fault tolerant)	Setup B (Less fault tolerant)
The mirrored servers do not need to be close together to have the printers close together	The mirrored servers must be close together to permit printers to be close together
Printers are not connected to the mirrored servers	Printers are connected to the mirrored servers.
If either mirrored server and either printer are functional, printing will continue.	If one mirrored server and its attached printer are functional, printing will continue. If one mirrored server and the printer attached to the other mirrored server fail, printing will not continue

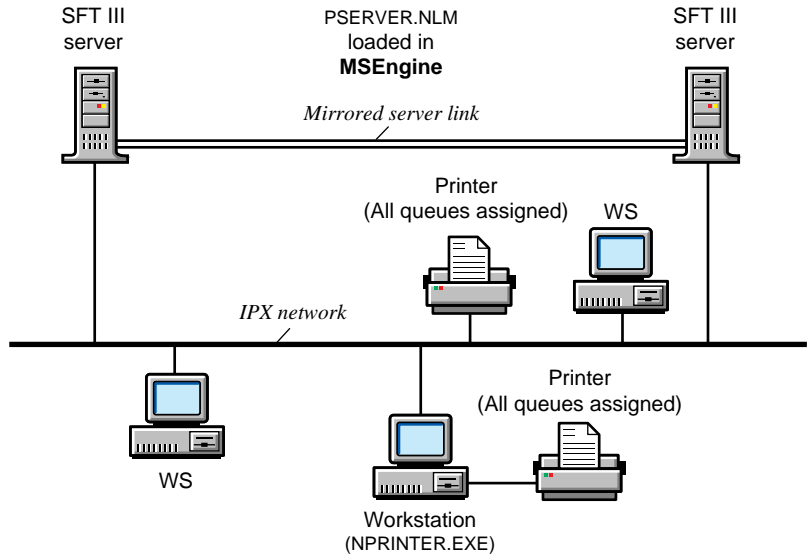


In SFT III v3.11, PSERVER.NLM was loaded in the IOEngine. In SFT III v4.1 PSERVER.NLM is loaded in the MEngine so that the print server is mirrored. NPRINTER.NLM, if used, is loaded in the IOEngine.

SFT III Printing Setup A (Most Fault Tolerant)


The following figure illustrates a fault tolerant printing setup using SFT III.

Figure 6-5
SFT III Network
Printing Setup A



The procedure for setting printers up in this way on an SFT III network is listed below.

Procedure

Procedure 

1. **Connect the printers to workstations.**

Workstations should be located on the same segment as both SFT III servers or connected directly to the segment if the printers are equipped with network interface cards.

2. **From a workstation, use PCONSOLE or NetWare Administrator to set up network printing.**

- 2a. **In the configuration for each printer, assign the same print queues to both printers.**

- 2b. **Configure each printer for "Manual Load."**

3. **At the SFT III server console, change to the MEngine and load PSERVER.**

To automate loading, insert the following command in the MSAUTO.NCF file:

```
LOAD PSERVER .<printserver name>.context
```

4. **Load NPRINT on the workstations where the printers are attached.**

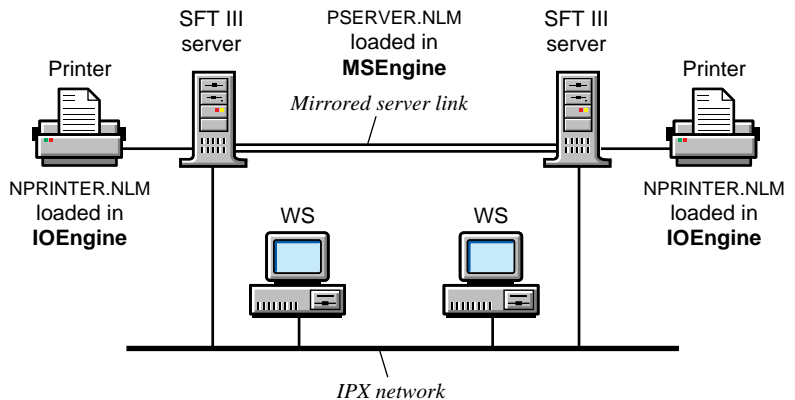
To automate, put the following line in each workstation's AUTOEXEC.BAT file:

```
NPRINT <printserver name> <printer number>
```

SFT III Printing Setup B (Less Fault Tolerant)

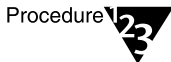
The following figure illustrates a less fault tolerant network printing setup using SFT III.

Figure 6-6
SFT III Network
Printing Setup B



The procedure for setting printers up in this way on an SFT III network is listed below.

Procedure



1. **Connect a printer to each SFT III server.**
2. **From a workstation, use PCONSOLE or NetWare Administrator to set up network printing.**
 - 2a. **In the configuration of each printer, assign the same print queue to both printers.**

2b. Configure each printer for “Manual Load.”

- 3. At the SFT III console, change to the MSEngine and load PSERVER, using the following syntax:**

```
LOAD PSERVER .<printserver name>.context
```

To automate loading, put this command in the MSAUTO.NCF file.

- 4. Load NPRINT.NLM in the IO_ENGINE of each server, using the following syntax:**

```
NPRINTER <printserver name> <printer number>
```

To automate loading put this command in the IOAUTO.NCF file of each server.

Troubleshooting Print Server Problems

The first step in troubleshooting print server-related printing problems is to use PCONSOLE, NetWare Administrator, or the print server console to monitor what is happening with your printers and print server.

- ◆ You can check on a printer that is not working by using the “Information and Status” option from the “Print Server Information” menu in PCONSOLE. This option will tell you whether the print server is running. You can also view printer status at the print server console.
- ◆ You can stop, pause, and start the printer, as well as abort or rewind a print job or realign the paper in PCONSOLE. Use the “Printer Configuration” option to access the “Printer status” form and select the “Printer Control” menu.
- ◆ For information on performing similar tasks with NetWare Administrator, see “Viewing Your Printing Layout and Status” on page 74 and “Viewing and Modifying a Printer’s Status” on page 63.

For a comprehensive discussion of printing troubleshooting strategies, see “Troubleshooting Printing Problems” on page 291.

Additional Information

For more information about	See
Creating, modifying, or deleting print servers	“Creating Print Servers” on page 47 (NetWare Administrator) “Creating or Modifying Print Servers” on page 112 (PCONSOLE)
Modifying a server’s AUTOEXEC.NCF file	“Creating or Editing a Server Batch (.NCF) File” in <i>Supervising the Network</i>

Setting Up Printers Attached to Workstations or Servers

Overview

This chapter explains how to use Novell® network port driver software. Every network printer requires a software program called a *port driver* to print network print jobs.

When you are finished with the instructions in this chapter, you should have a NetWare® port driver (NPRINTER) loaded for each network printer.

You must use NPRINTER.EXE or NPTWIN95.EXE if your printer will be attached to a workstation. Use NPRINTER.NLM if your printer will be attached to a NetWare server.

Printers attached directly to servers running PSERVER.NLM may be configured to be loaded either automatically (using the “Auto Load (Local)” option) or manually (using the “Manual Load” option). Printers attached to workstations can only be configured for manual loading.

The terms *local*, *remote*, *auto load*, and *manual load* may be confusing at first. Keep in mind that *local* and *auto load* are the same thing while *remote* and *manual load* are the same thing.

Configuring your printer to “Auto Load (Local)” means that when you load your print server, it is also going to load NPRINTER with the printers that you have configured as “Auto Load (Local)” printers.

Configuring your printer to “Manual Load” means that you can load a printer remotely; that is, NPRINTER may be run on a different machine from the print server.

In addition, you may want to load PCONSOLE on that workstation to allow you to monitor the status of these printers.

A network printer can print jobs sent from any network workstation. Network printers include printers that are cabled in any of the following ways:

- ◆ **To a DOS or OS/2 workstation (NPRINTER.EXE).** For standard systems, you can attach up to 3 parallel and 4 serial printers to a workstation.
- ◆ **To a Windows 95 workstation (NPTWIN95.EXE).** For standard systems, you can attach up to 3 parallel and 4 serial printers to a workstation.
- ◆ **To a NetWare server (NPRINTER.NLM).** For standard systems, you can attach up to 3 parallel and 4 serial printers to a single machine.
- ◆ **Directly to the network cabling.** See “Using Third-Party Network-Direct Print Devices with NetWare 4” on page 177.



Only printers cabled to a NetWare server running the print server may have NPRINTER.NLM loaded automatically when PSERVER.NLM loads.

Manually loaded NPRINTER NLM™ modules display a separate status screen on the NetWare server console. Any NPRINTER NLM configured for “Auto Load (Local)” is tracked in the print server console screen.

New NPRINTERS Features for NetWare 4

MS Windows Support

While RPRINTERS for NetWare 3™ software supports MS Windows, the support provided for MS Windows by NPRINTERS in NetWare 4™ software has been improved.

NLM Version

In NetWare 4, the port driver has been taken out of PSERVER.NLM and has become NPRINTERS.NLM. This allows greater flexibility in setting up your network and in deploying your network resources.

For example, you may now choose to include only one print server object in your Directory Services context. You can use this print server to service printers attached to NetWare servers that do not have a print server running. This was not possible in NetWare 3.

The use of NPRINTERS.NLM also allows you to unload the port driver without bringing down the print server.

Improved Performance

Tests indicate that NPRINTERS executes faster than RPRINTERS. The effect this added speed will have on printing performance on your own network will be determined by such items as port speed (the speed at which data can pass through your port), printer speed, type of data being printed (for example, graphics vs. text), and the speed of the machine NPRINTERS is running on.

For example, if you are printing graphics data from a fast machine that has a fast parallel port, and you also have a fast printer, the performance improvement should be quite noticeable. On the other hand, if you are printing to a serial port, you will not see any performance difference.

Requirements

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



- NetWare 4 server.
- Print server, print queue, and printer that have been created and assigned using one of the following:
 - ◆ NetWare Administrator (See “Using Print Services Quick Setup in NetWare Administrator” on page 18.)
 - ◆ PCONSOLE (See “Using Quick Setup in PCONSOLE” on page 19.)
- Print server (PSEVER.NLM) loaded on a NetWare server. (See “Using PSEVER.NLM” on page 166.)
- Printer cabled to a network workstation running DOS, MS Windows, or OS/2, directly to the network, or to a NetWare server.



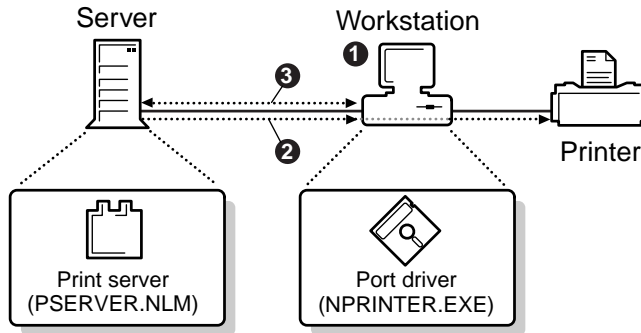
Make sure each printer functions properly in its current environment. If a printer functions properly in its current environment (non-network or otherwise), it will work with NetWare print services. If your printer is not functioning properly, see Appendix D, “Troubleshooting Printing Problems,” on page 291 or Appendix B, “Cabling Printers,” on page 269.

Using NPRINT.EXE

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

Figure 7-1 illustrates the path taken by print data from a print queue on a NetWare server to a printer attached to a network workstation.

Figure 7-1
Data Path for Print Jobs from PSERVER to a Printer



- ❶ NPRINTER waits for a print job.
- ❷ PSERVER sends print job data to the printer via NPRINTER. After checking for printer readiness, NPRINTER sends print job data until the printer's buffer is full or until its own buffer is empty.
- ❸ NPRINTER requests more data from PSERVER and also sends its status.

Printing Tasks Handled through NPRINTER.EXE

Table 7-1
NPRINTER.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"> 1. Type NPRINTER <Enter>. 2. Select a print server then a printer, or press <F4> and <Enter> to browse and select a printer. 3. Press <F1> for help from here.
Load port driver for printer P_1 for organizational unit Sales in organization Novell.	NPRINTER .P_1.SALES.NOVELL <Enter>

Table 7-1 *continued*

NPRINTER.EXE Tasks

To get to the screen where you can	Do the following
Load port driver for printer P_1 (logical number 0) for print server PS-SALES (NetWare 3 syntax).	<code>NPRINTER PS-SALES 0 <Enter></code>
View the status of all loaded port drivers.	<code>NPRINTER /S <Enter></code>
Unload the port driver loaded last.	<code>NPRINTER /U <Enter></code>
View Help for the command-line NPRINTER.	<code>NPRINTER /? <Enter></code>

Command Syntax

`NPRINTER [printer|printserver printernumber] option`

NPRINTER.EXE can be loaded up to seven times on the same workstation. This is because you can load NetWare port drivers for up to 3 LPT and 4 COM workstation ports with NPRINTER.EXE (menu or command-line)

The following figure shows you options available with NPRINTER.EXE at a DOS or OS/2 workstation.

Table 7-2

NPRINTER.EXE Options

Parameter	Syntax or variable	Description
Buffer	<code>B=number</code>	Overrides defined buffer size (3-60 KB). The default is 3.
Printer	<code>printername</code>	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	<code>printserver name</code>	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	<code>printer number</code>	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.

Table 7-2 *continued*

NPRINT. EXE Options

Parameter	Syntax or variable	Description
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.
Version	/VER	Displays version information for this utility. Also lists the names and version number of all files required to run this utility.
Help	? or /H	Displays online help.

Running Port Drivers from Local Drives

If you want to avoid logging in to the network before running NPRINT. 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.

To get a list of all of the associated files and correct version numbers of each, type NPRINT /VER at the network command line.

Running Port Drivers on DOS or MS Windows Workstations

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

NPRINT. EXE can run any printer configured in NetWare Administrator or PCONSOLE as "Manual Load."



Each loaded NPRINT. EXE occupies 2 KB more of workstation RAM than the buffer size defined for that printer. Buffer sizes can be set in either PCONSOLE or NetWare Administrator, or the command line. You can load NPRINT. EXE up to 7 times per workstation.

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

Loading Port Drivers on MS Windows Workstations

If your workstation uses MS Windows 3.0 or 3.1, you must load NPRINTERR.EXE before you load MS Windows *and* you must perform 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 MS Windows SYSTEM.INI file under the heading “[386Enh]”:

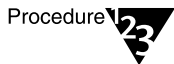
```
LPT1AutoAssign=0  
LPT1irq=-1
```

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

Loading Port Drivers from the NPRINTERR Menu

The NPRINTERR 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:**

```
NPRINTERR <Enter>
```

A list of available print servers appears.



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.

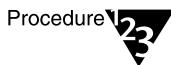


If you choose a printer of type "Other/Unknown," you will be asked to specify the printer type (parallel or serial), the port, the interrupt, and so forth.

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.
2. Type the following at the command line:

```
NPRINTER printername
```

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.NOVELL
```

OR

NPRINT *printservername printernumber*

For example, to load printer P1, which has printer number 0 and is assigned to PS-Sales, type

NPRINT 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.



NPRINT.EXE can be executed without logging in if you copy all necessary NPRINT files to a local workstation drive. To get a list of the necessary files and correct version numbers, type NPRINT /VER.

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

NPRINT /U

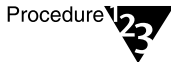
Loading Port Drivers on OS/2 Workstations

NPRINT provides the interface between OS/2 print queues and NetWare printers.

Before running NPRINT, you need to define an OS/2 printer to correspond with each NetWare printer that will be receiving print jobs from an OS/2 queue.

To load a port driver on an OS/2 workstation, use the following procedure:

Procedure



1. **Choose the Novell icon from your desktop.**

When you install the NetWare Client™ for OS/2, NPRINT.EXE is available as an icon named “Network Printer.”

2. **Choose the “Network Printer” icon from the Novell—Icon View window on your desktop. Then select the “Printers” menu from the NPRINTER window.**

The “Load” and “Unload” options are listed.

If the “Load” option is dimmed on this menu, it means you already have loaded the maximum number of OS/2 printers (7) allowed. You will need to unload one before you can load another one.

If the “Unload” option is dimmed, it means that no port drivers are currently loaded.

3. **Choose “Load” from the “Printers” menu.**

The “Load Printers” dialog box appears with a list of configured printers.

If there are no configured printers on the list, you must define a printer. The following steps describe how to define and add a new printer.

- 3a. **Choose “Define” from the “Load Printers” menu.**

A list of OS/2 printers currently defined on this workstation appears in the “Define Printers” dialog box.

- 3b. **Choose the “Add” button to define the OS/2 printer you want NPRINTER to load on this workstation.**

The “Add/Edit Printer” dialog box appears.

- 3c. **Type a printer name in the “Description” field.**

You must fill in this field.

Novell recommends that you use the same name for this OS/2 printer as you assigned to the corresponding NetWare printer. (NetWare printers are defined and configured in NetWare Administrator or PCONSOLE.)

- 3d. **Double-click a print server from the “Print Server Name” list.**

A list of NetWare printers now appears in the “Printer Name” box. These printers are active NetWare printers assigned to the selected print server. They were created with either PCONSOLE or NetWare Administrator.



Make sure the NetWare printers are defined as remote connection type. For example, on a parallel printer, the connection type should be Manual Load. Otherwise, the printers will not appear on the list.

3e. Choose the desired printer by highlighting the name.

This specifies the NetWare printer for NPRINTERT to later load.

3f. (Optional) Mark the box for “Load on startup” if you want NPRINTERT to load the printer when NPRINTERT is loaded.

3g. Choose the arrow box to the right of the “Default OS/2 Print Queue” and choose an OS/2 print queue.

NPRINTERT requires that an OS/2 print queue exist on the workstation.

3h. Choose the “OK” button.

This OS/2 printer now appears in the “Define Printers” dialog box with any other printers currently defined on this workstation.

3i. (Optional) Repeat the appropriate steps above for each additional printer NPRINTERT will load on this workstation.

You can have up to seven port drivers loaded concurrently.

4. Highlight the printer to be loaded and select “Load.”



You cannot capture a port that NPRINTERT is loaded on. This will intercept jobs that NPRINTERT is sending to the port. You can either capture a different port or print directly to the port NPRINTERT is loaded on. (The job will be queued by OS/2.)

Unloading Port Drivers on OS/2 Workstations

You can unload any or all port drivers by choosing “Unload” from the “Printers” menu. Highlight the printers you want to unload and choose the “Unload” button, or unload them all by choosing “Unload All.”

Using NPRINT (Windows 95)

Use NPRINT Manager to allow network users to share a printer attached to a Windows 95 workstation.

When you run NPRINT Manager after the initial setup, the program checks which printers need to be loaded. If the print server is running and the printer specified is free, that printer is loaded, and its information window is displayed in the “NetWare Nprinter Manager” window.

Sharing a Printer Attached to a Windows 95 Workstation

NPTWIN95.EXE, the NPRINT Manager executable, allows network users to share a printer physically attached to a Windows 95 workstation that is running the Novell NetWare Client™ 32™. Figure 7-1 on page 191 illustrates this principle using NPRINT.EXE on a DOS workstation as an example.

Running NPRINT Manager and adding a local printer makes the local printer available to network users. Any printer you add will remain available to the network during that session of Windows 95. You can also specify that the printer will be activated whenever NPRINT Manager starts.

NPTWIN95.EXE can run any printer configured in NetWare Administrator or PCONSOLE as “Manual Load.”

Prerequisites



- 386, 486, or 586 workstation
- Printer cabled to the workstation as if ready for local printing
- Initial print setup completed, which includes creating and associating a Print Server object, Printer object and Print Queue object (see “Setting Up NetWare Print Services” on page 18)

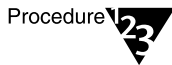
- PSERVER.NLM loaded at the server console
- Windows 95 operating system running on the workstation
- Novell NetWare Client 32 running on the workstation



NPTWIN95.EXE is not compatible with the Microsoft* NetWare Client.

Procedure

Upon completion of this procedure, network users should be able to capture a port for the shared printer, and then begin printing to the shared printer.



1. **Ensure the Windows 95 workstation with the attached printer is running the Novell NetWare Client 32.**
2. **At the workstation, log in to the network as any user.**
3. **Double-click “Network Neighborhood.”**
4. **Navigate to the SYS\PUBLIC\WIN95 folder on your server.**
5. **Double-click “NPTWIN95” (the NPrinter Manager program).**
6. **(Conditional) If the “Add Network Printer” dialog box does not display, choose “Printers” and then choose “Add.”**

The dialog box does not display after you have added your first printer to the program.

7. **Choose an NDS printer or bindery-based print server and printer.**
 - 7a. **Choose either “NDS Printer” or a “Bindery-Based Printer.”**
 - 7b. **Choose the button labeled “...” to browse.**
 - 7c. **(Conditional) If adding a bindery-based printer, choose a print server to view printers that you have rights to.**

The print servers displayed in the “Print Servers and Printers” window are all those which are advertising to your server. But when you choose a print server, only printers you have rights to will display.

7d. Choose a printer.

An NDS Printer object displayed might not be available if it is incompatible with your setup or if its print server is not running.

7e. Choose “OK.”

8. (Conditional) If the “Set Properties” dialog box displays, set printing properties in the displayed box, and choose “OK.”

The dialog box will only display if the selected printer was previously defined as “Other/Unknown.”

8a. Choose an LPT or COM port.

8b. Choose an interrupt setting or “Polled.”

Polled mode is usually the default setting for interrupts. However, dedicated interrupts usually provide better printing performance.

If you do not know what interrupt to set or if you are having interrupt conflicts, try using the polled mode. A polled mode printer may not be as fast as an interrupt-driven printer, but it avoids the difficulty of identifying an available interrupt and the conflicts that can arise from choosing an incorrect interrupt.

8c. Choose a buffer setting from 3 KB to 60 KB of memory.

8d. (Conditional) If a COM port was selected, set the following to correspond with your serial printer settings.

- ◆ Baud Rate
- ◆ Data Bits
- ◆ Stop Bits
- ◆ Parity
- ◆ XON/XOFF

8e. Choose “OK.”

9. (Optional) If you want NPRINT to load this printer and the required NLM programs the next time the program is run, check “Activate Printer When Nprinter Manager Loads.”

If the box is unchecked, the printer being added will only remain active for this Windows 95 session, and the printer must be added again to the program before it will be available as a shared printer to network users.

- 10. Choose “OK.”**
- 11. Verify that the printer was successfully set up by ensuring the printer’s status window displays and the settings are correct.**
 - ◆ If this is the only printer added to NPRINT Manager, from the “Printers” menu, choose “Clear,” and then choose “Add” and add the printer again.
 - ◆ If there are other printers added to NPRINT Manager, (1) from the “Printers” menu, choose “Properties” and uncheck “Activate Printer When Nprinter Manager Loads,” (2) choose “Remove,” and (3) add the printer again.
- 12. (Optional) Close the “NetWare NPRINT Manager” window by choosing “Printers” and then choosing “Exit.”**

By closing the window, you exit the program but leave the NLM programs required for printing loaded. Network users will still be able to print to the printers that have been added to the window.
- 13. (Optional) To automatically run NPTWIN95 when you start the workstation, add NPTWIN95 to the workstation “STARTUP” folder.**
 - 13a. From the Windows 95 desktop, choose “Start,” and then point to “Settings.”**
 - 13b. Choose “Taskbar,” and then choose the “Start Menu Programs” tab.**
 - 13c. Choose “Add,” and then choose “Browse.”**
 - 13d. Navigate to the NPTWIN95 file, and then double-click it.**
 - 13e. Choose “Next,” and then double-click “Startup.”**
 - 13f. Type the name that you want to see on the “StartUp” menu (like NPRINT), and then choose “Finish.”**
 - 13g. (Conditional) If Windows 95 prompts you to choose an icon, choose one, and then choose “Finish.”**

14. (Optional) To avoid logging in to the network before running **NPRINTER Manager**, copy the required files to your hard drive, as described in “Running **NPRINTER Manager** from a Local Drive” on page 204.

The attached printer should now be available as a shared network printer. Network users can now capture a port for the printer and begin printing to it. For information on capturing a port at a Windows 95 workstation running Novell NetWare Client 32, see “Setting Up Network Printing on a Windows 95 Workstation” on page 206.

Managing **NPRINTER** (Windows 95) and the Shared Printer

After you complete the required steps to activate the shared printer (see “Sharing a Printer Attached to a Windows 95 Workstation” on page 199), the **NPRINTER** program can be used to perform the following printing tasks.

Table 7-3

NPRINTER Manager Tasks

Task	Procedure
Add a printer to the “NetWare Nprinter Manager” window.	<ol style="list-style-type: none">1. From the “Printers” menu, choose “Add.”2. Choose to add an NDS printer or bindery-based printer.3. Browse to the printer, highlight it, and click “OK.”4. If you want to load this printer the next time the NPRINTER Manager runs, check “Activate Printer When Nprinter Manager Loads.” If not, uncheck the box.
Change all printers attached to the workstation from network printers to local printers.	<ol style="list-style-type: none">1. Notify users of the printers’ changing status.2. From the “Printers” menu, choose “Clear.”
Temporarily down a network printer attached to the workstation.	<ol style="list-style-type: none">1. Notify users of the temporary situation.2. In the “NetWare Nprinter Manager” window, make the printer’s information window active.3. From the “Printers” menu, choose “Remove.”

Table 7-3 *continued*

NPRINTER Manager Tasks

Task	Procedure
Temporarily down all network printers attached to the workstation.	<ol style="list-style-type: none">1. Notify users of the temporary situation.2. From the "Printers" menu, choose "Remove All."
View current printer configuration or status.	In the "NetWare Nprinter Manager" window, make the printer's information window active, and then from the "Printers" menu, choose "Properties."

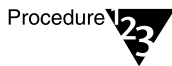
Running NPRINTER Manager from a Local Drive

If you want to avoid logging in to the network before running NPRINTER Manager, 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 NPTWIN95.EXE on your local drive.

If you have added NPRINTER Manager to the "StartUp" folder or if you have created any shortcut buttons for the program, the paths to NPTWIN95.EXE will need to be updated.

Procedure

Complete the following to load NPRINTER Manager on a hard drive.



1. **From the Windows 95 desktop, open "My Computer," choose a local drive, and create a folder called "Nprinter."**
2. **Choose "Network Neighborhood" and then navigate to the SYS\PUBLIC\WIN95 folder on the server.**

3. **Copy the following files from the SYS\PUBLIC\WIN95 folder to the “Nprinter” folder in “My Computer.”**
 - ◆ NPTWIN95.EXE (usually displays without the .EXE extension)
 - ◆ NPTWIN95.DLL
 - ◆ NPTWIN95.HLP
 - ◆ NPTR95.NLM
 - ◆ NPTDRV95.NLM
 - ◆ NPTDRV95.MSG
 - ◆ NRDDLL95.DLL
 - ◆ NWADLG95.DLL
 - ◆ NWADMR95.DLL
 - ◆ NWCOMN95.DLL
 - ◆ BIDS45F.DLL
 - ◆ CW3215.DLL
 - ◆ OWL252F.DLL

4. **Update the path in the “StartUp” folder or shortcut, if applicable.**

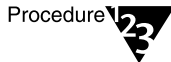
Setting Up Network Printing on a Windows 95 Workstation

In order to make use of network printers, all network users are required to capture a printer at their workstations. If, from a Windows 95 workstation running Novell NetWare Client 32, you want to capture a shared printer, this is the only procedure you should follow.



The “Add Printer” program accessed through “My Computer” does not support printing to shared network printers.

Procedure



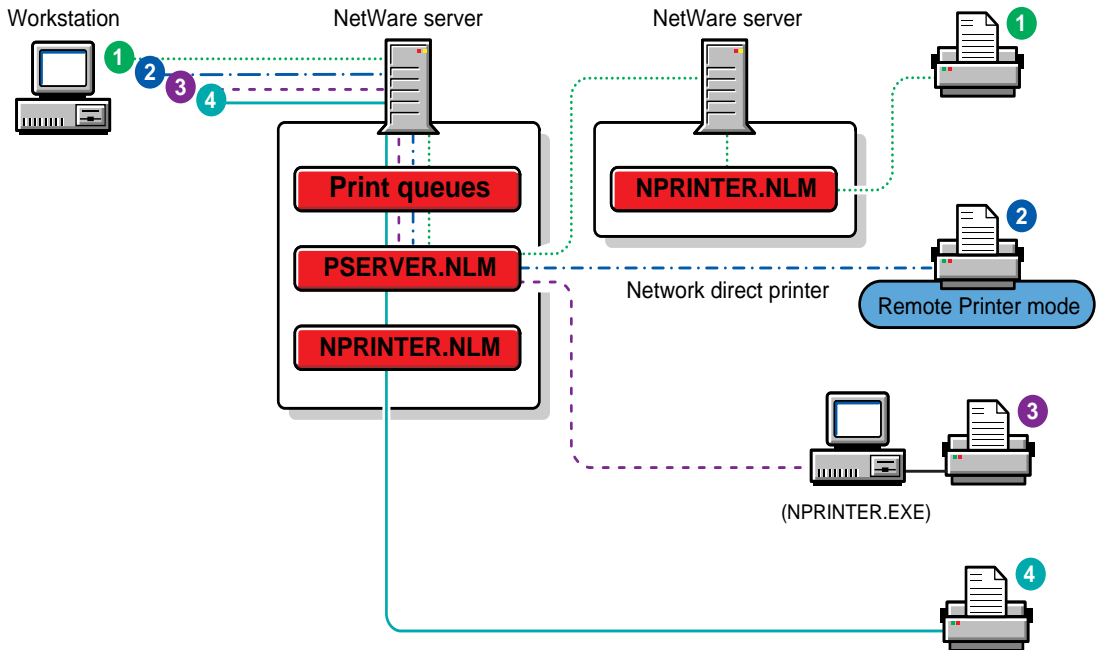
1. **Double-click “Network Neighborhood.”**
2. **Navigate to the network location where the printer or print queue resides.**
3. **Double-click the printer.**
4. **Follow the screen prompts using the following guidelines.**
 - ◆ Capture a printing port for the attached printer.
 - ◆ Change the printer name only to change the way the printer displays in “My Computer.” The default name will still display in “Network Neighborhood.”
 - ◆ Verify that this printer has been chosen as the default (see statement below “Printer name” box). You might have to choose “Yes.”

Using NPRINT.NLM

NPRINT.NLM allows you to attach network printers directly to a NetWare server, even a server other than the one on which your print server (PSERVER.NLM) is running.

Figure 7-2 shows typical printing setups using NPRINT.NLM, NPRINT.EXE, and a network-direct printer in remote mode, which contains its own port driver.

Figure 7-2
Typical NPRINT Setups



Printing Tasks Handled Through NPRINT.NLM

Table 7-4
NPRINT.NLM Tasks

Task	Procedure
Load printer P_1 (logical number 0) for print server PS-SALES.	Type <code>LOAD NPRINT PS-SALES 0</code>

Table 7-4

NPRINTER.NLM Tasks

Task	Procedure
Unload a manually loaded NPRINTER.NLM.	Go to the Status screen and press <Escape>.
Unload all loaded NPRINTER.NLMs.	Type UNLOAD NPRINTER <Enter>.

Loading NPRINTER.NLM

NPRINTER.NLM can be loaded on a NetWare server multiple times.

When a printer is configured to be loaded on the same server where the PSERVER is running, it can be configured to load automatically or manually. Specify which loading option you want to use as part of your printer configuration in either the PCONSOLE or NetWare Administrator utility.

If “Auto Load (Local)” is selected, NPRINTER.NLM loads whenever the print server is loaded. (The default is “Auto Load (Local).”)

Configuring printers attached to the server that loads PSERVER as “Manual Load” allows you to determine when you want the port driver to be loaded. This can be useful if you must limit the number of resources running on your network at a given time.

NPRINTER cannot load until the print server is running.

To load NPRINTER.NLM, at the NetWare server console, type one of the following:

```
LOAD NPRINTER printername
```

Depending on the default context for the NetWare server, 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:

```
LOAD NPRINTER .P_1.SALES.NOVELL
```

or

```
LOAD NPRINTER printservername printername
```

For example, to load printer P1, which is printer number 0 (as seen in NetWare Administrator or PCONSOLE) and is assigned to print server PS-Sales, type

```
LOAD NPRINTER PS-SALES 0
```



If NPRINTER is to be loaded on the same NetWare server as the print server, the printer can be configured as “Auto Load (Local).” If NPRINTER is to be loaded on a NetWare server other than where print server is running, the LOAD command can be placed in the AUTOEXEC.NCF file for automatic loading and the printer should be configured as “Manual Load.”

The following figure illustrates the status screen that appears if you manually load NPRINTER.NLM.

```
Print server:  PS-SALES
Printer:       0
Printer name:  P1.Sales.Novell
Printer type:  LPT1
Interrupt:    Polled

Status:
  NPRINTER status:  Waiting for Print Job
  Printer status:   Running
```

The status screen for a serial printer displays four characteristics used in RS-232-C serial communication: DCD (Data Carrier Detect), DSR (Data Set Ready), CTS (Clear To Send), and RI (Ring Indicator). You can typically interpret the high and low signal levels as follows:

- ◆ DCD remains low unless the printer is off or disconnected
- ◆ DSR remains high while in use by NPRINTER
- ◆ CTS fluctuates high when the printer is ready to receive data and low when the printer is unavailable
- ◆ RI (currently not used) remains constant depending on the port

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 4” on page 177.

Troubleshooting Tips for Administering Printer Stations

For a comprehensive discussion of strategies for troubleshooting network printing, see “Troubleshooting Printing Problems” on page 291.

Printing is Slow Using NPRINT.EXE as a Remote Network Station

The following are possible reasons why printing with 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 & 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 NetWare utilities 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.

NPRINTER.EXE Does Not Initialize or Hangs Periodically at Random

Sometimes the presence of a router between the NPRINTER station and the print server can cause problems for NPRINTER, causing the printer to hang.

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 NLM 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.

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.NLM 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.NLM, 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 running 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."

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. To get a list of all the necessary files and correct version numbers, type `NPRINTER /VER`.

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

For more information about	See
Creating, modifying, or deleting print servers or printers	“Setting Up Print Services with NetWare Administrator” on page 39 (NetWare Administrator)
	“Modifying NetWare Print Services” on page 53 (NetWare Administrator)
	“Creating or Modifying Print Servers” on page 112 (PCONSOLE)
	“Creating or Modifying Printers” on page 111 (PCONSOLE)
	“Using PCONSOLE in Bindery Mode” on page 133 (PCONSOLE)
Modifying a server's AUTOEXEC.NCF file	“Creating or Editing a Server Batch (.NCF) File” in <i>Supervising the Network</i>
Modifying a workstation's AUTOEXEC.BAT file	“Installing or Upgrading NetWare Client Software” in <i>NetWare Client for DOS and Windows User Guide</i>

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” on page 80 for information on using NetWare Administrator.

New Print Job Configuration Features for NetWare 4

The format of the PRINTCON databases has changed for NetWare 4. See “Location of Print Job Configuration Databases” in the following section.

If you are not using any applications or management tools that require the NetWare 3™ database, we recommend that you delete it (SYS:MAIL*<usernumber>*\PRINTCON.DAT).

Public Print Job Configurations Allowed

In previous versions of NetWare, all print job configurations were *private*, that is, owned by the individual user. In NetWare 4, administrators can also create *public* print job configurations that can be shared by all users on your network.

Users still have the option of adding their own private configurations. But with public print jobs, the supervisor only has to do it once.

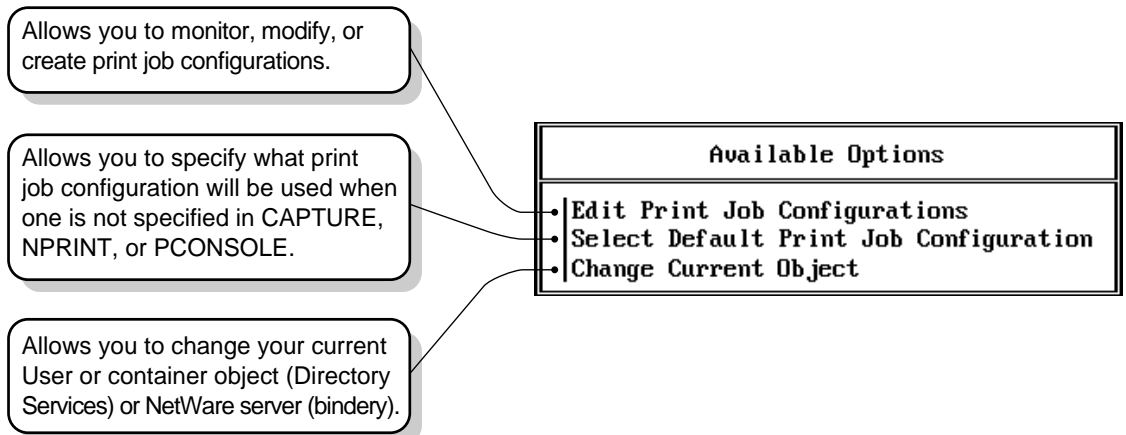
Limit of 37 Print Job Configurations Removed

The 37 print job configuration limit in NetWare 3 has been removed. There is no limit now.

Printing Tasks Handled through PRINTCON

The following figure illustrates the tasks you can perform with PRINTCON.

Figure 8-1
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

Both the format and location of the database for print job configurations have changed for NetWare 4.

- ◆ In NetWare 3, the PRINTCON database was
SYS:MAIL*<usernumber>*\PRINTCON.DAT.
- ◆ In the NetWare 4 Directory, 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 4 bindery mode, the public database is
SYS:PUBLIC\PRINTJOB. DAT.

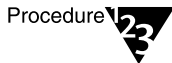
The private database is

SYS:MAIL*<usernumber>*\PRINTJOB.DAT

Creating Print Job Configurations

To create a print job configuration, complete the following steps.

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” on page 220.

6. **After you have set up your configuration, press <F10>.**

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.

- 1a. **Press <Insert> and browse through the “Other NetWare Servers” list until you select the bindery server you want to attach to.**

- 1b. **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.

- 1c. **Select the bindery server to make it the current server.**

You are returned to the “Available Options” menu.

Select the “Edit print job configurations” option.

The “Print Job Configurations” list appears.

2. **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:

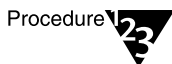
- ◆ Bindery-based users will have access only to print job configurations created by a bindery based user.
- ◆ Directory Services based users will have access only to print job configurations created in Directory Services mode.
- ◆ Only users defined in the bindery context will have access to bindery-based 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.



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

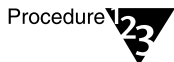


1. **From PRINTCON, select “Edit Print Job Configurations” from the “Available Options” menu.**

2. Highlight the configuration you want to delete from the “Print Job Configurations” list; then press .
3. Select “Yes” in the “Delete Current Print Job Configuration” confirmation box.

Renaming Print Job Configurations

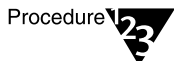
Procedure



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” on page 220.

4. To save the changes you have made, press <F10>.

Print Job Configuration Parameters

The following parameters can be set or changed.

Table 8-1

PRINTCON Configuration Parameters

Parameter	Explanation
Number of copies	Type a number from 1 to 65,000. Default: 1
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	<p>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.</p> <p>Default: 8</p>
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 <i>do not</i> 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	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. Default is None.
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>

Table 8-1 *continued*

PRINTCON Configuration Parameters

Parameter	Explanation
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>
Local printer	<p>This parameter is used only with CAPTURE. You can specify which local parallel printer port (LPT1, LPT2, or LPT3) you want to capture.</p> <p>Default: LPT1</p>
Auto endcap	<p>This parameter is used only with CAPTURE. Type "Y" for "Yes" or "N" for "No."</p> <p>Choose "Yes" if you want the captured data to be printed when you exit an application or when the application closes the printer.</p> <p>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 <code>TI=number</code> to your CAPTURE command.</p> <p>Default: Yes</p>
Enable timeout	<p>This parameter is used only with CAPTURE. Type "Y" for "Yes" or "N" for "No."</p> <p>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.</p> <p>Default: No</p>
Timeout count	<p>Specifies the number of seconds the operating system should wait after the last data is received before closing the print job.</p> <p>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.</p> <p>Default: 5</p>

Table 8-1 *continued*

PRINTCON Configuration Parameters

Parameter	Explanation
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

For more information about	Refer to
Creating print job configurations with NetWare Administrator	"Working with Print Job Configurations" on page 80 (NetWare Administrator)

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.



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" on page 217.

Location of Print Device Databases

The print device definitions (.PDF files) supplied in NetWare 4™ 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.

Both the format and location of the print device database have changed for NetWare 4:

- ◆ In NetWare 3™ software, the database for print device definitions was

SYS:PUBLIC\NET\$PRN.DAT

- ◆ In the NetWare 4 Directory, the database is an attribute of a container object accessed through the “Print Devices” option of PRINTDEF (or the “Print Devices” dialog for the container object in NetWare Administrator).

- ◆ In NetWare 4 bindery mode, the database is

SYS:PUBLIC/PRINTDEF.DAT



To see the print device definitions included in NetWare, change to the SYS:PUBLIC directory and type

```
NDIR *.pdf <Enter>
```

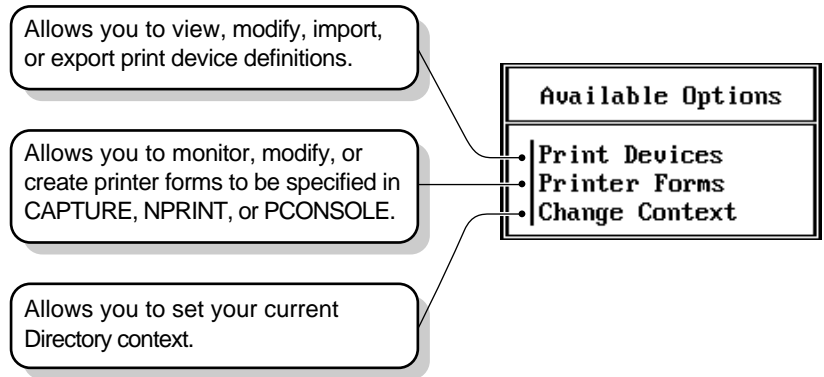
New definitions are added periodically.

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” on page 92.

Printing Tasks Handled through PRINTDEF

The following figure shows you the tasks you can perform with PRINTDEF.

Figure 9-1
Available Options
Menu

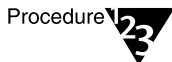


Working with Print Device Definitions

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.

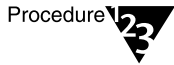
A list of the print device definitions appears. If the "Defined Print Devices" list is empty, none have been defined in or imported to the database.

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.”**

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.

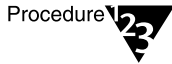
Creating or Modifying Print Device Definitions

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 .**

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 *prntername*” 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 onlineHelp.

10. **Enter the control sequences or printer commands for the specified print device.**

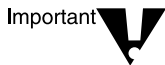
The documentation that came with the printer should have a chapter or section explaining printer commands. Consult that documentation.

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> .**



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 though 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 .**
15. **Press <F10> to save the modified function.**

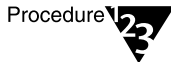


Because NetWare can place the functions only at the beginning or end of a print job, the best functions to use are those that affect the entire document (such as Condensed or Landscape).

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

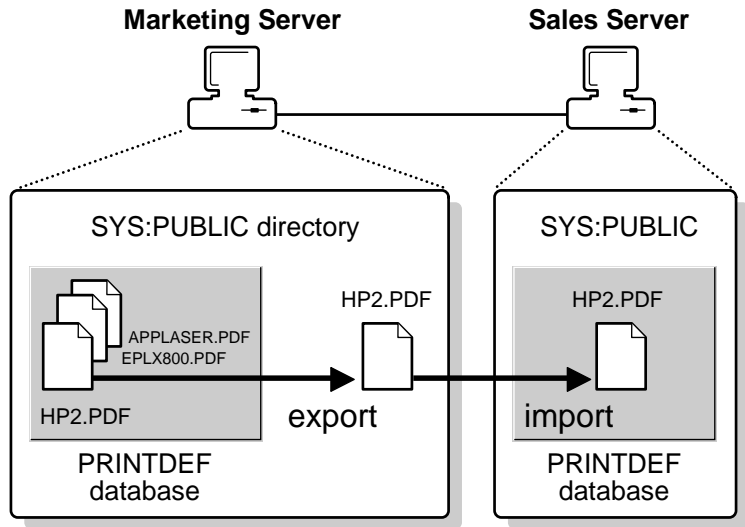
If you want to use another NetWare server’s print device definition, you must import the definition from that server. First export the print device definition from the original server into a .PDF (Print Definition) file. You can then import the .PDF file to the database on your server. You can copy only 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 on page 233 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 9-2
Importing .PDF Files
from Another Server

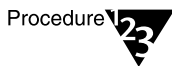


Exporting Print Device Definitions

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).

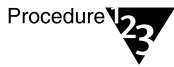
The file is created with a .PDF extension and is placed in the specified directory.

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.

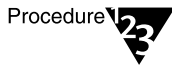


In most printers, the order of the functions is important. See your printer's documentation for more details.

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.

4a. To set up the “(Re-initialize mode),” highlight the mode and press <Enter>.

4b. To see a list of all defined functions for the print device, press <Insert>.

Most printers have a single control sequence for reset.

4c. 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).

4d. Press <Esc> to return to the “Modes for Device *devicename*” window.

5. Create additional modes as needed.

5a. At the “Modes for Device *devicename*” window, press <Insert>.

5b. Type the name of the mode you want to create (for example, “Final Printout”) in the “New Mode Name” entry box and press <Enter>.

5c. Select the new mode name.

The “Functions for Mode *modename*” window appears.

5d. 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 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.

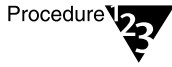
When you have completed the “Functions” list, press <Escape> to return to the “Modes” list.

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.**

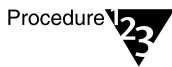
Modifying Print Device Modes

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 if you wish to delete the mode. Otherwise, press <Enter>.**

The “Functions for Mode *name*” is appears.

- ◆ **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>.

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 .

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.

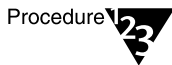
Printer form names must begin with an alphabetic character and can have up to 12 alpha-numeric characters. Numbers can range from 0 to 254. Length can range from 1 to 255. Width can range from 1 to 999. These numbers are for your reference only.



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*.

- 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 Step 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 Step 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 form can be mounted through the software.

Mounting a Printer Form from the Print Server Console

At the NetWare Server 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.

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” on page 89.

Mounting a Printer Form with PSC

From the command line, issue the following:

```
PSC PS=printserver P=printernumber MO F=formnumber
```

For example:

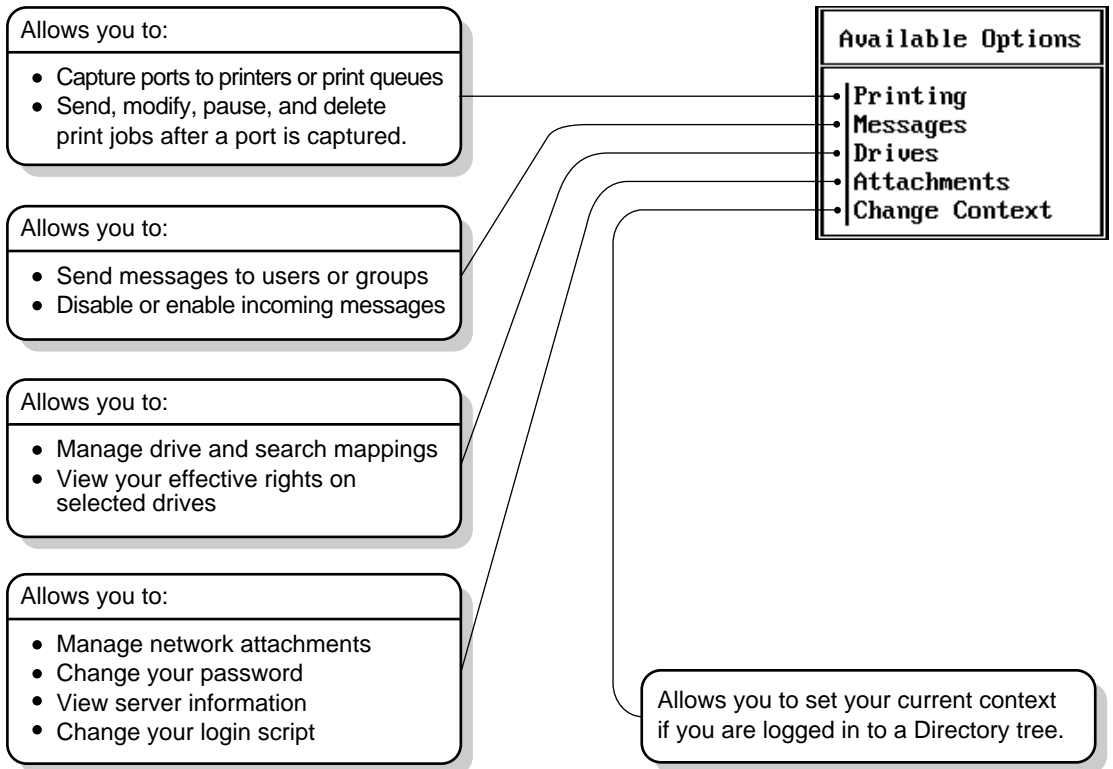
```
PSC PS=.DALLAS.SALES.NOVELL P=2 MO F=1
```


chapter **10** *Using NETUSER, PSC, and PUPGRADE*

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 10-1
NETUSER Tasks

To perform the following task	Do the following
Capture a printer.	<ol style="list-style-type: none">1. At the NETUSER "Available Options" menu, choose an LPT port under "Printing." (Press <F4> to toggle between Novell® Directory Services™ and bindery modes.)2. Select "Change Printers"; then choose a printer or print queue from the "Printers/Print Queues" menu.
Print a job.	<ol style="list-style-type: none">1. At the NETUSER "Available Options" menu, select a port that has been redirected to a network printer or print queue under "Printing."2. Select the "Print Jobs" option. Press <Insert> and follow the instructions in the information lines.3. When you are finished with the screen "New Print Job to be Submitted," press <F10> or <Esc> and choose "Yes" to save changes and print.
Attach to a NetWare server.	<ol style="list-style-type: none">1. At the NETUSER "Available Options" menu, select "Attachments"; then press <Alt><F1> to display more options at the bottom of the screen.2. Press <Insert> to display a list of available servers.3. Press <F1> for help from here.

Additional Information

For more information about	See
NET.CFG file	"NET.CFG Options Reference" in <i>NetWare Client for DOS and MS Windows Technical Reference</i>

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 10-2
Syntax for Common PSC Tasks

Task	Syntax
Cancel downing of Sales Print Server.	<code>PSC PS=PS-SALES CD <Enter></code>
Remove printer from the list of network printers.	<code>PSC PS=<i>printserver</i> PP=<i>printernumber</i> PRI <Enter></code>
Stop printer 1 on PS-SALES	<code>PSC PS=PS-SALES P=1 STO <Enter></code>
View all online help screens.	<code>PSC /? ALL <Enter></code>
View your current print layout in list format.	<code>PSC L <Enter></code>
View online help.	<code>PSC /? <Enter></code>
View specific online help for the START option.	<code>PSC /? STAR <Enter></code>
View status of all printers for PS-Sales.	<code>PSC PS=PS-SALES P=ALL STAT <Enter></code>

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 10-3
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	Cancels 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” (STAR) 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.

Table 10-3 *continued*

PSC Options

Option	Syntax	Description
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.
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 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.

Using PUPGRADE.NLM

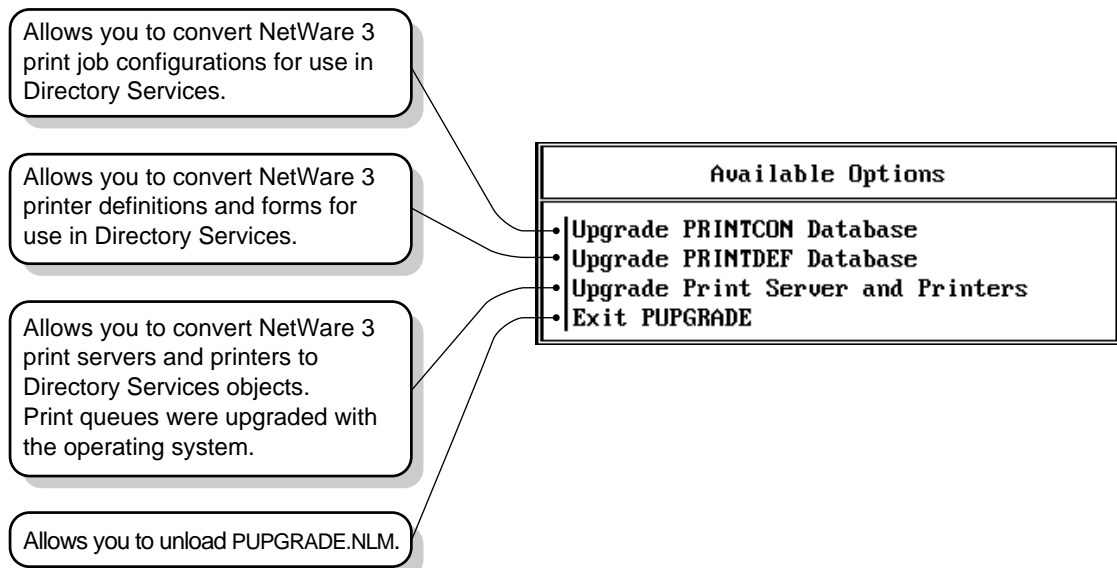
The PUPGRADE module allows you to upgrade your NetWare 3™ print servers and printers to NetWare 4™ Directory Services objects and your NetWare 3 PRINTCON and PRINTDEF databases to NetWare 4 format. Unless you run PUPGRADE, your NetWare 3 bindery printing objects will not be upgraded.

Printing Tasks Handled through PUPGRADE.NLM

The following figure shows the tasks you can perform with PUPGRADE.NLM.

Figure 10-2

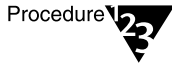
PUPGRADE Tasks



Upgrading NetWare 3 Printing Objects with PUPGRADE

Use the following procedure to upgrade bindery print servers, printers, print job configurations, or print device definitions.

Procedure



1. **At the system console, type `LOAD PUPGRADE` <Enter>.**

2. **Type in your username at the prompt.**

You must be user ADMIN or equivalent. For example, you might type

```
.ADMIN.NOVELL
```

You will also be prompted for a password.

The “Available Options” screen appears.

3. **Select the option you want.**

Each option is discussed in the following paragraphs.

Upgrading the PRINTCON Database

When you select “Upgrade PRINTCON Database,” a log appears that shows the elements of the database as they are upgraded. No action is required.

When the upgrade process is complete, the log is stored in ASCII format as file `SYS:SYSTEM/PRINTCON.UPG`. Here you can read the upgrade information and review any errors that may have occurred.

Upgrading the PRINTDEF Database

When you select “Upgrade PRINTDEF Database,” an “Enter Context” window appears with the container object listed (example: “O=Novell”). Select the context shown or type in the context you want to use. Then press <Enter>.

A log appears that shows the forms, device definitions, functions, and modes that are being upgraded. No action is required.

When the upgrade process is complete, the log is stored in ASCII format as file SYS:SYSTEM/PRINTDEF.UPG. Here you can read the upgrade information and review any errors that may have occurred.

Upgrading a Print Server and Associated Printers

When you select “Upgrade Print Server and Printers,” a list of the existing NetWare 3 print servers appears. Select the server you wish to upgrade.



Only print servers that existed before the NetWare server was upgraded will appear on this list. After you have upgraded your NetWare 3 server, you cannot add any bindery objects that PUPGRADE will recognize. If you add a bindery print server after the NetWare server is upgraded, the print server will not have a Directory Services object ID assigned to it. PUPGRADE will only find the old bindery ID, not the Directory Services object ID it is looking for.

A log appears that shows the print server being upgraded, printers that are being upgraded, notification objects, print queues, and so forth. No action is required.



User SUPERVISOR is not carried over to the NetWare 4 environment.

Also, because user ADMIN does not exist in NetWare 3, user ADMIN is not included in the list of authorized users for upgraded print queues. In addition, user ADMIN is not included as an authorized operator for upgraded print queues and print servers. You must manually add user ADMIN to these lists before it is authorized.

When the upgrade process is complete, the log is stored in ASCII format as file SYS:SYSTEM/<printserver>.UPG. Here you can read the upgrade information and review any errors that may have occurred. Each print server will have its own upgrade log file.

Additional Information

For more information about	See
Creating, modifying, or deleting print servers or printers	“Creating Print Servers” on page 47 (NetWare Administrator)
	“Creating Printers” on page 44 (NetWare Administrator)
	“Creating or Modifying Print Servers” on page 112 (PCONSOLE)
	“Creating or Modifying Printers” on page 111 (PCONSOLE)
	“Using PCONSOLE in Bindery Mode” on page 133

A *Setting Up and Servicing Printers*

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,” on page 269 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.)

Figure A-1

**Sample Workstation
NET.CFG File with
Print Header and
Print Tail
Parameters**

```
cache buffers = 10
file handles = 50
long machine type = compaq
print header = 72
print tail = 24
show dots on
spx connections = 60
```

Improving Printer Performance

For hints on improving printer performance, see Appendix C, “Optimizing Network Printing Performance,” on page 281.

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," on page 291.

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.



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 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," on page 291.

- ◆ 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.

appendix **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 or OS/2 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

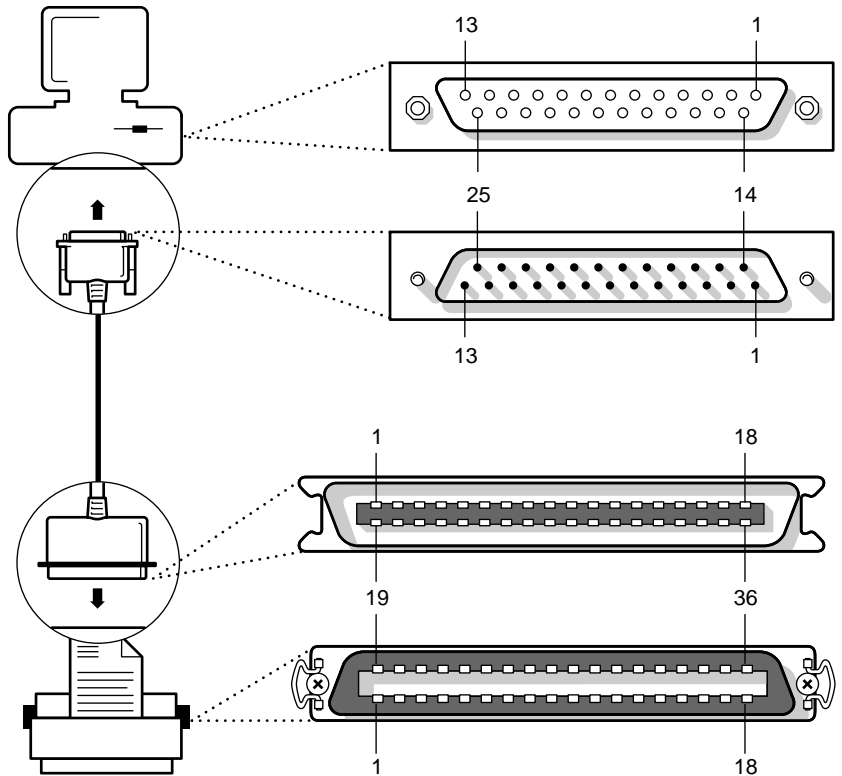


Novell® recommends that you use parallel printing instead of serial whenever possible. This greatly reduces your risk of having printing problems.

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



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. Figure B-2, Figure B-3, and Figure B-4 cover each scenario.

Table B-2
Cabling Serial Printers

If you have these types of connectors	Do this
Male 25-pin serial port on PC Female and male 25-pin connectors on cable	See Figure B-2 on page 272.
Male 9-pin serial port on PC Female 9-pin and male 25-pin connectors on cable	See Figure B-3 on page 272.
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 on page 273.

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

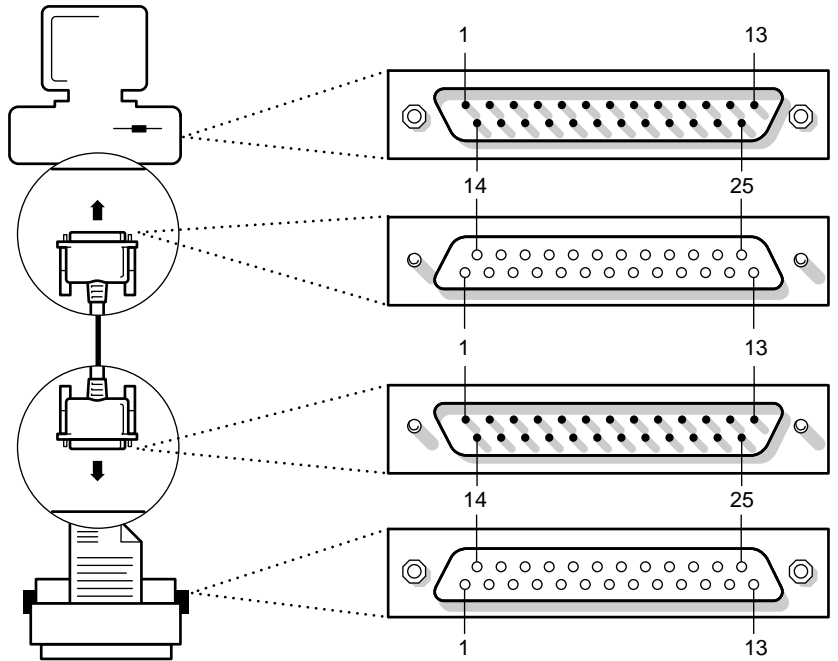


Figure B-3
Serial Cable with
9-Pin and 25-Pin
Connectors

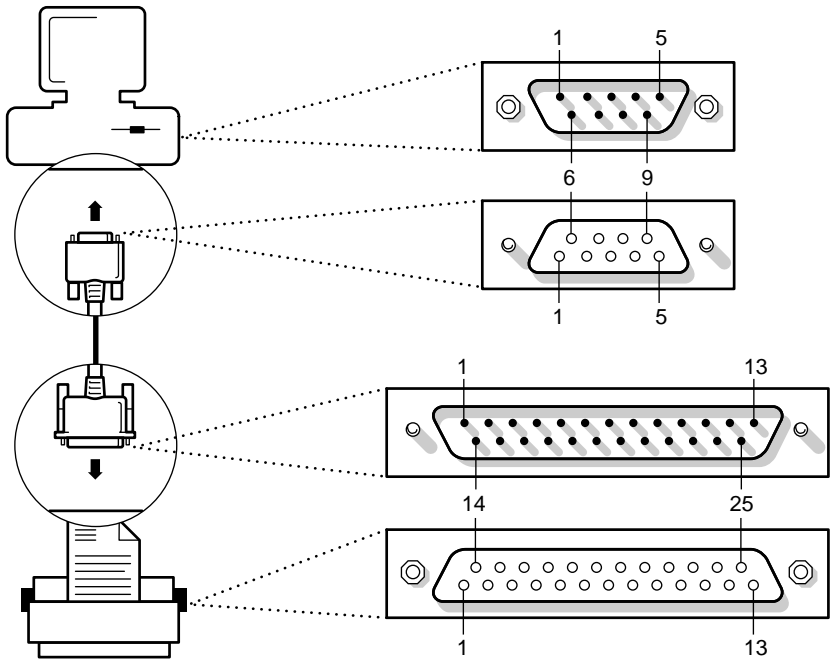
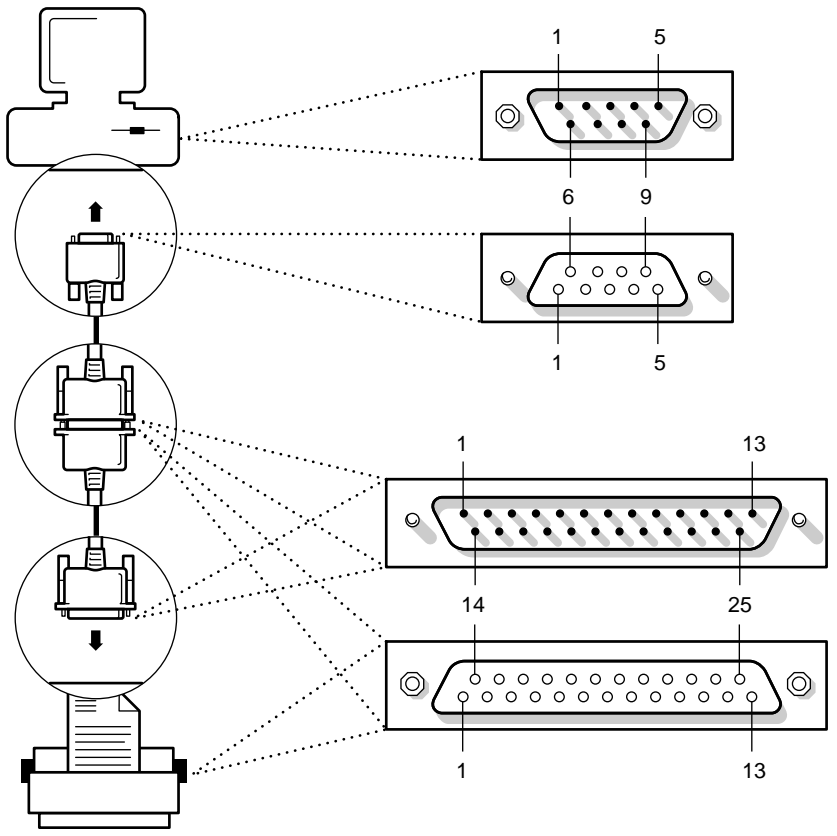


Figure B-4
Serial Cable with
Two 25-Pin
Connectors and a
9-Pin to 25-Pin
Converter



Optimal Serial Cabling

This section explains how Novell uses RS-232-C serial communication for printing.



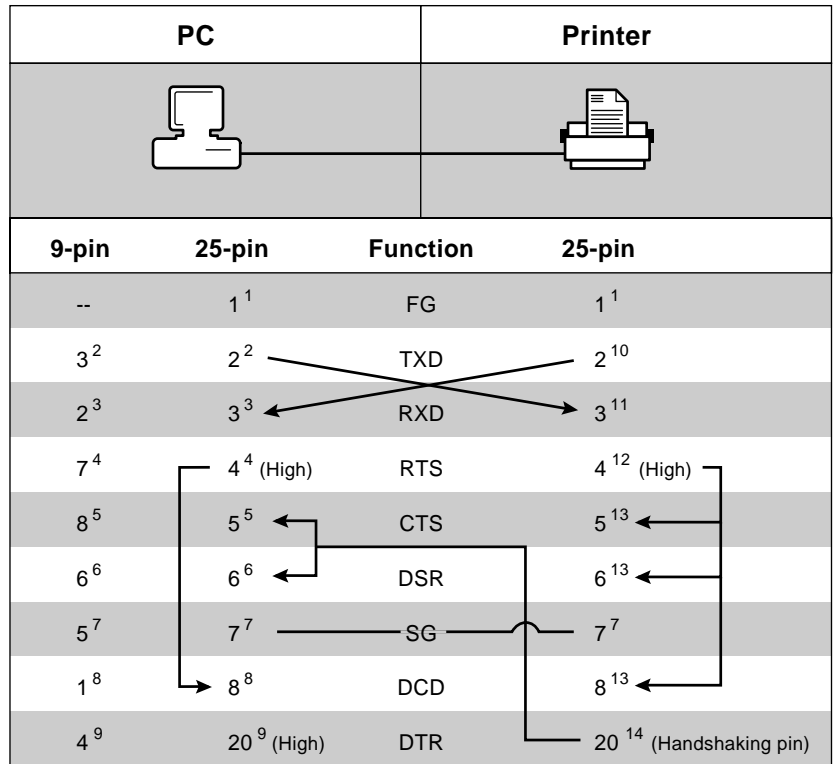
Anyone making changes to their cabling pin configurations should be familiar with soldering techniques and with tracing wires using a multimeter or color-coding.

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)

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.



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.



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. Novell 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.

Novell 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.



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)**

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-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

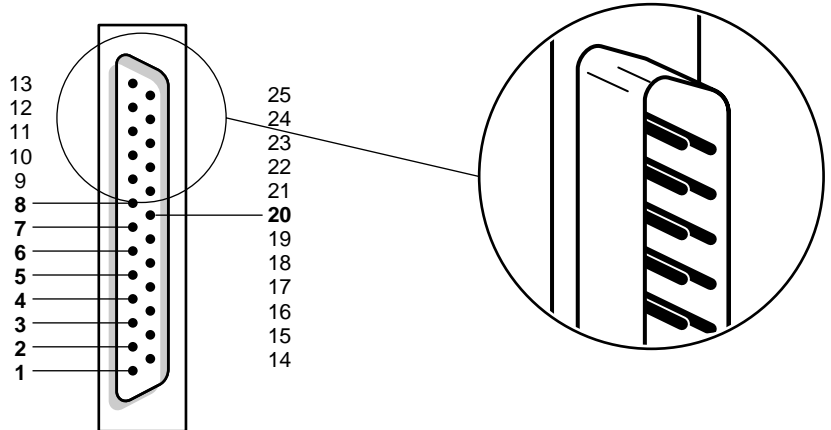


Figure B-7
25-Pin Female
Interface

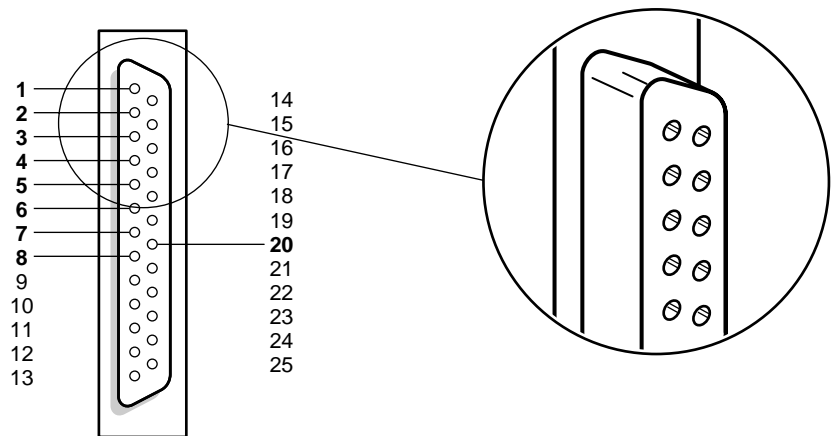


Figure B-8
9-Pin Male Interface

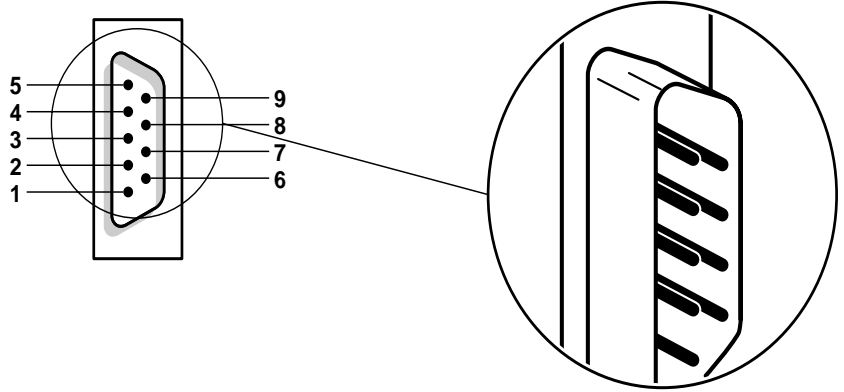
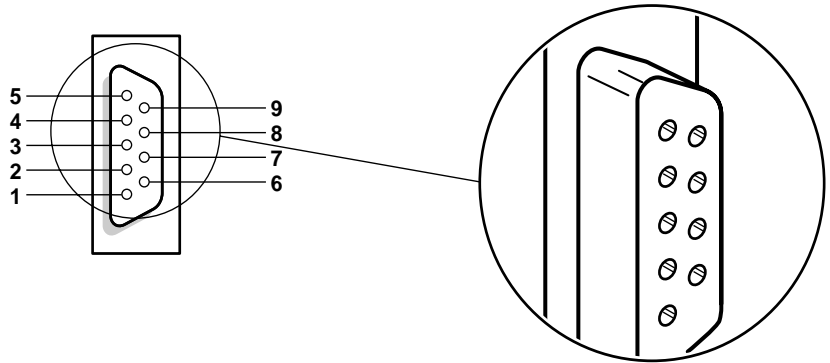


Figure B-9
9-Pin Female Interface



Optimizing Network Printing Performance

Overview

NetWare[®] 4™ 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 4 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 4 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 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 4, 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.

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 4, 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 4 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.



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 machines whenever possible on your system, especially for servers that will be handling the most traffic and workstations tied to fast printers.

NPRINT for NetWare 4 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 machines with slower processors and slower clock speeds.

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.

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 NPRINTER.

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.

Troubleshooting Flow Charts

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 Novell Authorized ResellerSM 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.

Figure D-1

Troubleshooting: No Printer Output

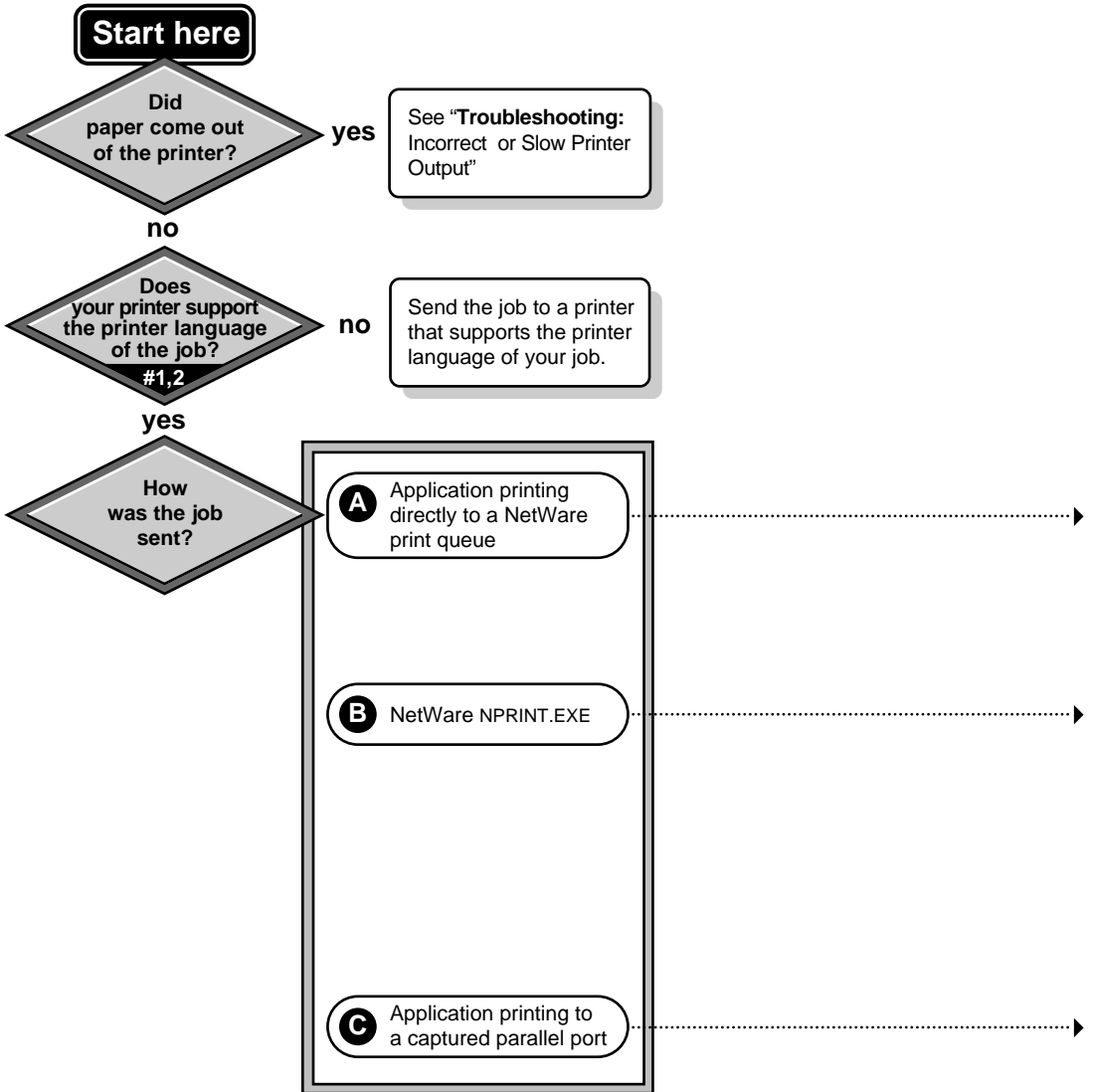


Figure D-2

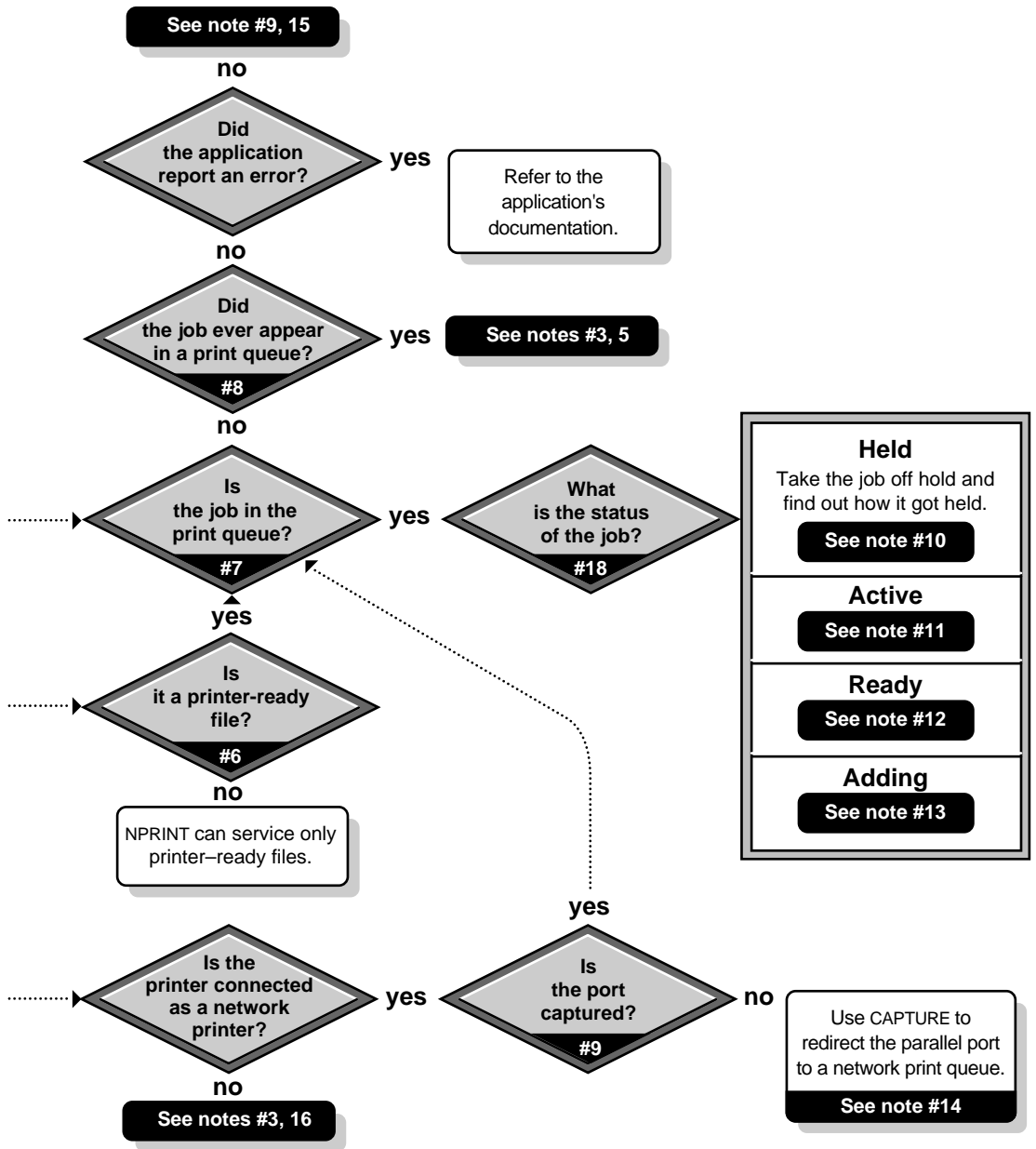


Figure D-3

Troubleshooting: Incorrect or Slow Printer Output

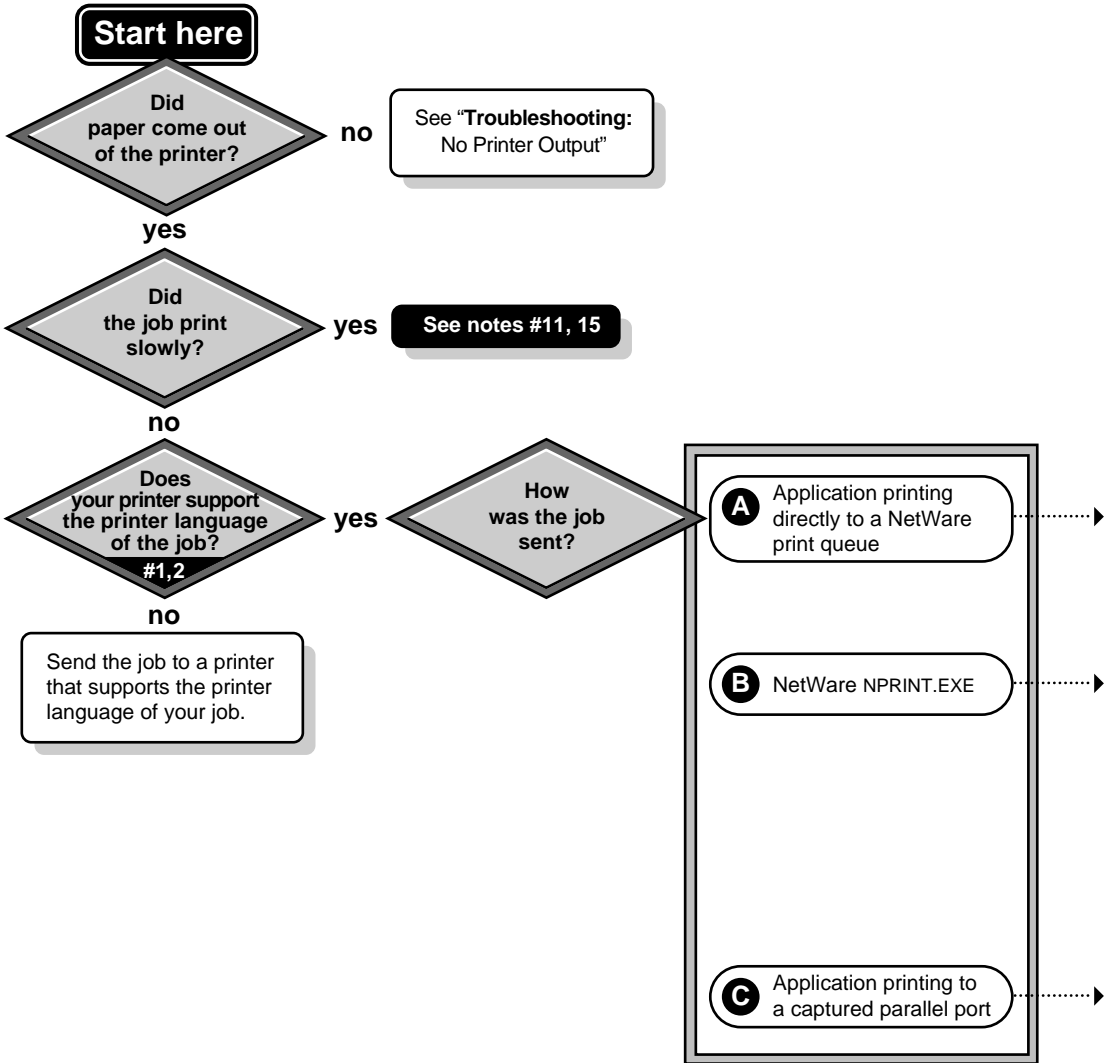
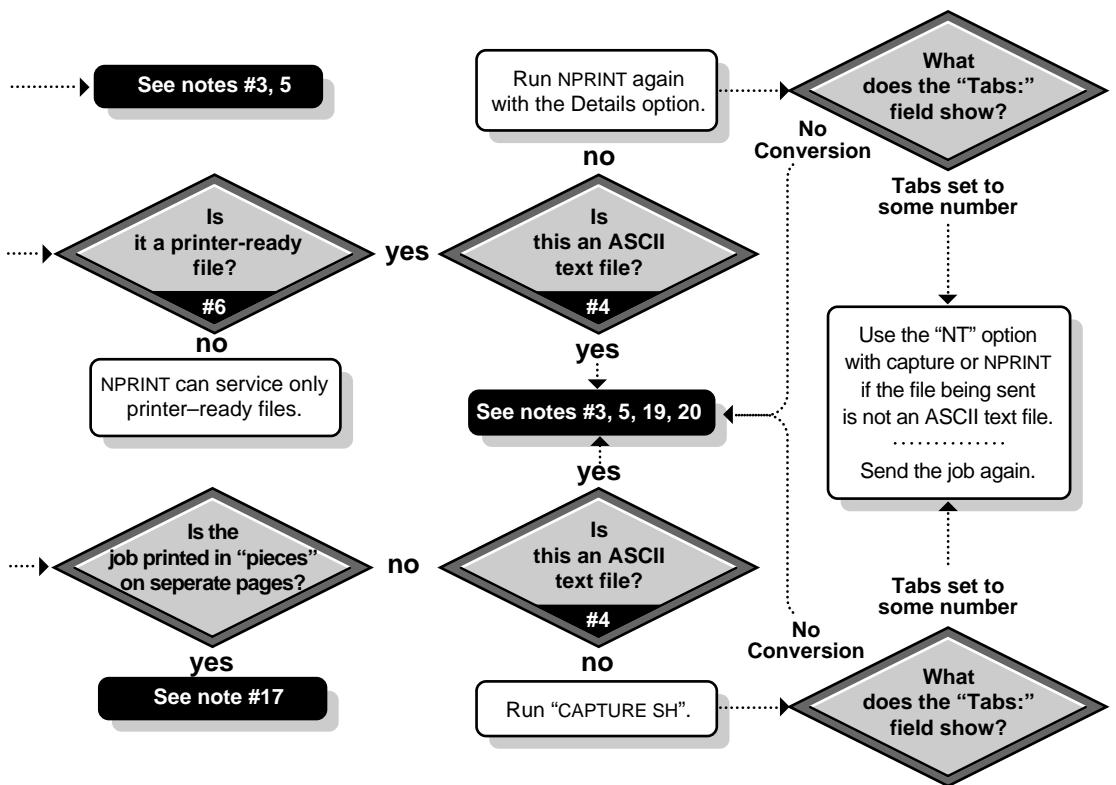


Figure D-4



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” on page 259 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 “2. Determining the Printer Languages Your Printer Supports” on page 297 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 MS Windows, OS/2, 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 a 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's data. However, an understanding of the characteristics of printer languages is necessary in order to determine the language type. See "5. Checking the Contents of Your Job for Incorrect Control Sequences" 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 4™ software. If printing performance improves, either continue using polled mode or configure your printer to use a unique interrupt. See “Polled versus Interrupt Mode” on page 284 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,” on page 269.

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,” on page 257 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.

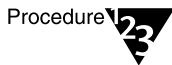
If you have determined that the job is text, yet it will not print properly with “File contents: Text” (or **T**=<1 through 18> in the **CAPTURE** command), change the setting to “File contents: Byte Stream” (or **NT** in the **CAPTURE** command.)

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.

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.

6. 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.

7. 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.

8. 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 MS 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.

9. 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.

10. 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.

11. 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 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.

12. 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.

13. 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 or OS/2 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” on page 140.

14. 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.

15. 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 “3. Checking Your Non-Network (Local) Printer Setup” for more information.
- ◆ The printer must be configured and have a queue assigned to it (using PCONSOLE or the NetWare Administrator utility).
- ◆ The server or workstation the printer is connected to must have the port driver loaded (NPRINTER).

16. 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.

17. Determining the Status of Your Print Job

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.

18. Solving NetWare Printing Problems When Running MS Windows

Sometimes printing problems that occur when running MS Windows can be resolved by any combination of the following, which are set in the “Printers” option in the MS 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 MS Windows spooler.

Printing problems may be corrected with User Tools by one or both of the following techniques:

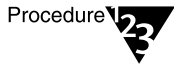
- ◆ Disable Tabs using User Tools.
- ◆ Match the banner type with the MS Windows printer driver type (PostScript or Text).

19. 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 “5. Checking the Contents of Your Job for Incorrect Control Sequences” on page 301.

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.



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.NLM), 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.

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 Novell Authorized Reseller to see if there is an updated version of the utility.

Trademarks

Novell, Inc. has attempted to supply trademark information about company names, products, and services mentioned in this manual. The following list of trademarks was derived from various sources.

Novell Trademarks

Client 32 is a trademark of Novell, Inc.

IPX is a trademark of Novell, Inc.

NetSync is a trademark of Novell, Inc.

NetWare is a registered trademark of Novell, Inc. in the United States and other countries.

NetWare 3 is a trademark of Novell, Inc.

NetWare 4 is a trademark of Novell, Inc.

NetWare Client is a trademark of Novell, Inc.

NetWare Core Protocol and NCP are trademarks of Novell, Inc.

Novell Directory Services and NDS are trademarks of Novell, Inc.

NetWare DOS Requester is a trademark of Novell, Inc.

NetWare Loadable Module and NLM are trademarks of Novell, Inc.

NetWare Requester is a trademark of Novell, Inc.

NetWare SFT and NetWare SFT III are trademarks of Novell, Inc.

NetWare Tools is a trademark of Novell, Inc.

NetWire is a registered service mark of Novell, Inc. in the United States and other countries.

Novell is a registered trademark of Novell, Inc. in the United States and other countries.

Novell Authorized Reseller is a service mark of Novell, Inc.

SFT and SFT III are trademarks of Novell, Inc.

SPX is a trademark of Novell, Inc.

UNIX is a registered trademark of X/Open Company, Ltd., in the United States and other countries.

Virtual Loadable Module and VLM are trademarks of Novell, Inc.

Third-Party Trademarks

Adobe is a registered trademark of Adobe Systems Incorporated.

AppleTalk is a registered trademark of Apple Computer, Inc.

COMPAQ is a registered trademark of COMPAQ Computer Corporation.

Digital is a trademark of Digital Equipment Corporation

EPSON is a registered trademark of Seiko Epson Corporation.

Hewlett-Packard is a registered trademark of Hewlett-Packard Company.

HP is a registered trademark of Hewlett-Packard Company.

IBM is a registered trademark of International Business Machines Corporation.

LaserJet is a registered trademark of Hewlett-Packard Company.

Microsoft is a registered trademark of Microsoft Corporation.

OS/2 is a registered trademark of International Business Machines Corporation.

PCL is a registered trademark of Hewlett-Packard Company.

PostScript is a registered trademark of Adobe Systems Incorporated.

ProPrinter is a registered trademark of International Business Machines Corporation.

Ventura Publisher is a registered trademark of Ventura Software, Inc.

Windows is a registered trademark of Microsoft Corporation.

Windows 95 is a trademark of Microsoft Corporation.

WordPerfect is a registered trademark of Corel Corporation Limited in the US and other countries.

Index

A

Address restriction

- configuring, with NetWare Administrator 61
- configuring, with PCONSOLE 118
- for remote printers, explained 164

AIO printers, configuring

- with NetWare Administrator 60
- with PCONSOLE 117

AppleTalk printers, configuring

- with NetWare Administrator 60
- with PCONSOLE 117

Applications, NetWare-aware, printing with

26, 139

Applications, non-NetWare-aware, printing with

- creating print jobs 26, 139
- explained 139
- using CAPTURE 26, 147
- using NetWare print services 26
- without exiting application 147

Applications, print drivers for, provided in

NetWare 227

ASCII text

- configuring print jobs for, with NetWare Administrator 83
- configuring print jobs for, with PCONSOLE 115
- configuring print jobs for, with PRINTCON 221
- determining whether print job is 300

Assigning

- multiple print queues to printers, with PCONSOLE 124
- object names 23
- print queue operator flags, with NetWare Administrator 55
- print queue operator flags, with PCONSOLE 113
- print queue priority, with NetWare Administrator 70
- print queue priority, with PCONSOLE 127
- print queues to printers, with NetWare Administrator 46
- print queues to printers, with PCONSOLE 124
- printers to print servers, with NetWare Administrator 50
- printers to print servers, with PCONSOLE 112, 113

Assignments, viewing, of printing objects,

with NetWare Administrator 37

Auditing log

- enabling, with NetWare Administrator 76
- enabling, with PCONSOLE 129
- explained 164
- viewing, with NetWare Administrator 76
- viewing, with PCONSOLE 129

AUTOEXEC.NCF file

- including print server LOAD command in 21
- setting bindery context in 13

Auto-Load (Local) option, for port drivers, explained 187
Auto-reconnect between queues and print servers, explained 163

B

Banner page

- specifying name, with NetWare Administrator 84
- specifying name, with PCONSOLE 116
- specifying name, with PRINTCON 222
- with print job, configuring, with NetWare Administrator 84
- with print job, specifying, with PCONSOLE 116
- with print job, specifying, with PRINTCON 222

Banner type

- configuring, with NetWare Administrator 61
- configuring, with PCONSOLE 118

Bindery context, setting with SET BINDERY CONTEXT 13

Bindery emulation. *See* Bindery print services

Bindery print services

- creating print job configurations, with PRINTCON 218
- explained 13
- referencing bindery queues, with NetWare Administrator 103
- referencing bindery queues, with PCONSOLE 135
- servicing NetWare 3 print queues and clients with NetWare 4 print servers, using PCONSOLE 175
- servicing NetWare 4 clients and queues with NetWare 3 print servers 175
- using NetWare Administrator with 103
- using PCONSOLE with 133

Browser, in NetWare Administrator
explained 32
printing Directory tree layout from 34
viewing objects with 34
viewing, multiple windows 34

Buffer size, printer

- specifying, with NetWare Administrator 61
- specifying, with PCONSOLE 118

Byte stream

- configuring print jobs to use, with NetWare Administrator 83
- configuring print jobs to use, with PCONSOLE 115
- configuring print jobs to use, with PRINTCON 221

C

Cabling, printer

- functions on PC side of serial cable 275
- functions on printer side of serial cable 278
- parallel connections 270
- parallel versus serial 269
- serial connections 271
- serial, optimal 274
- standard lengths 269

CAPTURE utility, adding to login scripts 151

CAPTURE utility, printing with

- command parameters listed and explained 142
- command syntax 140
- explained 146
- PostScript print jobs 261
- print job configurations in a different context 150
- print job configurations, specifying user in different context 151
- procedure, explained 146
- screen displays 148

- tasks, listed 7, 140
- tips on using 153
- to different Directory Services context 149
- to different parallel ports 147
- without exiting application 147

CAPTURE utility, saving data with

- from several applications, to single file 148
- to NetWare server you are not attached to 149

Capturing data to a network printer 146

Command syntax xii

Configuration databases

- format 12
- location 11

Configuring printing setup 23

Configuring printing setup. *See also* Specific utility name

Configuring. *See* NetWare Administrator utility, configuring with; PCONSOLE utility, configuring with; PRINTCON utility, configuring with

Connectors, printer cable

- parallel 270
- pins 279
- serial 271

Converter, 9-pin to 25-pin, for printer cabling 273

Creating. *See* NetWare Administrator utility, creating with; PCONSOLE utility, creating with; PRINTDEF utility, creating with

D

- Data transmission rate, estimating 282
- Data, print. *See* Print data
- Databases, configuration. *See* Configuration databases
- Databases, print device, location 226

- Deleting. *See* NetWare Administrator utility, deleting with; PCONSOLE utility, deleting with; PRINTDEF utility, deleting with
- Directory Services. *See* Novell Directory Services
- Dot-matrix printers

 - preventing problems with 263
 - troubleshooting 266

- Drivers, port. *See* Port drivers

E

- ESC-P printer language, characteristics of 259

F

- File contents

 - of print jobs, specifying, with NetWare Administrator 83
 - of print jobs, specifying, with PCONSOLE 115
 - of print jobs, specifying, with PRINTCON 221

- Form feed

 - enabling with NetWare Administrator 83
 - enabling with PCONSOLE 115
 - enabling with PRINTCON 221

- Functions, print device. *See* Print device functions

G

- Graphical utilities for printing, compared with text utilities 7

H

HPGL printer language, characteristics of 259

I

Interrupts, managing
overview 23
with PCONSOLE 118

L

Laser printers
preventing problems with 263
troubleshooting 265

Loading
NPRINTER.NLM 207
NPRINTER.EXE and NPRINTER.NLM 22
NPTWIN95.EXE 22, 200
port drivers 22
port drivers, from command line 195
port drivers, from NPRINTER menu 194
port drivers, on NetWare server as Manual
Load 208
port drivers, on OS/2 workstation 196
port drivers, on Windows 95 workstations
199
print servers 21, 166
PSERVER.NLM 166

Log, auditing. *See* Auditing log
Login scripts, adding CAPTURE command to
151

LPT ports. *See* Parallel ports

M

Manual Load option, for port drivers,
explained 187

Manual Load printers, loading from
NPRINTER menu 194

Modes, print device. *See* Print device modes

Modifying. *See* NetWare Administrator
utility, modifying with; PCONSOLE
utility, modifying with; PRINTDEF
utility, modifying with

Mounting, printer forms. *See* Printer forms,
mounting

MS Windows, workstations using
loading port drivers on 194
troubleshooting printing problems 309

N

Names, assigning to objects 23

NetSync, explained 14

NETUSER utility, printing tasks
listed 8, 247
procedures 247

NetWare Administrator utility
enabling form feed 83
enabling timeout with 84
mounting printer forms with 89
printing tasks, listed 7, 30
unloading print server with 79

NetWare Administrator utility features,
explained

browser 32
multiple browser windows 34
print layout page 74
printing object dialogs 36

NetWare Administrator utility, assigning
with

default print queue 70
print queue operator flags 55
print queue priority 70
print queues to printers 46
print server passwords 79
printers to print servers 50

- NetWare Administrator utility, configuring
 - with
 - AIO printers 60
 - AppleTalk printers 60
 - banner name for print jobs 84
 - banner type 61
 - NetWare print services 39
 - notification of print job completion 83
 - OS/2 printers as Other/Unknown type 62, 123
 - Other/Unknown printers 61
 - parallel printers 60
 - PostScript banner 61
 - print jobs for ASCII text 83
 - print jobs for byte stream 83
 - print jobs, to use application's formatting commands 83
 - printer buffer size 61
 - printer communication parameters 61
 - printer type 60, 67
 - printers 59
 - queue service interval 61
 - serial printers 60
 - UNIX printers 60
 - XNP printers 61
- NetWare Administrator utility, creating with
 - print device definitions 93
 - print device functions 95, 96
 - print device modes 95, 100
 - print job configurations 80
 - print queues 40
 - print servers 47
 - printer forms 87
 - printers 44
- NetWare Administrator utility, deleting with
 - print device definitions 95
 - print device functions 95
 - print device modes 95, 102
 - print jobs 56
 - print queues 55
 - print server passwords 79
 - print servers 55
 - printer forms 91
 - printers 55
 - printing objects 55
- NetWare Administrator utility, exporting
 - print device definitions with 99
- NetWare Administrator utility, importing
 - print device definitions with, to database 97
- NetWare Administrator utility, modifying
 - with
 - address restriction for remote printers 61
 - print device definitions 94
 - print device functions 95, 96
 - print device modes 102
 - print job configurations 85
 - print job status 55
 - print queues, list of operators 58
 - print queues, list of users 58
 - print queues, priority 70
 - printer event notification 68
 - printer features 71
 - printer forms 90
 - printer status 64
 - printing objects, moving 53
 - service sequence for print jobs 57
 - tab size 83
- NetWare Administrator utility, referencing
 - bindery queues with 103
- NetWare Administrator utility, renaming
 - with
 - print device modes 102
 - print queues 54
 - print servers 54
 - printers 54
 - printing objects 54
- NetWare Administrator utility, specifying
 - with
 - cartridges supported by printer 73

- default print job configuration 85
- file contents of print jobs 83
- printer languages supported by printer 72
- queue service mode for printer forms 61
- typefaces supported by printer 73
- NetWare Administrator utility, viewing with
 - auditing log 76
 - print device definitions 94
 - print device modes 102
 - print job configurations 85
 - print job details 56
 - print job status 56
 - print jobs 55
 - print queues, list of operators 58
 - print queues, list of users 58
 - printer status 63
 - printing layout 74
 - printing object assignments 37, 54
 - status of all printing objects, using print layout page 74
- NetWare Administrator, referencing bindery queues with 41
- Network printing, overview 1
- Network-direct print devices
 - queue server mode, explained 179
 - remote printer mode, as used by with NetWare 4 178
 - using with NetWare 4 177
- New printing features for NetWare 4 9
- Notification, of print job completion
 - with NetWare Administrator 83
 - with PCONSOLE 115
 - with PRINTCON 221
- Notification, printer event
 - setting up with PCONSOLE 119
 - setting up, with NetWare Administrator 68
- Novell Directory Services, overview 9
- NPRINT utility, printing with
 - command syntax 154
 - options, listed and explained 156
 - PostScript print jobs 261
 - print job configurations in different context 150
 - tasks, listed 7, 154
 - text (ASCII) files 154
 - tips on using 158
 - to different Directory Services context 149
- NPRINTER Manager utility
 - explained 199
 - managing shared printers with 203
 - procedures for 200
 - running 199
 - running, from local drive 204
- NPRINTER NLM
 - as new feature in NetWare 4 189
 - loading, on NetWare server 207
 - port driver function, explained 5
 - task procedures 207
 - tasks, listed 8
- NPRINTER NLM. *See also* Port drivers
- NPRINTER utility
 - command syntax 192
 - configuration options listed and explained 192
 - explained 187
 - loading 22
 - new features in NetWare 4 189
 - parameters listed and explained 192
 - port driver function, explained 5
 - running from local drive 195
 - tasks, listed 8
 - unloading on DOS or Windows workstation 196
- NPRINTER utility. *See also* Port drivers
- NPTWIN95.EXE. *See* NPRINTER Manager utility

O

- Object dialogs. *See* NetWare Administrator utility features, explained.
- Object names, assigning 23
- Operator flags, print queue
 - setting, with NetWare Administrator 55
 - setting, with PCONSOLE 113
- Optimizing printing
 - accessing latest versions on NetWare 283
 - adjusting printer's buffer size 284
 - adjusting timer tick values 285
 - checking for correct application and driver versions 283
 - estimating data transmission rates 282
 - evaluating parallel versus serial ports 281
 - evaluating polled vs interrupt mode 284
 - improving computer performance 286
 - matching applications and print drivers 288
 - reducing traffic on servers and networks 287
 - selecting best printer for your needs 289
- OS/2 printers, configuring as Other/
Unknown type
 - with NetWare Administrator 62, 123
 - with PCONSOLE 123
- OS/2 workstations
 - loading port drivers on 196
 - unloading port drivers on 199
- Other/Unknown printers, configuring
 - with NetWare Administrator 61
 - with PCONSOLE 117
- Other/Unknown printers, loading from
NPRINTER menu 194

P

- Page description printer languages. *See* PostScript
- Parallel ports
 - capturing data to 147
 - compared with serial ports for printing 281
- Parallel printers
 - cabling 270
 - characteristics of 258
 - specifying a local port, with PRINTCON utility 222
- Parallel printers, configuring
 - with NetWare Administrator 60
 - with PCONSOLE 117
- Parallel vs serial printing, for optimal performance 281
- Passwords, print server
 - assigning, with NetWare Administrator 79
 - assigning, with PCONSOLE 129
 - removing, with NetWare Administrator 79
 - removing, with PCONSOLE 129
- PCL printer language, characteristics of 259
- PCONSOLE utility
 - enabling form feed with 115
 - mounting printer forms with 125
 - new features for NetWare 4 107
 - task procedures 108
 - tasks, listed 8, 108
 - unloading print server with 132
- PCONSOLE utility, assigning with
 - default print queue 128
 - multiple queues and printers 124
 - print queue operator flags 113
 - print queue priority 127
 - print queues to printers 119
 - print server passwords 129
 - printers to print queues 113
 - printers to print servers 112
 - printing objects 124

- PCONSOLE utility, configuring with
 - banner name for print jobs 116
 - banner type 118
 - interrupts vs polled mode 118
 - notification of print job completion 115
 - OS/2 printers as Other/Unknown type 123
 - PostScript banner 118
 - print job parameters 114
 - print jobs for ASCII text 115
 - print jobs to use byte stream 115
 - print jobs, to use application's formatting commands 115
 - print servers 112
 - printer buffer size 118
 - printer options 117
 - printer type 123
 - printers 117
- PCONSOLE utility, creating with
 - print jobs 113
 - print queues 110
 - print queues, with Quick Setup option 20
 - print servers, with Quick Setup option 20
 - printers 111
 - printers, with Quick Setup option 20
- PCONSOLE utility, deleting with
 - print jobs 114
 - print queues 110
 - print server passwords 129
 - print servers 112
 - printers 111
- PCONSOLE utility, enabling auditing with 129
- PCONSOLE utility, managing printers with 120
- PCONSOLE utility, modifying with
 - address restriction for remote printers 118
 - hold status for print jobs 115
 - operator hold status 115
 - print jobs, deferring printing of 116
 - print queue priority 127
 - print queues, renaming 110
 - printer configurations 111
 - printer event notification 119
 - printer status 119
 - service sequence for print jobs 115
 - tab size 115
- PCONSOLE utility, referencing bindery queues with 135
- PCONSOLE utility, renaming with
 - print queues 110
 - print servers 112
 - printers 111
- PCONSOLE utility, servicing NetWare 3 print queues and clients, with NetWare 4
 - print servers 175
- PCONSOLE utility, specifying with
 - file contents of print jobs 115
 - queue service mode for print jobs 121
 - queue service mode for printer forms 118
- PCONSOLE utility, viewing with
 - auditing log 129
 - print jobs 113
 - print queues assigned to printers 124
 - print server auditing log 129
 - print server status 126
 - printer status 119
- PDL. *See* Page description language
- PDL. *See* PostScript
- Planning printing setup 9
- Plotters, troubleshooting 267
- Polled mode
 - as default for printer configurations 11
 - as default for printer configurations, with NetWare Administrator 59
 - as default for printer configurations, with PCONSOLE 118
 - explained 23
- Port drivers
 - explained 5, 187

- running from local drive 193, 195, 204
- Port drivers, loading
 - during initial setup 22
 - from command line 195
 - from NPRINT menu 194
 - on DOS workstations 193
 - on MS Windows workstations 194
 - on NetWare server 207
 - on NetWare server as Manual Load 208
 - on OS/2 workstations 196
 - on Windows 95 workstations 199
 - options, explained 187
- Port drivers, unloading
 - from command line, with NPRINT 196
 - on DOS or Windows workstation 196
 - on OS/2 workstations 199
- PostScript
 - characteristics of 260
 - guidelines for printing with 261
- PostScript banner
 - configuring, with NetWare Administrator 61
 - configuring, with PCONSOLE 118
 - support, explained 164
- Print data, explained
 - formatting and printing 6
 - generation and transmission 2
 - redirection to network queue 3
 - storage in queue 4
 - transmission to printer 5
 - transmission to printer station 5
- Print device databases, location 13, 226
- Print device definitions
 - explained 92
 - purpose explained 225
- Print device definitions, creating
 - with NetWare Administrator 93
 - with PRINTDEF 229
- Print device definitions, exporting
 - from database, with NetWare Administrator 99
 - from database, with PRINTDEF 233
- Print device definitions, importing
 - from another server, with PRINTDEF utility 232
 - to database, with NetWare Administrator 97
 - to database, with PRINTDEF utility 231
- Print device definitions, modifying
 - with NetWare Administrator 94
 - with PRINTDEF 230
- Print device definitions, viewing
 - with NetWare Administrator 94
 - with PRINTDEF 227
- Print device functions, creating
 - with NetWare Administrator 95, 96
 - with PRINTDEF 230
- Print device functions, deleting
 - with NetWare Administrator 95
 - with PRINTDEF 231
- Print device functions, modifying
 - with NetWare Administrator 95, 96
 - with PRINTDEF 231
- Print device functions, viewing
 - with PRINTDEF 228
- Print device modes
 - explained 100, 236
- Print device modes, creating
 - with NetWare Administrator 95, 100
 - with PRINTDEF 236
- Print device modes, deleting
 - functions, with PRINTDEF 240
 - with NetWare Administrator 95, 102
 - with PRINTDEF 238, 240
- Print device modes, modifying
 - with NetWare Administrator 102
 - with PRINTDEF 239
- Print device modes, renaming
 - with NetWare Administrator 102

- with PRINTDEF 240
- Print device modes, viewing
 - functions, with PRINTDEF utility 240
 - with NetWare Administrator 102
 - with PRINTDEF 239
- Print drivers, application, provided in NetWare 227
- Print job configurations
 - database locations 217
 - enabling timeout count, with NetWare Administrator 84
 - enabling timeout count, with PRINTCON 223
 - explained 15, 80, 215
 - parameters in NetWare Administrator 83
 - parameters in PRINTCON 221
 - printing with, in different context, using CAPTURE or NPRINT 150
 - renaming, with PRINTCON 220
- Print job configurations, creating
 - in bindery mode, with PRINTCON 218
 - with NetWare Administrator 80
 - with PRINTCON 217
- Print job configurations, creating using application's formatting commands
 - with NetWare Administrator 83
 - with PCONSOLE 115
 - with PRINTCON 221
- Print job configurations, deleting
 - with NetWare Administrator 85
 - with PRINTCON 220
- Print job configurations, modifying
 - with NetWare Administrator 85
 - with PRINTCON utility 220
- Print job configurations, public explained 215
- Print job configurations, specifying
 - captured local printer, with NetWare Administrator 83
 - captured local printer, with PRINTCON 222
 - default , with NetWare Administrator 85
- Print job configurations, viewing
 - with NetWare Administrator 85
 - with PRINTCON 219, 220
- Print jobs
 - auditing, with PCONSOLE 129
 - deferring printing, with PCONSOLE 116
 - determining printer language used in 296
 - redirecting, local ports to network using User Tools 56
 - sending, with NetWare-aware applications 26, 139
- Print jobs, auditing
 - with NetWare Administrator 76
- Print jobs, creating
 - with NetWare-aware applications 26, 139
 - with PCONSOLE 113
- Print jobs, deleting
 - with NetWare Administrator 56
 - with PCONSOLE 114
- Print jobs, modifying
 - hold status, with NetWare Administrator 56
 - hold status, with PCONSOLE 115
 - operator hold status, with PCONSOLE 115
 - parameters listed and explained, for PCONSOLE 114
 - service sequence, with NetWare Administrator 57
 - service sequence, with PCONSOLE 115
 - status, with NetWare Administrator 55
 - status, with PCONSOLE 114
 - tab size, with NetWare Administrator 83
 - tab size, with PCONSOLE 115
 - tab size, with PRINTCON 221
- Print jobs, specifying
 - file contents, with NetWare Administrator 83

- file contents, with PCONSOLE 115
- file contents, with PRINTCON 221
- queue service modes, with NetWare Administrator 61
- queue service modes, with PCONSOLE 121
- Print jobs, troubleshooting
 - activating when on hold status 304
 - checking contents for incorrect control sequences 301
 - determining status 309
 - determining where sent 304
 - determining whether ASCII text file 300
 - determining whether in queue 303
 - determining whether ever reached queue 303
 - resolving interrupt conflicts 299
 - when printed in pieces on separate pages 308
 - when printing slowly 307
 - when stuck in Adding status 307
 - when stuck in Ready status 306
 - when stuck on Active status 305
- Print jobs, viewing
 - details of, with NetWare Administrator 56
 - status of, with NetWare Administrator 56
 - with NetWare Administrator 55
 - with PCONSOLE 113
- Print layout page, in NetWare Administrator, explained 74
- Print queues
 - explained 4
 - specifying location, in different context, using CAPTURE or NPRINT 149
- Print queues, assigning
 - default, with NetWare Administrator utility 70
 - default, with PCONSOLE 128
 - multiple, with PCONSOLE 124
 - operator flags, with NetWare Administrator 55
 - operator flags, with PCONSOLE 113
 - priority, with NetWare Administrator 70
 - priority, with PCONSOLE 127
 - to printer, with PCONSOLE 119
 - to printers, with NetWare Administrator 46
- Print queues, bindery
 - reference queues, explained 136
 - referencing, with NetWare Administrator 41, 103
 - referencing, with PCONSOLE 135
- Print queues, creating
 - with NetWare Administrator 40
 - with PCONSOLE 110
 - with Quick Setup option in PCONSOLE utility 20
- Print queues, deleting
 - from list serviced by printer, from print server console 172
 - with NetWare Administrator 55
 - with PCONSOLE 110
- Print queues, managing
 - adding to list serviced by printer, from print server console 172
 - servicing NetWare 3 clients and queues with NetWare 4 print servers, using PCONSOLE 175
 - servicing NetWare 3 queues and clients with NetWare 4 print servers 175
 - servicing NetWare 4 queues and clients with NetWare 3 print servers 175
- Print queues, modifying
 - list of operators, with NetWare Administrator 58
 - list of users with NetWare Administrator utility 58
 - priority, with NetWare Administrator 70
 - priority, with PCONSOLE 127

- Print queues, renaming
 - with NetWare Administrator 54
 - with PCONSOLE 110
- Print queues, viewing
 - in or below current context, using NLIST 150
 - list of operators, with NetWare Administrator 58
 - list of users, with NetWare Administrator 58
 - printer assignments, with NetWare Administrator 54
 - printer assignments, with PCONSOLE 124
- Print server console
 - adding or deleting queues serviced from 172
 - managing printers from 170
 - mounting printer forms from 173, 244
 - specifying queue service mode from 173
 - viewing printer status information from 172, 174
- Print servers
 - address restrictions for remote printers, explained 164
 - auto-reconnect feature, explained 163
 - configurable queue sampling interval, explained 163
 - creating, with PCONSOLE 112
 - explained 161
 - increased performance with NetWare 4 162
 - loading 21, 166
 - number of printers supported in NetWare 4 162
 - PostScript banner support, explained 164
 - tasks, listed 166
 - troubleshooting 185
- Print servers, auditing
 - explained 164
 - with NetWare Administrator 76
 - with PCONSOLE 129
- Print servers, bindery reference, explained 136
- Print servers, configuring
 - with NetWare Administrator 47
 - with PCONSOLE 112
- Print servers, creating
 - with NetWare Administrator 47
 - with Print Services Quick Setup option in NetWare Administrator utility 18
 - with Quick Setup option in PCONSOLE utility 20
- Print servers, deleting
 - with NetWare Administrator 55
 - with PCONSOLE 112
- Print servers, managing
 - assigning and removing passwords, with NetWare Administrator 79
 - assigning and removing passwords, with PCONSOLE 129
 - from console 167
 - servicing NetWare 4 clients and queues with NetWare 3 print servers 175
 - specifying queue service mode, from console 168
- Print servers, renaming
 - with NetWare Administrator 54
 - with PCONSOLE 112
- Print servers, servicing NetWare 3 print queues and clients with NetWare 4, using PCONSOLE 175
- Print servers, unloading
 - at console command line 167
 - from console command line 167
 - from print server console 169
 - with NetWare Administrator 79
 - with PCONSOLE 132
- Print servers, viewing
 - assignments, with NetWare Administrator 54

- printing layout, with NetWare Administrator 74
- status, from print server console 169
- status, with NetWare Administrator print layout page 74
- status, with PCONSOLE 126
- PRINTCON utility
 - database locations 217
 - enabling form feed with 221
 - enabling timeout with 223
 - new NetWare 4 features described 215
 - print job configurations, explained 215
 - public print job configurations, explained 215
 - tasks, listed 8
- PRINTCON utility, configuring with
 - banner name for print jobs 222
 - notification of print job completion 221
 - parameters listed and explained 221
 - print jobs for ASCII text 221
 - print jobs to use byte stream 221
 - print jobs, to use application's formatting commands 221
 - specifying local parallel port 222
- PRINTCON utility, creating with
 - bindery print job configurations 218
 - print job configurations 217
- PRINTCON utility, deleting print job configurations with 220
- PRINTCON utility, modifying with
 - print job configurations 220
 - tab size 221
- PRINTCON utility, renaming print job configurations with 220
- PRINTCON utility, specifying with
 - file contents of print jobs 221
- PRINTCON utility, viewing print job configurations with 219, 220
- PRINTCON utility, viewing with
 - print job configurations 220
- PRINTDEF utility
 - location of print device databases 226
 - printer forms, location 241
 - tasks, listed 8
- PRINTDEF utility, creating with
 - print device definitions 229
 - print device modes 236
 - printer forms 241
- PRINTDEF utility, deleting with
 - print device mode functions 240
 - print device modes 238, 240
 - printer forms 242
- PRINTDEF utility, exporting print device definitions, from database 233
- PRINTDEF utility, importing with
 - print device definitions, from another server 232
 - print device definitions, to database 231
- PRINTDEF utility, modifying with
 - print device definitions. 230
 - print device modes 239
 - printer forms 242
- PRINTDEF utility, renaming print device modes with 240
- PRINTDEF utility, viewing with
 - print device definitions 227
 - print device functions 228
 - print device mode functions 240
 - print device modes 239
 - printer form definitions 243
 - printer forms 243
- Printer control options at print server console, explained 171
- Printer control options in PCONSOLE, explained 120
- Printer forms
 - explained 86, 241
 - location 86, 241
- Printer forms, creating
 - with NetWare Administrator 87

- with PRINTDEF 241
- Printer forms, deleting
 - with NetWare Administrator 91
 - with PRINTDEF utility 242
- Printer forms, modifying
 - with NetWare Administrator 90
 - with PRINTDEF utility 242
- Printer forms, mounting
 - explained 244
 - from print server console 173, 244
 - with NetWare Administrator 89
 - with PCONSOLE 125
 - with PSC command 245
- Printer forms, specifying queue service
 - modes for using
 - with NetWare Administrator 61
 - with PCONSOLE 118
- Printer forms, viewing
 - definitions, with NetWare Administrator 90
 - definitions, with PRINTDEF 243
 - with NetWare Administrator 90
 - with PRINTDEF utility 243
- Printer languages
 - determining, in print jobs 296
 - determining those supported by printer 297
 - explained 259
 - specifying those supported by printer, with NetWare Administrator 72
- Printers
 - attaching, with Print Services Quick Setup in NetWare Administrator utility 18
 - attaching, with Quick Setup in PCONSOLE 23
 - capturing data to parallel ports 147
 - connecting, options for 39
 - estimating data transmission rates 282
 - factors affecting output 282
 - languages described 259
 - number supported by NetWare 4 print servers 162
 - parallel compared with serial 258
 - preventing problems with 262
 - printer languages, determining those supported 297
 - selecting best type for your needs 258, 289
 - troubleshooting 264
 - troubleshooting network-related problems 267
 - types listed 257
 - viewing, in or below current context, using NLIST 150
- Printers, assigning
 - multiple, with PCONSOLE 124
 - to print server, with NetWare Administrator 50
 - to print server, with PCONSOLE 112
- Printers, configuring
 - address restriction, with NetWare Administrator 61
 - address restriction, with PCONSOLE 118
 - banner type, with NetWare Administrator 61
 - banner type, with PCONSOLE 118
 - communication parameters, with NetWare Administrator 61
 - options explained, for NetWare Administrator 59
 - options explained, for PCONSOLE 117
 - queue service interval, with NetWare Administrator 61
 - queue service mode for using printer forms, with NetWare Administrator 61
 - type, with NetWare Administrator 60, 67
 - type, with PCONSOLE 123
 - with PCONSOLE 111, 117
- Printers, creating
 - with NetWare Administrator 44

- with PCONSOLE 111
- with Print Services Quick Setup in NetWare Administrator utility 18
- with Quick Setup option in PCONSOLE utility 20
- Printers, deleting
 - with NetWare Administrator 55
 - with PCONSOLE 111
- Printers, dot-matrix
 - preventing problems with 263
 - troubleshooting 266
- Printers, laser
 - preventing problems with 263
 - troubleshooting 265
- Printers, managing
 - from PCONSOLE 120
 - from print server console 170
- Printers, modifying
 - features, with NetWare Administrator 71
 - status, with NetWare Administrator 64
 - status, with PCONSOLE 119
- Printers, renaming
 - with NetWare Administrator 54
 - with PCONSOLE 111
- Printers, specifying
 - cartridges supported, with NetWare Administrator 73
 - languages supported, with NetWare Administrator 72
 - location, in different context, using CAPTURE or NPRINT 149
 - typefaces supported, with NetWare Administrator 73
- Printers, troubleshooting
 - cabling problems 299
 - determining whether connected as network printer 308
 - faulty hardware 298, 300, 310
 - incompatible printer language versions 298
 - incorrect configuration 299
 - insufficient memory problems 298
 - non-network setup 298
- Printers, viewing
 - status, from print server console 172
 - status, with NetWare Administrator 63
 - status, with NetWare Administrator print layout page 74
 - status, with PCONSOLE 119
- Printers. *See also* Specific printer type
- Printing from Windows 95 workstations 206
- Printing layout, viewing , with NetWare Administrator 74
- Printing objects
 - deleting, with NetWare Administrator 55
 - moving, with NetWare Administrator 53
 - renaming, with NetWare Administrator 54
- Printing objects, assigning
 - printers to print servers, with PCONSOLE 124
- Printing objects, viewing
 - assignments, with NetWare Administrator 37, 54
 - with NetWare Administrator 74
- Printing objects. *See also* Specific object name
- Printing setup
 - configuring 23
 - examples 14
 - planning 9
- Printing tasks, sorted by utility 7
- Printing tasks. *See also* Specific NLM name
- Printing tasks. *See also* Specific utility name
- Printing utilities
 - graphical versus text, compared 7, 25
 - listed and explained 7
 - sorted by name 7
 - sorted by task 25
- Printing utilities. *See also* Specific utility name
- PSC utility
 - command syntax 249

- mounting printer forms with 245
- options, listed and explained 250
- purpose, explained 249
- tasks, listed 7, 249
- tips on using 251
- PSERVER NLM
 - loading 21
 - loading, command syntax 166
 - memory used per printer 161
 - new features in NetWare 4 162
 - tasks, listed 8, 166
 - troubleshooting 185
- PSERVER NLM. *See also* Print servers
- PUPGRADE NLM
 - purpose explained 251
 - tasks, listed 8, 252
- PUPGRADE NLM, upgrading with
 - NetWare 3 printing objects to NetWare 4 253
 - print server and associated printers 254
- PRINTCON database 253
- PRINTDEF database 253

Q

- Queue sampling interval
 - configuration explained 163
 - configuring, with PCONSOLE 119
- Queue server mode, as used by network-direct print devices, using with NetWare 4 179
- Queue servers, third party
 - using with NetWare 4 178
- Queue service interval. *See also* Queue sampling interval
- Queue service mode for printer forms
 - specifying, with NetWare Administrator 61
 - specifying, with PCONSOLE 118
- Queues. *See* Print queues

- Quick Setup option
 - attaching printers with, in NetWare Administrator 18
 - attaching printers with, in PCONSOLE 23
- Quick Setup option, creating with
 - bindery printing objects 133
 - print queues, with NetWare Administrator 18
 - print queues, with PCONSOLE 20
 - print servers, with NetWare Administrator 18
 - print servers, with PCONSOLE 20
 - printers, with NetWare Administrator 18
 - printers, with PCONSOLE 20

R

- Remote printer mode, as used by network-direct print devices 178
- Renaming. *See* NetWare Administrator utility, renaming with; PCONSOLE utility, renaming with; PRINTDEF utility, renaming with

S

- Sampling interval. *See* Queue sampling interval
- Screen displays, printing, with CAPTURE 148
- Security, managing 23
- Serial printers
 - cabling 271
 - characteristics of 258
- Serial printers, configuring
 - with NetWare Administrator 60
 - with PCONSOLE 117
- Service mode. *See* Queue service mode for printer forms

- Service sequence, setting for print jobs
 - with NetWare Administrator 57
 - with PCONSOLE 115
 - SFT III, printing with
 - explained 181
 - setting up, for uninterrupted performance 181
 - Status, print job
 - determining, for troubleshooting 309
 - modifying, with NetWare Administrator 56
 - modifying, with PCONSOLE 115
 - viewing, with NetWare Administrator 56
 - viewing, with PCONSOLE 115
 - Status, print server
 - viewing, at console 169
 - viewing, with NetWare Administrator
 - print layout page 74
 - viewing, with PCONSOLE 126
 - Status, printer
 - modifying, with NetWare Administrator 63
 - modifying, with PCONSOLE 119
 - viewing
 - from print server console 172
 - viewing, with NetWare Administrator 63
 - viewing, with NetWare Administrator
 - print layout page 74
 - viewing, with PCONSOLE 117, 119
 - Status, printing objects, viewing, with print layout page of NetWare Administrator 74
- ## T
- Tab size
 - setting with NetWare Administrator 83
 - setting with PCONSOLE 115
 - setting with PRINTCON 221
 - Tasks, printing. *See* Printing tasks
 - Text utilities for printing, compared with graphical utilities 7
 - Timeout
 - enabling with NetWare Administrator 84
 - enabling with PRINTCON 223
 - Timer tick values, setting for optimal printing 285
 - Troubleshooting, printing
 - activating print jobs on hold status 304
 - cabling 299
 - checking non-network printer setup 298
 - checking print job contents 301
 - common problems 296
 - determining print job status 309
 - determining printer language used in job 296
 - determining printer languages supported 297
 - determining where print job was sent 304
 - determining whether print job ever reached queue 303
 - determining whether print job is ASCII text file 300
 - determining whether print job is in queue 303
 - determining whether printer is connected as network printer 308
 - dot-matrix printers 266
 - faulty hardware 300
 - incompatible printer language versions 298
 - incorrect or slow printer output 294
 - incorrect printer configuration 299
 - insufficient printer memory 298
 - interrupt conflicts 299
 - isolating problems with bad hardware 310
 - laser printers 265
 - network-related printer problems 267
 - no printer output 292
 - plotters 267

- port driver problems 210
- print jobs printing slowly 307
- print jobs stuck in Adding status 307
- print jobs stuck in Ready status 306
- print jobs stuck on Active status 305
- print servers 185
- printers 264
- when print jobs print in pieces on separate pages 308
- when running MS Windows 309

X

- XNP printers, configuring
 - with NetWare Administrator 61
 - with PCONSOLE 117

U

- UNIX printers, configuring
 - with NetWare Administrator 60
 - with PCONSOLE 117
- Unloading
 - port drivers on DOS or Windows workstation 196
 - port drivers on OS/2 workstation 199
 - port drivers, from command line, with NPRINT 196
 - print servers, from console command line 167
 - print servers, from print server console 169
 - print servers, with NetWare Administrator 79
- Utilities, printing. *See* Printing utilities

W

- Windows 95 workstation
 - capturing a printer from 206
 - managing printer attached to 203
 - printing from 206
 - sharing printer attached to 22, 199
- Windows. *See* MS Windows
- Workstation printing 206

User Comments

We want to hear your comments and suggestions about this manual. Please send them to the following address:

Novell, Inc.
Documentation Development
MS C-23-1
122 East 1700 South
Provo, UT 84606
U.S.A
Fax: (801) 861-3002

IntranetWare
Print Services
Part #Place Part Number Here
June 1997

For technical support issues, contact your local dealer.

Your name and title: _____

Company: _____

Address: _____

Phone number: _____ Fax: _____

I use this manual as an overview a tutorial a reference a guide _____

	Excellent	Good	Fair	Poor
Completeness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Readability (style)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Organization/Format	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Accuracy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Examples	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Illustrations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Usefulness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please explain any of your ratings: _____

In what ways can this manual be improved? _____

You may photocopy this comment page as needed so that others can also send in comments.

