PATHWORKS for DOS

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Client Installation and Configuration Guide for the VMS Server

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Preface

PATHWORKS software for DOS allows personal computers (PCs) to operate as end nodes in a network, use resources on other nodes in the network, and use services offered by PATHWORKS servers. Personal computers connected to a PATHWORKS server over the network are called **clients**.

These services include:

- File, printer and disk services
- Device support
- Applications such as terminal emulation, mail, and network management tools

Purpose

This guide explains how to:

- Install or upgrade PATHWORKS for DOS on a VMS server
- Configure the PCs in your organization to use PATHWORKS

Audience

This guide is written for:

- System administrators who are installing and configuring PATHWORKS for DOS.

  The system administrator should be an experienced DOS user and be familiar with VAX computers and the VMS operating system.
- Advanced PATHWORKS for DOS users.

Organization

This guide is divided into four parts:

- Part 1 describes how to install or upgrade PATHWORKS for DOS on a VMS server.
- Part 2 outlines the steps you take to configure the PCs in your network.
- Part 3 describes client administration, including asynchronous DECnet communications.
- Part 4 contains appendixes with supplemental information.

Related Documentation

If you need more detailed information about the topics listed in the following table, refer to their associated documents.

Topic	Document
PATHWORKS overview	*Overview*
Using PATHWORKS for DOS	*User's Handbook*
Microsoft Windows support	*Microsoft Windows Support Guide*
Network commands	*Client Commands Reference*
Terminal emulation	*SETHOST Terminal Emulation Guide*
PC DECwindows Motif	*PC DECwindows Motif Guide*
Terminal emulation	*SETHOST Terminal Emulation Guide* and *Microsoft Windows Support Guide*
SEDT editor	*SEDT User's Reference*
Mail	*Mail User's Reference*
DECnet utilities	*DECnet User's Guide*
DECnet management	*DECnet Network Management Guide*
Memory requirements	*Memory Solutions for Client Administrators*
Master index	*Client Master Index*
Documentation map	*Client Documentation Map*
TCP/IP information	*TCP/IP User's Reference* Separate kit

Conventions

This manual uses the following conventions:

Convention	Meaning
Ctrl/*x*	While you hold down the Ctrl key, press another key or a pointing device button.
Ctrl/Alt/Del	While you hold down the Ctrl and Alt keys, press the Del key.
Return	Press the key that executes commands or terminates a sequence. This key is labeled Return, Enter, or ↵, depending on your keyboard.
"enter"	Type all required text, spaces, and punctuation marks; then press Return, Enter, or ↵, depending on your keyboard.
UPPERCASE	In VMS, DOS, and OS/2 syntax, uppercase letters indicate commands and qualifiers. You can enter commands and qualifiers in any combination of uppercase or lowercase, unless otherwise noted. ULTRIX commands are case-sensitive. You must enter commands in the correct case, as printed in the text.
lowercase	Lowercase letters in VMS, DOS, and OS/2 syntax indicate parameters. You must substitute a word or value, unless the parameter is optional.
teal blue type	In examples of dialog between you and the system, teal blue type indicates information that you enter. In online (Bookreader) files, this information appears in boldface.
boldface	Boldface type indicates a new term that appears in the glossary. In online (Bookreader) files, boldface indicates information you enter.

Convention	Meaning
two-line commands	In VMS commands, a hyphen (-) at the end of a command line indicates that the command continues to the next line. If you type the hyphen and press Return, the system displays the _$ prompt at the beginning of the next line. Continue entering the command. If you do not type the hyphen, VMS automatically wraps text to the next line. In ULTRIX commands, a backslash (\ ) performs the same function. In DOS and OS/2 commands, no character is used at the end of the first line; DOS automatically wraps text. Enter the complete command, then press Return at the end of the command.
[ ]	Square brackets in command descriptions enclose the optional command qualifiers. Do not type the brackets when entering information enclosed in the brackets.
/	A forward slash in command descriptions indicates that a command qualifier follows.
. . .	A vertical ellipsis in an example indicates that not all the data is shown.
NOTE	Notes provide information of special importance.
CAUTION	Cautions provide information to prevent damage to equipment or software.
WARNING	Warnings provide information to prevent personal injury.

Terminology

The terms "personal computer" (PC) and "PC workstation" refer to standalone systems. The term "client" refers to a PC, connected to the network by PATHWORKS software, that can access resources on a server. A server is a system that offers services to clients.

The term "PATHWORKS" refers to PATHWORKS software. PATHWORKS is a trademark of Digital Equipment Corporation.

Part 1

Installation

1

Preparing to Install or Upgrade PATHWORKS for DOS on the Server

This chapter describes what you need to do before installing or upgrading PATHWORKS for DOS. Use Table 1–1 as a checklist. Each item is discussed in this chapter.

Table 1–1 Installation or Upgrade Checklist

☐	Check your Bill of Materials (BOM) against the contents of the kit.
☐	Read the release notes.
☐	Check for prerequisite hardware.
☐	Check for prerequisite software.
☐	Complete the installation requirements.
☐	Copy the diskettes.
☐	Gather the installation media.

This chapter also contains:

- A map of installation and configuration paths
- Instructions on what to do next

Upgrade information

If you are upgrading from a previous version of PATHWORKS for DOS, make sure to complete the installation requirements listed in this chapter.

Installation and Configuration Paths

This section contains a map of the paths you need to follow to install and configure PATHWORKS for DOS.

Note

You must install and configure the server software before installing the client software.

Figure 1–1 outlines the steps to:

- Install or upgrade the client software on the server

  You first install the client software on a PATHWORKS server. Then you run the Netsetup configuration utility at the client PCs in your network. Follow these steps if you are installing PATHWORKS for DOS Version 4.1 for the first time or upgrading from a previous version.

- Install or upgrade the client software on the PC

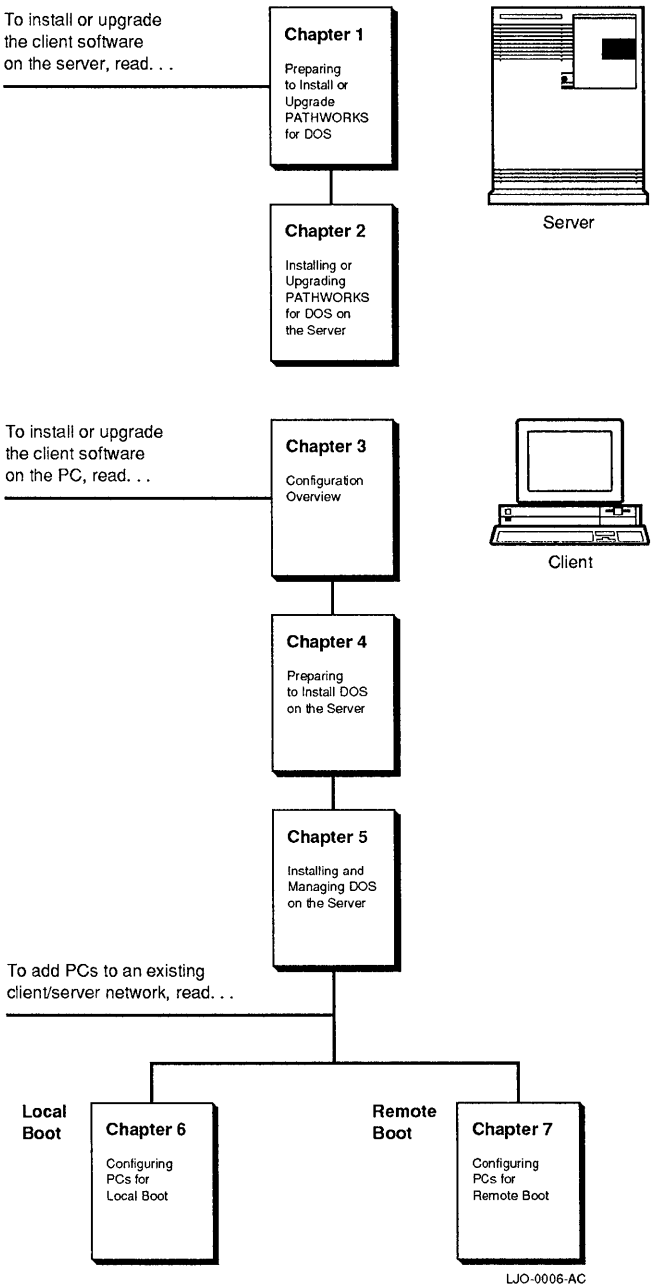
  Once you have installed the client software on the server, follow these steps to configure the PCs in the network.

- Add PCs to an existing PATHWORKS for DOS Version 4.1 network

  When you need to add PCs to your network, follow these steps to configure new PCs to use the PATHWORKS network.

For information on setting up the server and client to use asynchronous DECnet communications, see Chapter 15.

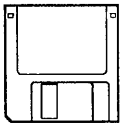
Figure 1–1 Installation and Configuration Paths



Step 1: Check Your Bill of Materials (BOM)

The software Bill of Materials (BOM) specifies the part numbers and contents of the media you receive. Be sure to check the contents of your kit against this information. If your kit is damaged or if parts are missing, contact your Digital representative.

Step 2: Read the Release Notes



Before you install the software, read the *PATHWORKS for DOS Release Notes*.

The release notes are included on the diskette labeled PWRKS V4.1 RELEASE NOTES. These release notes may contain important information about changes in the installation and configuration procedures.

Step 3: Check for Prerequisite Hardware

Be sure that the network, including cables, PCs and other hardware, is connected. For a list of supported hardware, see the *System Support Addendum* (SSA).

Note

If your server supports both Ethernet and asynchronous DECnet clients on the same network, your VAX computer must be configured as a DECnet phase IV routing node to relay data to its appropriate destination.

Step 4: Check for Prerequisite Software

Before installing PATHWORKS for DOS, make sure the following software is installed and running on your system:

- VMS Version 5.3 or higher
- DECnet-VAX Version 5.3 or higher
- VMS/ULTRIX Connection Version 1.3 or higher if you plan to use TCP/IP as the network protocol on the server.
- PATHWORKS for VMS Version 4.1

Use the procedures in the following sections to determine if the software is installed and running.

VMS and DECnet-VAX Version 5.3 or higher

To check the version number and determine if DECnet is running, enter the following command:

```
$ MCR NCP SHOW EXECUTOR
```

For example, this command displays the following information:

```
Executor Node            = node address (nodename)

State                      On ❶
Executor Identification    Decnet-VAX V5.3, VMS V5.3 ❷
```

In the above example:

❶ Shows the DECnet status

❷ Shows DECnet and VMS version numbers

VMS/ULTRIX Connection Version 1.3

If you plan on using TCP/IP as the network protocol on the server side, VMS/ULTRIX Connection Version 1.3 or higher must be installed on your system.

Enter the following command to check for UCX:

```
$ SHOW LOGICAL UCX$INET
```

If UCX is installed, you see a display similar to the following:

```
"UCX$INET_HOST" = SERVR1
```

If UCX is not running, start it by running:

```
$ @SYS$STARTUP:UCX$STARTUP
```

See the UCX documentation for more information.

PATHWORKS Server

The PATHWORKS for VMS Version 4.1 server must be installed on the VAX before you can install PATHWORKS for DOS.

To check the version of the VMS server, enter the following command:

```
$ PCSA SHOW VERSION
```

If your file server is running, you see a message that includes the version number. For example:

```
PCFS_SERVER version:  PATHWORKS for VMS V4.1
```

Starting the server

If your file server is not running, the following message is displayed:

```
PCFS_SERVER version    :  Not available
```

Start the file server by entering:

```
$ @SYS$STARTUP:PCFS_STARTUP
```

Step 5: Complete the Installation Requirements

Before you begin the installation or upgrade:

- Back up the system disk.
- Check for at least 40,000 free blocks on the server.
- Determine where to install the software on the server. The default location is SYS$SYSDEVICE:[PCSA.PCSAV41].

System Backup

Digital recommends that you do a system backup before installing any layered product. Use the backup procedures established at your site.

See the *VMS System Manager's Manual* for more information about backup procedures.

Disk Space

40,000 free blocks required

You need at least 40,000 free blocks available on one VMS disk to install the client software.

To determine the amount of available disk space on your server, enter the following command:

```
$ SHOW DEVICE D
```

The system displays a list of all disk devices, showing the number of free blocks available on each device. For example:

```
Device              Device    Error   Volume          Free     Trans     Mnt
Name                Status    Count    Label          Blocks   Count     Cnt
$1$DJA6:   (SRVR1)  Mounted       0  USER3           69072     1         8
$1$DUA0:   (SRVR1)  Mounted       0  SYSDSK          53883     241       8
$1$DUB0:   (SRVR1)  Mounted       0  SRVR1_9596      13505     1         8
$1$DUB1:   (SRVR1)  Mounted       0  DISK$DRIVER     43770     1         8
$1$DUB2:   (SRVR1)  Mounted       0  DISK$PUTTER     135200    7         8
```

File Service Directory Specification

The PATHWORKS for DOS installation creates a system file service named PCSAV41 on the server. A **file service** consists of the directory, subdirectories, and files on a VAX computer that a client can access. PC users can access the directory, its subdirectories, and files as if they were local directories and files.

By default, the installation uses SYS$SYSDEVICE:[PCSA.PCSAV41] as the directory for the system file service. SYS$SYSDEVICE is a logical name indicating the system disk. A logical name can be defined to refer to any physical device name.

You can install PATHWORKS for DOS to any directory that has 40,000 free blocks of disk space. If you want to install the system file service on another device and directory, enter the new disk device and directory when prompted during the installation procedure. Do not install PATHWORKS for DOS to the root directory of the device.

Step 6: Copy the Diskettes

Part of the PATHWORKS software for DOS is shipped on either 5 1/4-inch or 3 1/2-inch diskettes. After checking your Bill of Materials (BOM) to see that you have all the diskettes in your kit, create a backup copy of each diskette by using the DISKCOPY command.

Use the copies for configuring the PCs in your network.

Step 7: Gather the Installation Media

To complete the installation or upgrade, you need the installation media labeled PWRKS V4.1 DOS for VMS. Depending on your kit, the installation media can be either:

- TK50 cartridge tape
- 9-track magnetic tape

Next Steps

Install the client software on the server according to instructions in Chapter 2.

2

Installing or Upgrading PATHWORKS for DOS on the Server

This chapter describes how to install or upgrade PATHWORKS for DOS on the server. Use Table 2–1 as a checklist for installation or upgrade. Each item is discussed in this chapter.

Table 2–1 Installation and Upgrade Checklist

☐	Run the VMSINSTAL installation utility.
☐	Load the TK50 or magnetic tape.
☐	Purge files (upgrade or reinstallation only).
☐	Supply the location where the PCSAV41 system file service is to be installed.
☐	Supply the name of the system file service maintainer.
☐	Follow the prompts to complete the installation or upgrade.
☐	Verify the installation.

This chapter also includes sections on:

- Error messages and conditions
- What to do after upgrading PATHWORKS for DOS from an earlier version
- What to do next

Be sure you understand the information and complete the tasks described in Chapter 1 before you perform the installation or upgrade.

Default responses are displayed in brackets.

Responding to VMSINSTAL questions

Each VMSINSTAL question you need to answer is marked with an asterisk (*) at the beginning of the line. Some questions show a default response in brackets. Following is an example of a VMSINSTAL question with a default answer:

```
* Do you want to continue anyway [NO]?
```

To accept a default response, press Return during the installation.

Getting help

Press ? for help

You can get help anytime during the installation procedure by pressing ?

Stopping the installation

You can stop the installation procedure at any time by pressing Ctrl/C.

When you stop the installation program, all files created by the installation are deleted. You can begin the installation procedure again later.

Note

Depending on the configuration of your VAX computer, the dialog that occurs during your installation can differ slightly from the examples that appear in this section.

Step 1: Run VMSINSTAL

See Appendix D for a sample installation script.

Log into the system account on the server, then start the installation or upgrade by entering:

```
$ @SYS$UPDATE:VMSINSTAL PCSACLIENT041  device_name:
```

You supply the physical device name (device_name:) of the tape drive on the VMS server. For example:

```
$ @SYS$UPDATE:VMSINSTAL PCSACLIENT041  MUA0:
```

The procedure displays informational and warning messages indicating the condition of the VMS server, including a list of users and active processes currently on the system. Active processes do not interfere with installation or upgrade.

If there are active users on the system, the procedure asks:

```
* Do you want to continue anyway [NO]?
```

Type YES and press Return. The active processes do not interfere with the installation.

The procedure continues:

```
* Are you satisfied with the backup of your system disk [YES]?
```

Type YES and press Return if you are satisfied with the backup of your system disk. Otherwise, type NO and press Return to stop the installation.

Step 2: Insert the Tape into the Tape Drive

The procedure displays a message similar to the following:

```
Please mount the first volume of the set on MUA0:
* Are you ready?
```

Insert the tape labeled PWRKS V4.1 DOS for VMS into the tape drive. If you are using a TK50 tape, make sure that the tape is correctly write-protected.

Type YES and press Return when the tape is loaded.

The procedure displays a message containing device-specific information. For example:

```
%MOUNT-I-MOUNTED, CLIENT mounted on MUA0:
```

The procedure continues:

```
The following products will be processed:
  PCSACLIENT V4.1
  Beginning installation of PCSACLIENT V4.1 at 14:07

%VMSINSTAL-I-RESTORE,Restoring product saveset A
```

This step takes approximately 5 minutes.

Step 3: Purge Files

This step done during upgrade or reinstallation.

During an upgrade or reinstallation, the procedure displays the following:

```
* Do you want to purge files replaced by this installation [YES]?
```

Answering YES deletes old versions of the files replaced by the upgrade and saves disk space. If you answer NO, you can manually purge the files after you complete and verify the installation.

Step 4: Supply the Location for the System File Service

You need a minimum of 40,000 free blocks.

By default, the procedure installs the system file service, PCSAV41, on the system disk (SYS$SYSDEVICE). You have the option of installing the file service to another device and directory.

The procedure prompts you:

```
* Enter directory specification for PCSAV41 [SYS$SYSDEVICE:[PCSA.PCSAV41]]:
```

Enter any valid VMS directory specification or accept the default. Press Return to continue.

Note

If you specify a directory that has insufficient space to install the kit, the procedure displays an error message and offers you the choice of entering another directory specification or of stopping the procedure.

Step 5: Supply the Name of the Maintainer

The procedure prompts you for the VMS user name responsible for maintaining the PCSAV41 system file service:

```
* Enter the VMS username that will maintain
  the system service,PCSAV41 [SYSTEM]
```

Enter any valid VMS username or press Return to accept the default user name [SYSTEM].

This step grants read, write, and create privileges to PCSAV41 for the specified user.

Step 6: Complete the Installation or Upgrade

The procedure now continues unattended until completion. You can safely leave the installation for 25 to 35 minutes.

At the end of the procedure, VMSINSTAL displays a message similar to the following:

```
The VMSINSTAL procedure is complete.  To complete the installation of
PATHWORKS for DOS install DOS on the VMS server.  See your
Installation and Configuration Guide for more information.

%VMSINSTAL-I-MOVEFILES, Files will now be moved to their
target directories...
 Installation of PCSACLIENT V4.1 completed at 12:17

 VMSINSTAL procedure done at 12:18
```

Step 7: Verify the Installation/Upgrade

After the procedure is finished:

1. Verify the installation by entering:

   ```
   $ ADMINISTER/PCSA SHOW FILE SERVICE/REGISTERED/SERVICE=PCSAV41
   ```

   Make sure PCSAV41 is listed with the root directory you specified during the installation procedure. For example:

   ```
   File Server Registered Directory Services:

   Service name Root directory              Service type Att/Len Limit
   ------------ --------------------------- ------------ ------- -----
   PCSAV41      SYS$SYSDEVICE:[PCSA.PCSAV41] SYSTEM       STR/EST  NONE
   ```

2. Verify that the file service is mounted as a system service by entering:

   ```
   $ ADMINISTER/PCSA SHOW FILE SERVICE/AUTHORIZED/SERVICE=PCSAV41
   ```

   The table lists all the users and groups that have access to the system service. For example:

   ```
   File Server Authorized Services:

   User name    Alias name   Service name  Access  RMS protection
   -----------  -----------  ------------  ------  ------------------
   <PUBLIC>     PCSAV41      PCSAV41       R       S:RWED,O:RWED,G:,W:
   SYSTEM       PCSAV41      PCSAV41       RWC     S:RWED,O:RWED,G:,W:
   ```

Error Messages and Conditions

If errors occur during the installation or upgrade, the procedure displays the following failure message:

```
%VMSINSTAL-E-INSFAIL, The installation of PCSACLIENT V4.1 has failed.
```

Errors can occur during the procedure if any of the following conditions exist:

- The operating system is incorrect.
- A file server is not running.
- A prerequisite software version is missing.
- Quotas necessary for successful installation are not sufficient.
- Disk space is inadequate.

If you are notified that any of these conditions exist, take the appropriate action described in the message. For example, you may need to change a directory specification to one that has adequate disk space.

For more information about the error messages that can be generated by these conditions, see your VMS documentation on system messages, recovery procedures, and VMS software installation.

After Upgrading

You can upgrade from PATHWORKS for DOS Version 3.0 or 4.0. Read the sections that are appropriate for your upgrade.

Upgrading from Version 4.0

When you upgrade from PATHWORKS for DOS Version 4.0, the PATHWORKS for DOS Version 4.1 installation places the system file service in a new directory, SYS$SYSDEVICE:[PCSA.PCSAV41].

After installation is complete, you should:

- Transfer any versions of DOS from PCSAV40 to PCSAV41 using the DOSLOAD utility.

  For information about installing any versions of DOS on the new file service, see Reinstalling Client Operating Systems later in this section.

- Run Netsetup at each client to change the client startup files to the new service.

  After PCSAV41, the Version 4.1 file service, is up and running, you can upgrade your PCs by booting them from PCSAV40, then connecting to PCSAV41 to run Netsetup.

  For more information, see Chapter 3.

- Remove the the Version 4.0 file service, PCSAV40, after the new Version 4.1 file service is running.

Removing PCSAV40

After the upgrades are complete and you are satisfied the systems are running smoothly, you can save disk space by removing PCSAV40.

To remove PCSAV40, log in to a privileged account and enter the following command:

```
$ ADMINISTER/PCSA REMOVE SERVICE PCSAV40
```

You see a message asking if you want to delete the file service and all its files. For example:

```
Directory tree LOON$DUA1:[PCSA.PCSAV40...]*.*;* will be deleted
Proceed with deletion [YES or NO] (NO) :
```

Enter YES to delete the file service.

Reinstalling PATHWORKS for VMS

If you reinstall PATHWORKS for VMS after installing PATHWORKS for DOS, you must manually update SYS$STARTUP:PCFS_LOGICALS.COM. Add the following line to the end of the PCFS_LOGICALS.COM file:

```
$ DEFINE/SYSTEM/EXECUTIVE/NOLOG PCSA$SYSTEM_SERVICE_V41 PCSAV41
```

Upgrading from Version 3.0

When you upgrade from DECnet PCSA Client for DOS Version 3.0, the PATHWORKS for DOS Version 4.1 installation replaces the system disk service from previous versions of PCSA (PCSA$DOS_SYSTEM_V30 for example) with a system file service, PCSAV41.

The following sections describe how the change from a system disk service to a system file service affects:

- Existing system disk services
- Client operating systems installed on the server
- System logicals
- MS Windows Version 2.1

Deleting Existing System Disk Services

The installation of PATHWORKS for DOS Version 4.1 does not change or delete the system disk services for DECnet PCSA Client for DOS Version 3.0.

Keep the system disk service from the previous version until all clients have been upgraded. When you are sure you no longer need the system disk, do the following at the server:

1. Dismount the system disk. For example:

```
$ ADMINISTER/PCSA DISMOUNT/PURGE DISK -
_$ PCSA$DOS_SYSTEM_V30.DSK
```

Cluster considerations

If you are dismounting the system disk service on a cluster, delete the system disk service from the boot node. For example:

```
$ ADMINISTER/PCSA DISMOUNT DISK/CLUSTER/PURGE -
_$ PCSA$DOS_SYSTEM_V30.DSK
```

2. Delete the system disk service. For example:

```
$ ADMINISTER/PCSA DELETE DISK/TYPE=SYSTEM -
_$ PCSA$DOS_SYSTEM_V30.DSK
```

Deassigning System Logicals

If you have not installed PATHWORKS for VMS Version 4.1 and are continuing to use PCSA VMS Services for PCs Version 3.0, you must deassign the following logicals on the server:

- PCSA$SYSTEM_CONTAINER
- PCSA$SYSTEM_CONTAINER_V30

Use the VMS DEASSIGN command:

```
$ DEASSIGN PCSA$SYSTEM_CONTAINER
$ DEASSIGN PCSA$SYSTEM_CONTAINER_V30
```

Using MS Windows Version 2.1

The PATHWORKS for DOS Version 4.1 installation does not change or delete the MSWINV21.DSK disk service installed by previous versions of PCSA.

If you are running MS Windows version 2.1 from the MSWINV21 disk service, you can still connect to it from a client after you install PATHWORKS for DOS Version 4.1.

Deleting MSWINV21.DSK

If you no longer require the MSWINV21 disk service, dismount and delete it to save disk space. Do the following at the server:

1. Dismount the MSWINV21 disk:

```
$ ADMINISTER/PCSA DISMOUNT DISK MSWINV21
```

On a cluster

Note

If you are dismounting the MSWINV21 disk service on a cluster, use the following command from the cluster's boot node:

```
$ ADMINISTER/PCSA DISMOUNT DISK/CLUSTER MSWINV21
```

2. Delete the disk service:

```
$ ADMINISTER/PCSA DELETE DISK MSWINV21
```

Upgrading from Version 3.0 or 4.0

The following information applies to upgrading from Versions 3.0 and 4.0.

Reinstalling Client Operating Systems

If the PCs in your network are currently using DOS installed on a disk or file service on the server (for example, with remote boot), you must reinstall DOS on the PCSAV41 system file service.

The client installation does not copy DOS subdirectories from existing disk services or file services to the PCSAV41 system file service. After the upgrade is complete, you must run DOSLOAD at the client to reinstall any version of DOS previously installed on a disk or file service.

Checking current operating systems

Checking a Version 3.0 disk service

To see what client operating systems are currently installed on your PCSA$DOS_SYSTEM_V30 disk service:

1. Log in to a privileged account on the PATHWORKS for VMS server.
2. Start PCSA Manager:

```
$ PCSA MENU
```

3. Select **Workstation Options** from the PCSA Manager Menu.

4. Select **Remote Boot Workstation Options** from the Workstation Options menu.
5. Select **List Client Operating Systems** from the Remote Boot Workstation Options menu.

   The Manager Menu displays a list of each DOS operating system installed on the server. Make sure to write these down.

Checking a Version 4 file service

To see what client operating systems are currently installed on the PCSAV40 file service or on the new PCSAV41 file service, run the NETVER utility.

To run NETVER from the \PCAPP directory on PCSAV41, enter the following commands from a client that is connected to a PCSAV41 server:

1. Determine which drive is connected to a PCSAV41 server.

   ```
   C:\> USE
   ```

   Note which drive is connected to a PCSAV41 server.
2. Change to the drive connected to a PCSAV41 server.

   For example:

   ```
   C:\> J:
   ```

   The drive you need to change to may be different on your system.
3. Change directories to \PCAPP:

   ```
   J:\> CD PCAPP
   ```
4. Run NETVER:

   ```
   J:\PCAPP> NETVER
   ```

   The screen displays a list of the DOS versions installed on the service.

To check a service different from the client's default system service:

1. Connect to the file service, for example:

   ```
   C:\> USE ?:\\server_name\PCSAV40%
   ```

   Use the name of the server and service you want to connect to.

   You see a message indicating the drive that is connected to the service.

2. To run NETVER on that drive, enter the network drive letter after the NETVER command, for example:

```
C:\> NETVER J:
```

   The screen displays a list of the DOS versions installed on the server.

Reloading DOS

After upgrading the client software on the server, see the following for instructions on reloading DOS:

- Chapter 4 for instructions on making the first PC/server connection required to run DOSLOAD.
- Chapter 5 for information on using DOSLOAD.

Next Steps

Proceed to Part 2 for instructions on:

1. Using the Netsetup configuration utility
2. Loading DOS on the server (required for remote boot)
3. Configuring the PCs in your network

Part 2

Configuration

3

Configuration Overview

Read this chapter before configuring the personal computers (PCs) in your network. This chapter describes:

- Configuration options
- Preparing for configuration
- Using the Netsetup configuration utility
- Next steps

Note

You must install and configure the server software before installing the client software.

Configuration Options

You use the Netsetup utility to configure PCs to use the PATHWORKS network. Netsetup is run on the PC.

By responding to a series of Netsetup prompts, you provide the information to create or edit a **client profile**. A client profile defines how a PC connects to the PATHWORKS network.

Netsetup creates a **key disk** from the client profile. A key disk contains the software necessary to boot a client and connect to the network, including:

- Loading DOS software into the client memory
- Loading the network software
- Connecting to specified network services

The key disk can be a diskette or it can reside on the PC's hard disk.

You can configure clients for either local or remote boot, as described in the following sections.

Local Boot

With **local boot**, client configuration files are stored on the PC on the key disk. The key disk can be either a hard disk partition or a diskette.

Local boot is available over the following network transports:

- DECnet
- TCP/IP

Local boot supports PATHWORKS for DOS (NetWare Coexistence) V1.0 and access to Token Ring. For more information, see the following sections.

DECnet

DECnet is the default network transport and is supplied with the PATHWORKS for DOS software kit.

Clients using the DECnet transport have the following configuration options:

DECnet-DOS only

- DECnet-DOS components only

  You have the option of using only the DECnet-DOS portion of PATHWORKS. DECnet-DOS consists of a set of software components that work with the DOS operating system and let a PC communicate with other computers over the network communication lines.

  DECnet-DOS alone is used when the PC does not need the client/server functions of PATHWORKS.

  See *DECnet-DOS User's Guide* for more information on the DECnet-DOS components.

Asynchronous DECnet

- Asynchronous DECnet connections

  Local boot clients that cannot access the Ethernet (the client is located in a remote office, for example) can connect to the network with asynchronous DECnet communications. Asynchronous DECnet supports access to the network over telephone lines, leased lines, or by using a modem.

See Chapter 15 for more information on using asynchronous DECnet.

Note

When configuring a client for DECnet-DOS only or Asynchronous DECnet, Netsetup gives you the option of not loading the Redirector. Load the Redirector from the Memory Configuration Menu if you want to access file and print services.

TCP/IP

The TCP/IP transport is part of the PATHWORKS for DOS (TCP/IP) Version 1.1A kit. PATHWORKS for DOS (TCP/IP) must be ordered and installed separately.

Token Ring Support

The PATHWORKS for DOS Version 4.1 Token Ring support allows you to access an IEEE 802.5 Token Ring LAN as a Phase IV DECnet end node. You can use DECnet to access file and print services, terminal emulation, file transfer, and other functions across a Token Ring network. The PATHWORKS for DOS Token Ring support includes source level routing.

LAD, LAT, LAST, remote boot are not supported.

Token Ring support allows the DECnet process to work over a Token Ring network. Operation of the LAD, LAST, and LAT protocols over the Token Ring is not supported. Remote boot is not supported over Token Ring. To the user, Token Ring network access works in the same way as Ethernet network access.

PATHWORKS for DOS (NetWare Coexistence) V1.0 Support

PATHWORKS for DOS V4.1 provides access to PATHWORKS for DOS (NetWare Coexistence) V1.0, which lets you use services offered by a NetWare server. Access to NetWare services appears the same as PATHWORKS services.

Note

PATHWORKS for DOS (NetWare Coexistence) V1.0 must be ordered and installed separately.

Remote Boot

With **remote boot**, client configuration files are stored on the server on a **network key disk**. The network key disk is a virtual disk on the server that contains all the files needed to boot a PC over the network. Remote boot connects the client to the network key disk and loads the DOS operating system.

Remote boot simplifies the management of the client operating system software.

Loading LAD

In order to use remote boot, LAD must be loaded. You load LAD at the Memory Configuration menu.

Note

Remote boot using TCP/IP is not currently supported. Remote boot is only available using the DECnet network transport.

Redirector

The Redirector is the DOS software that interprets instructions for DOS drives and sends these instructions to remote network services. The Redirector is selected in Netsetup.

Netsetup provides three Redirector options:

- Basic Redirector
- Enhanced Redirector
- Enhanced Redirector with Full LAN Manager Version 2.0 support

Basic Redirector

The Basic Redirector responds to all PATHWORKS for DOS commands. It is recommended for the DOS client that connects only to a VMS or ULTRIX server. If you do not need full LAN Manager Version 2.0 or higher functions, you can save memory by using the Basic Redirector.

Through SETLOGON, the Basic Redirector can also connect DOS clients to an OS/2 server, which recognizes the Microsoft LAN Manager Version 1.0 file and print server commands. However, the Basic Redirector does not support full LAN Manager Version 2.0 or higher functions such as Named Pipes.

Enhanced Redirector

The Enhanced Redirector recognizes all the PATHWORKS for DOS commands. In addition, it enables the DOS client to access servers such as PATHWORKS for OS/2 that offer full Microsoft LAN Manager Version 2.0 or higher functionality, including Named Pipes. ULTRIX and VMS servers respond to Microsoft LAN Manager Version 1.0 file and print server commands.

When the DOS client is configured to use the Enhanced Redirector, the LAN Manager files needed to started the Redirector are copied to your local disk. The remainder are stored on the server.

Enhanced Redirector with Full LAN Manager Version 2.0 Support

The Enhanced Redirector with Full LAN Manager Version 2.0 Support offers all the benefits of the Enhanced Redirector plus two added features:

- It automatically copies all LAN Manager files to the local disk containing your PATHWORKS software.
- It recognizes both PATHWORKS and Microsoft LAN Manager commands.

  You can use PATHWORKS commands to connect to ULTRIX and VMS services. You can also connect directly to LAN Manager services on the OS/2 server without using SETLOGON.

  PATHWORKS NET commands provide some functions not offered by LAN Manager. The Enhanced Redirector with Full LAN Manager Version 2.0 support provides separate executable files for the NET commands:

  - NET.EXE for LAN Manager Version 2.0 or higher NET commands
  - NETD.EXE for PATHWORKS for DOS NET commands

  To invoke the the PATHWORKS functions, enter NETD instead of NET.

Preparing for Configuration

Before running Netsetup, make sure you have the right materials and information to configure the clients in your network.

Gather Materials

You need the following materials to run Netsetup:

- A PC with an Ethernet or Token Ring adapter installed and physically connected to the network.

  Netsetup supports any Ethernet or Token Ring adapter that supplies a Microsoft-certified NDIS driver. The DEPCA network adapter is supported in the EtherWORKS family of adapters.

  When you select an Ethernet adapter and have not chosen NetWare, you can choose between the EtherWORKS native datalink or Etherworks NDIS adapter. If you use an application that requires an NDIS driver, choose the Etherworks NDIS adapter. Otherwise, choose EtherWORKS native datalink for faster performance.

  When you run Netsetup, you select an adapter type to match the adapter installed in your PC. When you select an adapter type, Netsetup installs a driver on your key disk.

NDIS adapters

PATHWORKS for DOS Version 4.1 provides selected NDIS drivers and their PROTOCOL.INI stubs. When you select an adapter in Netsetup, Netsetup installs the driver and a PROTOCOL.INI file on your key disk. Netsetup includes information from the PROTOCOL.INI stub in the new PROTOCOL.INI file on your key disk.

If you are using an NDIS driver that is not supplied by PATHWORKS, Netsetup prompts you for the location of the driver and PROTOCOL.INI stub. Some NDIS drivers require additional files. Check your network adapter's documentation for information about NDIS driver files.

For more information about NDIS drivers and PROTOCOL.INI, see Appendix C, Using NDIS Drivers. For a list of NDIS drivers that come with the PATHWORKS kit, refer to the *PATHWORKS for DOS Software Product Description*.

Note

A network adapter is not required for asynchronous DECnet connections.

For first time configuration or upgrade

- If you are configuring a PC for the first time, you need backup copies of the following diskettes included with your installation media:
  - Client setup diskette(s)

    The client setup diskette(s) are labeled PWRKS V4.1 CLIENT SETUP
  - Network diskette(s)

    Use the diskette(s) labeled PWRKS V4.1 DNET TRANSPRT for the DECnet transport.

    Use the diskette(s) labeled PWRKS V1.1A TCP/IP INITIAL if you have installed the separate TCP/IP kit.
- A bootable diskette or a hard-disk partition to act as the key disk.

  See your DOS documentation for instructions on creating a bootable disk or hard-disk partition.

Gather Information

Netsetup prompts you for information on how to configure each PC. You have two ways of collecting this information:

- Netsetup Help text

  Each Netsetup screen has its own help text describing how to respond to the prompts. Use the help text to determine what information you need to configure the client.

Use the Netsetup help text to fill out the forms.

- The Client Profile form

  Appendix A of this guide includes Client Profile forms for:
  - Local boot using the DECnet and TCP/IP transports
  - Local boot using DECnet-DOS components only
  - Local boot for asynchronous DECnet connections
  - Remote boot

Use the Client Profile forms to:

- Maintain a written record of the clients in your network
- Respond to the Netsetup prompts.

  Each form lists the prompts displayed in each Netsetup operator mode.

Using the Netsetup Utility

This section describes how to use Netsetup, including:

- Starting Netsetup
- Using Netsetup screens and keys
- Getting help
- Entering and editing information in Netsetup
- Using the operator modes
- Using copies of client profile forms

Note

Use the following guidelines when using Netsetup:

- Netsetup requires approximately 360 Kbytes to run.
- Netsetup cannot be aborted while copying files.

Starting Netsetup

There are two methods of starting Netsetup:

From the client setup diskette

- If the PC cannot make the network connection to the server, run Netsetup from the client setup diskette, PWRKS V4.1 CLIENT SETUP, supplied with the kit.

  Use the client setup diskette when configuring the PC for the first time.

Over the network

- You can run Netsetup over the network from the server if the PC can make the network connection to the system file service (PCSAV41). Run Netsetup from the server when:
  - Changing Netsetup information for an existing client
  - Using one client to create boot media for other PCs

Starting Netsetup from the Client Setup Diskette

To start Netsetup from the client setup diskette:

1. Boot the PC.
2. Insert the diskette labeled PWRKS V4.1 CLIENT SETUP in drive A:.
3. Enter:

   ```
   A:\> NETSETUP
   ```

   The drive you are using may be different from the drive in this example.

Starting Netsetup from the Server

Use one of the following methods to start Netsetup located on the server. The drive you are using may be different from the drive shown in the examples.

For existing V4.1 networks

- With a PC that is already connected to a PATHWORKS V4.1 server, enter the following from the client's boot drive. For example:

  ```
  C:\> NETSETUP
  ```

For networks with multiple servers

- With a PC that is connected to a server running PATHWORKS for DOS Version 4.0 or lower:

  1. Connect to the PATHWORKS system file service (PCSAV41) by entering:

     ```
     C:\> USE ?:\\server_name\PCSAV41%
     ```

     Use the name of a server running PATHWORKS for DOS version 4.1 in place of *server_name*.

     For example:

     ```
     C:\> USE ?: \\SRVR1\PCSAV41%
     ```

     This example produces a message similar to the following:

     ```
     Device J: connected to \\SRVR1\PCSAV41
     ```

2. Change drives to where the system file service, PCSAV41, is located. For example:

   ```
   C:\> J:
   ```

3. Change directories to the PCAPP subdirectory. For example:

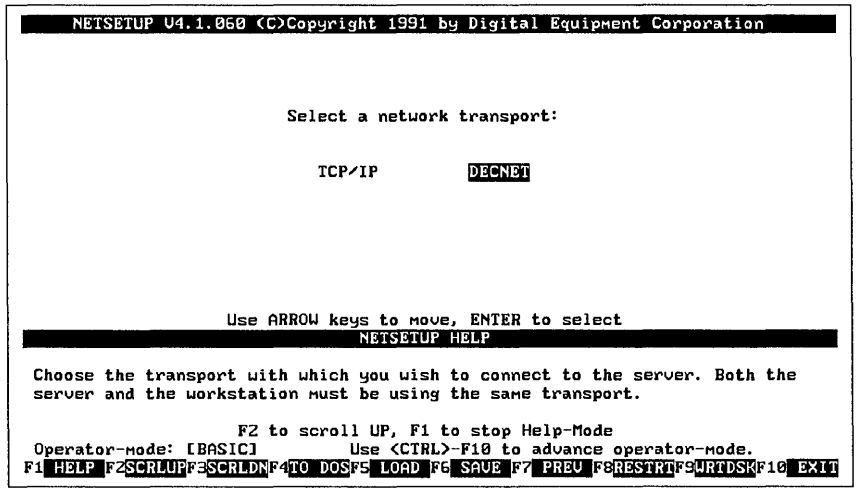
   ```
   J:\> CD \PCAPP
   ```

4. Start Netsetup by entering:

   ```
   J:\PCAPP> NETSETUP
   ```

Figure 3–1 shows a sample Netsetup screen.

Figure 3–1 Sample Netsetup Screen



Screens and Keys

The Netsetup function keys are listed at the bottom of the screen with their corresponding functions. Table 3–1 describes the function keys.

Table 3–1 Netsetup Function Keys

Key	Function
Ctrl/F10	Change the operator mode (Basic, Intermediate, Advanced).
F1	Enable and disable the help mode.
F2	Scroll up the help text.
F3	Scroll down the help text.
F4	Go to DOS. Type EXIT at the DOS prompt to return to the utility.
F5	Load a copy of a client profile to create a similar client profile.
F6	Save a copy of the client profile.
F7	Return to the previous prompt.
F8	Start the questions over without saving the entered information.
F9	Write the configuration files to the key disk. If you press the F9 key before all required information is entered, Netsetup displays an error message.
F10	Exit from the utility.
?	Enable one-time help. Press Return to leave.

Help

There are two types of Netsetup help:

F1

- Online

  When you start Netsetup, the top portion of the screen displays the prompt, and the bottom portion displays the help text.

  Help remains active and updates automatically to correspond with each screen.

  Pressing F1 turns help off and on.

?

- One-time

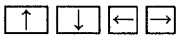
  If you shut off the online help by pressing F1, help is available on any screen by pressing ?.

  One-time help displays a dialog box with the help text. Pressing Return exits one-time help.

Entering and Editing Information

Netsetup has fields where you either accept the default or supply your own information to configure PATHWORKS clients.

To change any of the information displayed:



1. Use the arrow keys to highlight the information you want to change.
2. Enter the correct answer to the prompt and press Return.

Selecting the Operator Mode

Press Ctrl/F10 to change the operator mode.

Before configuring the PC, choose the Netsetup operator mode. The operator mode is displayed above the function keys on the Netsetup screen. Netsetup has three operator modes:

- Basic

  Basic mode supplies default information to quickly configure the PC to use the network. Basic mode also automatically adds the network start-up command to the PC's AUTOEXEC.BAT file. You supply the local network and client information.

  You can make these choices in basic mode:

  - Select TCP/IP or DECnet network transport
  - Select local or remote boot
  - Add LK250 keyboard setup information
  - Select the network adapter type

  Netsetup supplies the Basic Redirector in basic operator mode. For more information, see the section Redirector, earlier in this chapter.

- Intermediate

  Intermediate mode allows you to use one client to create key disks for other clients. Intermediate mode also allows you to change the way the client loads the network components into memory.

  You can make these additional choices in intermediate mode:

  - Configure this workstation or another workstation
  - Add the system service DOS subdirectory to the DOS search path

- Select Basic Redirector, Enhanced Redirector, or Full LANMAN 2.0 support.

  For more information, see the section Redirector, earlier in this chapter.

- Select character set/code page
- Add network startup command line to the AUTOEXEC.BAT file
- Which network components to load into memory and where to load them (RAM, EMS, XMS)

• Advanced

  In Advanced mode, Netsetup displays all prompts for a specific configuration. Advanced mode also displays all informational messages sent from the server during configuration.

  You can make these additional choices in advanced mode:

  - Asynchronous DECnet
  - DECnet-DOS
  - Maximum number of file and printer service connections
  - Printer buffer sizes
  - System or hardware clock for the scheduler (SCH)
  - The number of DECnet logical links

See the Sample Client Profile forms in Appendix A for a list of all Operator mode information.

Using Copies of Client Profiles

A client profile contains information about the PC, such as the necessary device drivers, the type of keyboard, and the PC node name and address, if applicable.

You can create and load copies of the client profile to duplicate common information when creating a new client profile. This is helpful if you are using one client to create the boot media for other PCs. You edit the profile to add client-specific information and make any additional changes you want.

Netsetup saves the default profile as \CFGWS.DAT on the key disk.

Saving a Copy of a Client Profile

To save a copy of a completed client profile:

1. After you respond to all Netsetup prompts and are satisfied that the client profile is correct, press F6.
2. When prompted, enter a file name for the client profile copy.

   The file name consists of the drive path, name, and extension. For example, the filename for a Tandy PC might be:

   ```
   C:\CONFG\TANDYS.CFG
   ```

You cannot use a copy of a client profile until you save one.

Loading a Copy of a Client Profile

After starting Netsetup, you can load a copy of a client profile at any time.

To use an existing copy

1. Press F5.
2. When prompted, enter the name of the profile copy you want to load.

   Netsetup displays the copy of the client profile you specify.
3. Edit the client profile form to add client-specific information.

Next Steps

- See Chapter 4 and Chapter 5 if you plan to install DOS on the server.

  Installing DOS on the server is required for remote boot clients. Installing DOS on the server permits local boot clients to use DOS utilities from the server.
- See Chapter 6 to configure clients for local boot.
- See Chapter 7 to configure clients for remote boot.

4

Preparing to Install DOS on the Server

You can simplify the management of client software by installing DOS on the server. Clients can then connect to the server and use DOS utilities and Digital-supplied DOS enhancements from the network.

For example, if you have a mix of IBM PS/2, COMPAQ, and DECstation PCs in your network, you would install each type of machine's DOS on the server. Remote boot clients access all their system software from the server.

This chapter explains how to make the initial PC-to-server connection this is required before installing DOS on the server.

You make this initial PC/server connection to install DOS on the server to prepare for:

- Planning to use DOS utilities from the server for local boot clients in a new network.
- Configuring PCs for remote boot in a new network.

  Before configuring PCs for remote boot, the DOS needed to boot those PCs over the network must be present on the server.

Upgrade information

- Upgrading your remote boot clients to PATHWORKS for DOS version 4.1.

  Earlier versions of PCSA installed DOS on a disk service on the server. PATHWORKS for DOS Version 4.1 requires that DOS be installed on the PCSAV41 system file service.

Use Table 4–1 as a checklist for preparing to install DOS. Each item is discussed in this chapter.

Table 4–1 Steps for Configuring the First Client

☐	Start Netsetup.
☐	Respond to the Netsetup prompts.
☐	Write the key disk.
☐	Reboot the PC to make the initial network connection.

This chapter ends with instructions on what to do next.

Note

See Chapter 3 for an overview of local boot configuration options and how to prepare for configuration.

The following steps describe how to make the initial PC-to-server connection. This is required before installing DOS on the server.

Step 1: Start Netsetup

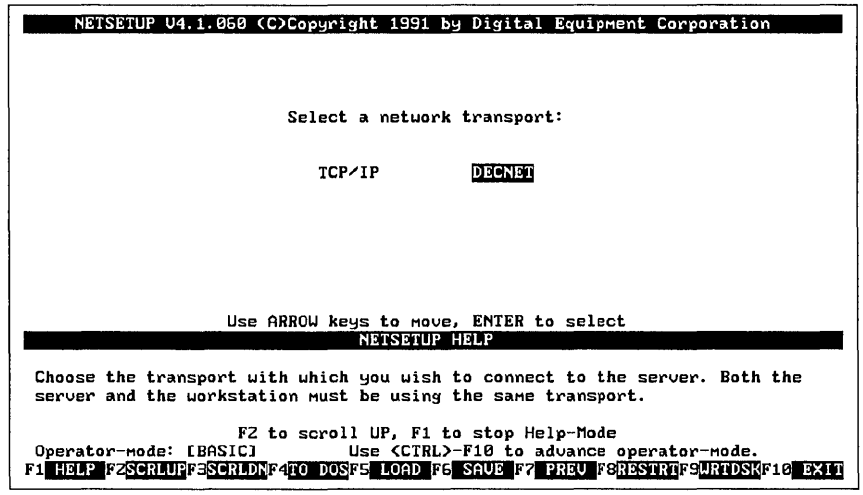
To start Netsetup:

1. Boot the PC.
2. Insert the PWRKS V4.1 CLIENT SETUP diskette in drive A:.
3. Enter:

```
A:\> NETSETUP
```

Figure 4–1 shows the first Netsetup screen.

Figure 4–1 First Netsetup Screen



Step 2: Respond to the Netsetup Prompts

Netsetup displays a series of prompts that configure the client and create the key disk.

Use the following guidelines when responding to the prompts:

1. Use the Basic operator mode to make the initial PC/server connection. After installing DOS on the server, you can reconfigure the PC if required.
2. When prompted for the network transport, choose:

   DECnet — If you are configuring the PC to use the DECnet transport.

   TCP/IP — If you are configuring the PC to use the TCP/IP transport. PATHWORKS for DOS (TCP/IP) must be purchased separately and installed to choose this option.

   Netsetup prompts you to put the network diskette in the A: drive.
3. At the prompt **Is this an initial workstation diskette?**, choose **YES**.

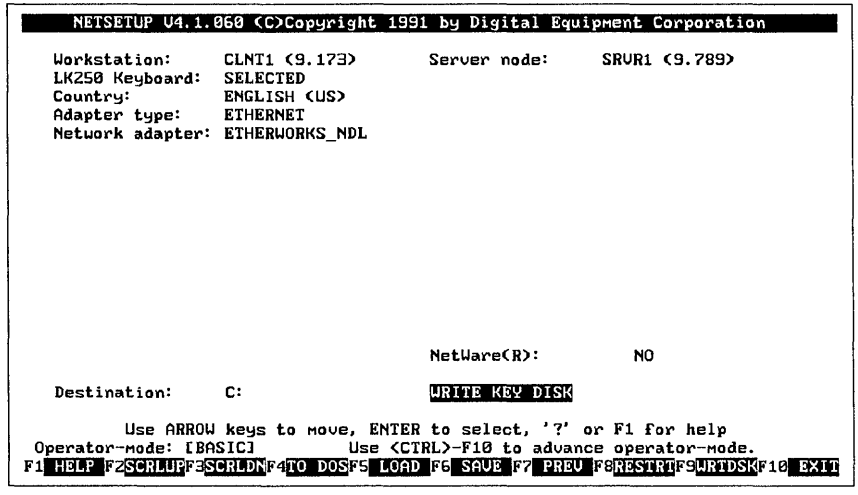
4. When prompted for the destination drive, enter the drive where you want your key disk to be written:
   - If you are creating boot media for another PC, you must write the startup and configuration files to a key disk on a diskette.
   - If you are configuring the PC on which you are running Netsetup, you can write the startup files to a key disk on the hard disk or on a diskette.

     The hard disk offers faster performance.

After you respond to all the prompts, Netsetup displays the client profile.

Figure 4–2 shows a sample client profile screen.

Figure 4–2 Sample Client Profile Screen



Review the client profile for accuracy. To change any of the displayed information:

1. Use the arrow keys to highlight the information you want to change and press Return.
2. Enter the correct answer to the prompt and press Return.

   Netsetup displays the client profile with the change you made. You can continue to make additional changes.

Step 3: Write the Key Disk

1. When you are satisfied with the client profile, write the key disk to the boot media by either:

   - Pressing F9
   - Selecting **WRITE KEY DISK** and pressing Return

   Netsetup displays a series of prompts telling you to insert the following:

   - PWRKS V4.1 CLIENT SETUP diskette(s)
   - Network transport diskette(s)
   - Key disk diskette

     If you specified a diskette drive as the destination drive for the key disk, you must insert a formatted diskette in the drive you specified.

   Follow the prompts carefully.

   Netsetup displays a message telling you which files are being copied or modified. When all files are copied or modified, the client profile is redisplayed.

   Hint

   If the process stops without an error message, check to make sure that the correct diskette is in the A: drive. If not, insert the correct diskette and press Return.

2. Press F10 twice to exit Netsetup.

Step 4: Reboot the Client

1. If you created a bootable key disk, make sure the diskette is in the boot drive.
2. Press Ctrl/Alt/Del to reboot the client.

Informational messages are displayed as the client makes the network connection to the server. For example:

```
DECnet DNP Version V4.1.00
   with NETBIOS Interface Support
DECnet Node Name 'CLIENT' (9.231)
DECnet Started
LAST Transport Version V4.1.00
DEC PCSA  Basic Lanman Redirector Y4.1.00
Now attempting connection to the system file service:
\\SRVR1\PCSAV41
Device J: connected to \\SRVR1\PCSAV41
Setting Path and Environment Variables
------------------------------------------------------------------
 Setting the date and time...
 Time/Date serviced by node SRVR2

 The current date is 12/04/90
 The current time is 09:51:14.00
------------------------------------------------------------------
         To complete workstation initialization enter the command:
              LOGON  server-name  user-name  [password or *]
------------------------------------------------------------------
         To unload the network use:  D:\DECNET\STOPNET.BAT
------------------------------------------------------------------
C:\>
```

For now, ignore the LOGON message.

Next Steps

After making the initial PC/server connection:

1. Install DOS on the server (Chapter 5).
2. Reconfigure this client or configure other clients for either:
   - Local boot (Chapter 6)
   - Remote boot (Chapter 7)

5

Installing and Managing DOS on the Server

You use the DOSLOAD utility to:

- Install different types and versions of DOS on the server.
- Reinstall a DOS from a PATHWORKS for DOS Version 4.0 service to a Version 4.1 service
- Copy a DOS from one system service to another
- List the types of DOS available on a server.
- Delete DOS directories on a server.

  For example, you can remove DOS versions no longer used by the clients in your network.

You run DOSLOAD on the client.

Use Table 5–1 as a checklist for using DOSLOAD to install and manage DOS on the server.

Table 5–1 Checklist for DOS Installation and Management

☐	Gather the required materials.
☐	Gather the required information.
☐	Run the DOSLOAD utility.
☐	Install DOS on the server.

This chapter discusses these items and provides information on what to do next.

Note

Earlier versions of PCSA and PATHWORKS installed DOS on a disk service or a file service on the server. The client installation process does not copy DOS subdirectories from existing disk or file services to the PCSAV41 system file service.

You must use DOSLOAD to reinstall any versions of DOS previously installed on a disk service. See Chapter 1 for more information.

Step 1: Gather Materials

To use DOSLOAD, you need:

- A PC connected to the PATHWORKS system service (PCSAV41).

  This can be the client you used in Chapter 4.

- A source for the version of DOS you want to load to the PCSAV41 system service.

  DOSLOAD lets you select a floppy drive, a hard disk drive, or a network drive as a source for a DOS.

DOS sources

Sources for a DOS can be:

- DOS source diskettes

  The DOS source diskettes are available from your client vendor.

- A hard disk drive on your PC

  Use the hard disk drive as a source for DOS 5.0. For more information, see DOS Information, later in this chapter.

- A DOS that is on a PCSAV40 or PCSAV41 system service

  DOSLOAD prompts you for the directory from which to copy DOS. The directory must contain DOS files with the boot block information file that DOSLOAD installed when it created that directory.

Step 2: Gather Information

DOSLOAD prompts you for:

- The name of the server where you plan to use DOS
- A name for the new DOS directory on the server
- The version of DOS you are loading on the server
- The source drive for the DOS you are loading on the server

  If you use a hard disk drive or a network drive, you are prompted for the name of the DOS subdirectory that contains the DOS you want to load.

Server Information

You need the following server information to use DOSLOAD:

- Server node name.

  By default, DOSLOAD displays the name of the server the client is connected to for its system service (PCSAV41).

- Server security information. This includes:
  - The name of an account with write access to the PCSAV41 system service on the server.
  - The password of the account with write access to the PCSAV41 system service.
- Name of each DOS subdirectory you plan to install on the server. Use the following format when naming the subdirectory:

  `xxSYSDnn`

Attributes	Description
xx	Indicates the type of client. For example, CQ for a COMPAQ client.
SYS	Indicates that the subdirectory contains system software.
Dnn	Indicates the DOS version. For example, D33 for DOS Version 3.3.

For example, the subdirectory for COMPAQ DOS Version 3.3 would be CQSYSD33.

DOS Information

You need the following information for each type and version of DOS you plan to install on a server:

- DOS version number.

  DOSLOAD supports the following DOS versions:

  - 3.3
  - 4.0
  - 5.0

    DOSLOAD can copy DOS 5.0 from a PC hard disk drive or from a network drive. DOSLOAD cannot copy DOS 5.0 from distribution diskettes because the files are compressed.

- Number of DOS diskettes you plan to install on the DOS subdirectory.

  DOSLOAD allows the installation of 1 to 99 DOS diskettes.

  If you are loading DOS from a hard disk drive or network drive, this information is not needed.

Checking DOS Versions on a File Service

To install a DOS from a PCSAV40 file service to a new PCSAV41 file service, you need to record what versions are available on the service you will use as the source.

Checking a 4.0 service

To see what versions of DOS are currently installed on a PCSAV40 file service, run the NETVER utility on a client PC. Enter the following commands from a client that is connected to a PCSAV41 server.

1. Connect to the file service you want to check, for example:

   ```
   C:\> USE ?:\\server_name\PCSAV40%
   ```

   Use the name of the server and service you want to connect to.

   You see a message indicating the network drive that is connected to the service.

2. To run NETVER on that drive, enter the network drive letter after the NETVER command, for example:

   ```
   C:\> NETVER J
   ```

Record DOS version and subdirectory

The screen displays a list of the DOS versions and their subdirectories installed on the service. Record the version of the DOS that you want to load and its subdirectory.

Step 3: Start DOSLOAD

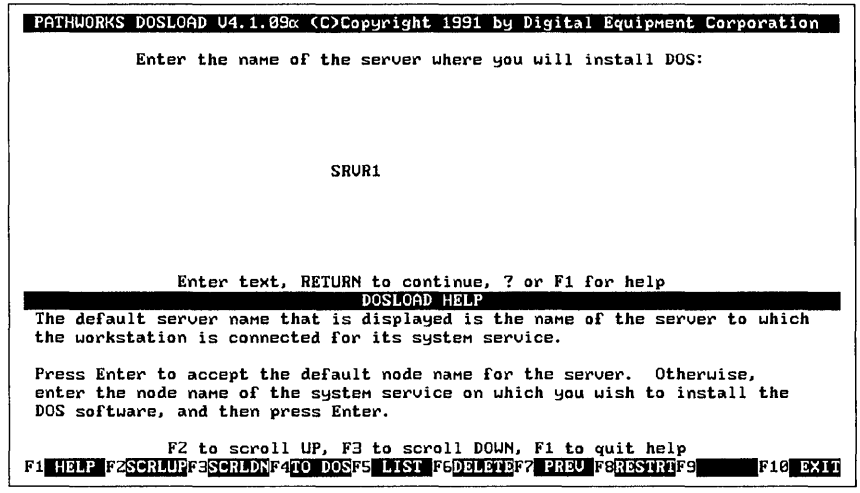
To start DOSLOAD, enter the following from your boot drive:

```
C:\> DOSLOAD
```

The boot drive on your system may be different.

Figure 5–1 shows the first DOSLOAD screen.

Figure 5–1 Initial DOSLOAD Screen



When you start DOSLOAD, it displays the name of the server to which the client is connected.

The DOSLOAD function keys are listed at the bottom of the DOSLOAD screen. Table 5–2 describes the function keys.

Table 5–2 DOSLOAD Function Keys

Key	Action
F1	Enable and disable the help mode.
F2	Scroll up the help text.
F3	Scroll down the help text.
F4	Go to DOS. Type EXIT at the DOS prompt to return to DOSLOAD.
F5	List the types of DOS currently available on the server.
F6	Delete a DOS subdirectory on the server.
F7	Return to the previous DOSLOAD prompt.
F8	Start the questions over.
F9	Install DOS on the server. If you press F9 before all required information is entered, DOSLOAD displays an error message.
F10	Exit DOSLOAD.
?	Enable one-time help. Press Return to leave.

DOSLOAD allows you to either accept the default or supply your own information. You enter and edit information in the same way as you do for Netsetup.

Step 4: Install DOS on the Server

DOSLOAD displays a series of prompts to install DOS on the server. For each DOS you install, DOSLOAD:

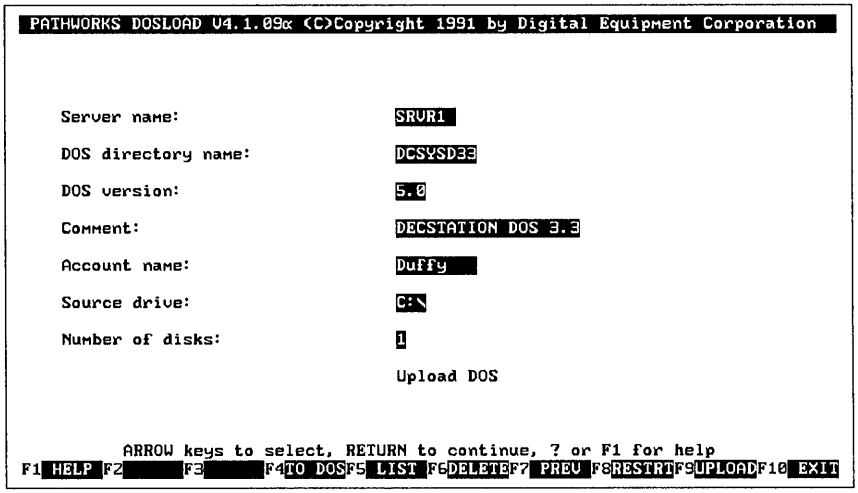
- Creates a subdirectory in the system file service (PCSAV41) on the server.
- Copies the following files into that subdirectory:
  - DOS files from the diskettes you supply, including boot block information from the first DOS diskette or subdirectory
  - Digital-supplied DOS enhancements

To install DOS on the server:

1. Respond to the DOSLOAD prompts using the information you gathered in the previous sections.
2. After you enter all the required information, DOSLOAD displays your answers for review.

Figure 5–2 shows a sample screen containing answers for the DOSLOAD prompts.

Figure 5–2 Sample Answer Display for DOSLOAD Utility



Review the DOSLOAD answer screen for accuracy. If you want to change any of the information displayed:

↑ ↓

- Use the arrow keys to highlight the information you want to change and press Return.
- Enter the correct answer to the prompt and press Return.

F9

3. Press F9 or choose **Upload DOS** to load DOS on the server.

Floppy drive

- If you specified a floppy drive, insert the DOS source diskettes as prompted.

  The first diskette must be bootable and contain the COMMAND.COM file.

  The DOSLOAD utility displays messages as the DOS is copied.

Hard disk

- If you selected a hard disk drive, the DOS that you selected when you specified the drive is loaded.

  The DOSLOAD utility displays messages as the DOS is copied.

Network drive

- If you selected a network drive, the DOS in the subdirectory you selected when you specified the drive is loaded.

  The network drive must contain DOS subdirectories with a boot block information file that was created by DOSLOAD when the DOS was loaded on the service. For information on finding the name of the subdirectory, see Checking DOS Versions on a File Service earlier in this chapter.

The DOSLOAD utility displays messages as the DOS is copied.

4. When DOSLOAD is complete, press Return to continue.

   The DOSLOAD answer screen is displayed again.

5. Repeat the DOS installation procedure for each type and version of DOS you want to store on the server.

Note

If you have more than one server on a local area network (LAN), be sure to install the DOS on each PATHWORKS server.

Press F10 twice to exit.

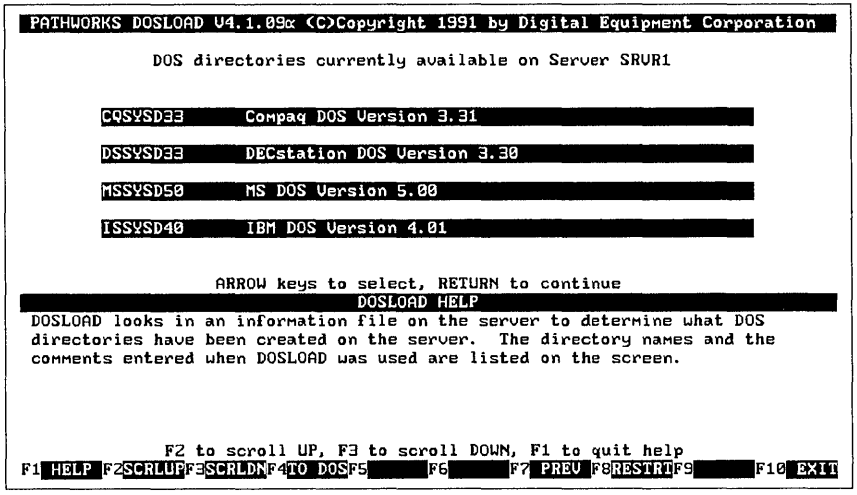
6. Press F10 twice to exit from the DOSLOAD utility.

Listing the DOS Versions Available on the Server

DOSLOAD allows you to list the types and versions of DOS currently available on a server.

Press F5 while in any DOSLOAD screen to list the types of DOS on a server. Figure 5–3 shows a sample DOS listing.

Figure 5–3 Sample DOS Listing



Press Return to resume DOSLOAD.

Deleting a DOS Subdirectory

You use DOSLOAD to delete a DOS subdirectory on the server.

To delete a DOS subdirectory:

1. Press F6 while in any DOSLOAD screen.

   If you have not entered the privileged account and password, DOSLOAD issues the following warning:

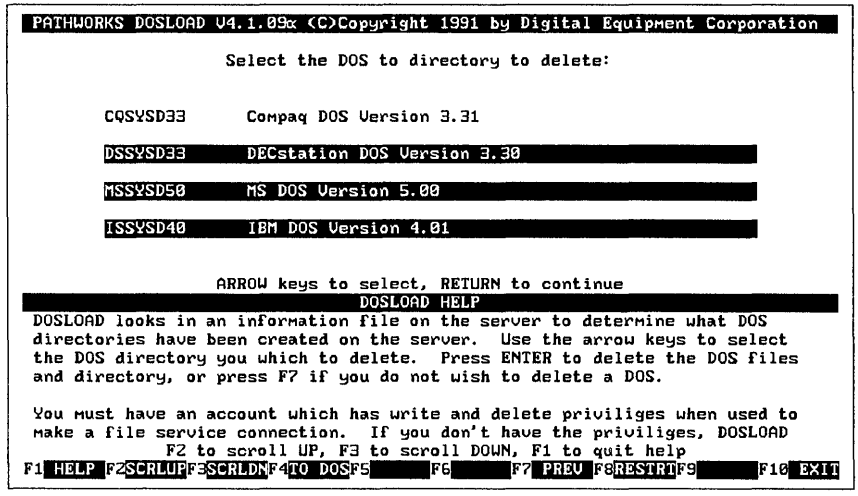
   ```
   Privileged account and password needed to delete a DOS
   ```

   Press Return to continue.

2. If you have not already done so, enter the account name and the password of a privileged server account.

   DOSLOAD displays a list of types and versions of DOS available on the server. Figure 5–4 shows a sample DOS listing.

Figure 5–4 Sample DOS Deletion



↑ ↓

3. Use the arrow keys to choose the DOS to delete and press Return.

   DOSLOAD prompts you to verify the DOS you want to delete. Press F7 if you do not want to delete the DOS. Press Return to delete the DOS you selected.

   If you choose to delete the DOS, DOSLOAD displays a message that it is deleting the DOS subdirectory.

4. DOSLOAD returns you to the screen where you pressed F6.

   At this point, you can:

   - Continue with other DOSLOAD operations
   - Press F10 twice to exit DOSLOAD

Next Steps

Now configure your clients for:

- Local boot (See Chapter 6)
- Remote boot (See Chapter 7)

6

Configuring PCs for Local Boot

This chapter describes how to configure a PC for local boot using the Netsetup configuration utility. Local boot is available over the following network transports:

- DECnet

  Clients using the DECnet transport have the following configuration options:

  - DECnet-DOS components only
  - Asynchronous DECnet connections

- TCP/IP

  The TCP/IP transport is part of the PATHWORKS for DOS (TCP/IP) kit. This kit is ordered separately and must be installed to configure a PC for local boot using TCP/IP.

Token Ring and NetWare

Local boot is also available to PCs using Token Ring and PATHWORKS for DOS (NetWare Coexistence) V1.0.

Use Table 6–1 as a checklist for each PC you configure for local boot.

Table 6–1 Checklist for Local Boot

☐	Start Netsetup.
☐	Select the operator mode.
☐	Respond to the Netsetup prompts.
☐	Write the key disk.
☐	Reboot the PC.

This chapter discusses each item and provides information on what to do next.

Step 1: Start Netsetup

Start Netsetup from one of the following locations:

- If your PC is not connected to a PATHWORKS server, put the backup copy of the PWRKS V4.1 CLIENT SETUP disk into drive A: and enter:

  ```
  A:\> NETSETUP
  ```

- If the PC is already connected to a PATHWORKS server, enter the following from the client's boot drive:

  ```
  C:\> NETSETUP
  ```

  The boot drive on your PC may be different.

See Chapter 3 for more information on starting and using Netsetup.

Step 2: Select the Operator Mode

Ctrl/F10

Press Ctrl/F10 at any time to change the Netsetup operator mode. The operator mode is displayed above the function keys on the Netsetup screen. Netsetup starts in Basic mode to configure the PC using the Netsetup defaults. For more information on operator modes, see Chapter 3.

Use the following guidelines when selecting the operator mode:

Using the TCP/IP Transport

The Intermediate and Advanced modes display the same information for the TCP/IP transport.

Configuring for Asynchronous DECnet Connections

You must use the Advanced mode to configure the PC for asynchronous DECnet connections.

Netsetup prompts you for additional asynchronous information.

Configuring for DECnet-DOS Components Only

You must use the Advanced mode to configure the PC for DECnet-DOS components only.

Step 3: Respond to the Netsetup Prompts

Respond to the Netsetup prompts to create or edit the client startup files. Use the online help at the bottom of the screen to guide you. Press F1 to turn help off and on.

Netsetup Guidelines

Use the following guidelines when running Netsetup:

- If prompted for a network transport, choose:

  DECnet — If you are configuring the PC to use the DECnet transport.

  TCP/IP — If you are configuring the PC to use the TCP/IP transport. PATHWORKS for DOS (TCP/IP) must be installed to choose this option.

  This prompt is displayed if you start Netsetup from either:

  - The server and TCP/IP is installed on the system file service
  - The PWRKS V4.1 CLIENT SETUP disk

- Choose **Local boot** when prompted to choose between local and remote boot.

Intermediate and Advanced modes only

- When asked which PC you are configuring, choose:

  This workstation — If you are configuring the PC on which you are running Netsetup.

  Another workstation — If you are using Netsetup to create a key disk for a different PC.

Redirector

- If you are using Microsoft Windows Version 3.0 or DOS 5.0, load the Redirector into conventional memory on the Memory Configuration Menu.
- At the prompt **Is this an initial workstation diskette?**, choose **NO**.

  This prompt is displayed if you are configuring the PC for the first time and running Netsetup from the PWRKS V4.1 CLIENT SETUP disk.

- When prompted for the destination drive, enter the drive where you want the key disk to be written:
  - If you are creating boot media for another PC, you must write the startup and configuration files to a key disk on a diskette.
  - If you are configuring the PC on which you are running Netsetup, you can write the startup files to the hard disk or to a diskette.

    The hard disk offers faster performance.

When you have responded to all the prompts, Netsetup displays the client profile using the information you entered.

Figure 6–1 shows an sample profile for a client using the DECnet transport in the Advanced mode.

Figure 6–1 Sample Local Boot (DECnet) Profile

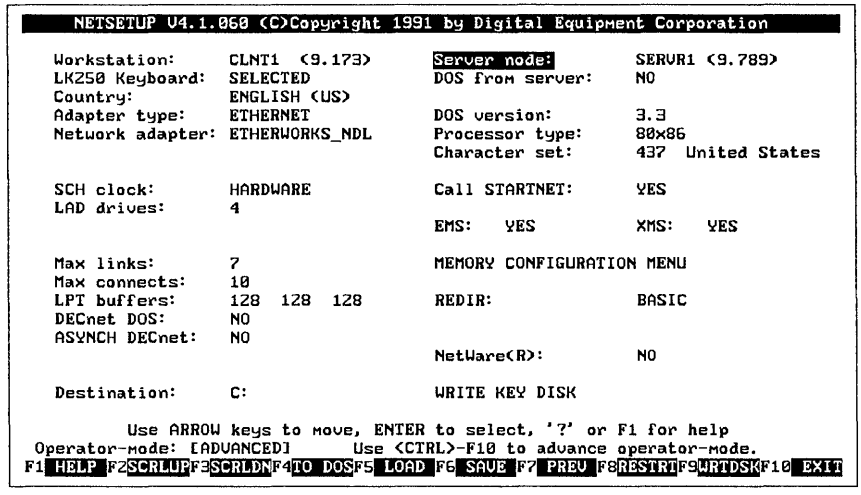
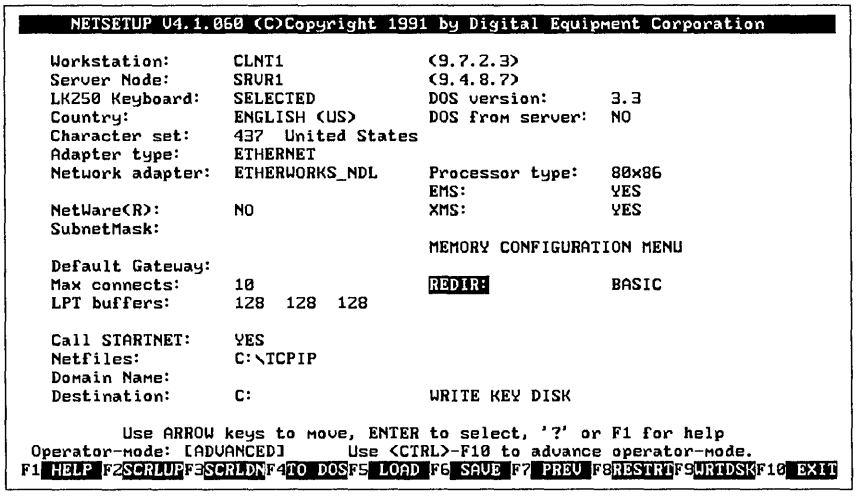


Figure 6–2 shows a sample profile for a client using the TCP/IP transport in the Advanced mode.

Figure 6–2 Sample Local Boot (TCP/IP) Profile Screen



Review the client profile for accuracy. If you want to change any of the information displayed, do the following:

↑ ↓ ← →

1. Use the arrow keys to highlight the information you want to change and press Return.
2. Enter the correct answer to the prompt and press Return.

   Netsetup displays the client profile with the change you made. You can continue to make additional changes.

Step 4: Write the Key Disk

When you are satisfied with the client profile, you write the key disk as follows:

1. Select **WRITE KEY DISK** and press Return.

   Before Netsetup writes the key disk, you may see additional messages if either of two conditions exist. See the next section, Special Conditions, for more information.

   Netsetup displays messages as it writes the startup files to the key disk. When all the files are copied, Netsetup displays a message that the key disk was written successfully.

   Press Return to redisplay the Client Profile.

2. Press F10 twice to exit Netsetup.

Special Conditions

Before Netsetup writes the key disk, you may see additional messages if either of the follow conditions are true:

Editing PROTOCOL.INI

- If you are doing a new configuration and select an NDIS network adapter, or if you have changed your NDIS adapter, the values for PROTOCOL.INI are displayed for you to edit before the key disk is written.

  If you run Netsetup in Advanced mode, the PROTOCOL.INI values are always displayed before the key disk is written.

  Follow screen instructions for editing and accepting the values. For more information on PROTOCOL.INI, see Appendix C.

Running from CLIENT SETUP diskette

- If you ran Netsetup from the PWRKS V4.1 CLIENT SETUP diskette, Netsetup displays a series of messages prompting you to insert the following:

  - PWRKS V4.1 CLIENT SETUP diskette(s)
  - The network transport diskette
  - Key disk

  Follow the Netsetup prompts carefully.

Step 5: Reboot the PC

1. If you created a bootable key disk on a diskette, make sure the diskette is in the boot drive of the PC it was created for.

Press Ctrl/Alt/Del to reboot

2. Press Ctrl/Alt/Del to reboot the client.

   Informational messages are displayed as the PC makes the network connection to the server. For example:

```
DECnet DNP Version V4.1.00
   with NETBIOS Interface Support
DECnet Node Name 'CLIENT' (9.231)
DECnet Started
LAST Transport Version V4.1.00
DEC PCSA  Basic Lanman Redirector Y4.1.00
Now attempting connection to the system container file service:
\\SRVR1\PCSAV41
Device J: connected to \\SRVR1\PCSAV41
Setting Path and Environment Variables
-----------------------------------------------------------------
 Setting the date and time...
 Time/Date serviced by node SRVR2

 The current date is 12/04/90
 The current time is 09:51:14.00
-----------------------------------------------------------------
        To complete workstation initialization enter the command:
             LOGON  server-name  user-name  [password or *]
-----------------------------------------------------------------
        To unload the network use:  C:\DECNET\STOPNET.BAT
-----------------------------------------------------------------
C:\>
```

   Any user can boot the PC from the network using the local boot media.

Note

Before users can use the LOGON command to access services on the server, you must add the user's profile using the PCSA Manager Menu on the server.

For information on the startup files that Netsetup creates or modifies, see Appendix F.

7

Configuring PCs for Remote Boot

This chapter describes how to use Netsetup to configure a PC for remote boot. You use Netsetup to:

- Create a **network key disk** on the server for a new remote boot client.
- Modify the network key disk of an existing remote boot client.

Upgrade information

You use this option to:

  - Upgrade a remote boot client to PATHWORKS for DOS Version 4.1.
  - Modify an existing remote boot client.

- Delete a client's network key disk from the server.

Note

The following restrictions apply for remote boot:

- Remote boot is supported only from a VMS server over the DECnet transport.

Remote boot is not supported from Token Ring.

- Floppy remote boot diskettes can only be created when running Netsetup from the PCSAV41 system file service.
- Ethernet controllers using NDIS drivers do not support remote boot.

Table 7–1 lists the steps you take to configure a PC for remote boot.

Table 7–1 Checklist for Remote Boot

☐	Prepare for configuration. This includes: • Preparing a floppy remote boot (**FRB**) disk, if required. • Determining the Ethernet card hardware address.
☐	Use Netsetup to create the following for each PC you are configuring: • Network key disk • FRB disk, if required

This chapter discusses these items and provides information on what to do next.

Preparing for Configuration

Chapter 3 describes the hardware and software needed to configure a PC with Netsetup. In addition, you need to do the following for each PC you configure for remote boot:

- Prepare an FRB disk
- Determine the Ethernet adapter's hardware address

Preparing an FRB Disk

You need a blank, formatted, non-system disk for each remote boot client to use as an FRB disk.

The FRB disk is used at the PC to make the network connection and load the appropriate DOS from the server.

An FRB disk is optional for DEC EtherWORKS and DEPCA controllers but required for the following controllers:

- 3Com EtherLink II (3C503)
- 3Com EtherLink/MC (3C523)

3Com Network Adapters

If you are using a 3Com adapter, Netsetup asks whether your network uses ThinWire or thick wire network cabling.

Caution

If you have an early 3Com 3C503, be careful when choosing the wire type. If you select ThinWire when you actually have a thick wire connection, you may blow a fuse on the board.

DEC EtherWORKS and DEPCA Adapter Guidelines

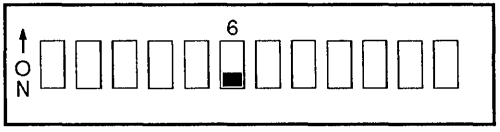
Use the following guidelines with the DEC EtherWORKS and DEPCA network adapters:

DEC EtherWORKS adapters

- For all DEC EtherWORKS adapters
  - If you do not want to use an FRB disk, set switch SW6 to the off position.
  - Set switch SW6 to the on position if you prefer to use an FRB disk.

  Figure 7–1 shows the location of SW6 on the DEC EtherWORKS adapters.

Figure 7–1 SW6 Switch



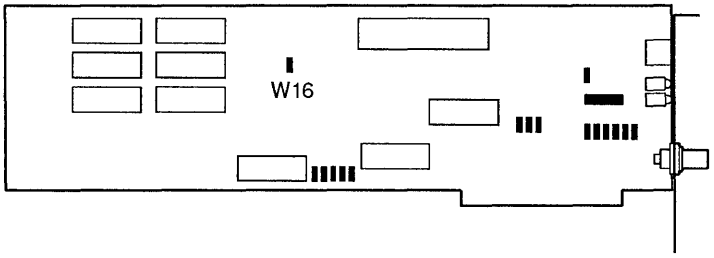
See the documentation that came with your adapter for the location of SW6.

DEPCA adapters

- For all DEPCA Ethernet adapters:
  - If you do not want to use an FRB disk, remove the W16 jumper from the DEPCA Ethernet adapter.
  - Leave the W16 jumper in place if you prefer to use an FRB disk.

Figure 7–2 shows the location of the W16 jumper on the DEPCA Ethernet adapter.

Figure 7–2 W16 Jumper



Determining the Ethernet Card Hardware Address

If you are running Netsetup at one client to configure another PC for remote boot, you need the remote PC's Ethernet card hardware address to create a network key disk.

Note

If you are running Netsetup on the PC you are configuring, this step is unnecessary. Netsetup automatically reads the Ethernet card address of the PC where it is being run.

Use one of the following methods to determine the hardware address of a remote PC:

- For a PC not connected to the network, use the Floppy Remote Boot Configuration (**FRBCON**) program:

  1. From the PC where Netsetup is being run, copy FRBCON.EXE to the formatted diskette.

     FRBCON.EXE is located in the \DECNET\FRB subdirectory on the PCSAV41 system file service.

  2. Insert the disk with the FRBCON program in drive A: of the remote PC.

  3. Enter:

     ```
     A:\> FRBCON
     ```

     FRBCON displays:

     ```
     Valid controllers are:  DEPCA, 3C503, 3C523
     Enter type of ETHERNET Controller:
     ```

  4. Follow the FRBCON prompts.

  For more information on the FRBCON program, see Appendix H.

- For a PC already connected to the PATHWORKS network enter:

  ```
  C:\> USE/STATUS
  ```

  The USE/STATUS command displays installed network components and PC node information, including the hardware address. For example:

  ```
      .
      .
      .
  Client Information
      DECnet node name:  CLIENT (9.012)
      Station address:   AA-00-02-00-04-F8
      Hardware address:  08-00-2b-04-B4-F4
      .
      .
      .
  ```

Configuring a PC for Remote Boot

To configure a PC for remote boot:

1. Start Netsetup
2. Select the operator mode
3. Respond to the Netsetup prompts to configure the PC
4. Write the network key disk
5. Create the Floppy Remote Boot (FRB) disk, if required
6. Customize the FRB disk, if required
7. Reboot the PC

Step 1: Start Netsetup

Start Netsetup from one of the following locations:

- If your PC is not connected to a PATHWORKS server, put the backup copy of the PWRKS V4.1 CLIENT SETUP disk into drive A: and enter:

  ```
  A:\> NETSETUP
  ```

- If the PC is already connected to a PATHWORKS server, enter the following from the client's boot drive:

  ```
  C:\> NETSETUP
  ```

  The boot drive on your system may be different.

See Chapter 3 for more information on starting and using Netsetup.

Step 2: Select the Operator Mode

Press Ctrl/F10 at any time to change the Netsetup operator mode. The operator mode is displayed above the function keys on the Netsetup screen.

Use the following guidelines when selecting the operator mode:

- In Basic mode, Netsetup:
  - Reads the hardware address of the PC's Ethernet controller
  - Creates a 1.2 Mbyte network key disk on the server
  - Allows read/write access to the network key disk

- The Intermediate and Advanced modes allow you to:
  - Change the Netsetup defaults
  - Use the client you are working on to create network key disks for other PCs.
- The Advanced mode displays all informational messages sent from the server, including a list of all remote boot clients booting from the server

Step 3: Respond to Netsetup Utility Prompts

Netsetup displays a series of prompts to configure a PC for remote boot.

Use the following guidelines when running Netsetup:

1. If prompted to choose a network transport, choose **DECnet**.

   This prompt is displayed if you start Netsetup from either:

   - The server and TCP/IP is installed on the system file service
   - The PWRKS V4.1 CLIENT SETUP disk

2. Choose **Remote boot** when prompted to choose between local and remote boot.

Displayed only in the Intermediate and Advanced modes

3. When asked which PC you are configuring, choose:

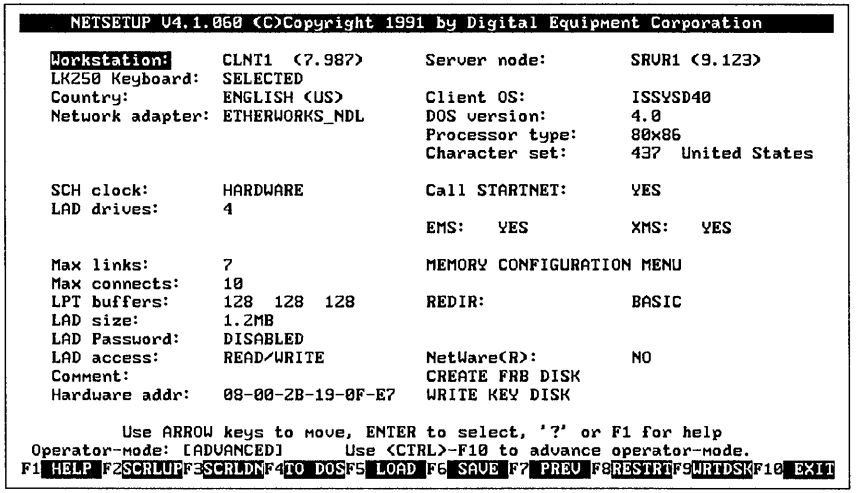
This workstation	If you are configuring the PC on which you are running Netsetup.
Another workstation	If you are using Netsetup to create a key disk for a different PC.

Redirector

4. If you are using Microsoft Windows Version 3.0 or DOS 5.0, load the Redirector into conventional memory on the Memory Configuration Menu.
5. Continue responding to the Netsetup prompts.

Netsetup displays the profile screen using the information you entered. Figure 7–3 shows a sample profile screen.

Figure 7–3 Sample Remote Boot Profile Screen



Review the client profile for accuracy. To change any of the displayed information:

- Use the arrow keys to highlight the information you want to change and press Return.
- Enter the correct answer to the prompt and press Return.

  Netsetup displays the client profile with the change you made. You can continue to make additional changes.

Step 4: Write the Network Key Disk

When you are satisfied with the client profile, write the network key disk to the server by doing on of the following:

- Pressing F9
- Selecting **WRITE KEY DISK** and pressing Return

Note

If you ran Netsetup from the PWRKS V4.1 CLIENT SETUP diskette, Netsetup displays a series of messages prompting you to insert the following:

- PWRKS V4.1 CLIENT SETUP diskette(s)
- The network transport diskette

Follow the prompts carefully.

Netsetup displays messages as it writes the startup files to the network key disk on the VMS server.

Press F10 twice to exit

When the final file is copied, Netsetup redisplays the Workstation Profile Screen. If you do not plan on creating an FRB disk, press F10 twice to exit Netsetup.

Step 5: Create the Floppy Remote Boot (FRB) Disk

If you are creating a Floppy Remote Boot disk for this or another PC, do the following:

1. Insert the blank, formatted disk into the A: drive.
2. Select **CREATE FRB**.

Netsetup copies files, including FRBCON.EXE, to the FRB disk. After the files are copied, Netsetup redisplays the Client Profile.

Press F10 twice to exit

Press F10 twice to exit Netsetup.

Step 6: Customize the FRB Disk

If you created an FRB disk for the remote boot PC, you must run the Floppy Remote Boot Configuration (FRBCON) program to customize the FRB disk:

1. Insert the FRB disk in drive A: of the client for which it was configured.
2. Enter:

```
A:\> FRBCON
```

FRBCON displays:

```
Valid controllers are:  DEPCA, 3C503, 3C523
Enter type of ETHERNET Controller:
```

3. Follow the FRBCON prompts.

For more information on the FRBCON program, see Appendix H.

Step 7: Reboot the PC

If you created an FRB disk, insert it in the A drive of the the PC it was created for.

Boot or press CTRL/ALT/DEL to reboot the PC.

Informational messages are displayed as the PC makes the network connection to the server. For example:

```
PCSA Remote Boot TSK Image Version V4.1.00

Network Kernel Version V4.1.00
Copyright (c) Digital Equipment Corporation. 1985, 1990 All Rights Reserved

DEPCA Data Link V4.1.00
Copyright (c) 1989, 1990 by Digital Equipment Corp.
Adapter: DE100, IRQ:5, I/O:0300, MEM:D000, 64K mode, buffers:41
Datalink installed successfully

LAST Transport Version V4.1.00

LAD Version V4.1.00


.06.07.08.09.10.11
```

The procedure ends with a display similar to the following:

```
DECnet DNP Version V4.1.00
   with NETBIOS Interface Support
DECnet Node Name 'CLIENT' (9.111)
DECnet Started
DEC PCSA  Basic Lanman Redirector Y4.1.00
Now attempting connection to the system container file service:
\\SRVR1\PCSAV41
Device J: connected to \\SRVR1\PCSAV41
Setting Path and Environment Variables
------------------------------------------------------------------
 Setting the date and time...
 Time/Date serviced by node SRVR2

 The current date is 12/04/90
 The current time is 09:51:14.00
------------------------------------------------------------------
         To complete workstation initialization enter the command:
              LOGON  server-name  user-name  [password or *]
------------------------------------------------------------------
         To unload the network use:  D:\DECNET\STOPNET.BAT
------------------------------------------------------------------
```

Any user can boot the PC from the network using the customized copy of the FRB disk.

Note

Before users can use the LOGON command to access services on the server, you must add the user's profile using the Manager Menu on the server.

Part 3

Administration

8

Backing Up a PC Hard Disk to a VMS Server

You can create a procedure to back up a PC client's hard disk to a VMS file server.

This procedure can be run nightly or weekly. Once created, the procedure is automated. However, each PC user in the group still must issue the SPAWNER command nightly to enable the procedure.

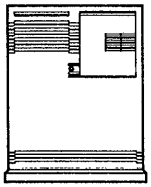
This chapter describes how to:

- Create the backup procedure on the server
- Create the backup procedure on the client
- Run the backup

Restrictions

This procedure is only available to clients using DECnet as a network transport.

Creating the Procedure on the Server



Before starting the backups, you must do the following on the VMS file server:

- Create a file service to serve as the backup directory
- Create a directory in the file service for each client running the backup procedure
- Create the communications file

Creating a File Service

Use the PCSA Manager Menu to create the file service on the VMS server:

1. Choose **Service Options** from the Manager Menu.
2. Choose **Add Service** from the Service Options menu.
3. Choose **Common File Service** from the Add Service menu.
4. Enter a unique 1 to 25 character name when prompted for the name of the service. For example:

   ```
   Common file service name (Example: PCCOMMON) : PCBACKUP
   ```

See the *Server Administrator's Guide* for more information on creating a file service.

Creating Client Subdirectories

You must create a subdirectory in the backup file service for each client by entering:

```
$ CREATE/DIR  device:[directory.username]
```

Variable	Description
device	The name of the disk the file service is on
directory	The name of the file service you created for the backup procedure
username	The name of the client or user whose files are to be backed up

For example:

```
$ CREATE/DIR $1$DUA1:[PCBACKUP.USER1]
```

Observe the following when creating client subdirectories:

- The user name can be either the client node name or the name of the user who owns the client.

  The user name is used later when creating the backup procedure on the client.

- Be sure there is restricted access to a user's subdirectory. For example, using the protection parameter, give only USER1 write privileges to the [.USER1] subdirectory. This prevents accidental overwriting of other users' files.

- Do not use passwords on these services. The backup procedure fails if a password is used.

Creating PC_BACKUP.COM

Before starting the backups, you must first create a file named PC_BACKUP.COM on the VMS server. This file works with the back up procedure created on the PC clients to sequentially back up the client files when requested.

To create and activate PC_BACKUP.COM:

1. Using any text editor, create PC_BACKUP.COM in the SYS$MANAGER directory.
2. Type the following sequence of commands:

```
$ SET NOON
$ SUBMIT/AFTER=TOMORROW SYS$MANAGER:PC_BACKUP.COM
$ BACKUP := "PCDAILY"
$ DAY := F$CVTIME("TODAY",,"WEEKDAY")
$ IF DAY .EQS. "FRIDAY" THEN BACKUP := "PCWEEKLY"
$ IF DAY .EQS. "SATURDAY" .OR. "SUNDAY" THEN EXIT
$ TYPE pcnode::"TASK=''BACKUP'"
$ EXIT
```

   Replace "pcnode" with the node name of your PC.

3. Exit and save from the file.
4. Activate the file by entering:

```
$ @PC_BACKUP.COM
```

   You submit this command procedure only once. Once submitted, it resubmits itself every night at 12:00 midnight.

Creating the Client Files

Before starting the backup procedure on the PC, you must

- Create or edit one of the following files on the PC:
  - PCDAILY.BAT

    The PCDAILY.BAT file does daily incremental backup of the PC files to the VMS server.
  - PCWEEKLY.BAT

    The PCWEEKLY.BAT file does weekly incremental backup of the PC files to the VMS server.

- Define the backup file in the NCP database

Creating the PCDAILY.BAT File

The PCDAILY.BAT file creates daily incremental backup files to the VMS server. Use any text editor to create the file in the root directory of the boot drive on your personal computer:

1. Type the following line:

   ```
   echo off
   ```

   This command turns off the echo facility.

2. Define the server variable by typing the following command with the name of your VMS server:

   ```
   set SERVER=
   ```

   For example:

   ```
   set SERVER=SRVR1
   ```

3. Define the file service variable by typing the following command with the name of the file service you created on the VMS server:

   ```
   set SERVICE=
   ```

   For example:

   ```
   set SERVICE=PCBACKUP
   ```

4. Define the user variable by typing in and completing the following command with the user name associated with the PC:

   ```
   set USER=
   ```

   The username must exactly match a subdirectory name on the VMS file service. For example:

   ```
   set USER=USER1
   ```

5. Define the backup drive:

   ```
   set BACKUP_DRIVE=?:
   ```

   This command is necessary to set aside environment space for the /ENV=BACKUP_DRIVE qualifier in the USE command in the next step.

6. Type the following series of command lines:

```
use ?: \\%SERVER%\%SERVICE%%%%USER% /ENV=BACKUP_DRIVE
if not errorlevel 1 goto do_backup
use ?: \\%SERVER%\%SERVICE%%%%USER /ENV=BACKUP_DRIVE
if not errorlevel 1 goto do_backup
echo ** ERROR ** could not attach to \\%SERVER%\%SERVICE%
goto done
:do_backup
backup c:\ %BACKUP_DRIVE%\%USER% /M /S
:done
```

   Including %%%USER after %SERVICE% provides security so that users can access only their own backup files.

7. Save and exit the file.

Figure 8–1 shows a sample PCDAILY.BAT file.

Figure 8–1 Sample PCDAILY.BAT File

```
echo off

set SERVER=SRVR1
set SERVICE=BACKUP
set USER=USER1
set BACKUP_DRIVE=?:

use ?: \\%SERVER%\%SERVICE%%%%USER /ENV=BACKUP_DRIVE
if not errorlevel 1 goto do_backup
use ?: \\%SERVER%\%SERVICE%%%%USER /ENV=BACKUP_DRIVE
if not errorlevel 1 goto do_backup
echo ** ERROR ** could not attach to \\%SERVER%\%SERVICE%
goto done
:do_backup
backup c:\ %BACKUP_DRIVE%\%USER% /M /S
:done
```

PCWEEKLY.BAT

This file creates weekly incremental backup files. You create it in exactly the same way as the PCDAILY.BAT file:

1. Copy the PCDAILY.BAT file to a new file called PCWEEKLY.BAT.
2. Use a text editor to remove the /M switch contained in the following line:

   ```
   backup c:\ %BACKUP_DRIVE%\%USER% /M /S
   ```

3. Save and exit from the PCWEEKLY.BAT file.

Adding the File to the NCP Database

You now must add the backup file to the NCP database on the PC. Follow these steps to define the PCDAILY.BAT file in NCP:

1. Start the NCP utility:

   ```
   C:\> NCP
   ```

2. Define your batch file as object 0 by entering:

   ```
   NCP> DEFINE OBJECT PCDAILY NUMBER 0 FILE drive:\file
   ```

   Include the drive letter and either PCDAILY.BAT or PCWEEKLY.BAT. For example:

   ```
   NCP> DEFINE OBJECT PCDAILY NUMBER 0 FILE C:\PCDAILY.BAT
   ```

For more information on the NCP database and definition of objects, see the *DECnet User's Guide*.

Using the Backup Procedure

To use the backup procedure, each PC user must start the Job Spawner (SPAWNER) utility to detect and initiate network connection requests.

Each PC user must do the following before leaving for the day:

1. If you have not started the PC_BACKUP.COM file on the server, do so now by entering:

   ```
   $ @PC_BACKUP.COM
   ```

2. Start the Spawner on the PC client.

   Start the Spawner with the following command:

   ```
   C:\> SPAWNER
   ```

   The Spawner displays the following message:

   ```
   press '!' to abort
   SPAWNER (Version 4.0.1) listening...
   ```

3. Turn off the PC monitor.

Once the PC_BACKUP.COM is run on the server:

- The SPAWNER utility invokes the back up batch file (PCDAILY.BAT or PCWEEKLY.BAT) for one client.
- The client connects to the VMS server and invokes the backup utility.

- The back up utility creates a backup file for that client.
- The back up utility returns control to the SPAWNER utility.

  At this point, the system generates the following error messages:

  ```
  -RMS-E-ACC, ACP file access failed
  -SYSTEM-F-LINKABORT,network partner aborted logical link
  ```

  You can ignore these messages. The back up procedure for one client has successfully completed.
- The VMS server starts the procedure on the next client.

The process continues until all client files in the group are backed up to the server.

9

Sharing Local Printers as LAT Services

This chapter describes using **LATCP** (Local Area Transport Control Program) to set up a parallel printer attached to a PC client as a shared network printer through a VMS or ULTRIX print queue.

This chapter describes:

- The advantages and limitations of sharing a local printer
- Setting up the shared printer service
- Connecting to a shared printer service

Note

Sharing a local printer is not available from Token Ring or TCP/IP.

Some steps in the procedure for sharing printers require VMS system privileges.

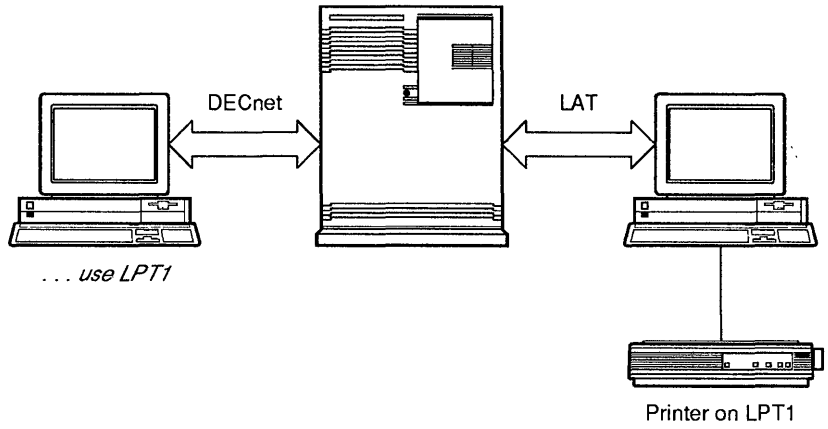
Sharing Printers: Advantages and Limitations

A parallel printer attached to a PC can be used by any computer that can connect to a VMS or ULTRIX print queue.

For example, if you have a parallel printer in your office, you can share it with other users on the network. Or you can share another user's printer who is away or using the printer infrequently.

Figure 9–1 shows a printer shared as a LAT service.

Figure 9–1 Sharing a Local Printer as a LAT Service



There are advantages and disadvantages to setting up a local printer as a shared printer service.

Advantages:

- A PC can offer one or more parallel printers and other computers can access them, regardless of whether an individual node is running DOS, ULTRIX, VMS, or Apple's Multifinder.
- The printer service runs in the background, allowing you to exit from LATCP and continue to run other applications.
- You can use local printers that are currently idle.
- Other nodes on the network (not necessarily PATHWORKS nodes) that use LAT can access the printer service through a VMS or ULTRIX print queue.

Disadvantages:

- If you are sharing your parallel printer using LAT, then LAT uses more PC memory.
- When you, as a client, offer your printer as a LAT service, you cannot access it locally. You must access it remotely, just like any other client in the group.
- Other users can now use the printer and, therefore, your print job is queued.

Note

Digital recommends that you do not offer more than one printer from a PC, unless the PC is exclusively used as a printer service.

Setting Up the Shared Printer Service

To set up a shared printer service:

1. Use LATCP on the client to share the printer service.
2. Create a dedicated LAT port on the server.
3. Set up the VMS print queue on the server.
4. Add the VMS queue with the PCSA Manager Menu.

Using LATCP to Share a Printer Service

Before you can share a printer in your group, the owner of the printer or the system administrator has to offer it as a LAT service by using the ADD LPTn command as follows.

1. Make sure that the printer is connected to the PC and the power is on.
2. Start the LATCP utility at the client by entering:

   ```
   C:\>  LATCP
   ```

3. Add the printer service with the following command:

   ```
   LATCP>  ADD LPTn SERVICE_NAME
   ```

You also use these names to set up the VMS print queue on the server.

Variable	Description
LPTn	The port on the PC where the printer is attached.
SERVICE_NAME	The logical name of the service you are offering. You supply this name.

For example, to add a printer attached to LPT1, you would enter the following:

```
LATCP> ADD LPT1 MYPCPRINTER
```

By default, the printer service does not require a password. To add a service password and learn about other ADD LPTn qualifiers, see the *Client Commands Reference*.

4. Get the server name of the PC by entering:

   ```
   LATCP>  SHOW CHARACTERISTICS
   ```

   Look at the information displayed and record the server name. It has the form LAT_AA000400324. You need this information to set up the VMS print queue on the server.

5. Add a preferred service for the server.

   Add the name of the server where you plan to set up the print queue to the LAT service table. The LAT service table stores a list of services offered on the network.

   To add a preferred service to the LAT service table, enter:

   ```
   LATCP>  ADD node_address node_name service_name
   ```

Variable	Value
node_address	Is the DECnet or Ethernet address of the server node offering the service
node_name	Is the name of the VMS server offering the service
service_name	Is the name of the printer service

The following example adds the server VMSSRV and VMSSRV_PRINT service to the LAT service table:

```
LATCP>  ADD 9.811 VMSSRV VMSSRV_PRINT
```

You can also specify the ADD command without arguments. The screen displays instructions on how to proceed.

6. To leave LATCP, enter:

```
LATCP> EXIT
```

Verifying the Printer Service

To verify the service you just added:

1. Make sure you have exited LATCP, then enter the following at the DOS prompt to unload the LAT:

   ```
   C:\> LAT /U
   ```

2. Now load the LAT by entering:

   ```
   C:\> LAT
   ```

3. Start LATCP by entering:

   ```
   C:\> LATCP
   ```

4. To verify the printer service, enter:

   ```
   LATCP> SHOW PORTS
   ```

   A list of printer services is displayed. Check the list for the new service you added.

5. To verify the preferred service that you just added, enter:

   ```
   LATCP> LIST
   ```

   A list of preferred services is displayed. Check the list for the new service you added.

6. To leave LATCP, enter:

   ```
   LATCP> EXIT
   ```

LATCP Help

LATCP provides online help. To access help on any LATCP command, enter:

```
LATCP> HELP
```

For more information on LATCP commands, see the *Client Commands Reference* or use the HELP command.

Deleting the Printer Service

To delete a printer service on the client, use the DELETE LPTn command. For example:

```
LATCP> DELETE LPT1
```

Setting Up a VMS Print Queue

This step requires system manager privileges

For users to access the printer you must set up the appropriate queues on the VMS server. You must have VMS system privileges to do this task.

To set up the printer service so that it appears as a VMS print queue:

1. Start LATCP on the VMS server by entering:

   ```
   $ MCR LATCP
   ```

2. Create an application port. This is the port that the VMS queue uses to communicate with the PC. Enter:

   ```
   LCP> CREATE PORT port/APP
   ```

   The port is the application port name. For example:

   ```
   LCP> CREATE PORT LTA321/APP
   ```

3. Enter the following to direct the application port to the printer service on the PC client:

   ```
   LCP>  SET PORT port/NODE=LAT_stationaddress -
   _LCP>  /SERVICE=service/APP
   ```

Variable	Description
port	The application port name
_station address	The Ethernet address of the PC where you added the printer service
service	The name of the printer service you added using LATCP at the PC

   For example:

   ```
   LCP> SET PORT LTA321 /NODE=LAT_AA0004001234 -
   _LCP> /SERVICE=mypcprinter/APP
   ```

4. Exit LATCP:

   ```
   LCP>  EXIT
   ```

5. Use the INIT command to create a VMS queue and direct it to the port:

   ```
   $  INIT/QUEUE/SEP=(FLAG)/START/ON=(port) -
   _$  /PROC=LATSYM queue_name
   ```

Digital recommends that you make the queue name the same as the service name on the PC. For example:

```
$ INIT/QUEUE/SEP=(FLAG)/START/ON=(LTA321:) -)
_$ /PROC=LATSYM mypcprinter
```

You now have a queue that points to the PC client running LAT. A file needs to be printed to establish the communication between VMS and the PC.

The VMS server maintains the print queue, using the print queue's form libraries and providing accounting information.

6. To prevent problems when queuing connection requests, enter:

```
$  SET TERM port/PERM/NOWRAP/NOBROAD/NOLINE -
$_  /DISCON/FORM/PASTHRU/EIGHTBIT/NOHANGUP
```

Make sure *port* matches the application port name.

Adding the Print Queue with the PCSA Manager Menu

Make sure that the VMS server knows about the printer queue. Use the PCSA Manager Menu Add a Printer Queue option from the Printer Queue Options Menu. Choose a printer from the list. If the printer you are connecting to is not on the list, see the *Server Administrator's Guide*.

Connecting to a Shared Printer

PC users connect to the shared printer with the USE command regardless of the operating system the client or server is running. For example:

```
C:\> USE LPT1: \\VMSSRV\MYPCPRINTER
```

In this example, VMSSRV is the VMS server where the MYPCPRINTER service is offered.

Remember that the printer must have already been added to the local LAT service table before you can share it.

10

Setting Up and Running the DECnet/SNA Gateway NETBIOS Access Routine

The DECnet/SNA Gateway NETBIOS Access Routine allows PATHWORKS for DOS clients running a 3270 terminal emulator to communicate with an IBM host through either:

- DECnet/SNA Gateway-ST
- DECnet/SNA Gateway-CT

The DECnet/SNA Gateway NETBIOS Access Routine (refered to as the NETBIOS access routine) is a terminate-and-stay-resident (TSR) utility and runs under DOS.

Note

All examples in this chapter use DCA's IRMALAN Workstation V2.02.02 software.

Use Table 10–1 as a checklist for setting up the NETBIOS access routine. Each item is discussed in this appendix. If you have problems running the software, refer to Client PC Status Messages later in this chapter.

Table 10–1 Checklist for the NETBIOS access routine

☐	Complete the preinstallation requirements.
☐	Install the NETBIOS access routine.
☐	Edit the configuration files.
☐	Run the software.

Preinstallation Requirements

You need the following to use the NETBIOS access routine:

- The PC must be configured as a PATHWORKS for DOS client, for either local or remote boot.
- The DECnet/SNA gateway must be accessible to the PC.
- The 3270 emulator software must be installed on the PC.

  See your emulator documentation for installation procedures.
- You must have access to the NETBIOS access routine software on the PATHWORKS system file service, PCSAV41

Installation

There are two NETBIOS access routine files you must install:

- SNAGNI.EXE

  This is the NETBIOS access routine executable file.
- SNAGNI.CFG

  This is a sample configuration file.

To copy the NETBIOS access routine files from the PCSAV41 system file service:

1. Connect to the PATHWORKS system files service (PCSAV41) by entering:

   ```
   \> USE ?: \\servername\PCSAV41%
   ```

   Use the name of a server running PATHWORKS version 4.0 in place of *servername*.
2. Copy the sample configuration file, SNAGNI.CFG, from the \DECNET subdirectory on the system file service to the \DECNET subdirectory on the client boot disk.

3. Copy the executable file, SNAGNI.EXE, to the directory from which you want to run SNAGNI.

   If you plan to run the NETBIOS access routine on your hard disk, copy SNAGNI.EXE from the \DECNET subdirectory on the PCSAV41 system file service to the appropriate disk and directory on your client. Make sure that this disk and directory are included in the client's DOS path.

   If you plan to run the NETBIOS access routine from the server, you do not need to copy it anywhere because it should already reside in the \DECNET subdirectory on the server.

Editing Configuration Files

In order for the NETBIOS access routine to run correctly you need to create appropriate 3270 emulator and NETBIOS access routine configuration files. Before you can edit these files you need to find out the name or names of the DECnet/SNA gateways to be used and the appropriate session definitions known to those gateways. The remainder of this section takes you through the steps of gathering the appropriate information and then editing the configuration files.

Hint

For example, if you are using the DCA IRMALAN Workstation software, the IRMALAN configuration file must define a Gateway Name known to the NETBIOS access routine; the NETBIOS access routine must define which DECnet/SNA gateway session to map a given IRMALAN session to.

Step 1: Gathering Configuration Information

3270 emulator software typically lets you define multiple terminal and printer sessions. Decide how many sessions you want to define and then copy and fill in the worksheet in Table 10–2 with information on each session.

Table 10–2 Configuration Worksheet

❶Callname:

Session No.	❷Gateway Node Name	❸Access Name, PU/LU	❹Max. RUSIZE	❺Security (Uid, Pwd, or both)	❻Note
1					
2					
3					
4					
5					

❶ Enter a name here that identifies the set of sessions that you are defining on this worksheet. The name can contain one to eight characters. You will use this name in both the 3270 emulator and NETBIOS access routine configurations to identify this set of sessions. You may want to use, for example, a name like DECNET to remind you that this is a set of sessions to be sent over DECnet.

❷ This is the DECnet node name of the DECnet/SNA gateway that will connect the session to its IBM destination. Different sessions may use different DECnet/SNA gateways. Get this information from your DECnet/SNA gateway manager.

❸ Find out from your DECnet/SNA gateway manager whether there is an access name defined in the gateway for this session. If there is, enter the access name here. You can optionally specify an LU along with an access name if you want to select a particular LU from within a pool of LUs defined for the access name.

If there is no access name, find out from the gateway manager which PU/LU pair is defined on the gateway for this session. The PU name will be of the form SNA-n, where n is a number from 0 to 3. The LU number will be a number from 1 to 255. If this session can use any available LU, enter 0 as the LU number for this session.

❹ The default MAX_RUSIZE, 3840 decimal, in the NETBIOS access routine configuration is adequate for most cases. If you wish to accept the default, then write "default" in this column. If you wish to customize this setting then, find out from your DECnet/SNA gateway manager or from the IBM system manager what the largest RUSIZE (outbound from IBM) is for any of the five sessions defined here. The largest outbound RUSIZE can be determined by looking at the VTAM log mode table entries used by these sessions.

❺ You can require User IDs, passwords, or both for these sessions. To use this feature you must set the appropriate security option in your 3270 emulator configuration and your NETBIOS access routine configuration.

If you plan to use security for this session, enter a U in this column if a user ID is required. Enter a P if a password is required. Enter both a U and a P if both a user ID and a password are required. Then check with your DECnet/SNA gateway manager to coordinate what the user ID and/or password are (these are defined using the SNANCP SET LU AUTHORIZATION command).

Hint

If you are using DCA IRMALAN Workstation software as your 3270 emulator, DEC IRMALAN allows only a single user ID and/or password for all five sessions in a configuration. Therefore, if you are using security, you must use the same gateway user ID and password for all the LUs that you want to secure. For example, if sessions 2 and 4 both require passwords then they must both have the same passwords on their corresponding DECnet/SNA gateway LUs.

❻ Use this column to note special information about a session, if any. For example, if you have different sessions for different CRT models, you could note that here. This column is for record keeping purposes only. Its use is optional.

Step 2: Configuring the 3270 Emulator Software

After installing the 3270 emulator software, configure it according to the documentation that came with the emulator.

Hint

If you are configuring a DCA Irmalan emulator, fill in screen F5 (the Network Access Parameter Definition screen) as follows:

- Enter a Gateway Name that indicates this configuration is for use with the NETBIOS access routine; use whatever name you entered as the Callname on your configuration worksheet, Table 10–2. You will be entering this same name in the NETBIOS access routine configuration, in the CALLNAME field. The Gateway Name field in the IRMALAN Workstation is not a DECnet/SNA gateway node name. DECnet/SNA gateway names are assigned to each session in the NETBIOS access routine configuration file.
- At the LU Reservation/Security Option field, enter a 1 if you entered any Us (user IDs) or Ps (passwords) in the security column in Table 10–2. If you are not using user IDs and passwords, then leave the value of this field as 0. This step is optional.
- Leave the remaining fields at their default values or change them, if needed, based on the instructions in the IRMALAN Workstation documentation.

Step 3: Modifying the NETBIOS Access Routine Configuration File

The configuration file for the NETBIOS access routine is a text file which you modify using an editor. This configuration file must be located in the current directory or the \DECNET subdirectory on the PC's boot disk.

You edit the configuration file using the information in this section. Consult the worksheet you filled out, Table 10–2, as you create your configuration. The worksheet contains the DECnet/SNA gateway and 3270 emulator parameter values that you need.

A sample NETBIOS access routine configuration file, called SNAGNI.CFG, is provided and should be already in the /DECNET directory (as specified in installation instructions).

Example 10–1 shows the sample configuration file.

Example 10–1 Sample SNAGNI.CFG File

```
!
! Sample DECnet/SNA Gateway NETBIOS Access Routine configuration file
!
! The first set of parameters apply to all sessions
!
name = DCAIRMALAN
max_sessions = 5
max_rusize = 3840
callname = cics3192
userid = n
password = n
!
! 5 sets of session parameters follow.
!
session = 1
gateway = snark
access_name = cics17
pu = sna-0
lu = 10
!
session = 2
gateway = taurus
access_name = tso
pu = sna-1
lu = 20
!
! This set does not select an LU number so the first available LU
! number specified in the CICS17B access name will be used.
!
session = 3
gateway = snark
access_name = cics17b
pu = sna-1
lu = 0
!
session = 4
gateway = snark
access_name = tso
pu = sna-1
lu = 40
!
session = 5
gateway = taurus
access_name = lulprint
pu = sna-0
lu = 29
```

Edit the sample SNAGNI.CFG to add your own configuration definitions and to delete, or comment out, lines that do not apply to your case. You may want to copy SNAGNI.CFG first so that you retain a copy of the sample.

Use the following guidelines when editing the configuration file:

- All parameters are of the form 'name' = 'value'.
- Use an exclamation mark (!) at the beginning of a comment line.
- All parameters following a SESSION line are associated with that session until another SESSION line is encountered.
- At least one set of session parameters is required for each configuration file.
- The number of sessions in the configuration file must be equal to the number declared in the MAX_SESSIONS parameter.
- If you create multiple configuration files, they must have unique names.
- The NETBIOS access routine looks for the default file, SNAGNI.CFG, first in the current directory and then in the \DECNET subdirectory on the client.

The configuration file has two types of parameters:

- Gateway parameters

  These set values that are common for all of the sessions defined in this configuration file.

  See Table 10–3 for an explanation of gateway parameters.

- Session parameters

  You must define a separate set of session parameters for each session. The number of sessions you define here must be greater than or equal to the number of sessions defined in the corresponding 3270 emulator file.

  Each session in your NETBIOS access routine configuration maps to a session in your 3270 emulator configuration.

  See Table 10–4 for an explanation of session parameters.

Table 10–3 Gateway Parameters

Parameter	Description
Required	
NAME	This is the name the 3270 terminal emulator is known by in a NETBIOS network. **Hint** For DCA IRMALAN, For example, this must always be set to DCAIRMALAN.
MAX_SESSIONS	This is an integer value in the range 1 to 5. Enter the number of sessions you listed in Table 10–2.
MAX_RUSIZE	This is an integer that specifies the maximum size of the RUs, or message units, that will be sent from the IBM host to the PC. The default value, 3840 decimal, works in most cases. If you wish to change this value, enter a number that is greater than or equal to the largest number in the Max. RUSIZE column from your worksheet, Table 10–2.
CALLNAME	This is the name that identifies an 3270 emulator session as one that should be intercepted by the NETBIOS access routine and sent to the DECnet/SNA gateway. Enter the Callname that you specified in your worksheet, Table 10–2.
Optional	
USERID	Enter YES if there is a U in the Security column for this session on the worksheet, Table 10–2. Check with your DECnet/SNA gateway manager to find out whether the LUs used by this session have the appropriate LU AUTHORIZATION set as specified in Table 10–2. Enter NO if a user ID is not used for this session.
PASSWORD	Enter YES if there is a P in the Security column for this session on the worksheet, Table 10–2. Check with your DECnet/SNA gateway manager to find out whether the LUs used by this session have the appropriate LU AUTHORIZATION set as specified in Table 10–2. Enter NO if a password is not used for this session.

Table 10–4 Session Parameters

Parameter	Description
SESSION	This is an integer in the range 1 to MAX_SESSIONS and is used to indicate which 3270 emulator session this definition corresponds to. Enter a Session number from your worksheet, Table 10–2. Define a separate set of session parameters for each session on your worksheet. Delete, or comment out, any sets of session parameters from the sample configuration file that you are not using.
GATEWAY	The name of the DECnet/SNA gateway to connect to for the current session. Enter the name from the Gateway Node Name column on your worksheet, Table 10–2.
ACCESS_NAME	The DECnet/SNA gateway access name. Enter the name from the Access Name column on your worksheet, Table 10–2. Access names are used in the DECnet/SNA gateway software to define session characteristics such PUs and LU ranges. If an access name is defined for this session, you do not need to fill in PU and LU values. You can optionally specify an LU name along with an access name if you want to identify a specific LU within a pool of LUs defined in the access name.
PU	The DECnet/SNA gateway PU name for this session. Enter the PU name from the corresponding column on your worksheet, Table 10–2. Delete or comment out this field if this session has an access name. If you define both a PU and an access name for this session, the NETBIOS access routine will use the PU value defined here rather than any defined in the access name.
LU	The LU (logical unit) number on the DECnet/SNA gateway for this session. Enter the LU name from the corresponding column on your worksheet, Table 10–2. Delete or comment out this field if this session has an access name. If a particular LU is not required, then a 0 may be entered here to indicate that any available LU is acceptable. If you define both a LU and an access name for this session, the NETBIOS access routine will use the LU value defined here rather than LUs specified in the access name.

Step 4: Configuring DECnet Logical Links

You may need to increase the number of DECnet logical links defined for the PC in order to have enough links for DECnet/SNA sessions.

Determine the number of logical links currently configured by invoking NCP and issuing the following command:

```
NCP> SHOW EXECUTOR CHARACTERISTICS
```

Note the Maximun links setting for this node. This number should be large enough to support the PC before the NETBIOS access routine was installed. Increase this number by 1 plus the number of sessions you defined for use with the NETBIOS access routine (as specified on the worksheet, Table 10–2). For example, if the current setting is 4 and you defined 5 NETBIOS access routine sessions, then define MAXIMUM LINKS to be 10. Use the following command to increase the number of links:

```
NCP> DEFINE EXECUTOR MAXIMUM LINKS number
```

Running the Software

The NETBIOS access routine runs as a TSR (terminate-and-stay-resident) program on the PC. The program uses approximately 45,000 bytes of conventional memory.

To send the 3270 emulator sessions through a DECnet/SNA gateway do the following:

1. Start the NETBIOS access routine by entering the following at the DOS prompt:

   ```
   \> SNAGNI [filename]
   ```

   Enter as the filename, the name of your NETBIOS access routine configuration file. If you do not supply a file name, the NETBIOS access routine looks for the default file, SNAGNI.CFG, first in the current directory and then in the \DECNET subdirectory on the boot drive of your client.

   The NETBIOS access routine displays the following when successfully loaded:

   ```
   DECnet/SNA Gateway NETBIOS Acess Routine, V1.0
   ```

   If the user of this PC uses the 3270 emulator frequently, you may want to enter the SNAGNI start up command in the AUTOEXEC.BAT file so that it is started up every time the PC is booted.

   Note

   DNP (the DECnet process) must be running before you start the NETBIOS access routine software.

2. Start the 3270 emulator software.

Hint

The NETBIOS access routine assigns LU numbers 2 through 6. If you are using DCA IRMALAN, session 1 in the IRMALAN configuration is displayed as LU 2, session 2 is displayed as LU 3, and so on through session 5 as LU 6.

The LU number in the status line is assigned by the NETBIOS access routine. It is not the same number as the LU number on the host.

Unloading the NETBIOS Access Routine

Enter the following to unload the NETBIOS access routine from the PC's memory:

```
\> SNAGNI /U
```

The NETBIOS access routine displays the following when successfully unloaded:

```
DECnet/SNA Gateway NETBIOS Access Routine, V1.0
Gateway NETBIOS Interface unloaded
```

Client PC Status Messages

The NETBIOS Access Routine displays error messages through the 3270 emulator it works with.

Each NETBIOS Access Routine message has a two-digit error code that appears as the last two characters in a client PC status message, in the communications reminder field of the status line. These messages are of the form:

-+z_*xxx*

When you see a message of this form, use Table 10–5 to look up the last two digits in the code. For example if you get the following message:

```
-+z_de3
```

look up e3 in the table. This error code means that the access name does not exist.

Table 10–5 Error Codes

Error Code (*xx* in -+z_*nxx*)	Meaning
03	One or more of the gateway entries in the SNAGNI configuration file is not a DECnet/SNA gateway. Edit the configuration file and make sure all gateway entries specify actual DECnet/SNA gateways.
09	There are no more NETBIOS resources available. Use the Network Control Program to increase the number of DECnet links. For example, to increase the number of links to 10, enter: `NCP> DEF EXEC MAX LINKS 10` After you enter the NCP command, you must reboot your PC for the increase to take effect. Increasing the number of links increases the amount of memory used by DECnet and may prevent loading DECnet into EMS. If this happens and you want to maintain your current DECnet configuration, reduce the number of DCA Workstation sessions.
12	A session open request was rejected. Unload SNAGNI and reload it. If the problem persists, contact you Digital representative.
15	The GATEWAY name cannot be found. Make sure the CALLNAME parameter in the SNAGNI.CFG file matches the GATEWAY name in the 3270 emulator configuration file.
18	There are too many files open at the same time. Use the Network Control Program to increase the number of DECnet links. For example, to increase the number of links to 10, enter: `NCP> DEF EXEC MAX LINKS 10` After you enter the NCP command, you must reboot your PC for the increase to take effect. Increasing the number of links increases the amount of memory used by DECnet and may prevent loading DECnet into EMS. If this happens and you want to maintain your current DECnet configuration, reduce the number of DCA Workstation sessions.

(continued on next page)

Table 10–5 (Cont.) Error Codes

Error Code (*xx* in -+z_*nxx*)	Meaning
20	Broken pipe. The DECnet link was broken for some reason. Unload SNAGNI and restart it. If the problem persists, contact your Digital customer service representative.
0D	There is a duplicate name in the local name table. Unload SNAGNI and reload it. If the problem persists, contact your Digital representative.
3C	A connection timed out. Check your Ethernet connection and make sure the cable is still connected.
D0	Internal error in access routine. If you get this error, contact your Digital customer service representative.
D1	GAP violation detected by access routine. If you get this error, contact your Digital customer service representative.
D2	Access to LU denied. Invalid access control information was specified. The User ID, password, or nodename do not match what is defined in the DECnet/SNA gateway LU AUTHORIZATION parameters. Check your 3270 emulator and NETBIOS access routine configuration files.
D3	All sessions already in use or not activated. There are no sessions available. Wait a while and retry later. If resources do not become available contact your DECnet/SNA gateway manager.
D4	Session terminated abnormally. Session was canceled for some unknown reason. Restart the 3270 emulator software and try the session again.
D5	Link or PU reinitialized. IBM host initialized the link or PU. Restart the 3270 emulator software and try the session again.
D6	Internal error in DECnet/SNA gateway. If you get this error, contact your Digital customer service representative.
D7	GAP violation detected by DECnet/SNA gateway. If you get this error, contact your Digital customer service representative.
D8	SLU deactivated via DACTLU. The IBM host has deactivated the LU terminating the session. Restart the 3270 emulator software and try the session again or try another session.
D9	UNBIND received from IBM application. IBM application issued an UNBIND for some reason. Restart the 3270 emulator software and try the session again or try another session.
DA	The BIND image specified unacceptable values. This is an internal error. If this condition persists, contact your Digital customer service representative.

(continued on next page)

Table 10–5 (Cont.) Error Codes

Error Code (*xx* in -+z_*nxx*)	Meaning
DB	Connect request rejected by IBM host. If you get this error, contact your Digital customer service representative.
DC	Session address already in use or not activated. Someone is already using the session. Restart the 3270 emulator software and try the session again or try another session.
DD	Session address has not been activated. The requested LU has not been activated by the IBM host. Restart the 3270 emulator software and try the session again or try another session. If that fails, check with your DECnet/SNA gateway manager or IBM system manager.
DE	Session address does not exist. The LU address for the specified PU is out of the range accepted by the DECnet/SNA gateway. Check your NETBIOS access routine configuration file.
DF	Application name was not specified. This is an internal error. If this condition persists, contact your Digital customer service representative.
E0	PU has not been activated. PU has not been activated by the IBM host. Restart your 3270 emulator software and try a session with a different PU or check with your DECnet/SNA gateway manager or your IBM system manager.
E1	PU name does not exist. The requested PU name is not one of the PUs in the specified DECnet/SNA gateway. Check your NETBIOS access routine configuration file.
E2	PU name not specified. No PU name was specified either in an access name or as a separate PU parameter. Check your NETBIOS access routine configuration file.
E3	Access name does not exist. The access name defined in the NETBIOS access routine configuration file is not defined in the gateway. Check your configuration.
E4	Insufficient Gateway resources for session establishment. Not enough resources in the gateway. Wait a while and retry later. If resources do not become available contact your DECnet/SNA gateway manager.
E5	Gateway access routines are incompatible with the Gateway. GAP (gateway access protocol) version of the NETBIOS access routine is higher than the GAP version in the DECnet/SNA gateway. Modify your NETBIOS access routine configuration and so that it uses a DECnet/SNA gateway with a compatible GAP version.
E6	User issued reject. If this error appears, contact you Digital customer service representative.

(continued on next page)

Table 10–5 (Cont.) Error Codes

Error Code (*xx* in -+z_*nxx*)	Meaning
E7	User issued abort. If this error appears, contact your Digital customer service representative.
E8 - FF	Internal errors. Unload SNAGNI and restart it. If the problem persists, contact your Digital customer service representative.
E9	The NETBIOS Access Routine does not support DECSA gateways. Use a DECnet/SNA Gateway-CT or -ST.
FF	Failed to get a socket. SNAGNI was unable to get a DECnet socket for establishing a link. Increase the DECnet MAX LINKS parameter on the PC, using NCP.

Restarting Sessions

If you have a problem with a session and wish to try the session again or start another session, exit the 3270 emulator software first and then restart it. If that does not work, try unloading and reloading SNAGNI in addition to restarting the 3270 emulator.

11

Starting and Stopping the Network

This chapter describes how to manually start and stop the network on your client. Stopping the network makes more memory available for running applications. When you stop the network, you cannot access PATHWORKS services.

Starting the Network

In Basic mode, Netsetup automatically modifies the client's AUTOEXEC.BAT file to call STARTNET.BAT.

STARTNET.BAT:

- Sets up the network connections for the client
- Starts the network software

In the Intermediate and Advanced modes you have the option of not adding the Startup command line to the AUTOEXEC.BAT file.

To start the network manually, run the STARTNET.BAT file from the client's boot device:

- For clients using the DECnet transport, enter:

  ```
  C:\> \DECNET\STARTNET
  ```

- For clients using the TCP/IP transport, enter:

  ```
  C:\> \TCPIP\STARTNET
  ```

Starting the network produces a display similar to the following:

```
DECnet DNP Version V4.1.00
   with NETBIOS Interface Support
DECnet Node Name 'CLIENT' (9.111)
DECnet Started
LAST Transport Version V4.1.00
DEC PCSA  Basic Lanman Redirector Y4.1.00
Now attempting connection to the system file service:
\\SRVR1\PCSAV41
Device J: connected to \\SRVR1\PCSAV41
Setting Path and Environment Variables
LAD Version V4.1.00
------------------------------------------------------------------
 Setting the date and time...
 Time/Date serviced by node SRVR2

 The current date is 12/25/90
 The current time is 09:51:14.00
------------------------------------------------------------------
         To complete workstation initialization enter the command:
              LOGON  server-name  user-name  [password or *]
------------------------------------------------------------------
         To unload the network use:  C:\DECNET\STOPNET.BAT
------------------------------------------------------------------
```

Using Microsoft Windows and DOS 5.0

Always start the PATHWORKS network or individual PATHWORKS components before starting Microsoft Windows or the DOS 5.0 task switcher. This insures that PATHWORKS has enough memory on the PC.

Stopping the Network

Once the network is running on the client, you can use STOPNET.BAT to unload all the network components from memory and stop the network.

To stop the network:

1. Run the STOPNET.BAT file from the client's boot drive by entering:
   - For DECnet:

     ```
     C:\>  \DECNET\STOPNET
     ```

   - For TCP/IP:

     ```
     C:\>  \TCPIP\STOPNET
     ```

2. At the prompt:

   ```
   OK to proceed? [No]:
   ```

   Enter **YES** and press Return.

STOPNET.BAT produces a display similar to the following:

```
------------------------------------------------------------------
          PATHWORKS for DOS V4.1 Network Unloading Procedure
------------------------------------------------------------------
Saving current network connections
Creating: C:\DECNET\RELOAD.INI
Writing: use J: \\SRVR1\PCSAV41%  */network/replace
Disconnecting network connections
Device J: disconnected from \\SRVR1\PCSAV41
Unloading the network
MEMMAN V4.1.16  PCSA Memory Information Utility
Copyright (C) 1988-1991 by Digital Equipment Corporation

Approximately 115632 bytes of memory will be released

OK to proceed? [No]: y

------------------------------------------------------------------
                        Network Unloaded Successfully
------------------------------------------------------------------
C:\DECNET>
```

12

Installing the PrintScreen Utility

PATHWORKS for DOS provides a PrintScreen utility. PrintScreen lets you:

- Print whatever is displayed on your screen when you press Shift/PrtScrn. PrintScreen directs the output to a local or remote printer. The output always goes to the printer assigned to LPT1.
- Send print jobs to the printer or close the print job when you press Ctrl/Alt/PrtScrn when printing from within an application.

This chapter describes how to install the PrintScreen utility on a PC client.

Installing PrintScreen

To install the PrintScreen utility:

1. Copy the PSC.COM file to the PC's boot device from the \LMDOS directory on the PCSAV41 system file service.
2. Edit the client's STARTNET.BAT file to load PSC.COM. The STARTNET.BAT file is located in the \DECNET directory on the boot device.

Use the following guidelines when loading PSC.COM:

- The PrintScreen command must be loaded before the command that starts the redirector (REDIR.EXE). For example:

```
.
.
.
rem ------------------------------------------------------------
rem Start PrintScreen
rem ------------------------------------------------------------
C:\PSC.COM
rem ------------------------------------------------------------
rem Start the redirector.
rem ------------------------------------------------------------
%BOOT%\decnet\redir.exe /L:10 /P1:128 /P2:128 /P3:128 /himem:no
.
.
.
```

- You can set the closure time for printers assigned to LPT1, LPT2, and LPT3. Automatic closure means you set the amount of time an application has to send the output to the printer before the file is automatically closed. You set the closure for a printer with the /P qualifier in the PSC command.

  The /P qualifier lets you define:

  - Printer device (LPT1 through LPT3).
  - Length of time (5-1000 seconds) the application pauses before sending the job to the printer queue. If you do not include a qualifier the default is zero seconds.

  Table 12–1 describes the PrintScreen qualifiers:

Table 12–1 PrintScreen Qualifiers

Qualifier	Output Destination
/P1=	LPT1
/P2=	LPT2
/P3=	LPT3
/H	Displays the Help text on the screen

Using the timed closure function involves some knowledge on your part about the applications you use. If the time you set is too short, the print output is unnecessarily cut

short. If you use /P1=0 or do not enter any qualifier at all, you turn off the timed closure function for that printer.

Note

It is recommended that you use /P1=0 for your local printer.

Example 1

LPT1 is assigned to your local printer, and LPT2 is assigned to a network printer. You use LPT2 to print the output of a spreadsheet application. Enter the following PSC command values:

```
C:\> PSC /P1=0 /P2=30
```

You can use the PSC /P command at the command line to override the values setup in your STARTNET.BAT file.

Example 2

You send a file to LPT2 that requires more time. At the DOS prompt enter:

```
C:\> PSC /P2=180
```

3. Reboot the client to use the PrintScreen utility.

Note

When run, Netsetup automatically modifies the client's STARTNET.BAT file. Running Netsetup causes any edits made in the STARTNET.BAT file to be lost. You must re-edit STARTNET.BAT changes to keep the modifications.

Forcing a File to Close

PrintScreen lets you force a file to close while you are using an application without ending your session.

Force the file to close by pressing Ctrl/Alt/PrintScrn.

Related Topics

- See *User's Handbook* for information on using the PrintScreen utility from the PC.
- See *Client Commands Reference* for information on the command qualifiers for PSC.COM.

13

Using the Local Area System Transport (LAST)

The Local Area System Transport (LAST) is a network protocol supplied with PATHWORKS for DOS. LAST is used only with VMS servers. It cannot be used with TCP/IP or Token Ring.

LAST provides local area network (LAN) services. When a user wants to connect to a file service in the LAN, the client software first uses LAST. If LAST fails to make the connection, the client attempts to make the connection over DECnet. LAST offers increased performance with VMS servers.

If you are using only file and printer services in a LAN, you can use LAST (in conjunction with LANSESS (Local Area Network Session) without DECnet for increased performance.

To use LAST without DECnet in a LAN:

1. Run Netsetup at the client to load both LANSESS and DNP from the memory screen.

   Use the Intermediate or Advanced mode to display the client memory screen.

2. Use a text editor to modify the client's \DECENT\STARTNET.BAT file:

   - Comment out the lines that load the DECnet Network Program (DNP).

     For example:

```
rem ----------------------------------------------------------------------
rem  Load DECnet Network Program
rem ----------------------------------------------------------------------
REM %BOOT%\decnet\dnneth.exe /msn:-1 /rem:2 /nbs:-1 /lan:-1 /nam:n /i2a:-1 /fc:0
REM if errorlevel 1 %BOOT%\decnet\dnneth.exe /msn:-1 /rem:2 /nbs:-1 /lan:-1 /nam:n REM /i2a:-1 /fc:0
REM if errorlevel 1 goto decneterror
```

- Supply a server node name as an argument to the nettime command. By default, Netsetup does not supply a name and uses nettime to set the time at the client from the first available server. For example:

```
echo ------------------------------------
echo  Setting the date and time...
%_SYSD%\PCAPP\nettime SRVR1
```

- Save and exit the STARTNET.BAT file.

3. Reboot the client.

   Informational messages are displayed as the PC makes the network connection to the server.

Once the LOGON message is displayed, you can use file and printer services in the LAN over LAST.

Note

When run, Netsetup automatically modifies the client's STARTNET.BAT file. Netsetup does not retain any changes you made to STARTNET.BAT. If you run NETSETUP after modifying STARTNET.BAT, you must re-edit STARTNET.BAT changes to keep the modifications.

14

Using Manual Remote Boot

When you start a PC configured for remote boot, it automatically loads the network startup files and operating system from the server you specified in Netsetup.

You have the option of manually starting remote boot. Manual remote boot interrupts the automatic connection to the server and allows you to:

- Select the remote boot LAD (local area disk) from which to boot the client.
- Boot your client from a local drive.
- Complete the remote boot when it is not completed automatically.

Starting Manual Remote Boot

When you start remote boot, the client displays messages similar to the following:

```
PCSA Remote Boot TSK Image Version V4.0.00

Network Kernel Version V4.0.00
Copyright (c) Digital Equipment Corporation. 1985, 1990 All Rights Reserved

DEPCA Data Link V4.0.00
Copyright (c) 1989, 1990 by Digital Equipment Corp.
Adapter: DE100, IRQ:5, I/O:0300, MEM:D000, 64K mode, buffers:41
Datalink installed successfully

LAST Transport Version V4.0.00

LAD Version V4.0.00


.06.07.08.09
```

To invoke manual remote boot, press Ctrl/C before the number 7 appears on the screen during automatic remote boot.

When you invoke manual remote boot, the client displays a message similar to the following:

```
PCSA Remote Boot Version 4.0.00
Type 'HELP' for help.
Default Boot Service: 08-00-2B-99-99-23
BOOT>
```

The Default Boot Service is the Ethernet address of the client.

You now run the USE command to select the device from which you want to boot. You can boot from:

- The default network key disk for this PC
- Another remote boot LAD (disk service) drive
- A network LAD drive (disk service) on a specific server
- A local drive

Booting From the Default Network Key Disk

To continue booting from the network key disk created for this client enter:

```
BOOT> USE password
```

A password is required only you assigned a password to this key disk. Using an asterisk (*) in place of the password causes you to be prompted for the password.

Booting From Another Remote Boot Drive

To boot from another remote boot LAD drive or disk service enter:

```
BOOT> USE service password
```

Variable	Description
service	The name of the remote boot LAD from which you want to boot.
password	The password for the service, if required.

Booting From a Remote Boot LAD From a Specific Server

To boot from a remote boot LAD offered by a specific server, enter:

```
BOOT> USE \\server\service password
```

Variable	Description
server	The name of the server from which you want to boot.
service	The name of the remote boot LAD from which you want to boot.
password	The password for the service, if required.

Booting From a Local Drive

To boot the PC from a local drive, enter:

```
BOOT> USE drive:
```

Variable	Description
drive	The name of the local drive from which you want to boot. For example, C:.

When you cancel remote boot and boot from a local drive, all the remote boot network components that were loaded into conventional memory are unloaded.

Related Topics

See Chapter 7 for information on configuring a PC for remote boot.

15

Running Asynchronous DECnet Communications

This chapter describes setting up the client and server to use asynchronous DECnet communications.

Using Asynchronous DECnet Communications

Asynchronous communications is a method of data transmission that lets you run DECnet over a serial port instead of using an Ethernet adapter.

You can run asynchronous DECnet with any of the following line combinations:

- Hardwired dedicated DECnet line
- Hardwired dynamically switched terminal line
- Modem with a dedicated DECnet line
- Modem with a dynamically switched terminal line

Using Dedicated DECnet lines

Dedicated DECnet lines are permanently configured as DECnet lines. They can connect your personal computer to another personal computer, a DECrouter, or a VMS system.

Using Dynamically Switched Terminal Lines

Dynamically switched terminal lines connect your personal computer to VMS systems running DECnet. They must be switched from terminal to DECnet DDCMP lines for use with DECnet communications. The lines are switched for the duration of the connection only.

Before you use asynchronous communications with dynamically switched terminal lines, check the following requirements with your system manager:

- The remote VMS node must have the asynchronous DDCMP driver, NODEVICE, loaded and the image, DYNSWITCH, installed.
- You must have system manager privileges to load the NODEVICE driver and install DYNSWITCH.

For more information on DYNSWITCH, refer to the *DECnet-VAX Networking Guide.*

Note

You cannot run asynchronous DECnet over a terminal server or a terminal multiplexer.

Selecting Asynchronous DECnet in Netsetup

You use Netsetup to configure your PC to use asynchronous DECnet communications. Refer to Chapter 3 of this guide for information on using the Netsetup. Use the following guidelines:

1. Use Ctrl/F10 to select Advance Mode.
2. Answer YES when asked if you want to use Asynchronous DECnet
3. Specify the communication port that you want to use. For example, specify COM-1.
4. Specify the modem type that you want to use. For example, specify NULL.
5. Specify the baud rate that you want to use. For example, specify 2400.
6. If you want access to file and print services, load the Redirector on the Memory Configuration Menu. By default, the Redirector is not loaded.

Using Scripts

When you establish an asynchronous DECnet connection, you usually enter a series of commands to set up the communication parameters, log in, and establish the asynchronous DECnet connection. You can enter these commands manually using SETHOST, or edit and use one of the SETHOST scripts copied to your server in the \DECNET\SCRIPT directory during installation.

The SETHOST scripts, described in this section, contain all of the commands you need to run asynchronous DECnet on your personal computer. You can edit the scripts to support your particular configuration. The only sections of the scripts that you may have to edit are the Baud Rate, Port, and Dial settings.

Using SETHOST Scripts

SETHOST scripts automate asynchronous connection procedures.

A **script** is a text file containing commands that allow the SETHOST utility to perform many operations automatically.

Scripts are useful when running asynchronous DECnet communications because you can edit them and use them to automate the asynchronous connection procedure. Otherwise, you have to enter a series of commands each time you want an asynchronous connection.

When you install PATHWORKS for DOS, Netsetup copies three scripts to your server and puts them in the \DECNET\SCRIPT directory:

Script	Use With
HARDDYN.SCR	A hardwired dynamically switched terminal line
DIALNET.SCR	A modem with a dedicated DECnet line
DIALDYN.SCR	A modem with a dynamically switched terminal line

Note: Hardwired dedicated DECnet lines need no script.

To use a SETHOST script:

- Choose the appropriate script for your configuration.
- Edit the script to supply the information (such as port method, telephone numbers, and baud rate) needed to make a successful connection.

- Make sure that SETHOST.EXE is on your path.
- Specify the script when you start SETHOST.

For example, to use the DIALNET.SCR script, first edit the script, then enter the following command to invoke DIALNET.SCR:

```
SETHOST /SCRIPT=DIALNET
```

DIALNET is the name of the script file. The default file type for script files is .SCR; you do not have to specify the type.

If you are unfamiliar with the SETHOST utility, refer to the *SETHOST Terminal Emulation Guide* for more information.

Script Commands

This section briefly describes the three SETHOST script commands that you may need to use:

- BAUD RATE
- DIAL
- PORT

If you are going to use a SETHOST script instead of entering all commands manually, you may need to edit the script to change one or all of these commands. If you need more information about these commands, refer to the PATHWORKS for DOS, *SETHOST Terminal Emulation Guide*.

BAUD RATE

The BAUD RATE command sets the physical line speed that characters are both received and transmitted.

Note: If you are dialing to a router, you must use the same baud rate as the router. Routers cannot automatically determine the line speed on a dial-up line.

Format

BAUD RATE: *speed*

Where:

The value of the baud rate must be one of the following:

50	300	2400
75	600	3600
110	1200	4800
134	1800	9600
150	2000	19200

DIAL

The DIAL command turns on the DTR (Data Terminal Ready) signal and dials a phone number.

Note: If you are connecting to a Level 1 router, your personal computer must have the same baud rate and must be in the same DECnet area as the router. If you are connecting to a Level 2 router, the two systems can be in different areas.

Format

DIAL: *dial-string*

Where:

dial-string represents a modem string instructing the modem to dial the number specified in that string.

PORT

The PORT command tells the script processor how to communicate with the host computer.

Format

PORT: *method*

Where:

method must be one of the following:

```
DATA-1
MODEM-1
DATA-2
MODEM-2
INTEGRAL-2
```

Using a Hardwired Dedicated DECnet Line

Asynchronous DECnet runs automatically on hardwired dedicated DECnet lines with asynchronous DDCMP configured workstations. No script is required. Once the Netsetup installation procedure completes, reboot your workstation and asynchronous DECnet runs automatically.

Using a Hardwired Dynamically Switched Terminal Line

Review HARDDYN.SCR to make sure your settings are correct.

Use the HARDDYN.SCR script with hardwired dynamically switched terminal lines. This script contains the commands to log in, turn on DECnet, and establish an asynchronous DECnet connection.

You must review the script to make sure all settings are correct for your configuration. You may have to edit the script to change the baud rate setting and the port setting.

HARDDYN.SCR Script

The following script is available for hardwired dynamically switched terminal line connections.

```
COMMENT: This script logs in, turns DECnet on, and establishes an
COMMENT: Async DECnet connection via the PC's COM1 port.

COMMENT: Please change the username and password from "USER" to your
COMMENT: username and password or use the SEND USERNAME [node] and
COMMENT: SEND PASSWORD [node] script commands to extract the username and
COMMENT: password from the DECnet database on your PC.

COMMENT: Reset the error conditions.
    ON ERROR:
    END ON ERROR:

COMMENT: Here is where we specify what port and baud rate to use.
    PORT: Data-1
    BAUD RATE: 2400

$connect:
        DISPLAY:Connected to remote system<CR><LF>
        PAUSE: 0:0:1
        SEND:<CR>
        WAIT FOR:Username:
        SEND:USER<CR>
        WAIT FOR:Password:
        SEND:USER<CR>
        PAUSE: 0:0:2
        WAIT FOR:$
        DISPLAY:Logged into remote system<CR><LF>
```

```
COMMENT:    Reset the error conditions.
        ON ERROR:
        END ON ERROR:

COMMENT: The following VMS DCL command will turn the
COMMENT: terminal line into a DECnet (DDCMP) line.
    SEND:set terminal/switch=DECnet/protocol=DDCMP/manual<CR>

COMMENT: VMS will time out the attempt if it sees no response in
COMMENT: 4 minutes (2400 seconds), so there is no need to wait
COMMENT: any longer than that.
    TIMER: 2400
    ON ERROR:
        GOTO: $Other end did not start DECnet
    END ON ERROR:

COMMENT: Watch for the response from VMS.
COMMENT: If we do not see it, we go to the above ON ERROR segment.
    WAIT FOR:line

COMMENT: If we get here, we must have received the correct response from VMS.
COMMENT: So, we use NCP to turn the line state on.
COMMENT: If the NCP command fails, we assume its because DECnet
COMMENT: is not installed, and tell the user.
    ON ERROR:
        GOTO: $Install DECnet and retry setting line state on
    END ON ERROR:
    SYSTEM:ncp set line state on
    EXIT EMULATOR:

$Other end did not start DECnet:
    DISPLAY:Other end did not start DECnet in time.<CR><LF>
    DISPLAY:Would you like to hang up and try again?
    READ: answer
    CASE: answer
        "Y" GOTO: $retry
        "y" GOTO: $retry
    DEFAULT: EXIT EMULATOR:
    CASE END:

$retry:
COMMENT: Hang up the phone and start over.
COMMENT: Leave DTR off for 4 seconds to make sure
COMMENT: it really hung up.
    DTR CLEAR:
    PAUSE: 0:0:4
    DTR SET:
    GOTO: $connect

$Install DECnet and retry setting line state on:
COMMENT: Tell the user to do it, because a script can't install DECnet
COMMENT: without leaving a hole in memory when SETHOST exits.
```

```
   DISPLAY:Please install DECnet and retry setting the
line state on.<CR><LF>
   EXIT EMULATOR:
```

Using a Modem with a Dedicated DECnet Line

Use DIALNET.SCR for modems with dedicated DECnet lines.

Use the DIALNET.SCR script for modems with dedicated DECnet lines. This script contains the commands to dial an asynchronous DECnet line and establish an asynchronous DECnet connection.

You must review the script to make sure that all settings are correct for your configuration. You may need to edit the following settings:

- BAUD RATE: *speed*
- DIAL: *dial-string*
- PORT: *method*

DIALNET.SCR Script

The following script is available for dedicated DECnet line connections using a modem.

```
COMMENT: This script dials up an Async DECnet line (i.e. DECrouter 200),
COMMENT: and establishes an Async DECnet connection via the PC's COM1 port.

COMMENT: There are two types of modem command languages in this script:
COMMENT: DMCL (Digital Modem Command Language) offered by Digital modems and
COMMENT: Hayes-compatible (AT Modem Command Language).
COMMENT: Since both can't be used at the same time, the Hayes-compatible
COMMENT: script commands are commented out.
COMMENT: Please change the telephone number below before using this script.

COMMENT: Reset the error conditions.
    ON ERROR:
    END ON ERROR:

COMMENT: Tell DECnet to stop using the comm port so SETHOST can use it.
    SYSTEM:ncpset set line state hangup

COMMENT: Here is where we specify what port and baud rate to use.
    PORT: Data-1
    BAUD RATE: 2400

$dialit:
COMMENT: Dial the modem.
        NO XON/XOFF:
 TIMER:1
 ON ERROR:
 GOTO: $dialit
 END ON ERROR:
```

```
        COMMENT: Tone dial a Scholar Plus modem in
        COMMENT: DMCL (Digital Modem Command Language) mode.
        DIAL:<CTRL/B>
        WAIT FOR:Ready
        SEND: dial t15551212<cr>

        COMMENT: Tone dial a Hayes-compatible
        COMMENT: (AT Modem Command Language) modem.
 COMMENT: DIAL:AT<CR>
 COMMENT: WAIT FOR:OK
 COMMENT: SEND:ATDT12345678<CR>

        ON ERROR:
            DISPLAY: <CTRL/G>Other end did not answer!<CR><LF>
            PAUSE: 0:0:5
            EXIT EMULATOR:
        END ON ERROR:

 TIMER:60
        COMMENT: Wait for "CONNECT" if Hayes-compatible is used.
        COMMENT: WAIT FOR:CONNECT
        COMMENT: Or wait for "Attached" if DMCL is used.
        WAIT FOR:Attached
        DISPLAY:Connected to remote system<CR><LF>
        PAUSE: 0:0:1

COMMENT:    Reset the error conditions.
        ON ERROR:
        END ON ERROR:

COMMENT: Use NCP to turn the line state on.
COMMENT: If the NCP command fails, we assume its because DECnet
COMMENT: is not installed, and tell the user.
    ON ERROR:
        GOTO: $Install DECnet and retry setting line state on
    END ON ERROR:
    SYSTEM:ncp set line state on
    EXIT EMULATOR:

$Other end did not start DECnet:
    DISPLAY:Other end did not start DECnet in time.<CR><LF>
    DISPLAY:Would you like to hang up and try again?
    READ: answer
    CASE: answer
        "Y" GOTO: $retry
        "y" GOTO: $retry
    DEFAULT: EXIT EMULATOR:
    CASE END:
```

```
$retry:
COMMENT: Hang up the phone and start over.
COMMENT: Leave DTR off for 4 seconds to make sure
COMMENT: it really hung up.
    DTR CLEAR:
    PAUSE: 0:0:4
    DTR SET:
    GOTO: $dialit

$Install DECnet and retry setting line state on:
COMMENT: Tell the user to do it, because a script can't install DECnet
COMMENT: without leaving a hole in memory when SETHOST exits.

   DISPLAY:Please install DECnet and retry setting the line state on.<CR><LF>
   EXIT EMULATOR:
```

Using a Modem with a Dynamically Switched Terminal Line

Use DIALDYN.SCR for modems with dynamically switched terminal lines.

Use the DIALDYN.SCR script for modems with dynamically switched terminal lines. This script dials a computer, turns on DECnet, and establishes an asynchronous DECnet connection.

You must review the script to make sure that all settings are correct for your configuration. You may need to edit the following settings:

- BAUD RATE: *speed*
- DIAL: *dial-string*
- PORT: *method*

DIALDYN.SCR Script

The following script is available for use with dynamically switched terminal line connections using modems.

```
COMMENT: This script dials up a computer, logs in, turns DECnet on, and
COMMENT: and establishes an Async DECnet connection via the PC's COM1 port.

COMMENT: There are two types of modem command languages in this script:
COMMENT: DMCL (Digital Modem Command Language) offered by Digital modems and
COMMENT: Hayes-compatible (AT Modem Command Language).
COMMENT: Since both can't be used at the same time the Hayes-compatible
COMMENT: script commands are commented out.
COMMENT: Please change the telephone number below before using this script.
COMMENT: Please change the username and password from "USER" to the your
COMMENT: username and password or use the SEND USERNAME [node] and
COMMENT: SEND PASSWORD [node] script commands to extract the username and
COMMENT: password from the DECnet database on your PC.
```

```
COMMENT: Reset the error conditions.
    ON ERROR:
    END ON ERROR:

COMMENT: Tell DECnet to stop using the comm port so SETHOST can use it.
    SYSTEM:ncpset line state hangup

COMMENT: Here is where we specify what port and baud rate to use.
    PORT: Data-1
    BAUD RATE: 2400

$dialit:
COMMENT: Dial the modem.
        NO XON/XOFF:
 TIMER:1
 ON ERROR:
 GOTO: $dialit
 END ON ERROR:

        COMMENT: Tone dial a Scholar Plus modem in
        COMMENT: DMCL (Digital Modem Command Language) mode.
        DIAL:<CTRL/B>
        WAIT FOR:Ready
        SEND: dial t15551212<cr>

        COMMENT: Tone dial a Hayes-compatible
        COMMENT: (AT Modem Command Language) modem.
 COMMENT: DIAL:AT<CR>
 COMMENT: WAIT FOR:OK
 COMMENT: SEND:ATDT12345678<CR>

        ON ERROR:
            DISPLAY: <CTRL/G>Other end did not answer!<CR><LF>
            PAUSE: 0:0:5
            EXIT EMULATOR:
        END ON ERROR:

 TIMER:60
        COMMENT: Wait for "CONNECT" if Hayes-compatible is used.
        COMMENT: WAIT FOR:CONNECT
        COMMENT: Or wait for "Attached" if DMCL is used.
        WAIT FOR:Attached
        DISPLAY:Connected to remote system<CR><LF>
        PAUSE: 0:0:1
        SEND:<CR>
        WAIT FOR:Username:
        SEND:USER<CR>
        WAIT FOR:Password:
        SEND:USER<CR>
        PAUSE: 0:0:2
        WAIT FOR:$
        DISPLAY:Logged into remote system<CR><LF>
```

```
COMMENT:    Reset the error conditions.
        ON ERROR:
        END ON ERROR:

COMMENT: The following VMS DCL command will turn the
COMMENT: terminal line into a DECnet (DDCMP) line.
    SEND:set terminal/switch=DECnet/protocol=DDCMP/manual<CR>

COMMENT: VMS will time out the attempt if it sees no response in
COMMENT: 4 minutes (2400 seconds), so there is no need to wait
COMMENT: any longer than that.
    TIMER: 2400
    ON ERROR:
        GOTO: $Other end did not start DECnet
    END ON ERROR:

COMMENT: Watch for the response from VMS.
COMMENT: If we do not see it, we go to the above ON ERROR segment.
    WAIT FOR:line

COMMENT: If we get here, we must have received the correct response from VMS.
COMMENT: So, we use NCP to turn the line state on.
COMMENT: If the NCP command fails, we assume its because DECnet
COMMENT: is not installed, and tell the user.
    ON ERROR:
        GOTO: $Install DECnet and retry setting line state on
    END ON ERROR:
    SYSTEM:ncp set line state on
    EXIT EMULATOR:

$Other end did not start DECnet:
    DISPLAY:Other end did not start DECnet in time.<CR><LF>
    DISPLAY:Would you like to hang up and try again?
    READ: answer
    CASE: answer
        "Y" GOTO: $retry
        "y" GOTO: $retry
    DEFAULT: EXIT EMULATOR:
    CASE END:

$retry:
COMMENT: Hang up the phone and start over.
COMMENT: Leave DTR off for 4 seconds to make sure
COMMENT: it really hung up.
    DTR CLEAR:
    PAUSE: 0:0:4
    DTR SET:
    GOTO: $dialit

$Install DECnet and retry setting line state on:
COMMENT: Tell the user to do it, because a script can't install DECnet
COMMENT: without leaving a hole in memory when SETHOST exits.

   DISPLAY:Please install DECnet and retry setting the line state on.<CR><LF>
   EXIT EMULATOR:
```

Note

Scripts that contain a username and password may compromise security.

General Hints

The following are general installation hints:

- When connecting your personal computer directly using an asynchronous DDCMP connection remember to use a null modem cable.

  Note

  You cannot use a terminal switch or a terminal server running LAT for connection of your PATHWORKS for DOS system to the adjacent node.

- When you use a router, such as the DECrouter 200, for asynchronous connections, the circuit must be full duplex and must be set to the same line speed as your machine.

  For example:

```
Direct: SET LINE ASYNC-1 SPEED 9600 MODEM DATA_LEADS_ONLY
Modem:  SET LINE ASYNC-3 SPEED 1200 MODEM YES
```

  The circuit cost and hello timer values can be set to any reasonable values. The state should be set to ON.

- When making a direct asynchronous DDCMP connection to an RSX-11 system, the controllers must support either terminals or DDCMP lines but not both. Make sure that your SYSGEN or system configuration **does not** include the chosen controller and that your DECnet build **does**.
- When using asynchronous DDCMP and connecting directly to a VMS system, the VMS system can share the lines on a controller between terminal support and asynchronous DDCMP support.
- When configuring your VMS adjacent node, use the following commands as a guide. These commands establish the chosen terminal lines as dedicated DDCMP lines.

```
$! Load asynch DDCMP device driver. This must be done after
$!  every system boot.
$ run sys$system:sysgen
connect noa0/noadapter
exit
$! Tell VMS which lines are to be dedicated to DDCMP
$!  This must be done after every system boot
$set term /protocol=ddcmp/speed=9600/notypeahead/perm ttb4:
$set term /protocol=ddcmp/speed=9600/notypeahead/perm ttb5:
$! Use NCP to properly configure the lines and circuits
$!  Remember that DEFINE changes the permanent database
$!  and SET works immediately.
$ NCP
define line tt-1-4 state on receive buffers 4
define line tt-1-5 state on receive buffers 4
define circuit tt-1-4 state on
define circuit tt-1-5 state on
exit
```

Configuring a VMS Node

When configuring your VMS adjacent node, use the following commands as a guide. These commands establish all terminal lines as switchable DDCMP lines (when using VMS V4.2 and later).

1. Load the asynchronous DDCMP driver, NODRIVER, using the following command:

   ```
   SYSGEN> CONNECT NODRIVER/NOADAPTER
   ```

2. Install DYNSWITCH as a shareable image. The DYNSWITCH image controls the switching of the line. Use the following command:

   ```
   $ INSTALL CREATE SYS$LIBRARY:DYNSWITCH/SHARE -
   _$ /PROTECT/HEADER/OPEN
   ```

3. Create a virtual terminal so that you can break the physical terminal connection without losing the logical connection between the two systems. To create a virtual terminal, use the following command:

   ```
   SYSGEN> CONNECT VTA0/NOADAPTER/DRIVER=TTDRIVER
   ```

4. Set the terminal line for 8-bit characters with no parity. Set the DISCONNECT attribute.

   Note

   The DISCONNECT attribute enables the virtual terminal to be used. The DISCONNECT attribute must be permanent; either it must be set using the /PERM switch after every boot or the default terminal

characteristics must be set properly. If you set the terminal characteristics for your own terminal, you must log out and log back in again for them to take effect. Also, if modem control is enabled, hangup must also be enabled. This step has been performed properly if your terminal device designator begins with VT.

---

5. Set the following parameters in the node database for the node that switches the asynchronous connection.
   - Set the INBOUND parameter to ENDNODE.
   - Set the RECEIVE PASSWORD to match the remote node's EXECUTOR TRANSMIT PASSWORD.

```
NCP>SET NODE node-id INBOUND [endnode] -
_ RECEIVE PASSWORD password
```

Note

The password is converted to uppercase letters unless it is defined as a quoted string.

Connecting Your Personal Computer to a Network Using DYNSWITCH

Use the following steps as a guide when connecting your personal computer to a network using DYNSWITCH.

1. Set the DECnet line to OFF, either by default or by using the following NCP command:

   ```
   NCP>SET LINE STATE OFF
   ```

Note

The EXECUTOR RECEIVE PASSWORD must not be set. When DYNSWITCH is used, DECnet-VAX does not send a password during routing initialization. If the receive password is set, the line will not come up.

---

2. Set both the terminal line and the DDCMP line to the speed of the physical line to be used. SETHOST and asynchronous DECnet do not share line characteristic information.
3. Connect to the VMS system as a normal terminal user using a terminal emulator.

   When you are ready to switch from a terminal line to a DDCMP line, enter the following DCL command:

   ```
   $ SET TERMINAL /PROTOCOL=DDCMP/SWITCH=DECNET/MANUAL
   ```
4. When the switch is initiated, a message appears on the terminal indicating that the switch is occurring on the VMS system and that you must exit terminal emulation mode and turn on the DECnet line.

   Note

   If the line is not turned on within approximately 4 minutes, a static asynchronous line will return to terminal mode and a dial-up asynchronous line with hangup will be disconnected.

Terminating a Switched DDCMP Connection

A DDCMP connection created using DYNSWITCH can be terminated from either end of the connection by setting the line or circuit to OFF (VMS only). The following scenarios can occur when the line is disconnected.

- The personal computer user sets the line to OFF or the line drops because of noise or other problems.

  If the switched line is a hardwired line from the personal computer to the VMS system, or a modem is used with the /NOHANGUP parameter specified, the circuit on the VMS system side enters the ON/STARTING state for approximately 4 minutes. This enables the personal computer user to set the line back on and have it operational without repeating the entire DYNSWITCH procedure.

- On the VMS system, you can either set circuit or the line to OFF.

  If either the circuit or the line is set to OFF, both the circuit and line information is removed from the volatile database and the asynchronous line returns to terminal mode.

Miscellaneous Information

The following is miscellaneous installation information:

- If a modem is used for a DYNSWITCH connection, the modem signal is not dropped during the switch.
- If the /NOHANGUP parameter is specified on the terminal line, the modem signal is not dropped after the DDCMP circuit is set to OFF. The line returns to terminal mode.
- If DECnet is turned on manually, entering a Ctrl/C or a Ctrl/Y after the switch message will abort the switch, and returns the line to terminal mode.
- For a dynamic connection, the line and circuit are automatically added to the volatile database on the VMS system when the line is switched from terminal mode to DDCMP mode. The line and circuit do not have to be manually added to the database.
- You cannot use DYNSWITCH to switch an asynchronous terminal connection to a VMS system through a switch or a LAT terminal server to a DDCMP line.

Solving Problems

If necessary, make the following changes to your script:

- If you have a prompt other than $ on your VMS system, the system will not be able to make the asynchronous connection. Eventually you will receive a timeout message.

  Change WAIT FOR:$ to WAIT FOR:*your prompt* (change the $ prompt to your VMS prompt).

- If you are connecting to an account that does not have a password, comment out the following lines:

```
WAIT FOR:Password:
SEND:password<CR>
```

Note

An account without a password compromises the security of the system.

- When the password has expired, the $ prompt does not display.

  If you cannot connect to the VMS system (if it never displays "Logged into remote system"), make sure that the account password has not expired (or pre-expired, if this is a new account).

16

Modem Control

The information in this chapter is provided for people who need to know how modem control is implemented and who understand modem operations.

Using Modem Control

To use modem control for DECnet on your personal computer, you should make sure that cables and connections conform to the EIA RS-232-C and CCITT V.28 and V.24 standards.

The following assumptions have been made for this release of PATHWORKS for DOS:

- Connections that were established before turning the line state ON will be maintained.
- Connections that still exist when turning the line state OFF will be maintained (unless the data set is specifically commanded to hang up).

You should also be aware of the following information:

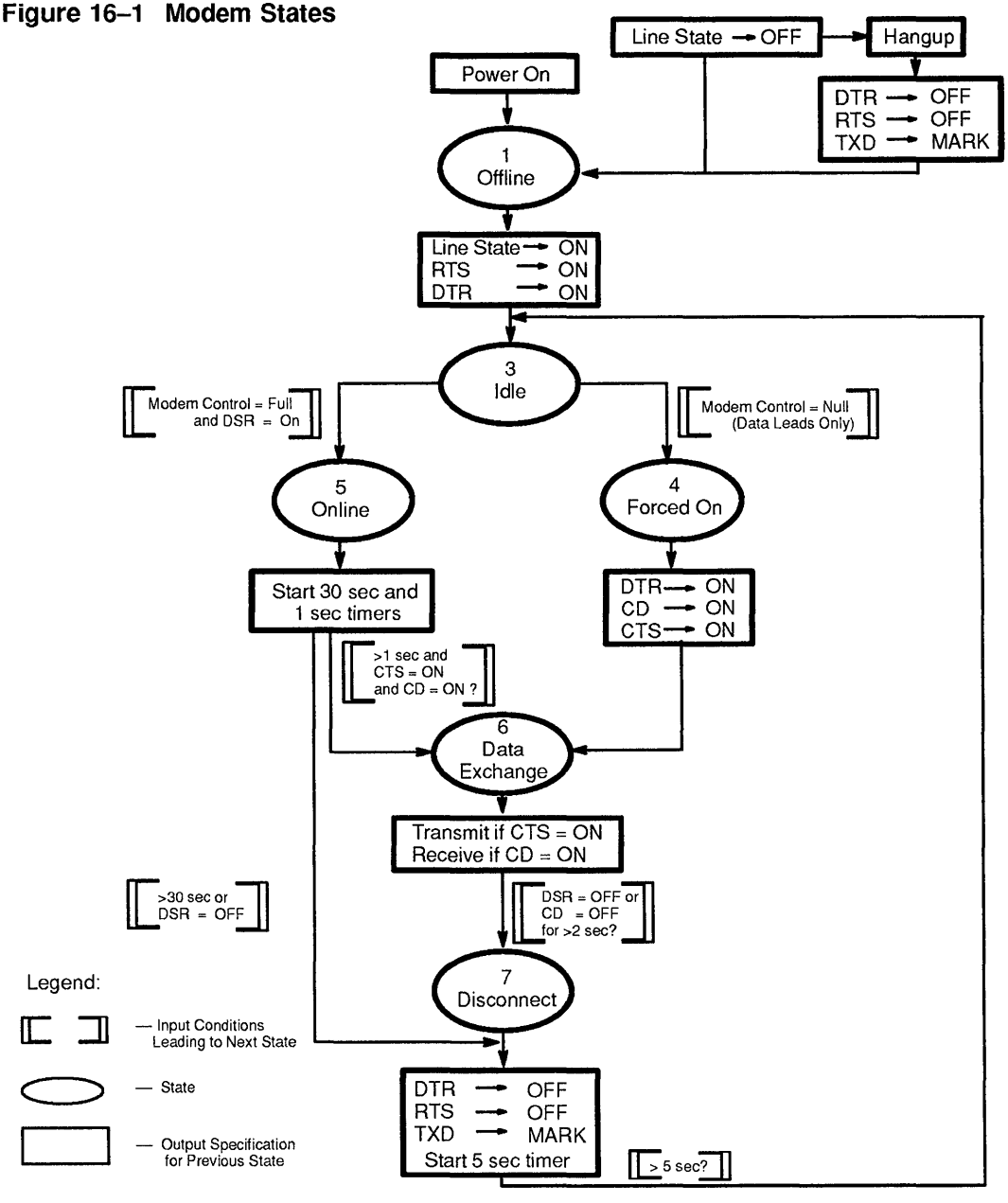
- In the United Kingdom (UK), the R1 relay in modem number 2B is held up for approximately 2 seconds in order to bridge the gaps in the ringing signal. For proper operation in calls that are automatically answered, the 2-second hold up requires that the amount of time from DSR=ON through DTR=OFF and back to DSR=ON be at least 5 seconds. This will avoid a false second call seizure. (Refer to state 7 in Figure 16–1.)
- It is assumed that the terminal has two modes of operation:
  - data leads only (modem control signals ignored)
  - full modem control (modem control signals acknowledged)

  The data leads only mode is used for local connections, such as null modem applications. The proper mode signals are simulated internally to allow the use of a single control flow. You can choose between the two modes by using a set-up parameter.

Modem States

Figure 16–1 shows the different states for the modem. (State 1 and state 2 refer to power ON and internal self-test functions, and are omitted from this diagram for purposes of clarity.)

Figure 16–1 Modem States



The following sections explain the modem states that are detailed in Figure 16–1.

General

The general states include:

- 1, OFF, or MARK — these relate to the negative voltage at the interface pin.
- 0, ON, or SPACE — these relate to the positive voltage at the interface pin.

State 1

This state is entered at power on.

State 2

This state is entered if the terminal is on-line.

State 3

This state exits unconditionally to state 4 if the data leads only mode is selected. If the full modem control mode is selected, state 5 is entered (as soon as Data Set Ready, DSR, has come on). The wait for DSR is untimed. State 3 is the state that an on line terminal is normally in before connection has been established.

In state 3, the Data Terminal Ready (DTR) and Request to Send (RTS) signals are turned on. In this state, the modem can switch itself on-line only if DTR is ON. The RTS signal is needed by some modems to prepare the transmit channel.

Note

In some cases (such as private wire), it is possible for DSR to be ON before DTR is ON. This is possible if there is a manual connection from the modem to the line.

State 4

In this state, the actual signals from the modem are ignored and forced internally ON (if the data leads only mode is selected). State 6 is then entered.

State 5

This state is entered only after Data Set Ready (DSR) has come ON. This indicates that the modem is on-line. The modem can come on-line either automatically or manually. It will come on-line *automatically* if there is a call coming in through the automatic answer unit of the modem. It will come on-line *manually* when you switch from voice to data after you have established an incoming or an outgoing manual call.

Once the modem is on-line, two timers are started. The timers are called T1 and T2. The timers operate as follows:

- T1 protects against a nondata call. This is a PTT requirement in Germany. If no data link has been established within 30 seconds after the modem has gone on-line (state 6), an automatic disconnect is initiated.
- T2 protects against data transfer within the first second after the modem has gone on-line. This avoids garbage due to transient effects in some older modems.

If Clear to Send (CTS) and Carrier Detect (CD) have both come ON, the link is considered established.

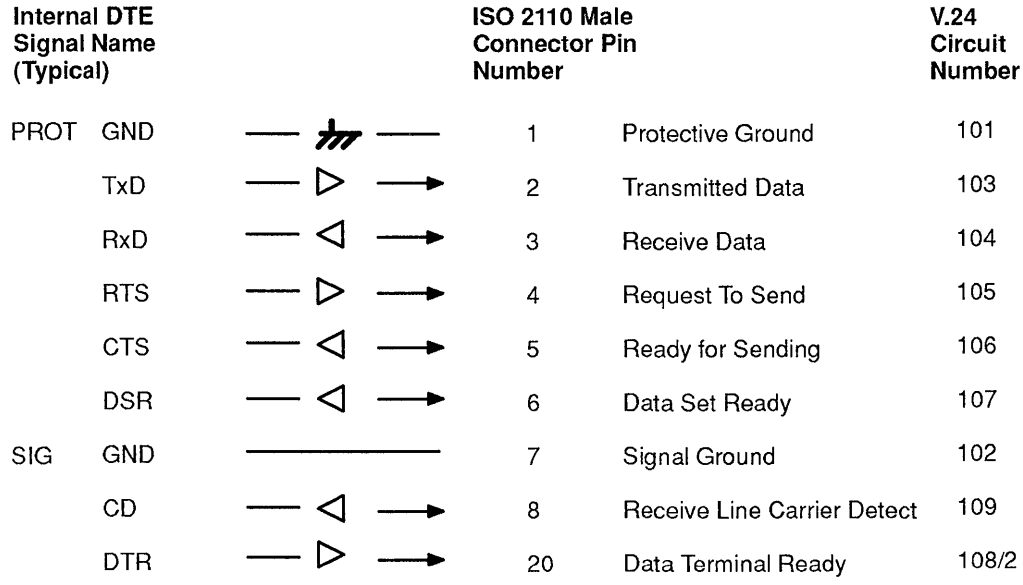
State 6

This state is the normal data exchange state of the terminal when the call is established.

State 7

This is the disconnect state. The disconnect is initiated by loss of carrier (CD) for greater than 2 seconds, or by the loss of Data Set Ready (DSR). The terminal waits 5 seconds, then a new connection is anticipated by entering state 3. This sequence provides a proper disconnection for all known modems. Figure 16–2 illustrates the minimum implementation of the V.24 circuits for full duplex modem control.

Figure 16–2 Minimum Implementation of V.24 Circuits for Full Duplex Modem Control



Interface Requirements

The following tables specify the interface leads which are required to use DECnet-DOS in asynchronous mode, either with a direct connection or with a modem. (The DECnet software will not monitor the modem leads when direct connection is specified. This allows for the connection to a remote node using a null modem, a modem eliminator, or null modem cable. These are cables and devices which may not provide all the signal leads required for a modem connection.)

Following each table is a list of the part numbers for the Digital EIA RS-232 communication cables that will provide these leads.

Table 16–1 Asynchronous Mode, Direct Connection

Pin No.	Function	CCITT V.24 Circuit No.	EIA RS-232-C Circuit No.
1	Protective Ground	101	AA
2	Transmit Data	103	BA
3	Receive Data	104	BB
7	Signal Ground	102	AB

Communication Cables:

BC22D 6	wire null modem cable (transmit and receive leads crossed within cable, eliminating the need for a separate null modem device
BC22E 16	wire modem cable
BC22F 25	wire modem cable
BCC14 16	wire modem cable (with thumb screw connectors)
BCC04 25	wire modem cable (with thumb screw connectors)

Table 16–2 Asynchronous Mode, Modem Connection

Pin No.	Function	CCITT V.24 Circuit No.	EIA RS-232-C Circuit No.
1	Protective Ground	101	AA
2	Transmit Data	103	BA
3	Receive Data	104	BB
4	Request to Send	105	CA
5	Clear to Send	106	CB
6	Data Set Ready	107	CC

(continued on next page)

Table 16–2 (Cont.) Asynchronous Mode, Modem Connection

Pin No.	Function	CCITT V.24 Circuit No.	EIA RS-232-C Circuit No.
7	Signal Ground	102	AB
8	Carrier Detect	109	CF
20	Data Terminal Ready	108/2	CD

Communication Cables:

BC22E 16	wire modem cable
BC22F 25	wire modem cable
BCC14 16	wire modem cable (with thumb screw connectors)
BCC04 25	wire modem cable (with thumb screw connectors)
H8571-E 25	DECconnect cable
H8571-J 9	AT Type DECconnect cable

Modem Option Selections

To use a modem with the asynchronous port, the modem must be configured to match the line characteristics used by DECnet-DOS. For many modems these will be the standard factory settings. Table 16–3 lists some of the user-selectable options you may find on your modem.

Table 16–3 User-Selectable Modem Options

Option	Description	Setting for Use with DECnet-DOS
Character Length	Number of bits used to encode a character.	10 bits — 8 data bits, 1 start bit, and 1 stop bit.

(continued on next page)

Table 16–3 (Cont.) User-Selectable Modem Options

Option	Description	Setting for Use with DECnet-DOS
Speed Indicate/Select	Indicate mode: modem speed on pin 12 (CCITT V.24 112).	Indicate mode. (Pin 23, CCITT V.24 111, is never inserted, and pin 12, CCITT V.24 112, is not monitored by DECnet-DOS).
Receive Responds to RDL	Allows modem to respond to a remote digital loopback test request.	Enabled (if you want to allow a remote modem test).

Other selectable modem options should be set according to the modem user's guide for the particular modem application you are using. (Other options include a public switched line, a leased line, asynchronous or synchronous mode, and so on.)

Part 4

Appendixes

A

Sample Client Profile Forms

This appendix contains sample Client Profile forms for:

- Local boot using the DECnet network transport
- Asynchronous connections (DECnet transport only)
- DECnet-DOS components (DECnet transport only)
- Local boot using the TCP/IP network transport
- Remote boot

Filling out the Client Profile form is optional, but is helpful when:

- Responding to the Netsetup prompts during configuration
- Maintaining a written log of information about clients in your network

Each form lists the information required for each Netsetup operator mode. When completing a Client Profile form, fill in only the sections required. For example, if you are configuring a PC for local boot in the Basic mode, you do not need to supply the Intermediate and Advanced mode information.

If you are not sure how to respond, see:

- The corresponding Netsetup prompt
- Appendix B for supplemental Netsetup information

Local Boot Profile Form (DECnet)

See Chapter 6 to configure a PC for local boot using the DECnet transport.

Table A–1 Local Boot Profile Form (DECnet transport)

Basic Mode Information	
Network Information:	
Client node name:	_____
Client node address:	_____
Server node name:	_____
Server node address:	_____
Keyboard information: (Digital LK250 only)	
LK250 keyboard? [Y N]	_____
Country keyboard for LK250:	_____
Network adapter information:	
Ethernet adapter:	_____
Token Ring adapter:	_____
For Other NDIS adapters:	
Drive:\path\filename of NDIS driver:	_____
Drive:\path for PROTOCOL.INI stub:	_____
PROTOCOL.INI values:	_____

(continued on next page)

Table A–1 (Cont.) Local Boot Profile Form (DECnet transport)

Intermediate Mode Information

DOS information:

DOS version: _____

Add system service DOS subdirectory to search path? [Y N] _____

System service DOS subdirectory name: _____

Type of Redirector:

Basic, Enhanced, or Full LANMAN 2.0 Support: _____

Startup information:

Add network startup command to AUTOEXEC.BAT? [Y N] _____

Add LK250 keyboard information to AUTOEXEC.BAT? [Y N] _____

Character set: _____

Memory information:

Is EMS available? [Y N] _____

Is XMS avaiable? [Y N] _____

Memory/performance selections: _____

_____

_____

_____

(continued on next page)

Table A–1 (Cont.) Local Boot Profile Form (DECnet transport)

Advanced Mode Information	
Network component information:	
SCH clock [Hardware | System]	_____
Number of LAD drives (Default 4):	_____
LAT service table size (Default 10):	_____
Maximum DECnet links (Default 4):	_____
Maximum file and printer connections (Default 10):	_____
LPT1 buffer size (Default 128):	_____
LPT2 buffer size (Default 128):	_____
LPT3 buffer size (Default 128):	_____

Local Boot Profile Form (Asynchronous Connection)

See Chapter 6 to configure a PC for an asynchronous network connection. You use the Advanced operator mode to configure the PC for an asynchronous network connection.

Table A–2 Asynchronous Connection Profile Form

Advanced Mode Information	
Network Information:	
Client node name:	
Client node address:	
Keyboard information:	
LK250 keyboard? [Y N]	
Country keyboard for LK250:	
Startup Information:	
DOS subdirectory name:	
Code page:	
Add network startup command to AUTOEXEC.BAT? [Y N]	
Add LK250 keyboard information to AUTOEXEC.BAT? [Y N]	
Memory Information:	
Is EMS available? [Y N]	
Is XMS available? [Y N]	
Memory/performance selections:	

(continued on next page)

Table A–2 (Cont.) Asynchronous Connection Profile Form

Advanced Mode Information	
Network Component Information:	
Maximum DECnet links (Default 4):	
Maximum file and printer connections (Default 10):	
LPT1 buffer size (Default 128):	
LPT2 buffer size (Default 128):	
LPT3 buffer size (Default 128):	
SCH clock [Hardware | System]	
Asynchronous information:	
COM port:	
Modem type:	
Baud rate:	
Type of Redirector:	
Basic, Enhanced, or Full LANMAN 2.0 Support:	

Local Boot Profile Form (DECnet-DOS components only)

See Chapter 6 to configure a PC to use the DECnet-DOS only portion of the PATHWORKS for DOS software. Use the Advanced operator mode to a configure a PC to use the DECnet-DOS only components.

Table A–3 DECnet-DOS Components Only Profile Form

Advanced Mode Information	
Network Information:	
Client node name:	_____
Client node address:	_____
Keyboard information:	
LK250 keyboard? [Y N]	_____
Country keyboard for LK250:	_____
Network adapter information:	
Ethernet adapter:	_____
Token Ring adapter:	_____
For Other NDIS adapters:	
Drive:\path\filename of NDIS driver:	_____
Drive:\path for PROTOCOL.INI stub:	_____
PROTOCOL.INI values:	_____

(continued on next page)

Table A–3 (Cont.) DECnet-DOS Components Only Profile Form

Advanced Mode Information only

Startup Information:

Add DOS subdirectory to search path? [Y N] _____

DOS subdirectory name: _____

Code page: _____

Add network startup command to AUTOEXEC.BAT? [Y N] _____

Add LK250 keyboard information to AUTOEXEC.BAT? [Y N] _____

Memory Information:

Is EMS available? [Y N] _____

Is XMS available? [Y N] _____

Memory/performance selections: _____

_____

_____

_____

(continued on next page)

Table A–3 (Cont.) DECnet-DOS Components Only Profile Form

Advanced Mode Information only

Network Component Information:

LAT service table size (Default 10): _____

Maximum DECnet links (Default 4): _____

Maximum file and printer connections (Default 10): _____

LPT1 buffer size (Default 128): _____

LPT2 buffer size (Default 128): _____

LPT3 buffer size (Default 128): _____

SCH clock [Hardware | System] _____

Type of Redirector:

Basic, Enhanced, or Full LANMAN 2.0 Support: _____

Asynchronous Information:

Asynch DECnet? [Y N]: _____

COM port: _____

Modem type: _____

Baud rate: _____

Local Boot Profile Form (TCP/IP)

See Chapter 6 to configure a PC for local boot over the TCP/IP transport.

Table A–4 Local Boot Profile Form (TCP/IP transport)

Basic Mode Information	
Network Information:	
Client name:	_____
Client Internet address:	_____
Server name:	_____
Server Internet address:	_____
Subnet mask (optional):	_____
Name server address (optional):	_____
Domain Name (optional):	_____
Keyboard information:	
LK250 keyboard? [Y N]	_____
Country keyboard for LK250:	_____
Network adapter information:	
Ethernet adapter:	_____
Token Ring adapter:	_____
For Other NDIS adapters:	
Drive:\path\filename of NDIS driver:	_____
Drive:\path for PROTOCOL.INI stub:	_____
PROTOCOL.INI values:	_____

(continued on next page)

Table A–4 (Cont.) Local Boot Profile Form (TCP/IP transport)

Intermediate and Advanced Mode Information

Startup Information:

Add network startup command to AUTOEXEC.BAT? [Y N] _____

Add LK250 keyboard information to AUTOEXEC.BAT? [Y N] _____

Memory:

Is EMS available? [Y N] _____

Is XMS available? [Y N] _____

Memory/performance selections: _____

_____

_____

Network information:

Default gateway: _____

Path for hosts files database (optional): _____

Domain name (optional): _____

Network component information:

Maximum file and printer connections (Default 10): _____

LPT1 buffer size (Default 128): _____

LPT2 buffer size (Default 128): _____

LPT3 buffer size (Default 128): _____

(continued on next page)

Table A–4 (Cont.) Local Boot Profile Form (TCP/IP transport)

Other information:

DOS subdirectory name: _____

DOS version: _____

Code page: _____

Remote Boot Profile Form

See Chapter 7 to configure a PC for remote boot over the DECnet transport.

Table A–5 Remote Boot Profile Form

Basic Mode Information	
Network Information:	
Client node name:	_____
Client node address:	_____
Server node name:	_____
Server node address:	_____
DOS Information:	
DOS subdirectory name:	_____
DOS version:	_____
Keyboard information:	
LK250 keyboard? [Y N]	_____
Country keyboard for LK250:	_____
Ethernet adapter information:	
Ethernet adapter type:	_____
For 3Com 3C503 Etherlink II adapters:	
ThinWire or thick wire?	_____
IRQ setting:	_____

(continued on next page)

Table A–5 (Cont.) Remote Boot Profile Form

Intermediate Mode Information

Startup Information:

Add network startup command to AUTOEXEC.BAT? [Y N] _____

Add LK250 keyboard information to AUTOEXEC.BAT? [Y N] _____

Memory:

Set up for EMS? [Y N] _____

Set up for XMS? [Y N] _____

Memory/performance selections: _____

_____

_____

_____

Other information:

Hardware address of Ethernet controller: _____

Network key disk size: _____

(continued on next page)

Table A–5 (Cont.) Remote Boot Profile Form

Advanced Mode Information	
Network component information:	
SCH clock [hardware software]	
Number of LAD drives:	
LAT service table size (Default 10):	
Maximum DECnet links (Default 4):	
Maximum file and printer connections (Default 10):	
Network key disk password [Y N]:	
Network key disk access:	
LPT1 buffer size (Default 128):	
LPT2 buffer size (Default 128):	
LPT3 buffer size (Default 128):	

B

Supplemental Netsetup Information

This appendix contains the following supplemental Netsetup information:

- DECnet network
- TCP/IP network
- Digital LK250 keyboard
- PC CPU type
- Adding a system service DOS subdirectory to the search path
- Network startup
- Network components
- Memory

This appendix does not contain all Netsetup information. Use Netsetup Help for complete information.

DECnet Network Information

This section describes the following DECnet information:

- The DECnet node name and network address
- The PATHWORKS server name and network address

Determining the DECnet Node Name

The DECnet **node name** for both server and client is a one- to six-character name uniquely identifying the node in a DECnet network. Node names can be any combination of the characters A through Z, and 0 through 9. At least one character must be a letter.

Examples of valid node names are:

- ALPHA
- 421A
- 32BETA
- 12345C

Node names can be entered in either upper or lower case.

Determining the DECnet Node Address

Make sure each area number is unique in the network and each node number is unique in the area.

The DECnet **node address** is a number uniquely identifying a client or server network node. The DECnet node address is a number that is made up of an area number followed by a decimal point and a node number. An **area** is a group of interrelated nodes. A **node number** is a number assigned to a specific node in the area.

The node address is in the format:

```
areanumber.nodenumber
```

Variable	Attributes
areanumber	A number from 1 through 63.
nodenumber	A number from 1 through 1023.

For example:

```
7.149
```

TCP/IP Network Information

This section describes the following:

- Client name and internet address
- Server name and internet address for the PCSAV41 file service
- Subnet mask (optional)
- Domain name server address (optional)
- Default domain name (optional)
- Default Gateway name (optional)
- Full path and filename for the hosts file (optional)

Determining the Internet Address

The Internet address has four fields.

An internet address is a unique number that identifies a host's connections to a TCP/IP network. A **host** is a computer in a TCP/IP network. Both the client and server are hosts.

The internet address contains four fields to specify the network number and the host number. Each field contains up to three digits. The fields are separated by periods. For example:

```
192.002.003.254
```

Network Classes

The actual format of the address varies depending on the network class. The class is based on the number of hosts participating in the network. Table B–1 lists the three main internet classes.

Table B–1 Sizes of Internet Classes

Network Class	Size
Class A	More than 65,536 hosts
Class B	From 256 to 65,536 hosts
Class C	Less than 256 hosts

Table B–2 lists the classes and the valid address format for each class. The maximum value for any single field is 255.

Table B–2 TCP/IP Address Format

Class	Range of First Address Field	Address Format	Example
A	0-127	nnn.hhh.hhh.hhh	126.0.0.100
B	128-191	nnn.nnn.hhh.hhh	135.1.0.200
C	192-223	nnn.nnn.nnn.hhh	192.2.3.254

n is a digit of the network number
h is a digit of the host number

The values 0 and 255 are special in TCP addresses. The value 0 means local, as in local host. The value 255 means all, as in all networks. For example, the class B address 135.1.255.255

indicates all hosts on the network 135.1. The class A address 0.0.0.37 indicates host 0.0.37 on the local network.

All hosts on the same network should be assigned an address containing identical network numbers to be able to communicate with one another. Two hosts with different network numbers cannot communicate with each other without a gateway.

If your network is (or will be) attached to the Internet, then you need to obtain an internet address. To obtain an internet address, contact the Network Information Center (NIC) in SRI International in Menlo Park, California. NIC assigns only the network number. The host number is the responsibility of the requesting organization.

If you know you will not be attached to the Internet, you can use any desired address.

Determining the Subnet Mask (Optional)

The subnet mask is an optional field. It has the same format as the internet address (###.###.###.###),

A subnet mask allows multiple physical networks to share the same internet address.

The subnet mask is divided into two parts:

- A network part identifying the Internet network address
- A local part identifying the physical network (subnet) and the host number

Determining the Default Gateway Address (Optional)

The gateway address is an optional field that specifies the gateway to use when communicating with a host not in the local network. The gateway address has the same format as the internet address (###.###.###.###).

A gateway (also called an internet protocol router) connects two or more physical networks.

Determining the Default Domain Name (Optional)

The domain name is an optional field that is a sequence of subnames separated by periods. Domain names are similar to the internet address but they have names instead of numbers:

```
<local>.<group>.<site>.<internet domain>
```

The domain name can contain a maximum of 116 characters.

Local and group names are controlled by a site authority; the site name is approved by the Internet authority; the internet domain names are established by the Internet authority.

Determining the Domain Server Address (Optional)

The domain name server address is an optional field that specifies the Internet address of the domain name server. The domain name server has the same format as the Internet address (###.###.###.###).

The domain name server maintains a database of domain names. The domain name server translates domain names to internet addresses.

Determining the Path and File for the Hosts File (Netfiles)

Netfiles is a legal path to the **hosts file**. The hosts file is a database of the names, aliases, and internet addresses of known DARPA internet hosts. The default netfiles path is the \TCPIP subdirectory of the network key diskette. For example, A:\TCPIP.

For each host, the file contains a single line with the following information:

```
<internet address> <host name> <aliases> <# comments>
```

The hosts file must be named hosts.

Note

The hosts file is the same as a UNIX hosts file, and you can copy this hosts file if it is available.

Aliases and comments are optional. In the hosts file, the period is the delimiter in the internet address. One or more spaces or tabs are delimiters between the items on each line. Host names can use any character other than a new-line or comment character. Comments start with a #, after which all characters to the end of the line are ignored. For example:

```
129.213.65.101  CLNT1 bobj    #386  clone -- b jones
```

Adding a System Service DOS Subdirectory to the Search Path

Netsetup asks if you want the DOS utilities directory from the system service, PCSAV41, appended to the search path.

The name of the subdirectory was specified when you ran DOSLOAD. The directory contains DOS utilities such as BACKUP, CHKDSK, and FORMAT.

Note

If the workstation's native DOS has not been loaded to the system service using DOSLOAD, select NO.

Loading the Digital Mouse Driver

If the PC has a DEPCA Ethernet adapter, Netsetup asks if you want to load the Digital mouse driver. If your DEPCA adapter has a mouse port, you should load it. If you load the driver, Netsetup updates the PC's CONFIG.SYS file to load DECMOUSE.COM.

Loading the mouse driver uses memory. If you do not use the mouse regularly, you can load the mouse driver manually before applications by running DECMOUSE.COM.

Note

DECMOUSE.COM is designed for the Digital-supplied mouse. If you have another type of mouse, see the mouse documentation for loading the mouse's driver.

Selecting the SCH Clock

The Scheduler (SCH) provides timing services and background multitasking under the DOS operating system. SCH also controls the network components' access to expanded memory (EMS).

Netsetup offers two timing options:

- Hardware

  The Hardware timer uses hardware interrupt 08h.

  This selection helps solve certain timing problems with hardware components in the personal computer such as:

  - The keyboard on the IBM PS/2 Model 55SX
  - The simultaneous use of both asynchronous and Ethernet communication if the asynchronous communication uses IRQ 3 or IRQ 4

- Software

  The software (or system) timer uses software interrupt 1Ch.

Specifying the Number of LAD Drives

The default is 4.

You specify the number of connections to virtual drives that you want available to the client. The valid range is 1 to 8. The default is 4. In most cases, the default is sufficient.

Netsetup displays this option only if you load LAD into memory using the Memory Configuration screen.

Determining the LAT Table Size

The default is 20.

The local area transport (LAT) service table lists the hosts available to SETHOST and VT320 terminal emulators.

The size of the LAT service table size determines the number of network nodes the client can access.

The valid range is 1-256. The default is 20. Netsetup displays this option only if you load LAT into memory using the Memory Configuration screen.

Memory Information

You supply Netsetup with information about the kind of memory available on the client you are configuring. Netsetup requires memory information only in the Intermediate and Advanced operating modes. The Basic mode uses the default information to configure a client.

This section describes:

- Expanded memory specification (EMS)
- Extended memory specification (XMS)
- Memory configuration

EMS

The PC needs an installed Expanded Memory Manager (EMM) driver to use expanded memory.

If the client has expanded memory and an EMM driver installed, select **YES**. Otherwise select **NO**. This allows Netsetup to check for a valid memory configuration.

Note

If you select **YES**, the EMM driver should already be installed. Netsetup does not modify the CONFIG.SYS to load the driver. If you try to load the network components into EMS and the driver is not installed, they are loaded into conventional memory instead.

XMS

If the client has extended memory select **YES**. Otherwise select **NO**. This allows Netsetup to check for a valid memory configuration.

Note

If you select **YES**, Netsetup does not modify the CONFIG.SYS to load HIMEM.SYS unless you also load the redirector (REDIR) into extended memory.

Loading HIMEM.SYS fails if you do not have extended memory.

If there is an existing HIMEM.SYS line in the client's CONFIG.SYS file, Netsetup gives you the option of modifying it. This option is valuable if you use an application that uses its own HIMEM.SYS driver; Microsoft Windows Version 3.0, for example.

Memory Configuration

Netsetup provides a memory configuration table that allows you to load and in some cases, unload, the network components in the PC's memory. You can select one of the following areas of memory for most of the network components:

- Conventional memory (RAM)
- EMS, if available
- XMS, if available

Netsetup requires memory configuration information only in the Intermediate and Advanced operating modes. The Basic mode uses the default information to configure a client.

For more information, see:

- *Memory Solutions for Client Administrators* for configuring client memory.
- *Client Commands Reference* for DECnet network components.
- *TCP/IP User's Reference* for TCP/IP network components if TCP/IP is installed.

Configuring Memory in a DECnet Client

Table B–3 lists the default values for DECnet network components.

Table B–3 Default Memory Information

Component	Local boot	Remote boot
LAD	Not loaded	RAM
LAST	Not loaded	RAM
DNP	RAM	RAM
REDIR	RAM	RAM
LAT	Not loaded	Not loaded
RCV	Not loaded	Not loaded
CTERM	Not loaded	Not loaded
NML	Not loaded	Not loaded
LANSESS	Not loaded	Not loaded
TTT	Not loaded	Not loaded
TFA	Not loaded	Not loaded
MSCDEX	Not loaded	Not loaded
NDDRV	Not loaded	Not loaded
NPDRV	Not loaded	Not loaded

By default, all required components are loaded into RAM or are not loaded:

- LAD - Local area disk

  LAD is used to start the virtual disk software, letting you use disk services. To use the virtual disk software, your client must be connected by a local area network (LAN) to a VMS system offering disk services.

- LAST - Local Area Transport

  When LAST is loaded, you can connect to:

  - Disk services, with LAD installed
  - File services, with LANSESS installed

- DNP - DECnet Network Process with NETBIOS interface

Netsetup automatically loads the correct DNP for the client you are configuring. DNP has the following variants:

DNNDCPLD	Loads asynchronous DNP with NETBIOS, into expanded memory. DNNDCPLD provides wide-area-network, asynchronous DECnet with NETBIOS support.
DNNDCPPC	Loads asynchronous DNP with NETBIOS into conventional memory. DNNDCPPC provides wide-area-network, asynchronous DECnet with NETBIOS support.
DNPDCPPC	Loads asynchronous DNP without NETBIOS into conventional memory.
DNNETH	Loads the Ethernet variant of DNP with or without NETBIOS.

- REDIR - Redirector

  The redirector routes your client's network requests to a server or to another client.

Note

The Memory Configuration Menu does not indicate whether you have chosen the Basic or Enhanced Redirector in a preceding Netsetup screen. For more information on the Enhanced Redirector, see Chapter 3.

- LAT - Local Area Transport

  LAT is communications protocol that operates in local area networks (LAN) to allow communication between computers and other devices such as terminals, printers, and modems.

- RCV - Receiver

  RCV is used to read broadcast messages over DECnet.

- CTERM - Command Terminal access interface

  CTERM provides a way for terminal emulators and other programs to communicate with a host system in a DECnet network. CTERM provides WAN services.

- NML - Network Message Listener

  NML allows remote DECnet nodes to monitor network activity and parameters on DECnet-DOS nodes. This allows network managers to determine whether or not remote DECnet-DOS nodes are functioning correctly on the network. Remote alteration of network parameters is not supported.

- LANSESS - Local Area Network Session

  LANSESS is used to provide file services when LAST is loaded.

- TTT - Transparent Task to Task

  TTT is used only with DECnet-DOS. It provides transparent task-to-task communication for high-level language and assembly language programs.

- TFA - Transparent File Access

  TFA is used only with DECnet-DOS. It allows PC applications to access files on other DECnet nodes.

- MSCDEX - Used to make InfoServer connections

  MSCDEX is used to access CD drives in an InfoServer. When you select MSCDEX, it is loaded in STARTNET.BAT and LADCDDRV.SYS is loaded in CONFIG.SYS. LADCDDRV is the Local Area Disk CDROM Driver. LADCDDRV.SYS specifies the number of LAD CDROM drives to allocate. If you do not use CDROM services, delete the `Device=LADCDDRV.SYS` line from the CONFIG.SYS file.

- NDDRV - Network Disk Driver

  NNDRV.SYS is the wide area virtual disk driver. Load it only if you need to access disk services over wide area links.

- NPDRV - Network Print Driver

  NPDRV.SYS is the wide area printer driver. Load it only if you need to access print services over wide area links.

Note

If you are unsure of the best memory solution for your client, select **ACCEPT CONFIGURATION** and use the default configuration.

Performance may be adversely affected by loading the components into EMS or XMS.

Determining Memory Usage In determining the best memory-saving solutions consider:

- LAD and LAST must remain in RAM for remote boot clients.
- To save RAM, it is advisable to load DNP and other network components into EMS. However, if the client will be used to run PC DECwindows Motif, load DNP into RAM.
- Netsetup automatically creates a CONFIG.SYS file for the client.
  - If you load components into XMS, the CONFIG.SYS file is complete.
  - If you load components into EMS, you need to load the EMS driver by modifying the CONFIG.SYS file.

Configuring Memory in a TCP/IP Client

Table B–4 lists the default values for TCP/IP network components.

Table B–4 Default TCP/IP Memory Information

Component	Local boot
REDIR	RAM
TRCV	Not loaded
NMTSR	Not loaded
SOCKTSR	Not loaded
TELNET	Not loaded
BAPI	Not loaded

By default, all required components are loaded into RAM or are not loaded:

- REDIR - Redirector

  The redirector routes your client's network requests to a server or to another client. REDIR is always loaded.

  Note

  The Memory Configuration Menu does not indicate whether you have chosen the Basic or Enhanced Redirector in a preceding Netsetup screen. For more information on the enhanced Redirector, see Chapter 3.

- TRCV - Receiver

  TRCV is used to read broadcast messages over TCP/IP. Load TRCV if you want the client to receive broadcast messages.

- BAPI - Bridge Application Program Interface

  Load BAPI if you plan on using a terminal emulator, like SETHOST. For terminal emulation, both BAPI and TELNET must be loaded.

- TELNET

  TELNET is used to connect to other TELNET servers. Load TELNET if you plan on using a terminal emulator, like SETHOST.

- NMTSR - Network maintenance facility

  NMTSR provides the TCP/IP network maintenance programs PING, ARP, and NETSTAT.

- SOCKTSR

  SOCKTSR is the TCP/IP socket library. Load SOCKTSR if you plan on using PC DECwindows Motif or other applications that require a socket library.

Note

If you are unsure of the best memory solution for your client, select **ACCEPT CONFIGURATION** and use the default configuration.

Performance may be adversely affected by loading the components into EMS or XMS.

Configuring Memory for PC DECwindows Motif

PC DECwindows Motif is a DOS program that uses all available conventional memory (RAM) and all available extended memory (XMS) to execute. Its memory needs are different from the needs of the PATHWORKS network components.

See *Memory Solutions for Client Administrators* for more information on configuring your client for PC DECwindows Motif.

C

Using NDIS Drivers

NDIS enables PATHWORKS to communicate with any vendor's certified NDIS network adapter or protocol driver.

The NDIS architecture provides a standardized way to write drivers for network adapters and communications protocols.

NDIS drivers written to the network driver interface specification operate correctly in a system with other networking protocol drivers, and with the PATHWORKS software. PCSA for DOS includes some NDIS drivers with the software kit.

Note

The PATHWORKS NDIS drivers are unsupported. Digital is not responsible for any damages that result from their use.

This appendix describes:

- Requirements for using an NDIS driver for a network adapter
- How to modify the PATHWORKS PROTOCOL.INI file to make the NDIS driver work
- A sample PROTOCOL.INI file

Requirements

To use an NDIS driver with PATHWORKS, you must:

1. Install and properly configure a network adapter for your personal computer.
2. Run Netsetup to install the corresponding NDIS driver and its PROTOCOL.INI stub. A **PROTOCOL.INI stub** contains the information that PATHWORKS needs to communicate with your network adapter. When you run Netsetup, the

information from the stub is included in the PATHWORKS PROTOCOL.INI file.

PATHWORKS for DOS provides NDIS drivers and sample PROTOCOL.INI stubs in the LMDOS\DRIVERS subdirectories. For a list of NDIS drivers that come with the PATHWORKS kit, refer to the *PATHWORKS for DOS Software Product Description*.

3. If you are using an NDIS driver that is not supplied by PATHWORKS, you must know the drive and the path for the NDIS driver, its PROTOCOL.INI stub, and any other files used by the NDIS driver. Netsetup prompts you for this information during the installation.

   Some NDIS drivers require additional files. Check your network adapter's documentation for information about its NDIS driver files and installation procedure. These files must reside in whichever directory Netsetup copied the driver. For example, the Proteon Token Ring network adapter requires that the file PROMAC.OUT (which is supplied with the adapter) be in the same directory as its device driver.

Modifying the PROTOCOL.INI File

You may need to make modifications to the PROTOCOL.INI file so that your NDIS driver works with the PATHWORKS for DOS data link. You can change the PROTOCOL.INI file:

- In Netsetup just before the key disk is written. Netsetup displays a screen that lets you change the PROTOCOL.INI file parameters.
- After you run Netsetup and before you reboot your personal computer by editing the PROTOCOL.INI file.

If you have problems, check the following PROTOCOL.INI file entries:

- NI_IRQ =
- SetStationAddress function

The NI_IRQ Entry

- The NI_IRQ entry in the [DATALINK] section must match the interrupt vector parameter (for example, the INTERRUPT = or the INTLEVEL = entry) for the network adapter.
- For 80286, 80386, or 80486 processors, you must set the NI_ IRQ entry in the [DATALINK] section to 9 for any adapter configured for Interrupt Level 2.

The SetStationAddress Function

The DLLNDIS and DLLNDIST data link drivers use the SetStationAddress function that is supported by most NDIS drivers. If you are using an NDIS driver that does not support the SetStationAddress function, you must set the station address by adding a NODEADDRESS = parameter to the PROTCOL.INI file.

The station address you must specify is based on the DECnet address for your personal computer. Ask your system administrator for the DECnet address for your personal computer, or enter the NCP LIST EXEC command to display your DECnet address.

Suppose the DECnet address of your workstation is 12.34. Convert the DECnet address to the station address as follows:

- Use the following formula:

  ```
  (12 * 1024) + 34 = 12322 or 3022H (Hex)
  ```

  3022H is byte-swapped to become 22-30

- Use the station address format AA–00–04–00–XX–YY. Therefore, in this example, the station address for USER1 is AA–00–04–00–22–30.

  If you are using a Token Ring controller, the DECnet station address must be bit-swapped. To bit swap each DECnet station address byte, you must reverse the order of the most significant bit and least significant bit. For example, to bit swap the station address for USER1:

  ```
  AA--00--04--00--22--30   10101010--00000000--00000100--00100010--00110000
  ```

  becomes

  ```
  55--00--20--00--44--0C   01010101--00000000--00100000--01000100--00001100
  ```

- Now that you have determined a station address or a bit-swapped station address, add the NODEADDRESS = parameter to the PROTOCOL.INI file.

If you are using a Madge Smart 16/4 Token Ring controller, add the following parameter, including the quotes:

```
NODEADDRESS = "55002000440C"
```

If you are using an Olicom Token Ring controller, add the following parameter to the PROTOCOL.INI file:

```
NODEADDRESS = 0x5500 0x2000 0x440C
```

Sample PROTOCOL.INI File

The following examples show:

- A sample PROTOCOL.INI stub for a 3Com Etherlink II network controller
- The PROTOCOL.INI produced by Netsetup using the supplied stub.

Example C–1 Sample PROTOCOL.INI Stub

```
; protocol.ini section for the 3Com Etherlink II Adapter Card

    IOADDRESS = 0x300
    INTERRUPT = 3
    MAXTRANSMITS = 40
    DRIVERNAME = ELNKII$
    XMITBUFS = 1
    TRANSCEIVER = EXTERNAL
```

Note

The supplied PROTOCOL.INI stub must not contain labels. Labels are information inside brackets ([ ]). Netsetup supplies the labels.

Example C–2 Sample PROTOCOL.INI

```
; PROTOCOL.INI file create by DNETOMO.V41 V4.1.043
;                          via DNETWIK.V41 V4.1.032

[protocol manager]
DRIVERNAME = PROTMAN$

[ELNKII.DOS]
DRIVERNAME = ELNKII$
IOADDRESS = 0x300
INTERRUPT = 3
MAXTRANSMITS = 40
XMITBUFS = 1
TRANSCEIVER = EXTERNAL

[IPX4MAC]
DRIVER = IPX$MAC
BINDINGS     = ELNKII.DOS

[DATALINK]
DRIVERNAME   = DLL$MAC
LG_BUFFERS   = 16
SM_BUFFERS   = 6
OUTSTANDING  = 32
HEURISTICS   = 0
BINDINGS     = ELNKII.DOS
;Specify IRQ level used by workstations network adapter
;NI_IRQ       = 5
```

Table C–1 describes the PROTOCOL.INI file parameters.

Table C–1 PROTOCOL.INI File Parameters

DRIVERNAME = *driver*	This should always be the first qualifier. Do not change it.
BINDINGS = *driverlabel*	Specifies the name of the adapter that DLLNDIS is to be bound to. The value for *driverlabel* is one of the bracketed items in PROTOCOL.INI. For example, if you are using a DEPCA and the DEPCA information is stored in a section labeled [DEPCA.DOS], then use BINDINGS = DEPCA.DOS.

(continued on next page)

Table C–1 (Cont.) PROTOCOL.INI File Parameters

	As shown in the example, PROTOCOL.INI can include parameter sections for multiple network controllers. Sections not indicated by BINDINGS = driverlabel are ignored.
LG_BUFFERS = *n*	Specifies the number of large data link buffers. A large data link buffer is 1518 bytes. The minimum is 16 (the default). You may need to increase the value for n if you are running a large number of simultaneous DECnet links.
SM_BUFFERS = *n*	Specifies the number of small data link buffers. A small data link buffer is 144 bytes long. The minimum is 8 (the default). You may need to increase the value for n if you are running a large number of simultaneous DECnet links.
OUTSTANDING = *n*	Specifies the number of outstanding transmit or receive requests. The minimum is 16 (the default). The value for n should be increased in proportion to the number of large and small data link buffers. Each outstanding request consumes 12 bytes.

(continued on next page)

Table C–1 (Cont.) PROTOCOL.INI File Parameters

NI_IRQ = *n*	Specifies the interrupt request vector that the network controller uses. This qualifier is not normally needed because the DLLNDIS data link driver can determine the interrupt number automatically for many devices. Controllers whose NDIS drivers conform to Version 1.x of the NDIS specification require that the NI_IRQ parameter be used. If the Scheduler fails to load, you may need to set NI_IRQ to the interrupt number that your network device is configured for.
DECPARM = *string*	An optional parameter you add to change the path name for your DECnet database files. Normally, this path is the current drive and the \DECNET directory. For example, setting DECPARM = "D:\DNETDATA" configures DLLNDIS and the other network components to find their data files in D:\DNETDATA.
HEURISTICS = n	An optional parameter you add to specify "fine tuning" values for DLLNDIS. This qualifier is bitmasked, meaning that each binary bit of the number is significant.The values are as follows:

2	Copy all "receive chain" buffers.
4	The adapter hears its own multicast transmissions.
8	Use the old interrupt shell for the scheduler.
16	Use GDT addresses on "receive lookaheads."

(continued on next page)

Table C–1 (Cont.) PROTOCOL.INI File Parameters

	To combine options, add the numbers together. Do not change the HEURISTICS option unless you are familiar with NDIS terms and concepts. It is used primarily for debugging new cards that have not been tested with DLLNDIS. Setting HEURISTICS = 6 provides the best results for testing cards that are not explicitly supported by PATHWORKS.

For additional information about the PROTOCOL.INI file, refer to the *Client Commands Reference*.

D

Sample Installation Script

The following is a sample VMS installation of DEC PATHWORKS for DOS from a TK50 onto a VMS V5.3 system.

```
$ set def sys$update

$ @vmsinstal pcsaclient041 mua0:

VAX/VMS Software Product Installation Procedure V5.4  It is 13-NOV-1990 at 07:53.

Enter a question mark (?) at any time
* Are you satisfied with the backup of your system disk [YES]? Y

Please mount the first volume of the set on  MUA0:.
* Are you ready? Y

%MOUNT-I-MOUNTED, CLIENT mounted on _SQUALL$MUA0:
The following products will be processed:
  PCSACLIENT V4.1
   Beginning installation of PCSACLIENT V4.1 at 07:57

%VMSINSTAL-I-RESTORE, Restoring product save set A ...
* Do you want to purge files replaced by this installation [YES]? Y
Checking for an existing registered system service...
%PCSA-E-NOREGSERMATCH, no registered services match user constraints
No registered system service was found.
* Enter directory specification for PCSAV41 [SQUALL$DUA2:[PCSA.PCSAV41]]:
%PCSA-I-DIREXISTS, directory SQUALL$DUA2:[PCSA.PCSAV41] exists
%PCSA-I-ACLCREATED, ACL created on SQUALL$DUA2:[PCSA]PCSAV41.DIR
%PCSA-I-SERADDED, service "PCSAV41" added

* Enter VMS username that will maintain the system service, PCSAV41 [SYSTEM]:
%PCSA-I-SERGRANTED, service "PCSAV41" granted to user/group "PUBLIC"

%PCSA-I-SERGRANTED, service "PCSAV41" granted to user/group "SYSTEM"

Installing PCSAV41 to SQUALL$DUA2:[PCSA.PCSAV41].
It will take approximately 25 minutes.
Installation may continue unattended.

%VMSINSTAL-I-SYSDIR, This product creates system disk directory VMI$ROOT:[PCSA.LOAD_FILE].
%VMSINSTAL-I-SYSDIR, This product creates system disk directory  VMI$ROOT:[PCSA.LOAD_FILE.V41].

The VMSINSTAL procedure is complete.  To complete the installation of,
DEC PATHWORKS for DOS install DOS on the VMS server.  See your
Installation and Configuration Guide for more information.

%VMSINSTAL-I-MOVEFILES, Files will now be moved to their
target directories...
Installation of PCSACLIENT V4.1 completed at 08:16

 VMSINSTAL procedure done at 08:17
```

E

System Service Files

This appendix contains:

- A description of each directory of the PCSAV41 system file service
- A listing of the files in PCSAV41

PCSAV41 Directory Contents

Table E–1 describes each directory in the PCSAV41 system file service.

Table E–1 PCSAV41 Directory Contents

Directory	Description
437USA	Contains character set files and keyboard maps used by Sethost.
850MUL	Contains character set files and keyboard maps used by Sethost.
860POR	Contains character set files and keyboard maps used by Sethost.
863CNF	Contains character set files and keyboard maps used by Sethost.
865NOR	Contains character set files and keyboard maps used by Sethost.
DECNET	Is the root directory for DECnet PCSA network files. It also contains executable files and the BCAST, LATCP, MEMMAN, and RCV applications.

(continued on next page)

Table E–1 (Cont.) PCSAV41 Directory Contents

Directory	Description
DECNET\DRV	Contains PATHWORKS for DOS network drivers. A **driver** is the software that lets a computer communicate with a device through the operating system by controlling all input to, and output from, the device.
DECNET\FRB	Contains the Floppy Remote Boot Configuration program (FRBCON) and other software need to create a floppy remote boot diskette
DECNET\SCRIPT	Contains terminal emulation scripts distributed with DECnet/DOS software.
DECNET\SOURCE	Contains programmers' library source modules.
DECNET\TEMPLATE	Contains the DECnet database files.
DOSENH	Contains the Digital-supplied DOS commands.
HELP	Contains files used by the online Help utility.
LMDOS	Contains PATHWORKS for DOS network files.
LMDOS\DRIVERS\CPQTOK	Contains files used by the Compaq Token Ring adapters.
LMDOS\DRIVERS\DEPCA	Contains files used by the DEC EtherWORKS and DEPCA Ethernet adapters.
LMDOS\DRIVERS\DOSUTILS	Contains DOS memory management utilities.
LMDOS\DRIVERS\ELNKII	Contains files used by the 3Com EtherLink II Ethernet adapter.
LMDOS\DRIVERS\ELNKMC	Contains files used by the 3Com EtherLink/MC Ethernet adapter.
LMDOS\DRIVERS\ELNKPL	Contains files used by Etherlink plus.
LMDOS\DRIVERS\IBMTOK	Contains files used by the IBM Token Ring adapters.
LMDOS\DRIVERS\MACWD	Contains files used by the Western Digital adapters.
LMDOS\DRIVERS\PCSA	Contains network components loaded by clients.
LMDOS\DRIVERS\PROTMAN	Contains files used by NDIS-compliant Ethernet adapters.
LMDOS\DRIVERS\TLNK	Contains files used by the 3Com Token Link adapters.
LMDOS\NETSRC	Contains LANMAN API programming base directories.
LMDOS\NETSRC\H	Contains Header files needed for C programming.
LMDOS\NETSRC\LIB	Contains libraries called through the H files.
LMDOS\NETWKSTA	Contains network station executables.

(continued on next page)

Table E–1 (Cont.) PCSAV41 Directory Contents

Directory	Description
LMDOS\SERVICES	Contains LANMAN services to install in the Enhanced Redirector space.
LMDOS\NETPROG	Contains network utilities for the Enhanced Redirector.
MSWINV30	Contains PATHWORKS support for Microsoft Windows Version 3.0
PCAPP	Contains applications that come with PATHWORKS for DOS: • Mail • PC DECwindows Motif executable files • SEDT (screen editor) • Sethost (terminal emulator) This directory also contains Netsetup and DOSLOAD files.
XSERVER	Is the root directory for PC DECwindows Motif.
XSERVER\FONTS100	Contains fonts for PC DECwindows Motif.
XSERVER\FONTS75	Contains fonts for PC DECwindows Motif.
XSERVER\FONTSMIT	Contains fonts for PC DECwindows Motif.
XSERVER\FONTSOL	Contains fonts for PC DECwindows Motif.
XSERVER\KEYSYMS	Contains keyboard map files for PC DECwindows Motif.
XSERVER\REMOTE	Contains software for starting DECwindows applications on remote systems.

PCSAV41 Files

```
437USA.DIR      850MUL.DIR      860POR.DIR      863CNF.DIR
865NOR.DIR      DECNET.DIR      DOSENH.DIR      HELP.DIR
LMDOS.DIR       MSWINV30.DIR    PCAPP.DIR       PCSAINFO.DAT (hidden)
XSERVER.DIR
```

Directory:\437USA

```
ASCII.CHR       BRITISH.CHR     CANADIAN.CHR    DECM.CHR
DUTCH.CHR       FINNISH.CHR     FRENCH.CHR      GERMAN.CHR
ISO.CHR         ITALIAN.CHR     NORDAN.CHR      PORTUGES.CHR
SPANISH.CHR     SWEDISH.CHR     SWISS.CHR
```

Directory:\850MUL

ASCII.CHR	BRITISH.CHR	CANADIAN.CHR	DECM.CHR
DUTCH.CHR	FINNISH.CHR	FRENCH.CHR	GERMAN.CHR
ISO.CHR	ITALIAN.CHR	NORDAN.CHR	PORTUGES.CHR
SPANISH.CHR	SWEDISH.CHR	SWISS.CHR	

Directory:\860POR

ASCII.CHR	BRITISH.CHR	CANADIAN.CHR	DECM.CHR
DUTCH.CHR	FINNISH.CHR	FRENCH.CHR	GERMAN.CHR
ISO.CHR	ITALIAN.CHR	NORDAN.CHR	PORTUGES.CHR
SPANISH.CHR	SWEDISH.CHR	SWISS.CHR	

Directory:\863CNF

ASCII.CHR	BRITISH.CHR	CANADIAN.CHR	DECM.CHR
DUTCH.CHR	FINNISH.CHR	FRENCH.CHR	GERMAN.CHR
ISO.CHR	ITALIAN.CHR	NORDAN.CHR	PORTUGES.CHR
SPANISH.CHR	SWEDISH.CHR	SWISS.CHR	

Directory:\865NOR

ASCII.CHR	BRITISH.CHR	CANADIAN.CHR	DECM.CHR
DUTCH.CHR	FINNISH.CHR	FRENCH.CHR	GERMAN.CHR
ISO.CHR	ITALIAN.CHR	NORDAN.CHR	PORTUGES.CHR
SPANISH.CHR	SWEDISH.CHR	SWISS.CHR	

Directory:\DECNET

CTERM.EXE	DECNET.EXE	DNETHLP.V41	DNETOMO.V41
DNETWIK.V41	DNNDCPEM.EXE	DNNDCPLD.EXE	DNNDCPPC.EXE
DNNETH.EXE	DNPDCPPC.EXE	DTR.EXE	DTS.EXE
DTS.TXT	EMSSPEED.EXE	FAL.EXE	FALNOWIN.EXE
LAT.EXE	LATCP.EXE	LATCP.MSG	MOP.EXE
MOPCONF.DEF	MOPCONF.EXE	MSNET.DCP	MSNET.ETH
MSNET.INI	NBTRACE.EXE	NCP.EXE	NCPDEFO.EXE
NCPDEFP.EXE	NCPEVENT.EXE	NCPHELP.BIN	NCPLOOP.EXE
NCPSET.EXE	NCPSHOW.EXE	NCPTELL.EXE	NDU.EXE
NFT.EXE	NFTHELP.BIN	NFTNOWIN.EXE	NML.EXE
RCV.EXE	SCH.EXE	SCHK.EXE	SNAGNI.EXE
SNAGNI.CFG	SPAWNER.EXE	TFA.EXE	TNT.EXE
TTT.EXE			

Directory:\DECNET\DRV

BSHELL.EXE	NDDRV.SYS	NPDRV.SYS	3C503.TSK
3C523.TSK	DEPCA_H.TSK	DEPCA_S.TSK	

Directory:\DECNET\FRB

3C503.EXE	3C523.EXE	DEPCA.EXE	FBOOT.BIN
FRBCON.EXE	FRBCP.BIN	RITEBOOT.EXE	

Directory:\DECNET\SCRIPT

COMLOGIN.SCR	DIALDYN.SCR	DIALNET.SCR	FILE.SCR
HARDDYN.SCR	LATLOGIN.SCR	LOGIN.SCR	MAIL.SCR
NOTES.SCR	UNTIL.SCR		

Directory:\DECNET\SOURCE

BREAKSRC.EXE	CODE437.SRC	CODE850.SRC	CODE860.SRC
CODE863.SRC	CODE865.SRC	DNETLIB.SRC	SAMPLES.SRC

Directory:\DECNET\TEMPLATE

DECOBJ.DAT DECPARM.ASY DECPARM.DAT

Directory:\DOSENH

ATTRIB.EXE DECGRAPH.COM DECKEYB.COM DECMODE.EXE
DECMOUSE.COM DECMOUSE.SYS KEYBRD.EXE ST2DK.KEY
ST2NO.KEY STDCA.KEY STDDE.KEY STDES.KEY
STDFI.KEY STDFR.KEY STDIT.KEY STDSD.KEY
STDSE.KEY STDSF.KEY STDUK.KEY XONXOFF.EXE

Directory:\HELP

ATTRIB.HLP COMMAND.HLP CONTINUE.HLP CREATE.HLP
DELETE.HLP DISK.HLP DISMOUNT.HLP DLL.HLP
DLL802.HLP DNP.HLP EMSLOAD.HLP ERROR.HLP
FILE.HLP HELP.HLM HELP.HLP HELP.LKP
KBDAT.HLP KBDEPC.HLP KBDGEN.HLP KBDLAP.HLP
KBDLK.HLP KBDLTE.HLP KBDLTEKP.HLP KBDM24.HLP
KBDM28.HLP KBDOTHER.HLP KBDSLT.HLP KBDVM.HLP
KBDXT.HLP KBDZENAT.HLP KBDZENXT.HLP LAD.HLP
LAST.HLP LAT.HLP LIST.HLP LOAD.HLP
MEMMAN.HLP MODIFY.HLP MOUNT.HLP PASSWORD.HLP
PAUSE.HLP PERMIT.HLP PRINT.HLP RCV.HLP
REDIR.HLP SAVE.HLP SCH.HLP SETHOST.HLP
TEST.HLP TIME.HLP USE.HLP ZERO.HLP

Directory:\LMDOS

DRIVERS.DIR LANMAN.INI NETPROG.DIR NETSRC.DIR
NETWKSTA.DIR PRTSC.EXE PSC.COM REDIR.330
REDIR.400 REDIR.500 SERVICES.DIR

Directory:\LMDOS\DRIVERS

DEPCA.DIR DOSUTILS.DIR PCSA.DIR PROTMAN.DIR

Directory:\LMDOS\DRIVERS\CPQTOK

CPQTOK.DOS MAC380.BIN PROTOCOL.INI

Directory:\LMDOS\DRIVERS\DEPCA

DEPCA.DOS DLLDEPCA.EXE PROTOCOL.INI

Directory:\LMDOS\DRIVERS\DOSUTILS

HIMEM.SYS

Directory:\LMDOS\DRIVERS\ELNKII

ELNKII.SYS PROTOCOL.INI

Directory:\LMDOS\DRIVERS\ELNKMC

ELNKMC.SYS PROTOCOL.INI

Directory:\LMDOS\DRIVERS\ELNKPL

ELNKPL.DOS PROTOCOL.INI

Directory:\LMDOS\DRIVERS\IBMTOK

IBMTOK.DOS PROTOCOL.INI

Directory:\LMDOS\DRIVERS\MACWD

MACWD.DOS	PROTOCOL.INI		

Directory:\LMDOS\DRIVERS\PCSA

DLL802.EXE	DLLNDIS.EXE	DLLNDIST.EXE	EMSLOAD.EXE
LAD.EXE	LADCDDRV.SYS	LADDRV.SYS	LANSESS.EXE
LAST.EXE	MSCDEX.EXE	SAVE.COM	SRM.EXE

Directory:\LMDOS\DRIVERS\PROTMAN

NETBIND.EXE	PROTCHK.EXE	PROTMAN.SYS	PROTOCOL.INI

Directory:\LMDOS\DRIVERS\TLNK

PROTOCOL.INI	TLNK.DOS

Directory:\LMDOS\NETPROG

LANMAN.DRV	LANMAN.HLP	MINSES.EXE	MSNET.EXE
NET.EXE	NET.HLP	NET.MSG	NET.PIF
NETAPI.DLL	NETAPI.EXE	NETCOPY.EXE	NETH.MSG
NETI.EXE	NETMOVE.EXE	NETUSER.EXE	NIFU.HLP
OSO001.MSG	PMSPL.DLL	PMSPL.EXE	WINPOPUP.EXE

Directory:\LMDOS\NETSRC

H.DIR	LIB.DIR

Directory:\LMDOS\NETSRC\H

ACCESS.H	ALERT.H	ALERTMSG.H	AUDIT.H
CHARDEV.H	CONFIG.H	DOSDEF.H	DOSPMSPL.H
ERRLOG.H	LAN.H	MAILSLOT.H	MESSAGE.H
NCB.H	NETBIOS.H	NETCONS.H	NETERR.H
NETSTATS.H	NMPIPE.H	PMSPL.H	PROFILE.H
REMUTIL.H	SERVER.H	SERVICE.H	SHARES.H
USE.H	WKSTA.H		

Directory:\LMDOS\NETSRC\LIB

DOSLAN.LIB	LAN.LIB	NETAPI.LIB	PMSPL.LIB
SYSCALL0.LIB			

Directory:\LMDOS\NETWKSTA

NETWKSTA.330	NETWKSTA.400	NETWKSTA.500

Directory:\LMDOS\SERVICES

ENCRYPT.EXE	MSRV.EXE	NETPOPUP.EXE

Directory:\MSWINV30

ATTRIB.PIF	DEC2100.DRV	DEC2200.DRV	DECCE250.DLL
DECCF250.DLL	DECDA250.DLL	DECFI250.DLL	DECFR250.DLL
DECGE250.DLL	DECIT250.DLL	DECMOUSE.DRV	DECNO250.DLL
DECSF250.DLL	DECSG250.DLL	DECSP250.DLL	
DECSW250.DLL	DECUK250.DLL	DECUS250.DLL	DW286R.PIF
DW386R.PIF	DWDOS286.PIF	DWDOS386.PIF	DWINFO2.PIF
DWINFO2R.PIF	DWINFO3.PIF	DWINFO3R.PIF	GENDRV.EXE
HPSYSTEM.DRV	LA324.DRV	LA70.DRV	LJ250.DRV
LK250.DRV	MAIL.PIF	NCP.PIF	NCPDEFO.PIF
NCPDEFP.PIF	NCPEVENT.PIF	NCPLOOP.PIF	NCPSET.PIF
NCPSHOW.PIF	NCPTELL.PIF	NFTWIN.HLP	OEMSETUP.INF
PCSA.DRV	RPLMEM.EXE	SEDT.PIF	SETHOST.PIF
SPAWNER.PIF	SYSTEM.DRV	TRMNLAXS.DLL	TRMNLAXS.H
TRMNLAXS.LIB	VDNET.386	VKD250.386	VMD.386
VNETBIOS.386	VT320.EXE	WIN3SETU.EXE	XLAT437.BIN
XLAT850.BIN	XLAT863.BIN	XLAT865.BIN	

Directory:\PCAPP

ATDOSH.EDT	ATDOSM.EDT	ATDOSM.INP	BCAST.EXE
CHKNET.EXE	DECTERM.FON	DECTERMC.FON	DECTERME.FON
DLHELP.TXT	DOSLOAD.EXE	DWCONFIG.EXE	DWCONFIG.STR
DWDOS.RGB	DWDOS.STR	DWDOS286.EXE	DWDOS386.EXE
DWDOS.VID	DWFONT.EXE	DWINFO2.EXE	DWINFO3.EXE
DWKEYSYM.EXE	DWLEGA.EXE	DWLEGAM.EXE	
DWLMCGA.EXE	FUNDEF.EDT	FUNDEF.INP	HELP.EDT
HELPD.EXE	KBDAT.KBD	KBDCODE.EXE	KBDEPC.KBD
KBDGEN.KBD	KBDLAP.KBD	KBDLK.KBD	KBDLTE.KBD
KBDLTEKP.KBD	KBDM24.KBD	KBDM28.KBD	KBDOTHER.KBD
KBDSLT.KBD	KBDXT.KBD	LANG.BAT	LDU.EXE
KDOSH.EDT	LKDOSM.EDT	LKDOSM.INP	
LOGON.BAT	MAIL.EXE	MAILBRWS.DEF	MAILCHK.EXE
MAILDEF.EXE	MAILEDIT.DEF	MAILHELP.HDX	MAILHELP.HLP
MAILMSGS.MSG	MAILPARS.EXE	MAILSEDT.1	MAILSEDT.2
MAILSEDT.3	MAILSEDT.4	MAILSEDT.5	MAILSEDT.6
MAILSEND.EXE	MAILSETU.EXE	MAILSETU.MSG	
MAILSORT.EXE	MAILUTIL.MSG	MAILVIEW.DEF	MAPKEY.EXE
MEMMAN.EXE	NETD.EXE	NETENVI.EXE	
PCDOSH.INP	NETSETUP.EXE	NETSHLP.V41	NETSYS.EXE
NETTIME.EXE	NETVER.COM	NPDOSH.EDT	NPDOSM.EDT
NPDOSM.INP	PCDOSH.EDT	PCDOSM.EDT	PCDOSM.INP
PERMIT.EXE	PRINTQ.EXE	RULER0.TXT	
SEDT.CNF	SEDT.ENV	SEDT.EXE	SETHOST.EXE
SETLOGON.EXE	SETNAME.EXE	SLTDOSH.EDT	SLTDOSM.EDT
SLTDOSM.INP	USE.EXE		

Directory:\TCPIP

TCPIPHLP.V41	TCPIPOMO.V41	TCPIPWIK.V41

Directory:\XSERVER

FONTS100.DIR	FONTS75.DIR	FONTSMIT.DIR	FONTSOL.DIR
KEYSYMS.DIR	REMOTE.DIR		

Directory:\XSERVER\FONTS100

AVBK10.SNF	AVBK12.SNF	AVBK14.SNF	AVBK18.SNF
AVBK24.SNF	AVBK8.SNF	AVBKO10.SNF	AVBKO12.SNF
AVBKO14.SNF	AVBKO18.SNF	AVBKO24.SNF	AVBKO8.SNF
AVD10.SNF	AVD12.SNF	AVD14.SNF	AVD18.SNF
AVD24.SNF	AVD8.SNF	AVDO10.SNF	AVDO12.SNF
AVDO14.SNF	AVDO18.SNF	AVDO24.SNF	AVDO8.SNF
CO10.SNF	CO12.SNF	CO14.SNF	CO18.SNF
CO24.SNF	CO8.SNF	COB10.SNF	COB12.SNF
COB14.SNF	COB18.SNF	COB24.SNF	COBO10.SNF
COBO12.SNF	COBO14.SNF	COBO18.SNF	COBO24.SNF
COBO8.SNF	COO10.SNF	COO12.SNF	COO14.SNF
COO18.SNF	COO24.SNF	COO8.SNF	DME10.SNF
DME12.SNF	DME14.SNF	DME8.SNF	DMI10.SNF
DMI12.SNF	DMI14.SNF	DMI8.SNF	DMSY10.SNF
DMSY12.SNF	DMSY14.SNF	DMSY8.SNF	DWCURSOR.SNF
DWSESS.SNFDWN	FIXED.SNF	FONTNAME.MAP	FONTS.ALI
HV10.SNF	HV12.SNF	HV14.SNF	HV18.SNF
HV24.SNF	HV8.SNF	HVB10.SNF	HVB12.SNF
HVB14.SNF	HVB18.SNF	HVB24.SNF	HVB8.SNF
HVBO10.SNF	HVBO12.SNF	HVBO14.SNF	HVBO18.SNF
HVBO24.SNF	HVBO8.SNF	HVO10.SNF	HVO12.SNF
HVO14.SNF	HVO18.SNF	HVO24.SNF	HVO8.SNF
IDME14.SNF	IDMI14.SNF	IDMSY14.SNF	LGBK10.SNF
LGBK12.SNF	LGBK14.SNF	LGBK18.SNF	LGBK24.SNF
LGBK8.SNF	LGBKO10.SNF	LGBKO12.SNF	LGBKO14.SNF
LGBKO18.SNF	LGBKO24.SNF	LGBKO8.SNF	LGD10.SNF
LGD12.SNF	LGD14.SNF	LGD18.SNF	LGD24.SNF
LGD8.SNF	LGDO10.SNF	LGDO12.SNF	LGDO14.SNF
LGDO18.SNF	LGDO24.SNF	LGDO8.SNF	MENU10.SNF
MENU12.SNF	NCSB10.SNF	NCSB12.SNF	NCSB14.SNF
NCSB18.SNF	NCSB24.SNF	NCSB8.SNF	NCSBI10.SNF
NCSBI12.SNF	NCSBI14.SNF	NCSBI18.SNF	NCSBI24.SNF
NCSBI8.SNF	NCSI10.SNF	NCSI12.SNF	NCSI14.SNF
NCSI18.SNF	NCSI24.SNF	NCSI8.SNF	NCSR10.SNF
NCSR12.SNF	NCSR14.SNF	NCSR18.SNF	NCSR24.SNF
NCSR8.SNF	PB10.SNF	PB12.SNF	PB14.SNF
PB18.SNF	PB24.SNF	PB36.SNF	PB48.SNF
PB72.SNF	PB8.SNF	SVD10.SNF	SVD12.SNF
SVD14.SNF	SVD18.SNF	SVD24.SNF	SVD8.SNF
SVDI10.SNF	SVDI12.SNF	SVDI14.SNF	SVDI18.SNF
SVDI24.SNF	SVDI8.SNF	SVL10.SNF	SVL12.SNF
SVL14.SNF	SVL18.SNF	SVL24.SNF	SVL8.SNF
SVLI10.SNF	SVLI12.SNF	SVLI14.SNF	SVLI18.SNF
SVLI24.SNF	SVLI8.SNF	SY10.SNF	SY12.SNF
SY18.SNF	SY24.SNF	SY8.SNF	TE10.SNF
TE14.SNF	TE18.SNF	TE20.SNF	TE28.SNF
TE36.SNF	TEB10.SNF	TEB14.SNF	TEB18.SNF
TEB20.SNF	TEB28.SNF	TEB36.SNF	TEBDW10.SNF
TEBDW14.SNF	TEBDW18.SNF	TEBDWT10.SNF	TEBDWT14.SNF
TEBDWT18.SNF	TEBN10.SNF	TEBN14.SNF	TEBN18.SNF
TEBN20.SNF	TEBN28.SNF	TEBN36.SNF	TEBNT10.SNF
TEBNT14.SNF	TEBNT18.SNF	TEBNT20.SNF	TEBNT28.SNF
TEBNT36.SNF	TEBT10.SNF	TEBT14.SNF	TEBT18.SNF
TEBT20.SNF	TEBT28.SNF	TEBT36.SNF	TEBW10.SNF
TEBW14.SNF	TEBW18.SNF	TEBWT10.SNF	TEBWT14.SNF
TEBWT18.SNF	TEDW10.SNF	TEDW14.SNF	TEDW18.SNF
TEDWT10.SNF	TEDWT14.SNF	TEDWT18.SNF	TEGS10.SNF
TEGS14.SNF	TEN10.SNF	TEN14.SNF	TEN18.SNF
TEN20.SNF	TEN28.SNF	TEN36.SNF	TENT10.SNF
TENT14.SNF	TENT18.SNF	TENT20.SNF	TENT28.SNF
TENT36.SNF	TET10.SNF	TET14.SNF	TET18.SNF
TET20.SNF	TET28.SNF	TET36.SNF	TEW10.SNF
TEW14.SNF	TEW18.SNF	TEWT10.SNF	TEWT14.SNF

TEWT18.SNF	TIB10.SNF	TIB12.SNF	TIB14.SNF
TIB18.SNF	TIB24.SNF	TIB8.SNF	TIBI10.SNF
TIBI12.SNF	TIBI14.SNF	TIBI18.SNF	TIBI24.SNF
TIBI8.SNF	TII10.SNF	TII12.SNF	TII14.SNF
TII18.SNF	TII24.SNF	TII8.SNF	TIR10.SNF
TIR12.SNF	TIR14.SNF	TIR18.SNF	TIR24.SNF
TIR8.SNF	VARIABLE.SNF	XTREK.SNF	

Directory:\XSERVER\FONTS75

AVBK10.SNF	AVBK12.SNF	AVBK14.SNF	AVBK18.SNF
AVBK24.SNF	AVBK8.SNF	AVBKO10.SNF	AVBKO12.SNF
AVBKO14.SNF	AVBKO18.SNF	AVBKO24.SNF	AVBKO8.SNF
AVD10.SNF	AVD12.SNF	AVD14.SNF	AVD18.SNF
AVD24.SNF	AVD8.SNF	AVDO10.SNF	AVDO12.SNF
AVDO14.SNF	AVDO18.SNF	AVDO24.SNF	AVDO8.SNF
CO10.SNF	CO12.SNF	CO14.SNF	CO18.SNF
CO24.SNF	CO8.SNF	COB10.SNF	COB12.SNF
COB14.SNF	COB18.SNF	COB24.SNF	COB8.SNF
COBO10.SNF	COBO12.SNF	COBO14.SNF	COBO18.SNF
COBO24.SNF	COBO8.SNF	COO10.SNF	COO12.SNF
COO14.SNF	COO18.SNF	COO24.SNF	COO8.SNF
DME10.SNF	DME12.SNF	DME14.SNF	DME8.SNF
DMI10.SNF	DMI12.SNF	DMI14.SNF	DMI8.SNF
DMSY10.SNF	DMSY12.SNF	DMSY14.SNF	DMSY8.SNF
DWCURSOR.SNF	DWSESS.SNF	FIXED.SNF	FONTNAME.MAP
FONTS.ALI	HV10.SNF	HV12.SNF	HV14.SNF
HV18.SNF	HV24.SNF	HV8.SNF	HVB10.SNF
HVB12.SNF	HVB14.SNF	HVB18.SNF	HVB24.SNF
HVB8.SNF	HVBO10.SNF	HVBO12.SNF	HVBO14.SNF
HVBO18.SNF	HVBO24.SNF	HVBO8.SNF	HVO10.SNF
HVO12.SNF	HVO14.SNF	HVO18.SNF	HVO24.SNF
HVO8.SNF	IDME14.SNF	IDMI14.SNF	IDMSY14.SNF
LGBK10.SNF	LGBK12.SNF	LGBK14.SNF	LGBK18.SNF
LGBK24.SNF	LGBK8.SNF	LGBKO10.SNF	LGBKO12.SNF
LGBKO14.SNF	LGBKO18. SNF	LGBKO24.SNF	LGBKO8.SNF
LGD10.SNF	LGD12.SNF	LGD14.SNF	LGD18.SNF
LGD24.SNF	LGD8.SNF	LGDO10.SNF	LGDO12.SNF
LGDO14.SNF	LGDO18.SNF	LGDO24.SNF	LGDO8.SNF
MENU10.SNF	MENU12.SNF	NCSB10.SNF	NCSB12.SNF
NCSB14.SNF	NCSB18.SNF	NCSB24.SNF	NCSB8.SNF
NCSBI10.SNF	NCSBI12.SNF	NCSBI14.SNF	NCSBI18.SNF
NCSBI24.SNF	NCSBI8.SNF	NCSI10.SNF	NCSI12.SNF
NCSI14.SNF	NCSI18.SNF	NCSI24.SNF	NCSI8.SNF
NCSR10.SNF	NCSR12.SNF	NCSR14.SNF	NCSR18.SNF
NCSR24.SNF	NCSR8.SNF	PB1075.SNF	PB1275.SNF
PB1475.SNF	PB1875.SNF	PB2475.SNF	PB3675.SNF
PB4875.SNF	PB7275.SNF	PB875.SNF	SVD10.SNF
SVD12.SNF	SVD14.SNF	SVD18.SNF	SVD24.SNF
SVD8.SNF	SVDI10.SNF	SVDI12.SNF	SVDI14.SNF
SVDI18.SNF	SVDI24.SNF	SVDI8.SNF	SVL10.SNF
SVL12.SNF	SVL14.SNF	SVL18.SNF	SVL24.SNF
SVL8.SNF	SVLI10.SNF	SVLI12.SNF	SVLI14.SNF
SVLI18.SNF	SVLI24.SNF	SVLI8.SNF	SY10.SNF
SY12.SNF	SY14.SNF	SY18.SNF	SY24.SNF
SY8.SNF	TE14.SNF	TE18.SNF	TE28.SNF
TE36.SNF	TEB14.SNF	TEB18.SNF	TEB28.SNF
TEB36.SNF	TEBDW14.SNF	TEBDW18.SNF	TEBDWT14.SNF
TEBDWT18.SNF	TEBN14.SNF	TEBN18.SNF	TEBN28.SNF
TEBN36.SNF	TEBNT14.SNF	TEBNT18.SNF	TEBNT28.SNF
TEBNT36.SNF	TEBT14.SNF	TEBT18.SNF	TEBT28.SNF
TEBT36.SNF	TEBW14.SNF	TEBW18.SNF	TEBWT14.SNF
TEBWT18.SNF	TEDW14.SNF	TEDW18.SNF	TEDWT14.SNF
TEDWT18.SNF	TEGS14.SNF	TEGS18.SNF	TEN14.SNF
TEN18.SNF	TEN28.SNF	TEN36.SNF	TENT14.SNF

TENT18.SNF	TENT28.SNF	TENT36.SNF	TET14.SNF
TET18.SNF	TET28.SNF	TET36.SNF	TEW14.SNF
TEW18.SNF	TEWT14.SNF	TEWT18.SNF	TEN10.SNF
TEN14.SNF	TEN18.SNF	TEN20.SNF	TEN28.SNF
TEN36.SNF	TENT10.SNF	TENT14.SNF	TENT18.SNF
TENT20.SNF	TENT28.SNF	TENT36.SNF	TET10.SNF
TET14.SNF	TET18.SNF	TET20.SNF	TET28.SNF
TET36.SNF	TEW10.SNF	TEW14.SNF	TEW18.SNF
TEWT10.SNF	TEWT14.SNF	TEWT18.SNF	TIB10.SNF
TIB12.SNF	TIB14.SNF	TIB18.SNF	TIB24.SNF
TIB8.SNF	TIBI10.SNF	TIBI12.SNF	TIBI14.SNF
TIBI18.SNF	TIBI24.SNF	TIBI8.SNF	TII10.SNF
TII12.SNF	TII14.SNF	TII18.SNF	TII24.SNF
TII8.SNF	TIR10.SNF	TIR12.SNF	TIR14.SNF
TIR18.SNF	TIR24.SNF	TIR8.SNF	VARIABLE.SNF
XTREK.SNF			

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10X20.SNF	12X24.SNF	5X8.SNF	6X10.SNF
6X12.SNF	6X13.SNF	6X13B.SNF	6X9.SNF
7X13.SNF	7X13B.SNF	7X14.SNF	8X13.SNF
8X13B.SNF	8X16.SNF	9X15.SNF	9X15B.SNF
CURSOR.SNF	DWCURSOR.SNF	FONTNAME.MAP	FONTS.ALI

Directory:\XSERVER\FONTSOL

FONTNAME.MAP	OLCURSOR.SNF	OLG10.SNF	OLG12.SNF
OLG14.SNF	OLG19.SNF		

Directory:\XSERVER\KEYSYMS

IS84DBE.TXT	IS84DBE.XKS	IS84DCA.TXT	IS84DCA.XKS
IS84DDE	IS84DDE.XKS	IS84DDK.TXT	IS84DDK.XKS
IS84DES.TXT	IS84DES.XKS	IS84DFI.TXT	IS84DFI.XKS
IS84DFR.TXT	IS84DFR.XKS	IS84DIT.TXT	IS84DIT.XKS
IS84DLA.TXT	IS84DLA.XKS	IS84DNO.TXT	IS84DNO.XKS
IS84DPO.TXT	IS84DPO.XKS	IS84DSD.TXT	IS84DSD.XKS
IS84DSE.TXT	IS84DSE.XKS	IS84DSF.TXT	IS84DSF.XKS
IS84DUK.TXT	IS84DUK.XKS	IS84DUS.TXT	IS84DUS.XKS
IS84IBE.TXT	IS84IBE.XKS	IS84ICA.TXT	IS84ICA.XKS
IS84IDE.TXT	IS84IDE.XKS	IS84IDK.TXT	IS84IDK.XKS
IS84IES.TXT	IS84IES.XKS	IS84IFI.TXT	IS84IFI.XKS
IS84IFR.TXT	IS84IFR.XKS	IS84IIT.TXT	IS84IIT.XKS
IS84ILA.TXT	IS84ILA.XKS	IS84INO.TXT	IS84INO.XKS
IS84IPO.TXT	IS84IPO.XKS	IS84ISD.TXT	IS84ISD.XKS
IS84ISE.TXT	IS84ISE.XKS	IS84ISF.TXT	IS84ISF.XKS
IS84IUK.TXT	IS84IUK.XKS	IS84IUS.TXT	IS84IUS.XKS
ISENHDBE.TXT	ISENHDBE.XKS	ISENHDCA.TXT	ISENHDCA.XKS
ISENHDDE.TXT	ISENHDDE.XKS	ISENHDDK.TXT	ISENHDDK.XKS
ISENHDES.TXT	ISENHDES.XKS	ISENHDFI.TXT	ISENHDFI.XKS
ISENHDFR.TXT	ISENHDFR.XKS	ISENHDIT.TXT	ISENHDIT.XKS
ISENHDLA.TXT	ISENHDLA.XKS	ISENHDNE.TXT	ISENHDNE.XKS
ISENHDNO.TXT	ISENHDNO.XKS	ISENHDPO.TXT	ISENHDPO.XKS
ISENHDSD.TXT	ISENHDSD.XKS	ISENHDSE.TXT	ISENHDSE.XKS
ISENHDSF.TXT	ISENHDSF.XKS	ISENHDUK.TXT	ISENHDUK.XKS
ISENHDUS.TXT	ISENHDUS.XKS	ISENHIBE.TXT	ISENHIBE.XKS
ISENHICA.TXT	ISENHICA.XKS	ISENHIDE.TXT	ISENHIDE.XKS
ISENHIDK.TXT	ISENHIDK.XKS	ISENHIES.TXT	ISENHIES.XKS
ISENHIFI.TXT	ISENHIFI.XKS	ISENHIFR.TXT	ISENHIFR.XKS
ISENHIIT.TXT	ISENHIIT.XKS	ISENHILA.TXT	ISENHILA.XKS
ISENHINE.TXT	ISENHINE.XKS	ISENHINO.TXT	ISENHINO.XKS
ISENHIPO.TXT	ISENHIPO.XKS	ISENHISD.TXT	ISENHISD.XKS
ISENHISE.TXT	ISENHISE.XKS	ISENHISF.TXT	ISENHISF.XKS
ISENHIUK.TXT	ISENHIUK.XKS	ISENHIUS.TXT	ISENHIUS.XKS
LK250DCA.TXT	LK250DCA.XKS	LK250DDE.TXT	LK250DDE.XKS

LK250DDK.TXT	LK250DDK.XKS	LK250DES.TXT	LK250DES.XKS
LK250DFI.TXT	LK250DFI.XKS	lK250DFR.TXT	LK250DFR.XKS
LK250DIT.TXT	LK250DIT.XKS	lK250DNO.TXT	lK250DNO.XKS
LK250DSD.TXT	LK250DSD.XKS	LK250DSE.TXT	LK250DSE.XKS
LK250DSF.TXT	LK250DSF.XKS	LK250DUK.TXT	LK250DUK.XKS
LK250DUS.TXT	LK250DUS.XKS	LK250ICA.TXT	LK250ICA.XKS
LK250IDE.TXT	LK250IDE.XKS	LK250IES.TXT	LK250IES.XKS
LK250IFI.TXT	LK250IFI.XKS	LK250IFR.TXT	LK250IFR.XKS
LK250IIT.TXT	LK250IIT.XKS	LK250INO.TXT	LK250INO.XKS
LK250ISD.TXT	LK250ISD.XKS	LK250ISE.TXT	LK250ISE.XKS
LK250ISF.TXT	LK250ISF.XKS	LK250IUK.TXT	LK250IUK.XKS
LK250IUS.TXT	LK250IUS.XKS		

Directory:\XSERVER\REMOTE

IS84D.MVB	IS84I.MVB	ISENHD.MVB	ISENHI.MVB
LK250D.MVB	LK250I.MVB	MWM2B.RC	PCX_DECS.ULT
PCX_VAX.ULT	PCX_VAX.VMS	PCX_WINM.VMS	

F

Client Configuration Files

By responding to the Netsetup prompts, you provide information that Netsetup uses to create or edit the following client startup files:

Files	Location
CONFIG.SYS	Boot drive
AUTOEXEC.BAT	Boot drive
STARTNET.BAT	\DECNET
STOPNET.BAT	\DECNET
CFGWS.DAT	Boot drive

In addition, Netsetup can also create or modify the following files, depending on your replies:

Files	Location
DECNET.INI	\DECNET
DECNODE.DAT	\DECNET
DECOBJ.DAT	\DECNET
DECLAT.DAT	\DECNET
DECLAT.INI	\DECNET
DECPARM.DAT	\DECNET
EXECINFO.BAT	\DECNET
TEMPLATE.INI	\DECNET

This appendix describes each file.

During the boot procedure:

1. DOS reads the CONFIG.SYS file to set system options and load device drivers.

   The order in which CONFIG.SYS loads device drivers determines how DOS assigns drive identification codes.

2. DOS reads the AUTOEXEC.BAT file, which can run the STARTNET.BAT file.

3. The STARTNET.BAT file runs programs that set up the PC network connections.

CONFIG.SYS

The CONFIG.SYS file sets DOS configuration parameters for the PC. DOS parameters can specify the number of files that can be open at the same time or the number of buffers allowed on the client. The commands in the CONFIG.SYS file can load device drivers when the operating system starts.

You can save memory by lowering the values for buffers and files. Some applications require minimum values for buffers and files; for those minimum values, see the documentation for the application.

AUTOEXEC.BAT

The AUTOEXEC.BAT file runs automatically when the client boots and runs DOS programs and utilities. The file can include commands that run the STARTNET.BAT file.

Note

Any post-network startup commands must be placed after the ":end" statement. Putting network commands before the ":end" statement causes STARTNET to fail.

If you installed DOS Version 4.0 before your PATHWORKS client software, edit the CONFIG.SYS file that is on the boot disk to be sure you have adequate environment space. After installing the client software, edit the AUTOEXEC.BAT so the DOSSHELL command is after the :end statment.

STARTNET.BAT

The STARTNET.BAT file loads the PATHWORKS software that connects the client to the system file service.

STOPNET.BAT

The STOPNET.BAT file unloads the PATHWORKS software from client memory and stops the network.

CFGWS.DAT

The CFGWS.DAT file contains the information you provided when you last ran Netsetup to configure the client. When you modify a client profile, Netsetup reads the CFGWS.DAT from the boot media and uses the information in that file for the defaults displayed with the utility prompts.

The CFGWS.DAT file contains all the answers in the configuration session for the key disk being created. CFGWS.DAT is loaded by Netsetup if it is found on the boot device. CFGWS.DAT can also be loaded by using the F5 Netsetup key.

DECNET.INI

The DECNET.INI file provides input to NCP to modify DECNODE.DAT, DECOBJ.DAT, and DECPARM.DAT.

DECNODE.DAT

The DECNODE.DAT file is a server node definition file for an individual client containing binary data about the nodes on the network to which the client can connect.

DECOBJ.DAT

The DECOBJ.DAT file contains definitions for DECnet objects.

DECLAT.DAT

The DECLAT.DAT file contains all the LAT configuration information. It is maintained by LATCP.

DECLAT.INI

The DECLAT.INI file provides input to LATCP to modify DECLAT.DAT.

DECPARM.DAT

The DECPARM.DAT contains the node name and address of the client and the number of maximum links allowed to the client. The DECPARM.DAT file is copied from the server or client setup disks during configuration, and is modified with Netsetup.

EXECINFO.BAT

The EXECINFO.BAT file is used by STARTNET.BAT to set the workstation node name and address environment variables and to rerun STARTNET.BAT. EXECINFO.BAT is modified by the server when you create remote key disks using a template.

TEMPLATE.INI

The TEMPLATE.INI file is used to duplicate a key disk for a remote boot client, using the PCSA command ADD WORKSTATION/TEMPLATE. TEMPLATE.INI is a hidden file, located in the DECNET subdirectory. It is not shown when you use the DIRECTORY command; it is listed when you use the ATTRIBUTE *.* command.

G

Customizing Netsetup

Netsetup uses WIK (Write Key Disk) files to manage how client key disks are created. WIK files are simple interpretative programs that Netsetup uses to create or edit the following files:

- AUTOEXEC.BAT
- CONFIG.SYS
- PROTOCOL.INI
- STARTNET.BAT
- STOPNET.BAT
- DECNET.INI

You can edit the WIK file to control how Netsetup configures the clients in your network. For example, if you wanted all your clients to load a specific driver, you could edit the WIK file to write the correct line in each CONFIG.SYS file.

The default WIK file for the DECnet transport contains the following lines to control how Netsetup creates or modifies the client's CONFIG.SYS file:

```
$begin  CONFIG.SYS
buffers=8  ❶
files=20
$if strdif(LADLOAD,"N")   ! if LAD support desired
  device=\decnet\laddrv.sys /D:{LAD}  ❷
$end_if LADLOAD
.
.
.
$if (DECNET==1) || (ASYNCH==1)  ❸
  device=\decnet\nddrv.sys
  device=\decnet\npdrv.sys
$end_if DECNET
lastdrive=z
$if strequ(REDIRLOAD,"X") ❹ ! if redirector is loaded into XMS
  device=\decnet\hiMEM.sys     ! then add the HIMEM.SYS driver
$end_if REDIRLOAD
$end CONFIG.SYS
```

In the above example, the client's CONFIG.SYS file is modified as follows:

❶ Adds the lines:

```
buffers=8
files=20
```

❷ If LAD is loaded from Netsetup, adds the line:

```
device=\decnet\laddrv.sys /D: (LAD)
```

❸ If DECnet-DOS only or asynchronous connections are specified, adds the following device drivers:

```
device=\decnet\nddrv.sys
device=\decnet\npdrv.sys
```

❹ If the redirector (REDIR) is loaded into XMS by Netsetup, adds the following driver:

```
device=\decnet\himem.sys
```

Locating the WIK Files

The WIK files are located on both the PCSAV41 system file service and on the diskettes included with the software kit:

- Server

If you are running Netsetup from a PATHWORKS server, the following WIK files are on the PCSAV41 system file service:

- \DECNET\DNETWIK.V41 if you are using the DECnet transport
- \TCPIP\TCPIPWIK.V41 if you have installed TCP/IP software kit on the server

- Diskettes

  The WIK files are located on the following diskettes:

  - \DECNET\DNETWIK.V41 on the PWRKS V4.1 DNET TRANSPRT
  - \TCPIP\TCPIPWIK.V41 on the PWRKS V1.1A TCP/IP INITIAL

Customizing a WIK File

To create a customized WIK file:

1. Make a back-up copy of the Digital-supplied WIK files before you customize. Make sure to keep a copy of the original WIK file.

   Note

   WIK files are the only part of Netsetup a system administrator can customize. Before doing any customization you need to determine the configuration requirements of the clients in your network.

2. Using an editor, modify the WIK file appropriate for the network transport and method of running Netsetup.

   See *Client Commands Reference* for a list of WIK commands.

3. After editing the WIK file, save and exit.
4. Run Netsetup.

H

Using the FRBCON Program

One of the steps in preparing a Floppy Remote Boot (FRB) disk for a remote boot PC involves running the Floppy Remote Boot Configuration (FRBCON) program.

To use the FRBCON programs:

1. Boot the PC on which you plan to use Remote Boot.
2. Insert a copy of the FRB disk in drive A of the PC.
3. At the DOS prompt enter:

   ```
   A:\> FRBCON
   ```

   FRBCON displays:

   ```
   PATHWORKS Remote Boot configuration utility version 4.1
   Copyright (c) Digital Equipment Corporation, 1986,1987,1988,1989,1990,1991
   All Rights Reserved. Unpublished rights reserved under the copyright
   laws of the United States.

   Valid controllers are:  DEPCA, 3C503, 3C523,
   Enter type of ETHERNET Controller:
   ```

4. Enter type of Ethernet controller on the PC.

   FRBCON displays:

   ```
   Valid SCHEDULER switches are : S and H
   Enter SCHEDULER switch:
   ```

   The Scheduler (SCH) provides timing services and background multitasking under the DOS operating system. Select one of the two timing options:

- Hardware (H)

  The hardware timer uses hardware interrupt 08h.

  This selection helps solve certain timing problems with hardware components in the personal computer such as:

  - The keyboard on the IBM PS/2 Model 55SX
  - The simultaneous use of both asynchronous and Ethernet communication if the asynchronous communication uses IRQ 3 or IRQ 4

- Software (S)

  The software (or system) timer uses software interrupt 1Ch.

If you selected a DEPCA Ethernet controller, go to step 6.

5. 3Com controllers types prompt you for the following information:

   - The IRQ setting. The IRQ setting is usually 3 or 5.
   - The I/O base address. The I/O address is usually 300.
   - Whether you have a ThinWire network

CAUTION

Specifying ThinWire Ethernet cable when using standard Ethernet cable can cause damage to the Ethernet controller board.

DMA channel number: 1

   - The DMA channel number
   - The data transfer type

     FRBCON displays the following:

```
Valid data transfer types are:
  1 = DMS single byte mode
  2 = Programmed I/O loop
  3 = DMS demand mode (usually for 8086 class machines)
  4 = Programmed I/O using Rep instructions (usually for
      80186, 80286, and 80386 class machines)
  5 = Allow software to select mode
```

6. **Read hardware address? Enter Y or N:**

   You need the Ethernet controller hardware address for each PC to create a remote boot PC profile.

   The Ethernet controller card must be installed for the Ethernet controller hardware address to be displayed.

   - If the Ethernet controller is installed, enter Y.

     The hardware address is displayed, as shown in the following example:

     ```
     DEPCA Hardware Address is  08-00-2B-99-99-23
     ```

   - Write down the hardware address. You need it to respond to the Netsetup prompts.

7. Leave the customized copy of the FRB disk at the PC.

I

Error Messages

This appendix lists:

- DOSLOAD error messages
- Netsetup error messages and error codes
- Remote boot error messages

The following information is presented for each message:

- The message displayed by the utility
- An explanation of the message, where appropriate
- How to correct the error

DOSLOAD Messages

A directory called <dirname> already exists on the system service offered on <servername>.

Explanation: You tried creating a directory using an existing directory name.

User Action: Reenter a valid unique name for the DOS subdirectory, or select a different server. See Chapter 5 for naming conventions.

All questions have not been answered yet. Please finish answering questions.

Explanation: You tried to perform a DOSLOAD function without supplying all the required information.

User Action: Enter all required information and try again.

Disk not ready error on drive A:

Explanation: The diskette is not in the drive or the drive door is not closed.

User Action: Make sure you have correctly inserted the diskette and closed the drive door.

DOS directory name <dirname> already in use; please supply a different name

Explanation: You tried to create a new directory, using the same name as an existing directory.

User Action: Reenter a valid, unique name for the DOS subdirectory. See Chapter 5 for conventions for naming DOS subdirectories.

DOS directory name must be 1 to 8.3 alphanumeric characters

Explanation: You entered an invalid DOS subdirectory name.

User Action: Reenter a subdirectory name of at least 1 and not more than 8 characters plus a 3 character extension; for example, LONGNAME.DOS. See Chapter 5 for conventions for naming DOS subdirectories.

DOS directory <dirname> could not be removed.

Explanation: DOSLOAD could not delete the specified directory on the server.

User Action: Check the server file protection of the subdirectory on the server. Check that the account used to connect to the system service has delete privileges for the system service.

Enter a number between 1 and 99

Explanation: When asked to enter the number of DOS source diskettes, you entered a non-numeric character, or a number outside the range of 1 to 99.

User Action: Reenter the number of DOS source diskettes you have.

Error accessing DOSLOAD help file.

Explanation: DOSLOAD could not find the help text in the help file or could not find the help text file.

User Action: Press Return to continue. DOSLOAD looks for \DECNET\DLHELP.TXT on the drive indicated by the _SYSD environment variable.

Error connecting to %s

Explanation: The DOSLOAD utility could not connect to the server for one of the following reasons:

- The server is not available.
- The server does not have a PCSAV41 service available.
- The workstation is not correctly configured to make the connection to the server.
- There are problems with the network.

User Action: Check that:

- The server is running.
- Check the server for a PCSAV41 service.
- You configured the workstation correctly. If necessary, rerun the Netsetup utility to reconfigure the workstation.

- The network is running successfully. If necessary, use the PCSA Troubleshooting V4.1 diskette to diagnose the problem.

  For more information on using the PCSA Troubleshooting V4.1 diskette, see the *Network Troubleshooting Guide.*

Error copying to PCSA Information file on system service.

Explanation: When deleting a DOS from the server, DOSLOAD makes a backup of PCSAINFO.DAT called PCSAINFO.BAK before it removes the record for the DOS that it has just deleted. DOSLOAD could not complete the operation.

User Action: Check that:

- The server is running.
- The network is running successfully.
- There is enough disk space on the server to copy the file.

If the error message persists, connect to the server with read/write privileges and copy PCSAINFO.TMP to PCSAINFO.DAT.

Error creating boot block file \<DOSDIRNAME>\BOOTBLOCK.DAT

Explanation: DOSLOAD could not create the DOS boot block on the server.

User Action: Check that:

- The server is running.
- The account used to connect to the PCSAV41 system service has write privileges.
- The system disk is installed and mounted.
- You have correctly configured the workstation. If necessary, rerun the Netsetup utility to reconfigure the workstation.
- The network is running successfully. If necessary, use the PCSA Troubleshooting V4.1 diskette to diagnose the problem.

  For more information on using the PCSA Troubleshooting V4.1 diskette, see the *Network Troubleshooting Guide.*

Error creating directory on File Service.

Explanation: DOSLOAD could not create the specified directory on the system file service.

User Action: Check that:

- The server is running.
- The account used to connect to the PCSAV41 system service has write privileges.
- The system disk is installed and mounted.
- You have correctly configured the workstation. If necessary, rerun the Netsetup utility to reconfigure the workstation.
- The network is running successfully. If necessary, use the PCSA Troubleshooting V4.1 diskette to diagnose the problem.

  For more information on using the PCSA Troubleshooting V4.1 diskette, see the *Network Troubleshooting Guide.*

Error creating temporary data file <filename>

Explanation: DOSLOAD could not create PCSAINFO.TMP while trying to delete a DOS on the server.

User Action: Check that:

- The server is running.
- There are no problems with the network.
- You are using an account with read/write privileges.
- There is enough disk space on the server.

Use DOSLOAD to recreate the DOS directory, copy one file into that directory and try deleting it again.

Error deleting directory <dirname>

Explanation: DOSLOAD could not delete the specified directory on the server.

User Action: Check the directory's file protection on the server.

Error deleting file(s) <dirname>

Explanation: DOSLOAD could not delete all the files in the specified DOS directory on the server.

User Action: Check that the DOS directory and the files in the DOS directory have the proper file protection. Also check the server to see if the file is locked by another user.

Error making path %s

Explanation: The server ran out of disk space while DOSLOAD was creating a DOS directory, or the account used to connect to the system service does not have write privileges.

User Action: Check the available disk space on the server and delete files as necessary. Rerun DOSLOAD and try again.

Error: Not enough memory for file copy buffer.

Explanation: Your client has no available memory.

User Action: Stop all unnecessary applications, such as terminal emulation, to free client memory. Once this is done, re-start DOSLOAD and try again.

Error opening PCSA Information file on system service.

Explanation: DOSLOAD could not find PCSAINFO.DAT on the file service.

User Action: Use the ATTRIB command supplied in the \DOSENH directory to check the root of the system service for PCSAINFO.DAT and PCSAINFO.BAK. Copy PCSAINFO.BAK to PCSAINFO.DAT. Make sure a copy of PCSAINFO.DAT is on the root directory of the file service. If you do not have a copy of PCSAINFO.DAT you must reinstall PATHWORKS for DOS.

Error reading DOS boot block from drive <drive>

Explanation: DOSLOAD could not read the DOS boot block from the disk in the indicated disk drive.

User Action: Make sure that you have the correct DOS disk in the drive. DOSLOAD requires the first disk to be bootable and contain the hidden system files.

Error reading file <filename>

Explanation: DOSLOAD could not read indicated file.

User Action: Exit DOSLOAD and make sure the client's network connections are still valid. Re-run DOSLOAD. If the error persists, the file may be corrupt.

Error searching for DECnet path

Explanation: The DOSLOAD utility could not connect to the server.

User Action: Check that:

- If you booted from a diskette, insert the boot diskette into the drive and try again.
- The server is running.
- You have correctly configured the workstation. If necessary, rerun the Netsetup utility to reconfigure the workstation.
- The network is running successfully. If necessary, use the PCSA Troubleshooting V4.1 diskette to diagnose the problem.

  For more information on using the PCSA Troubleshooting V4.1 diskette, see the *Network Troubleshooting Guide.*

Error setting attributes on file <filename>

Explanation: DOSLOAD could not set the attributes on the file it was copying to the DOS directory on the server.

User Action: Check the source file attributes and set the destination file attributes from the DOS command line.

Error spawning DOS from COMSPEC environment variable.

Explanation: The COMMAND.COM pointed to by COMSPEC is invalid.

User Action: Use a valid COMMAND.COM file before running DOSLOAD.

Error opening file <filename>

Explanation: DOSLOAD could not find the file.

User Action: First, make sure you have the proper floppy in the drive. Verify that the file is on the distribution kit or on the system file service. If the file is not there, you must reinstall PATHWORKS for DOS.

Error writing boot block to \<dirname>\bootblock.dat

Explanation: DOSLOAD could not write the DOS boot block on the server.

User Action: Check that:

- The account has write privileges on the system service.
- The server is running.
- The system disk is installed and mounted.
- You have correctly configured the workstation. If necessary, rerun the Netsetup utility to reconfigure the workstation.
- The network is running successfully. If necessary, use the PCSA Troubleshooting V4.1 diskette to diagnose the problem.

  For more information on using the PCSA Troubleshooting V4.1 diskette, see the *Network Troubleshooting Guide.*

Error writing file <filename>

Explanation: DOSLOAD could not write the file to the directory on the server.

User Action: Check that:

- There is sufficient disk space on the server.
- You are using an account with read/write privileges.

Error writing to PCSA Information file on system service.

Explanation: DOSLOAD could not write the file to the directory on the server.

User Action: Check that:

- There is sufficient disk space on the server.
- You are using an account with read/write privileges.

Fatal system error: out of memory

Explanation: Your workstation has no available memory.

User Action: Check that you are not using terminal emulation. If you are:

1. Exit from the terminal emulation session.
2. Start the DOSLOAD utility again.

No such directory: <dirname>

Explanation: The name you supplied does not match any DOS directories on the server.

User Action: Check the directory name and try again.

Node name must be all letters and numbers

Explanation: You entered an invalid node name that contains characters other than letters and/or numbers.

User Action: Reenter the node name, making sure it consists of only letters and numbers. The node name must contain at least one letter.

Node name must contain at least one letter

Explanation: You entered an invalid node name.

User Action: Reenter the node name, making sure it contains at least one letter.

Privileged account and password needed to delete a DOS.

Explanation: You tried deleting a DOS directory from a server account without answering account name and password questions.

User Action: Make sure the server account you are using has the proper privileges or retry the operation using a server account with the correct privileges.

Write-protected disk in drive <drive>:

Explanation: The diskette you inserted in the drive is write protected.

User Action: Remove the write-protect tab from the diskette. Insert the diskette and start the DOSLOAD utility again.

Enhanced LANMAN Redirector detected: DOSLOAD cannot make connections with USERNAME and PASSWORD.

Explanation: Unlike the basic Redirector, the enhanced Redirector cannot use a username and password when connecting.

User Action: If you have set up your system service to allow the PC to connect with write privileges without a username and password, then continue and leave the account and password fields blank when asked. Otherwise, you must reconfigure your PC using Netsetup to select the basic Redirector.

Network connection manager error: <error message>

Explanation: DOSLOAD encountered an error while making a call to USELIB.

User Action: Read the error message for a description of how to solve the problem.

Error reading <drive>:\<filename>
DOSLOAD cannot load DOS from this disk.

Explanation: DOSLOAD allows you to select any drive connected to your PC as a source for DOS. DOSLOAD checks for DOS hidden system files that are required to boot from the drive. This error indicates that the hidden files were not found.

User Action: Select a different drive, or insert a bootable diskette and select that drive.

Netsetup Error Messages

This section lists Netsetup error messages and error codes.

Error Messages

ADD WORKSTATION process is not complete until you validate the workstation profile and write the key disk.

User Action: Review all the fields on the workstation profile screen for accuracy and completeness. Enter correct data for any fields that are blank or filled in with ?????? or #####.

BAPI can not be selected without first loading TELNET.

Explanation: You tried loading TELNET into client memory without also loading BAPI.

User Action: Load BAPI before loading TELNET.

Can not connect to LAD because its maximum connections would be exceeded

Explanation: The Netsetup utility attempted to connect to a network key disk to which another workstation is already connected.

User Action: If the network key disk you specified is correct, disconnect the other workstation from the network key disk. (The name of the network key disk is the hardware address for the Ethernet controller.)

Could not allocate 4096 bytes for copying PROTOCOL.INI file.

Explanation: There is not enough available memory to create a 4096 bytes buffer.

User Action: Exit Netsetup and check the PC's memory status and free any available memory. Restart Netsetup.

Could not create AUTOEXEC.BAT

Explanation: Netsetup could not create the AUTOEXEC.BAT file on the client's key disk.

User Action: Check for enough disk space on the key disk and make sure the key disk is not write protected.

Could not create CONFIG.SYS

Explanation: Netsetup could not create the CONFIG.SYS file on the client's key disk.

User Action: Check for enough disk space on the key disk and check to make sure the key disk is not write protected.

Could not open *file name*

Explanation: Netsetup could not find the file.

User Action: First, make sure you have the proper floppy in the drive. Verify that the file is on the distribution kit or on the system file service. If the file is not there, you must reinstall PATHWORKS for DOS.

Could not read from *file name*

User Action: Exit Netsetup and make sure the network connections are still valid. Re-start Netsetup. If the error persists, the file may be corrupt.

ERROR %u: %s Could not connect to LAD \\%s\%s

User Action: Make sure:

- The server is running.
- The network is running successfully.

See the following sections for a list of error codes.

ERROR %d: %s Unable to connect to system service \\%s\PCSAV41. Press F4 to DOS, F7 to cancel attempts, any other key will retry.

User Action: Make sure:

- The server is running.
- The network is running successfully.

See the following sections for a list of error codes.

ERROR %d: %s Unable to disconnect drive A: from \\%s\PCSAV41
Press F4 to DOS, F7 to cancel attempts, any other key will retry.

Explanation: Netsetup was unable to disconnect the network link, because the network link was already disconnected.

User Action: If you have finished using Netsetup, ignore this message. Otherwise, make sure the file server is running.

Enter password for network key disk %s

Explanation: You attempted to connect to an existing network key disk that has a password.

User Action: At the prompt, enter the password.

Error connecting to server %s

Explanation: The DOSLOAD utility could not connect to the server for one of the following reasons:

- The server is not available.
- The workstation is not correctly configured to make the connection to the server.
- There are problems with the network.

User Action: Check that:

- The server is running.
- You configured the workstation correctly. If necessary, rerun the Netsetup utility to reconfigure the workstation.
- The network is running successfully. If necessary, use the PCSA Troubleshooting V4.1 diskette to diagnose the problem.

  For more information on using the PCSA Troubleshooting V4.1 diskette, see the *Network Troubleshooting Guide*.

For workstations that do not have an LK250 keyboard, NETSETUP is unable to set the country specific keymap.

Explanation: The information you entered in the Country field on the workstation profile screen does not apply for the workstation hardware configuration.

User Action: Press any key to continue.

Imbedded spaces are not allowed.

Explanation: You entered an invalid name format.

User Action: Reenter the name without spaces.

Insufficient information to be able to write a key disk.

Explanation: The Netsetup utility is unable to write a key disk, because the information provided is not sufficient.

User Action: At the workstation profile screen, make sure that the following information is supplied:

- Server node name and node address
- Workstation node name and node number
- Destination drive, if you are configuring for local boot
- DOS subdirectory name, if you are configuring for remote boot

INT 21 ERROR #%X while setting attributes of file

Explanation: A hardware error occurred while setting the file attributes.

User Action: Exit from Netsetup. If the error occurred on a floppy drive, try re-seating the drive. If the error persists, you may have to reformat the media generating the error.

INT 25 ERROR #%X while reading boot block from *drive:*

Explanation: A hardware error occurred while reading the boot block.

User Action: Exit from Netsetup. If the error occurred on a floppy drive, try re-seating the drive. If the error persists, you may have to reformat the media generating the error. If the error occurred while using a LAD drive, check to make sure the network connections are still valid.

INT 25 ERROR #%X while reading first sector of FAT from *drive:*

Explanation: A hardware error occurred while setting the file attributes.

User Action: Exit from Netsetup. If the error occurred on a floppy drive, try re-seating the drive. If the error persists, you may have to reformat the media generating the error.

INT 26 ERROR #%X while writing first sector of FAT to drive *drive:*

Explanation: A hardware error occurred while setting the file attributes.

User Action: Exit from Netsetup. If the error occurred on a floppy drive, try re-seating the drive. If the error persists, you may have to reformat the media generating the error.

INT 26 ERROR #%X while writing sector *number* to drive *drive:*

Explanation: A hardware error occurred while setting the file attributes.

User Action: Exit from Netsetup. If the error occurred on a floppy drive, try re-seating the drive. If the error persists, you may have to reformat the media generating the error.

MODIFY WORKSTATION process is not complete until you validate the workstation profile and write the key disk.

User Action: Review all the fields on the workstation profile screen for accuracy and completeness. Enter correct data for any fields that are blank or filled in with ?????? or #####.

NETSETUP can not find an available LAD disk device. You must run NETSETUP with at least one LAD drive available when configuring for remote boot. You may shell to DOS and disconnect from a LAD drive.

Explanation: All available LAD drives are in use.

User Action: Press F4 to shell to DOS and disconnect from one of the LAD drives. Return to Netsetup and continue with the configuration.

NETSETUP is unable to connect to the LAD associated with remote-boot workstation *name* on server *name*. Therefore it is presently impossible to modify this workstation.

Explanation: The Netsetup utility must connect to the network key disk before it can remove the workstation.

User Action: Make sure that the server is running and that the network is running successfully.

For information on diagnosing network problems, see the *Network Troubleshooting Guide*.

NETSETUP is unable to connect to the network key disk [Ethernet controller hardware address]. Therefore, it is presently impossible to remove the workstation.

Explanation: The Netsetup utility must connect to the network key disk before it can remove the workstation.

User Action: Make sure that the server is running and that the network is running successfully.

For information on diagnosing network problems, see the *Network Troubleshooting Guide.*

Node *name* is already registered for remote boot on server *name.*

Explanation: You tried adding a remote boot client already registered for remote boot on this server.

User Action: If you wish to change the remote boot information for this client, use the Modify option in Netsetup.

Node %s is registered but LAD is not offered on server %s. Now trying to mount the disk.

Explanation: You tried adding a remote boot client already registered for remote boot on this server.

User Action: If you wish to change the remote boot information for this client, use the Modify option in Netsetup.

No workstation configuration file found on LAD. NETSETUP needs to know what Ethernet controller type the old adapter was.

Explanation: The Netsetup utility could not find the CFGWS.DAT file when you tried to modify a network key disk or change an Ethernet controller.

User Action: Make sure you entered the correct hardware address for the Ethernet controller. If the hardware address was correct, the network key disk does not exist. Answer the prompts according to the instructions in Chapter 7.

Once a remote-boot workstation has been created you may not change the size of its LAD drive.

Explanation: You tried modifying the size of an existing network key disk.

User Action: If you want to modify the network key disk size, delete the remote boot client and re-add it using the desired network key disk size.

On workstations that do not have a 3Com 3C503 Ethernet controller, the IRQ number is not applicable.

Explanation: The information you entered in the IRQ number field on the workstation profile screen does not apply for the workstation hardware configuration.

User Action: Press any key to continue.

On workstations that do not have a 3Com 3C503 Ethernet controller, the wire type is not applicable.

Explanation: The information you entered in the Wire type field on the workstation profile screen does not apply for the workstation hardware configuration.

User Action: Press any key to continue.

Source file is same as destination file. Press F7 to cancel copying. F10 to abort. Press any other key to continue successive copies.

Explanation: You are either running Netsetup from the same drive as the key disk or you are in a \DECNET or \TCPIP subdirectory and there is a WIK file present.

User Action: Run Netsetup from a different drive.

The hardware address *number* is already being used by node *name* on server *name*.

Explanation: The hardware address of the Ethernet card is already associated with a client registered for remote boot.

User Action: Verify that the hardware address you supplied is correct. If it is not correct, enter your correct hardware address and add the PC with Netsetup again. If the hardware address is correct, either your PC is already registered for remote boot or another PC is using your address.

The node number, *number*, you entered is already in use by remote-boot workstation *name*.

Explanation: You tried creating a remote boot client using an existing node number.

User Action: Reenter a valid node number.

There is another node currently connected to the LAD *name* for node *name*. If you wish to cancel connecting to this service then press F7. Any other key will dismount the LAD and remount it so that NETSETUP can connect. If you do this any password of read/only access will be cleared.

Explanation: A LAD drive can only be accept one read/write connection at a time. The LAD drive you are trying to access already has a read/write connection.

User Action: F7 cancels the operation. Any other key breaks all connections to the LAD drive and mounts it for the Netsetup operation.

There was an error while trying to create/modify the *file name* on the key disk. To abort the WRITE KEY DISK procedure press F7. To shell to DOS press F4. Any other key will continue the WRITE KEY DISK procedure.

Explanation: Netsetup could not create/modify the CONFIG.SYS file on the key disk. This is due to either lack of disk space or the disk was write protected.

User Action: Either cancel the operation by pressing F7 or by shelling to DOS by pressing F4. Check the disk protection and delete unnecessary files to create more disk space.

This field requires only numeric input.

Explanation: You attempted to enter a character other than a number or a decimal point.

User Action: Enter a numeric response.

This option can not be selected when the workstation does not support EMS.

Explanation: You selected an option that requires EMS.

User Action: Press any key to continue.

This option can not be selected when the workstation does not support XMS.

Explanation: You selected an option that requires XMS.

User Action: Press any key to continue.

The floppy in drive %c: is not freshly formatted.

Explanation: Netsetup found existing files when trying to create an FRB disk.

User Action: Use the FORMAT command to reformat the disk (no system, no label).

Unable to add remote-boot workstation.

Explanation: Netsetup was not able to add the remote boot client on the server.

User Action: Use Advanced mode to see all messages returned from the server. Use these messages to diagnose the problem.

Unable to allocate memory for boot block copy.

Explanation: There is not enough available memory on the client to copy the boot block.

User Action: Exit Netsetup, check the PC's memory status, and free any available memory. Restart Netsetup.

Unable to allocate memory for disk scan.

Explanation: There is not enough available memory on the client to read information needed to add a remote boot workstation from the LAD drive.

User Action: Exit Netsetup, check the PC's memory status, and free any available memory. Restart Netsetup.

Unable to allocate for quick copy.

Explanation: There is not enough available memory on the client for the copy.

User Action: Exit Netsetup and check the PC's memory status and free any available memory. Restart Netsetup.

Unable to append to *file*

Explanation: Netsetup is unable to find the file to be able to append to it.

User Action: Exit Netsetup. First make sure you have the correct floppy in the correct drive. Verify that the file is in the directory from which Netsetup is being run. If the file is not there you must reinstall.

Unable to close file *file*

Explanation: Netsetup could not close the file. This is due to either lack of disk space or the disk was write protected.

User Action: Either cancel the operation by pressing F7 or by shelling to DOS by pressing F4. Check the disk protection and delete unnecessary files to create more disk space.

Unable to copy DNETWIK.V41 therefore the key disk can not be written.

Explanation: Netsetup could not find the WIK file. The WIK file is required to write the key disk.

User Action: Make sure a copy of DNETWIK.V41 is in your default directory or in the \DECNET directory on the drive from which Netsetup is run. If DNETWIK.V41 is not present, you must reinstall PATHWORKS for DOS.

Unable to copy TCPIPWIK.V41 therefore the key disk can not be written.

Explanation: Netsetup could not find the WIK file. The WIK file is required to write the key disk.

User Action: Make sure a copy of TCPIPWIK.V41 is in your default directory or in the \TCPIP directory on the drive from which Netsetup is run. If TCPIPWIK.V41 is not present, you must reinstall PATHWORKS for DOS.

Unable to create backup file

Explanation: Netsetup could not create the file. This is due to either lack of disk space or the disk was write protected.

User Action: Either cancel the operation by pressing F7 or by shelling to DOS by pressing F4. Check the disk protection and delete unnecessary files to create more disk space.

Unable to create CFGWS.DAT

Explanation: Netsetup could not create the CFGWS.DAT file on the client's boot media. This is due to either lack of disk space or the disk was write protected.

User Action: Either cancel the operation by pressing F7 or by shelling to DOS by pressing F4. Check the disk protection and delete unnecessary files to create more disk space.

Unable to disconnect drive A: from \\%s\PCSAV41

Explanation: Netsetup was unable to disconnect the network link, because the network link was already disconnected.

User Action: If you have finished using Netsetup, ignore this message. If you need to continue using Netsetup, make sure the server is running.

Unable to modify remote-boot workstation.

Explanation: The Netsetup utility could not find the CFGWS.DAT file when you tried to modify a network key disk or change an Ethernet controller.

User Action: Make sure you entered the correct hardware address for the Ethernet controller. If the hardware address was correct, the network key disk does not exist. Answer the prompts according to the instructions in Chapter 7.

Unable to obtain the server node name from network. Please provide this information in the next question.

Explanation: The server node name and node address is required for remote boot.

User Action: Press any key. Then, at the prompt, enter the DECnet node name and node address for the server.

Unable to open *name* for reading.

Explanation: Netsetup is unable to find the file.

User Action: Exit Netsetup. First make sure you have the correct floppy in the correct drive. Verify that the file is in the directory from which Netsetup is being run. If the file is not there you must reinstall.

Unable to open *name* for writing.

Explanation: Netsetup is unable to find the file.

User Action: Exit Netsetup. First make sure you have the correct floppy in the correct drive. Verify that the file is in the directory from which Netsetup is being run. If the file is not there you must reinstall.

Unable to read 512 bytes from FBOOT.BIN

Explanation: Netsetup was unable to read the boot block located on the file server.

User Action: Make sure the network connect to the server is still valid. Also make sure FBOOT.BIN is located on the file server.

Unable to read from file *name*

Explanation: Netsetup is unable to read from the file.

User Action: Exit Netsetup. First make sure you have the correct floppy in the correct drive. Verify that the file is in the directory from which Netsetup is being run. If the file is not there you must reinstall.

Unable to remove remote-boot workstation *name* from server *name*.

Explanation: Netsetup was not able to remove the remote boot client from the server.

User Action: Use Advanced mode to see all messages returned from the server. Use these messages to diagnose the problem.

Unable to write to file *file name*

Explanation: Netsetup could not write the *file name*.

User Action: Check for enough disk space on the key disk and check to make sure the key disk is not write protected.

Unable to verify that the remote-boot workstation was actually added.

Explanation: Netsetup was unable to verify that the client was added on the server.

User Action: Exit from Netsetup. Make sure the network connection to the server is still valid. Re-establish the network connection if it has failed. Re-run Netsetup and if you can modify the remote boot LAD for this client, then it has been successfully added. If you cannot use Netsetup to modify the remote boot client, use the **SHOW WORKSTATION** command from PCSA Manager Menu on the server to see if the client was added. If the remote boot client was not added, try adding it again with Netsetup.

Unable to verify that the remote-boot workstation was actually removed.

Explanation: Netsetup was unable to verify that the client was removed from the server.

User Action: Exit from Netsetup. Make sure the network connection to the server is still valid. Re-establish the network connection if it has failed. Re-run Netsetup and try to modify the remote boot LAD you just removed. If the LAD is still present, use Netsetup to remove it. If the LAD is not present, use the **SHOW WORKSTATION** command from PCSA Manager Menu on the server to see if the client was removed. If the remote boot client was not removed, try removing it again with Netsetup.

You may not add that workstation because it is already registered for remote-boot on this server.

Explanation: You tried adding a remote boot client already registered for remote boot on this server.

User Action: If you wish to change the remote boot information for this client, use the Modify option in Netsetup.

You must have a preformatted DOS system diskette or hard disk partition prepared before you start writing a key disk.

Explanation: You tried creating a key disk on a non-system disk or hard disk partition.

User Action: Make sure the key disk is bootable. See your DOS documentation for making a bootable disk or hard disk partition.

Error Codes

In this section:

- Table I–1 describes the error code ranges.
- Table I–2 lists Netsetup error codes and associated messages.

Table I–1 Error Code Ranges

Range	Description
Errors 1-89	DOS extended error codes. These are normal DOS error codes and messages and are detailed in the MS-DOS Programmer's Reference. Only errors that occur in the PATHWORKS for DOS library functions are listed. You should consult your reference manual for errors not shown below. The NETnnn: prefix on the message strings in the DOS error class are provided for clarity only. These prefixes are not included in the actual message strings within the library.
Errors 90-109	LAD error codes. These errors are only generated by the LAD functions in the library. Any error codes not listed are reserved for future use.
Errors 110-189	NETBIOS error codes. These errors are generated by the RMI functions in the library on internal calls made to the session layer.
Errors 190-202	DEC Session error codes. These errors are generated by the RMI functions in the library.
Errors 203-250	USE library error codes. These error codes can be returned by any library function and are the most common errors. Any error codes not listed are reserved for future use.

Table I–2 Error Codes

Number	Message Text
1	Invalid function number
11	Invalid format
13	Invalid data
15	Invalid drive
50	NET809: Network request not supported
51	NET801: Remote computer not listening
52	NET802: Duplicate name on network
53	NET803: Network name not found
54	NET804: Network busy
55	NET805: Network device no longer exists
56	NET806: Network command limit exceeded
57	NET807: Network adapter hardware failure

(continued on next page)

Table I–2 (Cont.) Error Codes

Number	Message Text
58	NET808: Incorrect response from network
59	NET810: Unexpected network error
60	NET811: Incompatible remote adapter
61	NET812: Print queue full
62	NET813: Not enough space for print file
63	NET814: Print file was deleted
64	NET815: Network name was deleted
65	NET816: Network access denied
66	NET817: Network device type incorrect
67	NET818: Network name not found
68	NET819: Network name limit exceeded
69	NET820: Network session limit exceeded
70	NET821: Sharing temporarily paused
71	NET823: Network request not accepted
72	NET822: Print or disk redirection is paused
84	Too many redirections
85	Duplicate redirection
86	Invalid service or password
87	Invalid parameter
88	NET825: Network data fault
90	Service not available
91	Service is read-only
92	Connection was rejected
93	Maximum connections exceeded
94	LAD resource error
95	Server error
96	Server timeout error
97	Bad data received
98	Bad disk format

(continued on next page)

Table I–2 (Cont.) Error Codes

Number	Message Text
110	Illegal buffer length
112	Illegal command
114	Command timeout
115	Message incomplete
117	Session number out of range
118	Resource unavailable
119	Session closed
120	Command canceled
122	Duplicate name in local name table
123	Name table full
124	Name has active session; de-registered
126	Local session table full
127	Session open rejected by host
128	Illegal name number
129	Name not found or did not answer
130	Name not found or invalid
131	Name in use
132	Name deleted
133	Session aborted
134	Name conflict detected
135	Unexpected protocol packet error
142	Interface busy
143	Too many commands outstanding
144	Invalid LANA number
145	Command completed during cancel
146	Command not valid to cancel
178	Interface failure
190	Remote adapter table full
191	Duplicate node name

(continued on next page)

Table I–2 (Cont.) Error Codes

Number	Message Text
192	Duplicate node number
193	Node name not found
194	Node number not found
195	No valid entry at index
196	Index out of range
197	Illegal function
198	Out of resource
199	Cannot delete own node
200	Buffer length too small
201	No remote adapter table
203	Library not initialized
204	Bad error code
205	Redirector is not installed
206	LAD is not installed
207	Unsupported DOS version
208	Unsupported PCSA version
209	Session is not installed
210	Datalink is not installed
211	DECnet is not installed
212	Illegal character
213	Illegal length
214	Illegal format
215	Missing required item
216	Illegal device
217	Illegal node
218	Illegal service
219	Illegal username
220	Illegal password
221	Illegal directory

(continued on next page)

Table I–2 (Cont.) Error Codes

Number	Message Text
222	Device is not connected
223	Device is connected
224	Device is in use
225	Device is not in use
226	No available devices
227	Null pointer assignment
228	Large media requires DOS 4.0 or above
229	Information not available
233	LADDRV is not installed
234	Inappropriate device type

Remote Boot Error Messages

Access denied

Explanation: A connection could not be made to your remote boot LAD disk.

User Action: Make sure that another user is not connected to your remote boot LAD disk and that the LAD does not require a password.

Cannot boot local disk

Explanation: The disk drive you are trying to boot from cannot be read properly or does not contain valid DOS system files.

User Action: Make sure that the disk drive that you are trying to boot from contains a valid system disk. The disk must be a DOS bootable device and contain the DOS system files.)

Cannot find XXXXX.EXE file. (Where XXXXX is: DEPCA, 3C503 or 3C523)

Explanation: The floppy remote boot diskette cannot find the datalink file for your Ethernet card. The floppy remote boot diskette is damaged or was not created correctly.

User Action: Create a new floppy remote boot diskette.

Cannot load Datalink.

Explanation: The Ethernet card that is being used does not match the Ethernet card that was selected via the FRBCON program.

User Action: Re-run the FRBCON program and select the Ethernet card that is installed in your PC.

CONFIG.DAT file is in the wrong format:

Explanation: The CONFIG.DAT file is corrupt.

User Action: Re-run the FRBCON program to re-create the CONFIG.DAT file.

Data corruption detected, can not continue...

Explanation: The .TSK image has been corrupted and is unusable.

User Action: Contact your system administrator and report the .TSK image has been corrupted.

Error initializing LAST XX (where XX is an error code). Hit any key to attempt local boot.

Explanation: A problem was encountered when LAST was being initialized.

User Action: There is a problem with the .TSK file. Report this problem to your Digital representative.

Error reading configuration file.

Explanation: The CONFIG.DAT file on the floppy remote boot diskette cannot be read. The floppy remote boot diskette may be damaged.

User Action: Re-run the FRBCON program to re-create the CONFIG.DAT file. If the error still occurs the floppy remote boot diskette must be damaged. You must create a new floppy remote boot diskette and run the FRBCON program.

Error reading Datalink file.

Explanation: The datalink file on the floppy remote boot diskette is damaged.

User Action: Create a new floppy remote boot diskette.

Error in server name.

Explanation: The service name that you are trying to connect to was incorrectly typed.

User Action: Check service name and re-type the correct service name.

Error reading diskette directory.

Explanation: The floppy remote boot diskette is damaged.

User Action: Create a new floppy remote boot diskette.

Error reading FAT.

Explanation: The floppy remote boot diskette is damaged.

User Action: Create a new floppy remote boot diskette.

Error reading virtual disk

Explanation: The remote boot LAD disk that you are trying to connect to has been corrupted.

User Action: Contact your system administrator to try and recover your LAD disk. If this fails you will have to delete your LAD disk and create a new one.

Error re-initializing LAST XX (where XX is an error code). Hit any key to attempt local boot.

Explanation: A problem was encountered when LAST was being re-initialized.

User Action: There is a problem with the .TSK file. Report this problem to your Digital representative.

Error writing CONFIG.DAT

Explanation: The disk/diskette that the CONFIG.DAT file is being written to is either bad or is write protected.

User Action: Make sure that the disk/diskette that CONFIG.DAT is being written to is not write protected. Then re-run the FRBCON program.

Ethernet board not installed.

Explanation: The hardware address of the Ethernet board was trying to be read and the Ethernet board was not present.

User Action: Install your Ethernet board before requesting to read its hardware address via the FRBCON utility.

Floppy Remote Boot failed. Press any key to attempt reboot.....

Explanation: You have one of the following problems:
1) Your floppy remote boot diskette is either damaged or invalid.
2) Your workstation node is not correctly registered on your server.
3) The floppy remote boot .TSK file does not exist on your server.

User Action: Attempt to reboot by pressing any key. If this does not work you should: 1) Create a new floppy remote boot diskette. 2) Make sure that your remote boot node is correctly registered on your server. 3) Make sure that the .TSK file exists on your server.

Maximum connections exceeded

Explanation: A connection could not be made to your remote boot LAD disk because another user is connected to it.

User Action: Disconnect any connection to your remote boot LAD disk before remote booting.

Memory corruption detected, can not continue

Explanation: The .TSK image in memory has been corrupted.

User Action: Contact your system administrator and report the .TSK image has been corrupted. Also contact your Digital representative.

No configuration file in directory.

Explanation: The CONFIG.DAT file does not exist on the floppy remote boot diskette.

User Action: Run the FRBCON program on the floppy remote boot diskette to create the CONFIG.DAT file.

Service name too long

Explanation: Too many characters were typed in the service name that you are trying to connect to.

User Action: Re-type the correct service name.

Password too long.

Explanation: Too many characters were typed for the password of the service that you are trying to connect to.

User Action: Check the password and re-type the correct password.

Service not offered

Explanation: The remote boot service that you are trying to connect to does not exist.

User Action: Make sure that you are connecting to an existing remote boot LAD disk or file service.

Unable to load boot image over the network.

Explanation: The remote boot node is not registered on the server or is register incorrectly.

User Action: Re-register the remote boot node on the server.

Unrecognized command. Type 'HELP' for help

Explanation: You entered an invalid command at the local boot prompt.

User Action: Type HELP at the local boot prompt for a list of valid local boot commands.

Warning: DEPCA firmware version not supported by REMOTE BOOT

Explanation: Your DEPCA has an unsupported ROM.

User Action: Remote Boot will try to continue, but functionality will be unsupported and unpredictable. Contact your Digital representative.

Glossary

The terms that appeared in the text of this book in **boldface** are explained in this glossary. Additional computer-related terms are also explained here.

area (n.)

In networking, a group of interrelated nodes.

asynchronous communications (n.)

The method of transmitting data one character at a time over a serial interface. Asynchronous communications can work locally or by using a modem. Timing between bits is constant; timing between characters is variable. Also called *start-stop transmission*.

backup (n.)

A copy of the contents of an entire disk, directory, or file.

boot (v.)

(Short for bootstrap.) To run a program that loads the DOS operating system into memory and starts up the computer.

boot media (n.)

The diskette, hard disk, or virtual disk that contains the startup files. See also *key disk* and *network key disk.*

client (n.)

A personal computer or workstation, connected to the network with PATHWORKS, that can access resources on a server. A client can have DOS, OS/2, or Macintosh software. See also *server*.

client profile (n.)

Files that are created by the configuration process that contain information to start the workstation and define the workstation's hardware and software components.

conventional memory (n.)

That portion of system memory that is available for DOS and DOS application software. Its maximum range is 640 Kbytes.

CTERM (n.)

Digital Command Terminal. Network protocol that provides local and wide area network services to DOS computers for VT terminal emulation. CTERM is one of the possible protocols used in the SETHOST utility. See also *SETHOST.*

current directory (n.)

The directory in which you are currently working.

DECnet (n.)

Digital networking software that runs on server and client nodes in both local area and wide area networks. With DECnet, different types of computers that have different operating systems can be connected and users can access information and services on a remote computer over the network connections.

A networking protocol. See also *TCP/IP.*

disk server (n.)

A network program that allocates space on a VMS disk where DOS users can store, create, and maintain DOS files. This space is called a *virtual disk.* Disk services are available only on VMS servers accessed with DECnet transport. See also *virtual disk.*

driver (n.)

A background software program typically dedicated to the control of a device or resource on a personal computer.

EMS

See *expanded memory* and *Expanded Memory Specification 4.0.*

end node (n.)

A network node that sends and receives network messages cannot forward packets intended for other nodes.

environment variable (n.)

In a startup batch file, such as STARTNET.BAT, a command that directs the computer to make a predefined connection every time you boot. For example, the following command uses the environment variable to ensure that the DOS_SYSTEM service is connected to the next available drive when you start the computer:

```
USE ?: DOS_SYSTEM/VIRTUAL/ENVIRON=DRV
```

In DOS, a string you define as a name or a number using the DOS SET command.

Ethernet address (n.)

An alphanumeric string that identifies a node on the Ethernet. The form is six pairs of alphanumeric characters, separated by hyphens. For example, AA–00–04–00–91–27.

Ethernet controller (n.)

A combination of hardware, firmware, and software that controls the transmission and reception of data between a workstation or server and the Ethernet network. For example, a DEPCA is an Ethernet controller for a personal computer that is connected to the network.

expanded memory (EMS) (n.)

Physical memory outside the addressing range of a processor that can be accessed through a 64-Kbyte frame. Portions of expanded memory, called pages, are switched into a designated area of upper memory for execution. See also *extended memory*.

expanded memory specification 4.0 (n.)

A specification of methods for allocating and releasing expanded memory that was developed by Lotus, Intel, and Microsoft (LIM) and sometimes referred to as LIMs 4.0.

extended memory (XMS) (n.)

Memory beyond the 1-Mbyte addressable boundary up to 16 Mbytes. This space is normally not available to DOS applications. The High Memory Area (HMA) is the first 64 Kbytes above the 1 Mbyte line and can often be accessed by DOS.

extended memory specification 2.0 (n.)

A specification for allocating and releasing extended memory.

file server (n.)

A network program that lets a client connect to available file and printer services.

file service (n.)

Directories, subdirectories, and files on a file server. Users can use network commands from a client to access a file service and then store and retrieve data. A file service provides read/write access to applications and services for many users simultaneously.

host system (n.)

A computer, such as a server, that provides services to clients.

initial workstation disk (n.)

The first key disk created for the workstation as part of the client installation procedure. Copy the initial key disk before modifying it to create key disk for other workstations. See also *key disk*.

key disk (n.)

A disk that is used to start up the personal computer or workstation and make network connections. The key disk stores files with configuration information, optional user-specific information, and some DOS utilities. The key disk is a type of boot media that can be created. See also *boot media* and *initial workstation disk*.

LAD (n.)

Local area disk. Digital's virtual disk software on a DECnet network. LAD provides high performance disk services to DOS and OS/2 clients connecting to a VMS server. See also *virtual disk*.

LAN (n.)

Local area network. A self-contained network that offers a high-speed, reliable communication channel. LANs span a limited distance, such as a building or cluster of buildings, but can be connected to wide area networks (WANs) with bridge devices.

LAST (n.)

Local Area System Transport. The network protocol used by the virtual disk server to send and receive data between two computers. LAST provides local area network services to LAD drives.

LAT (n.)

Local Area Transport. A communications protocol that operates on a local area network (LAN) to permit communication between nodes and other devices such as terminals, printers, and modems. See also *SETHOST* and *LAN*.

LATCP (n.)

LAT Control Program. A utility that allows you to manage LAT services from the client.

local area disk

See *LAD*.

local area network

See *LAN*.

local area transport

See *LAT*.

local boot (n.)

A process in which a client operating system is loaded and started locally from either the hard disk or from a key diskette. See also *remote boot*.

NDIS (n.)

The Network Device Interface Specification written jointly by Microsoft Corporation and 3Com Corporation. By supporting NDIS, Digital enables any personal computer vendor's Ethernet controller to work under PATHWORKS for DOS software.

network key disk (n.)

A virtual disk that downline loads an operating system and network startup information to a client over the network. A network key disk is a type of boot media that can be created. See also *boot media* and *remote boot.*

node (n.)

An individual computer such as a server or client that can communicate with other computers in a network.

node address (n.)

A unique numerical identification of a node in a network. It includes the area and node number.

node name (n.)

A one- to six-character name uniquely identifying a node within a network. The characters must be alphanumeric and contain at least one alphabetic character. A valid node name is SERVR7.

node number (n.)

A number uniquely identifying a specific node in the area.

path name (n.)

In DOS, a description of the location of directories and/or files in the operating system. A path name can consist of drives, directories, and files. Each directory and file name is preceded by a backslash. For example, \LMDOS\DRIVERS\PCSA is a valid path name. See also *search path.*

PC DECwindows/Motif X server (n.)

The primary component of PC DECwindows Motif. The PC DECwindows/Motif X server lets you run DECwindows/Motif and other X Windows System applications located on various nodes on your network and display the application output on your personal computer.

personal computer (n.)

See *client.*

printer service (n.)

The availability of a printer that is connected to a server. From the client, users run network commands to access a printer service and then print files. A file server makes a printer service available to clients.

print queue (n.)

A list of files waiting to print.

profile (n.)

A set of information about a client or a user. The profile provides information that the server may need to recognize the client or the user.

program information file (PIF) (n.)

A file that provides information about how a standard application uses client resources. The system service uses the appropriate PIF when you run an application.

Random access memory

See *RAM*.

RAM

Random access memory. Memory from which information can be read and to which new information can be written.

read-write access (n.)

Having the privilege to copy (read) or save to (write) a file, application, or disk area.

redirect (v.)

To assign a logical device name, which is a local representation of a physical device located on the network.

redirector (n.)

The DOS software that interprets instructions for DOS drives and sends these instructions to remote network services.

remote boot (n.)

A process by which a client operating system is loaded and started from a network key disk. See also *network key disk*.

remote boot database (n.)

A set of information containing a list of clients that can be started by a network key disk.

remote boot diskette (n.)

A diskette containing customized operating system and network startup information required to remote boot any personal computer that does not have a DEPCA Ethernet controller. See also *network key disk.*

script (n.)

In SETHOST and the Microsoft-Windows VT320 terminal emulation application, a text file containing sets of commands to perform a function automatically.

server (n.)

A computer running PATHWORKS software that offers file, printer, or disk services to clients. See also *client.*

service (n.)

The availability of files, devices, or disks that let clients access resources on the network or on a server. A service enables a client to use resources on a printer, on the network, or on a server. See also *file service*, *printer service*, and *virtual disk service.*

SETHOST

Terminal emulator that allows clients to establish terminal sessions to host systems. Allows a client to act as if it were a terminal connected to a VAX computer.

system file service (n.)

A file service offering system software, including PCSA for DOS and PATHWORKS network software, DECwindows/Motif software and applications, and the DOS operating system and utilities.

TCP/IP

Transmission Control Protocol/Internet Protocol. A set of protocols that govern the transport of information between computers and networks of dissimilar types. The Internet is a group of networks that includes regional networks, military networks, and

local networks at universities and commerical institutions. An alternative to DECnet transport protocols. *See also DECnet.*

terminate-and-stay resident (TSR) (adj.)

A program that stays in memory, running in the background, even after the user closes the application.

ThinWire (n.)

A Digital Ethernet coaxial cable that is thin, flexible, IEEE 802.3/Ethernet compliant, and used for local area networks.

Transmission Control Protocol/Internet Protocol

See *TCP/IP.*

transport (n.)

Network software that routes user data to its destination and controls the flow of data.

WAN (n.)

Wide area network. Two or more standard or extended local area networks (LANs) that are joined by the use of DECnet routers, gateways, or Packet System Interface (PSI) software.

wide area network (n.)

See *WAN.*

workstation (n.)

See *client.*

XMS

See *extended memory.*

XMS 2.0

See Extended memory specification 2.0.

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PATHWORKS for DOS
Client Installation and Configuration
Guide for the VMS Server
AA–PAF8C–TK

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