

# **Configuring Printer Serving Features**

**Xyplex Access Server Software**

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**451-0112A**

## EFFECTIVE PAGES

This manual contains 83 pages consisting of the following:

**Issue:** Original

**Date:** January, 1995

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# Preface

This manual describes the configuration, setup, and management of a communication server software package, supplied by Xyplex, Inc. to provide access to network services from remote locations. It is intended that this manual will be read by network and communication server managers.

This manual is organized as follows:

Chapter 1 - **Introducing the Access Server**, provides an overview of the Xyplex Access Server Software features that support network printer serving.

Chapter 2 - **Basic Setup Activities for Printer Serving**, describes the activities that you must perform that are common to all printer server configurations.

Chapter 3 - **Setting Up Printers Using the lpd Daemon**, describes how to configure an access server to support printing from any lpd-compliant host software.


Chapter 4 - **Installing and Using the cspord Daemon**, describes how to configure an access server to support printing from UNIX hosts that do not support standard lpd printing services.

Chapter 5 - **Configuring Print Services for Novell Users**, describes how to configure an access server to support printing for Novell NetWare users.

Chapter 6 - **Setting Up VMS/Ultrix Printers**, describes how to configure an access server to support printing from DEC LAT hosts.

### Conventions

This manual uses the following conventions:

1. The CTRL key on the keyboard provides alternate functions when used with some keyboard keys. Notation such as CTRL-A indicates that you press both the CTRL key and the letter A key at same time. The terminal server will echo this control character as ^A.
2. Unless otherwise specified, commands are executed when you press the RETURN key on the keyboard. The symbol  in the text means press the RETURN key.

3. The manual uses the following typographical conventions:

Monospace Typeface indicates text displayed at a terminal (displays, messages, system responses, etc).

*italics* indicates variables in commands and procedures.

4. The following typeface indicates user input in response to system prompts:

```
Xyplex> connect
```

5. The server prompt for secure and non-privileged users is this:

```
Xyplex>
```

The server prompt for privileged users is this:

```
Xyplex>>
```

This is the default communication server user interface prompt; the server manager can specify a different prompt, so the prompt in use at your site may be different.

6. The following default user prompts will be shown (different prompt may be in use at your site):

VMS	\$
UNIX/ULTRIX	%
UNIX/ULTRIX Superuser	#
DOS	C:\

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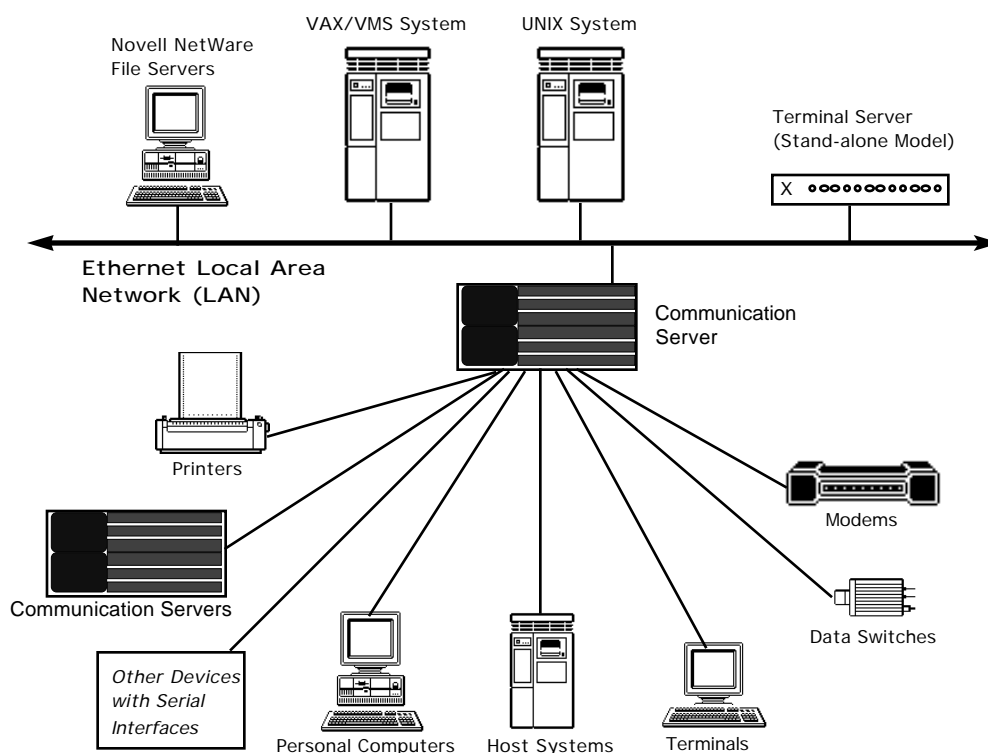
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# Chapter 1

## Introducing the Access Server

The multiprotocol access server software supplied by Xyplex, Inc. operates on Xyplex-supplied communication hardware modules, which are part of the MAXserver family and Network 9000 family of Ethernet-based communication products. This combination of software and hardware is called an access server, or sometimes a communication server.

Access servers support connections between serial-interface devices and other devices connected to the Ethernet network. The serial-interface devices include: terminals, serial printers, personal computers running terminal emulation or networking software, modems, serial ports on other communication servers, and host computer serial ports. Figure 1-1 represents a communication server configuration.



**Figure 1-1. Network Configuration with Communication Servers.**



Figure 1-1 shows that several different types of devices can be connected to the serial ports of the communication server. Users at any of these devices can gain access to any resources on the network, such as host computers, workstations, etc, and resources available at other communication server ports. (System administrators can also limit user access to these resources, if desired.) Because the communication server software supports multiple communication protocols, these connections can be made regardless of the operating system running at the desired resource.

Compare this to operation without a communication server, where users would need to go to a terminal that is directly connected to a serial port on the host or node they want to use. With a communication server, users can perform work on any computer that is connected to the network that the communication server is on. Providing access from serial ports to host computer resources is referred to as "terminal serving."

Similarly, consider the example of a user who wants to print a job. Without a communication server, the user would need to print the job to a printer that is directly connected to a serial port on the host where the data is located. With a communication server, many users can have access to a shared printer resource, because the resource is located on the network. Providing shared printing resources is also referred to as "printer serving."

For terminal serving and printer serving, the devices which provide services are connected to a network and the users of those services usually work at a location that is geographically local to the device offering the service. Serial ports at communication servers can also be connected to modems, switches and other devices to provide access to services that are available at remote locations or for users who are at remote locations. This is referred to as "access serving."

Access serving configurations include anything from simple dial-in and dial-out modems for low speed interactive traffic (terminal emulation, text editing, file transfers, electronic mail), to more sophisticated applications.

Printer sharing functions require cooperating processes in the host system and the server. This chapter provides an overview to the following printer serving features:

- Print serving features for TCP/IP networks and hosts.
- Print serving features for Novell NetWare (IPX) networks.
- Print serving features for LAT networks.
- The Connection Queue

---

## Print serving features for TCP/IP networks and hosts

Xyplex supports two methods of printing for TCP/IP networks (typically used for UNIX hosts): `lpd` and `cspord`. You only need to use the `cspord` daemon to configure shared printing from UNIX if your UNIX host does not support the use of remote printers via `lpd`.

### **lpd**

Standard UNIX operating systems (and also some PC remote access packages) typically provide a method for configuring remote printers through `lpd`. AT&T System V UNIX and BSD UNIX implementations use different `lpd` configuration procedures, and some UNIX implementations do not support the use of remote printers via `lpd`.

In addition to most UNIX implementations, `lpd` is supported by most PC and workstation TCP/IP implementations, including:

- Microsoft Windows NT
- Chameleon
- MultiNet (TGV) for VAX/VMS Hosts
- FTP Software Company's PC/TCP

If you are using another PC and workstation TCP/IP implementation, you should consult the user documentation supplied with your software to determine if you can use `lpd` for printer serving support.

**csportd**

The csportd daemon is a host-based daemon which provides a general-purpose tool for making connections to a port and "piping" data to or from that port. One could use this connection to send a file or user data to a port, for printing to PostScript® printers, or as a permanent connection between a host and a specific port. csportd is a Xyplex-proprietary daemon and is implemented as a utility at a UNIX host.

csportd gives users the ability to "pipe" data between a UNIX host and a communications server port. Data can be sent to the port from the host, or received from the port by the host. At the host, csportd accepts data from standard input (stdin), the standard UNIX pseudo-terminal (pty devices) mechanism, or from a FIFO (named pipe, which is a file to which you send data) and passes the data to the communication server port .

csportd comes with an installation script and a MAN page. The utility must be copied from a UNIX media kit, then installed using the installation script. csportd can be installed on any UNIX host running BSD and AT&T System V UNIX operating systems, and has also been tested on hosts running the AIX, MIPS, HP/UX, and ULTRIX operating systems.

## Print serving features for Novell NetWare networks

Xyplex supplies a feature, XPRINTER, which provides IPX printing support so that the unit provide shared printer services on a Novell NetWare network. You can configure XPRINTER parameters either with standard Xyplex TCP/IP-LAT software commands or with the XPRINTER Setup Dialog (only on MAXserver 1400A and 1450 Printer Servers).

XPRINTER is available on the following unit types:

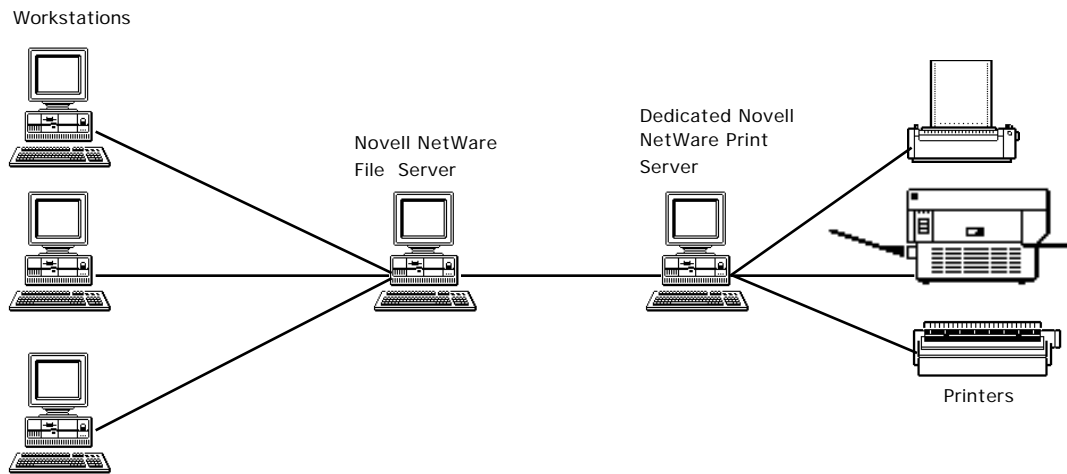
- MAXserver 1450 and 1400A Printer Servers
- Network 9000 Access Server 720
- MAXserver 800/1120/1520/1600/1620/1640/1820 Access Servers
- MAXserver 2120/2220 Terminal Servers

For all units except for the MAXserver 1450 and 1400A Printer Servers, the unit needs at least 2 megabytes of memory. The XPRINTER Setup Dialog is only available on MAXserver 1450 and 1400A Printer Servers. You must use the commands described in the next section to configure XPRINTER features for all other unit types.

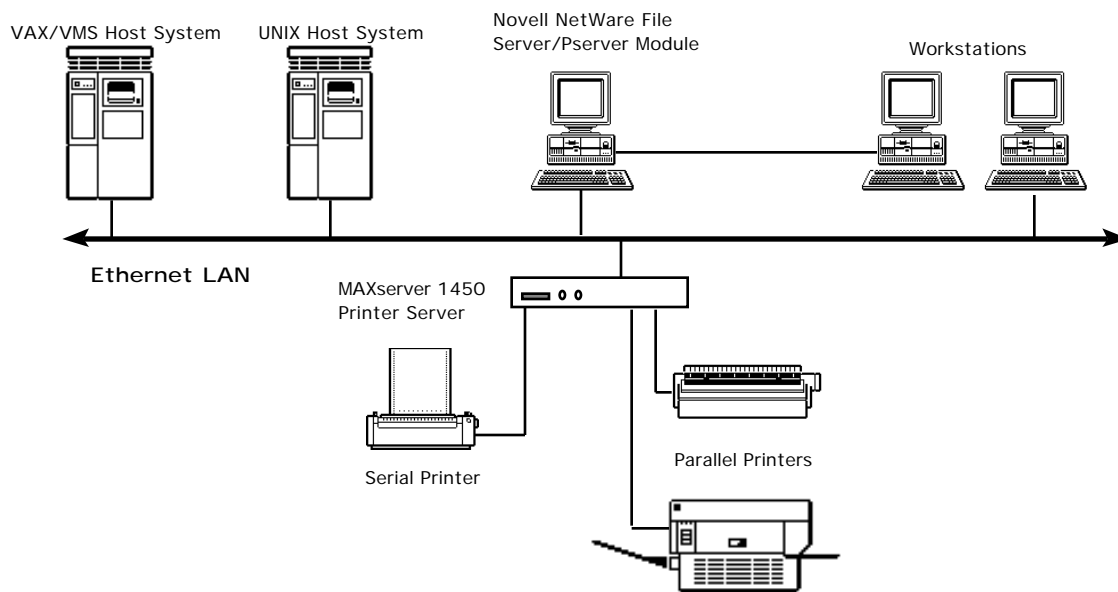
Figure 1-2 shows the differences between a Novell-only network printing environment, and one which uses a Xyplex terminal server or printer server, in this case a MAXserver 1450 Printer Server. You should not confuse a Xyplex Printer Server with a Novell "print server." In this application, you configure terminal server or printer server ports as one or more Novell remote printers, which are assigned to a new or existing Novell print server.

In the standard Novell-only network printing environment, the workstations send all print jobs to a queue on a NetWare File Server, which maintains the print queues for a NetWare Print Server. The NetWare print server resides either on a NetWare file server or on a dedicated print server workstation (PC). When a printer is ready to accept a job, the print server services each queue assigned to that printer and sends the first job in the queue to the printer. In the case of remote printing, the printer(s) would normally be connected to a PC somewhere on the network. (Printers connected directly to the file server are not treated as remote printers.)

### Standard Novell-Only Network Printing Environment



### Network Printing Environment With MAXserver 1450



**Figure 1-2. Network Printing Environments.**

As shown in Figure 1-2, there are two major differences between the Xyplex XPRINTER network printing environment and the standard Novell-only environment. First, the printers are physically connected to the Xyplex terminal server or printer server, rather than a PC. Second, users at VAX/VMS hosts and UNIX hosts also have access to those printers. In this network printing environment, you configure the Novell printing facilities at the Novell print server and file server in the same way as you would a Novell remote printer. To configure a remote printer, you use the Novell PCONSOLE utility. You must also set up the software on the Xyplex terminal server or printer server so that this unit communicates with the Novell file server. To do this, you can use the XPRINTER commands or the Setup Dialog described in chapter 5.

### **Print serving features for LAT networks**

DEC operating systems (VMS and Ultrix) provide LAT protocols which provide printer registration and connection protocols that support printer sharing. For VAX/VMS hosts, DEC provides a print symbiont (LATSYM) that interfaces with the VMS print spooling system and implements the shared printer protocols. For Ultrix hosts, there are TCP/IP-related keywords that you include in the printcap file. At the server, there is a process that listens to and responds to registration requests.

To make local services at the terminal/printer server available to users at hosts running DEC operating systems, you need to use DEC-supplied LAT control programs to create an application port. These programs are the LATCP program on VMS and the `/etc/lcp` program on Ultrix. You then map the application port to a physical terminal/printer server port. Users can gain access to the service with normal commands, such as PRINT commands. The connection queue, described in the next section, controls further activity between the host and the service offered at the terminal server port.

## The Connection Queue

A printer server or access server contains a single queue, in which it stores requests for access to services offered by the printer server from devices on the network that support queuing (for example, VMS hosts). Queuing allows all devices to contend for access to printer services, and have the request placed into the connection queue whenever a requested service is busy or unavailable. Figure 1-3 depicts the types of print jobs that may be entered into the connection queue.

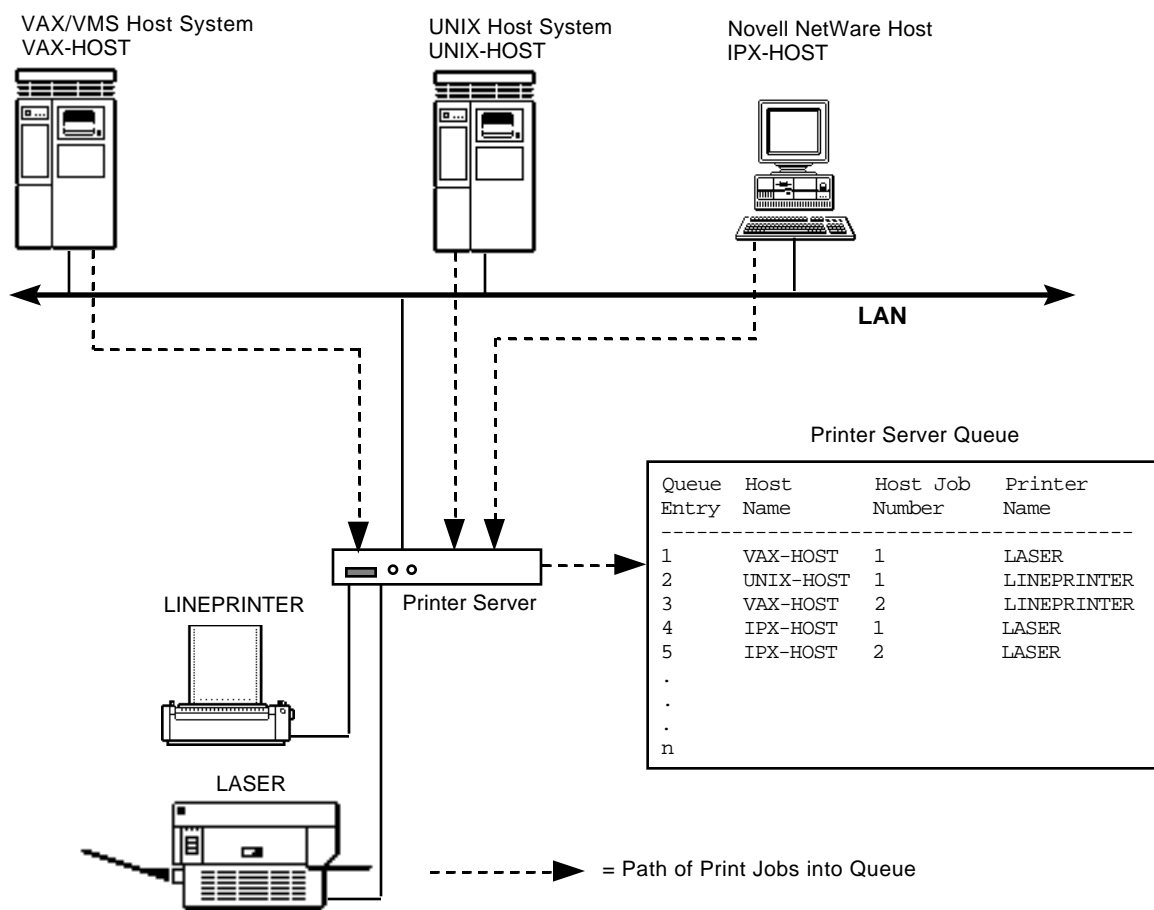
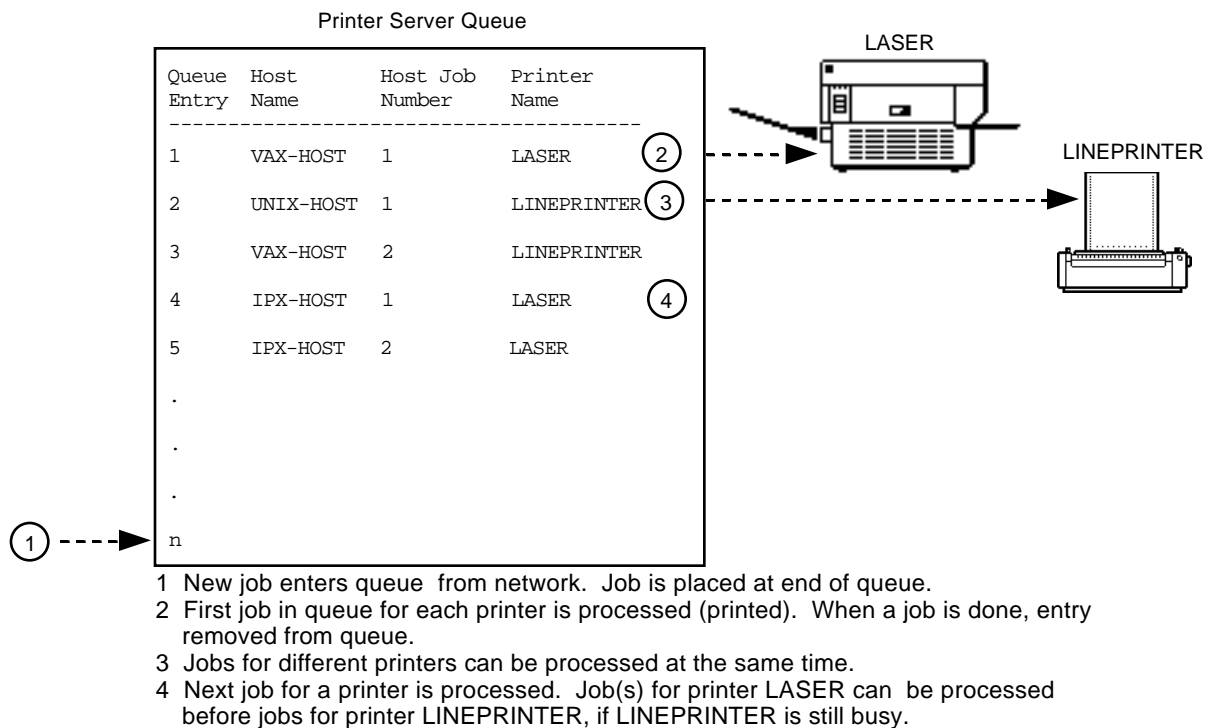


Figure 1-3. Print Jobs Entering the Queue.

If queuing is not enabled for a printer service, when a device requests connection to the service that is busy or unavailable, the server notifies the device that the service is unavailable. The user must try to make the connection later. For example, a printer connected to a server may be busy printing a job from one host, when another host makes a connect request. If queuing is enabled for the service, in this example the printer, the server places the request in the connection queue and notifies the waiting host when the printer is available to print the job.

For LAT and TCP/IP connections, the service node scans the connect-back queue in first-in/first-out (FIFO) order in an attempt to locate a connection request which it can satisfy. Once a connection request is picked, the server attempts to form a connection to the destination specified in the registration request. Figure 1-4 depicts print job processing.



**Figure 1-4. Print Job Processing.**



The software provides support for queued connection requests. The following list summarizes the events that occur when a host initiates a connection request with a service offered at a server:

- For LAT connections, the host sends a multicast message asking all servers (service nodes in LAT terminology) which offer the particular service to respond. The host then waits for the servers offering the desired service to respond. The responses also indicate the Ethernet addresses of the servers.
- The host chooses one of the responding servers and sends a registration message to that server. This registration message informs the server which service is of interest and the destination the server should attempt to connect back to. The server can reject or accept the registration request. If the registration is accepted, the server places a connection request in a connect-back queue.
- The server will send status messages to each requestor in the connect-back queue on a periodic basis. These messages inform the requestor of the status of the connection request in the connect-back queue.
- For LAT local services, when more than one port offers the same local service, the server will choose the next-highest numbered available port in the *port-list* each time a connection is made, rather than continuously using the first available port in the *port-list*. (This continues in "round robin" fashion, i.e., when the highest-numbered port offering the service is reached, the server next chooses the lowest numbered port.) This has the effect of balancing the service load among all available ports where the local service is offered.

- For LAT and TCP/IP connections, the server provides support for the maintenance of the connect-back queue. This includes the removal of entries in response to commands issued locally on the server or in response to commands received from the network.

Servers may also register with a LAT service node for connect-back. If a server attempts to connect to a service that is busy, it may take the same steps to register with the service node as described above. The service node must have QUEUING ENABLED for the specified service in order for it to accept registration requests. Print servers must have the QUEUING port characteristic ENABLED in order for it to attempt to register with a service node. The service node may reject a registration request if QUEUING has been DISABLED for the service specified or if the connect-back queue is full. When the service node dequeues a connect-back request, it attempts to form a connection to the destination specified in the registration request. If the connection attempt fails, the service node will discard the registration request. It is up to the registrant to re-register the connect-back request.

The following are additional considerations related to the connection queue:

- It is possible to issue connection requests faster than the server can satisfy these requests. Such requests are discarded. You can determine if connection requests are being discarded by viewing the SHOW SERVER COUNTERS display, and checking the "Solicitations Accepted" and "Solicitations Rejected" fields.
- If the size of the connection queue is reduced during server operation with the SET SERVER QUEUE LIMIT command, and the new queue size is less than the number of entries currently in the queue, no entries are deleted. However, the server will not accept new entries until the number of entries currently in the connection queue falls below the new queue size.
- Authorized group codes are not checked when a request is placed in the connection queue. If the requester is not authorized to access a particular local service, a rejection message is not returned until the connection is attempted.
- The connection queue is non-blocking. All entries in the queue are checked for servicing, even if the top entry cannot be serviced.

## Chapter 2

# Basic Set-Up Activities for Printer Serving

There are many activities that you may need to perform before you configure any printer serving feature. This chapter covers these activities and includes the following information:

- An Overview to Setting Up the Printer Server.
- Selecting Protocols and Features.
- Configure Port Characteristics
- Setting Up Queues

---

### An Overview to Setting Up the Printer Server

#### Preliminary Activities

Certain basic server set-up activities are not covered in this guide. You must, however, perform these activities before you proceed to set-up printer serving features. These basic activities include:

1. **Install server hardware and connect devices to the ports.** The *MAXserver Hardware Installation and Maintenance Guides*, *Hardware Installation and Maintenance Notes*, *Network 9000 Getting Started Guide* or *Product Release Notes* supplied with server cards or stand-alone units cover various aspects of this activity.
2. **Install server software at a load server.** You can install the software on a VAX host, a UNIX host, or a Xyplex loader. The *Software Installation Guides* supplied with your software kit contains the procedures to do this. The *Software Kit Information* supplied with your software kit will contain a list of load images.
3. **Initialize the unit.** Press the Reset button on the communication server to initialize it with the load image. The *Getting Started Guide*, *Hardware Installation and Maintenance Guides*, *Hardware Installation and Maintenance Notes*, or *Product Release Notes* supplied with the hardware explains how to do this.

4. **Assign basic server Internet characteristics if you are using the Internet protocol.** Refer to the *Software Management Guide* for more information about these characteristics. LAT-only or IPX-only (XPRINTER) units do not need an Internet address. The Internet characteristics you need to specify include the following:
  - The Internet address and subnet mask for the communication server.
  - The characteristics associated with a Domain Name Server.
  - Other characteristics which allow the communication server to communicate through Internet gateways, if needed.
5. **Specify which protocols and features will be available.** Some protocols and features are not enabled by default, and you must enable them if you wish to use them. Also, some protocols require a password to enable.
6. **Initialize the communication server when you have enabled features and protocols** This allows all of the changes that you have made to take effect. Use the INITIALIZE command or press the reset switch again to do this.
7. **Configure specific printer serving features.** The remaining chapters of this guide describe the detailed configuration activities for individual printer serving features. Chapters 3 through 6 cover these activities.

## Selecting Protocols and Features

The access server software offers many protocols and features. Which ones you use depend on the type of network you have and the amount of memory in the communication server. Most sites do not require all possible features and protocols. In general, if a protocol is not needed, you should disable it to make more memory available for other uses. The chapter on Managing Memory Resources in the *Software Management Guide*, explains more about selecting the appropriate features and protocols for your site.

Table 2-1 lists the printer serving software protocols that you can enable or disable, as well as the amount of memory that will be used or freed up. Table 2-1 only lists the printer serving protocols that one can enable or disable. A complete list of protocols and features can be found in Chapter 2 of the *Software Management Guide*.

**Table 2-1. Memory Usage For Features and Protocols.**

Protocol/Feature Name	Memory Used in Kilobytes	Type	Default
XPRINTER	18.5, plus 2 additional per port	Protocol	Disabled, except on MAXserver 1400A/1450 units
LPD	16	Daemon	Disabled

To enable or disable the XPRINTER protocol, use the command:

```
Xyplex>> define server protocol xprinter enabled
```

The server will indicate how much memory remains available for other server uses with a message that is similar to the following:

```
-705- Change leaves approximately nnnnn bytes free.
```

It is strongly recommended that you leave a minimum of 180 kilobytes of memory after all desired features have been enabled. If the memory needed for the desired features exceeds the amount of memory available on the unit, the server will display a message similar to the following message, to indicate approximately how much memory you need to free up in order to enable the feature:

```
-708- Requires approximately nnnnn additional bytes; Change not done.
```

Initialize the server after you have made all changes. When a protocol is enabled, the software sets all server or port characteristics associated with that protocol, meaning those characteristics set with DEFINE/SET SERVER and DEFINE/SET PORT commands, to their default values. When a protocol is disabled, the software changes all server or port characteristics associated with that protocol to reflect this.

To enable the lpd daemon, use the following command:

```
Xyplex>> define server daemon lpd enabled
```

The server responds with a message similar to:

```
-705- Change leaves approximately nnnnn bytes free.
```

Initialize the terminal server after you issue this command, so that the change takes effect.

## Configure PORT Characteristics

You must specify the type of access allowed to the port, and configure the server port so that its characteristics match those of the device (serial or parallel printer, etc) to which it is connected. Server port characteristics are set with SET/DEFINE PORT commands. For most devices, nearly all of the PORT characteristics can be left at their default settings, but the following paragraphs list the PORT characteristics that you may need to change.

The basic steps for setting up shared printer port characteristics include:

- Printers need to have ports configured with either REMOTE or DYNAMIC access. If you want the port to be able to accept connections (for example, a laser printer or a standard dot-matrix printer, etc) , but not originate them, use a command such as:

```
DEFINE PORT port-list ACCESS REMOTE
```

If you want the port to be able to both originate and accept connections (for example, for a hardcopy terminal that can act as both a printer and a terminal), use a command such as:

```
DEFINE PORT port-list ACCESS DYNAMIC
```

- Ports configured with the PORT ACCESS characteristic set to REMOTE or DYNAMIC should also have the PORT AUTOBAUD characteristic set to DISABLED, and the SPEED, PARITY, and CHARACTER SIZE characteristics set appropriately for the device. If a local service is available at several ports (for example, a modem pool or more than one of the same model of printer), you must set the appropriate port characteristics for all the ports offering the local service. To set these characteristics, use commands similar to:

```
DEFINE PORT port-list AUTOBAUD DISABLED
DEFINE PORT port-list SPEED baud-rate
DEFINE PORT port-list PARITY parity
DEFINE PORT port-list CHARACTER SIZE character-size
```

## Setting Up Queues

This section describes some basic considerations about queue setup.

- For LAT local services, you must use SET/DEFINE SERVICE commands to specify service characteristics, as well as the SET/DEFINE PORT commands to specify appropriate port characteristics. For example, to define a printer service named PRINT, at port 1 of the server, you would use a command such as:

```
Xyplex>> define service print port 1 connections
enabled
```

You could also assign an identification message for server displays, using the IDENTIFICATION characteristic.

- Queuing is supported on all local services. Two commands affect queuing operations:

```
DEFINE SERVICE service-name QUEUE ENABLED
```

This command applies only to LAT local services, and enables or disables queuing for these services.

```
DEFINE SERVER QUEUE LIMIT queue-size
```

This command applies to LAT, lpd, XPRINTER, or other TCP/IP queued connections. This command sets the maximum number of entries for the entire server. Setting the *queue-size* to zero (0) essentially disables queuing.

The only requirement that applies to queued remote access connections is that the service must not be password protected with the SERVICE PASSWORD characteristic. Note that while queuing is also supported for host requests made to *port-numbers* or *port-names*, rather than *service-names*, using *service-names* is generally more convenient and gives you greater control over access to the service. For example, if a service is password protected, the only way for a host to bypass the protection is to connect directly to the port.



- To define TCP/IP local services, you assign a Telnet remote port number which is only used at the ports which offer that service. For example, if two ports on the same server offer the same TCP/IP local service (such a two of the same printer model, or a bank of dial-out modems), you would assign the same Telnet remote port number at both ports. Users, including UNIX printer daemons, then connect to that service through the TCP/IP port which matches the Telnet remote port number. To assign a Telnet remote port number, use a command similar to:

```
Xyplex>> define port 8 telnet remote port 3600
```

- There are a number of commands available for managing the connection queue. For example, you can obtain a list of current connection queue requests with a SHOW QUEUE command. The display can be further limited to connection requests made to a specific port or service, or requests made from a specific node.

You can remove specific entries in the queue with the REMOVE QUEUE ENTRY command. Alternatively, you can disable the entire queue for a specific service can be using a command such as:

```
SET SERVICE service-name QUEUE DISABLED
```

Note that if the queue is disabled for a specific *service-name*, connection requests that are made to a *port-number*, rather than the *service-name*, are still placed in the connection queue.

The following are some additional considerations related to remote connections:

- Connections can be made by specifying a server *node-name*, *service-name*, or *port-name*, or all of these.
- Hosts cannot connect to services that are password protected. However, a host can connect directly to the *port-name*, which is never password protected.
- The *node-name* used in the remote connection request must match the server name specified by the DEFINE/SET SERVER NAME command. This name is not necessarily the same as the DECnet node name for the server.

## Chapter 3

# Setting Up Printers Using the lpd Daemon

Standard UNIX operating systems typically provide a method for configuring remote printers through lpd. AT&T System V UNIX and BSD UNIX implementations use different procedures, and some UNIX implementations do not support the use of remote printers. If your UNIX host does not support the use of remote printers, you will need to use the `csporstd` daemon to configure shared printing from UNIX.

This chapter covers:

- Setting up lpd shared printers
- Operating and managing lpd printers and print queues

## Setting Up lpd Shared Printers

For UNIX implementations which support the use of remote printers, the process of configuring an lpd printer at a terminal/printer server is fairly straight-forward. The basic steps for setting up lpd devices when using a remote printer (i.e., a printer connected to a terminal/printer server port) are:

1. Enable the lpd daemon. This is covered in Chapter 2.
2. Set port characteristics to support shared printer connections. This is covered in Chapter 2.
3. Set up server queues for lpd. This is covered in this chapter.
4. Configuring the lpd printer at the UNIX host. This is covered in this chapter.

You need to do this for each printer, and you can use this procedure to add printers at any time.

## Setting up queues for lpd

This section describes some basic considerations about queue setup for lpd printing.

- Define an lpd queue at the server and assign it to one or more ports. The queue-name that you assign at the server is also the name of the remote printer at the UNIX host. For example, the following command creates an lpd queue called "LinePrinter" and assigns it to ports 2 through 5:

```
Xyplex>> DEFINE SERVER LPD QUEUE "LinePrinter" PORT 2-5  
ENABLED
```

The lpd *queue-name* ("LinePrinter" in this example) is case sensitive. You can offer the same *queue-name* at more than one port. When the same *queue-name* is offered at more than one port, when lpd jobs are queued, they are serviced by the next available port on a first-in, first-out basis. You can also have one port service more than one lpd queue-name (as well as LAT, XPRINTER, or other TCP/IP queues).

- If it has not already been done, enable queuing for the server with a command such as:

```
Xyplex>> DEFINE SERVER QUEUE LIMIT queue-size
```

This command applies to LAT, lpd, XPRINTER, or other TCP/IP queued connections. This command sets the maximum number of entries for the entire server. Setting the *queue-size* to zero (0) effectively disables queuing.

## Configuring the lpd Printer at the UNIX Host

In the procedures which follow, it is assumed that you are familiar with contents of the UNIX documentation for your UNIX host. For example, for BSD 4.3, you need to be familiar with the Line Printer Spooler Manual, including the organization of the printer definition file, `/etc/printcap(5)`.

### Setting up Berkeley (BSD) UNIX lpd printers

You must do a small amount of planning prior to setting up an lpd printer on a terminal or printer server. The main considerations are these: what will be the name by which users will know the printer, and whether or not each print job is to be processed through an output filter program (for example, to add a banner page or to do some other job processing which the terminal or printer server cannot process, since the server cannot process lpd control files associated with a print job).

Also, for Berkeley UNIX systems, the remote machine to which a print job is directed must be specified using a domain-name. The host must be able to obtain the internet-address which corresponds to the domain-name, either by looking in a local host table (`/etc/hosts`) or by using a Domain Name Server (NIS, DNS, etc). The server must also be configured with an internet-address (refer to Chapter 2 of the *Software Management Guide* for setting this up.)

When using NIS, or any other name server, you generally have one host configured to be the name server for the entire network. You add names only on that host. NIS has a set of utilities for updating its database. (Read the MAN page about your name server for more information.)

When using a local host table, the entry consists of the domain-name and matching internet-address. For example, if the remote machine is named "print-server" and has the internet-address of 192.12.119.18, the entry in the `/etc/hosts` file would look like:

```
192.12.119.18 print-server
```

In this example, "print-server" would be included in the `/etc/printcap` file as the name of the remote machine (the `:rm=` entry in the `/etc/printcap` file).

### **Checklist of necessary information**

- the name of the printer for users
- the domain-name of the remote machine (i.e., the terminal or printer server)
- the remote printer-name (which is actually an lpd queue that you set up on the server )
- (optional) the name and contents of an output filter file

### **Setting up a basic printer**

To set up a basic printer which prints simple data files with no banner page or processing by an output filter:

Add an entry in the `/etc/printcap` file for each printer connected to a Xyplex terminal or printer server. All you need to specify is the printer device name (what the user will know the printer as), the remote machine name (domain-name of the terminal or printer server), a remote printer name, the spool directory and error log file.

For example, for an lpd printer on a terminal or printer server which the user knows by the name "line-printer," you could use your favorite text editor to add a simple printcap entry such as:

```
line-printer:Line Printer on Xyplex server:\
:rm=printer-server:\
:rp=print-queue1:\
:sd=/usr/spool/printer:\
:lf=/usr/adm/lpd-errs:\
```

In this example, "printer-server" is the domain-name by which the UNIX host knows the terminal or printer server and "print-queue1" is the name of an lpd queue on the terminal or printer server. (Creating the lpd queue is described in the "Setting up queues for lpd" section earlier in this chapter.) The remaining items in the printcap entry designate a spool directory and error log file. Be careful to observe the syntax rules for entries in the `/etc/printcap` file. Each line must end with `:\`. Each line, except the first must begin with a colon character (`:`).

This new printer will be available after you start the printer using the `lpc` command, as described in the "Operating and Managing lpd printer and print queue" section of this chapter.

### Setting up a printer which uses an output filter

To set up a printer which prints files after first processing them through an output filter, you must add two entries to the `/etc/printcap` file. The first entry is for a "pseudo-printer," which causes the UNIX host to process the print job according to whatever is required by the output filter, and then passes the processed print job to the lpd printer defined in the second entry, which contains information about the actual printer on the terminal or printer server.

To set up this type of printer at a BSD UNIX host:

- a. Use a text editor to create a "pseudo-printer" entry in the `/etc/printcap` file for each printer connected to a Xyplex terminal or printer server. For this entry, you need to specify the printer device name (what users will know the printer as), a local printer name (which will always be `/dev/null`) the spool directory, error log file, and output filter file name.

For example, for an lpd printer on a terminal or printer server which the user knows by the name "line-printer2," you would add a printcap entry such as:

```
line-printer2:Printer on Xyplex server:\
:lp=/dev/null:\
:sd=/usr/spool/printer:\
:lf=/usr/adm/lpd-errs:\
:of=/usr/adm/filter:
```

In this example, `/usr/adm/filter` is the directory path and name of an output filter file. Be careful to observe the syntax rules for entries in the `/etc/printcap` file. Each line must end with `:\`. Each line, except the first must begin with a colon character (`:`).

- b. Create another entry in the `/etc/printcap` file for each printer connected to a Xyplex terminal or printer server.

For example, for an lpd printer on a terminal or printer server which the output filter knows by the name "remote-printer," you would add a printcap entry such as:

```
remote-printer:Printer on Xyplex server:\
:rm=printer-server:\
:rp=print-queue2:\
:sd=/usr/spool/printer:\
:lf=/usr/adm/lpd-errs:
```

In this example, "printer-server" is the domain-name by which the UNIX host knows the terminal or printer server and "print-queue2" is the name of an lpd queue on the terminal or printer server. (Creating the lpd queue is described in the "Setting up queues for lpd" section earlier in this chapter.) The remaining items in the printcap entry designate a spool directory and error log file.

- c. The output filter can be used to do whatever job processing is required by the system administrator. Typically, it is a simple shell script file which reads data from stdin, processes it appropriately, writes the processed data to a temporary file, passes the temporary file to lpd to be printed at the remote printer (the printer at the terminal or printer server), and then cleans up the temporary file.

The following is an example of a basic output filter. In this case, it is a Bourne shell script which copies data to the printer (which gives you a banner page).

```
#!/bin/sh
cat - | lpr -Premote-printer
```

This new printer will be available after you start the printer using the `lpc` command, as described in the "Operating and Managing lpd printer and print queue" section of this chapter.

## Setting up AT&T System V UNIX lpd printers

Not all AT&T System V UNIX hosts can use remote printing. You will need to refer to the documentation supplied with the operating system to determine if you can configure the host to use remote printing. You will also need to check the information about how to configure a remote printer, since the method differs for each variation of System V UNIX.

As with BSD UNIX operating systems, you must do a small amount of planning prior to setting up an lpd printer on a terminal or printer server. You will need to have the following information available to you when you configure the remote printer.

- The name of the printer for users.
- The domain-name of the remote terminal or printer server.
- The remote printer name, which is an lpd queue that you set up on the server.

The remainder of this section contains a brief example of how one configures a remote printer for the SunOS V5.1 (Solaris V2.1) version of the AT&T System V UNIX operating system:

### Setting up a SunOS V5.1 (Solaris V2.1) remote printer

To set up this type of printer:

- a. Run the Administration Tool as superuser. Use the command:  
  

```
# $admintool
```
- b. Select, or click on, the "Printer Manager" icon.
- c. From the menu bar, select the Edit menu. Choose the "Add Printer" sub-menu item. From this sub-menu, choose the "Add Access to Remote Printer..." item.



- d. The Administration Tool gives you a form to complete. The form is similar to:

<p><b>Printer Client:</b></p> <p><b>Printer Name:</b></p> <p><b>Printer Server:</b></p> <p><b>Comment:</b></p> <p><b>Printer Server OS:</b></p> <p><b>System Default:</b></p>
---

The items in the form describe the lpd printer. Specify the local lpd queue name for the "Printer Client:" item. This is the name by which users will know the printer. For the "Printer Name" item, specify the name of an lpd queue on the terminal or printer server. (Creating the lpd queue is described in the "Setting up queues for lpd" section earlier in this chapter.). Specify the domain-name of the terminal or printer server for the "Printer Server:" item. You can include an optional comment if you want to. Type BSD for the "Printer Server OS:" item. If you want the printer to be the default printer for the host, type YES for the "System Default:" item, otherwise say NO. A completed form might look like:

<p><b>Printer Client:</b> line-printer1</p> <p><b>Printer Name:</b> print-queue1</p> <p><b>Printer Server:</b> printer-server</p> <p><b>Comment:</b> Printer on Xyplex server</p> <p><b>Printer Server OS:</b> BSD</p> <p><b>System Default:</b> NO</p>
---

Exit from the Administration Tool.

Remote printer set-up is now complete.

## Setting up AIX lpd printer

AIX provides two ways to configure remote lpd printers. One method is to edit an ASCII text file, similar to the `/etc/printcap` file for BSD UNIX. The other is to run the System Management Interface Tool (smit) and complete a form. For both methods, the planning considerations are similar to those for BSD UNIX. This section contains a brief example of how one configures a remote printer for the AIX operating system using smit. To set up this type of printer, do the following:

- a. Run the System Management Interface Tool (as superuser). Use the command:

```
# $smit
```

- b. Select (click on) the following buttons:

- Devices
- Printer/Plotter
- Manage Remote Printer Subsystem
- Client Services
- Remote Printer Queues
- Add a Remote Queue

c. The smit tool gives you a form to complete. The form is similar to:

```
* NAME of queue to add
* ACTIVATE the queue?
  Will this become the DEFAULT queue?
  Queueing DISCIPLINE
  ACCOUNTING FILE pathname
* DESTINATION HOST for remote jobs
* Pathname of the SHORT FORM FILTER for queue
  status output
* Pathname of the LONG FORM FILTER for queue
  status output
* Name of QUEUE on remote printer
* NAME of device to add
* BACKEND PROGRAM pathname
```

The items in the form describe the lpd printer. Specify the local lpd queue name for the "NAME of queue to add" item. This is the name by which users will know the printer. Specify the domain-name of the terminal or printer server for the "DESTINATION HOST for remote jobs" item. For the "Name of QUEUE on remote printer" item, specify the name of an lpd queue on the terminal or printer server. (Creating the lpd queue is described in the "Setting up queues for lpd" section earlier in this chapter.). Fill out the remaining items with whatever values are appropriate to your AIX host. A completed form might look like:

```
* NAME of queue to add                line-printer1
* ACTIVATE the queue?                yes
  Will this become the DEFAULT queue? no
  Queueing DISCIPLINE                first come first serve
  ACCOUNTING FILE pathname
* DESTINATION HOST for remote jobs    printer-server
* Pathname of the SHORT FORM FILTER for queue /usr/lpd/aixshort
  status output
* Pathname of the LONG FORM FILTER for queue /usr/lpd/aixlong
  status output
* Name of QUEUE on remote printer    print-queue-1
* NAME of device to add              print-device
* BACKEND PROGRAM pathname           /usr/lpd/rembak
```

Exit from the smit tool.

Remote printer set-up is now complete.

## Operating and managing lpd printer and print queue

There are a number of commands available for managing lpd print jobs in the server connection queue from the host. For example, the Berkeley UNIX system uses lpr, lpc, lprm, and lpq commands to make print requests, queries or changes. The AT&T System V UNIX uses lpstat, enable, and disable commands for these functions. For a complete description, refer to the documentation supplied with your UNIX system. The examples shown below are specific to BSD 4.3.

At a UNIX host, use the lpc (8) command to enable printing and start a spooling daemon for the printer. For example to start a printer queue named "lp" use the command:

```
#lpc start lp
```

Use the lpr (1) command to request the lpd daemon to print the named file when the printer facilities become available. For example:

```
%lpr monthly.report
```

The UNIX like interface provides the lpc, lpq, and lprm commands to manage an lpd queue. There are also DECserver like commands which can be used to manage an lpd queue. The following table summarizes these ULI commands and their approximate DLI equivalents.

ULI command	DLI Equivalent
lpc     ? help [ <i>command</i> ]	HELP [ <i>command</i> ]
abort <i>printer</i>	CLEAR SERVICE <i>service-name</i>
clean <i>printer</i>	REMOVE QUEUE SERVICE <i>service-name</i>
create <i>printer</i> [-p <i>ports</i> ][ <i>args</i> ]	DEFINE SERVICE <i>service-name</i> [ <i>options</i> ]
delete <i>printer</i>	PURGE SERVICE <i>service-name</i>
disable <i>printer</i>	DEFINE SERVER LPD <i>printer</i> DISABLED
enable <i>printer</i>	DEFINE SERVER LPD <i>printer</i> ENABLED
status <i>printer</i>	SHOW QUEUE or SHOW SERVICE LOCAL
lprm    [-P <i>printer</i> ][ <i>job#</i> ]	REMOVE QUEUE ENTRY <i>entry-number</i>
lpq     [-P <i>printer</i> ][ <i>job#</i> ]	SHOW QUEUE

## Chapter 4

# Installing and Using the csportd Daemon

This chapter covers configuration of csportd, which is a host-based daemon. The csportd daemon comes with an installation script and a MAN page. The utility must be copied from a UNIX media kit, then installed using the installation script. csportd can be installed on any UNIX host running BSD and AT&T System V UNIX operating systems, and has also been tested on hosts running the AIX, MIPS, HP/UX, and ULTRIX operating systems.

This chapter covers:

- Running the installation script
- csportd options
- Communication server port setup considerations
- Example applications
- Example installation script

Throughout this chapter, it is assumed that you are familiar with the C compiler, libraries, and the general directory structure in use at your UNIX host.

## Running the installation script

The installation script, MAN page, and C source code file for the csportd daemon are provided on the distribution media in a tar archive named host.tar. Use the following procedure to install these items on your UNIX System:

- a. Log on to your UNIX host. You must log on as root in order to install the Host Utilities package contained in the host.tar archive (any user can build the utilities using the installation script).
- b. Load the distribution tape or diskette into a drive, then copy the host.tar archive to the UNIX system. You can copy the archive to any directory that you want using a "tar" command of the form:

```
% tar xvf /dev/ (your tape drive name) host.tar
```

NOTE: For nine-track tapes, make sure that you use the correct tape-drive-device-name to match the format (QIC11 or QIC24) of the tape.

For example, on Sun Workstations to extract the host.tar archive from a QIC24 tape, use the command:

```
% tar xvf /dev/rst8 host.tar
```

- c. Unpack the host.tar archive, using a "tar" command of the form:

```
% tar xvf host.tar
```

You can delete the host.tar archive when you have completed extracting the files from it.

The tar utility automatically copies files and subdirectories from the host.tar archive into the appropriate directories. For example, the csportd C source file (csportd.c) and "make" file (Makefile) are copied into a subdirectory of src/ called src/csportd. MAN pages are installed in man/cat/ and man/src/ directories. (You will have an opportunity to change the location of these items later when you run the installation script.)

You should examine the text document "ReadMe" which contains some simple installation instructions, warnings, a list of known problems, information about new host types that may be supported, as well as other up-to-date information about the Install script or the csportd daemon.

- d. Run the csportd installation script with the command:

```
% Install
```

The Install script is a Bourne shell script. For supported host types, the script automatically determines the host type, looks for libraries and installs software into default locations. An example of using the Install script is included at the end of this chapter. You should look at this example in order to understand the typical installation process, and to help you to prepare to answer questions asked by the script.

During script execution, you will be asked questions that allow you to optimize the installation or compilation of the source file. These questions vary depending on your actual UNIX implementation, the C compiler and libraries that you are using, and the directory structure that has been established on the host. However, each question will contain a default choice in brackets. To accept the default choice, simply press the RETURN key. To use a different choice, type in the choice and then press the RETURN key. For example, the first question you will usually be asked is:

```
Where do you want the executables installed (~name ok)?  
[/usr/local/bin]
```

If you want the compiled csportd daemon to be installed in /usr/local/bin, simply press the RETURN key and the script will continue. If you want a different choice, specify your choice and press the RETURN key. For some of the questions (for example, the question shown above), you will be told that you can use the "~name" construct. This means that you can direct the script to use the default login directory belonging to the user specified by ~name. For example, if you specified ~gsmith, the executable image would be installed in the login directory belonging to user gsmith.

At any time during while running the installation script, if you are unable to answer a question, you can use a ! command to escape from the shell and execute a command or start a subshell. This could be used, for example, to obtain the names of libraries, or ascertain the correct directory where some item is located, or if necessary to edit the Install script or other files.

During script execution, you will also be shown informational messages about the installation process and asked:

```
[Type carriage return to continue]
```

This message typically follows some informational text. Read the text and press the RETURN key when you are ready to proceed.

- e. You will see the message "Install Done," when the csportd installation script has completed. You should examine the output of the procedure contained in the file "Install.out," to make sure that the proper libraries and directories were used and that the installation was completed correctly, or to understand what errors occurred in the event that the installation was not completed correctly.

The output of the installation process is an executable csportd image.

### csportd command and options

To use the csportd daemon, use a command in the form:

```
% csportd [options] address port-number
```

where:

- |                    |  |
|--------------------|--|
| <i>options</i>     | control the operation of the csportd daemon. A complete list of options is given in the UNIX MAN page supplied with csportd. All options begin with a dash character (-) and are case-sensitive. |
| <i>address</i>     | is the domain-name or internet-address of the terminal server or printer server to which the data will be sent or from which it will be received.  |
| <i>port-number</i> | is the physical number of the port with which the connection is made.  |

### Communication server port setup considerations

Follow the steps listed in the "Configure PORT Characteristics" section in Chapter 2 to specify the type of access allowed to the port, and configuring the port so that its characteristics match those of the device (terminal, serial or parallel printer, etc) to which it is connected.



## Example applications

This section will describe the following basic applications for csportd:

1. Send data from standard input (stdin) directly to the communication server port.
2. Process data through the UNIX pseudo-terminal (pty) mechanism.
3. Process data through a named pipe (FIFO).

Refer to the examples in the csportd MAN page supplied with for other examples of how one might use csportd and csportd options.

1. Send data from standard input (stdin) directly to the communication server port. In this application, you would use the cat utility to send a file to the csportd daemon. The csportd portion of the command would not use a -T or -P option. The basic command would be:

```
% cat file-name | csportd [options] address port-number
```

For example, use the following command to send a file named "report.txt" to port 5 of a communication server which has a *domain-name* "ts720.xyplex.com":

```
% cat report.txt | csportd ts720.xyplex.com 5
```

You could also use an *internet-address* instead of a *domain-name*, and you can use options, such as the -d, -e, -g, -w, -x, and -L options.

2. Process data through the UNIX pseudo-terminal (pty) mechanism. In this application, you would create a link to a PTY device using the csportd -T option. A user could then use the cat utility to send a file to the port using this device. The first step would be to create the pty device. For this you would use a csportd command of the form:

```
% csportd -Tpty-device [options] address port-number
```

For example, use the following command to create a pty-device named "modem1" in the /dev directory which maps to port 15 of a communication server which has the internet address 140.179.151.221:

```
% csportd -T/dev/modem1 140.179.151.221 15
```

The cspord command automatically allocates either the default pty devices, or when the -c option is used the command allocates the pty devices you specify in the configuration file. You could also use a *domain-name* instead of an *internet-address*, and you can include options, which are described in the cspord MAN page.

When users want to send files to this port, they can simply cat the file to /dev/modem1. For example, to send the file report.txt, the user would issue the command:

```
% cat report.txt > /dev/modem1
```

3. Process data through a named pipe (FIFO). In this application, you would create a named pipe using the cspord -P option. A user could then use the cat utility to send a file to the pipe. The first step would be to create the named pipe. For this you would use a cspord command of the form:

```
% cspord -Ppipe-name [options] address port-number
```

For example, use the following command to create a *pipe-name* named "/usr/spool/port15" which maps to port 15 of a communication server which has a *domain-name* "ts720.xyplex.com":

```
% cspord -P/usr/spool/port15 ts720.xyplex.com 15
```

This command automatically creates the file /usr/spool/port15. You could also use a *domain-name* instead of an *internet-address*, and you can include options, such as the -d, -g, -t, -w, -x, and -L options.

When users want to send files to this port, they can simply cat the file to the pipe. For example, to send the file report.txt, the user would issue the command:

```
% cat report.txt > /usr/spool/port15
```

### Example cspord installation script

The following four pages show the actual output of the Install script. The host system used was a BSD UNIX host. Your output will be different, and depends on the host system.

## Chapter 5

# Configuring Print Services for Novell Users

Printer servers maintain a database of permanent and operational (current) configuration data in local storage (non-volatile RAM). The configuration data include parameters, or characteristics, which allow the unit to communicate on a Novell NetWare network. You can configure these parameters either with standard Xyplex TCP/IP-LAT software commands or with the XPRINTER Setup Dialog (only on MAXserver 1400A and 1450 Printer Servers). This chapter describes how you configure Novell NetWare-related characteristics at the server, as well as at the Novell printer server.

- Using Commands to Configure Novell Printing
- Using the XPRINTER Setup Dialog to Configure Novell Printer Services
- Novell Server Configuration

After you have enabled the XPRINTER protocol, you must set up other XPRINTER related server and port characteristics. This can be done using the XPRINTER Setup Dialog (only on MAXserver 1400A and 1450 Printer Servers) or via commands. After you have completed these activities, you will need to perform configuration activities at the Novell printer servers. You will need to configure the RPRINTER utility so that the Novell printer servers communicate with the terminal server or printer server. The complete list of tasks to perform are the following:

Task	Procedure
Configure terminal server or printer server to support IPX printing.	Use the XPRINTER SETUP Dialog (only on MAXserver 1400A and 1450 Printer Servers ) or commands to create a local printer
Configure Novell printer server to be able to communicate with the Xyplex unit	

XPRINTER is available on the following unit types:

- MAXserver 1450 and 1400A Printer Servers
- Network 9000 Terminal Server 720
- MAXserver 1600/1620/1640
- MAXserver 1120/1520/1820
- MAXserver 800
- MAXserver 2120, 2220

For all unit types except MAXserver 1450 and 1400A Printer Servers, the unit needs at least 2 megabytes of memory. The XPRINTER Setup Dialog is only available on MAXserver 1450 and 1400A Printer Servers. You must use the commands described in the next section to configure XPRINTER features for all other unit types.

## Using Commands to Configure Novell Printing

The access server software includes several commands which allow you to configure Novell support on a server port. The following is a list of these commands and their purpose. Some of the commands described in this section require you to be in "privileged mode."

### Setting IPX Protocol Packet Type

```
DEFINE SERVER IPX PROTOCOL ETHERNET
                                MAC
                                IEEE802_2
                                IEEE8023
                                IEEE8023_48
                                IEEE8023_10B
```

IPX is a protocol used by Novell NetWare. The Xyplex terminal server or printer server can accept any one of four packet types over an IPX Interface: Ethernet-type packets, IEEE802.2, IEEE 802.3 (MAC), or IEEE SNAP type packets. You can only use one of these types at a time on a server. Enabling one packet type will disable the other types. By factory default, the server is configured to use Ethernet-type packets for IPX. If you use the Setup Dialog, it will prompt you for this information, rather than require you to type in this command. You must make sure that the protocol type you set for the server matches the value set at your Novell file server. You must re-initialize the unit after making a change to the IPX packet type selection, for the change to take effect.

NOTE: The IEEE802\_2 and IEEE8023 options are only available with V5.3.1 and later versions.

### Configuring a Port to Support Novell Printing

```
SET/DEFINE XPRINTER printer-server printer-number PORT port-number
```

*printer-server* is the name of an Novell NetWare printer server, that you set up using the PCONSOLE utility.

*printer-number* is the number of a Novell NetWare printer that you set up at the Novell printer server (file server) using the Novell PCONSOLE utility. Novell NetWare allows you to specify up to 256 printers, numbered 0 through 255.

NOTE: Only V5.3.1 and later versions support 256 printers. For previous versions, the maximum number of printers is 16.

*port-number* is a terminal server or printer server port. Each port can be connected to only one Novell Printer Server.

### Viewing Available Novell Printer Servers

```
SHOW XPRINTER
```

```
Available Print Servers
ENGINEERING_PRINTER_SERVER
MANUFACTURING_PRINTER_SERVER
```

Figure 5-1. Example SHOW XPRINTER Display

### Viewing Status of XPRINTER Ports

```
SHOW
LIST XPRINTER PORTS      [port-list]
                          [ALL]
```

where *port-list* represents the server ports which have local XPRINTER services assigned to them. If you want to view the status of more than one port, you can specify the individual port-numbers separated by commas or specify a range of port-numbers separated by a hyphen, or a combination of both (do not include spaces). For example, the *port-list* 1,3-14 refers to the individual ports: 1, and 3 through 14. If you specify ALL, the display will show the status for all ports. Figure 5-2 is an example of what this display might look like, after a local XPRINTER service named "PRINTER" had been defined for port 3.

Port	Status	Print Server	Printer #	State
1	IDLE			
2	IDLE			
3	CONNECTED	PRINTER	3	
4	IDLE			

Figure 5-2. Example SHOW/LIST XPRINTER PORTS Display

### Terminating Xprinter Operation

```
CLEAR/PURGE XPRINTER PORTS [port-list][ALL]
```

where *port-list* represents the server ports which have local XPRINTER services assigned to them. This command disconnects the port in the *port-list* from the print servers to which they are connected. If you want to terminate Novell printing at more than one port, you can specify the individual port-numbers separated by commas or specify a range of port-numbers separated by a hyphen, or a combination of both (do not include spaces). For example, the *port-list*: 1,3-14 refers to the individual ports: 1, and 3 through 14. If you specify ALL, the server will terminate Novell client printing at all ports.

```
CLEAR/PURGE XPRINTER PSERVER printer-server
```

where *printer-server* represents the name of a Novell NetWare printer server that is serviced by the terminal or printer server. This command removes the print server from the list of active print servers that the server maintains. Note that once per minute, an active Novell print server broadcasts a message on to the network to indicate that it is "alive." This means that the server will re-learn the print server until you also unload it from the NetWare file server or print server workstation.

### Viewing IPX Protocol Packet Type Setting

```
LIST  
MONITOR  
SHOW SERVER CHARACTERISTICS
```

Figure 5-3 shows the SERVER CHARACTERISTICS display. The field which is highlighted shows the current setting of the IPX packet type.

### Clear a "Hung" Parallel Port

```
RESET PORT port-list
```

```
Xyplex> show server characteristics

MAXserver V5.3.1 Rom 410000 HW 00.00.00 Lat Protocol V5.1 Uptime:  0 01:30:25

Address:  08-00-87-00-85-D4   Name:   X0085D4           Number:    0

Identification:  Xyplex Terminal Server
Welcome:        Welcome to the Xyplex Terminal Server.

Circuit Timer:      80           Password Limit:      3
Console Port:       0           Queue Limit:         24
Inactivity Timer:   30           Retransmit Limit:    8
Keepalive Timer:    20           Session Limit:       8
Multicast Timer:    30           Software:            XPCS00S.SYS
Node Limit:         100          Identification Size:  63
Textpool Size:      8192         Timezone:            00:00
Accounting Entries:  0           Packet Count:        100
Nested Menu Size:   0           Menu Name:
Userdata Delay:     50          Xprinter Timeout:    80
IPX Protocol: Ethernet
Service Groups:     0

Enabled Characteristics:

Announcements, Broadcast, Dump, Lock, Parameter Polling
```

Figure 5-3. Example LIST/MONITOR/SHOW SERVER CHARACTERISTICS Display.



## Using the XPRINTER Setup Dialog to Configure Novell Printer Services

The Setup Dialog provides a simple method of configuring all the relevant server and port parameters so that the unit can accept print jobs from the network. The Dialog asks you to provide relevant configuration information by answering a series of questions, rather than having you type in commands. The next page shows an example of a typical Dialog session. Following the example Dialog, you will find the detailed procedures for running the Dialog to set up the server so that it can be used for Novell printing.

**Notes** The Setup Dialog is only available on MAXserver 1450 and 1400A Printer Servers.

If you make a mistake in answering any prompt or question in the Dialog, the Dialog will give you an opportunity to correct your mistake. If you make the same mistake 3 times, the Dialog will terminate.

Where possible, the Dialog changes both the "permanent" parameters for the unit, as well as the current "operational" parameters.

### Example Dialog

```
Xyplex> SETUP  
Password> SYSTEM    (not displayed)  
Use BREAK or Local Switch at any time to return to the Command Line  
Prompt.  
Press <RETURN> to Continue.
```

Assign an Internet Address to this unit? [Y]: **Y**

Note:

Please refer to the manual supplied with this unit for detailed information regarding these parameters.

```
This unit's Internet Address [0.0.0.0]:  
This unit's Subnet Mask [0.0.0.0]:  
(Optional) Primary Gateway Address [0.0.0.0]:  
IPX Protocol (Ethernet II, 802.2, SNAP, MAC (802.3 RAW))? [E]: MAC
```

Save, Edit or Cancel [Cancel]: **S**

Add or Modify Local TCP/IP print capability? [Y]: **N**

Add or Modify a Local LAT Service? [Y]: **N**

Add or Modify Local XPRINTER print capability? [Y]: **Y**

Port	State	Print Server	Printer #	Status
1	IDLE			
2	IDLE			
3	IDLE			
4	IDLE			

Select a Port to be assigned to a print server:

```
Local Port to print to: 4  
Print Server Name: PRINT  
Xyplex -911- Warning: Print Server PRINT is not currently available.  
Print Server Printer Number: 4
```

Save, Edit or Cancel [Cancel]: **S**

Add or Modify Local XPRINTER print capability? [Y]: **N**

Setup Complete

## Running the Setup Dialog

- a. Log on to a port (serial port or the console port).
- b. From the Xyplex prompt, type the following command:

```
Xyplex> SETUP
```

The Setup Dialog will respond with the privileged Password prompt. (You do not see this prompt if the port is already in privileged mode.)

```
Password>
```

Type the privileged password for the unit (if applicable; the factory default is the word SYSTEM), and press the RETURN (or ENTER) key. Note that the port does not display the password as you type it. The Dialog will display the following prompt:

```
Use BREAK or Local Switch at any time to return to the Command Line Prompt.
```

```
Press <RETURN> to Continue
```

To continue with the procedure, press the RETURN (or ENTER) key. To leave the Setup Dialog, you can press the BREAK key on your keyboard (if your terminal has one). If you had defined a "local switch" character (using other commands), you can also use this character to leave the Setup Dialog. If you leave the Setup Dialog, the software returns you to the Xyplex prompt.

- c. The Dialog begins this procedure by asking:

```
Assign an Internet Address to this unit? [Y]:
```

If you type N (No), and press the RETURN or ENTER key the Dialog will continue go to step g. Answer this question Y (Yes) and press the RETURN or ENTER key. The Dialog will continue by displaying the following note:

Note:

Please refer to the manual supplied with this unit for detailed information regarding these parameters.

- d. The Dialog asks:

This unit's Internet Address [0.0.0.0]:

Press the RETURN or ENTER key.

- e. The Dialog asks:

This unit's Subnet Mask [255.255.0.0]:

Press the RETURN or ENTER key.

- f. The Dialog asks:

(Optional) Primary Gateway Address [0.0.0.0]:

Press the RETURN or ENTER key.

- g. The Dialog asks:

IPX Protocol (Ethernet II, 802.2, SNAP, MAC (802.3 RAW))? [E]:

IPX is a protocol used by Novell NetWare. The MAXserver 1400A/1450 Printer Server can accept four packet types over an IPX Interface: Ethernet-type packets, IEEE 802.3 (MAC), IEEE 802.2, and IEEE SNAP type packets. You can only use one of these types on a given network. Enabling one protocol type disables the other three. By factory default, the MAXserver 1400A/1450 is configured to use Ethernet-type packets for IPX.

You will need to decide which packet type to use. Type the appropriate packet type and press the RETURN or ENTER key.

If you enable an additional protocol (using the DEFINE SERVER IPX PROTOCOL command), the MAXserver 1400A/1450 will use only Ethernet-type packets (IEEE 802.3).

- h. The Dialog asks:

Save, Edit or Cancel [Cancel]:

If you are satisfied with the choices you have made for the Dialog questions and prompts, type S (Save) and press the RETURN or ENTER key. If you made a mistake, or you want to change your mind about something, type E (Edit) and press the RETURN or ENTER key. The Setup Dialog will repeat the questions in this procedure, allowing you to correct any mistakes. If you decide that you do not want to configure the basic Internet characteristics, type C (Cancel) and press the RETURN or ENTER key.

- i. The Dialog asks (this question is only asked if you selected the Cancel option in the previous question):

Assign an Internet Address to this unit? [Y]:

If you type Y (Yes), and press the RETURN or ENTER key, the Dialog will repeat this procedure. If you type N (No), and press the RETURN or ENTER key the Dialog will continue with the next procedure.

- j. The Dialog asks:

Add or Modify Local TCP/IP print capability? [Y]:

If you answer Yes, you will be asked a series of questions relating to adding or changing a TCP/IP print capability. (Refer to the documentation supplied with your MAXserver 1450 Printer Server for more information about this portion of the dialog.) To continue with the procedure to add an IPX print capability, answer this question N (No) and press the RETURN or ENTER key.

- k. The Dialog asks:

Add or Modify a Local LAT Service? [Y]:

If you answer Yes, you will be asked a series of questions relating to adding or changing a LAT print capability. (Refer to the documentation supplied with your MAXserver 1450 Printer Server for more information about this portion of the dialog.) To continue with the procedure to add an IPX print capability, answer this question N (No) and press the RETURN or ENTER key.

l. The Dialog asks:

Add or Modify Local XPRINTER print capability? [Y]:

Answer this question Y (Yes) and press the RETURN or ENTER key.  
The Dialog will continue by displaying the following display:

Port	State	Print Server	Printer #	State
1	IDLE			
2	IDLE			
3	IDLE			
4	IDLE			

This display shows any existing local XPRINTER services. The first time you run the Dialog, no local XPRINTER services will be listed, as shown above. The following is an example of what this display might look like, after a local XPRINTER service named "PRINTER" had been defined for port 3.

Port	State	Print Server	Printer #	State
1	IDLE			
2	IDLE			
3	CONNECTED	PRINTER	3	
4	IDLE			

m. The Dialog asks:

Select a Port to be assigned to a print server:

You can assign this XPRINTER print service to be available at any of the ports available on the MAXserver 1400A/1450 Printer Server. To answer this question, you must provide a *port-number*. Type the desired port number and press the RETURN or ENTER key. Each port of a MAXserver 1400A/1450 can be connected to only one Novell Printer Server. If you select a port that is already connected to a Novell NetWare printer server, the Setup Dialog will display the existing printer server information as the default answers to the remaining questions in this procedure.

n. The Dialog asks:

Print Server Name:

To answer this question, you must supply the name of an active Novell NetWare printer server. If the Novell NetWare printer server is not currently available, you may see a message similar to the following:

Xyplex -911- Warning: Print Server PRINT is not currently available.

o. The Dialog asks:

Print Server Printer Number:

To answer this question, you must supply the number of a Novell NetWare printer. Novell NetWare allows you to specify up to 256 printers, numbered 0 through 255.

p. The Dialog asks:

Save, Edit or Cancel [Cancel]:

If you are satisfied with the choices you have made for the Dialog questions and prompts, type S (Save) and press the RETURN or ENTER key. If you made a mistake, or you want to change your mind about something, type E (Edit) and press the RETURN or ENTER key. The Setup Dialog will repeat the questions in this procedure, allowing you to correct any mistakes. If you decide that you do not want to configure an XPRINTER print service, type C (Cancel) and press the RETURN or ENTER key.

q. The Dialog asks:

Add or Modify Local XPRINTER print capability? [Y]: n

If you type Y (Yes), and press the RETURN or ENTER key, the Dialog will repeat this procedure. You can repeat this procedure in order to create additional local XPRINTER (Novell) printer services. If you type N (No), and press the RETURN or ENTER key the Dialog will display the message:

Setup Complete

The Setup Dialog procedure is complete.

## **Novell Server Configuration**

To configure a remote printer, you must use the Novell PCONSOLE utility. This section contains the following procedures, which are used to do this:

- Adding a New NetWare Print Server
- Changing an Existing NetWare Print Server



## Adding a New NetWare Print Server

The Novell NetWare *Printer Server* guide contains all of the information that you need to configure Novell software and equipment to support remote printing. This section summarizes the information contained in the *Printer Server* guide. There are four basic steps for configuring remote printing from a Novell server:

1. Create and configure a print server and printers
2. Create a print queue
3. Assign logical connection between printer and queue
4. Load(unload) the print server software

Each of these steps is summarized below.

The following example is for Novell NetWare Version 3.11.

### 1. Create and configure a print server and printer.

Login to the Novell server from a Novell client. You must use the SUPERVISOR account and password.

Once the you complete the login sequence you will be left on the default drive and directory configured for the user (usually C:\ or C:\SYSTEM.) Start the Novell utility that allows you to create and configure a print server and queue by typing:

```
C:\>PCONSOLE
```

The PCONSOLE program will respond with the following menu:

Available Options
Change Current File Server
Print Queue Information
<b>Print Server Information</b>

Use the arrow keys and select (highlight) the "Print Server Information" option (shown in highlights above) and press the RETURN or ENTER key. The Print Servers window appears. The next figure depicts this window. The display you see will list any print servers that actually exist for your network.

Print Servers
Print_Server_1
Print_Server_2
Print_Server_3

You can use the arrow keys to select an existing print server or press the INSERT (or INS) key to add a new print server. If you press the INSERT key to add a new print server, a New Print Server Name window appears:

New Print Server Name:
------------------------

Enter the name of the print server you wish to create and press the RETURN key. The PCONSOLE program will return you to the Print Servers window. The print server name you just created will appear in the Print Servers window and will now be highlighted. Press the RETURN key. The PCONSOLE program will display the Print Server Information window.

Print Server Information
Change Password
Full Name
<b>Print Server Configuration</b>
Print Server ID
Print Server Operators
Print Server Users

Use the arrow keys to select (highlight) the "Print Server Configuration" option (shown in highlights above) and press the RETURN or ENTER key. The PCONSOLE program will display the Print Server Configuration Menu.

Print Server Configuration Menu	
File Servers to be Serviced	
Notify List for Printer	
<b>Printer Configuration</b>	
Queues Serviced by Printer	

Use the arrow keys to select (highlight) the "Printer Configuration" option (shown in highlights above) and press the RETURN or ENTER key. The PCONSOLE program will display the Configured Printers window.

Configured Printers	
Not Installed	0
Not Installed	1
Not Installed	2
Not Installed	3
Not Installed	4
Not Installed	5
Not Installed	6
Not Installed	7
Not Installed	8
Not Installed	9
Not Installed	10
Not Installed	11
Not Installed	12
Not Installed	13
Not Installed	14
Not Installed	15

You can use the arrow keys and press the RETURN or ENTER key to select an existing printer or you can use the arrow keys to add a new printer. If you add a new printer, a New Printer Name window appears:

For a new printer, enter a descriptive name for the printer and press the RETURN key. Whether you created a new printer or selected an existing printer, the PCONSOLE program will display the following window:

Printer_0
Name: Printer_0 Type: Defined elsewhere
Use Interrupts IRQ:
Buffer Size in K:
Starting Form: Queue Service Mode:
Baud Rate: Data Bits Stop Bits Parity: Use X-ON/X-OFF:

The cursor will automatically be positioned on the "Type" field of this window, press the RETURN or ENTER key to view the Printer Types window.

Printer Types
Parallel, LPT1
Parallel, LPT2
Parallel, LPT3
Serial, COM1
Serial, COM2
Serial, COM3
Serial, COM4
Remote Parallel, LPT1
Remote Parallel, LPT2
Remote Parallel, LPT3
Remote Serial, COM1
Remote Serial, COM2
Remote Serial, COM3
Remote Serial, COM4
<b>Remote Other/Unknown</b>
Defined elsewhere

This window shows a list of the possible printer types available. Using the arrow keys, position to the "Remote Other/Unknown" selection for printer type (shown in highlights above) and press the RETURN or ENTER key. The PCONSOLE program will return you to the previous window. Note that the Type field and the next five fields have been altered. The window now appears as follows:

Printer_0
Name: Printer_0
Type: <b>Remote Other/Unknown</b>
Use Interrupts: Yes
IRQ: 7
Buffer Size in K: 3
Starting Form: 0
Queue Service Mode: Change forms as needed
Baud Rate:
Data Bits
Stop Bits
Parity:
Use X-ON/X-OFF:

Press the ESCAPE key to complete this portion of the configuration. You will be asked if you wish to save the configuration changes with the following window.

Save Changes
No
<b>Yes</b>

Use the arrow keys to select the "Yes" option (shown highlighted) and press the RETURN or ENTER key. Press the ESCAPE key a few times, until you return to the Available Options window.

## 2. Create a print queue.

At the Available Options window, use the arrow keys to select the "Print Queue Information" option (shown highlighted in the next figure) and press the RETURN or ENTER key.

Available Options
Change Current File Server
<b>Print Queue Information</b>
Print Server Information

An Available Queues window, listing all existing queues will appear (the following is an example of this window; your window will be different).

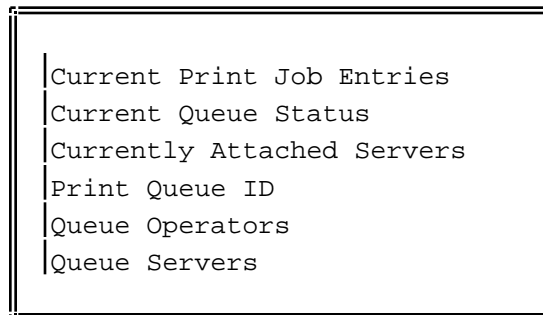
Available Queues
Queue_1
Queue_2

Use the arrow keys and select (highlight) a queue. Press the INSERT (or INS) key to add a new queue. If you inserted a new queue, a New Print Queue Name window appears:

New Print Queue Name:
-----------------------

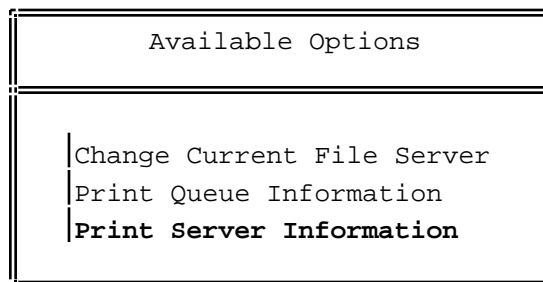
Enter a descriptive name for the queue name and press RETURN. After you specify a queue name the PCONSOLE program will display the Print Queue Information window.

Print Queue Information
-------------------------

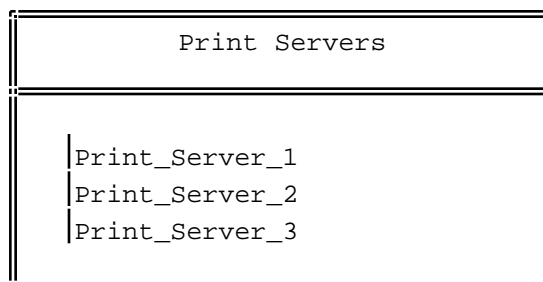


Make any desired queue changes and when you are done press the ESCAPE key a few times, until you return to the Available Options window.

### 3. **Assign logical connection between printer and queue.**



Use the arrow keys and select (highlight) the "Print Server Information" option (shown in highlights above) and press the RETURN or ENTER key. The Print Servers window appears. The next figure depicts this window. The display you see will list any print servers that actually exist for your network.





Select the print service you previously created and press the RETURN or ENTER key. The Print Server Information window appears.

Print Server Information	
	Change Password
	Full Name
	<b>Print Server Configuration</b>
	Print Server ID
	Print Server Operators
	Print Server Users

Use the arrow keys to select (highlight) the "Print Server Configuration" option (shown in highlights above) and press the RETURN or ENTER key. The Print Server Configuration Menu appears.

Print Server Configuration Menu	
	File Servers to be Serviced
	Notify List for Printer
	Printer Configuration
	<b>Queues Serviced by Printer</b>

Use the arrow keys to select (highlight) the "Queues Serviced by Printer" option (shown in highlights above) and press the RETURN or ENTER key. The Defined Printers window appears (the following is an example of this window; your window will be different).

Defined Printers	
LPT1	0
COM1	3
COM2	4
COM3	5

Use the arrow keys to select (highlight) the printer you just defined and press the RETURN or ENTER key. The following window appears (the following is an example of this window; your window will be different):

File Server	Queue	Priority
Server 1	Queue_1	1

Use the arrows keys select the queue you wish to associate with the printer and press the RETURN or ENTER key. The following window appears:

Priority: 1
-------------

Press the RETURN or ENTER to select the default. Exit from the PCONSOLE program by pressing the ESCAPE key until the the Exit PConsole window appears. Select the "Yes" option and press the RETURN or ENTER key. When the program exits, you will see the DOS prompt.

## 4. Load the print server software.

Proceed to the Novell server and bring up the system utility if it is not running. If the utility is running, press the ALT and ESCAPE keys simultaneously until you see the System Console display. The command prompt for this display is the colon character (:). At the command prompt, type the following Novell command:

```
LOAD PSERVER printer-server-name
```

where *printer-server-name* represents the printer server you created in step 1 of this procedure. You are now finished with the procedure.

## Changing an Existing NetWare Print Server

The Novell NetWare *Printer Server* guide contains all of the information that you need to configure Netware software and equipment to support remote printing. This section summarizes the information contained in the *Printer Server* guide. There are three basic steps for changing an existing Netware Print Server so that it can be used on a terminal server or printer server.

1. Unload the print server software
2. Change the print server and printer PCONSOLE configuration
3. Load the print server software

Each of these steps is summarized below.

The following example is for Novell NetWare Version 3.11.

### **1. Unload the print server software.**

You must unload a printer server before you make any changes to it. Netware will not save changes that are made to a printer server that is running. At the Netware server and bring up the system utility if it is not running. If the utility is running, press the ALT and ESCAPE keys simultaneously until you see the System Console display. The command prompt for this display is the colon character (:). At the command prompt, type the following Netware command:

```
UNLOAD PSERVER printer-server-name
```

where *printer-server-name* represents the printer server you wish to change.

### **2. Change the print server and printer PCONSOLE configuration.**

Login to the Netware server from a Netware client. You must use the SUPERVISOR account and password.

Once the you complete the login sequence you will be left on the default drive and directory configured for the user (usually C:\ or C:\SYSTEM.) Start the Netware utility that allows you to create and configure a print server and queue by typing:

```
C:\>PCONSOLE
```

The PCONSOLE program will respond with the following menu:

Available Options
Change Current File Server
Print Queue Information
<b>Print Server Information</b>

Use the arrow keys and select (highlight) the "Print Server Information" option (shown in highlights above) and press the RETURN or ENTER key. The Print Servers window appears. The next figure depicts this window. The display you see will list any print servers that actually exist for your network.

Print Servers
Print_Server_1
Print_Server_2
Print_Server_3

Use the arrow keys to select the existing print server to be changed. Press the RETURN or ENTER key. The PCONSOLE program will display the Print Server Information window.

Print Server Information
Change Password
Full Name
<b>Print Server Configuration</b>
Print Server ID
Print Server Operators
Print Server Users

Use the arrow keys to select (highlight) the "Print Server Configuration" option (shown in highlights above) and press the RETURN or ENTER key. The PCONSOLE program will display the Print Server Configuration Menu.

Print Server Configuration Menu	
	File Servers to be Serviced
	Notify List for Printer
	<b>Printer Configuration</b>
	Queues Serviced by Printer

Use the arrow keys to select (highlight) the "Printer Configuration" option (shown in highlights above) and press the RETURN or ENTER key. The PCONSOLE program will display the Configured Printers window. For this example, assume that you wish to change a printer named Laser\_printer

Configured Printers	
<b>Laser_printer</b>	0
Line_printer	1
Not Installed	2
Not Installed	3
Not Installed	4
Not Installed	5
Not Installed	6
Not Installed	7
Not Installed	8
Not Installed	9
Not Installed	10
Not Installed	11
Not Installed	12
Not Installed	13
Not Installed	14
Not Installed	15

You can use the arrow keys and press the RETURN or ENTER key to select the existing printer. The PCONSOLE program will display the following window:

Laser_printer
---------------

Name:	Laser_printer
Type:	Defined elsewhere
Use Interrupts	
IRQ:	
Buffer Size in K:	
Starting Form:	
Queue Service Mode:	
Baud Rate:	
Data Bits	
Stop Bits	
Parity:	
Use X-ON/X-OFF:	

The cursor will automatically be positioned on the "Type" field of this window, press the RETURN or ENTER key to view the Printer Types window.

Printer Types
---------------

```
|Parallel, LPT1  
|Parallel, LPT2  
|Parallel, LPT3  
|Serial, COM1  
|Serial, COM2  
|Serial, COM3  
|Serial, COM4  
|Remote Parallel, LPT1  
|Remote Parallel, LPT2  
|Remote Parallel, LPT3  
|Remote Serial, COM1  
|Remote Serial, COM2  
|Remote Serial, COM3  
|Remote Serial, COM4  
|Remote Other/Unknown  
|Defined elsewhere
```



This window shows a list of the possible printer types available. Using the arrow keys, position to the "Remote Other/Unknown" selection for printer type (shown in highlights above) and press the RETURN or ENTER key. The PCONSOLE program will return you to the previous window. Note that the Type field and the next five fields have been altered. The window now appears as follows:

Laser_printer
Name: Laser_printer
Type: <b>Remote Other/Unknown</b>
Use Interrupts: Yes
IRQ: 7
Buffer Size in K: 3
Starting Form: 0
Queue Service Mode: Change forms as needed
Baud Rate:
Data Bits
Stop Bits
Parity:
Use X-ON/X-OFF:

Press the ESCAPE key to complete this portion of the configuration. You will be asked if you wish to save the configuration changes with the following window.

Save Changes
No
<b>Yes</b>

Use the arrow keys to select the "Yes" option (shown highlighted) and press the RETURN or ENTER key. Press the ESCAPE key a few times, until you

return to the Available Options window. You can exit from the program or go on to configure other printers or queues if you wish. Refer to the Novell NetWare *Printer Server* guide for information about other configuration activities.

### **3. Load the print server software.**

Proceed to the Netware server and bring up the system utility if it is not running. If the utility is running, press the ALT and ESCAPE keys simultaneously until you see the System Console display. The command prompt for this display is the colon character (:). At the command prompt, type the following Netware command:

```
LOAD PSERVER printer-server-name
```

where *printer-server-name* represents the printer server you changed in this procedure. You are now finished with the procedure.

## Chapter 6

# Setting Up VMS/Unix Printers

This chapter includes the following sections which describe how to set up shared printers on VAX/VMS hosts and Unix hosts:

- Setting Up a VMS Printer Service
- Setting Up an UNIX Printer Service

### Setting Up a VMS Printer Service

For detailed information on setting up queues directed to services offered on the server, refer to the *LATplus/VMS Service Node Management Guide* or the *Guide to Maintaining a VMS System*, depending on the release of VMS software. The basic steps are as follows:

- a. Start the LAT Control Program.

```
$ RUN SYS$SYSTEM:LATCP
```

LATCP will display the LCP> prompt.

- b. Create a LAT application port.

```
LCP>CREATE PORT LTAnnn: /LOG
```

where *LTAnnn* represents a device (*nnn* is a decimal number). If desired, you can use the /NOLOG qualifier.

- c. Map the applications ports to specific ports on the server.

```
LCP>SET PORT LTAnnn: /APPLICATION /NODE=node-name -  
/SERVICE=service-name /PORT=port-name
```

where *node-name*, *service-name*, and *port-name* are on the server. You must include the *node-name* and either the *service-name* or the *port-name*.

- d. Exit from LATCP.

```
LCP>EXIT
```

- e. Set up the local characteristics for the application port. For example, for a remote printer, the format of the command would be similar to the following:

```
$ SET TERMINAL LTAnnn: /PERMANENT /DEVICE=device-type -  
    /WIDTH=width /PAGE=page-size /LOWERCASE /NOBROADCAST
```

(*device-type* (for example, LA36, LQP02, LN03, etc), *width*, and *page-size* are standard VMS device characteristics).

- f. Set the protection on the devices so that only system users (for example, the LAT symbiont) have access to them.

```
$ SET PROTECTION=(S:RWLP,O,G,W) /DEVICE LTAnnn:
```

- g. Set up the devices to be spooled devices:

```
$ SET DEVICE LTAnnn: /SPOOLED=(VAX-queue-name, SYS$SYSDEVICE:)
```

where *VAX-queue-name* represents the name of the VMS queue to which print jobs are submitted.

- h. Optionally, you can define a form to use with remote printers.

```
$ DEFINE /FORM form form_number /WIDTH=width /STOCK=DEFAULT  
/TRUNCATE
```

where *form* is a name users will specify in print commands, and *form\_number* is an unused form number.

- i. Make sure the VMS Queue Manager is started. Initialize the remote printer queue.

```
$ INITIALIZE /QUEUE /START /PROCESSOR=LATSYM /RETAIN=ERROR -  
    /ON=LTAnnn: /DEFAULT=(NOBURST, FLAG=ONE, NOTRAILER) -  
    /RECORD_BLOCKING VAX-queue-name
```

Alternatively, you can place all of these commands into a command procedure file or the SYSTARTUP.COM file. Figure 6-1 shows an example VMS command file that sets up a printer queue directed to a port on the server.

```

$ RUN SYS$SYSTEM:LATCP
CREATE PORT LTAnnn: /LOG
SET PORT LTAnnn: /APPLICATION /NODE=node-name /SERVICE=service-name
/PORT=port-name
EXIT
$
$ SET TERMINAL LTAnnn: /PERMANENT /DEVICE=device-type /WIDTH=width
/PAGE=page-size -
        /LOWERCASE /NOBROADCAST
$ SET PROTECTION=(S:RWLP,O,G,W:RWLP) /DEVICE LTAnnn:
$ SET DEVICE LTAnnn: /SPOOLED=(VAX_queue_name, SYS$SYSDEVICE:)
$ DEFINE /FORM form form_number /WIDTH=width /STOCK=DEFAULT /TRUNCATE
$ INITIALIZE /QUEUE /START /PROCESSOR=LATSYM /RETAIN=ERROR /ON=LTAnnn: -
        /DEFAULT=(NOBURST, FLAG=ONE, NOTRAILER) /RECORD_BLOCKING VAX_queue_name

```

Figure 6-1 Example VMS Print Queue Command File.

## Setting Up an Unix Printer Service

For Unix hosts, you use the Unix routines such as the LAT Control Program (lcp) and LAT pseudoterminal interface (lta). Users can then access the service with normal lpr commands. Further activity between the host and the service offered at the server port is governed by the connection queue, as described in the next section.