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RapidPrint 500
Multiprotocol Micro Server for Printers

Reference Manual

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1 Introduction

1 - Introduction

The RapidPrint 500 is a multi-protocol print server that provides shared network access to printers for a variety of network protocols and operating systems.

1.1 Protocol Support

The RapidPrint 500 supports five industry-standard network protocols:

- **AppleTalk**

  AppleTalk allows networked Apple Macintosh computers to see devices attached to the RapidPrint 500 and access them as they would any networked printer.

- **LAN Manager**

  LAN Manager allows devices attached to the RapidPrint 500 to access networked printers. Systems running OS/2 and Windows NT can access the devices using the Digital Network Port for Windows NT or the NetBIOS protocol.

- **Local Area Transport (LAT)**

  LAT is a protocol developed by Digital for local network terminal connections and is supported on almost all Digital operating systems. It provides host-initiated print spooling.

- **IPX/SPX (NetWare)**

  NetWare allows devices attached to the RapidPrint 500 to act as networked printers. The RapidPrint 500 supports all NetWare frame types: Ethernet v2, Native Mode (802.3), 802.2, and 802.2 SNAP. In addition, it supports both Bindery mode and NetWare Directory Service (NDS).

- **TCP/IP**

  Support includes Telnet, Rlogin, and the LPR and RTEL printing systems.

1.2 Terms

In this manual, the following terms are used to describe parts of a network. See the Glossary of Terms for more detailed explanations of these terms.

host	A computer, sometimes referred to as a CPU, attached to the network. The term **host** generally denotes interactive computers, or computers that users can log into.
node	Any intelligent device directly connected to the Ethernet network and having have its own Ethernet addresses, such as a host, an Ethernet printer, or a terminal or print server. Devices connected to the RapidPrint 500 are *not* nodes.
service	A resource that can be accessed locally or via the network. For example, a host is a service to which terminals can connect. The RapidPrint 500 can offer attached printers to the network as services.
Local mode	The RapidPrint 500 user interface, which is used to issue configuration and session management commands and establish sessions with services.

1.3 Server Features

1.3.1 AppleTalk Support

The RapidPrint 500 provides Ethernet access to attached laser printers; RapidPrint 500 print services appear in the Macintosh Chooser window like any other printer on the network. Note that bidirectional communication, either a serial or IEEE 1284 parallel interface, is required for this functionality.

1.3.2 LAN Manager Support

The RapidPrint 500 can be configured to appear as a print node to other LAN Manager nodes. Supported systems include OS/2, Windows NT, and Windows 95.

1.3.3 LAT and Digital Compatibility

The RapidPrint 500 supports LAT and TSM/NCP, making it fully compatible with most Digital operating environments.

1.3.4 NetWare Support

The RapidPrint 500 is used primarily for print serving. The RapidPrint 500 can also be configured and logged into from a NetWare fileserver, and can function as a print node for other NetWare fileservers.

1.3.5 TCP/IP and UNIX Compatibility

Almost all UNIX systems support Telnet, an established industry standard. Telnet can be used for logging into the server to issue configuration commands. UNIX systems generally implement Rlogin as well, unless security considerations dictate that it be disabled at a particular site.

1.3.6 Small Size

The small, attractive case is designed to fit into any office environment. Because there is no internal fan, the RapidPrint 500 operates silently.

1.3.7 Easy Configuration

The EZCon utility (provided on CD-ROM) allows users to configure the RapidPrint 500 from a Macintosh, PC, or UNIX machine as well as configure NetWare print queues without having to use PCONSOLE. It also allows remote host logins into the RapidPrint 500, which are similar to Telnet and LAT logins.

1.3.8 Command Line Interface

A simple but powerful command interface is provided for both users and system managers. The RapidPrint 500 operating code is downloaded automatically at power-up, making software upgrades as easy as copying a file. The RapidPrint 500 stores its operating software permanently on-board, so it does not need to download code unless new versions become available. Servers can also be configured to request a downloaded configuration file at boot time.

The *Command Reference* chapter of this reference manual describes the commands available in the RapidPrint 500's local command line mode. These commands control port and server configuration.

NOTE: *See the Command Reference for more information on the command line and command recall features.*

1.3.9 Host-Initiated Connections

The RapidPrint 500 may be configured to provide its attached devices as services to other nodes, allowing hosts to share printers. AppleTalk, LAN Manager, LAT, NetWare, and TCP/IP hosts can queue jobs to RapidPrint 500 services simultaneously. The optional RTEL host software provides both printer backend access and a named pipe interface to the RapidPrint 500 from TCP/IP hosts.

1.3.10 Security

The RapidPrint 500 includes several configurable security features. They include:

- Group codes, which allow the RapidPrint 500 to act as a filter to limit the user's knowledge of, and access to, specific services.
- Automatic logouts of sessions when a port is disconnected or when a device is turned off.
- Password protection for privileges, ports, services, maintenance commands, and the remote console.

1.3.11 Remote Configuration

The RapidPrint 500 can be logged into and remotely configured using one of the following methods:

- Digital's NCP and TSM facilities
- The Telnet console port, similar to the NCP remote console
- The network login feature, which allows managers to log into the RapidPrint 500 via TCP/IP, LAT, and NetWare using EZCon.
- EZCon, a configuration application that runs on Windows, NetWare, AppleTalk, and UNIX clients

1.3.12 SNMP Support

The RapidPrint 500 supports the Simple Network Management Protocol (SNMP). SNMP can be used by network managers to monitor network load and error conditions. No enterprise-specific MIBs are supplied.

1.3.13 Diagnostics

Power-up and interactive diagnostics help system managers troubleshoot network and serial line problems.

1.4 How To Use This Manual

The rest of the chapters in this manual describe the features and commands of the RapidPrint 500. Information is broken down as follows:

- Chapter 2, *Concepts*, explains the basic ideas behind RapidPrint 500 operation.
- Chapter 3, *Getting Started*, explains available configuration methods, as well as steps needed for reconfiguration and maintenance operation.
- Chapter 4, *Server Configuration*, explains server-wide configuration options, including protocol-specific configuration and security issues.
- Chapter 5, *Ports*, details the port-specific configuration options.
- Chapter 6 covers the setup needed for AppleTalk hosts to use the RapidPrint 500.
- Chapter 7 covers LAN Manager host setup needed for printing to the RapidPrint 500.
- Chapter 8 explains how to set up a VMS host for LAT printing.
- Chapter 9 details the NetWare fileserver setup needed for printing.
- Chapter 10 explains how to set up a UNIX host for LPR and RTEL printing.
- Chapter 11, *Command Reference*, lists the RapidPrint 500 command set in detail, including syntax, options, errors, examples, and where to find related information.

NOTE: *Installation and cabling are covered in the Configuration Guide.*

2 Concepts

2 - Concepts

The RapidPrint 500 supports incoming connections to services, such as printer support.

Services are the basic method of connecting to the RapidPrint 500 from any host or another server. In general, a service is required on the RapidPrint 500 before any job or connection queueing will take place. See the *Server Configuration* chapter for details on creating and using services on the RapidPrint 500.

2.1 Network Protocols

A network protocol describes the data contained in Ethernet packets. The network protocols provided by the RapidPrint 500 are completely separate, other than the use of the Ethernet data layer. The following figure shows the protocol stacks supported by the RapidPrint 500.

Figure 2-1: RapidPrint 500 Network Protocols

AppleTalk	**LAN Manager**	**LAT**	**NetWare**	**TCP/IP**
Printer Access Protocol	SMB	LAT	NCP	Telnet / Rlogin / RTEL / lpd
ATP	NetBEUI		SPX	TCP
DDP			IPX	IP
Ethernet / IEEE 802.3 Data Layer				

There are three different “Ethernet” frame formats, one of which is subdivided:

- What is typically called “Ethernet” is technically referred to as Ethernet v2. This is the default frame type for most TCP / IP, LAT, and MOP / NCP protocol stacks. It can also be used for NetWare.
- The IEEE 802.3 frame format comes with either a regular or SNAP SAP (Service Access Point). AppleTalk uses the SNAP format by default. Both types can be used by NetWare.
- NetWare 2.x and 3.x stations, by default, do not use any of these frame types. They use a “native mode” format that is being phased out.

2.2 AppleTalk

AppleTalk is a protocol used primarily by Apple Macintoshes to access network resources such as file servers and printers. AppleTalk is also available for UNIX, NetWare, and other operating systems. The AppleTalk protocol can be run over Ethernet (EtherTalk), Token Ring (TokenTalk), or LocalTalk, which is a medium speed network type built into every Macintosh. These various network media can be connected with AppleTalk routers to allow all nodes to communicate with one another. The AppleTalk protocol supports features such as file sharing and security in addition to printing.

The RapidPrint 500 supports only the Printer Access Protocol (PAP) and therefore cannot create outgoing AppleTalk sessions—only incoming print requests are accepted. Any services on the RapidPrint 500 with AppleTalk enabled will show up as LaserWriters in Macintosh Chooser windows and are associated with an available zone (explained in *Zones*, below). Users who select the RapidPrint 500 service as their LaserWriter and then print will have their jobs forwarded to the RapidPrint 500 for printing, or for queueing if the print port on the RapidPrint 500 is in use or otherwise unavailable.

AppleTalk printing is different from printing in other protocols. There are standard Macintosh drivers provided for specific Apple printer types, such as LaserWriters and ImageWriters, but there are no plain ASCII line printers by default. ASCII jobs are converted into PostScript (for laser printers) or bitmaps (for ImageWriters) when printed. For this reason, only laser printer devices are supported by the RapidPrint 500 under AppleTalk.

In addition, the Macintosh client will need to query the printer about status, so only laser printers that will reply to these interactive PostScript requests can be used. The RapidPrint 500 parallel port supports Bitronics mode, provided the attached laser printer also implements it.

2.2.1 Addressing

AppleTalk provides for dynamic node addressing, allowing a node to choose its address at boot time. It will send network packets to the other nodes to avoid choosing a node ID already in use. A node can also discover its network number by listening for AppleTalk router broadcasts; if none are heard, a default network number is chosen. The RapidPrint 500 will save discovered zone / network / node ID triplets in permanent memory, reducing traffic at reboot time, although the RapidPrint 500's AppleTalk address may change across boots in response to any network changes.

Network numbers are configured in the routers, so the only AppleTalk configuration supported by the RapidPrint 500 is the specification of a zone name other than the default. Due to the generally non-configurable nature of AppleTalk, most AppleTalk devices are truly "plug-and-play"—they can be powered up and are used right out of the box.

2.2.2 Zones

Zones are arbitrary groupings of AppleTalk nodes used to organize resources into groups that are easier for users to understand. For example, a college may organize zones around departments, for example, Math Department and Physics Department. Zones allow users to sift through large numbers of nodes by choosing those groups they are familiar with regardless of the organization of the network. In general, zones need not have a correlation to physical or network location, thus any node can declare itself a member of any single zone.

Zones, like nodes, originate from and are configured on AppleTalk routers. One zone on each network will be chosen by the router as the default zone. If there are no AppleTalk routers on the network, there will be only one zone, the default zone, of which all nodes are members. If no zone

name has been previously defined on the RapidPrint 500, or if the defined zone is no longer valid, the RapidPrint 500 will join the default zone and no other configuration is needed. The RapidPrint 500 can be placed in a different zone with the **Define Protocols AppleTalk** command. Each time the RapidPrint 500 is booted, or when its zone is changed, it will verify the zone name with a router.

2.2.3 Name Binding Protocol (NBP)

NBP is used by AppleTalk to advertise resources, such as printers and fileservers, to the network. Any resource that other users can access will have NBP information that must be communicated to other nodes. The items in the Chooser windows reflect the various NBP resources that are visible on the network.

NBP and the Chooser organize resources by three levels: name, type, and zone. Names are arbitrary strings assigned by users, such as **Kathy** or **MyPrinter**. Types are generic classes of resources, such as **Macintosh IIci**, and **LaserWriter**. Zones, mentioned above, are collections of nodes on the network. Typical Macintosh NBP information might be [Kathy, Macintosh IIci, Accounting] for the name, type and zone, respectively. A service offered by the RapidPrint 500 called **MyPrinter** that had AppleTalk enabled and is located in the **Engineering** zone would have an NBP description of [MyPrinter, LaserWriter, Engineering]. If LaserWriter resources in the Engineering zone were selected in the Chooser, one of the resources shown would be the MyPrinter service offered by the RapidPrint 500. The Chooser sends out queries whenever a new zone or resource type is selected.

NOTE: *If an expected RapidPrint 500 service is absent, there is a configuration problem somewhere.*

The NBP type LaserWriter designates a PostScript printer, so nodes printing to printers of type LaserWriter assume that the printer supports PostScript. Care must be taken to attach only PostScript printers to RapidPrint 500 services with AppleTalk enabled, and to disable AppleTalk on services that do not support PostScript printers. It is not possible to print to non PostScript printers (for example, ImageWriters) from a Macintosh via the RapidPrint 500.

2.3 LAN Manager

LAN Manager is used by several PC-based operating systems, notably OS/2, Windows NT, and Windows for Workgroups, although LAN Manager servers have been written for HP and Sun workstations. LAN Manager is based on the NetBIOS protocol. The RapidPrint 500 implements only enough of the NetBIOS protocol stack to provide print services to nodes; no interactive logins are allowed.

The RapidPrint 500 also implements the straightforward and easy to use DLC printer protocol typically used by HP laser printers. DLC operation is only supported under Windows NT. DLC does not provide queueing on the RapidPrint 500, nor does it allow printing to more than one RapidPrint 500 **service**. You must select the hardware address of the RapidPrint 500 as the target for the print job.

2.3.1 Networking

NetBIOS is not a routable protocol, so the RapidPrint 500 can only communicate with local nodes or nodes that are accessible via a gateway capable of bridging the NetBIOS data.

LAN Manager node lookups take a text resource name and resolve it into a hardware address. For this reason, node and resource names must be unique on the network, and the RapidPrint 500 will print an error message if any configuration that violates this rule is attempted.

2.4 LAT

Digital Equipment Corporation's LAT (Local Area Transport) networking software is designed to ease the process of accessing and managing local area networks. LAT software is built around the concept of **services**. A service may be provided by a dedicated device, such as a printer, or by a network host. A device that offers one or more services, such as the RapidPrint 500, is a **node**.

In general, all services offered by the RapidPrint 500 are associated with a port; exceptions to this rule will be noted later.

Nodes advertise their services to the network by broadcasting occasional messages about them. These messages, referred to as **multicasts**, contain the node's name and its list of services. By monitoring multicast messages, all hosts on the network know what nodes and services are available and can provide this information to their interactive users. The **Show Services** and **Show Nodes** commands display this information.

LAT multicast messages contain a **rating** for each service offered. Ratings range from 0 to 255; 0 means the service is unavailable, while 255 means the service is available and has no current users. Ratings for a given service may change over time. For example, the rating for a computer accepting logins will generally change as its workload changes. Conversely, ratings for a modem are typically either 0 (in use) or 255 (not in use). In the example above, the server with eight modems attached will continue to advertise that the service "modem" is available (a 255 rating) until all eight modems are in use (a 0 rating).

Service ratings may concern even casual users, since they are used to determine which service a user will be connected to whenever there is a choice. For example, if a user types `Connect Hub` and five nodes offer service **hub**, the user will be connected to the least busy node automatically. In the case mentioned above, where both the local RapidPrint 500 and a remote node offered the same service, the ratings determine which node will service the connect attempt.

The other major network management feature of LAT is the concept of **service groups**. The RapidPrint 500 parallel port and each service on the network can be thought of as belonging to one or more groups. When a user or device requests a service connection, the LAT host will check to see if the groups to which the requester belongs match those of the requested service. If any group number is common to both the requester and the service, the connection attempt continues. If there are no common group numbers, the connection attempt fails. Note that there may be additional access restrictions on the service, such as password protection.

NOTE: *See the Set/Define Port Authorized Groups and Set/Define Server Service Groups commands for more information.*

Group numbers also are useful to nodes because each node only needs to pay attention to multicasts that involve its users' groups. As a result, groups can hide services that would otherwise be visible. The server manager can also hide services from a set of ports. Setting up and managing services and groups is discussed in more detail in the *Server Configuration* chapter.

LAT is significantly different from other protocols in two important ways. First, LAT is not routable. There is no way to divide LAT networks into smaller subnetworks and use routers to reduce traffic between nodes. Second, LAT is a timer-driven protocol. Packets are expected at certain intervals, and the protocol cannot adapt to slow network links dynamically. For these reasons, LAT traffic over wide areas is typically carried inside (or **encapsulated** in) TCP/IP or IPX/SPX packets. The latter two protocols are fully routable, and can handle wide-area, slow network links.

NOTE: *If LAT is bridged across slow links, session time-outs and errors are very likely.*

2.5 TCP/IP

2.5.1 IP Addresses

Every TCP/IP node on a network has an IP address, which is unique to that network, in addition to the Ethernet Address, which is unique across all hardware anywhere in the world. The IP address provides information needed to forward packets across multiple networks, if necessary.

The address is of the form *n.n.n.n*, where each *n* is a number from zero to 254, as in 192.0.0.1. The exception is that there cannot be a zero in the last segment of the address.

NOTE: *The number 255 is strictly reserved for broadcast packets.*

A unique address has to be specified on the RapidPrint 500 before any of the TCP/IP functionality is available. See your *Configuration Guide* for more information on configuring the IP address.

2.5.2 Subnetworks

Usually, a TCP/IP internet is broken down into "networks," where a host is able to see only the hosts on its own network or sub-unit. TCP/IP networks then rely on **routers** (or **gateways**) to transfer network traffic to hosts on other networks.

Routers are typically connected to two or more networks, and will pass, or route, TCP/IP messages across network boundaries. The RapidPrint 500 can be told explicitly which hosts are the gateways for the local network. If no gateways are currently specified, the RapidPrint 500 will listen to routing-protocol packets (for example, RIP) to decide which hosts are acting as gateways.

NOTE: *See Set/Define Server Gateway for more details.*

The RapidPrint 500 decides at connection time whether the desired TCP/IP host is on the local network segment with the help of the **subnet mask** on the server. This mask tells how much of the IP address is the network address, which is applied to the IP addresses of both the RapidPrint 500 and the remote host. If the resulting addresses are identical, the connection is deemed local and the host is contacted directly. If not, the connection attempt and all subsequent messages to this host will be directed to the RapidPrint 500's gateway host for forwarding. The subnet mask, if not set explicitly, will be automatically configured for the given IP address.

NOTE: *See Set/Define Server Subnet Mask for more details.*

2.5.3 Simple Network Management Protocol (SNMP)

The RapidPrint 500 supports the SNMP network protocol, which allows hosts on the network to query nodes for counters and network statistics and change some parameters on those nodes. The form of these requests is documented by RFC 1098. The list of items that can be queried and/or set and the type of data used, such as integer and string, are both documented in various Management Information Bases (MIBs). MIBs cover a variety of things, such as parallel port status, and counters and IP address resolution tables.

The RapidPrint 500 supports the following MIBs:

MIB-II (RFC 1213):	System, Interface, Address Translation, IP, ICMP, TCP, and UDP. They do not support the EGP group.
Parallel MIB (RFC 1660):	All objects (parallel devices).

The RapidPrint 500 will respond to queries for unknown MIBs with a “not in MIB” error to the requesting host. See RFC’s 1065, 1066, and 1098 for more information on SNMP queries and the structure of the MIBs.

NOTE: *See Set/Define SNMP for more details.*

Traps are sent to a host when an abnormal event occurs on the RapidPrint 500. The RapidPrint 500 can generate limited forms of three of the SNMP traps. It will generate a Coldstart trap when it first boots, and a Linkup trap when the startupfile (if any) has been read from a host and normal operation commences. If a startupfile has been configured but the download fails, the RapidPrint 500 will send an Authentication trap. In all three cases, the trap will be directed to the IP address of the RapidPrint 500’s loadhost. The RapidPrint 500 will not generate traps for cases other than those listed here.

The RapidPrint 500 has a local SNMP security table to restrict or prevent unauthorized SNMP configuration.

2.5.4 Reverse Telnet (RTEL)

When a server provides a service to a LAT host, the connection is often referred to as Reverse LAT, in that “normal” LAT connections are logins from the server to a host. Hosts request a Reverse LAT connection when they wish to access a service, such as a printer or modem, connected to a server. There was no real standard (or even analogy) for this type of data connection in the TCP/IP world until now.

To add this functionality to the TCP/IP environment, the RapidPrint 500 comes with special software for your UNIX host. Reverse Telnet, much like Digital’s Reverse LAT, provides the software capability for a UNIX host to initiate connections to the RapidPrint 500. These connections can be made through a back-end program for a printer, or through a named pipe. For example, you can print files from your UNIX host to a printer attached to the RapidPrint 500 through your host’s **lp** or **lpr** print system. RapidPrint 500 services do not care what type of hosts are using them. Multiple jobs from any of the supported protocols can be queued up simultaneously on any service.

2.5.5 LPR Support

The RapidPrint 500 and many UNIX systems implement the Berkeley remote printing protocol (lpr). This protocol makes it very easy to add print hosts to a system. To add the RapidPrint 500 as a print host, add the server’s IP address to a host table and add the server’s service name as a print queue. No special host software or other configuration is needed; RapidPrint 500 services can be accessed via the normal lpr commands on the host.

Print jobs can be forwarded multiple “hops” in the network. If you only want one host to know about the RapidPrint 500 print queues, all other hosts can be configured to forward their print jobs to that one host which then forwards them to the RapidPrint 500 for printing.

NOTE: *See Chapter 10, UNIX Host Setup for more information.*

2.5.6 TCP/IP Utilities and Commands

The following commands have been added to help TCP/IP usability:

Netstat	Displays the status of the routing tables and current network sessions.
Finger	Displays users on local and remote hosts. The finger command by itself will show the users on the RapidPrint 500. If given with a parameter, such as bob@hydra, it shows information regarding user **bob** on TCP/IP host **hydra**. The username can be omitted, in which case all the users on the remote host will be displayed. If the host cannot be reached or accessed, the finger command fails.

NOTE: *To see a list of processes on the RapidPrint 500, issue the command "finger finger."*

2.6 LAT and TCP/IP Connection Methods

Users can "log into" the RapidPrint 500 from either a TCP/IP host (using Telnet or Rlogin) or a LAT host. For example, if the server's IP address is 192.0.1.92, a Telnet connection from an IP host to this address will return the local prompt just as if the user had logged in on a hardwired port. Also, the server can advertise itself as a "service" to LAT hosts. That is to say, LAT hosts can connect to the server and obtain the local prompt.

Once an incoming (LAT or Telnet) connection has been started, users can use the server as if they were connected on a local port. They can connect to local services and configure the server. TCP/IP users then have a convenient way to remotely "manage" the server. Managers can simply log in and become the privileged user, change server parameters, and log out again.

2.7 NetWare

Novell's NetWare software provides a way to link computers together and provide file and printer sharing. It is typically used to network DOS-based PC's, but is starting to appear under UNIX and other operating systems. NetWare is built around file servers, which handle user logins, provide network resources, and control security. At least one file server, such as a PC or UNIX host, is required in any NetWare environment. NetWare users typically have to log into a file server to enjoy the networked (shared) benefits.

The RapidPrint 500 supports a significant subset of the NetWare functionality, most notably print spooling. Fileservers can be configured to send queued print jobs to printers attached to the RapidPrint 500. No special software is required on the fileserver; configuration uses the EZCon Configuration software or the standard PCONSOLE utility. Any users or applications that can use the NetWare print queues can spool jobs to the RapidPrint 500.

The RapidPrint 500 must periodically query the file servers for pending jobs. To do so, it logs into a file server to access the print spooler, and will try to connect to all file servers on the local network (subject to access lists, below) to check for such jobs.

NOTE: *See Set/Define Server NetWare Loadhost for more information.*

2.7.1 Networking

Each NetWare node uses its hardware address as its node ID; no additional address configuration is necessary. In addition, the RapidPrint 500 gets all the networking information it needs from periodic broadcasts sent by NetWare routers on the network. It will learn its own network number as well as routes to non-local file servers. No further configuration is needed.

The NetWare protocol can use all four Ethernet frame formats. It will listen for all frame formats, and then use the correct one for the connection. The different frame types are treated as different networks, and thus each frame type has a different network number. If there is only one frame format in use on the LAN, the RapidPrint 500 will use the network number for that frame type. If there are multiple frame types, limitations to the NetWare protocol require that the RapidPrint 500 use a different network number for each frame type on which it wants to advertise itself.

The RapidPrint 500 can use multiple frame types by creating a new, unique “internal network number” and advertising itself as a router to the internal network. Any nodes or fileservers that need to communicate with the RapidPrint 500 use this new network number, and treat the RapidPrint 500 as a router to that network. If this behavior is not desired, the RapidPrint 500 can be forced to use only one frame type (and thus not need an internal network number).

2.7.2 Access Lists

Since NetWare networks can be quite large, with hundreds of file servers, a method for restricting the RapidPrint 500 print polling is needed. If polling is left unrestricted, the time needed to poll each server would make printing incredibly slow and inefficient. By using access lists (created with the **Set/Define Protocols NetWare Access** command) you can control which file servers the RapidPrint 500 will and won’t poll for print jobs. Note that the file servers have no control over the RapidPrint 500 access lists, so they will never know if a misconfiguration of the access list prevents them from spooling print jobs to the RapidPrint 500.

2.8 PostScript Notes

Many printers (including all LaserWriters and other AppleTalk compatible laser printers) use a printing language called PostScript. Unlike other printer protocols, which typically accept ASCII characters and print them verbatim, PostScript is also a programming language. Shapes and fonts can be defined as routines and re-used on successive pages, multiple fonts and copies can be printed, and text and diagrams can be rotated and shifted on pages.

PostScript is also an interactive language, where the printing host can query the printer for its knowledge about fonts and software versions. If the host expects to receive data from the printer (as is the case for all AppleTalk printing), the printer must be connected to a bidirectional port such as the RapidPrint 500 port. Note that the attached printer must also support the Bitronics mode. PostScript printing from UNIX, LAT, and NetWare hosts, where bidirectional data flow is not a requirement, can generally use any parallel port.

Due to the interactive nature of PostScript, it is possible for the printer and host to get out of synch in their communication. Since the printer “interprets” the entire PostScript job and then prints the pages, it is possible for the RapidPrint 500 to complete the transfer and accept a new job while the printer is still digesting the last job. For this reason, an end-of-job character (ASCII 0x4, or Ctrl-D) is used to end all PostScript jobs. Typically the host will send one at the end of the job and the printer will reply with one when it is done processing.

The RapidPrint 500 will force a Ctrl-D character when PostScript is enabled on the appropriate service and wait for one in return. This is **strongly** recommended for all PostScript printer applications. It guarantees that the printer is ready to accept new data when the job actually starts. Job loss and printer hangs are the usual result if PostScript is not enabled on the service and the printer cannot keep up with the job rate. High-speed printers may happen to work if the PostScript attribute is not enabled, simply because they finish the current job in the time it takes for the RapidPrint 500 to accept the next one.

NOTE: *For information on end-of-job characters, see Set/Define Service EOJ*

2.9 Remote Configuration

VMS hosts can remotely control the RapidPrint 500 using the NCP utility. The NCP program can signal remote hosts to perform specific operations across the network or form connections to the server. This is especially useful for Flash-ROM servers, which might not be placed in easily accessible locations. The RapidPrint 500 also supports the TSM utility, which uses NCP to start login sessions with the RapidPrint 500 and allows files of RapidPrint 500 commands to be sent to the server. Access to remote control of the RapidPrint 500 can be protected by the maintenance password.

NOTE: *See Set/Define Server Maintenance Password for information on remote access control.*

For TCP/IP environments, the RapidPrint 500 allows a user to Telnet into the TCP **console port** to configure the server. Users connecting to this console port (port 7000) will be prompted for the server's login password as if they had logged in via NCP. After entering the login password, the users can issue normal configuration commands, but will still have to enter the privileged password to issue privileged commands. Connections to this port are not subject to the **Set/Define Server Incoming** command, and thus managers can log into this port regardless of whether regular TCP logins are enabled.

NCP, TSM, and the Telnet console all require the correct login password to be entered. The default password is **access**. It can be changed via the **Set/Define Server Login Password** command.

The server also supports the SNMP network protocol. SNMP (Simple Network Management Protocol) allows network hosts to query other hosts for counters and network statistics. In general, one host on a network will be running an SNMP application that queries the other hosts on the network and collects statistics, signals error conditions, and other information. The RapidPrint 500 will not generate queries of its own; it can only respond to queries from other hosts. See the discussion of SNMP in the TCP/IP section for more information.

2.10 Security

Incoming logins can be selectively disabled and/or password protected via the **Set/Define Server Incoming** command. In addition, ports used for network logins can be "preconfigured" with a standard set of characteristics for each login.

For more information about security measures and user/connection restriction options, including some RapidPrint 500 features that are used for more than security reasons, see the *Server Configuration* and *Ports* chapters.

3 Getting Started

3 - Getting Started

This chapter covers some background information to get you started using the RapidPrint 500. Topics include methods used to initially set up the RapidPrint 500 as well as ongoing maintenance issues, such as rebooting the server and restoring factory default settings

This chapter assumes the following:

- The RapidPrint 500 has booted properly and is running RapidPrint 500 operational code
- The RapidPrint 500 is connected to the Ethernet
- For IP network users, the RapidPrint 500 has been assigned a valid IP address.

NOTE: *See your Configuration Guide for details on booting, connecting your unit to the Ethernet, and setting the IP address.*

3.1 Configuration Methods

The RapidPrint 500 may be configured using one of two methods: the EZCon configuration software, or commands issued at the command line (Local> prompt).

To configure the RapidPrint 500 when a problem has occurred, refer to the Troubleshooting appendix of your **Configuration Guide**.

3.1.1 EZCon

The EZCon software is the easiest way to configure the unit. EZCon guides you through configuration using a graphical interface.

UNIX, Macintosh, and Windows versions of EZCon are shipped with the RapidPrint 500 on CD-ROM. To use the CD-ROM, refer to the instructions on the CD-ROM case. To install EZCon, refer to the appropriate EZCon README file located on the CD-ROM.

NOTE: *EZCon configurations take effect immediately, like Set commands, and are permanent, like Define commands. See Command Types for more information.*

All instructions for using EZCon are included in each README file. For assistance once EZCon is running, refer to the EZCon on-line help.

3.1.2 Command Line Interface

To configure the RapidPrint 500 without EZCon, you must enter configuration commands at a command line. These commands are entered when a port is in **character mode**; in this mode, the Local> prompt will be displayed.

There are three ways to display the Local> prompt:

1. Establish a Telnet or Rlogin connection to the RapidPrint 500 from a TCP/IP host.
2. In EZCon, click the Terminal icon. The Local> prompt will be displayed in a terminal emulation window.
3. Establish a TCP/IP remote console connection by Telnetting to port 7000:

Figure 3-1: Remote Console Connection

```
% Telnet 192.0.1.166 7000
```

Remote console logins are password protected via the server login password. The default login password is **access**. See *Login Password* for more information.

3.1.2.1 Entering and Editing Commands

In examples throughout the manual, RapidPrint 500 commands and keywords are displayed in uppercase for clarity. They may be entered in upper, lower, or mixed case.

The *Command Reference* chapter displays the syntax of each command, and includes restrictions, known errors, and references to related commands. Optional parameters are enclosed in straight brackets **[ ]**; multiple options may be entered, or options can be omitted entirely. Required parameters are enclosed in curly braces **{ }**; one and only one of the parameters must be used. User-supplied parameters, such as a particular port ***number*** or host ***name***, are shown in italics.

When entering a string, such as a username or filename, it is important to remember to enclose the string in quotes to preserve case and spacing. If a string is not enclosed in quotes, it will be automatically changed to all uppercase characters.

NOTE: *The privileged and login passwords are case-independent, even when entered in quotes.*

All keys used for entering and editing commands are listed in Table 3-1.

Table 3-1: Command Line Editing Keys

Key	Purpose
Return	Executes the current command line
Delete	Deletes the character before the cursor
Ctrl-A	Toggles insert mode (insert or overstrike). Overstrike is on by default.
Ctrl-D	Logs out of the server
Ctrl-E	Moves the cursor to the end of the line
Ctrl-H or Backspace	Moves the cursor to the beginning of the line

Table 3-1: Command Line Editing Keys, Cont.

Key	Purpose
Ctrl-R	Redisplays the current command
Ctrl-U	Deletes the entire current line
Ctrl-Z	Logs out of the server
Left Arrow	Moves the cursor left
Right Arrow	Moves the cursor right
Up Arrow or Ctrl-P	Recalls the previous command
Down Arrow or Ctrl-N	Recalls the next command
!*text*	Recalls the last command starting with *text*
!!	Recalls the last command

3.1.2.2 Restricted Commands

To prevent unauthorized users from changing server-wide characteristics, some commands require privileged user status. Privileged commands can only be issued by the superuser, or manager, on the server. To obtain privileged status, the privileged password must be entered. See *Privileged Password* for more information about passwords, including the default passwords.

3.1.2.3 Command Types

The following commands appear frequently throughout this manual. There are subtle differences between each group of commands, as explained below:

3.1.2.3.1 Set and Define

Set Makes an immediate (but not permanent) change. To make the change permanent, the Save command must be used.

Define Makes a permanent change, but one that generally doesn't take effect until the unit is rebooted. Define Port will take effect as soon as the port is logged out.

NOTE: *Settings that are made with both Set and Save behave as if they were configured using Define commands.*

3.1.2.3.2 Show, Monitor, and List

Show Displays the current settings. Current settings include those made using the Set command but not yet saved as permanent changes.

Monitor Displays the current settings at regular intervals; information is updated every three seconds.

List Displays the unit's permanent settings. Note that some settings that are Listed (those made with Define, or those that have been made with both Set and Save) will not take effect until the unit is rebooted.

3.1.2.3.3 Clear and Purge

Clear Removes an item immediately, but does not make a permanent change. When the unit is rebooted, the old setting will again be in effect.

Purge Removes an item permanently, but generally does not take effect until the unit is rebooted. Purge Port will take effect as soon as the port is logged out.

3.1.2.4 Abbreviating Keywords

On the command line, it is only necessary to type as many characters as are needed to distinguish the keywords from one another. For example, the following two commands are equivalent:

Figure 3-2: Full and Abbreviated Commands

```
Local>> DEFINE PORT BITRONICS ENABLED DSRLOGOUT ENABLED GROUPS 1-5,77,123-139
Local>> DEF PO BI EN DSR EN GR 1-5,77,123-139
```

Extra white space (more than one consecutive space between keywords) is ignored.

3.2 Maintenance Issues

The following sections detail configuration that is required on a sporadic or ongoing basis.

3.2.1 Changing the Server Name

The RapidPrint 500 is initially configured with a server name. However, you can give the server a custom name of up to 13 alphanumeric characters using the following command:

Figure 3-3: Changing the Server Name

```
Local>> DEFINE SERVER NAME “PrintServer”
```

The server name string must be enclosed in quotes if lowercase letters are used.

3.2.2 Rebooting the RapidPrint 500

There are two ways to reboot the RapidPrint 500: pressing the Reset button while using EZCon, or entering the Initialize command at the Local> prompt.

Options to the **Initialize** command include rebooting the server, reloading the Flash-ROM code, and restoring the unit’s factory default settings. The example below shows a simple (and immediate) reboot.

Figure 3-4: Rebooting the RapidPrint 500

```
Local>> INITIALIZE SERVER DELAY 0
```

NOTE: *See Initialize Server for a complete description of the command.*

Remember that any settings that were set but not defined or saved (such as port and server settings) will be lost when rebooting.

3.2.3 Restoring Factory Defaults

Should it become necessary, the RapidPrint 500 can be restored to the default settings installed at the factory. Note that this will restore **everything**—the RapidPrint 500 will function as though it just came out of the box. Be certain you wish to do this before you start.

There are two ways to restore the factory settings. As discussed above, the **Initialize** command can reboot the server with the factory settings.

Figure 3-5: Restoring Factory Defaults

```
Local>> INITIALIZE FACTORY
```

You can also hold down the Test button while powering up the unit.

3.2.4 Reloading Operational Software

The RapidPrint 500 stores its software in Flash ROM. This software controls the initialization process, the operation of the RapidPrint 500, and the processing of commands. The contents of Flash ROM can be updated by downloading a new version of the operational software.

Reloading the code into the Flash ROMs (for example, to load a newer version of the operational code) is a straightforward process. The operational code is downloaded from a network host via TFTP or MOP and then programmed into the Flash ROMs. To force the unit to re-download and reprogram its stored code, enter the Initialize Reload command from the command line.

Compressing the code and loading it into the Flash-ROM takes approximately two minutes, during which time the console port is unusable. If the server is powered off or otherwise interrupted during the ROM programming phase, the code in the ROMs will be invalid and the server will have to be reloaded again from the network host.

3.2.5 Editing the Boot Parameters

If the information that the RapidPrint 500 uses at boot time changes, you must edit the RapidPrint 500 **boot parameters**, including:

- Loadhost (TCP / IP or NetWare)

  The **loadhost** is the host from which the RapidPrint 500 operational software is downloaded at boot time.

- Backup loadhost (optional)

  Software is downloaded from a backup loadhost when the primary loadhost is unavailable.

- Software filename
- RARP (may be enabled or disabled)
- BOOTP (may be enabled or disabled)
- NetWare fileserver name

Boot parameters are edited with **Set/Define Server** commands. For example, the loadhost and software filename can be changed using the following commands.

Figure 3-6: Editing Single Boot Parameters

```
Local>> DEFINE SERVER LOADHOST 192.0.1.8
Local>> DEFINE SERVER SOFTWARE “newload”
```

NOTE: *Set/Define Server commands are listed in the Command Reference chapter.*

Both parameters can be included on the same command line as shown in the following example:

Figure 3-7: Editing Multiple Boot Parameters

```
Local> DEFINE SERVER LOADHOST 199.34.67.184 SOFTWARE “newload”
```

3.2.6 System Passwords

There are three important passwords for the RapidPrint 500: the privileged password, the login password, and the maintenance password. All three are discussed in the following sections.

3.2.6.1 Privileged Password

Changing any server or port setting (and issuing certain other commands) requires being the privileged user. When using EZCon, you will be prompted for the privileged password when it is needed. If you are not using EZCon, you need to enter the **Set Privileged** command at the Local> prompt to become the privileged user. The default privileged password for the RapidPrint 500 is **system**.

Figure 3-8: Set Privileged Command

```
Local> SET PRIVILEGED
Password> system (not echoed)
Local>>
```

If you made a Telnet connection, the prompt will change to reflect privileged user status. If another user is currently logged into the RapidPrint 500 as the privileged user, you can use the **Set Privileged Override** command to forcibly become the privileged user.

To change the privileged password, use the **Set/Define Server Privileged Password** command shown in Figure 3-9 to enter a new password of up to six alphanumeric characters. It is not necessary to enclose the password string in quotes; the privileged password is not case-sensitive.

Figure 3-9: Changing Privileged Password

```
Local> SET PRIVILEGED
Password> system (not echoed)
Local>> SET SERVER PRIVILEGED PASSWORD hippo
Local>> DEFINE SERVER PRIVILEGED PASSWORD hippo
```

NOTE: *You can abort any password-entering process by pressing Ctrl-Z at the password prompt.*

If you do not provide the password on the command line, you will be prompted to enter it, then verify your entry. In the latter case, the password will not be displayed on the terminal.

When you are finished entering the privileged commands, we suggest that you turn off privileged status with the **Set Noprivileged** command so that you do not inadvertently change the server's settings or other users' settings.

3.2.6.2 Login Password

Users can be required to enter a password when logging in via the network; the Local> prompt will not be displayed until the correct password is entered.

The default login password is **access**. To change this password, use the **Set/Define Server Login Password** command shown in Figure 3-10. You may enter a new password of up to six alphanumeric characters. It is not necessary to enclose the password string in quotes; the login password is not case-sensitive.

Figure 3-10: Defining Login Password

```
Local>> DEFINE SERVER LOGIN PASSWORD badger
```

If you do not provide the password on the command line, you will be prompted to enter it, then verify your entry. In the latter case, the password will not be displayed on the terminal.

The RapidPrint 500 uses the login password to log into NetWare file servers. If the login password is changed, NetWare print queue setups must also be changed to reflect the new password.

3.2.6.3 Maintenance Password

The maintenance password is used for MOP/TSM access to the server. Unlike the other passwords, the maintenance password is a string of up to 16 hexadecimal digits (0-9,A-F).

The default server maintenance password is a string of 16 zeroes. To change the password, become the privileged user and enter the following command.

Figure 3-11: Defining a Maintenance Password

```
Local> DEFINE SERVER MAINTENANCE PASSWORD ac067df
```

3.2.7 Configuration Files

A configuration file is a series of RapidPrint 500 commands used to automatically configure the server. It may be used by the system administrator when necessary or downloaded automatically from a TCP/IP host (via TFTP), from a VMS host via LAT, or from a NetWare fileserver each time the server boots.

Using a configuration file can reduce the time required to configure the RapidPrint 500. Options that would need to be manually set using EZCon or using commands at the Local> prompt can be automatically executed.

3.2.7.1 Using EZCon

EZCon will examine the current configuration of your RapidPrint 500, translate this information into a series of commands, and save the commands in a file. This file may then be downloaded to configure the server. Refer to EZCon's on-line help for more information.

3.2.7.2 Without EZCon

To create a configuration file without EZCon, each RapidPrint 500 command will need to be manually entered into the file. To create or edit the file, complete the instructions in the following sections.

3.2.7.2.1 Creating the File

The configuration file basically contains RapidPrint 500 commands, one per line, that will be executed by the RapidPrint 500 in sequence. Privileged commands can be used because the startupfile is run in privileged mode on the server.

Capitalization of commands is optional. If a string (such as a password or filename) is entered, it must be enclosed in quotes to preserve case or non-alphabetic characters. To include a comment, preface each line of text with a pound character (#); these lines will be ignored.

If Define Server commands are included in the file, they will not take effect until the next reboot. Similarly, Define Port commands will not take effect until the port(s) are logged out. All other Define Service commands will take effect for the current boot.

The download file is re-read at every boot unless it is re-configured, so do not put commands such as Initialize Server or Crash 451 in the file. Unless the startup filename has been changed, an Initialize command will cause the RapidPrint 500 to boot perpetually and its recovery will require that NVR be flushed.

Managers can use the **Source** command to test the file, in effect causing the RapidPrint 500 to attempt to download a configuration file before making it a part of the server's boot routine. This test is strongly recommended as it helps eliminate errors that might prevent the RapidPrint 500 from booting. An example configuration file is shown in Figure 3-12.

Figure 3-12: Configuration File

```
#setting up the port
DEFINE PORT ALL BITRONICS ENABLED
DEFINE PORT ALL DSRLOGOUT ENABLED
#setting up a print service
SET SERVICE print1 IDENTIFICATION “Printer on lab RapidPrint 500 port 1”
SAVE SERVICE print1
```

3.2.7.2.2 Configuring the Host

The configuration file can be downloaded from a TCP/IP host (via TFTP), from a VMS host via LAT, or from a NetWare fileserver. In either case, some host configuration will be necessary.

- For TFTP loading, you will have to enable TFTP loading on your host and place the configuration file in a download directory.
- For LAT downloading, you will have to install the ets$configd service handler on your VMS hosts. The service handler code is included on the software media included with your RapidPrint 500.
- For NetWare, the configuration file must be in the fileserver's login directory.

3.2.7.2.3 Configuring the RapidPrint 500

To configure the RapidPrint 500 to use the commands in the configuration file, use the **Source** command. If the configuration file must be downloaded each time the RapidPrint 500 boots, the filename must be specified using the **Set/Define Server Startupfile** command.

The configuration filename is generally of the form "host*filename", where host can be a TCP/IP, VMS, or NetWare node name. The asterisk should be replaced with colons or a backslash as follows: use one colon (:) for a TCP/IP host, two colons (::) for a LAT host, and one backslash (\) for a NetWare host.

For example, to download the file "config.cmd" from TCP/IP host TROUT at IP address 192.0.1.5, the following command would be used:

Figure 3-13: Downloading from a TCP/IP Host

```
Local> DEFINE SERVER STARTUP "192.0.1.5:config.cmd"
```

Figure 3-14 displays the command needed to download a startup file with the same filename from NetWare host BASS:

Figure 3-14: Downloading from a NetWare Fileserver

```
Local> DEFINE SERVER STARTUP "BASS\SYS:\LOGIN\config.cmd"
```

Figure 3-15 displays the command needed to download a startup file with the same filename from VMS host PIKE:

Figure 3-15: Downloading from a VMS Host

```
Local> DEFINE SERVER STARTUP "PIKE::config.cmd"
```

3.2.7.2.4 Download Sequence

If the configuration file cannot be downloaded at boot time, the server's behavior depends on the setting of the Retry limit. If the retry limit is zero, the RapidPrint 500 will wait forever until it can download the file. Otherwise it will try *retry* times and then continue booting. The command to specify the file and the number of retry attempts looks like the following:

Figure 3-16: Defining the Startupfile

```
Local> DEFINE SERVER STARTUPFILE "filename" RETRY 10
```

NOTE: *The server is NOT usable while retrying the download.*

If the startupfile is not readable, or if there is a problem with the file and the server cannot boot fully, the server is still accessible via the NCP/TSM and Telnet console ports.

Scripts written for TSM should work unchanged, with the possible exception of privileged mode. Set Privileged cannot be used in either a Source or Startupfile file, so the command must be removed from any TSM scripts that are to be used with Startupfile.

4 Server Configuration

4 - Server Configuration

After powering up the server for the first time, you will want to configure it for everyday use. Most of the parameters discussed in this chapter only need to be set once and can be left alone until a major change is needed.

NOTE: *Before Telnet can be used, IP parameters must be specified. See your Configuration Guide.*

After configuring server-wide parameters for your RapidPrint 500, proceed to Chapter 5 for port-specific configuration. In addition, be sure to read the appropriate Host Setup chapter(s) to configure your host machine(s) to take advantage of available RapidPrint 500 features.

4.1 Preconfiguring Virtual Ports

Incoming LAT or Telnet/Rlogin logins to the RapidPrint 500 do not have a physical "port" associated with them, since they can appear and disappear at random. Therefore, each such connection receives a "virtual port" at the time of connection which disappears after logout. These virtual ports are created from a "template port," which is the set of characteristics that every network login receives. Each user can then use the Set Port commands to customize his or her own port during that connection, but cannot save the individual port settings.

The RapidPrint 500 provides a way to preconfigure virtual ports. If a parameter is Defined on port zero, it will set up default parameters to be provided for all of the network logins. Users can change or clear these characteristics on their own ports with their own Set Port command after login. List Ports allows users to see the **template port** setup (port 0). A recommended use for the template port is to provide local switches to network logins, as they typically do not have any Break key to use after they connect.

NCP and Telnet remote consoles are considered virtual logins, so they will also receive the template port's setup.

4.2 AppleTalk Server Parameters

The only configurable AppleTalk parameter is the zone to which the RapidPrint 500 will belong. If there is no AppleTalk router on the network, all devices will pick the same zone ("*"). If a router is present, the RapidPrint 500 will use the network's default zone unless **Define Protocols AppleTalk** is used to specify a different zone name.

Figure 4-1: Specifying AppleTalk Zone

```
Local> SET PROTOCOL APPLETALK ZONE "AcctZone"
```

The above command places the RapidPrint 500 in an AppleTalk zone called "AcctZone." An error will be returned (and the default zone used) if the zone could not be confirmed with a router.

NOTE: *Zone names are case-sensitive; if lowercase letters are used in the name, it must be enclosed in quotation marks.*

The current zone name is visible via the Show Protocols screen. The Show Protocols AppleTalk screen and its subscreens give even more detail, including the current network range and packet counts. A node will only show up in the display if it is a router or is in direct contact with the RapidPrint 500 for printing or configuration.

4.3 LAT Server Parameters

Two groups of LAT parameters can be specified in order for the server to communicate on the network: the server's identification information (its ident string and name) and network timers. In addition, a node limit can be set.

4.3.1 Server Identification

Setting these parameters is straightforward. Select a short, unique and descriptive name for the server, as well as a more descriptive string to be used as the identification string. The name may contain up to 16 characters and the identification string may contain up to 40 characters.

Figure 4-2: Defining Server Name

```
Local> DEFINE SERVER NAME "Server_1"
Local> DEFINE SERVER IDENT "Biolab Server: Modem Available"
```

In the example above, Define is used to make the changes permanent, and quotes are used around the strings to preserve lowercase letters, spaces, and punctuation.

NOTE: *If you Define parameters, be sure to reboot the server to put them into effect.*

4.3.2 Network Timers

The LAT network timers (Circuit, Keepalive, and Multicast) as well as the Retransmit Limit are set to default values at the factory and are correct for most networks. They should be changed only if you are sure the change is necessary. If for some reason you need to change one or more of these parameters, the commands might look like the following:

Figure 4-3: Changing LAT Parameters

```
Local> DEFINE SERVER CIRCUIT 60
Local> DEFINE SERVER RETRANSMIT LIMIT 100
```

4.3.3 Node Limit

The **Set/Define Server Node Limit** command is used to set the number of remote LAT service nodes the server will store information for. This can be set in large network environments to keep RapidPrint 500 network overhead down. Figure 4-4 displays an example.

Figure 4-4: Setting a Node Limit

```
Local> DEFINE SERVER NODE LIMIT 5
```

4.4 NetWare Server Parameters

Several NetWare parameters can be configured to ensure that your RapidPrint 500 functions properly on an IPX network. First, Set / Define Server NetWare Loadhost can be used to specify the fileserver from which to download operational code.

Figure 4-5: Defining a NetWare Loadhost

```
Local> DEFINE PROTOCOLS NETWARE LOADHOST “loadserv”
```

Other configurable parameters are discussed in the following sections.

4.4.1 Routing and Encapsulation

The RapidPrint 500 will listen to all NetWare frame types by creating an internal network number and advertise itself as a router to this network. In general, this will allow all nodes and fileservers to access the RapidPrint 500 regardless of frame type. If this behavior is not desired, the RapidPrint 500 can be restricted to only one frame format (and thus does not need the internal network and routing support). Three commands control this behavior:

- **Set/Define Protocols NetWare Routing** disables or enables the creation and use of an internal network number.
- **Set/Define Protocols NetWare Internal** allows you to set the internal network number if the preconfigured internal network number does not meet your requirements.
- **Set/Define Protocols NetWare Encapsulation** controls which frame type to use when routing is disabled. The choices are ETHER_II, NATIVE, 802_2, and SNAP. These provide for Ethernet v2, Native mode, 802.2, and 802.2 SNAP, respectively.

Figure 4-6: Setting Frame Types

```
Local> DEFINE PROTOCOL NETWARE ENCAPSULATION SNAP
```

By default, Routing is enabled and all applicable encapsulation types are supported. See *Network Protocols* for more information on the various frame types.

4.4.2 NetWare Access Lists

The NetWare access lists are used to control which fileservers the RapidPrint 500 will query for print requests. Recall that, by default, the RapidPrint 500 will query all fileservers on the local network for pending print jobs.

Since NetWare networks can have hundreds of fileservers, the network needs a way to reduce the number of RapidPrint 500 queries, both to reduce network traffic and to prevent long delays in servicing active queues. The access list contains the names of the fileservers to query, and / or the keywords **All** and **Local**. All means no restrictions, while Local means only those fileservers that are on the same network as the RapidPrint 500.

For example, the following commands (Figure 4-7) allow the RapidPrint 500 to query all fileservers on the local network, as well as the non-local server RFS2.

Figure 4-7: Setting NetWare Access

```
Local> DEFINE PROTOCOL NETWARE ACCESS LOCAL
Local> DEFINE PROTOCOL NETWARE ACCESS RFS2
```

The **Show/Monitor/List Protocols NetWare Access** command shows the current and saved access lists, respectively. The **Clear/Purge Protocol NetWare Access** command removes items from the access list.

The **Set Protocols NetWare Reset** command can be used if necessary to force the RapidPrint 500 to rescan all fileservers for pending jobs. This is useful after rebooting or after configuring new queues on the fileservers to ensure that the RapidPrint 500 recognizes queues directed to itself.

Since the fileservers wait to be polled by the RapidPrint 500 for print jobs, they cannot tell if the RapidPrint 500 is not polling them due to access restrictions. There will be no error messages if a valid fileserver cannot print to the RapidPrint 500 due to the access list.

4.5 TCP/IP Server Parameters

If you want TCP/IP connectivity (Telnet, Rlogin, LPR, and reverse Telnet support), you must configure IP parameters on the RapidPrint 500. First and foremost, the RapidPrint 500 *must* have a unique IP address. If this was set at boot time (by BOOTP or RARP), it does not need to be reset. Other parameters are explained in this section.

4.5.1 IP Address

One of the most common problems encountered is that of duplicate IP addresses on the network. Signs of this problem are Telnet/Rlogin connections that fail soon after connecting and ARP requests that do not find a known host. If these problems occur, make sure that the RapidPrint 500 has a unique IP address on the network.

NOTE: *See your Configuration Guide for more information on configuring the IP address.*

If the server either loses its IP address when booting or will not allow a new IP address to be configured, another host might be using the same address. Again, check the IP addresses on the network.

4.5.2 Other TCP/IP Parameters

You can set a gateway host, which allows TCP/IP connections to other connected network segments. Finally, you can set a loadhost (if not done already) so that TCP/IP boots will be attempted. All of the TCP/IP server parameters can be configured as shown in Figure 4-8.

Figure 4-8: Setting TCP/IP Parameters

```
Local> DEFINE SERVER IPADDRESS 192.0.1.228
Local> DEFINE SERVER GATEWAY 192.0.1.188
Local> DEFINE SERVER LOADHOST 192.0.1.33
```

Multiple commands can be entered on a single line, subject to the server's command line length limit of 132 characters. The following commands have the same effect as those in the previous example.

Figure 4-9: Setting Multiple Parameters on One Command Line

```
Local> DEFINE SERVER IPADDRESS 192.0.1.228 LOADHOST 192.0.1.33 GATEWAY 192.0.1.188
```

You can also configure a backup host in case the primary gateway fails.

Figure 4-10: Configuring Backup Hosts

```
Local> DEFINE SERVER SECONDARY GATEWAY 192.0.1.195
```

4.5.3 Host Limit

The **Set/Define Server Host Limit** command is used to set the number of remote TCP / IP hosts the server will store information for. This can be set in large network environments to keep RapidPrint 500 network overhead down. An example of the command is shown in the following figure:

Figure 4-11: Setting a Host Limit

```
Local> DEFINE SERVER HOST LIMIT NONE
```

4.6 Creating Services

A service is any resource that can be accessed locally or via the network. For example, a host is a service to which terminals can connect. The RapidPrint 500 can offer its attached printer to the network as services.

When you try to modify a service that already exists, the command will simply change its characteristics. If the service does not exist yet, the server assumes you want to create that service. The RapidPrint 500 will only print an error message if you try to remove a service that does not exist. Note also that connections and queueing are enabled by default whenever you create a service.

NOTE: *The RapidPrint has no method of connecting to a local service; services must be tested from another LAT, TCP, NetWare, or AppleTalk node.*

The RapidPrint 500 contains three unique default printing services: one for text (MPS_*xxxxxx*_TEXT), one for PostScript (MPS_*xxxxxx*_PS), and one for Binary / PCL (MPS_*xxxxxx*_PCL). For more information on default RapidPrint 500 services, see the *Services* chapter of your RapidPrint 500 **Configuration Guide**.

4.6.1 Creating a Simple Service (Such As a Line Printer)

Figure 4-12 shows the command needed to create a service called *dump_port* on the parallel port. Connections, queueing, banner, and formfeed options are enabled by default when you enter a Set Service command, so it is not necessary to configure them explicitly. NetWare, and RTEL access are provided by default, but LAT and AppleTalk access have to be explicitly enabled.

Figure 4-12: Set Service Command

```
Local> SET SERVICE dump_port LAT ENABLED
Local> LOGOUT PORT
```

Enter the Show Services commands to verify the service was created and usable. You should see something like the following:

Figure 4-13: Show Service Command

```
Local> SHOW SERVICE LOCAL CHARACTERISTICS

Service: DUMP_PORT          Ident:
Rating: 255                 Ports: 1
Characteristics:            Queuing Banner RTEL Formfeed
                            NetWare LAT Connections

Enabled Groups: 0
```

Note that the service rating is non-zero, indicating that the service is available for connections. If the service rating were zero, the service would not be available. This can happen if connections are disabled, or if the service / port is in use by someone else. The Show Port All command is useful for finding out why a service is unavailable, as it shows port login statuses, and the services currently being offered.

4.6.2 Setting Up a Service With Group Codes

Local ports can be given a list of LAT service groups that they are authorized to use. The access list will deny the ports access to services that do not belong to any matching authorized groups. For example, you may wish to limit connections to a printer or to a certain set of ports on a server. To start up a printer service and ports with group list access, you could enter the following commands:

Figure 4-14: Service Configuration Example

```
Local> DEFINE SERVER GROUPS 1,2-5 ENABLED
Local> DEFINE PORT 1 AUTHORIZED 1,4,7 ENABLED
Local> DEFINE PORT 1 NAME “printer”
Local> LOGOUT PORT 1
Local> SET SERVICE “printer” IDENTIFICATION “LocalPrint
Local> SAVE SERVICE “printer”
```

In order, the commands in Figure 4-14:

1. Enable group 1 and groups 2 through 5 on the server and assign them to any local services.
2. Define the port so it can access groups 1, 4, and 7. When a port logs in, all of its authorized groups are usable.

NOTE: *For more information on port settings, see Chapter 5.*

3. Name the port.
4. Log the port out so that the Define commands take effect.
5. Create a service "printer" on the port that allows connections and queueing by default, and enable the server send out an identification string in network multicasts.
6. Save the service so that it will be enabled after the next server reboot.

NOTE: *Group codes only apply to LAT connections. They have no effect on the other protocols supported by the RapidPrint 500 (AppleTalk, LAN Manager, NetWare, and TCP/IP).*

4.6.3 TCP/Telnet Service Sockets

The TCPport and Telnetport service options allow you to configure a TCP socket associated with a service. Connections to that socket number are mapped to the service. As long as the service rating is non-zero (that is, providing a port is available to handle the TCP connection), TCP connections to the socket are accepted.

The Telnetport and TCPport options are identical, except that Telnetport will perform Telnet IAC interpretation on the data stream, while TCPport treats the connection as a raw data pipe. Neither provides for queueing—if the service is unavailable, the TCP connection is rejected.

4.6.4 Enabling Other Service Options

In addition to the TCPport and Telnetport service options, seven other print-related options can be enabled on a service:

Table 4-1: Service Options

Option	Functionality
AppleTalk	If enabled, allows AppleTalk users to see this service. Macintosh computers, for example, will see the service name in their Choosers if they are on the same zone / network as the RapidPrint 500. Note that all AppleTalk enabled services on the RapidPrint 500 are assumed to be LaserWriter printers running PostScript. There is no way to support non PostScript devices (like ImageWriters and modems).
Banner	If enabled, provides a banner page before service data is sent to the port. Note that the host software may still provide its own banner page regardless of the RapidPrint 500 service setting. This option should not be used with PostScript.

Table 4-1: Service Options , Cont.

Option	Functionality
Binary	If enabled, prevents the RapidPrint 500 from processing the data stream. Disabling this feature, the default, allows the RapidPrint 500 to convert <LF> to <CR><LF> and possibly perform tab expansion. PostScript (below) implies binary mode. Binary should be enabled for PCL jobs.
DLC	If enabled, handles NT DLC print connections. Only once service per server can have DLC enabled.
Formfeed	If enabled, appends a Formfeed to print jobs.
NetWare	If enabled, allows print queues on NetWare fileservers to use this service. Note that if NetWare is not enabled on any RapidPrint 500 services, the RapidPrint 500 will not poll the fileservers; it will only poll if there is a possible queue in use.
Postscript	If enabled, queries the printer (via Ctrl-D exchanges) to make sure it is ready for a new job before starting any job. Any service supporting only a PostScript printer should also have this flag enabled.

4.7 Security

4.7.1 SNMP Security

Since SNMP can be used to change server settings, a way to prevent unauthorized set commands is needed. The server provides a security mechanism for restricting SNMP access to the unit that is linked to the SNMP community name used. By default, only the name **Public** is allowed, and it is given only Read privileges. To prevent easy access to the allowed community names, the Show and List SNMP commands are restricted to privileged users.

Set SNMP requires a community name and an access type: Readonly, Both (read and write), or None. Clear requires that you enter either a community name to remove an individual entry or the All parameter to clear the entire table. SNMP queries or Set requests that are not permitted are sent an error reply specifying the problem.

4.8 Quick Reference

LAT Server Parameters

To	Use This Command	Example(s)	What Example Does
Set Server Identification Parameters	Set / Define Server Name	`SET SERVER NAME "Server_1"`	Gives the server a unique name to use on the LAT network. See *Server Identification* for more information.
	Set / Define Server Identification	`SET SERVER IDENTIFICATION "Biolab Server: printer available"`	Gives more detailed information about the server to be used for server queries. See *Server Identification* for more information.
Change the LAT Network Timers	Set / Define Server Circuit Timer, Set / Define Server Keepalive Timer, Set / Define Server Multicast Timer		These timers should not have to be changed under normal circumstances. See *Network Timers* for more information.
Change the Retransmit Limit	Set / Define Server Retransmit Limit		See above.
Specify a LAT Node Limit	Set / Define Server Node Limit	`SET SERVER NODE LIMIT 5`	Allows the RapidPrint 500 to store information for up to five LAT nodes. See *Node Limit* for more information.

TCP/IP Server Parameters

To	Use This Command	Example(s)	What Example Does
Change the Server's IP Address	Set / Define Server IPaddress	`DEFINE SERVER IPADDRESS 192.0.1.55`	Sets the server's IP address to 192.0.1.55. Make sure that this address is unique to the network. See *IP Address* for more information.
Override the Default Subnet Mask	Set / Define Server Subnet Mask	`DEFINE SERVER SUBNET MASK 255.255.192.0`	Creates a custom subnet mask of 255.255.192.0. See the *Command Reference* for more information.
Configure the Gateway	Set / Define Server Gateway	`DEFINE SERVER GATEWAY 192.0.1.188`	Designates TCP / IP host 192.0.1.188 as the primary gateway used for routing. See *Other TCP/IP Parameters* for more information.
Configure the Backup Gateway	Set / Define Server Gateway	`DEFINE SERVER SECONDARY GATEWAY 192.0.1.225`	Designates TCP / IP host 192.0.1.225 to be used as a gateway when the primary gateway is unavailable. See *Other TCP/IP Parameters* for more information.
Specify the Server's Loadhost	Set / Define Server Loadhost	`DEFINE SERVER LOADHOST 192.0.1.33`	Specifies host 192.0.1.33 as the loadhost to be used for software downloads. See *Other TCP/IP Parameters* for more information.
Specify a TCP / IP Host Limit	Set / Define Server Host Limit	`DEFINE SERVER HOST LIMIT NONE`	Allows the server to store information about all TCP / IP hosts on the network. See *Host Limit* for more information.
Display the TCP / IP Configuration	Show / Monitor / List Protocols	`SHOW PROTOCOLS TCPIP`	Displays information about the current TCP / IP configuration.

NetWare Server Parameters

To	Use This Command	Example(s)	What Example Does
Change the Internal Network Number	Set / Define Protocols NetWare Internal	`SET PROTOCOLS NETWARE INTERNAL NETWORK a3cc0850`	Changes the preconfigured internal network number to "a3cc0850." See *Routing and Encapsulation* for more information.
Configure Routing and Encapsulation	1. Set / Define Protocols NetWare Encapsulation	`SET PROTOCOLS NETWARE ENCAPSULATION ETHER_II DISABLED`	Disables the Ether_II frame type. Unless explicitly disabled, the Native, 802.2, and Snap frame types are still enabled.
	2. Set / Define Protocols NetWare Routing	`SET PROTOCOLS NETWARE ROUTING ENABLED`	Enables internal routing. If more than one frame type is enabled, internal routing must also be enabled. See *Routing and Encapsulation* for more information.
Configure the Rapid-Print 500 to Query Access Lists	Set / Define Protocols NetWare Access	`SET PROTOCOLS NETWARE ACCESS ALL`	Scans all fileservers on the network for queues.
		`SET PROTOCOLS NETWARE ACCESS LOCAL`	Scans only fileservers on the local network segment for jobs. See *NetWare Access Lists* for more information.
View the Current and Saved Access Lists	Show / Monitor / List Protocols	`SHOW PROTOCOLS NETWARE ACCESS`	Shows the current fileserver access list. See *NetWare Access Lists* for more information.
Rescan All NetWare Fileservers for Pending Jobs	Set Protocols NetWare Reset	`SET PROTOCOLS NETWARE RESET`	Immediately rescans the network for new connections. See *NetWare Access Lists* for more information.

AppleTalk Server Parameters

To	Use This Command	Example(s)	What Example Does
See Which AppleTalk Zones are Available	Show / Monitor / List Protocols AppleTalk Zones	`SHOW PROTOCOL APPLETALK ZONES`	Displays the AppleTalk zones that the RapidPrint 500 can see on the network. See *AppleTalk Server Parameters* for more information.
Specify the Server's AppleTalk Zone	Define Protocols AppleTalk	`SET PROTOCOL APPLETALK ZONE "Accounting"`	Places the RapidPrint 500 in the Accounting zone of the AppleTalk network. See *AppleTalk Server Parameters* for more information.

Services

To	Use This Command	Example(s)	What Example Does
Create a Simple Service	1. Set / Define Service	`DEF SERVICE print1 PORT 1`	Creates a service called "print1" that can be used from port 1. See *Creating a Simple Service (Such As a Line Printer)* for more information.
	2. Logout	`LOGOUT PORT 1`	Logs out the port so the entry can be tested (see 3).
	3. Show / Monitor / List Services	`SHOW SERVICES CHARACTERISTICS`	Verifies that the service has been created and is usable.

SNMP Security

To	Use This Command	Example(s)	What Example Does
Change the SNMP Access Mode	Set / Define SNMP	`SET SNMP COMMUNITY PUBLIC ACCESS READ`	Allows read-only access. See *SNMP Security* for more information.

5 Ports

5 - Ports

This chapter covers port-specific configuration for the RapidPrint 500, including virtual port configuration, port groups, port names, and security features.

5.1 Virtual Ports

Incoming Telnet and Rlogin connections are not associated with a physical port. Instead, they are associated with a **virtual port**, port 0, which serves for the duration of the connection.

Each virtual port is created with a default set of characteristics. The Define Port commands can be used to customize a virtual port during the Telnet/Rlogin session; however, these customizations cannot be saved. The port reverts to the default set of characteristics once the session is closed.

To make configurations that apply to all virtual ports (all future Telnet/Rlogin connections), use Define Port commands and specify zero as the port number. Figure 5-1 displays an example.

Figure 5-1: Configuring Virtual Ports

```
Local>> DEFINE PORT 0 LOCAL SWITCH ^F
```

When the command in Figure 5-1 is used, all ports will process the Break key locally rather than passing it on to the remote service.

Because NCP and Telnet remote console sessions are considered virtual logins, configurations made with Define Port 0 commands will apply to them. Define Port 0 commands are often used to provide local switches to network logins, as they typically do not have a Break key to use after the connection is made.

To display the characteristics used for virtual ports, enter the following command:

Figure 5-2: Displaying Virtual Port Characteristics

```
Local>> LIST PORT 0
```

5.2 General Port Characteristics

5.2.1 Group Numbers

Each port can be given one or more authorized LAT group numbers. By default, only group zero is authorized, which restricts a port's access to only those nodes that offer services in group zero. The server is also configured for group zero, so by default, all ports can access any services local to this RapidPrint 500. To allow port 1 access to specific groups, enter the **Set/Define Port Authorized Groups** command.

Figure 5-3: Defining Port Authorized Group

```
Local> DEFINE PORT 1 AUTHORIZED GROUPS 0,77,122-178
```

NOTE: *For information on server-wide enabling of LAT groups, see Set/Define Server Service Groups.*

5.2.2 Naming Ports

The default name for each port is Port_*n*, where *n* denotes the port number; for example, Port_1. To assign a particular name to a port, use the **Set/Define Port Name** command:

Figure 5-4: Assigning Port Name

```
Local>> DEFINE PORT 1 NAME “console_1”
```

5.3 Automatic Logouts

Ports can be configured to log out automatically when the DSR signal is dropped or when they’ve been inactive for a specified period of time.

5.3.0.1 DSRlogout

When a device connected to the RapidPrint 500 is disconnected or powered off, the DSR signal is dropped. To configure a port to log out when this happens, use the **Set/Define Port DSRlogout** command.

Figure 5-5: Enabling Dsrlogout

```
Local>> DEFINE PORT 1 DSRLOGOUT ENABLED
```

Normally, DSR must be enabled on a port for it to automatically log out when the device it is attached to is turned off or disconnected. When DSRlogout is enabled, the server will log out the port’s user if *either* of these cases occurs.

5.3.0.2 Inactivity Logout

To configure a port to log out after a specified period of inactivity, use the **Set/Define Port Inactivity Logout** command. This command works in conjunction with the **Set/Define Server Inactivity Timer** command, which defines an inactivity limit as a particular number of minutes. After this period of time, a port with Inactivity Logout enabled will be considered inactive and automatically logged out.

To enable Inactivity Logout for all ports, parallel and virtual, use the following command:

Figure 5-6: Enabling Inactivity Logout

```
Local>> DEFINE PORT 1 INACTIVITY LOGOUT ENABLED
```

5.4 Quick Reference

General Port Characteristics			
To	**Use This Command**	**Example(s)**	**What Example Does**
Assign LAT Group Numbers to a Specific Port	Set / Define Port Authorized Groups	`DEFINE PORT 1 AUTHORIZED GROUPS 0,77,122-178`	If they are also enabled server-wide, this command allows port 1 to use the listed groups. See *Group Numbers* for more information.
Assign a Name to a Port	Set / Define Port Name	`DEFINE PORT 1 PORT NAME "fast_printer"`	Assigns the name "fast_printer" to port 1. See *Naming Ports* for more information.
Port Security			
To	**Use This Command**	**Example(s)**	**What Example Does**
Force Users to Enter a Login Password	Set / Define Server Login Password	`DEFINE SERVER LOGIN PASSWORD "badger"`	Defines "badger" as the login password.
Log Out a Port When the DSR Signal Is Dropped	Set / Define Port DSRlogout Enabled	`DEFINE PORT 1 DSRLOGOUT ENABLED`	When the DSR signal is dropped (deasserted), port 1 will be logged out. See *DSRlogout* for more information.
Log Out a Port When It Is Idle for Too Long	1. Set / Define Server Inactivity Timer	`DEFINE SERVER INACTIVITY TIMER 15`	Sets a server-wide inactivity limit of 15 minutes.
	2. Set / Define Port Inactivity Logout Enabled	`DEFINE PORT 1 INACTIVITY LOGOUT ENABLED`	Enables inactivity logouts on port 1. When port 1 is inactive for 15 minutes (see above), the port is logged out and any active connections are disconnected. See *Inactivity Logout* for more information.

6 AppleTalk Host Setup

6 - AppleTalk Host Setup

AppleTalk configuration is extremely simple for Macintoshes that support EtherTalk. Macintoshes that do not support EtherTalk will need either an Ethernet interface or an EtherTalk-to-LocalTalk router to use the RapidPrint 500.

If a router is used, it will provide an EtherTalk zone on the Ethernet network, and the RapidPrint 500 devices will appear under that zone (see *Macintosh Service Configuration*, below). The RapidPrint 500 service name(s) should be visible and usable like any other LocalTalk device.

The RapidPrint 500 advertises its attached printers as LaserWriters. The RapidPrint 500 and its printers can be assigned to a specific zone with the **Define Protocols AppleTalk** command.

Figure 6-1: Specifying a New AppleTalk Zone for the Printer

```
Local>> DEFINE PROTOCOLS APPLETALK ZONE “Accounting”
```

Since printers attached to the RapidPrint 500 aren’t directly connected to the network, any programs or utilities that attempt to modify their AppleTalk settings will fail. The RapidPrint 500 controls all AppleTalk parameters, such as zone name and job time-outs, so modifying these settings on the printer itself will have no effect.

6.1 Bitronics Interface

Printing from a Macintosh requires bidirectional PostScript data flow. For that reason, the RapidPrint 500 supports the Bitronics interface created by Hewlett-Packard (IEEE 1284 nibble mode). This interface is an extension to the standard Centronics interface. Printers that support Bitronics (such as the DECLaser 3500) allow bidirectional communication via the parallel port. To enable Bitronics on the RapidPrint 500 parallel port, use the following commands:

Figure 6-2: Enabling Bitronics Mode

```
Local>> DEFINE PORT BITRONICS ENABLED
Local>> LOGOUT PORT 1
```

If the PostScript printer attached to the RapidPrint 500 can not provide interactive responses to the printing host, AppleTalk printing will fail. Macintoshes typically require responses to PostScript queries sent to the printer.

NOTE: *The printer must support Bitronics and the Bitronics mode must be enabled on the printer.*

6.2 Macintosh Service Configuration

To print from a Macintosh, you will need to enable both AppleTalk and PostScript. In Figure 6-3, a parallel service (RP_PRT) is created using the **Set/Define Service** command.

Figure 6-3: Enabling AppleTalk and PostScript on a Service

```
Local>> DEFINE SERVICE RP_PRT APPLETALK ENABLED POSTSCRIPT ENABLED
```

Once you've created the service, it should be visible in the Chooser of any Macintoshes that are in the same zone as the RapidPrint 500. If you have multiple zones on your network, the service will appear in the default zone specified by the AppleTalk router.

Once you locate your RapidPrint 500 printing service in the Chooser, select it and complete the appropriate setup options. Close the Chooser window and send a test page to the printing service.

6.2.1 Using AppleTalk on UNIX or VMS

If you are using third-party software that provides AppleTalk for UNIX or VMS, the RapidPrint 500 services should be visible like any other AppleTalk printer, and print queues should be able to access the RapidPrint 500 as any other AppleTalk printer. Due to the variety of software packages and their configurations, setup details cannot be shown here—refer to your local documentation for details. Note that native UNIX and TCP/IP printing methods such as lp and lpr are generally easier to set up and administer than non-native AppleTalk printing, and should be used whenever possible.

6.3 Printing from AppleTalk

6.3.1 Using LaserPrep

The LaserPrep application reduces the size of print jobs and therefore saves bandwidth. All Macintoshes printing to the RapidPrint 500 must be running the same version of LaserPrep, otherwise print jobs can be lost; reloading the LaserPrep file repeatedly can prevent jobs from printing reliably.

6.3.2 Printing Bitmap Graphics

Files containing embedded bitmap graphics may not print correctly even if the text surrounding the graphics does. This is because the bitmaps are actually binary data in this case, and binary data cannot be printed via serial or parallel interfaces.

Most major application packages have provisions to print using either "binary PostScript" (for printers connected to the network via LocalTalk) or "hex PostScript" (for printers connected to the network via a serial or parallel port). If the application you're using does not have this provision, contact the application vendor to see if there is an upgrade patch that adds this functionality.

6.4 Troubleshooting Macintosh Printing

AppleTalk printing is easy to set up, but can be hard to debug. Since the Macintosh is expecting PostScript replies from the print device, you cannot just attach a terminal to the RapidPrint 500 and watch the output. Also, there is no way to "connect" to the RapidPrint 500 port and talk to the printer via AppleTalk.

Table 6-1 shows a few common problems that you may encounter. When possible, try to get an error message from the printer to track down the problem (see *Error Messages*).

Table 6-1: Troubleshooting Macintosh Printing

Problem	Possible Cause	Explanation/Remedy
The print job doesn't print	The printer is not receiving data.	Most printers blink a LED as they receive data to show that they are getting something from the RapidPrint 500 / Macintosh. If the LED is not blinking, try to get an error message from the printer (see *Error Messages*).
Unreadable error message on the printer.	The printer's switches are set improperly.	Many printers can be configured via PostScript as well as by switches on the printer itself. PostScript configuration takes precedence over the switches. If you are unsure of the current saved setup, check your printer manual for a way to force the printer to obey the switch settings.
A readable error that says something like "Unknown command <characters>."	There may be a flow control problem.	If the RapidPrint 500 never sees the printer flow control, it may overrun the printer buffer resulting in corrupt data. Many printers can be configured via PostScript as well as by switches on the printer itself. If you are unsure of the current saved setup, check your printer manual for a way to force the printer to obey the switch settings.
The first print job prints fine, but other print jobs are garbled or lost.	The printer cannot distinguish between jobs.	Make sure PostScript is enabled on the RapidPrint 500 service—this ensures that the RapidPrint 500 will not start a new job before the last job is finished. It will force a Ctrl-D to the printer before beginning a new job, and wait for an acknowledgment before continuing.

NOTE: *See your printer's documentation for more information on printer configuration and any printer-specific errors.*

6.4.1 Error Messages

Macintosh print spoolers (for example, PrintMonitor or LaserSpool) typically report errors, possibly via a “distressed printer” icon in the upper right part of the screen. If you see a similar indication on your screen, open the spooler window and check for an error message from the printer.

If you can connect to the printer service on the RapidPrint 500 via LAT or TCP/IP, try typing some keys to the printer and pressing Return. The printer will typically respond with a PostScript error message like that shown in the following figure.

Figure 6-4: PostScript Error Message

```
%% Unknown command <stuff>.
%% Flushing to end of job.
```

If the message is legible, the printer is apparently receiving and sending data correctly. Press Ctrl-D to signal the end of job (and clear the error condition), and then disconnect from the service without typing any more data to the printer.

7 LAN Manager Host Setup

7 - LAN Manager Host Setup

The following sections cover print configuration for LAN Manager hosts. These instructions are designed mainly for Windows NT users.

7.1 Printing Methods

If you are unable to use EZCon, the best way to configure the RapidPrint 500 is to use the IP protocol and the Berkeley remote LPR software. See *LPR on Windows NT Hosts* for LPR configuration instructions.

NOTE: *The RapidPrint 500 must be added as a Windows NT printer before it can accept print jobs from a Windows NT host.*

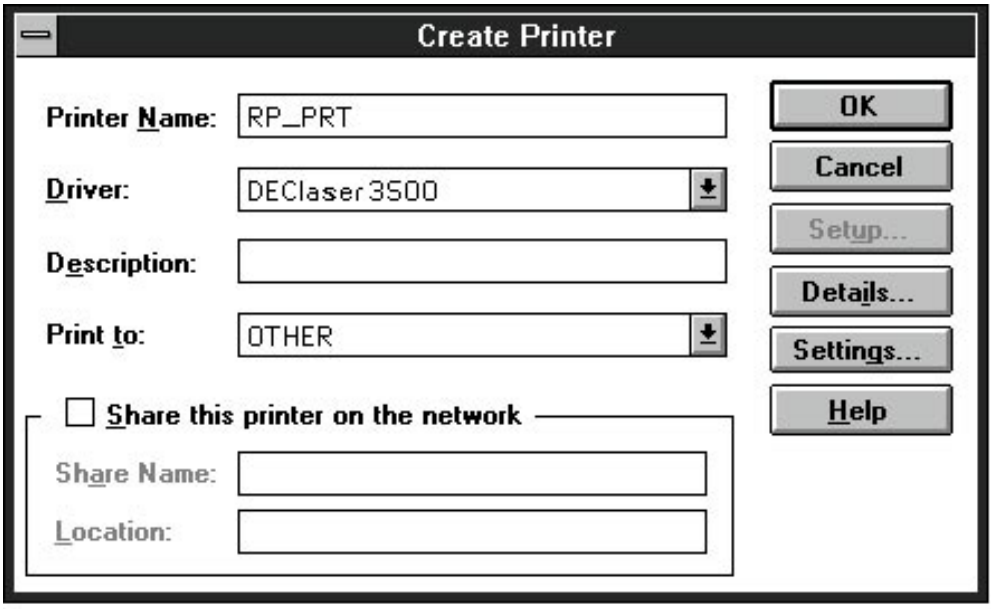
The following sections cover Digital Network Port and NetBIOS protocol configuration for Windows NT hosts.

7.1.1 Digital Network Port

This section describes how to configure the RapidPrint 500 in the Windows NT environment. It is assumed that the permanent IP address has already been set on the RapidPrint 500.

1. Open the NT Print Manager; its icon is located in the Main window of the Windows Program Manager.
2. From the Printer menu, choose **Create Printer**.

Figure 7-1: Create Printer Dialog Box



NOTE: *If the printer driver isn't already installed, you will need the Windows NT installation disks.*

3. In the **Printer Name** box, enter a printer name of up to 32 characters.
4. In the **Driver** box, select **Other** to install a printer driver, then select the desired printer driver from the pull-down menu.
5. Enter a description string in the **Description** box.
6. If applicable, choose the **Share this printer on the network** option. (This is not recommended until the print queue is confirmed to be running properly.)
7. In the **Print To** box, scroll to the **Other** option.
8. In the **Print Destinations** window, select **Digital Network Port** and click the **OK** button.
9. In the **Add Port - Digital Network Port** window,:
   A. Select the port type **Digital RapidPrint Server (via TCP/IP)**.
   B. For **Address of printer**, enter the printer's IP address.
   C. Enter a name for the port (you can use the same name as you did for the printer), then click on the **Options** button.
10. In the **Digital RapidPrinter Server Options** dialog box:
    A. Enable **Print Banner Page** (optional —for use with PostScript printing only).
    B. Under **Additional Port information**, select **Other** and enter port number 3001. Do not use the **Configure** button. (This step applies only to the RapidPrint 200 server, not the RapidPrint 500 server.)
    C. Click **OK**.
11. Click on the **OK** button in the **Add Port** window, then in the **Create Printer** window.
12. You may see an additional dialog box that allows you to set default parameters such as paper size, paper source, etc. When completed, click on the **OK** button.

    A window will appear with the printer name as the title.
13. Close this window and an icon will be displayed in the **Print Manager**. You may now select this printer as the default printer.
14. Close the **Print Manager**.

The printer is now ready to accept jobs.

7.1.2 NetBIOS

To install NetBIOS, first create a service with LAN Manager enabled (see Figure 7-2). Note that in the example below, we've also used the **Set/Define Server Name** command to give the server a name.

Figure 7-2: Enabling LAN Manager

```
Local_1>> SET SERVER NAME GRAPHICSERVER
Local_1>> SET SERVICE NTX LANMANAGER ENABLED
```

7.1.2.1 Redirecting a Port

Redirecting allows a user to use a service on the RapidPrint 500 as if the RapidPrint 500 parallel port were on the host machine. To print from NetBIOS, you will need to redirect a port.

1. Choose one of the lpt ports to redirect (typically the ports to choose from will be lpt1 through lpt4). Make sure that the chosen port doesn't currently have a printer connected to it.
2. Double-click the DOS Command Prompt icon to open a DOS session.
3. At the DOS prompt, issue the **Net Use** command to indicate that the lpt port will be redirected to the RapidPrint 500 service. In the example below, **GRAPHICSERVER** is the name of the RapidPrint 500 and **NTX** is the name of the service.

Figure 7-3: Net Use Command

```
C:> NET USE LPTn: \\GRAPHICSERVER\NTX
```

The Windows NT node will attempt to connect to the RapidPrint 500; if it cannot do so, it will inform you of the problem. At this point, all references to LPT*n* (the port specified with the NET USE command above) will go to the service that you created. For testing purposes, you can try to use a copy command, if the RapidPrint 500 is ready to accept data.

4. To make the lpt redirect permanent, use the following command.

Figure 7-4: Making Redirect Permanent

```
C:> NET USE /PERSISTENT:YES
```

When the host is rebooted, the lpt redirect will be remembered; the host will automatically attempt to connect to the RapidPrint 500.

7.1.2.2 Printing from NetBIOS

Follow these steps to print from NetBIOS.

1. Exit the MS-DOS shell.
2. Open the NT Print Manager; its icon is located in the Main window on the desktop. Choose **Create Printer** from the Printer menu (see Figure 7-1).
3. In the **Printer Name** box, enter the name of the queue on the NT host.
4. Click the **Driver** menu arrow; select the required printer driver from the pull-down menu. Enter a description string in the **Description** box.
5. Click the Print To menu arrow to view its pull-down menu, and select the lpt port you wish to redirect. Click the **OK** button in each print dialog displayed.

   Windows NT versions prior to 3.51 do not ship with a basic text-only printer driver. If you wish to print to a terminal for testing purposes, you'll need to use some type of line printer driver and will see the embedded print codes.
6. If you'd like this printer to be the default printer, click the **Default** menu arrow on the Print Manager's title bar and scroll to the printer's name.

7.2 Windows NT Troubleshooting

If you've followed the setup instructions listed in this chapter, Windows NT printing should run smoothly. However, there are two potential problems.

1. When Windows NT determines that insufficient progress is being made on a print job, it will automatically time out print jobs, forcing you to abort or retry.

   By default, the timeout period is set to 45 seconds. If you have a slow printer, this timeout period may not be long enough; Windows NT may time out your print job when it's queued to the RapidPrint 500. To change the timeout period, see the **Settings** dialog box in Windows NT.

   On some versions of Windows NT editing the timeout period does not actually change the 45 second timeout period.When a timeout occurs, Windows NT will try to restart the entire job. If you are unable to change your timeout period, try using LPR instead.
2. Windows NT supports printing via AppleTalk and LAN Manager. However, the RapidPrint 500 and NT AppleTalk implementations are not compatible at this time; the RapidPrint 500 cannot accept AppleTalk jobs from Windows NT hosts.

8 LAT Host Setup

8 - LAT Host Setup

LAT print queues can print directly to a port or print to a service. Printing directly to a port requires no RapidPrint 500 configuration and is the recommended configuration. Note that the LAT characteristic must be enabled on any service being used.

Refer to your LATCP documentation as you read the following sections. Note that you need system privileges to create and change LAT ports.

8.1 Printing to an Application Port

Most VMS applications that can utilize the RapidPrint 500 will require the setup of a LAT **application port**. This is a device that allows programs to treat a LAT connection as a physical port for input and output. For example, a printer might be configured to use port LTA3419, which might be connected, or mapped, to port 1 on the RapidPrint 500. The LAT port can be mapped to either a service or a specific port on the RapidPrint 500.

To configure LAT on your VMS host machine so that users can connect to a remote port, use the LATCP program to create a new, unique port, then set it to the appropriate node and port name. Enter the following commands at the VMS system prompt:

Figure 8-1: Creating a LAT Application Port

```
$ RUN SYS$SYSTEM:LATCP
LCP> CREATE PORT LTAnnnn/APPLICATION
LCP> SET PORT LTAnnnn/node=nodename/port=port_1
LCP> SHOW PORT LTAnnnn
LCP> EXIT
```

In the example above, **nodename** and **port_1** are the names of the print server and port name, respectively. The *nnnn* designation is any unused LAT port number; use the Show Ports command to see which port numbers are in use. Once the port has been created, VMS users can use port LTA*nnnn* to connect to the RapidPrint 500. When the port is used as the target of an application, such as a print queue, a LAT connection with the service will be attempted.

LATCP ports are not permanently configured. To create the required LAT devices after each host reboot, add the necessary commands to the SYS$MANAGER:LAT$SYSTARTUP.COM file.

To create and start a LAT queue using a LAT application port, enter the following command.

Figure 8-2: Creating and Starting the Queue

```
$ INITIALIZE/QUEUE/START/ON=LTAnnnn:/PROCESSOR=LATSYM/RETAIN=ERROR queue_name
```

A print request would then look like this:

Figure 8-3: Print Request

```
$ PRINT/QUEUE=queue_name filename.txt
```

8.2 Printing to a Service

Printing using a LAT service requires the creation of three items:

- A LAT service on the RapidPrint 500
- A LAT device (application port) that references the print resource
- A print queue that uses the LAT application port

Set up the print service on the RapidPrint 500 as shown in the example below. See *Creating Services* for an explanation of the RapidPrint 500 commands used to complete this task.

Figure 8-4: Sample Commands For Service

```
Local>> DEFINE SERVER NAME server1
Local>> DEFINE SERVICE printer1 LAT ENABLED
Local>> INIT DELAY 0
```

A LAT application port can then be created. For example, if you want to create a new LAT device *LTA1234* that accesses print service **printer1** on the RapidPrint 500 named **server1** using VMS queue **remote_prq**, enter the commands in Figure 8-5.

Figure 8-5: Creating LAT Device

```
$ RUN SYS$SYSTEM:LATCP
LCP> CREATE PORT LTA1234/APPLICATION
LCP> SET PORT LTA1234/NODE=server1/SERVICE=printer1
LCP> EXIT
```

The RapidPrint 500 name must match the name in the **/Node** field in the LATCP Set Port command above. The service names specified must also match. In addition, you may want to use the following commands on the RapidPrint 500 to set up terminal characteristics for the print device.

Figure 8-6: Setting Up Terminal Characteristics

```
$ SET TERM/PERM/NOBROAD/FORM/WIDTH=132 LTA1234
```

When the configuration is complete, create and start a VMS queue.

Figure 8-7: Creating and Starting VMS Queue

```
$ INIT/QUEUE/START/ON=LTA1234:/PROCESSOR=LATSYM/RETAIN=ERROR remote_prq
```

A print request might look like the following:

Figure 8-8: Print Request

```
$ PRINT/QUE=remote_prq filename.txt
```

8.3 Printing Using DCPS Software

The DCPS software supplied by Digital requires a bidirectional data path. This is only available on the parallel port if the printer supports the Bitronics extensions to the Centronics interface. For more information, see *Bitronics Interface*.

NOTE: *Autoselecting printers must be locked into PostScript mode for DCPS to work correctly.*

8.4 The ets$configd Download Server

The download server process must be installed if you plan to use the Source command or Startup-file option to download a configuration file into your RapidPrint 500. It is also required for sending syslog information to a VMS host. The process runs on a VMS machine and waits for a download connection, then tries to download the requested file to the RapidPrint 500.

Two steps are required to use the download server. First, the server code must be compiled on your VMS host. The code is written in C and should build on any VMS system. Second, the download process has to be started on the VMS machine either by hand or as part of the system startup.

To compile the download server, enter the following commands:

Figure 8-9: Compiling Download Server

```
VMS> cc ets$configd
VMS> link ets$configd,sys$input/opt
sys$share:vaxcrtl.exe/share <ctrl-z>
VMS> copy ets$configd.exe sys$startup
```

Then start the ets$configd server. The format for the command is shown in the following example.

Figure 8-10: Starting the ets$configd Server

```
VMS> @SYS$STARTUP:ETS$STARTUP cmd dir dev log
```

The parameters listed in the command are:

cmd	Either Start, Show, or Stop. Start will create the server process, Show will show the process's current status, and Stop will kill the server process.
dir	The directory out of which the download files will be loaded.
dev	The LAT device, if different from the default LTA9777.
log	The name of the file to which status data from the server will be written.

The configuration parameters must be specified in order, and cannot be left out unless you are ending the command line, as in the next example.

Figure 8-11: Syntax Example

```
VMS> @SYS$STARTUP:ETS$STARTUP START -
VMS>_ DUA0:[RAPIDPRINT] LTA5000:SYS$MANAGER:ETSLOG.DAT
```

You can use the VMS command **Show System** to ensure the download process started properly. To shut down the server process, enter the following command:

Figure 8-12: Shutting Down a Server Process

```
VMS> @SYS$STARTUP:ETS$STARTUP STOP
```

Managers can use the **Source** command on the RapidPrint 500 to attempt to download a configuration file and test the functionality of the download server before actually using the download file at boot time. See the Source entry in the *Command Reference* chapter for more details.

The RapidPrint 500 must be able to find the VMS host in order to utilize the download process. If the node limit on the RapidPrint 500 is set to zero, it may not be able to locate the VMS host. For downloading to work reliably, ensure that the RapidPrint 500 node limit is non-zero.

NOTE: *See Set/Define Server Node Limit for more information on node limits.*

8.5 VMS Printer Troubleshooting

If a remote print queue is not functioning properly, check the following items:

- Verify that the LTA*nnnn* device is mapped to the correct server and port / service name. Use the LATCP **Show Port LTA*nnnn*** command to see what server / service combination the LTA device is mapped to.
- Verify that the print server name matches the information obtained via Show Port LTA*nnnn*.
- On the print server, verify that the server and port / service names specified match the names obtained via Show Port LTA*nnnn*, and
- If using a service, verify that the service is available by issuing the following server command:

Figure 8-13: Show Service Command

```
Local> SHOW SERVICE service_name CHARACTERISTICS
```

The service port should be the port to which the printer is physically connected. The service rating should be non-zero to signal that the service is available.

- Verify that the LAT characteristic is enabled on the service.
- On the server, issue the following command to see if the host is attempting to make a LAT connection:

Figure 8-14: Monitor Queue Command

```
Local> MONITOR QUEUE
```

When a job is active, a queue entry from the VMS host to the specified service should appear.

If the printer still does not function properly after verifying these conditions, contact Digital technical support for assistance.

9 NetWare Host Setup

9 - NetWare Host Setup

This chapter covers NetWare host setup for printing.

NetWare print queues may be configured using EZCon (the recommended method), PCONSOLE, or QINST. The method that you use to set up NetWare print queues will be determined by the version of NetWare that you are using and whether you use Bindery Emulation or NetWare Directory Service (NDS). If you are running NetWare version 4.0 or greater, refer to the *Creating NDS Print Queues* section. If you are running versions 2.x, 3.x, or version 4.0 with Bindery Emulation, refer to the *Creating Bindery Print Queues* section.

EZCon and QINST are all provided on the distribution CD-ROM. See the CD-ROM booklet and README files for more information on installation and use.

NOTE: *To use EZCon, NetWare users must be running Windows version 3.1 or later with the NetWare VLM or a Winsock-compliant IP stack.*

9.1 Access Lists

By default, the RapidPrint 500 will only scan local file servers (file servers one hop away) for print queues to service. File servers on non-local Ethernets, such as those with an IPX router between them and the RapidPrint 500, can be scanned for print queues using the following command:

Figure 9-1: Enabling Non-local File Servers

```
Local>> DEFINE PROTOCOL NETWARE ACCESS fileserver
Local>> INITIALIZE DELAY 0
```

To enable scanning for jobs on all file servers in the extended network, replace the file server name with the keyword **All**.

NOTE: *On an extended wide or local-area network with many file servers, specifying All can severely impact the time between jobs and the overall printing performance.*

9.2 Printing

The RapidPrint 500 can process NetWare print jobs either as a printserver (pserver) or via rprinter. When using the pserver method, the RapidPrint 500 logs into a file server and then queries the server for pending print jobs that it can service. When using the rprinter method, the RapidPrint 500 dedicates the printer to a particular file server; the printer is not usable by other file servers or protocols. The significant benefit of the rprinter method is that rprinter does not use a login slot on the file server (pserver does).

The pserver login uses the RapidPrint 500's name and the login password to log into the file server. If the default login password is changed, NetWare print queue setups must also be changed to reflect the new password.

Printing can be configured in one of four ways. The first three methods configure the RapidPrint 500 services as pserver devices, while the fourth covers rprinter setup.

1. Pserver configurations can be made via PCONSOLE's Quick Setup utility. To use Quick Setup you must be running NetWare version 4.0 or greater with NDS enabled. Three basic steps are involved: NDS licensing, print server configuration, and print queue configuration.
2. The preferred pserver configuration method for Bindery print queues is to use the QINST utility. It will interactively prompt you for the names of the file server, the name of the print queue to create, and the RapidPrint 500 name and service names to use.
3. Pserver configuration can also be done via manual PCONSOLE configuration on the file server(s). PCONSOLE is useful, for example, when you want to see exactly what is being configured by the QINST utility. Some basic familiarity with PCONSOLE is assumed in the examples.
4. Rprinter is set up via the PCONSOLE utility on the file server(s). Again, basic familiarity with PCONSOLE is assumed in the examples.

9.2.1 Creating NDS Print Queues

The Quick Setup option is the easiest way to create NDS print queues with PCONSOLE. The following steps refer to NetWare v4.x or greater.

1. License NDS on your RapidPrint 500.
   A. Read and complete an NDS registration form:
   – If you have World Wide Web access and a forms-capable browser, navigate to the Digital World Wide Web site (located at URL http://www.printers.digital.com) and find the **NDS Registration** link. When you have completed the form, click the **Submit** button.
   – If you do not have Internet access, contact a Digital sales representative for assistance. Contact information is provided in *Appendix A*.
   B. Enable NDS on the RapidPrint 500 by entering the **Define Protocols NetWare DSlicense** command along with the string that you have received via Step A.

Figure 9-2: Enabling NDS on the RapidPrint 500

```
Local>> DEFINE PROTOCOL NETWARE DSLICENSE string
```

2. Configure the print server.
   A. Use the **Define Protocols NetWare DStree** command to define the directory service tree in which the print server is located.

Figure 9-3: Defining the Directory Service Tree

```
Local>> DEFINE PROTOCOL NETWARE DSTREE foodco
```

NOTE: *For an explanation of the structure of the NetWare Directory Service tree, see your host documentation.*

B. Use the **Define Protocols NetWare DScontext** command to define the directory service context where the print server is located.

Figure 9-4: Defining the Directory Service Context

```
Local>> DEFINE PROTOCOL NETWARE DSCONTEXT ou=kiwi.ou=exotic.o=fruit
```

C. Enter the **List Protocol NetWare Access** command to ensure that at least one of the file servers in the directory service tree is in the access list.

The access list is set to Local by default, which includes all file servers attached to a local Ethernet segment (not accessed through a router). To add to this list, enter the **Set/Define Protocols NetWare Access** command.

Figure 9-5: Adding to the Access List

```
Local>> DEFINE PROTOCOL NETWARE ACCESS fileserver
```

3. Reboot the RapidPrint 500.

Figure 9-6: Rebooting the Server

```
Local>> INIT DELAY 0
```

4. Set up the PCONSOLE print queue.

A. Log in as **Admin** on the file server you will be changing and type PCONSOLE at the F: prompt to start the utility.

B. From the main menu choose **Quick Setup**. The Quick Setup window will appear. Enter the name of the RapidPrint 500, the name of the RapidPrint 500 service used for printing, the name of the print queue, and other information at the prompts.

Figure 9-7: Quick Setup

```
Print Server: MPS_xxxxxx
New Printer: MPS_xxxxxx_PCL
New Print Queue: printq
...
```

The print server name is the name of your RapidPrint 500. The new printer name is the name of the RapidPrint 500 service. The new print queue can be any name. The print queue volume is the disk to be used to spool print jobs. The remaining fields can be left in their default settings.

C. Press the **F10** key to save the print queue information.

NOTE: *Step 4 must be completed on each file server that will need access to RapidPrint 500 queues.*

5. Log back into the print server and enter the **NETSTAT** command.

This will display information about file servers, printers, and queues that the print server has found. If a queue appears in **JobPoll**, the print server has successfully attached to the queue. If the print server does not successfully attach to the print queue, see *NDS Print Queue Troubleshooting*.

9.2.2 Creating Bindery Print Queues

The QINST utility is the recommended way to configure Bindery print queues.

NOTE: *If you wish to enable Bindery emulation on a Novell 4.x file server, refer to your NetWare documentation.*

Log in as **Supervisor** (NetWare 2.2/3.1x) or **Admin** (NetWare 4.x) on the target file server. and copy the QINST.EXE file from the distribution CD-ROM into the **Public** directory on the file server. Type **QINST** to start the utility.

NOTE: *For NetWare version 4.0 and greater, the QINST program requires access to UNICODE tables to provide character translation. Please copy QINST into the NetWare **Public** directory or ensure that the PATH variable includes the required UNICODE tables.*

The following example shows how to create a Novell print queue named TESTQ on a server named MPS_xxxxxx using a service named MPS_xxxxxx_PCL.

Figure 9-8: Creating Novell Print Queue

```
F:\> \Public\QINST
Q-Install

Logged in as ADMIN
Installing on GIZA, NetWare V3.xx

Volume number: 0 <CR>

Enter the name of the print server.

: MPS_xxxxxx <CR>

Enter the name of the queue to create.

: MPS_PRT <CR>

Adding print queue MPS_PRT on volume GIZA_SYS

Enter the service name on MPS_xxxxxx which will service this queue

: MPS_xxxxxx_TEXT <CR>

Adding print server MPS_xxxxxx. Please wait...

Attaching MPS_xxxxxx to MPS_PRT

Adding print server MPS_xxxxxx_TEXT. Please wait...

Attaching MPS_xxxxxx_TEXT to MPS_PRT


Print queue installed successfully. Resetting MPS_xxxxxx.

Resetting print server.

Install another queue [y/n]? n

F:\>
```

After creating the print queue, use the **nprint** command to print a job to the RapidPrint 500.

Figure 9-9: NPRINT Command

```
F:\> nprint C:\AUTOEXEC.BAT /queue=MPS_PRT
```

9.2.2.1 Installing a Print Queue Using PCONSOLE

To install a print server using PCONSOLE, you will need to do the following:

- Tell the NetWare file server which print resources (services) are available on the RapidPrint 500.
- Assign print queues on the file server to use the RapidPrint 500 resources. This step must be completed for each file server that will need access to the RapidPrint 500 queues.
- Tell the RapidPrint 500 to re-poll the file servers to update the queue information.

Users on each file server wishing to print will specify the file server's queue name; the file server and RapidPrint 500 will decide which, if any, of the RapidPrint 500 queues can service the requests.

The following detailed steps refer to NetWare v3.11, but are similar for v2.x. Be sure to note the name of the print server; it is located on the back label.

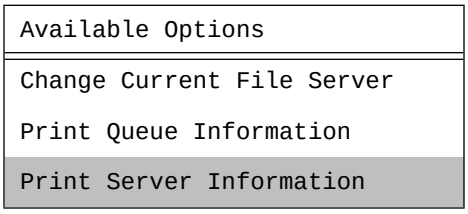
1. Log in as **Supervisor** on the file server.
2. Type PCONSOLE at the F: prompt and press **Enter** to start the utility.

Figure 9-10: Starting PCONSOLE

```
F:> PCONSOLE
```

3. Using the cursor keys, select **Print Server Information** from the **Available Options** menu, then press **Enter**.

Figure 9-11: Print Server Information Option



You will see a list of current print servers.

4. Press **Insert** to create a new entry, add the RapidPrint 500 name, and press **Enter**.

Figure 9-12: Entering RapidPrint 500 Name

```
Enter Print Server Name: MPS_PRT
```

This is the name that the RapidPrint 500 will log in as when querying the file server's print queues. If you later change the RapidPrint 500 name, you will need to update the file server(s).

If you change the login password on the RapidPrint 500, you will need to add a password for the entry you just added. Highlighting the RapidPrint 500 name and pressing **Enter** shows the **Print Server Information** menu, in which you can change the RapidPrint 500 password.

5. Use **Insert** to add the name of the service on the RapidPrint 500 which will service the queue, and press **Enter**. The example below adds a service named **MPS_PRT_PCL**

Figure 9-13: Entering RapidPrint 500 Services

```
Enter Print Server Name: MPS_PRT_PCL
```

6. Press **Escape** to return to the Available Options menu.

   Repeat Step 1 through Step 5 for all necessary queues. When no other configuration is desired, the RapidPrint 500 must be told to rescan the file server queues so that it is aware of the modifications. This can be done with the following steps.

7. In the **Available Options** menu, highlight **Print Server Information** and press **Enter**.

Figure 9-14: Available Options Menu

```
Available Options
Change Current File Server
Print Queue Information
Print Server Information
```

8. Select the RapidPrint 500 name (MPS_PRT) and press **Enter**. The menu shown in Figure 9-15 appears.

Figure 9-15: Print Server Information Menu

```
Print Server Information
Change Password
Print Queue Full Name
Print Server Configuration
Print Server ID
Print Server Operators
Print Server Status/Control
Print Server Users
```

9. Highlight **Print Server Status/Control** and press **Enter**.

10. Highlight **Server Info** and press **Enter**.

Figure 9-16: Server Status Menu

```
Print Server Status/Control
File Servers Being Serviced
Notify List for Printer
Printer Status
Queues Services by Printer
Server Info
```

11. Highlight **Current Server Status**: **Running** and press **Enter**.

Figure 9-17: Print Server Info / Status Menu

Print Server Info/Status	
Print server version	3 0xx
Print server type	Dedicated DOS
# of printers	n
Queue service nodes	0
Current server status	Running
Serial number	006497

NOTE: *If you don't get the menu above, the file server could not contact the RapidPrint 500 for some reason.*

12. Select **Down** and press **Enter**.

Figure 9-18: Current Server Status

Current Server Info/Status
Down
Going down after current jobs
Running

This will not reboot the RapidPrint 500—it will only force it to re-scan the available file servers for new queue entries.

13. Select **Print Queue Information** from the **Available Options** screen.
14. Press **Insert** to create a new queue, enter the queue name, and press **Enter** (it is not necessary to enter any more information about the queue at this time).
15. Press **Escape** repeatedly to return to the **Available Options** menu.
16. Press **Escape** repeatedly to exit the PCONSOLE utility.
17. Test the queue by using nprint.

Figure 9-19: Nprint Command

```
C:> nprint c:\autoexec.bat /queue=TESTQ
```

The file will be spooled to the RapidPrint 500 for printing and should appear on the proper physical port. If the print port is in use, the NetWare job should be visible via the RapidPrint 500 **Show Queue** display.

9.2.3 Configuring Rprinter

Configuring a RapidPrint 500 service as an rprinter device prevents any other users from using the service. It will be tied to the rprinter node for as long as the node is running and pserver is executing. Only one rprinter node can be configured on the RapidPrint 500, but multiple ports on the RapidPrint 500 can be tied to queues on that node.

NOTE: *rprinter is also known as nprinter.*

Before beginning rprinter configuration, you will need to know the name of the printserver process you will be starting on the file server, and the name of the print service on the RapidPrint 500.

1. Set the rprinter printserver on the RapidPrint 500.

   From the RapidPrint 500 local prompt, enter the **Set/Define NetWare Printserver** command, where *pserver_name* is the name with which the pserver NLM/VAP/standalone program will be started (under Step 4).

   Figure 9-20: Setting the Printserver

   ```
   Local>> SET PROTOCOL NETWARE PRINTSERVER pserver_name
   Local>> DEFINE PROTOCOL NETWARE PRINTSERVER pserver_name
   ```

2. Create a print queue on the file server and associate it with the RapidPrint 500 services.

   A. Under "Available Options," select the **Print Queue Information** option and press **Enter**.

   Figure 9-21: Print Server Information Option

   ```
   Available Options
   Change Current File Server
   Print Queue Information
   Print Server Information
   ```

   You will see a list of configured print queues on the file server.

   B. Press **Insert** to create a new queue on the file server, type the new queue name, and press **Enter**.

   Figure 9-22: Queue Name Example

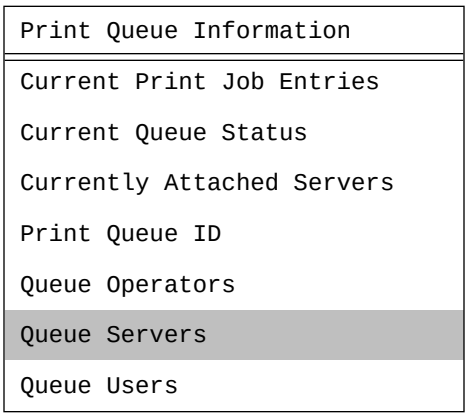
   ```
   New Print Queue Name: TESTQ
   ```

   The name does not have to be related to the name of the RapidPrint 500 resources, but should be short and easy to remember.

   C. Highlight the queue you just entered and press **Enter** to configure the queue itself.

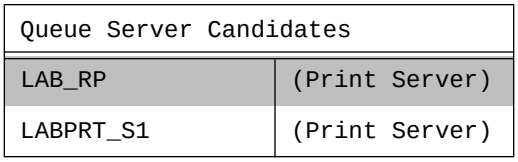
D. From the menu that appears, select **Queue Servers** and press **Enter** to specify which network print servers can print jobs from this print queue. The list will be empty, as none have been selected yet.

Figure 9-23: Queue Servers Option



E. Press **Insert**. The resources entered in the *Creating Bindery Print Queues* section should appear in a selection list:

Figure 9-24: Queue Options

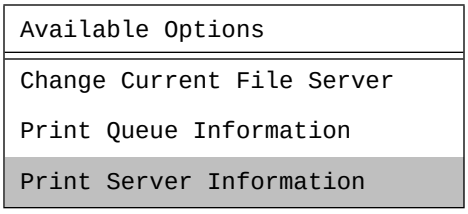


3. Tell the file server about the RapidPrint 500 service that will be used.

A. Press **Escape** three times to return to the main PCONSOLE menu (titled **Available Options**).

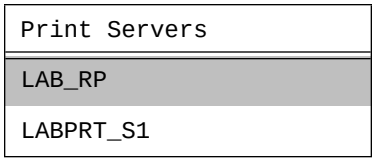
B. Select **Print Server Information** and press **Enter**.

Figure 9-25: Print Server Information Option



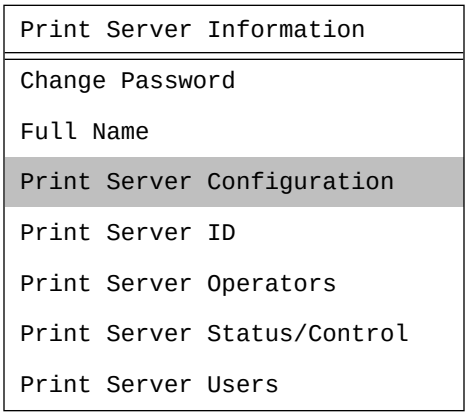
C. Select the RapidPrint 500 name from the list of print servers and press **Enter**.

Figure 9-26: Available Print Servers



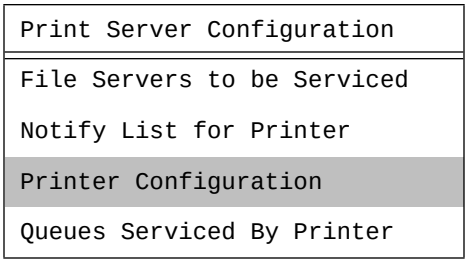
D. Select **Print Server Configuration** from the following menu and press **Enter**.

Figure 9-27: Print Server Configuration Option



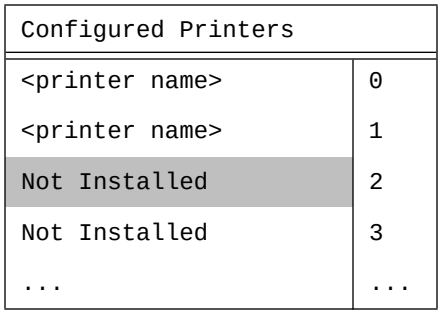
E. Select **Printer Configuration** and press **Enter**.

Figure 9-28: Printer Configuration Option



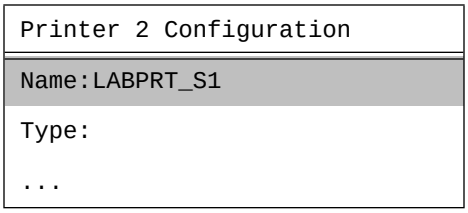
F. Highlight the first printer entry called **Not Installed** and press **Enter**.

Figure 9-29: Configured Printers Menu



G. Highlight the **Name** field and enter the printer name. Press **Enter**.

Figure 9-30: Name Field



H. Highlight the **Type** field and press **Enter**. You should see the following menu:

Figure 9-31: Printer Types Menu

Printer Types
Parallel, LPT1
Parallel, LPT2
Serial, COM 1
Serial, COM 2
Remote Parallel, LPT1
Remote Parallel, LPT2
Remote Serial, COM 1
Remote Serial, COM 2

I. Highlight **Remote Serial, Com 1** and press **Enter**. The printer ports under PCONSOLE are always configured as remote serial even if they are physically parallel ports.

J. Press **Escape**.

K. In the **Save Changes** menu, select **Yes** and press **Enter**.

L. Press **Escape** to return to the Print Server Configuration Menu.

M. Select **Queues Serviced by Printer** and press **Enter**.

Figure 9-32: Print Server Configuration Menu

Print Server Configuration
File Servers to be Serviced
Notify List for Printer
Printer Configuration
Queues Serviced By Printer

N. Highlight the desired rprinter from the list of configured rprinters and press **Enter.**

Figure 9-33: Defined Printers Menu

Defined Printers	
TEST_S1	0
LABPRT_S1	1
...	2

O. Select the name of this file server and press **Enter** (or just press Enter if no file servers appear).

Figure 9-34: Selecting the File Server

File Server	Print Queue	Priority
eng_server	TESTQ	1
docserver	DOCQ	1
labserver	LABQ	1

P. Highlight the name of the queue created in Step 2 and press **Enter** twice, leaving the priority at **+1**.

Q. Exit PCONSOLE by repeatedly pressing **Escape**.

4. Restart the pserver VAP / NLM / process on the file server or PC.

To connect the RapidPrint 500 port to the rprinter file server, complete **one** of the following steps, depending on how pserver is running:

A. If pserver is running as a VAP, enter the following on the file server.

Figure 9-35: Restarting pserver as a VAP

```
: STOP pserver_name
: START pserver_name
```

The pserver name must match the name you entered on the RapidPrint 500 for the PRINTSERVER.

B. If pserver is running as an NLM, enter the following on the file server:

Figure 9-36: Restarting pserver as an NLM

```
: UNLOAD PSERVER pserver_name
: LOAD PSERVER pserver_name
```

C. If pserver is running on a dedicated PC, start it by entering the following:

Figure 9-37: Restarting pserver on a Dedicated PC

```
F:> PSERVER pserver_name
```

At this point, the RapidPrint 500 will connect the port to the rprinter file server, and the port is ready to print from NetWare. The port will be unavailable for other protocols' use. If the RapidPrint 500 does not connect within one minute, use the **Set Protocol NetWare Reset** command to force the RapidPrint 500 to re-scan the NetWare connections.

9.2.4 Printing PCL From NetWare

Printing PCL jobs requires an 8-bit clean data path between the NetWare file server and the printer. In addition, the Binary attribute must be enabled on the service being used.

Figure 9-38: Enabling Binary

```
Local>> DEFINE SERVICE RP_xxxxxx_S1 BINARY ENABLED
```

9.2.5 Printing PostScript From NetWare

PostScript printing from NetWare requires that the PostScript attribute be enabled on the printing service:

Figure 9-39: Enabling Postscript

```
Local>> DEFINE SERVICE RP_xxxxxx_S1 POSTSCRIPT ENABLED
```

9.3 Troubleshooting

9.3.1 QINST Print Queue Troubleshooting

This troubleshooting section assumes the Novell queue was created using the QINST utility. If the queue was created manually using PCONSOLE, either delete the queue and re-create it using QINST or re-verify the steps in the *Creating Bindery Print Queues* section.

Table 9-1: NetWare Host Troubleshooting

Things to Check	Suggestion
Verify that the server name appears and that it matches the server and service names.	Try PCONSOLE. (If you are using NetWare 4.0, use the F4 key to enter bindery emulation mode.)
Verify that the NetWare access table will allow access to the specified file server.	By default, only local (non-routed) file servers are scanned for queues. See *Access Lists* for more information on manipulating the NetWare access lists.
Verify that the login password on the RapidPrint 500 and the queue password on the file server match.	If necessary, change the password on the RapidPrint 500. Unless the passwords match, the RapidPrint 500 will not be able to log into file servers to scan for jobs.
Look for poor printing performance in general.	If there is a significant delay between NetWare jobs, the delay may be a result of scanning too many file servers. This delay is often increased if the file servers are distributed across a wide area network. Configure the NetWare access list to only allow scanning for jobs on the file servers of interest. To configure the NetWare access list, see *Access Lists*.

9.3.2 NDS Print Queue Troubleshooting

The following section assumes that the Novell queue was created using PCONSOLE's Quick Setup option. If you experience NDS printing problems, try the following steps:

1. To check that the print server has successfully attached to the queue, type `NETSTAT` at the Local> prompt. This will display information about file servers, printers, and queues that the print server has found. If a queue is in JobPoll then the print server has successfully attached to the queue.
2. Type **Show Protocol NetWare NDS**. This command shows the tree and the context that you have configured, a failure code, and an NDS error code for each NDS server. Ensure that the tree and context are correct. The context should be where the print server object is located.

   The following are failure codes that may be displayed.

Table 9-2: NDS Printing Errors

Failure Code	Failure Code Meaning	Remedy
0	Success.	None needed.
1	Print server ran out of memory.	Cycle power on the box. If the problem persists, disable the unused protocols and change the NetWare access list to only include file servers which have print queues associated with them.
2	Unexpected response from file server.	Report the problem to Digital Technical Support.
3		
4	No printers found for the print server.	Check to make sure that there are printers for the print server and the printer names match the service names on the print server.
5	No queue found for the printer.	Check to make sure that the printers have associated queues.
6	Login failed.	Check to make sure there is a print server object configured with the same name as the print server.
7	Authentication failed.	Check that the login password on the print server is the same as the password for the print server object. If the login password on the print server is the default (access) then there should be no password for the print server object.
8	Print server cannot attach to queue.	Check the NDS partitions, replicas, and volumes to make sure that the file server where the queue actually lives has the information about the print server and printers.

The following are errors that you may receive from the file server.

Table 9-3: NDS Errors from the File Server

Failure code	Failure code meaning	Remedy
0	Success	
fffffda7	Object could not be found in the given context.	Check the print server name, dscontext, and dstree to make sure that the printer server is set up correctly with PCONSOLE.
fffffda5	The requested attribute could not be found.	Use PCONSOLE to make sure that the print server has associated printers and that the printers have associated queues.
fffffd69	DS Database is locked.	An administrator is probably updating the database. Wait a few minutes and issue the **Set Protocol NetWare Reset** command.
fffffd63	The password is invalid.	Make sure the password for the print server object under PCONSOLE is the same as the login password for the print server. If the login password on the print server is the default (access) then there should be no password for the print server object. If the login password is something other than the default, then the password for the print server object should match.
fffffd54	Secure NCP violation.	The file server is probably requiring NCP packet signature, which is currently not supported. Turn down the NCP packet signature level so that it is not required from the server.

3. Reboot the print server to force it to rescan the NDS tree. If you have changed printer and queue setups, it may take a few minutes for the changes to propagate through the directory tree.

10 UNIX Host Setup

10 - UNIX Host Setup

This chapter covers print configuration for TCP/IP hosts.

The server must have an IP address before configuration (see your **Configuration Guide** for details). Any host wishing to access the RapidPrint 500 will have to be informed of this IP address, which is typically configured in the UNIX **/etc/hosts** file or via a nameserver.

NOTE: *One of the most common causes of IP network problems is duplicate IP addresses. Please make sure that your RapidPrint 500 has a unique IP address.*

10.1 Selecting A Printing Method

The RapidPrint 500 provides two major TCP/IP printing methods: Berkeley remote LPR and RTEL host software. Both methods provide queueing of jobs if the RapidPrint 500 is busy with another job. If custom queueing software has been designed, raw TCP/IP or Telnet socket connections can be made directly to the RapidPrint 500 ports.

NOTE: *See the man pages included with the distribution CD-ROM for a full discussion of RTEL functionality and configuration.*

Instructions for host configuration for LPR, RTEL, and socket connections are described in the following sections. Please read through the entire configuration procedure before beginning.

1. LPR

   LPR allows the RapidPrint 500 to look like a UNIX host that can print files. It is the recommended way of printing because it is easy to set up and requires no additional host software. However, not all machines (notably machines running UNIX based on System V instead of BSD) support the lpr system.

NOTE: *The RapidPrint 500 cannot implement all lpr options; the print job information is not available until the print job is completed.*

2. RTEL Host Software

   Digital supplies RTEL software, which requires installation and configuration on the host but provides more functionality than remote-LPR. It allows the host's lp or lpr printing system to transparently use the RapidPrint 500 print devices, and also allows the creation of named pipe devices on the host that map to the RapidPrint 500's ports.

   A. The **RTEL backend filter** interfaces with the host-based spooling system. It receives data from the spooling system and sends the data to the RapidPrint 500. The advantages of the backend filter are that the banner page is printed at the front of a job, multiple copies can be printed, and simple reformatting such as <LF> to <CR><LF> conversion and tab expansion can be performed. However, the backend filter does not support any complicated output filtering or conversions.

   B. The **RTEL Pipe Daemon** process (RTELPD) uses a UNIX named pipe as its interface to the host. This allows any host- or user-supplied backend filter to be used for printing. Any data that is sent into the pipe is simply moved to the RapidPrint 500. However, the data flow is one-way from the host system to the RapidPrint 500 and this approach does require one RTELPD daemon process for each print queue configured.

3. TCP Socket Connections

   The RapidPrint 500 supports direct TCP connections to its ports. These connections provide 8-bit clean full-duplex data communication. They do require that the user provide his or her own software. The RTEL software includes an example program showing how to form these connections. Note that the TCP Socket interface does not support queueing. If the resource is busy when a connection attempt is made, the connection will be rejected.

10.2 LPR

LPR is supported on many machines, and is simple to configure for the RapidPrint 500. Add the host print queue name into **/etc/printcap**, and then specify the remote nodename (the host name of the RapidPrint 500) and the service name on the RapidPrint 500.

NOTE: *There are slight variations in LPR configuration for AIX, HP, SCO UNIX, Solaris, ULTRIX, and Windows NT hosts; after reading this section, refer to the following sections for platform-specific configuration information.*

NOTE: *Windows 95 does not support LPR directly, but there are third-party solutions available.*

To add a print queue for a RapidPrint 500, add the RapidPrint 500's name and IP address to the host's **/etc/hosts** file.

Edit the **/etc/printcap** file and add an entry of the following form:

Figure 10-1: Example printcap File Entry

```
RP_PRT|Printer on LAB RP:\
      :rm=MPS_xxxxxx:\
      :rp=MPS_xxxxxx_TEXT:\
      :sd=/usr/spool/lpd/RP_PRT:
```

Note that the punctuation shown is required, and whitespace should be avoided within each option. The example above creates a queue named **RP_PRT**. The **rm** parameter is the name of the RapidPrint 500 in the host's address file, the **rp** parameter is the name of the service as it exists on the RapidPrint 500, and the **sd** parameter specifies the name of the directory used to hold temporary spooling files.

Create the spooling directory using the **mkdir** command, and make sure it is world-writable.

Figure 10-2: Creating a Spooling Directory

```
# mkdir /usr/spool/lpd/RP_PRT
# chmod 777 /usr/spool/lpd/RP_PRT
```

The **mx** option may be used to allow unlimited size files to be printed, and the **sh** (suppress header) option may be used to prevent header pages from being generated. See the host's documentation or man pages for more information on the format of the printcap file and how to create the spool directory.

After adding the queue entry to the printcap file, check the queue setup using the **lpc status** command.

Figure 10-3: lpc Status Display

```
% lpc status
RP_PRT:
       queuing is enabled
       printing is enabled
       no entries
       no daemon present
```

You can now print to the queue using normal lpr commands.

Figure 10-4: Printing from a BSD system

```
% lpr -PRP_PRT /etc/hosts
```

10.2.1 Notes about LPR

There are several important things to note about the LPR printing method:

- Because of the way the LPR protocol is typically implemented on the host, the processing options and the banner page are sent after the job data itself. Because of this, the RapidPrint 500 will print a banner page at the end of a job, and cannot support most of the LPR options. If it is necessary to have the banner page at the beginning of the printout, install and use the RTEL software.
- The RapidPrint 500 cannot print multiple copies of the print job when the **-#x** lpr option is used.
- If banners are not needed, they can be disabled on custom services using the following RapidPrint 500 commands:

Figure 10-5: Disabling the LPD Banner Page

```
Local>> DEFINE SERVICE service_name BANNER DISABLED
```

- By default, a formfeed is added to the end of each LPD job to force a page eject on laser printers. If this formfeed is not wanted, it can be disabled using the following RapidPrint 500 command:

Figure 10-6: Disabling the LPD Formfeed Characteristic

```
Local>> DEFINE SERVICE service_name FORMFEED DISABLED
```

- Many LPR spoolers are not intelligent about using multiple queues on one host. Queues on the print host must use separate spooling directories. If only the default directory is used, data from multiple queues can be intermixed or sent to the wrong RapidPrint 500 service.
- No special purpose input or output filters can be used when printing via LPR. If this functionality is necessary, use the named pipe interface program in the RTEL software.

10.2.2 LPR on AIX Hosts

LPR is available on machines running IBM's AIX operating system versions 3.2 and higher. Print queues on AIX hosts can be configured using either UNIX commands or the System Management Interface Tool (SMIT) application.

10.2.2.1 Using UNIX Commands

Using LPR on AIX hosts involves a slightly different configuration procedure. The queue configuration file is **/etc/qconfig** and the format of the entry is different, as shown in the example below. Note the lack of colons (:) and the required white space.

Figure 10-7: Example AIX qconfig entry

```
RP_PRT:
        device = RP_PRTd
        up = TRUE
        host = MPS_xxxxxx
        s_statfilter = /usr/lpd/bsdshort
        l_statfilter = /usr/lpd/bsdlong
        rq = MPS_xxxxxx_S1
RP_PRTd:
        backend = /usr/lpd/rembak
```

The device name is simply the queue name with a "d" added. To print, normal lp syntax is used.

Figure 10-8: Printing to a Queue

```
% lp -dRP_PRT filename
```

10.2.2.2 Using SMIT

The System Management Interface Tool (SMIT) allows you to enable LPD printing and create print queues. The following steps are needed.

1. At the host prompt, type `SMIT`.
2. From the main window in the application, choose **Print Spooling**.
3. Choose **Manage Print Server** and **Start the Print Server Subsystem (lpd daemon)**.
4. In the **Start the Print Server Subsystem** dialog box, type `BOTH` in the first field. Click **OK**.

   The message 'The lpd subsystem has been started' will appear in the Output section of the next window. Click **Done**.

To add a print queue, follow these instructions:

1. From the main window, choose **Print Spooling**.
2. Choose **Manage Print Server** and **Manage Print Queues**.
3. Choose **Add a print queue**.
4. From the dialog box that appears, choose **remote**.
5. From the next dialog box choose the desired type of remote printing.
6. Add the following information to the **Add a Standard Remote Print Queue** dialog box:
   - The name of the print queue to add
   - The name of the RapidPrint 500 unit
   - The name of the RapidPrint 500 service
   - The type of print spooler on the remote server, and
   - A description of the printer on the remote server.

   A dialog box will appear with the message "Added print queue." To print to this queue, normal lp syntax is used (see Figure 10-8).

10.2.3 LPR on HP Hosts

LPR is supported in HP/UX versions 9.0 and greater. Print queues on HP hosts can be configured using either UNIX commands or the System Administration Manager (SAM) application.

10.2.3.1 Using UNIX Commands

To configure a print queue using LPR, become the superuser and issue the following commands:

Figure 10-9: Configuring a Print Queue Using UNIX Commands

```
# /usr/lib/lpshut
# /usr/lib/lpadmin -pRP_PRT -v/dev/null -mrmodel \
-ocmrcmodel -osmrsmodel -ormMPS_xxxxxx -orpMPS_xxxxxx_P1
# /usr/lib/accept RP_PRT
# /usr/bin/enable RP_PRT
# /usr/lib/lpsched
```

NOTE: *Issuing the "lpshut" command will stop the HP spooling system, so this command should not be performed when print jobs are active.*

The **lpadmin** command adds to the print queue. The **accept** command tells the queueing system that the queue is accepting requests and the **enable** command enables the print queue so it can start printing. Finally, the **lpsched** command restarts the queuing system. To print to this queue, normal lpr syntax is used (see Figure 10-8).

10.2.3.2 Using SAM

Follow these steps to create a print queue using the System Administration Manager (SAM) application.

1. At the HP prompt, type `SAM`.
2. From the main application window, choose **Printers and Plotters**. Click **Open**.
3. Choose **Printers/Plotters**.
4. In the Actions pull-down menu, select **Add Remote Printer/Plotter**.
5. Enter the following information:
   - The name of the print queue to add
   - The name of the RapidPrint 500 unit
   - The name of the RapidPrint 500 service

To print to this queue, normal lp syntax is used (see Figure 10-8).

10.2.4 LPR on SCO UNIX Hosts

LPR is supported in SCO V3.2 release 4 with TCP/IP versions 1.2 and greater.

Before attempting to configure a print queue using LPR, ensure that the Berkeley remote printing files and executable programs are installed on the host machine. If not, issue the **mkdev** command to install them.

Figure 10-10: Installing Print Files

```
# mkdev rlp
```

NOTE: *The mkdev rlp command should only be installed once. If it is used repeatedly, serious problems will result with the machine.*

To create the remote printer, use the following command:

Figure 10-11: Creating the Remote Printer

```
# rlpconf
```

The **rlpconf** command will ask a series of questions and create a printcap entry for the specified queue. The process is shown in the following figure.

Figure 10-12: Configuring the Remote Printer

```
Remote Printing Configuration

Enter information for remote printers or local printers accepting re-
mote printing requests

Please enter the printer name (q to quit): MPS_xxxxxx_P1

Is printer MPS_xxxxxx_P1 a remote printer or a local printer? (r/l) r

Please enter the name of the remote host that MPS_xxxxxx_P1 is attached
to: host_name

The MPS_xxxxxx_P1 is connected to host RP_PRT.

Is this correct? (y/n) y

Would you like this to be the sys.default printer? (y/n) y

Make sure your hostname appears in host_name's /etc/hosts.equivor or /
etc/hosts:lpd file.

Make sure MPS_xxxxxx_P1 appears in /etc/printcap (in BSD format).

Make sure MPS_xxxxxx_P1 has a spool directory on RP_PRT.

Putting the_printer in printer description file and creating spool di-
rectory... done

Updating LP information... done
```

When prompted for the queue name, keep in mind that it must match the service name on the print server. If you'd like to change the queue name at a later point, manually edit the printcap file.

To print to this queue, normal lp syntax is used (see Figure 10-8).

10.2.5 LPR on Sun Solaris Hosts

The following commands configure a BSD print queue on a Solaris 2.3 system. These commands require that you are the superuser and in the bourne shell.

Figure 10-13: Creating a BSD Print Queue

```
# /usr/lib/lpsystem -t bsd MPS_xxxxxx_P1
# /usr/lib/lpadmin -p RP_PRT _s MPS_xxxxxx_P1!RP_serv
# /usr/lib/accept RP_PRT
# enable RP_PRT
```

NOTE: *Due to problems in the Solaris queueing system, LPR is not reliable on Solaris machines. Users with Solaris hosts should use the RTEL software provided by Digital.*

10.2.6 LPR on ULTRIX Hosts

ULTRIX hosts will need additional information added to the printcap entry to show that there is no physical device for this queue and tell the host that this is a remote connection.

Figure 10-14: Example ULTRIX Printcap Entry

```
RP_PRT|Printer on LAB RP:\
        :lp=:ct=remote:\
        :rm=MPS_xxxxxx:\
        :rp=MPS_xxxxxx_P1:\
        :sd=/usr/spool/lpd/RP_PRT:
```

To print to this queue, normal lpr syntax is used

Figure 10-15: Printing to a Queue

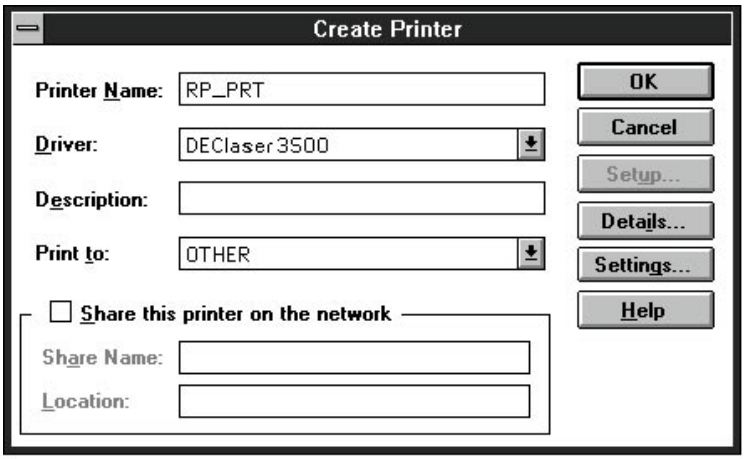
```
% lpr -PRP_PRT filename
```

10.2.7 LPR on Windows NT Hosts

The following procedure configures an lpr print queue. This installation assumes the TCP/IP protocol has been installed, and that the Simple TCP/IP Services and TCP/IP Print Server have been installed and started on the NT host.

1. Open the NT PrintManager; its icon is located in the Main window on the desktop. Choose **Create Printer** from the Printer menu.

Figure 10-16: Create Printer Dialog Box

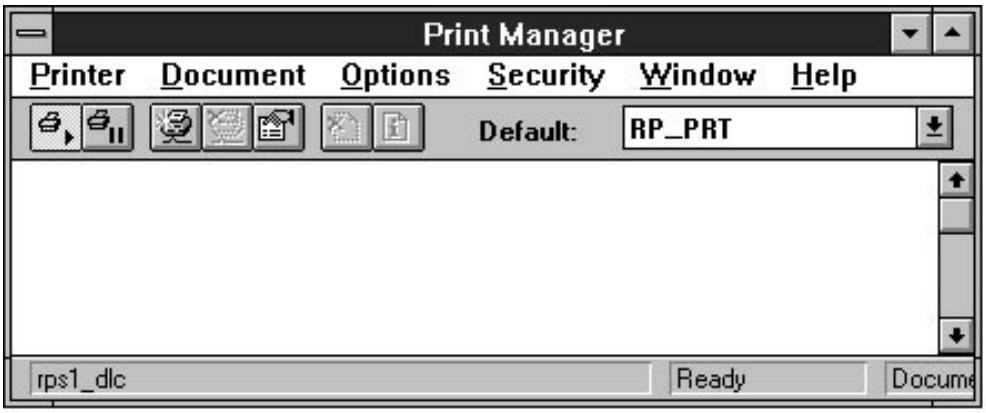


2. In the **Printer Name** field, enter the name of the queue on the NT host.
3. Click the **Driver** menu arrow and select the required printer driver from the pull-down menu. Enter a description string in the **Description** field if desired.

NOTE: *If the printer driver isn't already installed, you will need the Windows NT installation disks.*

4. If applicable, choose the **Share this printer on the network** option. (This is not recommended until the print queue is confirmed to be running properly.)
5. Click the **Print To** menu arrow to view its pull-down menu. Scroll to select the **OTHER** option.
6. Choose **LPR Port** and click the **OK** button.
7. In the resulting dialog box, provide the name or IP address of the host providing LPD, and the name of the RapidPrint 500 print service, and click **OK**.
8. In the printer-specific dialog box that appears, fill out the necessary information and click **OK**.
9. If you'd like this printer to be the default printer, click the default menu arrow on the Print Manager's title bar and scroll to the printer's name.

Figure 10-17: Print Manager Dialog Box



NOTE: *Verify that you have read/write permissions on the NTFS file system.*

10.3 Reverse Telnet (RTEL)

If the LPR method of printing is not adequate for an application (for example, if banners are needed before jobs or more flexibility is needed in printing), the supplied RTEL software can be configured on the host.

RTEL is a set of programs designed to allow host-initiated connections to devices attached to your terminal / print server. The RTEL software is simply a transport mechanism, and as such, it makes no assumptions about the actual devices attached to the server. Once the software is installed and connections to the RapidPrint 500 have been configured, normal UNIX print commands and queue utilities (such as lpc and lpstat) can be used.

The RTEL software is supported on seven platforms: AIX on IBM RS6000's, ULTRIX on Digital workstations, HP / UX on HP platforms, RISC / OS on MIPS workstations, SCO on PC platforms, IRIX on SGI machines, Solaris on SUN workstations, and SUN / OS on SUN workstations. If the target machine is not one of these platforms, some modification may be necessary to make the RTEL software compile, link, and run properly. See the RTEL-build man page for hints on building on unsupported platforms.

NOTE: *RTEL Binaries are provided for many systems and source code is provided for use on non-supported systems. See the Digital web site for a list of platforms.*

10.3.1 Components of RTEL

RTEL provides two main types of interfaces to the server. The first is a printer backend filter for BSD, SYSV, and AIX type printing subsystems. The second method of printing with RTEL uses a UNIX named pipe as the actual interface to the host system.

The backend filter simply accepts data from the queue manager (LPD for BSD, lpsched for SYSV, and qdaemon on AIX) and moves that data over the network to the terminal / print server. The backend filter can perform simple reformatting of the job, such as tab expansion, <CR> to <CR> <LF> expansion, and banner pages. It cannot, however, perform complicated tasks such as PostScript conversion. See the RTEL-backend man page for more information.

The named pipe interface allows host-supplied or third party software to send output to a device (the pipe) after which the RTELPD daemon process sends the data to the server. See the RTELPD man page for more information.

10.3.2 Installing Reverse Telnet Software

Installing the RTEL software is a fairly simple process. The first step is getting the software onto the target machine. The software will be provided on the distribution CD-ROM in tar format and can be restored into a local directory. Set your current directory to the RTEL directory.

Figure 10-18: Restoring RTEL software

```
# mkdir /tmp/rtel
# cd /tmp/rtel
# tar xvf /cdrom/products/servers/rtelv4_2_2/rtel_src.tar
```

NOTE: *The word "cdrom" in the example above should be replaced with the name of the current distribution CD-ROM.*

For MS-DOS, the source code will be in a single tar archive file (rtel_src.tar). This file contains all of the source code, but does not contain any executables. Simply copy the tar archive file onto the host system, remembering to use binary mode during the copy, and untar it. Since the rtel_src.tar file does not contain any executables, it will be necessary to recompile the software on the target machine.This will be done automatically for supported systems.

Once all the files are in place, issue the command **./lpinstall**. The results are shown in Figure 10-19.

Figure 10-19: RTEL Installation

```
# ./lpinstall
Installing the RTEL software package requires root privileges
Do you want to continue the installation [yes]
The RTEL binaries are provided for the following machines:

      AIX ---- IBM RS6000 based machines
      DEC ---- Ultrix RISC (non-VAX) machines
      HP ----- HP/UX HP/PA based machines
      MIPS --- RISC/OS
      SCO ---- SCO UNIX
      SGI ---- IRIX
      SOL ---- Solaris Sparc machines
      SPARC -- Sun/OS Sparc machines
      other -- (input file extension of other)

Please select your machine type: sparc
Please select type of spooling system to install [lpr]
Installation of RTEL software package complete.
#
```

This script moves everything necessary to run the RTEL software into the /usr/spool/rtel directory tree. The source code can then be removed from the system.

The next step is to create and install backend filter program, or set up a named pipe and start the RTELPD daemon process. For instructions on how to do this, please consult the README files in the newly-installed RTEL directory.

10.3.3 Queueing with the RTEL Software

There is one important thing to note about queueing jobs to RTEL services. A job can be queued by the host's print system (lp, lpr, and others) or by the RapidPrint 500 itself. If you are only printing to one queue from one host to one RapidPrint 500 service, the queueing is provided by the host; it will not release a new job to the RapidPrint 500 until the previous job has completed.

When multiple print queues (possibly on more than one host) point to the same RapidPrint 500 queue, the hosts will provide local queueing, but you may still have multiple jobs attempting to access the RapidPrint 500. In this case, the RapidPrint 500 will provide queueing among the hosts. Jobs from multiple hosts are handled in order, without regard to size or any priority. This may explain why a particular host's queue seems to stop for an extended time.

The Show Queue display on the RapidPrint 500 will show the order of jobs pending on the RapidPrint 500. The host's lp or lpr utilities must be used to show jobs queued by the host.

10.3.4 Setting up the RTEL Backend Filter

RTEL backend filters are designed to work with BSD, SYSV, and AIX type printing subsystems. The backend filter simply accepts data from the queue manager and moves that data over the network to the terminal / print server.

To install a print queue using the backend filter, first install the RTEL software according to Figure 10-19, then execute the **mkprt** script. The following example illustrates the process on a BSD-type system.

Figure 10-20: Installing the Backend Filter

```
# cd /usr/spool/rtel
# ./mkprt
Installing a print queue requires root privileged. Do you want to
continue the installation [yes]
Please enter the name of the print queue to create: hp4
A printcap entry for hp4 needs to be created.
hp4|RTEL printer:\
      :lp=/usr/spool/rtel/hp4_dev:\
      :of=/usr/spool/rtel/hp4:\
      :sd=/usr/spool/rtel/hp4_sd:
Should this entry be added to your printcap file [y]: yes
In order to establish RTEL connections, an IP address and a host name
must be assigned to the terminal server.
Please enter the server's host name []: ps3
A connection on the server can be specified by either a port number or
a service name. A port number is simpler, but a service allows more
flexibility.
Would you like to specify a (p)ort number or a (s)ervice name [p]: p
Please enter the port number []: 2
By default, a password is not needed to connect to a service or a port.
(Note that the word null actually means no password.)
Please enter the password [null]:
The following options are available:
      banner ------- Print a banner page before every job
      binary ------- Do not format data for printing
      expandtabs --- Expand tabs into spaces
      formfeed ----- Append formfeed to end of job
      none --------- No options are to be used
      postscript --- Append <ctrl-d> to postscript job
Please enter a comma separated option string [none]: none
The following entry has been added to the server_host file
queue  server  service  password  option
hp4    ps3     :2       null      none
Installation of queue hp4 complete
```

NOTE: *Become superuser before running the above commands.*

The queue created should now be ready to process requests.

The options field specifies which if any of the print options are enabled. The available choices are listed in Table 10-1.

Table 10-1: Print Options

Option	Functionality
Banner	A banner page is printed before each job. The banner will show the date, name of the job, and name of the user who requested it.
Binary	No Line Feed processing is performed. This is useful for non-text files (such as plotter or graphics files).
Expandtabs	Tabs are changed into space characters. Eight space tabs are assumed.
Formfeed	Formfeeds (ASCII 0xC, Ctrl-L) are appended to the end of the job. This option should not be used with the PostScript or Binary options.
None	No options are enabled
Postscript	A Ctrl-D (ASCII 4) is used to terminate a print job, rather than the standard formfeed (ASCII 12).

NOTE: *Options must be specified in lowercase characters; multiple options can be specified separated by commas.*

There must be at least one entry in the options field; use the word “None” if no options are desired. There must also be an entry in the server_hosts file for each RapidPrint 500 print queue you wish to use. You may have multiple UNIX print queues using the same RapidPrint 500 print queue (for example, when you want to use different sets of options) but a UNIX print queue cannot use multiple RapidPrint 500 queues.

Use the **lpstat -t** command for lp spooling systems or the **lpc status** command for lpr spooling systems to make sure the printer was created correctly. For example, if we created printer **hp4** on our lp spooling system, entering the lpstat -t command might display the following information:

Figure 10-21: lpstat -t Information

```
% lpstat -t
scheduler is running
device for hp4: /usr/spool/rtel/hp4_dev
hp4 accepting requests since Apr 18 15:44
printer hp4 is idle. enabled since Apr 18 15:44
```

For an LPR type spooling system, the corresponding output would look like this:

Figure 10-22: lpc status Information

```
% lpc status hp4
hp4:
      queueing is enabled
      printing is enabled
      no entries
      no daemons present
```

10.3.5 Setting up the RTEL Named Pipe Daemon

The basic concept behind the RTELPD daemon is to allow a UNIX system to use its own output filter programs that provide special purpose post-processing and then write the data into a named pipe device. The RTELPD daemon will read the data from the pipe and send it out over the network to a terminal or print server port.

NOTE: *The output filter in this case is either provided by the host system or is custom software. It is not provided as part of the RTEL software package.*

The command line parameters will be verified when the RTELPD daemon is started. The daemon process will then wait for input to arrive on the pipe device. When input data is detected, a connection attempt will be made to the target terminal server port, and if it is successful, data will start moving through the path.

If the specified service or port is currently busy, the daemon process will wait until the service or port is available and then try again to connect. To the process dumping data into the pipe device, this waiting looks like flow control. Eventually, the connection attempt should succeed, and the user data will flow through the path. When the user process closes the pipe device, the RTELPD daemon will detect the end-of-file, close the network connection and then restart the job cycle by waiting for input to arrive on the pipe.

It is important to remember that data will only move in one direction through a pipe. That is, data will flow from the host to the printer, but not from the printer back to the host. Host application packages like NewsPrint should be configured as if they were talking to parallel attached devices to ensure that the software is not expecting a response from the printer.

Installing the RTELPD daemon process and creating a pipe is very simple. First create the named pipe and set up the server_hosts file using the mkpipe script.

Figure 10-23: Installing the RTELPD Daemon Process

```
# cd /usr/spool/rtel
# ./mkpipe
Installing a pipe device requires root privileges.
Do you want to continue the installation [yes]
This install script will create a named pipe as the interface
to the RTEL software. This pipe will be used as the output
device for your printing system.
Note that the full directory path must be specified for the
pipe name, i.e. /dev/rtelp1.
Please enter a pipe name: /dev/rtp1
Created pipe /dev/rtp1 with root ownership and world read/
write privileges. If this is not appropriate for your appli-
cation, please change these characteristics.
In order to establish RTEL connections, an IP address and a
host name must be assigned to the terminal server.
Please enter the server's host name []: ps3
A connection on the server can be specified by either a port
number or a service name. A port number is simpler, but a
service allows more flexibility.
Would you like to specify a (p)ort number or a (s)ervice name
[p]: p
Please enter the port number []: 2

By default, a password is not needed to connect to a service
or a port. (Note that the word null actually means no pass-
word.)
Please enter the password [null]:
The following entry has been added to the server_host file

     queue       server    service    password   option
     /dev/rtp1   ps3       :2         null       -b

Installation of pip /dev/rtp1 complete.
#
```

The previous example has not actually set up a print queue. It has simply created the named pipe and put an entry in the server_hosts file that says how to start up the RTELPD daemon process.

NOTE: *See the supplied RTELPD man page for a complete list and description of the RTELPD options.*

To start the RTELPD daemon process, issue the command `/usr/spool/rtel/rtelpd -s` from a shell prompt. You can check the RTEL setup by sending data into the named pipe and seeing if it appears at the printer.

Figure 10-24: Checking RTEL Setup

```
# cat /etc/hosts > /dev/rtp1
```

Obviously, if the printer is a PostScript printer, a PostScript job should be sent to the pipe. Remember to add the `/usr/spool/rtel/rtelpd -s` command to the host startup files so that the RTELPD daemon will be started automatically each time the system boots.

Once the RTELPD daemon is running, a UNIX print queue can be configured and should use the named pipe as its output device. This allows all the normal option processing associated with host-supplied or third-party backend programs.

10.3.5.1 RTELPD Command Line Parameters and Options

The RTELPD daemon process has a set of command line options, which are detailed in the following table.

Table 10-2: RTELPD Command Line Options

Option	Description	Usage
b	rteld spawned as a system daemon	-b
c	specify a host and service to connect to	**-c***service@host*
e	convert <lf> into <cr><lf>	-e
h	help screen	-h
k	kill daemon for the specified named pipe	-k/dev/pipe
	kill all running RTELPD daemon processes	-kall
n	named pipe to use	-n/dev/pipe
p	specify a password for the remote service	-ppassword
r	shows all active RTELPD sessions	-r
s	start rtelpd daemons in server_hosts file	-s
v	Show version of RTEL software	-v

NOTE: *See the RTELPD man page for more information about each of these options and what they do.*

10.3.5.2 Creating a BSD Print Queue Using RTELPD

To create a generic BSD print queue using the RTELPD pipe daemon, first create a named pipe as shown above. Then edit the **/etc/printcap** file and insert an entry in the following form to create a simple queue.

Figure 10-25: Editing the /etc/printcap File

```
rtel_prt:\
      :lp=/dev/rtp1:|
      :sd=/usr/spool/lpd:
```

NOTE: *See the RTELPD man pages for specific examples of configuring a print queue for each supported system type.*

To test the queue, ensure that the RTELPD daemon is running and print a job; the output should appear on the printer.

10.3.5.3 Creating a SYSV Print Queue Using RTELPD

To create a generic SYSV print queue using the RTEL pipe daemon, first create a named pipe as shown above. Then issue the following commands to create a simple queue.

Figure 10-26: Creating a SYSV Print Queue

```
# /usr/lib/lpshut
# /usr/lib/lpadmin -prtel_prt \
      -i/usr/spool/lp/model/dumb \
      -v/dev/rtp1
# /usr/bin/enable rtel_prt
# /usr/lib/accept rtel_prt
# /usr/lib/lpsched
```

To test the queue, ensure that the RTELPD daemon is running and print a job; the output should appear on the printer.

NOTE: *See the RTELPD man pages for specific examples of configuring a print queue for each supported system type.*

10.3.6 RTEL Troubleshooting

The **job_status** diagnostic file in the /usr/spool/rtel directory may help locate problems. The file contains any errors that occurred on a particular print job, such as job aborted, invalid service name, and so on. This file should be examined if the RTEL queue is not performing correctly. Entries are time-stamped to indicate when the error(s) took place; make sure when looking at these error logs that the errors shown are for roughly the same time as the problem(s) occurred. In addition, each error name in the log files has a name that identifies roughly where the error took place, as shown in Table 10-3.

Table 10-3: RTEL Errors

Error Name	Error
%Exxxxxx	Error reported by the host operating system itself. Error names generally correspond to values for **errno**.
%LAT_xxxx	A reject code from the server. Generally indicates a problem with the RapidPrint 500 setup or the server_hosts file.
%RTEL_xxxxx	The host system could not initiate the connection to the server properly. The message should indicate the reason.

10.4 TCP Socket Connections

If custom queueing software has been designed, raw TCP/IP (or Telnet) connections can be made directly to the RapidPrint 500 ports. Opening a TCP session to port 3001 will attempt a direct connection to the RapidPrint 500's parallel port. If Telnet IAC interpretation is needed, form a connection to the 20*nn* range of ports using the **Set/Define Service Telnetport** command.

If the port is busy or unavailable when the TCP connection attempt is made, a TCP RST will be sent back to the host and the connection attempt will be rejected. It is up to the application software to detect this condition and retry the connection.

NOTE: *See Set/Define Service TCPport or Set/Define Service Telnetport for more information on socket connections.*

10.5 PostScript Configuration

To print PostScript jobs, you must enable the PostScript attribute on the service being used.

Figure 10-27: Enabling the PostScript Attribute

```
Local>> DEFINE SERVICE RP_P1 POSTSCRIPT ENABLED
```

A very common problem when printing PostScript jobs from UNIX queues is including non-PostScript data, such as header or banner pages, as part of the job. When printing from a UNIX host machine, verify that header and trailer pages are not sent. See the host's documentation for information on preventing header and trailer pages.

11 Command Reference

11 - Command Reference

This chapter describes the RapidPrint 500 command set. Each command and its syntax is shown, as well as whether or not the command is restricted to the privileged user.

NOTE: *See Set Privileged/Noprivileged for information on changing your port to privileged status.*

The following conventions are used in the syntax diagrams of this chapter:

- **Bold type** denotes command keywords, which may be entered in upper, lower, or mixed case.
- *Italics* signal a user-supplied parameter, such as a particular port number or host name. Replace the italicized word with an entry that corresponds to your setup.

  To preserve case and spaces, user-entered parameters must be enclosed in quotes.
- Brackets **[ ]** denote optional parameters. Multiple optional parameters can be entered in any order or combination on a single command line. Items in brackets may be left out of the command if not desired.
- Curly braces **{ }** indicate that one and only one of the items enclosed within the braces must be used to complete the command.

11.1 Command Line Interface

Command line entry is both simple and powerful. Users can enter up to 132 characters on a command line, or abbreviate commands to a sequence of the smallest unique keywords (sometimes single characters). Commands are executed when the Return key is pressed or when the command line exceeds 132 characters.

11.1.1 Command Line Editing

Table 11-1 lists the special keys used for command line editing.

NOTE: *Line editing is disabled on Hardcopy ports.*

Table 11-1: Line Editing Keys

Key	Purpose
Return	Executes the current command line
Delete	Deletes the character before the cursor
Ctrl-A	Toggles insert / overstrike modes. Overstrike is on by default.
Ctrl-D	Logs out of the server
Ctrl-E	Moves cursor to end of line
Ctrl-H or Backspace	Moves cursor to the beginning of the line
Ctrl-R	Re-displays the current command
Ctrl-U	Deletes the entire current line
Ctrl-Z	Logs out of the server
Left Arrow	Moves cursor left
Right Arrow	Moves cursor right
Up Arrow or Ctrl-P	Recalls the previous command
Down Arrow or Ctrl-N	Recalls the next command
!*text* <Return>	Recalls command starting with *text*
!! <Return>	Recalls and executes the last command

11.2 Clear/Purge Protocol NetWare Access

{CLEAR | PURGE} PROTOCOL NETWARE ACCESS { ALL | *fileserver* }

Clears one or more of the currently specified entries in the NetWare access list.

Restrictions You must be the privileged user to use this command.

Errors An error is returned if the entry isn't found or if no entries are configured.

Parameters

fileserver
Removes only the specified entry from the NetWare access list.

Examples

```
Local> PURGE PROTOCOL NETWARE ACCESS ALL

Local> CLEAR PROTO NET ACC LAB_FS4
```

See Also Set / Define Protocols NetWare Access; Show / Monitor / List Protocols; *NetWare Access Lists*; *Access Lists*.

11.3 Clear/Purge Service

{CLEAR / PURGE} SERVICE {LOCAL / *service*}

Removes a defined service from the RapidPrint 500. The login service can not be deleted via the Clear / Purge commands—you must use the **Set/Define Server Incoming** command to remove them.

Restrictions You must be the privileged user to use this command.

Errors Clear Service fails when there are sessions connected to the service or when there are connect requests in the service's queue. These conditions can be eliminated with the **Logout Port** and **Remove Queue** commands.

NOTE: *Default services cannot be deleted; they can only be disabled.*

Parameters

Local
Removes the definitions of all local services.

service
Removes the definition of the specified service.

Examples

```
Local> CLEAR SERVICE LOCAL

Local> CLEAR SERVICE fileserver
```

See Also Set / Define Service commands beginning with Set / Define Service AppleTalk; Show / Monitor / List Services; *Creating Services*.

11.4 Clear/Purge SNMP

{CLEAR / PURGE} SNMP {ALL / *CommunityName*}

Removes entries from the SNMP security table.

Restrictions You must be the privileged user to use this command.

Parameters

All
Removes all table entries.

CommunityName
The only valid community name is *public*.

Examples

```
Local> CLEAR SNMP public
```

See Also Set / Define SNMP; Show / Monitor / List SNMP; *Simple Network Management Protocol (SNMP)*.

11.5 Crash 451

CRASH 451

Immediately reboots the server. All users are logged off and sessions are disconnected. If upline dumping is enabled, the server generates a dump file on the VMS load host before rebooting.

Restrictions You must be the privileged user to use this command.

See Also Initialize Server; *Rebooting the RapidPrint 500*.

11.6 Define

Define is equivalent to Set, but Define changes the *permanent* characteristics of ports, servers, and services. Define Port settings do not take effect until after the current user logs out. Define Server and Define Service settings remain unchanged until the server is rebooted. To make a permanent change that takes effect immediately, you must enter both a Define and a Set command with the same parameters. All Define commands are documented together with their corresponding Set commands later in this chapter.

11.7 Finger

FINGER [[*username*] [*@host*]]

This command is an implementation of the UNIX Finger command that shows local and remote users. The finger command by itself will show the ports on the RapidPrint 500.

Errors An error is displayed if the host cannot be accessed.

Parameters

username
Shows information about user *username* on the RapidPrint 500.

username@host
Shows information regarding user *username* on TCP/IP host *host*.

@host
Shows all users currently connected to TCP/IP host *host*.

NOTE: *To see a list of processes running on the RapidPrint 500, use the command "finger finger."*

Examples

```
Local> FINGER

Local> FINGER bob

Local> FINGER @hydra

Local> FINGER bob@hydra

Local> FINGER FINGER
```

See Also Show/Monitor Users.

11.8 Help

HELP [*command* [*parameter*]]

Lets you access the online Help system. Enter **Help** with no parameters to see a list of all available commands.

Restrictions The help processor only shows the help text for the commands that the user is privileged to use. To see all help text, become the privileged user.

Parameters

command
Gives general information about the command, and lists any parameters.

parameter
Gives more specific information about the command and parameter, and lists any sub-parameters. Several parameters can be specified, provided they are listed in the proper hierarchical order.

Examples

```
Local> HELP DEFINE SERVER BROADCAST
```

11.9 Initialize Server

INITIALIZE [SERVER] [CANCEL | DELAY *delay* | FACTORY | NOBOOT | RELOAD]

Resets the server or cancels a pending Initialization. When reset, the server loses all changes made using Set commands unless corresponding Define or Save commands were also entered.

NOTE: *Initialization options can be used in any order or combination.*

Restrictions You must be the privileged user to use this command.

Parameters

Cancel
Cancels any impending Initialize command. Cancel and Delay cannot be used together.

Delay
Schedules the Initialize after a specified number of minutes (the range is 0-120 minutes). Show Server Status will show the time pending until a scheduled reboot.

Factory
Causes the server to reload the factory settings. In addition to Set configurations, all Saved and Defined settings will be cleared.

NOTE: *A Factory Init clears all settings not enabled by default, including NDS and LAT. After the initialization, you will have to re-enter the LAT license.*

Reload
For flash-ROM units, this option forces the server to download operational code from a host machine and reprogram the flash-ROM.

Examples

```
Local> INITIALIZE DELAY 12

Local> INITIALIZE FACTORY

Local> INITIALIZE CANCEL
```

See Also Crash 451; Show / Monitor / List Server Status; *Rebooting the RapidPrint 500*.

11.10 List

List is similar to the Show command, except that List displays defined (permanent) characteristics, which may or may not be the same as those currently set (temporary). List shows settings that will take effect the next time the server is re-initialized. Each List command is documented together with its corresponding Show command.

11.11 Logout

LOGOUT [PORT *PortNum*]

Logs out the current port by default, or another port if specified, and disconnects all of the port's open sessions.

Restrictions You must be the privileged user to logout a port other than your own.

Examples

```
Local> LOGOUT

Local> LOGOUT PORT 2
```

11.12 Man

The Man command is functionally identical to the Help command. It is provided for UNIX compatibility.

11.13 Monitor

Monitor commands are the same as Show commands, except that the displayed information is continuously updated approximately every three seconds. The display can be stopped by pressing any key. See the corresponding Show commands for details and options.

11.14 Netstat

NETSTAT

The Netstat command shows the currently active network connections. Information is displayed for the AppleTalk, LAT, LAN Manager, Netware and TCP/IP protocols. This information is primarily meant for debugging network problems.

11.15 Ping

PING *hostname*

Ping sends a TCP/IP request for an echo packet to another network host and therefore provides an easy way to test network connections. In general, any host that supports TCP/IP will respond if it is able, regardless of login restrictions, job load, or operating system. If there is no reply from the host, there may be a network or TCP/IP configuration problem.

Parameters **hostname**
Either a text hostname or IP address can be provided.

Examples

```
Local> PING 192.0.1.23

Local> PING hydra.local.net
```

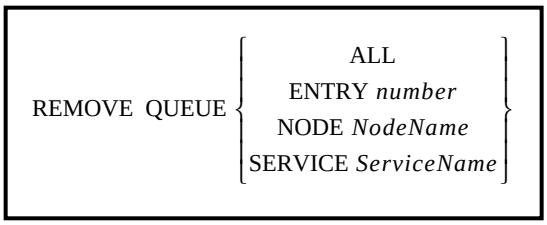
See Also **Configuration Guide**.

11.16 Purge

Purge commands permanently remove an entry (service or IP host) from the server's database when the unit is rebooted. Purge does not affect the current operating characteristics.

Because Purge is similar to Clear, some Purge commands are explained together with their corresponding Clear commands earlier in this chapter.

11.17 Remove Queue



Removes requests for local services from that service's queue.

Restrictions You must be the privileged user to use this command.

Parameters

All
Removes all requests in the local server queue.

Entry number
Removes the specified queue entry. Use the Show Queue command to display the queues and entries by number.

Node NodeName
Removes all queue requests originating from the specified node.

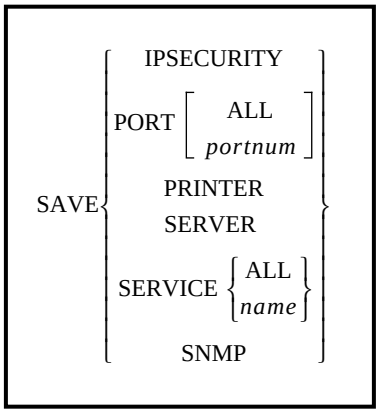
Service ServiceName
Removes all requests queued to the specified local service.

Examples

```
Local> REMOVE QUEUE ALL

Local> REMOVE QUEUE ENTRY 5

Local> REMOVE QUEUE NODE opus

Local> REMOVE QUEUE SERVICE MODEM
```

See Also Show / Monitor / List Protocols.

11.18 Save



This command saves current configurations into the permanent database, essentially Defining everything you have set so far. Instead of issuing a Define for each Set command to make your changes permanent, you can just issue the Save command after you have configured the port, service, server or printer.

NOTE: *You cannot save the login service; you must use Define Server Incoming to make it permanent.*

Restrictions You must be the privileged user to use this command.

Errors Save without a parameter is invalid.

Parameters

IPsecurity
Saves the current IPsecurity table.

Port
Saves the settings for one selected port or all ports. If the Port parameter is used without the **All** or *portnum* keywords, the current port is Saved.

Printer
Saves the current printer port settings.

Server
Saves the current Server settings.

Service
Saves all entered Set Service commands for all local services or the named service. If used without the **All** or **name** parameters, the local service characteristics are saved.

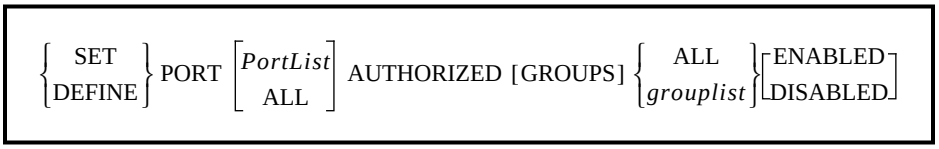
SNMP
Saves all parameters associated with SNMP.

See Also *Set and Define*.

11.19 Set Noprivileged

Removes privileges from the current session. See Set Privileged / Noprivileged.

11.20 Set/Define Port Authorized Groups



Adds (Enabled) or deletes (Disabled) groups from the list of service groups that are accessible to a port. Use service groups to restrict access to services on a per-port basis; the authorized groups are the only groups a port can see. When entries are specified without the Enabled / Disabled parameters, they replace the current group list.

Restrictions You must be the privileged user to use this command.

Parameters

PortList/All
Specifies a particular port or group of ports, or all ports. Port numbers are specified with integers between 1 and the total number of physical ports. Lists of ports must be separated by commas. Ranges of ports must be separated by a dash (-).

NOTE: *In the absence of a PortList or the All parameter, the configuration will affect the current port only.*

All/grouplist
Group numbers range from 0 to 255. They can be listed individually (1, 3, 12) and by range (3-25, 110-112), with individual entries separated by a comma. The default is group 0 enabled, groups 1-255 disabled.

Examples

```
Local> SET PORT AUTHORIZED 0,2-5,101
```

See Also Set Port Groups; Set / Define Server Service Groups; Show / Monitor / List Ports; *Group Numbers*.

11.21 Set/Define Port Bitronics

{SET / DEFINE} PORT [*PortList* / ALL] BITRONICS {ENABLED / DISABLED}

Enables or disables bidirectional parallel port functionality. The attached printer must also support Bitronics mode.

Parameters

PortList/All
Specifies a particular port or group of ports, or all ports. Port numbers are specified with integers between 1 and the total number of physical ports. Lists of ports must be separated by commas. Ranges of ports must be separated by a dash (-).

NOTE: *In the absence of a PortList or the All parameter, the configuration will affect the current port only.*

Examples

```
Local> DEFINE PORT 2 BITRONICS ENABLED
```

See Also *Bitronics Interface*.

11.22 Set/Define Port DSRlogout

{SET / DEFINE} PORT [*PortList* / ALL] DSRLOGOUT {ENABLED / DISABLED}

When enabled, the port will be logged out when the port's DSR signal is dropped. This usually happens only when the attached device is powered off or disconnected. Any open connections will be closed before logging out.

Restrictions You must be the privileged user to use this command.

Parameters

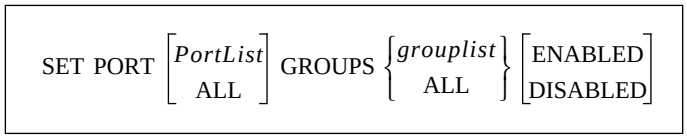
PortList/All
Specifies a particular port or group of ports, or all ports. Port numbers are specified with integers between 1 and the total number of physical ports. Lists of ports must be separated by commas. Ranges of ports must be separated by a dash (-).

NOTE: *In the absence of a PortList or the All parameter, the configuration will affect the current port only.*

Errors When Modem Control is enabled for a port, DSRlogout is also enabled.

See Also Show / Monitor / List Ports; *DSRlogout*.

11.23 Set Port Groups



Limits which of the Authorized groups the port can access; the groups must already be in the Set Port Authorized Groups list. If the Enabled or Disabled modifiers are used, the group list is added to or removed from the current list. Otherwise, the group list given replaces the current one. Group lists are applicable to LAT connections only. The only group enabled by default is group 0.

Parameters

PortList/All
Specifies a particular port or group of ports, or all ports. Port numbers are specified with integers between 1 and the total number of physical ports. Lists of ports must be separated by commas. Ranges of ports must be separated by a dash (-).

NOTE: *In the absence of a PortList or the All parameter, the configuration will affect the current port only.*

Examples

```
Local> SET PORT GROUPS 4,5-9
```

See Also

Set / Define Port Authorized Groups; Show / Monitor / List Ports; *Group Numbers*.

11.24 Set/Define Port Inactivity Logout

Enables automatic logout of the port if it has been inactive for a set period of time. Inactive is defined as having no keyboard or network activity on the port. The port's open connections (if any) will be closed before logging out.

Restrictions

You must be the privileged user to use this command.

Parameters

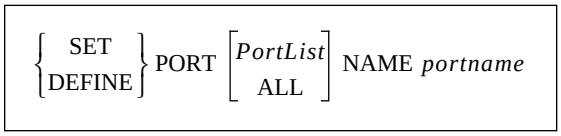
PortList/All
Specifies a particular port or group of ports, or all ports. Port numbers are specified with integers between 1 and the total number of physical ports. Lists of ports must be separated by commas. Ranges of ports must be separated by a dash (-).

NOTE: *In the absence of a PortList or the All parameter, the configuration will affect the current port only.*

See Also

Set / Define Server Inactivity Timer; Show / Monitor / List Ports; *Inactivity Logout*.

11.25 Set/Define Port Name



Sets a unique name for each port. Remote LAT connections to the RapidPrint 500 can use either a service name or the port name to identify a port for connection purposes.

Restrictions You must be the privileged user to use this command.

Parameters

PortList/All
Specifies a particular port or group of ports, or all ports. Port numbers are specified with integers between 1 and the total number of physical ports. Lists of ports must be separated by commas. Ranges of ports must be separated by a dash (-).

NOTE: *In the absence of a PortList or the All parameter, the configuration will affect the current port only.*

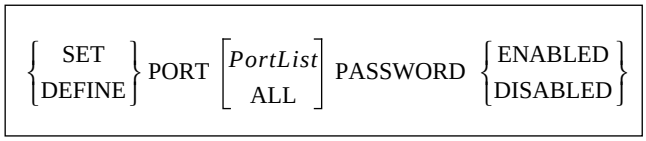
portname
A 16 character name composed of alphanumeric characters or the underscore (_) character. The default is *Port_n*, where *n* is the port number. If the name is not enclosed in quotation marks, it will be converted to uppercase.

Examples

```
Local> SET PORT NAME "HighSpeed_Modem"
```

See Also Show / Monitor / List Ports; *Naming Ports*.

11.26 Set/Define Port Password



Controls whether a password is needed to log into the server from this port. The Set / Define Server Login Password command is used to set the password itself.

Restrictions You must be the privileged user to use this command.

Parameters

PortList/All
Specifies a particular port or group of ports, or all ports. Port numbers are specified with integers between 1 and the total number of physical ports. Lists of ports must be separated by commas. Ranges of ports must be separated by a dash (-).

NOTE: *In the absence of a PortList or the All parameter, the configuration will affect the current port only.*

See Also Set / Define Server Login Password; Show / Monitor / List Ports; *System Passwords*.

11.27 Set Privileged/Noprivileged

Changes the current port's privilege status. Only one port on the server can be privileged at any time. When changing your port to privileged status, you will be queried for the privileged password. The factory default privileged password is **system**; this password can be changed with the **Set Server Privileged Password** command. If the password is forgotten, the server can be reset to factory defaults.

Restrictions To become the privileged user, the user must know the privileged password. Secure users cannot become privileged.

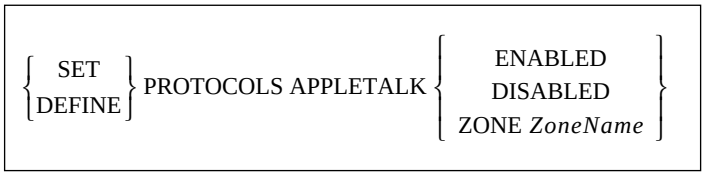
Parameters Forces the current port to become the privileged port; the previously privileged port loses the privilege.

Examples

```
Local> SET NOPRIVILEGED
Password> system (not echoed)

Local> SET PRIVILEGED OVERRIDE
Password> system (not echoed)
```

See Also Set / Define Server Privileged Password; *Privileged Password*.

11.28 Define Protocols AppleTalk



Enables or Disables the AppleTalk protocol on the server, and allows the specification of a zone other than the default when there is a router and more than one AppleTalk zone is present.

Restrictions You must be the privileged user to use this command.

Errors If the zone specified cannot be confirmed by a router, the command will fail.

Set does not work with the Enabled / Disabled parameters; they must be defined.

Parameters

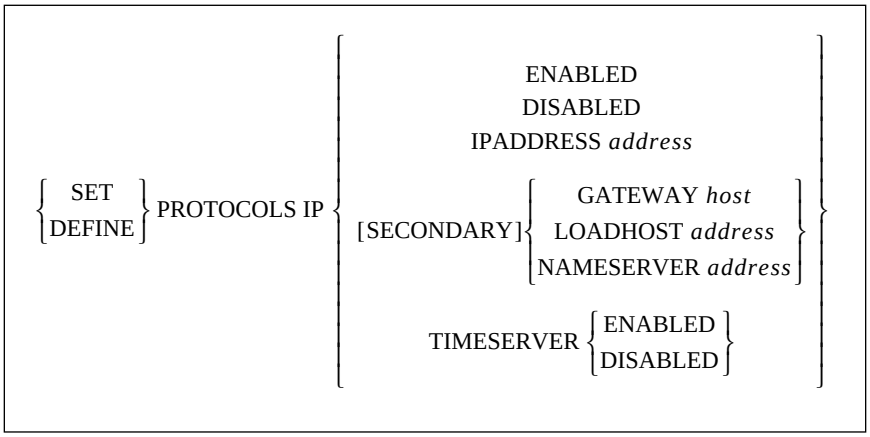
ZoneName
Name of the zone to move the RapidPrint 500 into.

Examples

```
Local> DEFINE PROTOCOL APPLETALK ZONE "AcctZone"
```

See Also Show / Monitor / List Protocols; *AppleTalk Server Parameters*.

11.29 Define Protocols IP



Enables or Disables the IP protocol, and allows configuration of other IP parameters. Some parameters may be duplicates of **Set Server** commands; the functionality is identical. See the Set Server commands for descriptions of the parameters not explained here.

Restrictions You must be the privileged user to use this command.

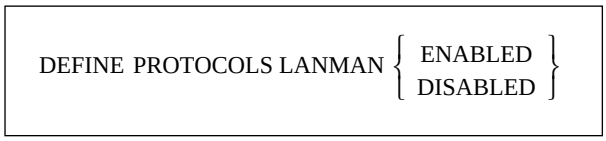
Errors Enabled / Disabled parameters must be defined.

Parameters

Timeserver
Controls whether the RapidPrint 500 will send IP daytime request packets. It is enabled by default.

See Also Set / Define Server IPaddress; Set / Define Server Gateway; Set / Define Server Loadhost; *TCP/IP Server Parameters*; **Configuration Guide**.

11.30 Define Protocols LAN Manager



Enables or Disables the LAN Manager protocol.

Restrictions You must be the privileged user to use this command.

See Also *LAN Manager*.

11.31 Set/Define Protocols LAT

Enables or Disables the LAT protocol.

Restrictions You must be the privileged user to use this command.

See Also *LAT*.

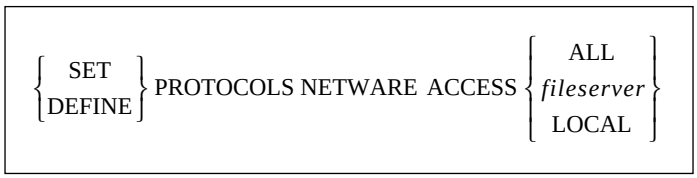
11.32 Define Protocols NetWare

Enables or Disables the NetWare protocol.

Restrictions You must be the privileged user to use this command.

See Also *NetWare*.

11.33 Set/Define Protocols NetWare Access



Allows configuration of a list of fileservers that the RapidPrint 500 will contact for print jobs. By default, only fileservers on the local network will be queried; this command can be used to add or remove additional fileservers.

Restrictions You must be the privileged user to use this command.

Parameters

All
All fileservers will be contacted, including those on routed networks.

fileserver
An individual fileserver to be queried. The name can be up to 8 characters in length.

Local
Only fileservers on the local network will be queried.

Examples

```
Local> DEFINE PROTOCOLS NETWARE ACCESS LAB_FS4
```

See Also Show / Monitor / List Protocols; *NetWare Server Parameters*.

11.34 Define Protocols NetWare DScontext

DEFINE PROTOCOLS NETWARE DSCONTEXT *context*

Configures the NetWare Directory Service context where the print server is located.

Restrictions You must be the privileged user to use this command.

Parameters

context
Specify the NDS context where the print server is located. For more information about the format of the NDS context and tree, see your host documentation

Examples

```
Local>> DEFINE PROTOCOLS NETWARE DSCONTEXT
ou=kiwi.ou=exotic.o=fruit
```

See Also *Creating NDS Print Queues*.

11.35 Define Protocols NetWare DSlicense

DEFINE PROTOCOLS NETWARE DSLICENSE *licenseString*

Configures the NetWare Directory Service license needed to enable NDS on the server.

Restrictions You must be the privileged user to use this command.

Parameters

DSlicense
Enables NDS on your server. The **licenseString** should be obtained from Digital.

See Also *Creating NDS Print Queues*.

11.36 Define Protocols NetWare DStree

DEFINE PROTOCOLS NETWARE DSTREE *treeString*

Configures the NetWare Directory Service tree in which the server is located.

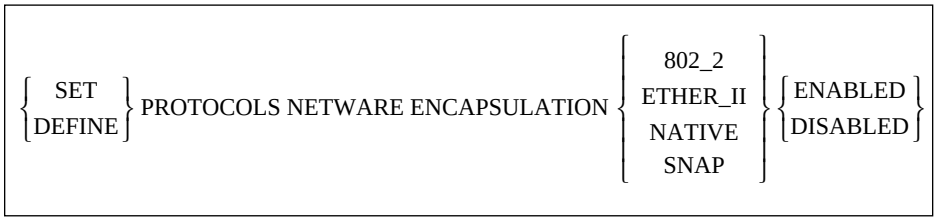
Restrictions You must be the privileged user to use this command.

Examples

```
Local>> DEFINE PROTOCOLS NETWARE DSTREE foodco
```

See Also *Creating NDS Print Queues*.

11.37 Set/Define Protocols NetWare Encapsulation



In conjunction with the **Set Protocol NetWare Routing** command, this command configures which frame types the RapidPrint 500 will pay attention to. When routing is enabled, all frame types are enabled; any undesired frame types may then be disabled with this command. When routing is disabled, all frame types are disabled; the desired single frame type may then be enabled using this command.

Restrictions You must be the privileged user to use this command.

Parameters

802_2
The server uses 802.2 frame format with NetWare SAPs.

Ether_II
The server uses Ethernet v2 frame format.

Native
The server uses "native mode" NetWare frame format.

Snap
The server uses 802.2 frame format with SNAP SAPs.

Examples

```
Local> DEFINE PROTOCOLS NETWARE ENCAPSULATION ETHER_II DIS-
ABLED
```

See Also Show / Monitor / List Protocols; Set / Define Protocols NetWare Routing; *NetWare Server Parameters*.

11.38 Set/Define Protocols NetWare Internal

Sets the internal network number for the server. This number becomes the server's address when routing packets between nodes speaking different NetWare frame types. Under normal circumstances, the default internal network number should not have to be changed.

Restrictions You must be the privileged user to use this command.

Parameters

netnum
A non-zero network number of up to eight hexadecimal digits in length.

Examples

```
Local>> DEFINE PROTOCOLS NETWARE INTERNAL a3cc0850
```

See Also Set / Define Protocols NetWare Routing; Show / Monitor / List Protocols; *NetWare Server Parameters*.

11.39 Set/Define Protocols NetWare Loadhost

Specifies the name of the fileserver to attempt to download from when the unit is booted. This parameter is only useful if it is defined; if it is Set, it will be cleared / reset at boot time.

Restrictions You must be the privileged user to use this command.

Parameters

fileserver
The fileserver name can be up to 8 characters long. The null string (“ “) returns the setting to undefined.

None
Clears the previously-configured loadhost.

Examples

```
Local> DEFINE PROTOCOLS NETWARE LOADHOST LAB_FS4
```

See Also Set / Define Server NetWare Loadhost; Set / Define Server Software; *NetWare Server Parameters*.

11.40 Set/Define Protocols NetWare Printserver

Configure the fileserver to which the RapidPrint 500 will be dedicated for Rprinter operation.

Restrictions You must be the privileged user to use this command.

Parameters

printserver
The printserver name can be up to 8 characters long. The null string (“ “) returns the setting to undefined.

None
Clears the previously configured printserver.

Examples

```
Local> DEFINE PROTOCOLS NETWARE PRINTSERVER LAB_FS4
```

See Also Set / Define Server NetWare Printserver.

11.41 Set Protocols NetWare Reset

Instructs the Print Server module to immediately rescan the network for new connections. This is typically necessary when setting up queues or print servers using PCONSOLE.

Restrictions You must be the privileged user to use this command.

See Also *Installing a Print Queue Using PCONSOLE*.

11.42 Set/Define Protocols NetWare Routing

Configures whether the RapidPrint 500 will act as an internal router. If routing is enabled, the RapidPrint 500 advertises all of its NetWare services as part of an internal network and itself as a "router" to that network.

Turning routing on enables all frame types. Turning routing off disables all frame types; you must then enable the single desired frame type using the **Set/Define Protocols NetWare Encapsulation** command. Routing must be enabled if more than one frame type is desired.

Restrictions You must be the privileged user to use this command.

See Also Set / Define Protocols NetWare Encapsulation; Set / Define Protocols NetWare Internal; Show / Monitor / List Protocols; *Routing and Encapsulation*.

11.43 Set/Define Server Announcements

Governs whether the RapidPrint 500 will send messages over the network to advertise its available local services. If announcements are enabled but no services are active, no messages will be sent.

Restrictions You must be the privileged user to use this command.

11.44 Set/Define Server BOOTP

Enables or disables querying for a BOOTP host at system boot time.

Restrictions You must be the privileged user to use this command.

See Also Set / Define Server RARP; *Editing the Boot Parameters*.

11.45 Set/Define Server Buffering

Specifies the size of buffer (in bytes) to use for network connections. The default, 512 bytes, should be sufficient for most cases. The size can be increased for large data transfers (for example, file transfers or printing).

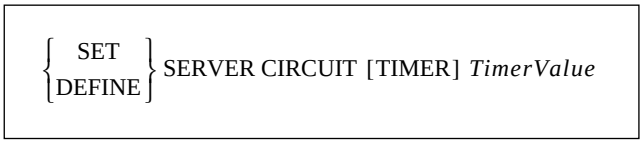
Restrictions You must be the privileged user to use this command.

Parameters **buffersize**
Acceptable buffer sizes range from 128 bytes to 4096 bytes.

Examples

```
Local> SET SERVER BUFFERING 1024
```

11.46 Set/Define Server Circuit Timer



Specifies the delay between LAT messages transmissions from the server to other nodes. This setting should not need to be changed under normal circumstances, and should **never** be altered while there are active sessions.

Restrictions You must be the privileged user to use this command.

Parameters **TimerValue**
Specify a value from 30 to 200 milliseconds. The default is 80.

Examples

```
Local> SET SERVER CIRCUIT TIMER 55
```

See Also *LAT*; *Network Timers*.

11.47 Set/Define Server Gateway

{ SET / DEFINE } SERVER [SECONDARY] GATEWAY *IPaddress*

Specifies the host to be used as a TCP/IP gateway between networks. Packets destined for a different network will be directed to the gateway for forwarding.

Restrictions You must be the privileged user to use this command.

Errors If no gateway is defined, an error message is returned.

Parameters

Secondary
If desired, a secondary gateway can be configured for use when the primary gateway is unavailable.

IPaddress
Enter an IP address in standard numeric format. Specifying "0.0.0.0" as the address clears any previously-defined setting.

Examples

```
Local> SET SERVER GATEWAY 192.0.1.27

Local> SET SERVER SECONDARY GATEWAY 192.0.1.10
```

See Also Set/Define Server Subnet Mask; Show/Monitor/List Protocols IP; *TCP/IP*; *TCP/IP Server Parameters*.

11.48 Set/Define Server Host Limit

{ SET / DEFINE } SERVER HOST [LIMIT] { *limit* / NONE }

Configures the maximum number of TCP/IP hosts about which the server will keep information. Only hosts seen with rwho broadcasts are subject to this limit.

Restrictions You must be the privileged user to use this command.

Parameters

limit
The server can be limited to between 0 and 200 hosts (the default is 20). If the new limit is less than the current limit and the host table is full, the host limit will be slowly graduated down to the new value.

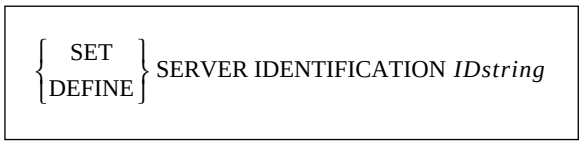
None
No limit is imposed.

Examples

```
Local> SET SERVER HOST LIMIT 6
```

See Also Show/Monitor/List Protocols IP; *Host Limit*.

11.49 Set/Define Server Identification



Specifies the identification string that is broadcast along with LAT service messages. The identification string is also broadcast as the ident string for a LAT login service.

Restrictions You must be the privileged user to use this command.

Parameters

IDstring
Enter up to 40 characters of identification data.

Examples

```
Local> SET SERVER IDENTIFICATION “Googol Company LAT Box”
```

See Also Set / Define Protocols LAT; Show / Monitor / List Protocols; Show / Monitor / List Server; *Server Identification*.

11.50 Set/Define Server Inactivity Timer

Sets the period of time after which a port with Inactivity Logout enabled is considered inactive and automatically logged out.

Restrictions You must be the privileged user to use this command.

Parameters

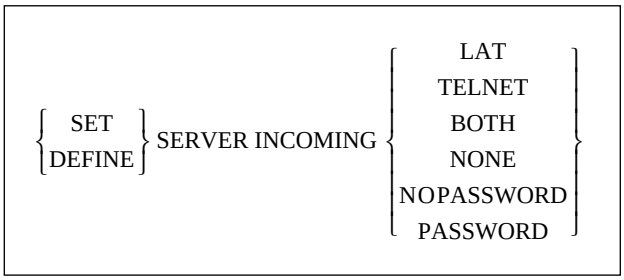
limit
Enter the desired inactivity period in minutes. The default is 30 minutes.

Examples

```
Local> DEFINE SERVER INACTIVITY LIMIT 20
```

See Also Set / Define Port Inactivity Logout; Show / Monitor / List Server; *Inactivity Logout*.

11.51 Set/Define Server Incoming



Allows or denies incoming LAT or Telnet connections and enforces password protection, if desired. The Show Server command shows the status of incoming connection parameters.

Restrictions

You must be the privileged user to use this command.

Parameters

LAT
Enables incoming LAT connections only, and creates a new LAT service that is used to log into the server.

Telnet
Enables incoming Telnet connections only. The status of incoming Telnet also controls incoming Rlogin sessions from remote hosts. It also removes any LAT- or Both-created service and the ability to log in using LAT.

Both
Enables incoming LAT and Telnet connections, and creates a new LAT service that is used to log into the server.

None
Disables incoming LAT and Telnet connections (the default). It also removes any LAT- or Both-created service and the ability to log in using LAT.

Nopassword
Allows the establishment of incoming connections without prompting for a password (the default).

Password
Causes the server to prompt for a password for all incoming connections.

Examples

```
Local> SET SERVER INCOMING TELNET INCOM PASSW
(sets up password protected Telnet logins)
```

See Also

Set / Define Server Rlogin; Show / Monitor / List Server; *System Passwords*.

11.52 Set/Define Server IPaddress

Sets the server's IP network address. The IP address must be set before any TCP/IP connectivity is available (i.e., Telnet, Rlogin, and Reverse Telnet) and cannot be changed when there are active TCP/IP sessions. A default subnet mask will also be created when you set the IP address; it can be overridden with the Set Server Subnet Mask command.

NOTE: *If the IP address is cleared after a reboot but List Server still shows the address, there is some other node on the network responding to that IP address.*

Restrictions You must be the privileged user to use this command.

Parameters

IPaddress
Enter the address in standard numeric format.

Examples

```
Local> SET SERVER IPADDRESS 192.0.1.49
```

See Also Set/Define Server Subnet Mask; Show/Monitor/List Server; Show/Monitor/List Protocols IP; *TCP/IP*.

11.53 Set/Define Server Keepalive Timer

Sets the period between "hello" messages on active, but quiet, LAT sessions.

Restrictions You must be the privileged user to use this command.

Parameters

time
Enter the time period in seconds.

Examples

```
Local> SET SERVER KEEPALIVE TIMER 30
```

See Also Show/Monitor/List Server; *Network Timers*.

11.54 Set/Define Server Loadhost

{ SET / DEFINE } SERVER [SECONDARY] LOADHOST *IPaddress*

Specifies the TCP/IP host from which the RapidPrint 500 requests its runtime code. For LAT-loading servers, this command has no function.

Restrictions You must be the privileged user to use this command.

Parameters

Secondary
Allows you to specify a backup loadhost for use when the primary loadhost is unavailable.

IPaddress
Specify the address in standard numeric format. Specifying "0.0.0.0" as the address clears the previously-defined loadhost. No text host names can be used.

Examples

```
Local> DEFINE SERVER LOADHOST 193.23.71.49

Local> DEFINE SERVER SECONDARY LOADHOST 192.0.1.89
```

See Also Editing the Boot Parameters; Show/Monitor/List Server; *UNIX Host Setup*.

11.55 Set/Define Server Login Password

{ SET / DEFINE } SERVER LOGIN [PASSWORD][*passwd*]

Specifies the password that is used to log into the server from the network. If the password is not given on the command line, the user will be prompted for it; it will not be displayed when typed. Users will only be required to provide this password if their ports also have Port Password enabled.

Restrictions You must be the privileged user to use this command.

Parameters

passwd
Enter a password of up to 6 alphabetic characters.

Examples

```
Local> SET SERVER LOGIN PASSWORD
Password> platyp (not echoed)
Verification> platyp (not echoed)
Local>
```

See Also Set/Define Port Password; *Login Password*.

11.56 Set/Define Server Maintenance Password

{ SET / DEFINE } SERVER MAINTENANCE [PASSWORD][*passwd*]

Specifies the password that allows remote NCP connections to the server. The maintenance password is only used by the MOP protocol itself; it is not needed for user-level logins.

Restrictions You must be the privileged user to use this command.

Parameters **passwd**
A string of up to sixteen hexadecimal digits (0-9, A-F, a-f) that defaults to all zeros (off). Zero is also NCP's default.

Examples

```
Local> DEFINE SERVER MAINTENANCE PASSWORD 89aacb
```

See Also *Maintenance Password*.

11.57 Set/Define Server Multicast Timer

{ SET / DEFINE } SERVER MULTICAST[TIMER] *timer*

Specifies the length of time between RapidPrint 500 service announcement broadcasts for LAT circuits. This parameter should not need to be changed under normal circumstances.

Restrictions You must be the privileged user to use this command.

Parameters **timer**
Enter an interval between multicast, ranging from 10 to 180 seconds. The default value is 30 seconds.

Examples

```
Local> SET SERVER MULTICAST TIMER 40
```

See Also Show / Monitor / List Server; *LAT*; *Network Timers*.

11.58 Set/Define Server Name

Specifies the name of the RapidPrint 500.

Restrictions You must be the privileged user to use this command.

Parameters

ServerName
The server name is restricted by service name constraints. Print service names, typically *servername*_text or *servername*_p1, may be no more than 16 characters including the suffix.

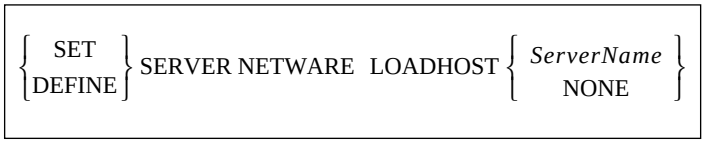
NOTE: *The server name string must be enclosed in quotes to preserve case.*

Examples

```
Local> SET SERVER NAME "LATBOX2"
```

See Also Show / Monitor / List Server; *Changing the Server Name*.

11.59 Set/Define Server NetWare Loadhost



Used to specify the name of the NetWare file server to be used for downloading new software.

Restrictions You must be the privileged user to use this command.

Parameters

ServerName
Enter a file server name of up to 11 characters. The null string (" ") returns the setting to undefined.

None
Clears the previously-configured loadhost.

Examples

```
Local> SET SERVER NETWARE LOADHOST FRED
```

See Also Set / Define Protocols NetWare Loadhost; Show / Monitor / List Protocols NetWare; *Editing the Boot Parameters*.

11.60 Set/Define Server NetWare Printserver

```
{ SET    }
{ DEFINE } SERVER NETWARE  PRINTSERVER { ServerName }
                                       { NONE       }
```

Used to specify the name of the print server VAP / NLM running on the NetWare file server. This is used when setting up the RapidPrint 500 as an RPRINTER client.

Restrictions You must be the privileged user to use this command.

Parameters

ServerName
The printserver name can be up to 8 characters long. The null string (“ “) returns the setting to undefined.

None
Clears the previously-configured setting.

Examples

```
Local> SET SERVER NETWARE PRINTSERVER FRED
```

See Also Set / Define Protocols NetWare Printserver; Show / Monitor / List Protocols NetWare.

11.61 Set Server NetWare Reset

```
SET SERVER NETWARE  RESET
```

Instructs the Print Server module to immediately rescan the network for new connections. This is typically necessary when setting up queues or print servers using PCONSOLE.

Restrictions You must be the privileged user to use this command.

Examples

```
Local> SET SERVER NETWARE RESET
```

See Also Set Protocols NetWare Reset; Show / Monitor / List Protocols NetWare.

11.62 Set/Define Server Node Limit

{ SET / DEFINE } SERVER NODE [LIMIT] { *limit* / NONE }

Sets the maximum number of LAT service nodes about which the server will keep information. If the new limit is less than the current limit and the service table is full, the number of nodes will be slowly pruned down to the new value.

Restrictions You must be the privileged user to use this command.

Parameters

limit
The server can be limited to between 0 and 200 hosts; the default is 50.

None
No limit is imposed.

Examples

```
Local> SET SERVER NODE LIMIT 6
```

See Also Show / Monitor / List Server; *Node Limit*.

11.63 Set/Define Server Password Limit

{ SET / DEFINE } SERVER PASSWORD [LIMIT] { *limit* / NONE }

Limits the number of failures allowed when entering the privileged password while attempting to become the privileged user. After this number of tries, the port will be logged out. The user can abort the password process by pressing Ctrl-Z instead of typing the password.

Restrictions You must be the privileged user to use this command.

Parameters

limit
A value between zero and 100. If zero is specified, the port is never logged out for too many password failures. The default is three retries.

None
Changes the retry limit to zero (no limit).

Examples

```
Local> SET SERVER PASSWORD LIMIT 10
```

See Also Set Privileged / Noprivileged; Set / Define Server Privileged Password; *System Passwords*.

11.64 Set/Define Server Privileged Password

{ SET / DEFINE } SERVER PRIVILEGED[PASSWORD][*passwd*]

Sets the password for becoming the privileged user or “superuser” of the server. If the password is not specified on the command line, the user will be prompted for it; it will not be displayed on the screen as it is typed.

Restrictions You must be the privileged user to use this command.

Parameters **passwd**
Enter a password of six or fewer alphanumeric characters.

Examples

```
Local> SET SERVER PRIVILEGED PASSWORD “yodel”
```

See Also Set Privileged / Noprivileged; Set / Define Server Password Limit; *System Passwords*.

11.65 Set/Define Server Prompt

{ SET / DEFINE } SERVER PROMPT *PromptString*

Allows the system administrator to change the prompt that users see (the default is **Local_x>**). A string up to 16 characters can be entered, and should be enclosed in quotes to preserve case.

Restrictions You must be the privileged user to use this command.

Parameters **PromptString**
The following variables can be included in the prompt string:

%p	substitutes the current port’s name
%n	substitutes the current port’s number
%s	substitutes the current server name
%D	substitutes the product name
%C	substitutes the manufacturer’s name
%S	substitutes the current session name
%P	Adds a > if user is currently privileged
%%	substitutes a %

Examples (Shown with the resulting prompts on the next command line)

```
Local> SET SERVER PROMPT "Port %n:"

Port 1: SET SERVER PROMPT "%p%S_%n%P%%"

Port_2[NoSession]_2>% SET SERVER PROMPT "Lcl_%n>%P"

Lcl_3>>
```

11.66 Set/Define Server Queue Limit

{ SET / DEFINE } SERVER QUEUE [LIMIT] { *limit* / NONE }

Limits the number of queue entries for users waiting for a local service. If connect requests come in after the limit is reached, they will be rejected.

Restrictions You must be the privileged user to use this command.

Parameters

limit
A value between zero and 32 (the default). If zero is specified, queueing is not allowed and only the user with possession of the service may use it.

None
There will be no limit except for the server's memory constraints.

Examples

```
Local> DEFINE SERVER QUEUE LIMIT 4
```

See Also Show / Monitor / List Server; Show / Monitor Queue.

11.67 Set/Define Server RARP

{ SET / DEFINE } SERVER RARP { ENABLED / DISABLED }

Enables or disables querying for a RARP host at system boot time.

Restrictions You must be the privileged user to use this command.

See Also Set / Define Server BOOTP; *Editing the Boot Parameters*.

11.68 Set/Define Server Reload

Specifies when to reload flash. This command serves no purpose on non-flash units.

Restrictions You must be the privileged user to use this command.

Parameters

Always
The server will reload flash each time it boots.

Default
The server will only reload flash when told to do so (the default).

See Also Initialize Server Reload; *Reloading Operational Software*.

11.69 Set/Define Server Retransmit Limit

Specifies the number of retries attempted if a network message receives no acknowledgment. This limit may need to be increased on especially noisy or heavily-used networks.

Restrictions You must be the privileged user to use this command.

Parameters

RetransLimit
Enter a value between 4 and 100. The default value is 50.

Examples

```
Local> SET SERVER RETRANSMIT LIMIT 5
```

See Also Show / Monitor / List Protocols; *Network Timers*.

11.70 Set/Define Server Rlogin

Restricts the use of the RLOGIN command from the server to other hosts. If Rlogins are disabled, users may not RLOGIN to remote hosts, but incoming Rlogin connections are still permitted.

Restrictions You must be the privileged user to use this command.

See Also Show / Monitor / List Server; Set / Define Server Incoming.

11.71 Set/Define Server Service Groups

Establishes the LAT group numbers of the services provided by this server, and whether groups should be added to the list (Enabled) or removed from the list (Disabled).

Restrictions

You must be the privileged user to use this command.

Parameters

All
All group numbers are provided or disabled.

GroupList
Adds to or subtracts from the server's list of group numbers. Group numbers range from zero to 255, and can be entered one at a time. In addition, ranges can be separated with dashes, and multiple entries can be separated by commas. Group zero is the only group enabled by default.

Enabled
The given group numbers are added to the server's list of the service groups.

Disabled
The given group numbers are removed from the server's list of service groups.

Examples

```
Local> DEFINE SERVER SERVICE GROUPS 2,5,6,8-44 ENABLED

Local> SET SERVER SERVICE GROUPS ALL DISABLED
```

See Also

Set / Define Port Authorized Groups; Show / Monitor / List Server.

11.72 Set/Define Server Software

Specifies the name of the download software file (if any) that the server will attempt to load at boot time. For IP or LAT-loading hosts, this is the file that will be requested at boot time. For TFTP loading, you can also specify the complete pathname of the file if the file is located in a directory other than the default.

NOTE: *This option is only useful if a Define command is used; if a Set command is used, the setting will be cleared/reset at boot time.*

Restrictions You must be the privileged user to use this command.

Parameters

filename
Enter the desired loadfile name of up to 11 characters. The server will add the ".SYS" extension to the filename.

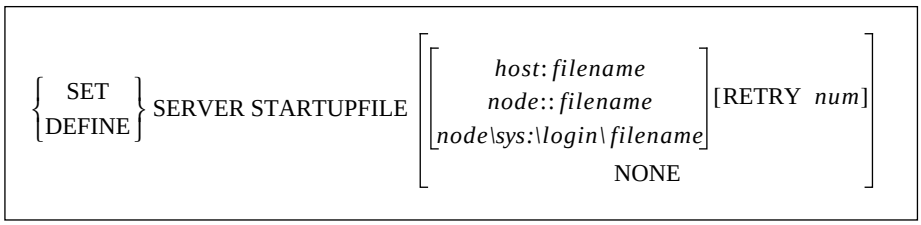
For TFTP loading, a pathname of up to 15 characters not including the filename can be specified, and should be placed in quotes to preserve lowercase characters.

Examples

```
Local> DEFINE SERVER SOFTWARE  RapidPrint 500

Local> DEFINE SERVER SOFTWARE "SYS:\LOGIN\PS1.SYS"

Local> DEFINE SERVER SOFTWARE "/tftpboot/tscode"
```

See Also Set / Define Server Loadhost; *Reloading Operational Software*; **Configuration Guide**.

11.73 Set/Define Server Startupfile



Configures the startup configuration file that the RapidPrint 500 will attempt to download at boot time. This file contains the RapidPrint 500 commands that will configure the server before any users and services, etc., are started. If a text hostname is used for TFTP, the name must be resolvable at boot time, otherwise you must use an IP address.

Both the Telnet and NCP consoles are available at the time the server attempts to download the startupfile; if there is a problem with the download, you can still log into the server and determine what went wrong.

Restrictions You must be the privileged user to use this command.

Parameters

host:filename
Used to load from a TCP/IP host via TFTP. Enter a TCP/IP hostname or IP address followed by a colon and a startup file name of up to 11 characters in length.

node::filename
Used to load from a VAX machine via LAT. Enter the nodename followed by two colons and the startup file name of up to 11 characters in length.

node\sys:\login\filename
Used to load from a Novell fileserver. Enter a node name, path, and startup filename of up to 11 characters.

None
Clears any previously configured startupfile name, host, and retry setting.

Retry num
Specifies how many times to retry the download attempt. If zero is specified, the server will retry indefinitely until the startupfile is read.

Examples

```
Local> DEFINE SERVER STARTUPFILE “bob:start” RETRY 6

Local> DEFINE SERVER START hevax::start.com

Local> DEFINE SERVER STARTUPFILE engfs\sys:\login\start.cmd”
```

See Also Set/Define Server Loadhost; *Reloading Operational Software*; **Configuration Guide**.

11.74 Set/Define Server Subnet Mask

{ SET / DEFINE } SERVER SUBNET [MASK] *mask*

Sets an IP subnet mask for the server, or overrides the subnet automatically created when the IP address was configured for the server. The mask is applied to target IP addresses to determine whether the destination address is on the local network segment. If it is not, the server’s gateway host will be accessed to provide the connection.

Restrictions You must be the privileged user to use this command.

Parameters

mask
Enter a mask in numeric IP format. A zero in any bit position prevents that bit from passing while a 1 in any bit position allows the bit to pass through.

Examples

```
Local> SET SERVER SUBNET MASK 255.255.192.0
```

See Also Set/Define Server IPaddress; Set/Define Server Gateway; *TCP/IP*; *IP Address*.

11.75 Set/Define Service

{ SET / DEFINE } SERVICE *ServiceName*

Creates a local service. A maximum of 16 services may be configured for the RapidPrint 500. Additional service parameters are discussed in the following pages.

NOTE: *Services have no default parameters; all options must be configured manually.*

Restrictions You must be the privileged user to use this command.

Parameters

ServiceName
Enter a service name of up to 12 alphanumeric characters. The default service name is based on the server name.

NOTE: *The Set/Define Service options do not necessarily apply to virtual sessions.*

See Also Clear / Purge Service; Show / Monitor / List Services; *Creating Services*.

11.76 Set/Define Service AppleTalk

{ SET / DEFINE } SERVICE *ServiceName* APPLETALK { ENABLED / DISABLED }

Specifies whether AppleTalk clients will be able to use the service. If enabled, the service name will be displayed as a selectable printer in Macintosh chooser screens.

Restrictions You must be the privileged user to use this command.

See Also Clear / Purge Service; Show / Monitor / List Services; *Enabling Other Service Options*; *Macintosh Service Configuration*.

11.77 Set/Define Service Banner

{ SET / DEFINE } SERVICE *ServiceName* BANNER { ENABLED / DISABLED }

Specifies whether the RapidPrint 500 will print a banner page before starting a print job. Banners should be disabled (the default) for all PostScript and plotter (binary) data.

Restrictions You must be the privileged user to use this command.

See Also Clear / Purge Service; Show / Monitor / List Services; *Enabling Other Service Options*.

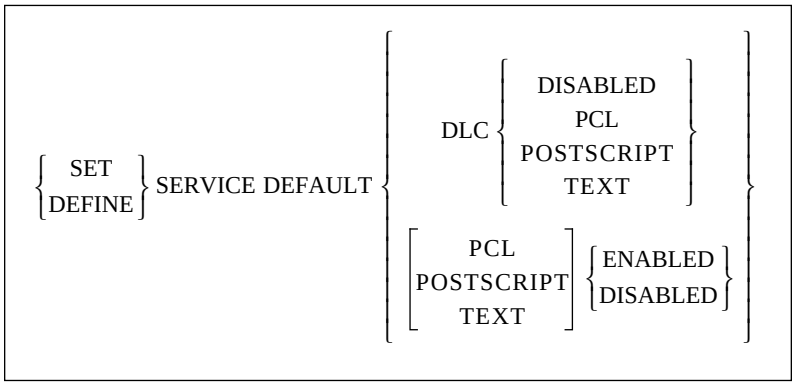
11.78 Set/Define Service Binary

If the binary characteristic is enabled on a service, there will be no data processing (<CR> to <CR> <LF> translation and tab expansion). The binary characteristic should be enabled when printing PCL data.

Restrictions You must be the privileged user to use this command.

See Also Clear / Purge Service; Show / Monitor / List Services; *Enabling Other Service Options*.

11.79 Set/Define Service Default



Configures which of the RapidPrint 500 default services are enabled, and which service, if any, has DLC enabled. If a particular default service is disabled, it will not be created at boot time. If it is enabled, it will be created, but will not prevent the use of any other custom services.

NOTE: *The default service names (MPS_xxxxxx_PCL, MPS_xxxxxx_PS, and MPS_xxxxxx_TEXT) are based on the server name; if you wish to change the server name, be sure to choose a name of 12 or fewer characters.*

Restrictions You must be the privileged user to use this command.

Parameters

DLC
Sets this service as the handler for Windows NT DLC print connections. Only one RapidPrint 500 service can have DLC enabled.

PCL
Enables or disables the MPS_*xxxxxx*_PCL service, which accommodates binary print jobs (for example, plotter or PCL files).

POSTSCRIPT
Enables or disables the MPS_*xxxxxx*_PS service, which accommodates PostScript print jobs.

TEXT
Enables or disables the MPS_*xxxxxx*_TEXT service, which accommodates text print jobs.

Examples

```
Local>> DEFINE SERVICE DEFAULT DLC POSTSCRIPT

Local>> DEFINE SERVICE DEFAULT PCL DISABLED
```

See Also Set / Define Server Name; Set / Define Service DLC; Creating Services; **Configuration Guide**.

11.80 Set/Define Service DLC

Specifies that the service will handle DLC print requests from Windows NT hosts. Note that only one service on the RapidPrint 500 can have DLC enabled at any time.

Restrictions You must be the privileged user to use this command.

See Also Clear / Purge Service; Set / Define Service Default; Show / Monitor / List Services; *Enabling Other Service Options*; *Digital Network Port*.

11.81 Set/Define Service EOJ

Specifies a string to be sent to the attached device at the end of every job regardless of network protocol.

Restrictions You must be the privileged user to use this command.

Parameters

EndString
Any ASCII characters, or non-ASCII characters entered as a backslash and 2 hex digits (for example, \45). The combined length of the SOJ and EOJ strings must not exceed 62 characters.

None
Clears any previously-configured string. No string is configured by default.

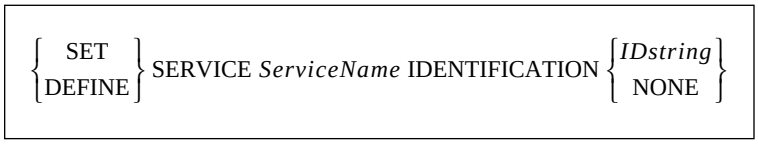
See Also Clear / Purge Service; Set / Define Service SOJ; Show / Monitor / List Services.

11.82 Set/Define Service Formfeed

Determines whether the RapidPrint 500 will append a formfeed to the end of any LPR print jobs.

See Also Clear / Purge Service; Show / Monitor / List Services;*Enabling Other Service Options*.

11.83 Set/Define Service Identification



Specifies an identification string for this service to be sent by the server in multicast messages.

Restrictions You must be the privileged user to use this command.

Parameters

IDstring
Enter up to 40 characters of identification information. Enclose the string in quotes to preserve case and spaces.

None
Clears any previously-configured IDstring.

Examples

```
Local> SET SERVICE pplab5 IDENT “Printer for Lab 5”
```

See Also Clear / Purge Service; Show / Monitor / List Services.

11.84 Set/Define Service LAN Manager

Enables or disables LAN Manager (NetBIOS) access to the specified service.

Restrictions You must be the privileged user to use this command.

See Also Clear / Purge Service; Show / Monitor / List Services; *NetBIOS*.

11.85 Set/Define Service LAT

{ SET / DEFINE } SERVICE *ServiceName* LAT { ENABLED / DISABLED }

Enables or disables LAT access to the specified service. LAT must be licensed to use LAT functionality.

Restrictions You must be the privileged user to use this command.

See Also Clear / Purge Service; Show / Monitor / List Services; *Printing to a Service*.

11.86 Set/Define Service NetWare

{ SET / DEFINE } SERVICE *ServiceName* NETWARE { ENABLED / DISABLED }

Enables or disables NetWare access to the specified service.

Restrictions You must be the privileged user to use this command.

See Also Clear / Purge Service; Netstat; Set / Define Protocols NetWare Access; Show / Monitor / List Services.

11.87 Set/Define Service Password

{ SET / DEFINE } SERVICE *ServiceName* PASSWORD { *passwd* / NONE }

Specifies an access password that users must enter to connect to the service. If the password is not given on the command line, the user will be prompted for it.

Restrictions You must be the privileged user to use this command.

Parameters

passwd
Choose a password of up to 6 alphanumeric characters.

None
Clears any previously-configured password for the given service.

Examples

```
Local> DEFINE SERVICE lab5 PASSWORD “this”
```

See Also Clear / Purge Service; Show / Monitor / List Services.

11.88 Set/Define Service PostScript

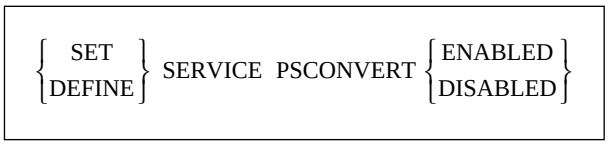
Determines how the RapidPrint 500 will handle PostScript print jobs. If enabled, the RapidPrint 500 will assume there is a PostScript printer attached to the service port(s) and try to ensure a job is done before starting another. It will send a small PostScript job to the printer before the user data to “force” the printer into PostScript mode.

At the end of each job it will wait for the printer to signal that the job was completed. If this is not done, slower printers may lose jobs as new jobs overwrite a previous job which is still being interpreted. Enabling PostScript mode is strongly recommended for all PostScript queues.

Restrictions You must be the privileged user to use this command.

See Also Clear / Purge Service; Show / Monitor / List Services; *Enabling Other Service Options*.

11.89 Set/Define Service PSConvert



Controls whether the RapidPrint 500 will place a PostScript wrapper around each job (enabled). The RapidPrint 500 will try to detect if it is already a PostScript job, in which case it would not add an additional wrapper.

See Also Clear / Purge Service; Show / Monitor / List Services.

11.90 Set/Define Service RTEL

Enables or disables TCP / IP access to the specified service.

Restrictions You must be the privileged user to use this command.

See Also Clear / Purge Service; Show / Monitor / List Services; *Reverse Telnet (RTEL)*.

11.91 Set/Define Service SOJ

Specifies a string to be sent to the attached device at the start of every access regardless of network protocol.

Restrictions You must be the privileged user to use this command.

Parameters

StartString
Any ASCII characters, or a backslash and two hex digits.

None
Clears any previously-configured string. No string is configured by default.

Examples

```
Local>> DEFINE SERVICE myserv SOJ \45
```

See Also Clear / Purge Service; Set / Define Service EOJ; Show / Monitor / List Services.

11.92 Set/Define Service TCPport

Specifies a TCP listener socket for this service. TCP connections to the socket are accepted or rejected based on the availability of the service.

Restrictions You must be the privileged user to use this command.

Parameters

portnum
Enter a socket number between 4000 and 4999.

None
Clears any previously-defined TCPport. No TCPport is configured by default.

NOTE: *Either a TCPport or a Telnetport may be configured for a service, but not both.*

See Also Clear / Purge Service; Set / Define Service Telnetport; Show / Monitor / List Services; *TCP/Telnet Service Sockets*.

11.93 Set/Define Service Telnetport

Specifies a TCP listener socket for this service. TCP connections to the socket are accepted or rejected based on the availability of the service. Unlike the TCPport option, a Telnetport socket will perform Telnet IAC negotiations on the data stream.

Restrictions You must be the privileged user to use this command.

Parameters

portnum
Enter a socket number of 4000 to 4999.

None
Clears any previously-configured Telnetport. No Telnetport is configured by default.

NOTE: *Either a TCPport or a Telnetport may be configured for a service, but not both.*

See Also Clear / Purge Service; Set / Define Service TCPport; Show / Monitor / List Services; *TCP/Telnet Service Sockets*.

11.94 Set/Define SNMP

Configures an access mode for SNMP: Read (read access only), Both (read and write access), or None (no SNMP requests allowed).

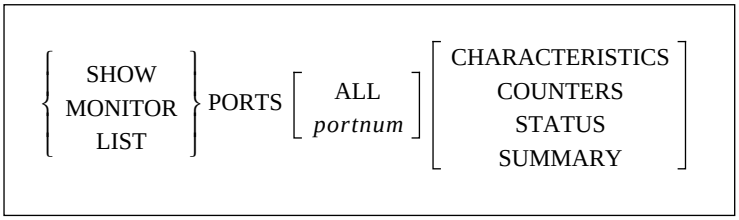
Restrictions You must be the privileged user to use this command.

Examples

```
Local> SET SNMP COMMUNITY public ACCESS BOTH
```

See Also Clear / Purge SNMP; Show / Monitor / List SNMP; *Simple Network Management Protocol (SNMP)*; SNMP Security.

11.95 Show/Monitor/List Ports



Displays information about the server's ports. The current port is the default, unless an optional port designation is specified.Any List on a virtual port will display template port configuration.

Restrictions You must be the privileged user to use the Monitor Ports command. Secure users cannot Show or List ports other than their own.

Errors Status and Counters parameters are not valid with List. Counters is also not valid for virtual ports.

Parameters

All
Displays information about all ports.

portnum
Displays information about a specified port.

Characteristics
Displays the port's settings, such as name and group codes.

Counters
Displays communication errors.

Status
Displays the port's information about the current connection.

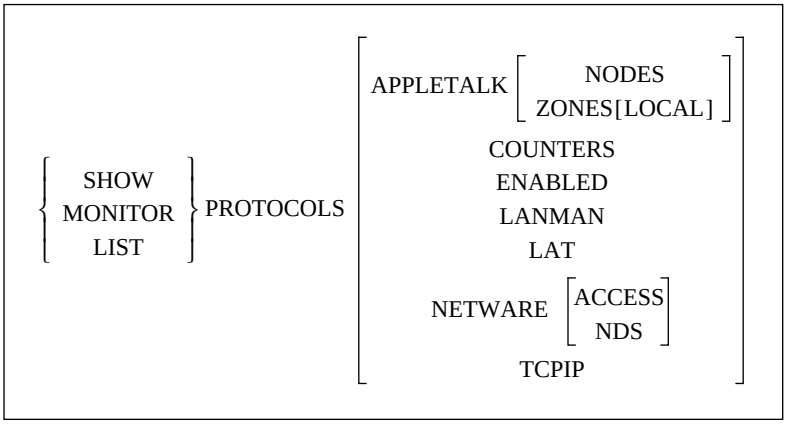
Summary
Displays the access type, offered services, and the login status of the port.

Examples

```
Local> LIST Port ACCESS DYNAMIC SUMMARY
```

See Also Set / Define Ports commands; Chapter 5, *Ports*.

11.96 Show/Monitor/List Protocols



Displays a summary screen of all supported protocols. General figures, such as packet counts and error status, will be shown. Individual protocol options show what is happening in greater detail. Also refer to the Netstat command, which shows currently active network socket connection, as opposed to counters.

Restrictions You must be the privileged user to use this command.

Errors Counters is not valid with List.

Parameters

AppleTalk
Displays counters and status messages specific to the AppleTalk protocol.

Nodes
Displays nodes, hardware addresses, status, and uptime of all AppleTalk nodes.

Zones
Displays available AppleTalk zones, including those learned via routers.

Local
Displays only those AppleTalk zones located on the server's local network segment.

Counters
Displays general Ethernet counter information and counters specific to the LAT and Telnet protocols.

Enabled
Displays a list of the enabled protocols.

LANMan
Displays information specific to the LAN Manager protocol, including NetBIOS and SMB statistics.

LAT
Displays detailed counters and status messages specific to the LAT protocol, including configured timers and session limits.

NetWare
Displays detailed counters and status messages specific to the NetWare protocol, including routing and encapsulation information, and packet transfer counters by packet type.

The Error Reasons field shows error counters in hexadecimal with the rightmost bit being 0. For example, an Error Reason of 0040 represents 0000 0000 0100 0000 in binary, which means that bit 6 is set. The meaning of each bit is explained in Table 11-2.

Table 11-2: IPX Error Reasons

Bit	Meaning	Explanation
0	Received packet for an unknown IPX protocol.	Packet discarded.
1	Received packet for unknown socket.	Packet discarded.
2	Couldn't attach to print queue on file server.	When a printer is found that needs to be serviced, the RapidPrint 500 attaches to the fileserver. If the RapidPrint 500 cannot attach, it can't service the queue.
3	Couldn't connect to a fileserver.	If the RapidPrint 500 hears from a fileserver that matches its own access list, it will try to connect to the fileserver and scan for print queues. If the connection does not go through, there may be security or license limit issues.
4	Couldn't log out of the fileserver.	This bit should never be set.
5	The RapidPrint 500 couldn't get its server name and password credentials from fileserver during login.	Login fails.
6	Fileserver did not accept the RapidPrint 500's server name and password credentials.	If the login password is "access" (the default), the RapidPrint 500 doesn't send a password. Otherwise, the login password has to match the print server password on the fileserver. For example, if the name of the RapidPrint 500 is "BUNDY" and the login password for BUNDY is "shoes," then under PCONSOLE, printserver BUNDY needs to have password "shoes."
7	Couldn't log into the fileserver.	Perhaps the login slots are filled.
8	Check membership call failed.	While scanning for print queues, the RapidPrint 500 checks the memberships of various objects; this is not generally a problem.
9	Couldn't map user to trustee.	This is where the RapidPrint 500 tries to get rights to access the print queue; login fails.
10	Couldn't attach to print queue on fileserver.	Same as bit 2.
11	Couldn't service the print queue or couldn't read the job.	There is a print job on the fileserver, but the RapidPrint 500 cannot access it.
12	Couldn't open a file on the fileserver.	This is not a serious error.
13 +	Unused, should be 0.	

Access
Displays the current list of accessible NetWare fileservers.

NDS
Displays NDS-related NetWare information.

TCPIP
Displays detailed counters and status messages specific to the TCP/IP protocol, including configured nameservers and gateways, the default domain name, packet information, and ICMP counters.

ICMP messages are sent by TCP/IP nodes in response to errors in TCP/IP messages or queries from other nodes. The ICMP failure reason counters may be helpful for detecting specific network problems. They are listed in the following table.

Table 11-3: ICMP Failure Reasons

Bit	ICMP Message Reason
0	ICMP echo message received
1	ICMP echo reply received
2	Destination unavailable—see bits 4-7
3	Unknown ICMP type received
4	Network unreachable, usually from a gateway host
5	Host unreachable
6	Port unreachable, usually due to attempting to nameserve an unwilling host
7	Protocol unreachable
8-15	Unused, should be 0

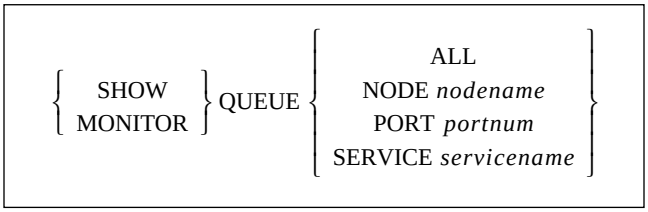
Examples

```
Local> SHOW PROTOCOLS APPLETALK ZONES
```

See Also

Netstat; Clear/Purge Protocol NetWare Access; Set/Define Protocols commands, beginning with Define Protocols AppleTalk.

11.97 Show/Monitor Queue



Displays the entries in a particular local service's connect queue, if it exists. Particular sets of queues or entries can be selected with the parameters.

Restrictions You must be the privileged user to use the Monitor Queue command.

Parameters

All
Displays all queue entries, regardless of type.

Node nodename
Displays only connect requests from a specific network node.

Port portnum
Displays the entries that could be serviced by the specified port.

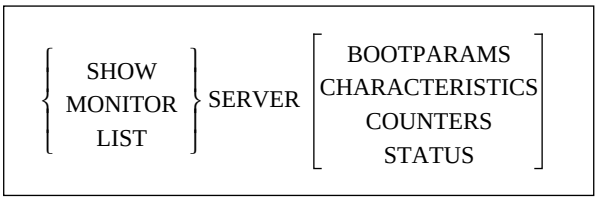
Service servicename
Displays the entries waiting for the specified service.

Examples

```
Local> SHOW QUEUE Port 2

Local> MONI QUEUE Service lab5
```

See Also Set / Define Server Queue Limit.

11.98 Show/Monitor/List Server



Displays the global attributes or counters for the server itself, and the software version number and the time since the last reboot. The Counter fields are described below.

Restrictions You must be the privileged user to use the Monitor Server command.

Errors Counters and Status are not valid with List.

Parameters

Bootparams
Displays parameters related to rebooting the unit and reloading the software file.

Characteristics
Displays the LAT network settings, the IP addresses, the server's enabled characteristics, and the local limits (such as password and queue). This is the default if no parameter is used.

Counters
Displays the accumulated counters for the Ethernet, LAT and TCP / IP protocols. The first seven lines of counters apply to Ethernet traffic in general. The fields and error counters are explained below.

Table 11-4: Counters Display Fields

Field	Meaning of Counter
Frames sent with xx collisions	Gives a rough estimate of Ethernet traffic. In general, higher traffic levels cause more collisions.
Bad Destination	Counts packets that the RapidPrint 500 received for an unsupported protocol. These are generally multicasts or broadcast packets; frequently seen unknown protocols include LAVC and DECnet routing.
Buffer Unavailable	Counts packets lost due to an inability to allocate receive space on the part of either the Ethernet controller (Net Buffer) or the operating system (Sys Buffer).
Data Overrun	Shows packets that were dropped due to the controller's inability to transfer Ethernet data to memory. Generally, this happens only under unusually heavy load conditions. Note that packets dropped by the Ethernet hardware are retransmitted by the LAT or TCP / IP protocol handlers.
Reasons	Values represent a combination of the error reasons that have occurred since the counters were last zeroed.

The values for failure reasons are expressed in hexadecimal codes and represent binary masks of all of the errors that have occurred since the counters were last zeroed. There are different numbers of significant digits for each field; they represent the following:

Format: 0 0 h h (0 = unused, h = hex digit)

For example, a value of 000C in the **Recv Failure Reasons** represents a non-aligned packet and FIFO overrun because 000C hex= 12 decimal= 0000 0000 0000 1100 binary, meaning that bits 2 and 3 are set (the rightmost bit being zero).

Table 11-5 shows the RapidPrint 500 failure reasons and thir meanings.

Table 11-5: Failure Reasons

Bit	Send Failure Reason	Receive Failure Reason	Connect Failure Reason	Invalid Packet Reason
0	Unused, should be 0	Unused, should be 0	Internal failure, should be 0	Data received outside window
1		Packet received with CRC error		Connection was terminated abnormally
2	At least one collision has occurred while transmitting	Received packet did not end on byte boundary	No nameserver defined for a text hostname	Packet received with an invalid data checksum
3	Transmit aborted due to excessive (more than 16) network collisions	FIFO overrun: could not write received data before new data arrived	Attempted nameservice failed	Packet received with an invalid data header
4	Carrier sense was lost during transmission	Receive packet could not be accommodated due to lack of available receive buffers	No gateway was configured for a non-local connection	RST packet sent to remote node
5	FIFO underrun: Ethernet controller could not access transmit data in time to send it out (ERROR)	Received a packet larger than the maximum Ethernet size (1536 bytes)	Attempted ARP failed	Packet received for an unknown local user
6	RapidPrint did not receive CD heartbeat after transmission	Unused, should be 0	Remote host did not answer	Unused, should be 0
7	Out-of-window collision detected		Host rejected the connection	
8-15	Unused, should be 0		Unused, should be 0	

Status

Displays current server use, such as active ports, services, and circuits.

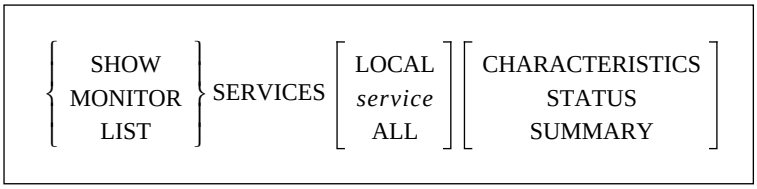
Examples

```
Local> SHOW SERVER STATUS

Local> MONITOR SERVER COUNTERS
```

See Also

Set / Define Server commands, beginning with Set / Define Server Announcements.

11.99 Show/Monitor/List Services



Displays characteristics of the services on the network. Remember that the service list is masked by the service groups that this port is eligible to see, that is, users will not see services to which they cannot connect.

Restrictions

You must be the privileged user to use the Monitor Services command.

Parameters

Local
Displays those services provided by this server, whether available or not.

All
Displays all known network services usable by the current port.

service
Displays any known information about this service. Wild cards are permitted.

Characteristics
Displays the service's rating, group codes, and, if the service is local, the service ports and service flags (such as Queueing, Connections, and Password).

Status
Displays the service name, offering node, availability status, and ident string.

Summary
Displays the service, ident string, and availability. This is the default if no parameter is added.

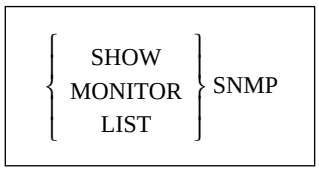
Examples

```
Local> SHOW SERVICE lab5_prtr STATUS

Local> MONITOR SERVICE LOCAL SUMMARY
```

See Also

Clear / Purge Service; Set / Define Service commands, beginning with Set / Define Service; *Creating Services*.

11.100 Show/Monitor/List SNMP

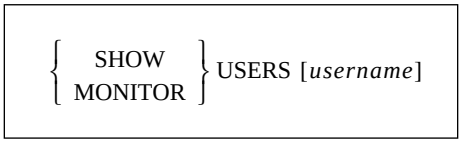


Displays the current (Show) or saved (List) SNMP security table entries.

Restrictions You must be the privileged user to use this command.

See Also Clear / Purge SNMP; Set / Define SNMP; *Simple Network Management Protocol (SNMP)*; *SNMP Security*.

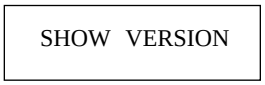
11.101 Show/Monitor Users



Displays the current users logged onto the server. If a **username** is given, only information for that user is shown.

Restrictions You must be the privileged user to use the Monitor users command.

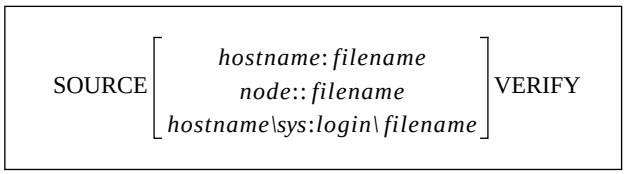
11.102 Show Version



Displays operating software version information.

See Also Set / Define Server Software; *Reloading Operational Software*.

11.103 Source



Attempts to download a configuration file from a MOP, TFTP, or NetWare host. The file is assumed to contain lines of server commands to be executed. The Source command is most useful for trying out a configuration file before using the Set Server Startupfile command.

Restrictions You must be the privileged user to use this command.

Parameters

hostname:filename
For TFTP downloads, enter the TFTP hostname (either a text name or an IP address) followed by a colon and the download path and file name.

node::filename
To download from a MOP host, enter a MOP node name followed by two colons and the download path and file name.

hostname\sys:\login\filename
For NetWare downloads, enter the host, pathname, and filename in the above format. Due to access restrictions, download files must be in the fileserver's login directory.

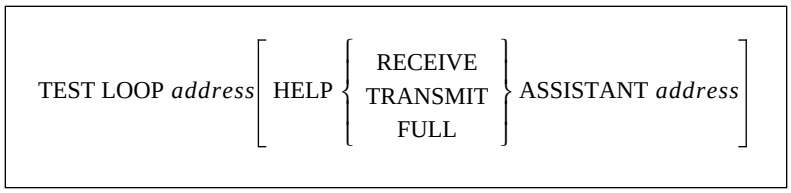
Verify
Causes each command from the downloaded file to be echoed before execution.

Examples

```
Local> SOURCE ALVAX::start.com veri

Local> SOURCE "labsun:start.com"

Local> SOURCE LABFS4\SYS:\LOGIN\RP.COM
```

See Also Set / Define Server Software; **Configuration Guide**.

11.104 Test Loop



Tests the network connections to MOP hosts. A simple loopback service verifies that the remote node is receiving the server's transmissions. An Assistant or "helper" node can be specified to forward one or both of the transmissions (outbound or incoming).

Restrictions You must be the privileged user to use this command.

Parameters

address
Specify either a text host name or an Ethernet address. Ethernet addresses are specified in *xx-xx-xx-xx-xx-xx* (hexadecimal) format, where each *xx* represents one of the 6 bytes of the node's hardware address. If text names are used, only LAT service names can be resolved to hardware addresses.

Examples

```
Local> TEST LOOP 45-a2-ed-48-12-3c

Local> TEST LOOP 12-68-df-ea-38-c5 HELP REC ASSI 78-23-ad-
2c-11-4e

Local> TEST LOOP LABVAX
```

11.105 Test Port

Tests a port's connection by sending a continuous stream of ASCII alphabetic characters from the port for a certain number of lines. If no width or count is specified, the server will produce 70-character lines until a key is pressed to stop the test.

Restrictions You must be the privileged user to test a port other than your own. Virtual and multisession-enabled ports can only be tested by the current user on that port.

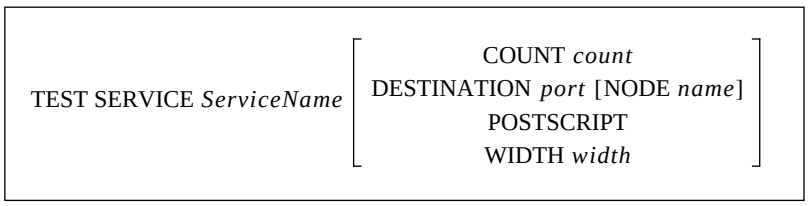
Parameters

PostScript
Sends a PostScript test page to the port instead of ASCII data. The Count parameter controls the number of pages to print in this case, and the Width parameter is ignored.

Examples

```
Local> TEST Port
```

11.106 Test Service



Tests a connection to a service. A continuous stream of ASCII alphabetic characters is sent to the service and (hopefully) echoed back until the number of lines specified by Count is reached; the test can be stopped at any time by pressing a key. The RapidPrint 500 will show the number of packets sent and lost.

NOTE: *Optional parameters can be used in any combination. They work the same as in the Test Port command.*

Restrictions

You must be the privileged user to test a port other than your own.

Errors

Testing a service local to this RapidPrint 500 will fail and return an error. Testing either the Login Service or a proxy Telnet service will fail; use Test Port if you are unsure of the connection to a local service.

Parameters

Count
Governs the number of test lines that will be sent. For all intents and purposes, the *count* value can be any whole number. If a count is not specified in the command, the server will continue to produce character streams until a key is pressed.

Destination
The test stream will be sent to the specified port on the LAT device.

Node
The test stream will be sent to the specified node of the LAT destination port.

PostScript
Performs a bidirectional data test of the interface between the RapidPrint 500 and the printer. This test will not generate any paper output. Instead it should echo the PostScript data back to the RapidPrint 500 and issue a status message on the result of the test. Note that autosensing printers must be locked into PostScript mode for this test to succeed.

Width
Breaks the stream of ASCII characters into lines that are each *width* characters long. The width value can range from one to 133 defaulting to 70.

Examples

```
Local> TEST Service ALEX COUNT 1000 WIDTH 80
```

See Also

Set / Define Server Incoming.

11.107 Who

The Who command is functionally identical to the Show / Monitor Users command. It is provided for UNIX compatibility.

11.108 Zero Counters

Resets the counters for errors and other network and server events. If no parameter is added to the command, only the port counters for the current port will be reset.

Restrictions You must be the privileged user to Zero a port other than your own.

Parameters

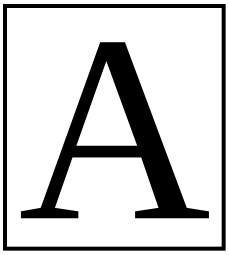
All
Zeroes all port, node, and server counters.

Port portnum
Zeroes counters for events associated with the specified virtual port, including SLIP events.

Examples

```
Local> ZERO COUNTER NODE vax5

Local> ZERO COUNTERS Port 2
```

See Also Show / Monitor / List Ports Counters.



Technical Support

A - Technical Support

If you are experiencing an error that is not listed in Appendix B of your **Configuration Guide**, or if you are unable to fix the error, contact your dealer or Digital Technical Support at the address or phone number listed below. We are also available via the World Wide Web at **http://www.printers.digital.com**.

Digital Equipment Corporation
200 Forest Street
Maynard, MA 01752-3011 • Toll Free 800-354-9000

A.1 Digital Problem Report Procedure

If you are experiencing problems with the RapidPrint 500 or have suggestions for improving the product, please contact Digital Technical Support.

When you report a problem, please provide the following information:

- Your name, company name, address, and phone number
- Product name
- Digital model number
- Unit serial number
- Software version (use the **Show Version** command to display)
- Network configuration including the output from a **Netstat** command
- Description of the problem
- **Debug** report (stack dump) if applicable
- Unit status when the problem occurred (please try to include information on user and network activity at the time of the problem)

B Glossary

AppleTalk — AppleTalk was developed by Apple Computer to allow networking between Macintoshes. All Macintosh computers have a LocalTalk port running AppleTalk over a 230kbit serial line. AppleTalk also runs over Ethernet (via EtherTalk) and Token Ring network media (via TokenTalk). Due to dynamic addressing and powerful name directory services, installing an AppleTalk device is generally as simple as attaching it and turning it on.

AUI — Attachment Unit Interface. A 15-pin shielded, twisted pair Ethernet cable used (optionally) to connect the RapidPrint 500 and a **MAU**.

backbone — Any communications network has a main "cable," and devices can be thought of as attaching to this main conductor. ("Cable" is misleading, because networks can be over microwave or fiber optic carriers, as well.) For example, in a university setting, the backbone might be the cable that runs to all the buildings that need network access. Local sub-networks and devices are attached off the main backbone.

BOOTP — BOOTP is a TCP/IP network protocol that lets "dumb" network nodes request configuration information from a BOOTP server node. At boot time, the dumb node sends a broadcast message requesting information and waits for a reply. The BOOTP host, if configured, provides the dumb node with an IP address, the IP address of a load host (usually itself), and the name of the download file. The dumb node needs only know its own hardware address, as this is what the BOOTP server uses to decide whether it can help the node and what information to provide.

BOOTP implementations usually have a configuration file (such as **/usr/etc/bootptab**) that lists the hardware and IP addresses of BOOTP clients, as well as the download file they should use. Most TCP/IP hosts can act as servers if BOOTP replies have been enabled. See your local documentation (man pages, etc) for specific information.

download — The transfer of a file or information from one network **node** to another. Generally it refers to transferring a file from a "big" node, such as a computer, to a "small" node, such as a terminal server or printer. Because the server code is downloaded (as opposed to being stored permanently in the device's ROM), the code can be upgraded easily.

flash ROM — See **ROM**.

gateway — A TCP/IP host that can access two or more different Ethernet networks. As such, it can forward messages across networks that other hosts would not be able to access. The host generally has multiple IP addresses, one for each network. For example, a gateway might "live" at addresses 192.0.1.8 and 193.0.1.8. Hosts wishing to forward messages may address the messages to the gateway which will then pass them on to the other network. The RapidPrint 500 supports this with the Set/Define Server Gateway command. The IP address of the gateway host on this server's network is specified, and messages for hosts not on the local network will be forwarded. For example, if a RapidPrint 500 at address 192.0.1.33 wished to talk to a host at address 196.0.1.58, he would have to go through a gateway machine on his network. The gateway would forward messages between networks 192.0.1 and 196.0.1. See the **subnet mask** entry for information on how these networks work.

hardware address — See **Network Address**.

host — Host is generally used in this manual to mean a **node** on a network that can be used interactively, or logged into. This generally refers to interactive computers. In the RapidPrint 500's command set, host is used to refer to a TCP/IP node, rather than TCP/IP and LAT nodes. For example, the Show Hosts command displays only the known TCP/IP nodes.

ICMP — ICMP stands for the Internet Control Message Protocol. ICMP messages are sent by TCP/IP **nodes** in response to errors in TCP/IP messages or queries from other nodes. They are sent, for example, when a node sends a packet to an incorrect gateway host, or when a network packet expires. ICMP messages may also be sent as broadcasts, not just sent to a specific host. The RapidPrint 500 counters for ICMP messages may be helpful for detecting network problems.

IP address — See **network address**.

LAT — Local Area Transport. LAT is a Digital Equipment Corporation proprietary network communication **protocol**. The protocol is based on the idea of a relatively small, known number of hosts on a local network sending small network packets at regular intervals. LAT will not work on a wide area network scale as **TCP/IP** does, as it cannot distinguish large numbers of **nodes**. For local networks, however, LAT is usually faster and less prone to pauses than TCP/IP.

LAT also allows remote connections to **services** and other network devices, about which TCP/IP has no understanding. The fact that the RapidPrint 500 supports both LAT and TCP/IP protocols transparently means that you are not bound by the limitations of either protocol.

login service — If the RapidPrint 500 is configured to allow users to log in from the network (as opposed to logging in from the serial ports), it creates what is called a login **service**. The RapidPrint 500 advertises a new service with the same name as the server. **LAT** users who connect to the "service" will not be connected to a physical port or device; they will be given a "virtual port" on the RapidPrint 500 instead. Although they obtain a "Local>" prompt and can issue commands as if they were physically connected to the RapidPrint 500. When they log off the RapidPrint 500, their "port" disappears.

MAU

Medium Attachment Unit. This is a small device used as a transceiver between a **Thinwire** network cable and an **AUI** cable or a **Thickwire** cable and an **AUI** cable. It consists of the physical adapter as well as the circuitry needed to convert signals from one medium to the other.

MOP

Maintenance Operations Protocol. MOP is a Digital **protocol** for Ethernet network traffic. The protocol is used for remote communications between **hosts** and devices on the network. Terminal servers use this protocol to download code from a host quickly and easily. For networks where LAT and MOP are the dominant network services, MOP is the simplest way to boot the server.

At boot time, the server broadcasts a request on the network for a load file, and a MOP host will respond and send the file. MOP is also used to signal the server of an **NCP** request or connection from another host, and is the protocol that TSM is based on.

MTU

Maximum Transmission Unit. The MTU of a link is the maximum packet size, in bytes, that can be transmitted across the link. For Ethernet, this is 1536 bytes. For SLIP lines, it can be variable, based on each host's ability to receive and reassemble packets. The RFC for SLIP suggests an MTU of 1006 bytes, but this is not a requirement.

multicast

A message that is sent out to multiple devices on the network by a **host**. Multicasts are generally sent at specified intervals to avoid cluttering the network, and in the case of LAT, contain the name of the host sending them as well as information about what LAT **services** that host provides.

nameserver

When starting Telnet and Rlogin connections, you can specify the host to use for the connection in one of two ways: either by a text name, such as "alex.weasel.citco.com," or by a numeric **IP address**, such as 195.22.89.172. The latter form can be routed easily since hosts on the network know how to map numeric addresses to exact hosts. They have more trouble with names, however, and this is where name servers come in. Some host(s) on the network are designated as name servers, to translate (or *resolve*) text-style names into numeric addresses. No Telnet connect request can be attempted until a numeric address is known for a host, so if there is no accessible name server, numeric addresses must be used.

NCP

Network Control Program. NCP is a program run on VMS machines to configure local network hardware and remote network devices. In the case of the RapidPrint 500, NCP can be used to remotely log into and reboot the server or cause it to "dump" its memory to a host for analysis. It is can also be used to access the RapidPrint 500 console port from a host VMS system.

NetWare

A Novell-developed Network Operating System (NOS). Provides file and printer sharing among networks of Personal Computers (PC's). Each NetWare network must have at least one fileserver, and access to other resources is dependent on connecting to and logging into the fileserver. The fileserver(s) control user logins and access to other network clients, such as user PC's, print servers (such as the RapidPrint 500), modem / fax servers, disk / file servers, and so on.

network address

Every **node** on a network has one or more addresses associated with it. Every node has what is called a "hardware address" that is unique across every network. If you know a node's hardware address, you should be able to identify the exact piece of equipment that goes with it. Hardware addresses are generally set up by the company that manufactured the equipment and should never change. The hardware address is usually specified as a list of six hexadecimal numbers separated by dashes, such as "ae-34-2c-1d-69-f1." The hardware address for your RapidPrint 500 is shown on a label on the rear of the unit.

In the case of **TCP/IP** networks, each node also has a software or "IP" address that is configurable by the managers of the nodes.

The software address is usually specified as four decimal numbers separated by periods (for example, "197.49.155.247"). In this case, each number must be between zero and 255, and each corresponds to a different network or sub-network. Depending on how many other nodes and networks a node can "see" on its network, addresses are either assigned to nodes (in the case of large, cross-country networks) or chosen randomly (for small networks that do not connect to the outside world). Each software address should be unique across all the networks it can access.

node

A node is any intelligent device connected to the network. This includes terminal servers, host computers, and any other devices that are directly connected to the network. A node can be thought of as any device that has a "hardware address" (see **network address**). A "service node" is a node on the network that provides a service other users can connect to, for example, a printer. A terminal server that allows only local logins, on the other hand, is not a service node, as it does not allow remote network users to connect to it.

PostScript

A printer / display protocol developed by Adobe Corp. PostScript is an actual printing and programming language to display text and graphics. Unlike line / ASCII printers, which print character input verbatim, PostScript printers accept an entire PostScript page, and then interpret and print it. The programming aspects of PostScript can be used to define shapes and routines that will be used on successive pages, change fonts and text orientation, and print fine bitmap images within blocks of text.

protocol

Any standard method of communicating over a network. There are protocols for placing actual bits onto the network cable; other protocols are layered on top from there. **LAT** is a protocol for network access, while both **TCP** and **IP** are also protocols (TCP runs on top of the IP layer / protocol).

proxy service

A proxy **service** is created when the RapidPrint 500 is configured to offer a Telnet host as a LAT service. When the users connect, the RapidPrint 500 translates between the LAT and Telnet sessions. When the user logs out of the remote Telnet host, he is also disconnected from the RapidPrint 500.

RARP

RARP is a protocol that allows a node to broadcast a message asking for an IP address given its hardware address. If a RARP server has been configured to reply to this node, it will tell the node what its IP address should be. Note that RARP provides less information than BOOTP, but is more widely implemented.

repeater A network device that repeats signals from one cable onto one or more other cables, while restoring signal timing and waveforms. Repeaters are the most common way to connect local networks together, and can provide either **Thinwire** or **Thickwire** connections. They are commonly used to create larger local networks up to a certain limit based on the number of repeaters and the length of the cables.

RFC Request For Comments. A standard document describing protocols, systems, or procedures used by the Internet community. For example, the IP network protocol is detailed in an RFC (RFC 791), as are SNMP, TCP, Finger, BOOTP, and the Domain name system. Information on obtaining RFC's is available from NIC@NIC.DDN.MIL.

Rlogin Rlogin is an application that provides a terminal interface between (usually UNIX) hosts using the **TCP/IP** network protocol. Unlike **Telnet**, Rlogin assumes the remote host is or behaves like a UNIX machine. Rlogin can also be configured to disable login password checking, so should be used with care. See your host's documentation, especially regarding the *.rhosts* and *hosts.equiv* files, for more information.

ROM Read-Only memory. A memory device that retains its information even when power to it is removed. A ROM version of the RapidPrint 500 does not need to **download** code, since it carries the entire executable code in ROM and thus never needs to reload it. Frequently the ROM is provided as "flash ROM," which can be reprogrammed if the software needs updating.

router On large networks, some hosts are connected to more than one network and are designated routers—they route messages on the net to the correct "place." They may send an incoming message to an adjacent network if they do not know the destination host by name, or they may send it right to the intended destination. On cross-country networks, a message may go through several routers before arriving at its final destination.

rwho A UNIX feature that enables network **hosts** to know what users and systems are on the network without actively connecting to them. If rwho is enabled on a host, it both sends and receives network broadcasts containing this information. The packets generally contain the host's name, IP address, and the number and names of the users on the system.

Because the broadcasts are periodic (typically 30 seconds to 2 minutes), hosts that are seen with rwho and then removed from the local host table will reappear later. Rwho usually has to be enabled explicitly on the host system, and may not be enabled on large network environments where the extra network traffic is unacceptable. In this case hosts can be added to the RapidPrint 500' host table by hand.

service Any device on a network that can be connected to and accessed, such as a printer, modem, or a remote computer. Network users can generally see the services available on the network because the **nodes** that provide these services "advertise" them to the world. In the case of LAT, each service node sends out occasional network messages called **multicasts** describing what services it is providing and which users are connected to them. Note that the concept of services is one specific to **LAT** and local area networks. TCP/IP and other wide area networks have no such facility. The service will occasionally be used to refer to anything that can be connected, whether LAT or not.

SNMP

Simple Network Management Protocol. SNMP allows a TCP/IP host running an SNMP application to query other nodes for network-related statistics and error conditions. The other hosts, which provide SNMP *agents*, respond to these queries and allow a single host to gather network statistics from many other network nodes. The terminal server provides this SNMP agent only; it cannot generate queries to other hosts. It only responds to them.

subnet mask

The RapidPrint 500 supports Telnet connections across networks through the use of **gateways**. A gateway host will forward messages across network boundaries. At connection time, however, the RapidPrint 500 must decide whether the remote machine is on the local network (and can be accessed directly) or whether it is on a remote network (and must be accessed through a gateway). It does this with the subnet mask set up for the server. The RapidPrint 500 uses the mask as a filter; if the RapidPrint 500's IP address and the remote IP address appear the same after the filter, the remote host is assumed to be on the same local network. Otherwise, the gateway is used. The mask itself is a list of bits that should be enabled in the result—a 1 in the mask means to let that bit in the IP address through, and 0 means do not.

For example, address 192.1.2.22 with mask 255.255.0.0 becomes 192.1.0.0. For network purposes, host 192.1.5.12 is on the same network, based on the mask specified. In this case, a gateway would not be accessed. A host at 192.8.12.34 would be considered on a different network, however, since the network mask comes out to be 192.8.0.0, and this does not match the previous two masks. In this second case, the gateway host would be used—if it had not been defined, the connect attempt would fail. If the subnet mask is not set explicitly (with the Set Serve Subnet command), the RapidPrint 500 will assume a mask based on the RapidPrint 500's IP address and thus the apparent network type. This mask will be 255.255.255.0 for most (19x.x.x.x and 2xx.x.x.x) IP addresses.

tap

A tap usually refers to a point on the network **backbone** where other devices can be attached. If the network is thought of as a freeway, the taps on the network are the on and off ramps to the freeway (and like freeway access ramps, taps are usually where network problems occur). Taps may be of several types, including simple "T" connectors or "Vampire" taps that attach directly to a network cable.

TCP/IP

TCP and IP are the standard network **protocol** in UNIX environments. They are almost always implemented and used together and called TCP/IP. TCP/IP is an extremely flexible protocol, allowing reliable access to over four billion possible nodes anywhere in the world. It also allows many protocols to run on top of it, notably **Telnet**, **Rlogin**, and **TFTP**. TCP/IP support may be integral to an operating system, as in UNIX, or it can be a separate product added later as on VMS machines.

Telnet

Telnet is an application that provides a terminal interface between hosts using the **TCP/IP** network protocol. It has been standardized so that Telnetting to any host should give you an interactive terminal session, regardless of the remote host type or operating system. Note that this is very different from the **LAT** software, which allows only local network access to LAT hosts only.

10BASE2

Thinwire network cable.

10BASE5 — **Thickwire** network cable.

10BASE-T — Ethernet running across Unshielded Twisted Pair (UTP) cable. Note that 10BASE-T is a point-to-point network media, with one end of the cable typically going to a repeater / hub and the other to the network device.

TFTP — Trivial File Transfer Protocol. On computers that run the **TCP/IP** networking software, TFTP is used to quickly send files across the network with fewer security features than FTP. TFTP is used by the RapidPrint 500 to download a boot file in the UNIX environment.

Thickwire — Ethernet cables generally come in two varieties: thickwire and **Thinwire**. Thickwire network cable is 1 / 2" diameter coax cable. It is generally found on larger networks where a cable may travel for long distances and usually connects multi-user computers to the network. It is harder to work with than thinwire cable, but offers better noise and error protection and can be run much farther (up to 500m / 1500 ft. without repeaters) than **Thinwire**. Connections to thickwire networks are usually made with 15-pin connectors.

Thinwire — Thin, co-axial cable similar to that used for television / video hookups and typically used with BNC-type connectors. Thinwire cable is much easier to route and work with than **Thickwire**, but it should not be run more than 185 meters (~600 feet) without using a repeater to reinforce the signal. Thinwire connectors are usually seen on terminal servers, personal workstations, networked printers, and in networks where the **nodes** are all relatively close to each other.

transceiver — The actual device that interfaces between the network and the local **node**. When talking about networks, the term transceiver generally refers to any connector that actively converts signals between the network and the local node. An example of a transceiver is a **MAU**.

TSM — Terminal Server Manager (TSM). TSM is a software package that allows terminal servers on a network to be remotely managed from another node. It is supported on VMS systems running the LAT protocol and is incompatible with TCP / IP-only networks.

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