

## Chapter 3

# Printing From SCO UNIX to a Network-Attached Compaq Pagemarq

This chapter describes a configuration for printing from an SCO UNIX host/server to a Compaq Pagemarq printer attached to a NetWare network. The following figure illustrates the SCO UNIX to network-attached Compaq Pagemarq configuration:

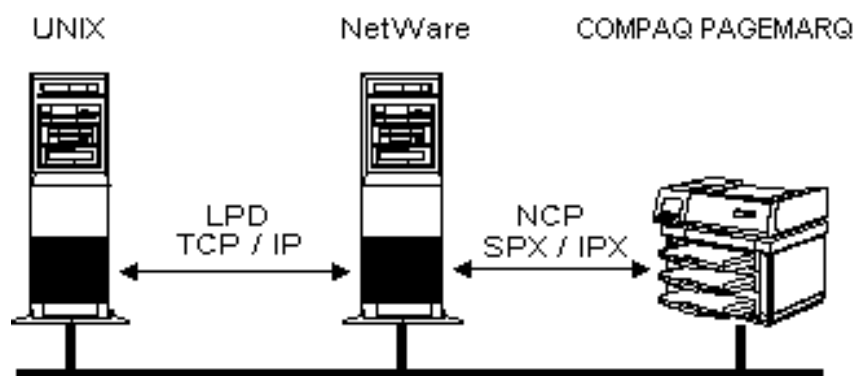


Figure 3-1. SCO UNIX to Network-Attached Compaq Pagemarq Configuration

This method routes the print job first to a spool directory on the SCO UNIX server. Next, the UNIX scheduling program, **lpsched**, sends the print job from the spool directory to the NetWare print queue across a TCP/IP connection using LPD (line printer daemon). Finally, the **print server** program (which, in this case, runs on the Compaq Pagemarq) retrieves the print job from the NetWare queue by way of an SPX/IPX connection.

## Prerequisites

This configuration assumes the following:

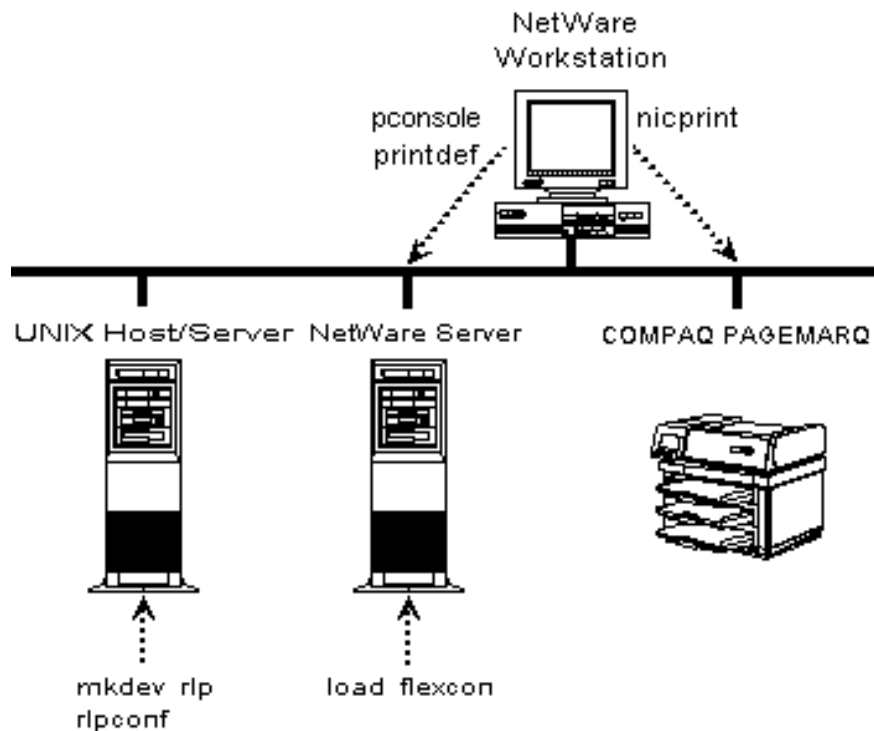
- NetWare server with a minimum of 4 megabytes of system memory, running NetWare Version 3.11
- TCP/IP is running on the NetWare server (Ethernet II frame type is bound to TCP/IP.)
- SCO UNIX server running SCO UNIX System V 3.2 v.4 with TCP/IP Version 1.2
- DOS is resident in file-server memory (in other words, do not include the command, REMOVE DOS, in *autoexec.ncf*.)

## Configuration Overview

Procedures for configuring SCO UNIX to NetWare printing include the following:

- Configuring the Compaq Pagemark printer
  - Validating network printing
  - Installing NetWare FLeX/IP Version 1.2 on the NetWare server
  - Configuring UNIX to NetWare Print Services on the NetWare server
  - Configuring the SCO UNIX host/server for LPD communications
  - Validating printing from SCO UNIX to the network-attached Compaq Pagemark
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The following figure illustrates the configuration programs used:



**Figure 3-2.** Configuration Programs SCO UNIX to a NetWork-Attached Printer

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### 3-4 Printing From SCO UNIX to a Network-Attached Compaq

The following table lists the configuration programs and describes their functions:

Table 3-1 Configuration Programs		
Configuration Program	Executes From	Description
mkdev rlp	UNIX host/server	Configures remote printing
rlpconf	UNIX host/server	Configures remote printers
printdef.exe	NetWare Workstation	Creates the file: sys:\public\net\$prn.dat which speeds printing
nicprint.exe	NetWare Workstation	Configures and starts the print server that executes on the Compaq Pagemark
pconsole.exe	NetWare Workstation	Configures file servers, queues, printers, and print servers
flexcon.nlm	NetWare Server	Configures UNIX to NetWare printing with LPD protocols

## Configuring the Compaq Pagemark Printer

Configuring the printer for network printing involves the following procedures on the NetWare server:

- Installing the NICPrint utility
- Creating a queue
- Creating a print server
- Defining the printer and printer connection
- Associating the print server, printer, and print queue

We use the following names for our examples:

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**Table 3-2**  
**Naming Conventions for**  
**SCO UNIX to NetWare Printer Configuration**

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NetWare server	nwserv
NetWare print queue	pgmq_queue
NetWare print server	pgmq_pserver
NetWare printer (Printer connected to the NetWare server LPT1 port)	pgmq_printer

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## Installing the NICPrint Utility

The NICPrint utility configures the printer network interface card (NIC) and manages the Compaq Pagemarq printer from a personal computer on the network. To install the utility, complete the following steps:

1. Boot the NetWare server with the following commands:

```
cd /netware
server
```

2. Login from a NetWare workstation. For example:

```
f:
login supervisor
c:
```

3. Insert the NICPrint Software Utility diskette into a diskette drive of the NetWare workstation.

4. Make the diskette drive the current drive by entering the drive designator. For example:

```
a:
```

5. Enter

```
install
```

6. A message appears indicating where NICPrint will be installed. The default path listed is *C:\PAGEMARQ\NICPRINT*. Accept the default by pressing **ENTER**.

7. After copying the files, a dialogue box asks if you want your *autoexec.bat* file updated with the path statement for the **NICPrint** utility. Select *Yes*.

8. A dialogue box informs you that the **NICPrint** utility is successfully installed and asks if you want to start the utility now. Select *Start NICPrint*.
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9. The Network Printers list box displays. Note that the logical name and the physical name of the printer is the same at this point. To configure the highlighted printer, select it by pressing **ENTER**.
10. From the Configuration Options menu, select *Configure Printer* → *Print Server*.
11. The Configure Print Server dialogue box displays with the name of the NetWare server in the Login Server field. Press the **DOWN** arrow to move the cursor to the Print Server Logical Name field.
12. In the Print Server Logical Name field, type a name for the print server and press **ENTER**. For example:  

pgmq\_pserver
13. Exit the dialogue box by pressing **ESC**.
14. To save changes, select *Yes*.
15. To exit to **pconsole**, select *Yes* and continue with the following section, "Creating a Print Queue."

## Creating a Print Queue

To create a print queue on the NetWare server, complete the following steps:

1. From the Available Options menu, select *Print Queue Information*. The Print Queues list box displays on the screen with no contents.
2. To add the print queue, press **INSERT**.
3. In the New Print Queue Name: dialog box, enter a name for the queue. For example:  

pgmq\_queue
4. The queue name displays in the list box. Exit the list box by pressing **ESC** and continue with the next section, "Creating a Print Server."

## Defining a Print Server Configuration

To create a printer server, follow these steps:

1. From the Available Options menu, select *Print Server Information*.
2. The Print Servers list box displays on the screen with no contents. To add the print server, press **INSERT**.
3. In the New Print Server Name: dialogue box, enter a name for the print server. For example:  
  
pgmq\_pserver
4. The print server name displays in the list box. To configure the print server, select it (already highlighted) by pressing **ENTER**.
5. From the Print Server Information menu, select *Print Server Configuration* → *Printer Configuration*.
6. The Configured Printers list box displays on the screen showing no printers installed. Select *Not Installed 0*.

## Defining the Printer and Printer Connection

The following steps define the printer and printer connection.

1. Once you select *Not Installed 0* from the Configured Printers list box, the Printer 0 Configuration dialogue box displays on the screen. In the Name: field, type the name of the printer to define. For example:  
  
pgmq\_printer
  2. Exit the dialog box by pressing **ESC**.
  3. Save changes by selecting *Yes*.
  4. The Configured Printers list box appears on the screen displaying the new printer. Press **ESC**. The Print Server Configuration menu returns to the screen. Continue with the next section, "Associating the Print Server, Printer, and Print Queue."
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## Associating the Print Server, Printer, and Print Queue

Next you need to associate the print server, printer, and print queue.

1. From the Print Server Configuration menu, select *Queues Serviced by Printer*.
2. The Defined Printers list box shows the printer name. Select the printer by pressing **ENTER**.
3. A list box displays fields for File Server, Queue, and Priority. To add a queue, press **INSERT**.
4. The Available Queues list box appears on the screen. Select the newly created print queue name. For example: *pgmq\_queue*
5. Select priority 1 (default) by pressing **ENTER**. A screen now lists the defined file server, queue, and priority.
6. Exit **pconsole** by pressing **ESC** at each screen.
7. After pressing **ESC** at the Available Options menu, verify the exit by selecting *Yes* in the dialogue box.

## Validating Network Printing

Validating the NetWare printing involves:

- Resetting the printer NIC
- Starting the print server from the NetWare server.
- Redirecting the workstation print jobs
- Printing from the workstation

### Resetting the Printer NIC

Before printing, reset the printer NIC by following these steps:

1. From the NetWare workstation, enter  
`nicprint`
  2. At the Network Printers list box, select the network printer.
  3. From the Configuration Options PGMQ\_PSERVER menu, select *Network Interface Controller (NIC) Management* → *Reset NIC*.
  4. A message appears warning of the possibility of losing data when resetting. Press **ENTER** to select *OK*.
  5. Exit from the NIC Management screen by pressing **ESC**.
  6. Exit from the Configuration Options menu by pressing **ESC**.
  7. At the Network Printers list box, press **F2** to regenerate the list. The list box now shows the status as running.
  8. Exit the list box by pressing **ESC**.
  9. Verify the exit by selecting *Yes*.
-

## Redirecting Workstation Print Jobs

To print from the NetWare workstation to the printer connected to the network, you must redirect the workstation print jobs from the local serial/parallel port to the network.

At the NetWare workstation, capture the workstation printer port LPT1 and redirect it to the printer attached to the network by entering

```
capture q=pgmq_queue
```

You see the following message:

---

```
Device LPT1: re-routed to queue PGMQ_QUEUE on server NWSERV
```

Now anything printed to LPT1 on the workstation will print out on the printer attached to the network.

## Printing from the Workstation

Test the NetWare printing by printing a copy of the *autoexec.bat* file from the NetWare workstation.

To print a copy of the *autoexec.bat* file, enter

```
copy c:\autoexec.bat lpt1
```

A message stating "1 file(s) copied" displays on the NetWare workstation. The *autoexec.bat* file of the workstation prints out on the network printer.

## Installing Novell FLeX/IP

After configuring network printing for the serial/parallel port of the NetWare server, the next task is to install Novell FLeX/IP to supply the NetWare server with the LPD protocol. The following procedures include:

- Adding the *net\$prn.dat* file
- Installing FLeX/IP Version 1.2

### Adding the NET\$PRN.DAT File

To speed printing, you need to add the *net\$prn.dat* file to the *f:\public* directory before installing FLeX/IP. To add the file, complete the following steps from the NetWare workstation:

1. From the NetWare workstation, enter  

```
printdef
```
  2. From the PrintDef Options menu, select *Print Devices → Edit Print Devices*. The Defined Print Devices list box displays on the screen with no contents.
  3. To add the print device, press **INSERT**.
  4. In the New Device Name dialogue box, enter  

```
net$prn
```
  5. The Defined Print Devices list box now lists *net\$prn.dat*. Exit the list box by pressing **ESC**.
  6. At the Print Device Options menu, press **ESC**.
  7. At the PrintDef Options menu, press **ESC**.
  8. Verify the exit by selecting *Yes* at the dialog box.
-

9. From the Exit Options menu, select *Save Data Base*, then *EXIT*.

10. To verify that the file is added, enter

```
dir f:\public\net$prn.dat
```

A message appears on the screen listing the file and the number of bytes.

## Installing FLeX/IP

To install FLeX/IP on the NetWare server, complete the following steps:

1. With the NetWare server running, insert the FLeX/IP diskette into a diskette drive.

2. At the colon (:) prompt, enter

```
load install
```

3. At the Installation Options menu, select *Product Options*.

4. Currently Installed Products list box displays with no contents. To install a new product, press **INSERT**.

5. A dialog box prompts you to enter the drive and or path to the new product source media. Enter the appropriate drive indicator or press **ENTER** to select the default, a:

As files transfer their filenames display on the screen.

6. A dialog box prompts you for the drive or path for booting NetWare and provides a: as the default. Backspace over the a: and enter the appropriate path. For example:

```
c:\netware
```

7. From the NetWare FLeX/IP Installation Options menu, select *Install*.

8. After a message informs you that the serial number is being checked, a number of dialog boxes display requiring yes or no answers. The following table lists the prompts and appropriate responses.

---

**Table 3-3**  
**NetWare FLeX/IP Installation Options**

Prompt	Response
SYS:\ETC\HOSTS EXISTS Overwrite Existing File?	No
SYS:\ETC\SERVICES EXISTS. Overwrite Existing File?	No
Automatic startup for Unix-to-Netware Printing?	Yes
Automatic startup for Netware-to-Unix Printing?	No
Automatic startup of the Remote Console for Unix?	No
Automatic Startup for FTP Server?	No

9. Once you respond to all the option prompts, the NetWare FLeX/IP Installation Options menu displays on the screen. Select *Exit*.
10. A dialog box prompts for verification. Select *Yes*.
11. The Currently Installed Products list box displays with FLEXCON, NFSPRINT, and NWPRINT now listed. Exit this menu by pressing **ESC**.
12. At the Installation Options menu, select *Exit*.
13. A dialog box prompts for verification. Select *Yes*.
- NetWare module screen now shows the FLeX/IP NLMs.
-

## Configuring UNIX-to-NetWare Print Services

The following procedures configure UNIX to NetWare print services on the NetWare server. These procedures include:

- FLeX/IP
- Starting the LPD protocol

### Configuring FLeX/IP

To configure FLeX/IP, complete the following steps:

1. From the colon (:) prompt on the NetWare server, enter  
  
load flexcon
2. At the Configuration menu, select *Workstation IP Address*. The Workstation IP Address list box appears.
3. Verify that both the NetWare and SCO UNIX servers are listed and exit by pressing **ESC**.
4. At the Configuration menu, select *UNIX-To-Netware Print Service*
5. At the Main menu, select *Select Print Queues for use by LPD*.
6. The Print Queues Selected list box displays on the screen with no contents. To add a queue, press **INSERT**.
7. The Available Print Queues list box appears on the screen. Select the queue you are adding from this list. For example: *pgmq\_queue*.
8. The Print Queues Selected list box now displays *pgmq\_queue* as the selected queue. Exit the list box by pressing **ESC**.

9. Save the changes by selecting *Yes* at the dialogue box.
10. At the Main menu, select *Select Trusted Hosts*.
11. The Trusted Hosts List list box appears with no contents. To add a host, press **INSERT**.
12. From the Available Hosts list, select the name of the SCO UNIX host/server. For example: *unxserv*.
13. The host name now appears on the Trusted Hosts List. Press **ESC** to exit.
14. Save changes by selecting *Yes* at the dialogue box.
15. At the main menu, select *Select Username Mapping Mode*.
16. At the menu, Current Mode is SINGLE ACCOUNT, select *All Clients use the same Netware Account*.
17. When prompted for the Selected Username, press **INSERT**.
18. From the Available Usernames list box, select *Guest*.
19. The Selected Username dialogue box now displays Guest. Exit by pressing **ESC**.
20. To save changes, select *Yes*.
21. At the menu, Current Mode is SINGLE ACCOUNT, press **ESC**.
22. At the Main menu, select *Exit*.
23. Verify the exit by selecting *Yes* at the dialogue box.
24. At the Configuration menu, select *Quit*.
25. Verify the exit by selecting *Yes* at the dialogue box.

## Starting the LPD Protocol

Next, start the LPD protocol from the NetWare server by entering

```
load plpd
```

---



## Configuring the SCO UNIX Host/Server for LPD Communications



**IMPORTANT:** Do not follow the SCO-specific instructions provided in the Novell FLeX/IP file, *\public\sysvpr.doc*. This information does not apply to SCO TCP/IP Version 1.2.

Before you begin the following procedures, it is a good idea to make back-up copies of *lp*, *lpstat*, and *cancel* in */usr/bin*.

**NOTE:** The **mkdev rlp** procedure used in the following section, "Configuring the Remote Printing Daemon," moves the local versions of these files to a different directory and replaces them with remote versions of these files. It is important that both sets of files are correct. If the **mkdev rlp** procedure is accidentally executed twice, the current remote versions are copied over the local versions and new remote versions added. Local versions are then lost making local printing unreliable. Saving an extra copy of the local versions makes recovery possible.

To make copies of these files, enter the following commands:

1. Log in as *root*.
2. Change directories to */usr/bin* by entering
3. Make back-up copies of the *lp*, *lpstat*, and *cancel* files into */usr/bin* by entering the following commands:

```
cp lp lp.local
cp lpstat lpstat.local
cp cancel cancel.local
```

## Configuring the Remote Printing Daemon

To configure the remote printing daemon, complete the following steps:

1. Enter

```
mkdev rlp
```

2. A number of prompts display. The following table lists the prompts and the appropriate responses:

---

**Table 3-4**  
**mkdev rlp Prompts**

Prompt	Response
Do you want to install or delete remote printing (i/d/q)?	i
Do you want to change the remote printer description file /etc/printcap (y/n)?	n
Do you want to start remote daemon now?	n

## Configuring a Remote Printer

The following procedure configures the remote printer.

1. From the *root* prompt, enter

```
rlpconf
```

The following message displays on the screen:

---

Please enter the printer name: (q to quit)

The value needed here is actually the NetWare queue name (in our example, *pgmq\_queue*.) However, a more descriptive logical local printer name could be more informative. For this example we chose to enter a more descriptive printer name and later edit the *printcap* file to correctly identify the NetWare queue. For example:

```
pgmq_network
```

---

3. number of additional prompts display. The following table lists the prompts and the appropriate responses:

Table 3-5 rlpconf Prompts	
Prompt	Response
Is pgmq_network a remote or local printer?	r
Please enter the name of the remote host that pgmq_network is attached to:	<i>NetWare servername</i> For example: nwserv
pgmq_network is connected to host nwserv. Is this information correct?	y
Be the system default printer (y/n)?	y
Please enter the printer name (q to quit)	q

## Editing PRINTCAP to Correct the NetWare Queue Name

To have the system understand that the "printer name" pgmq\_network is really the NetWare print queue (pgmq\_queue) you must edit the *printcap* file. The following procedure uses **vi** to edit the file.

1. Enter the following command:

```
vi /etc/printcap
```

The following displays all on one line:

```
:lp=:rm=nwserv:rp=pgmq_network:sd=/usr/spool/lpd/pgmq_network:
```

2. Edit the line changing `rp=pgmq_network` (remote printer = `pgmq_network`) to `rp=pgmq_queue`.
  - a. To move the cursor to the line, press the **DOWN** arrow key twice.
  - b. Move the cursor to the "n" in `pgmq_network` by pressing the **RIGHT** arrow key.
  - c. With the cursor on the "n," type **ew**.
  - d. Type **queue**.
  - e. Press **ESC**.
3. Once you edit the line, exit **vi** by entering  
`:wq`
4. Start LPD by entering  
`lpd start`

## Validating SCO UNIX to Network Printing

To validate SCO UNIX to Network printing, you first set up the NetWare workstation so you can monitor whether or not the print job makes it to the NetWare queue. Then you send the print job from the SCO UNIX host/server and monitor the results.

1. At the NetWare workstation, enter  
`pconsole`
2. From the Available Options menu, select *Print Queue Information*.
3. From the Print Queues list box, select *pgmq\_queue*.
4. At the Print Queue Information menu, select *Current Print Job Entries*.

A blank screen displays with the column headings Sequence, Banner, Name, Description, Form, Status, and Job. Any print job from the SCO UNIX host/server sent to the NetWare queue will appear on this screen before being sent on to the printer.

---

5. Then enter

```
lp /etc/hosts
```

When the job is accepted on the UNIX side, the request id message appears on the screen.

Next the NetWare Workstation screen shows print job information.

Then, the *hosts* file prints out on the NetWare printer.