HP 9000 Computers
Using Network Services

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Printing History

Conventions

The table below explains the conventions used in this manual.

Conventions	
Notation	**Description**
Boldface	Boldface type is used when a term is defined.
`Computer Text`	Computer type is used for commands and keyboard entries that you must type exactly as shown. It is also used for on-screen prompts and messages.
italics	Italic type is used for emphasis and for titles of manuals and publications. Italic type is also used to represent a variable, such as *nodename*.
[Key]	This font is used to indicate a key on the computer's keyboard. When two or more keys appear together with dashes separating them, such as [Ctrl}[D] press those keys simultaneously to execute the command.
Softkey	This font is used to represent function softkeys that appear at the bottom of your screen.
<u>Underlining</u>	Underlining is used to emphasize a user entry. It distinguishes what you type, such as a command, from other data on the command line, such as the command prompt, a computer response, or a variable. For example: $ <u>dscopy</u> *filename1 filename2*
[ ]	An element inside brackets in a syntax statement is optional. Several elements stacked inside brackets means you may select any one or none of these elements.

Conventions	
Notation	**Description**
{ }	When several elements are stacked within braces in a syntax statement, the user must select one of those elements. For example: {A} {B} {C} You must select A, B, or C option.
. . .	A horizontal ellipsis in a syntax statement indicates that a previous element may be repeated. For example: [*option*][*option*]... In addition, vertical and horizontal ellipses may be used in examples to indicate that portions of the example have been omitted.
Δ	When necessary for clarity, the symbol Δ may be used in a syntax statement to indicate a required blank or an exact number of blanks. For example: SET[*modifier*]Δ*variable*

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Product Overview

Overview

Hewlett-Packard Network Services for HP 9000 computers is a data communications product that enables HP computer systems to exchange information and share resources in a **computer network**. A computer network is a collection of many types of equipment and software. The major components of a network are generally designated as **nodes** and **links**.

- A node is a computer system with its associated operating system and communication software.

- A node is connected to other nodes by communication links. Messages are sent to other computers over these communication links which may be either physically hardwired connections or modem connections. The link includes the interface cards and cables.

The most significant feature of a network is **resource sharing**. Simply defined, resource sharing means that elements at each node are accessible from other nodes in the network. These elements may include disc files, printers, magnetic tapes, terminals, and other programs. One result of resource sharing is increased efficiency.

Note   The information contained in this manual applies to the HP 9000 Series 300, 400, 600, and 800 computers. Any differences in the installation, configuration, operation, or troubleshooting of these computers are specifically noted.

A Local Area Network (LAN) facilitates information sharing among otherwise separate computers. LAN allows:

- Communication among computers: Programs running on separate computers can share data and start and terminate processes.

- Sharing of software resources: Information can be accessed reliably and efficiently without shared discs or tapes. Memory-consuming programs that reside on one computer can be shared by all computers, thus eliminating the need for expensive copies.

- Sharing of hardware resources: Printers, plotters and other peripheral equipment can be used by all computers on the network.

A Wide Area Network (WAN) facilitates information sharing among otherwise separate computers. WAN allows:

- Communication among computers: Programs running on separate computers can share data and start and terminate processes.

- Transfer of information: Users can copy files among computers on the network.

Network Architecture

The architecture of NS is based on the seven-layer **Open Systems Interconnection (OSI)** model developed by the International Standards Organization (ISO). This layered design offers a structured, modular approach to the different tasks necessary for transmitting and interpreting data across a network. It is not necessary to know these architectural details to use the high-level services of NS. However, some familiarity with the different tasks performed at the different levels may be helpful.

In the NS network architecture, different transmission and communications tasks are assigned to logically distinct modules called layers or levels. The highest layer regulates user services while the lowest layer regulates the actual transmission of data from one computer to another. At each layer one or more protocols are responsible for carrying out the appropriate tasks. A protocol is a set of rules governing a particular communication task. In a logical sense, the protocol entity at each level communicates with the corresponding protocol entity at the same level on another node. In reality, except for the physical transmission of data to another node, each protocol entity communicates with other protocols at the layers immediately above and below its own.

When a message is sent from one node to another in a network, it is first passed through the architectural levels at the source node. At one of the middle layers, the message is broken down into packets. At the lowest layer, the packets are actually sent across the physical communications link.

The Figure 1-1 shows the seven layers of the OSI model.

OSI MODEL LAYERS

7	Application Layer
6	Presentation Layer
5	Session Layer
4	Transport Layer
3	Network Layer
2	Data Link Layer
1	Physical Layer
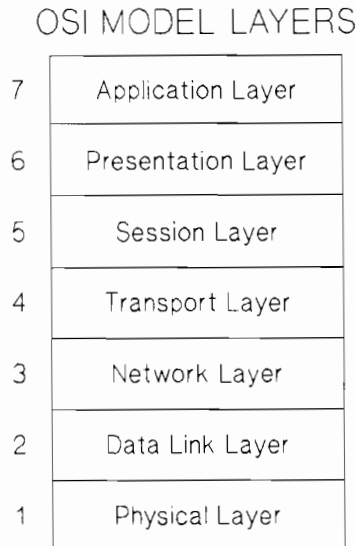
Figure 1-1. OSI Model

In NS, the Application Layer at the top of the hierarchy corresponds to the following NS User Services: Network File Transfer, and Virtual Terminal to the HP 3000 (VT3K). The next two layers, Presentation and Session, define functions which contribute to these high-level services. However, there is no exact correspondence between NS features and these layers. Network Interprocess Communication, which is a programmatic service provided by the link product, can be considered a function of the Session Layer.

The Transport Layer handles end-to-end communication between a source and a destination node, ensuring that a message from the source arrives at its destination in the proper form. The fragmentation of messages into packets can occur at this level. The Network Layer performs an addressing function, making sure that packets are acquired by the node to which they are addressed. Like the Transport Layer, the fragmentation of messages into packets can occur at this level. The Data Link Layer governs the actual transmission of the packets over the communications link. (At this level the packets are technically known as frames.) The lowest layer, the Physical Layer, provides electrical and mechanical specifications for the transmission of bits across the link.

User Services

User Services describe the user-level services provided by NS, along with Network Interprocess Communication (which is provided by the link products).

- **Network File Transfer (NFT)**. NFT allows you to copy files between different nodes in your network interactively or from a command line. This manual documents NFT only between HP 9000 computers. In addition to the HP 9000 computers, the HP 1000, HP 3000 and DEC VAX computers running Network Services support NFT. HP Vectra PCs and IBM PC/ATs running NS-User Services also support NFT. NFT between different types of systems is documented in the *NS Cross-System NFT Reference Manual*.

- **Network Interprocess Communication (NetIPC)**. NetIPC consists of a set of programmatic calls that allow processes at different nodes in your network to communicate. NetIPC is fully documented in *NetIPC Programmer's Guide*.

- **Link Level Access (LLA)**. LLA provides an alternative to using HP Network Services software. Special purpose network protocols can be implemented by directly accessing the network interface drivers. Link Level Access is fully documented in *LLA Programer's Guide*.

- **VT3K**, a Network Services application, allows you to log into a remote MPE (HP 3000) host from your local HP-UX host. VT3K works with either MPE V or MPE XL.

Note   Remote File Access (RFA) is no longer part of the NS product. In order to maintain distributed file access, you *must* use NFS Services. For more information, see Appendix B in *Installing and Administering Network Services*.

Node Management Services and Features

In addition to the User Services described in the previous section, NS provides Node Management Services. These services are documented in *Installing and Administering Network Services* and in the link product manuals.

Node Names

Each computer system or node in an NS network has a name. You must specify **node names** when using the *User Services*. Node names at NS nodes have the following syntax:

node [*.domain* [*.organization*]]

Domain and *organization* names may be useful for grouping nodes and collections of nodes, but they currently have no special meaning regarding the structure of the network within the NS product. When all three parts of the node name are specified, it is called a *fully-qualified* node name.

Each node, domain, and organization name is a maximum of 16 characters long. The maximum total length of a fully-qualified node name is 50 characters. All alphanumeric characters are allowed, including the underscore (_) and dash (-) characters, but the first character of each parameter must be alphabetic. Upper and lower case characters are not considered distinct. For example: ANIMAL.DCL.IND would indicate node ANIMAL in the DCL lab (domain) of the IND division (organization).

2
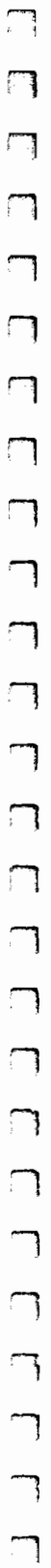
Network File Transfer

Overview

Network File Transfer (NFT) is a service that allows you to copy files between systems in your network. Files are copied using the NFT dscopy command.

Using the dscopy command you can:

- *Copy files between HP 9000 systems.* Using NFT at your local HP 9000 system, you can copy files to, from, and between other HP 9000 systems in your network.

- *Copy files between unlike systems.* Using NFT at your local HP 9000 systems you can copy files to and from HP 1000 systems, HP 3000 systems, NS for the DEC VAX systems, and HP Vectra PCs or IBM PC/ATs with NS-User Services. You can also copy files between some of these other systems. This manual explains how to use NFT to copy files between HP 9000 systems only; refer to the *NS Cross-System NFT Reference Manual* for detailed information about copying files from one type of computer to another.

- *Copy remote files.* You can copy files from your system to a remote system, from a remote system to your system, and between remote systems. You initiate all copies at your local system, not at the remote system or systems.

- *Translate file attributes.* Translation of file attributes is performed transparently when files are copied between different types of systems. You can also explicitly convert file attributes.

- *Access remote accounts.* You can access files under any account if you provide the correct login name and password.

Note	If any of the computers involved in your file transfer are not HP-UX systems, refer to *NS Cross-System NFT Reference Manual* for additional important information.

NFT Terminology

NFT uses a **three-node model** to copy files between systems. Under the three-node model there are three logical participants in the file copy process:

- The **Initiator.** Located on the system where the copy request originates, the Initiator receives the user request and initiates the copy process.

- The **Producer.** Located on the same node as the *source file*, the Producer accesses that file and produces the data which is to be copied.

- The **Consumer.** Located on the same node as the *target file*, the Consumer consumes the data and writes it into the target file.

In Figure 2-1, the arrows represent data moving from the source file to the target file. If computer A is the initiator in each case, the location of the producer and the consumer depends on the location of the source and target files.
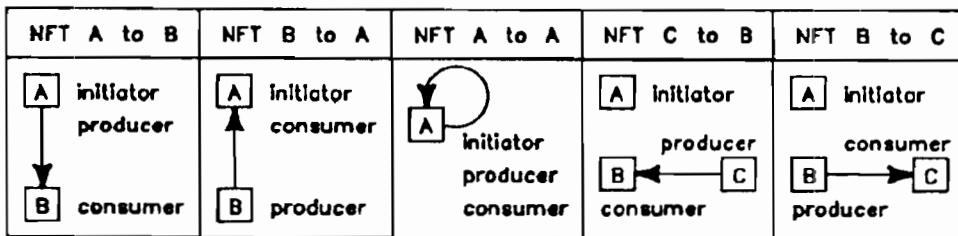
Figure 2-1. Initiator/Producer/Consumer Model

You can get a list of the accessible nodes on the network from your node manager.

File Copying Formats

NFT uses two file copying formats: **Transparent Format** and **Interchange Format**.

Note	The term **HP-UX system** is used in this chapter to refer to HP 9000 computers that have HP-UX operating systems.

Transparent Format

Transparent Format is invoked by default when the source file and the target file nodes have the same type of operating system. Two examples of this are:

- When the source file node is an HP 9000 system and the target file node is an HP 9000 system running HP-UX.

- When the source file and target file nodes are both remote HP 1000 systems and NFT is initiated from the local HP 9000 system.

Transparent Format does not alter a file's attributes, but simply copies the file from one system to another. Use it when you want a low-overhead, maximum-speed file copy between systems of the same type.

Interchange Format

When the source file and the target file nodes are different types of systems (for example, one is an HP 9000 system and one is an HP 1000 A-Series), files copied from one to the other must be converted to Interchange Format. Interchange Format consists of a set of attributes that describe a file in a standard way so that it can be understood by any NS system.

Interchange Format is invoked by default whenever you use NFT to copy a file on one type of system to a system of another type. You can also invoke Interchange Format explicitly by specifying one or more Interchange Format options when copying a file. These options specify how the source file will be read and how it will be stored in the target file. (The Interchange Format options are explained later in this chapter.)

When a file is copied using Interchange Format, it is translated into Interchange Format at the source file node before being copied to the target file node. At the target file node, the file is mapped from Interchange Format into the target file system's file format. Interchange Format's standard file attributes enable the target file computer to map the source file into a target file that has attributes that match the source file's attributes as closely as possible.

You can use the Interchange Format options to give a target file a different set of attributes from those that characterized the source file from which it was copied, even if the file is being copied between computers of the same type.
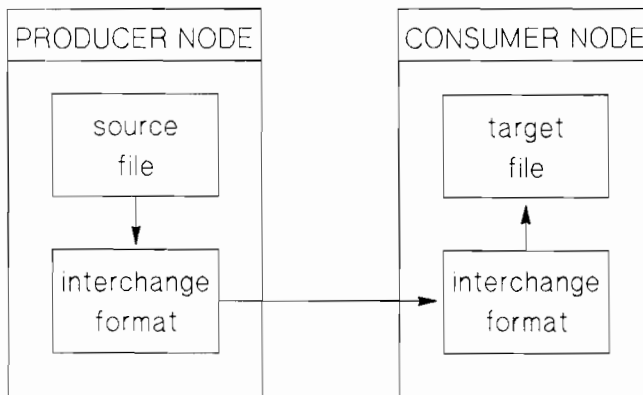
Figure 2-2. Interchange Format

Data Interpretation

Although the purpose of Interchange Format is to create an accessible target file on a system of a different type, it does not ensure that the target file will be usable. This is because Interchange Format changes a file's attributes only; it does not perform data interpretation. Interchange Format can create an unusable target file if the target system has a different representation for the data present in the source file.

For example, if you transfer a data file which contains floating point numbers to a computer with a different type of file system, there is no guarantee that the computer can interpret the representation as the proper floating point number. Be careful when transferring non-ASCII files between heterogeneous computers. The various dscopy options provide different results.

Note   Refer to the *NS Cross-System NFT Reference Manual* for information on copying files between different types of systems.

Using dscopy Command

You can perform NFT by issuing the dscopy command as follows:

dscopy Syntax

    dscopy   {copydescriptor}
                {-i}

dscopy Parameters

copydescriptor   A copy descriptor is a string which contains options, the source file
                        and target file node names, logins and the names of the source and
                        target files. (The syntax of *copydescriptor* is below.)

-i   Specifies that Interactive Mode should be used. (Interactive Mode is
                        described in detail below.)

dscopy Description

You can issue the dscopy command with either a copy descriptor or the -i option. When
you issue the dscopy command with a copy descriptor, the connection established with the
target system is terminated after the command is successfully executed.

When you use the dscopy command with the -i option, NFT enters Interactive Mode. When
NFT is used in Interactive Mode, dscopy prompts you for copy descriptors until you enter
[CTRL]-[D] to indicate end-of-file. (End-of-file is configurable and may be different for
your system.) After each copy descriptor is executed, the connection between the source
file and target file systems is maintained; you do not need to respecify the node names and
logins if subsequent copies are between the same two systems.

If you want to change the source file node or target file node from a remote node to the
local node, you can add a prefix of # to the local file name. However, if you want to change
the source file node and/or target file node to different remote nodes, you must respecify
the node names and logins. Whenever the source file or target file node specifications are
changed, NFT terminates the existing connection and establishes a new connection.

Examples of Interactive Mode are provided in "DSCOPY Examples" later in this chapter.

Copy Descriptor Syntax

[*option*] [*option*] . . . [[*snode#*]*slogin#*]*sfile* [[*tnode#*]*tlogin#*]*tfile*

Copy Descriptor Parameters

option

Can be one or more dscopy options. If multiple options are specified, they must be separated by a space. Options can be specified in any order. Table 2-1 lists the dscopy options. (Refer to "Dscopy Options" later in this chapter for a complete description of these options.)

Table 2-1. dscopy Options		
Option	**Mnemonic**	**Default**
-A	ASCII	Off
-B	Binary	Off
-F	Fixed-Length	Off
-L [*num*]	Record Length	2(31-1) bytes
-s*char*	Search Character	Newline
-d*char*	Delimiter Character	Newline
-p	Print Status	Off
-r	Replace	Off
-P	Specify File Lock Word	Off

snode   The name of the source file node. NS node names have the following
                     syntax:

                     node[.*domain*[.*organization*]]

                     An explanation of NS node names is provided in Chapter 1 of this
                     manual.

                     Default: You may omit the organization, organization and domain,
                     or all parts of the node name. When the organization, or
                     organization and domain, are omitted, the default is the local
                     organization and/or domain. If the entire node name is omitted, the
                     source node name default is your local node.

slogin   The login and password, if any, at the source node. The login at
                     HP-UX systems must be in the form *userID:password*. The *userID* is
                     the login name for the user account on the computer. The *password*
                     is the password, if any. The colon and *password* need not be
                     specified if no password exists for the login. (*For security reasons,
                     you should avoid creating logins without passwords*.) If the colon is
                     specified but the password is not, the local system will prompt you
                     for the password with the local echo turned off. (*When you supply
                     the password in the command line, you may be revealing it to other
                     users on your system. Keep your password secure by always specifying
                     the colon but not the password*.) The login must be separated from
                     the *snode* and *sfile* parameters by pound signs (#). (Login syntax is
                     different at different NS systems. Refer to the *NS Cross-System NFT
                     Reference Manual* for the login syntax at other NS systems.)

                     Default: If this parameter is omitted, the source login default is your
                     local login.

sfile   The path name of the source file. If the source file is a local file, and
                            snode and *slogin* are not specified, then the path name may start
                            from your current working directory or from the local "root"
                            directory. If the source file is a remote HP-UX file or if *slogin* is
                            specified, the path name may start from the home directory of the
                            login specified in the *slogin* parameter, or from the remote "root"
                            directory. HP-UX path names can be a maximum of 1023 bytes long.
                            NFT does not support the use of HP-UX wild card characters. (File
                            name syntax is different at different NS systems. Refer to the
                            NS Cross-System NFT Reference Manual for the file name syntax at
                            other NS systems.)

Note   If Network Services are not installed on your computer, executing a
                            dscopy command causes your shell to exit with one or more error
                            messages. If this happens, see your node manager.

---

tnode   The name of the target file node. NS node names have the following
                            syntax:

                            node[.domain[.organization]]

                            An explanation of NS node names is in the Chapter 1 of this manual.

                            Default: You may omit the organization, organization and domain,
                            or all parts of the node name. When the organization, or
                            organization and domain, are omitted, the default is the local
                            organization and/or domain. If the entire node name is omitted, the
                            target node name default is your local node.

tlogin	The login and password, if any, at the target file node. The login at HP-UX systems must be in the form *userID:password*. The *userID* is the login name for the computer. The *password* is the password, if any. The colon and *password* need not be specified if no password exists for the login. *(For security reasons, you should avoid creating logins without passwords.)* If the colon is specified but *password* is not, the local system will prompt you for the password with the local echo turned off. *(When you supply the password in the command line, you may be revealing it to other users on your system. Keep your password secure by always specifying the colon but not the password.)* The login must be separated from the *tnode* and *tfile* parameters by pound signs (#). (Login syntax is different at different NS systems. Refer to the *NS Cross-System NFT Reference Manual* for the login syntax at other NS systems.)

Default: If this parameter is omitted, the target login default is your local login. |
| *tfile* | The path name of the target file. If the target file is a local file and *tnode* and *tlogin* are not specified, then the path name may start from your current working directory or from the local "root" directory. If the target file is a remote HP-UX file or if *tlogin* is specified, the path name may start from the home directory of the login specified in the *tlogin* parameter, or from the remote "root" directory. HP-UX path names can be a maximum of 1023 bytes long. NFT does not support the use of HP-UX wild card characters. (File name syntax is different at different NS systems. Refer to the *NS Cross-System NFT Reference Manual* for the file name syntax at other NS systems.) |

dscopy Examples

The following are examples of the dscopy command.

Example 1: A remote HP-UX file is copied to the local HP-UX system. After the first file is copied, another file is copied between the same two nodes. Note that the node name and login parameters for the remote node are needed in each command.

    dscopy remnode1#logname#/users/lab/sfile /users/testsite/d1file

    dscopy remnode1#logname#/users/lab/nextfile /users/testsite/d2file

Example 2: The same files are copied using Interactive Mode. After the first file is copied, the connection is used to copy another file between the same two nodes. Note that the node name and login parameters for the remote node are omitted in the subsequent command.

    dscopy -i

    dscopy> remnode1#logname#/users/lab/sfile /users/testsite/d1file

    dscopy> /users/lab/nextfile /users/testsite/d2file

Example 3: The source file node specification is changed to a different remote HP-UX system while NFT is still in Interactive Mode. The target file node specification is unchanged.

    dscopy> remnode4#bob#/users/tests/sourcefile /users/testsite/d4file

Example 4: The target file node specification is changed to a remote HP-UX system while NFT is still in Interactive Mode.

    dscopy> /users/tests/source5 remnode5#carol#/users/mgr/tests/lab

Example 5: If you want to change the source or target file node from a remote computer to the local computer, you can add a pound sign (#) prefix to the local file name as shown in the following example. This will cause the target file to be created at the local node.

```
dscopy> /users/lab/sfile  #/users/testpool/report/sfile
```

Example 6: To terminate Interactive Mode NFT, type [CTRL]-[D]. (The end-of-file character is configurable and may be different for your system.)

```
dscopy>  [CTRL]-[D]
```

Security

File Protection

The file mode assigned to a newly created file is the same as that of the source file if the source file and target file nodes are both HP-UX systems. The ownership of the new file is set to the target file node login name you supply. If the target file already exists and is write protected for the target file node login name, dscopy will return the following error message:

```
dscopy: unable to access target file/device
```

You must use the replace option (-r) to write to the file.

Password Security

Your local HP-UX system will prompt for passwords with the local echo turned off for HP-UX logins if you enter the login name and a colon, but do not enter the password. The system recognizes the colon as a key to prompt you for the password. The login name and the password are then passed to the remote HP-UX computer as two separate entities.

Note   Security is different at different NS systems. Refer to the
NS Cross-System NFT Reference Manual for security information
if the source or target file node is another type of NS system.

For C2 Security refer to *A Beginner's Guide to HP-UX*, *A Beginner's Guide to Using Shells*, and *HP-UX System Security*.

The following example shows a file being copied from your local HP-UX system to a remote HP-UX system. Note that the single colon is the key for the system to prompt for the password. (Although the password is displayed in this example, it would not be echoed to the screen.)

```
dscopy  localfile  remnode#cathy:#newfile

target  password 1> notebook
```

When copying to an HP 3000 computer, you can specify a file lock word by using the "-P" option and two colons "::" at the appropriate place in the file specifier.

Using Escape Characters

An escape character is a designated character that tells your system to interpret a specific character literally rather than by its designated system meaning. Precede a special character with a backslash (\) or enclose it in quotation marks to "escape" its special system meaning. You must use an escape with any character that might otherwise be taken literally.

When you are not using dscopy in Interactive Mode, you must use an escape for the command characters listed in Table 2-2, if they are to be interpreted literally.

Table 2-2. Characters That Require an Escape

?	&	•
;	(	)
\	|	$
"	,	

When you use dscopy in Interactive Mode, you need only need to escape the pound sign (#) and backslash (\) characters.

When NFT is in both Interactive Mode and non-Interactive Mode, the pound sign (#) character is a special case because it is part of the copy descriptor file name syntax. If you must use the pound sign character as part of a file path name, follow these rules:

- In a non-Interactive Mode dscopy operation, you must escape the pound sign character twice. (For example, \\#.)

- In an Interactive Mode dscopy operation, you must escape the pound sign character only once. (For example, \#.)

HP-UX Signals

The HP-UX quit signal terminates any file transfer in progress. [CTRL]-[\] invokes quit.
(The character used to invoke the quit signal is configurable and may be different for your
system.) If quit terminates a dscopy operation before it has completed, the target file will be
removed.

The interrupt signal causes the system to produce a value that indicates the percentage of
the file that was copied at the time that the interrupt occurred. The value is sent to the
standard output device. The [BREAK] key or [CTRL]-[C] invokes interrupt. (The control
character used to invoke the interrupt signal is configurable and may be different on your
system.)

When you enter [BREAK] while a dscopy command is being processed, the system responds
with:

    xx% of current file transferred

Note   The interrupt or quit signals are occasionally ignored during
                  connection set up activity. If this occurs, re-enter the signal.

                  [BREAK] only works when brkint is set. Refer to *stty*(1) in the
                  HP-UX Reference.

Errors

In addition to the error messages supplied to stderr, the exit status values are returned to $status (/bin/csh, C-Shell) or $? (/bin/sh, Bourne shell or /bin/ksh, Korn shell). Table 2-3 lists the exit status values.

Table 2-3. Exit Status for Dscopy	
Value	Meaning
0	requested transfer completed successfully
1	source file or source file node is inaccessible
2	target file or target file node is inaccessible
3	syntax error
4	transfer began, but did not complete successfully
5	internal error

dscopy Options

NFT provides eight different options that may be used with the dscopy command. These options are part of the copy descriptor (*option* parameter) and precede the file and node specifications. (Refer to the copy descriptor syntax diagram for syntax information.)

The dscopy options can be divided into two categories:

- **Format-Independent Options.** These options do not invoke either Interchange Format or Transparent Format. They can be used when a file is copied in either format and do not affect the attributes of the target file.

- **Interchange Format Options.** These options invoke Interchange Format and allow you to give a target file a different set of attributes from those that characterized the source file from which it was copied.

Although the Interchange Format options can be used when copying files between HP-UX systems, their primary and most useful purpose is for copying files between unlike systems. Using an Interchange Format option when copying a file between HP-UX systems overrides the default file copying format (Transparent Format) and causes the file to be copied in Interchange Format.

Table 2-4 describes how the Format-Independent options operate when the source file and target file nodes are both HP-UX systems. Refer to the *NS Cross-System NFT Reference Manual* for information on the operation of these options in regard to other NS systems.

Table 2-4 . Format-Independent Options	
Option	**Description**

-p	The Print Status option causes the status of the dscopy command to be printed to the standard output file. If the -p option is not used, the status is not printed to the standard output file.
	
	In the following example, the -p option is used to print the result of a dscopy command. The status will be printed to the standard output file.
	
	`dscopy -p storyfile remnode1#john:boxer#text/story`
	`100 bytes transferred for the source target pair:`
	`storyfile >> text/story`
	
	If the interchange mode is used, the system responds with the number of records transferred instead of the number of bytes.

Table 2-4 . Format-Independent Options

Option	Description
-r	The *replace* option causes an existing target file to be replaced by the source file. This option operates differently depending on the source file and target file node configuration. If both the source and the target computer are HP-UX systems, the target file gets the file mode of the source file and the ownership of the target file node login name you supply. For example, assume the file sample.txt exists on both your local producer node and the remote consumer node. On your local node, it has the mode -rw-rw—— and is owned by pam in the group users. On the remote node, it has the mode -rwxrwxrwx and is owned by joe in the group other. If you executed dscopy -r sample.txt remnode1#marie:#sample.txt the remote target file sample.txt would now have the mode -rw-rw—— and the ownership marie in the group guest (assuming the remote login name marie is in the group guest). If the source file node is an HP-UX system and target computer is a non-HP-UX system, the target file receives the default file protection and/or ownership of the target logon. If the source file node is a non-HP-UX system and the target file node is an HP-UX system, the target file acquires the file mode 666 (-rw-rw-rw-). If both the source file and target file nodes are non-HP-UX systems, the target file receives the default file protection of the target logon. If the -r option is not used and target file already exists and is an HP-UX file, it is automatically overwritten by the source file (unless the target file is write protected for the target node login), and the target file retains the ownership and file mode of the overwritten file. If the -r option is not used and target file already exists and is a non-HP-UX file, the target file is not overwritten, and an error is returned.

Table 2-4 . Format-Independent Options

Option	Description

-P	Give file lock words when talking to an HP 3000 computer.
	
	For those file systems that allow individual file lockwords (passwords), the -P option provides password security. As with login passwords, a key must be used in the file name argument. Enter two colons in place of the file lockword and include the -P option, and the system prompts you for the password with the local echo turned off. If a double colon key is used for a file password and -P is not specified, the key is interpreted as part of the file name.
	
	Example: The file named testfile requires a lockword, which is yellow.
	
	<pre>*Enter*: dscopy -P local_file rem_node1#john/::.lab/::#testfile/::
	Prompt: target password 1>
	Enter: collie (not echoed to the screen)
	Prompt: target password 2>
	Enter: setter (not echoed to the screen)
	Prompt: target file password>
	Enter: yellow (not echoed to the screen)</pre>
	This option is valid only if the file system of at least one computer involved in the transfer supports file lockwords (for example, the HP 3000). Otherwise, the option is ignored.
	
	This option causes problems with access from VAX computers. Refer to the *NS Cross-System NFT Reference Manual* for details.

NFT and the HP-UX File Type

On HP 9000 computers, the only file type is a stream of bytes. An ASCII file is stored as a stream of bytes with LINEFEED characters to delimit variable-length records.

Records can be interpreted in different ways. Some dscopy options allow you to specify how the source file is read and how it is stored in the target file. This section describes each of these options and the type of results obtained by using them.

The terms **ASCII** and **binary** refer to the **contents** of a file, that is, ASCII or binary data. The terms **fixed** and **variable** refer to the **structure** of a file — that is, fixed-length or variable-length records. HP-UX itself does not care about these distinctions. However, it is convenient to use these terms because some other file systems and most applications impose these concepts on files.

Table 2-5 describes how the Interchange Format options operate when the source file and target file nodes are both HP-UX systems. Refer to *NS Cross-System NFT Reference Manual* for information on the operation of these options in regard to other NS systems.

Table 2-5. Interchange Format Options	
Option	**Description**
-A	The ASCII option is intended to be used when copying files between unlike systems. It is not useful when used to copy files between HP-UX systems. Refer to *NS Cross-System NFT Reference Manual* for more information. *Default*: = off
-B	The Binary option is not useful when copying files between HP-UX systems unless it is used in conjunction with other Interchange Format options. (See the descriptions of the Fixed-Length and Record Length (-L) options for more information.)
-F	The Fixed-Length option causes "records" in an HP-UX ASCII source file to be converted to fixed-length "records" in an HP-UX target file. (The Fixed-Length option considers an HP-UX "record" to be the data found between ASCII LF characters.) When the Fixed-Length option is specified, data between ASCII LF characters in the ASCII source file is truncated or padded with ASCII SPACE characters, if necessary, so that the data is *num* bytes long. (You can set *num* with -L option. The default is 160 bytes.)
-F-B	If the Binary (-B) option is used in conjunction with the Fixed-Length option, source file data is divided into "records" every *num* bytes. ASCII LF characters found in the source file are considered part of the data. If the last "record" is less than *num* bytes, it is padded with ASCII NUL characters. (You can set *num* with -L option. The default is 256 bytes.)

Table 2-5. Interchange Format Options

Option	Description

-d*char*	The Delimiter Character option allows you to specify a delimiter character to be inserted after each "record" in the target file. (When the Delimiter Character option is not specified, ASCII LF characters are used as delimiters.) The *char* argument is the delimiter character in its literal form or in its equivalent decimal ASCII value. The ASCII value must be prefixed by a zero. The char argument is required.
	
	 Example: The file testfile1 contains LINEFEED delimiters, represented by the L character as shown below.
	
	 ``` this isL a test fileL for use in dscopy examples.L ```
	 To insert @ characters as record delimiters, instead of the LINEFEED characters, execute the following:
	
	 Enter: `dscopy -d@ testfile1 hpux2#mike:#testfile2`
	 Prompt: `target password >`
	 Enter: `mypass` (not echoed to the screen)
	
	 On the system hpux2, the file testfile2 now contains the following:
	
	 ``` this is@a test file@for use in dscopy examples.@ ```
	 Use of this option forces the transfer to occur in interchange mode. The -d option is ignored if specified for an HP 3000 consumer.
	
	 The -d option is valid *only* if the target file is a stream-type file. This includes all HP-UX files and certain types of files on other computers.

Table 2-5. Interchange Format Options

Option	Description
-schar	The Search Character option allows you to specify a character to be recognized by NFT as a delimiter character. (When the Delimiter Character option is not specified, ASCII LF characters are interpreted as delimiters.) The *char* argument is the search character in its literal form or in its equivalent decimal ASCII value. The ASCII value must be prefixed by a zero. The *char* argument is required. *Example*: Testfile2 contains: this is@a test file@for use in dscopy examples.@ To create a file in the local directory that replaces the @ character from testfile2 with linefeed delimiters represented with L, execute the following commands: *Enter*: dscopy -s@ hpux2#mike:#testfile2 testfile3 *Prompt*: source password > *Enter*: mypass (not echoed to the screen) The file testfile3 now contains: this isL a test fileL for use in dscopy examples.L Some example search characters are: *Character*: -s012 *Result*: Creates a new logical record every time a form feed (ASCII value 012) is encountered. *Character*: -s\$ *Result*: Creates a new logical record every time a "$" is encountered. Note that the "$" must be escaped to have literal meaning. The "$" is escaped in the command line, not the file. (See the "Using Escape Characters" section.) *NOTE*: Use of this option forces the transfer to occur in interchange mode. The -s option is valid only if the source file is an HP-UX file.

Table 2-5. Interchange Format Options

Option	Description

-L[*num*]	This option forces an interchange mode transfer and sets a maximum record length. The number specified immediately after -L is the new maximum record length in bytes.
	
	Example: To transfer the file testfile1 which contains:
	
	`this isL`
	`a test fileL`
	`for use in dscopy examples.L`
	
	with a specified record length of 10 characters, enter the following:
	
	Enter: `dscopy -L10 testfile1 hpux2#mike:#testfile2 testfile4`
	Prompt: `target password`
	Enter: `mypass` (not echoed to the screen)
	
	The -L10 option forces the producer to truncate the last two records of testfile1 to 10 characters. The file testfile4 on the node hpux2 now contains:
	
	`this isL`
	`a test filL`
	`for use inL`
	
	If -L is specified with no value, the default length is 160 bytes. A warning is sent to stderr if records are being truncated during a transfer. If the -L option is not used, the default record length is producer-consumer dependent. Truncation depends on the maximum record length, which is usually determined by the source file's maximum record length.
	
	In a variable record file transfer, the -L value specified is the maximum possible record length. In a fixed record file transfer, the -L value specified is the forced record length and can result in truncation or padding.

Table 2-5. Interchange Format Options

Option	Description
-L[*num*] (cont.)	If a value of 0 is entered for the maximum record length, the result is not an empty file on the target computer. The system uses the default value as determined by the producer. For HP 9000 computers, the default is 160 bytes for ASCII file transfers and 256 bytes for binary file transfers. Other producers use other values; see the *NS Cross-System NFT Reference Manual* for details.
-L[*num*]-B	If the Binary (-B) option is used in conjunction with the Record Length option, the source file is divided into "records" every *num* bytes, ASCII LF characters found in the source file are considered part of the data, and no truncation occurs.

-L[*num*]-F	You can use the Fixed-Length option with the Record Length option to produce a target file with fixed-length "records" that are *num* bytes long. The data between ASCII LF characters in the source file is truncated or padded with ASCII SPACE characters, if necessary, so that it is *num* bytes long.
	
	In the format:
	
	`    dscopy -F -L20 source target`
	
	The end of a record is recognized by the LINEFEED terminator. The -L option limits records to 20 bytes (20 ASCII characters). Records are truncated or padded as necessary.
	
	An example of the target file after execution of this command, should look like:
	
	`    He drove his red speL`
	`    From dawn to sunset L`
	`    He never slept.SSSSSL`
	
	The first two records have been truncated to 20 characters. The third record has been padded with SPACE characters because the source record is shorter than 20 characters. The record delimiter characters have been inserted as the last character in each record.

Table 2-5. Interchange Format Options

Option	Description

-L[*num*]-B-F	If the Record Length option is specified in conjunction with both the Binary and Fixed options, the source file is divided into "records" every *num* bytes, ASCII LF characters are considered part of the data, and the last "record" in the target file is padded with ASCII NUL characters if it is less than *num* bytes long.
	
	The source file contains 116 characters, including LINEFEED characters.
	
	In the format:
	
	```dscopy -F -L20 -B source target```
	
	The combination of the -F and -L20 options indicate the target file should contain records which are 20 characters in length. The -B option indicates all characters (including LINEFEED characters) should be transferred as data. Because the last record is less than 20 bytes long, it is padded with NULL characters.
	
	```He drove his red speedster a thousand miles.L```
	```From dawn to sunset to dawn again he drove, on and on.L```
	```He never slept.LNNNN```
	
	The file is transferred as six 20-byte records, with the sixth record padded with NULL characters to meet the fixed record length.

Logging into an HP 3000 with VT3K

Overview

VT3K, a Network Services application, allows you to log into a remote MPE (HP 3000) host from your local HP-UX host. VT3K works with either MPE V or MPE XL.

Before using VT3K, prepare the system as follows:

- Ensure that your HP 9000 and HP 3000 are on the same network, and that they are properly configured for NS.

  NS Configuration Indicator: If dscopy works between your HP 9000 and HP 3000 systems, then the systems are configured for NS. For more information, refer to *Installing and Administering Network Services*.

- Ensure that the NS Virtual Terminal Services are running on the remote HP 3000.

Note   VT3K only supports V + applications.

Terminals You Can Use with VT3K

VT3K is supported on the following configurations:

- HP 2392 or HP 700/92 terminal connected via RS-232 to an HP 9000 Series 600/800.

- HP 9000 Series 300/400 workstation running HPTERM.

Hpterm (HP-UX 7.0 or later) offers HP Block Mode terminal emulation if you use X-Windows on a Series 300/400 workstation.

Using VT3K

Using VT3K involves the following steps:

- Invoking VT3K, and providing the name of a remote HP 3000.

- Logging into the remote host.

After logging in, you can use VT3K to do work on the remote MPE system as if your terminal or workstation window is physically connected to that HP 3000.

Invoking VT3K

At your HP-UX prompt, enter:

    $ vt3k remote_host

The system responds:

    To suspend to vt3k command mode press 'Break' 3 times in a 1 second period.

Note   The values "3" and "1" are defaults. You can set them to whatever you wish. See the section, "Changing Break Count and Timing Values."

For *MPE V*, vt3k displays the prompt:

    :

For *MPE XL*, vt3k displays the prompt:

    MPE XL:

Logging into the Remote Host

Log into the remote HP 3000 as you normally would by supplying a valid login name and a password (if one is required). You must supply vt3k with a valid login name and password (if required) in order to log in to the remote HP 3000.

If the login name and password you supplied are valid on the remote HP 3000, the remote host logs you in and displays its login message and its prompt. You may now work on the MPE system as though you were logged on directly.

If you do not receive an MPE login prompt or you are unable to log into the HP 3000, go to the section, "Responding to Unexpected Results when Using vt3k."

Responding to Unexpected Results when Using vt3k

Although many vt3k errors are reported with NetIPC error codes, vt3k also uses its own termination codes.

NetIPC Errors

The most common NetIPC error is "NSR_NO_NODE (40) node does not exist." This error may stem from one of the following conditions:

- Remote HP 3000 is not up.

- Node name is incorrect.

- Remote node is on a different network.

- Remote node is running an incorrect version of MPE.

- Remote node is not listed on the local network routing tables.

For a complete list of error codes and corrective actions, refer to the *NetIPC Programmer's Guide*.

Descriptions for Terminating vt3k Codes

Table 3-1 defines each of the vt3k termination codes:

Table 3-1. Termination Codes for vt3k	
Codes	Description
Connection Terminated [0]	Result of a normal logoff.
Connection Terminated [1]	Indicates that someone has issued an ABORTJOB on the MPE session.
Connection Terminated [2]	Indicates that the network has shut down.
Connection Terminated [8]	Indicates that the remote MPE host has no vt ports available.

Exiting VT3K

Three situations for exiting VT3K are:

- Logging out of the remote HP 3000.
- Returning to HP-UX from the MPE login prompt.
- Aborting and suspending VT3K.

Logging Out of the Remote HP 3000

At your MPE system prompt, enter:

```
bye
```

vt3k logs you out of the remote host, disconnects you from the remote host, returns you to HP-UX on your local host, and displays the following:

```
Connection Terminated [0]
$
```

Returning to HP-UX from the MPE Login Prompt

At times, you may mistakenly invoke vt3k on the wrong HP 3000 or on an HP 3000 that you do not have an account. To terminate your connection to that HP 3000, enter the appropriate (MPE V or MPE XL) command at the MPE login prompt.

Example Entry on MPE V:

```
:  :eof:                              (Enter both colons.)
```

Example Entry on MPE XL:

```
MPE XL: bye
```

You are returned to your local HP-UX system and the following message is displayed:

```
Connection Terminated [0]
$
```

Aborting and Suspending VT3K

VT3K has an escape mode that allows you to completely exit a VT3K session. In addition, it is possible to suspend to the local HP-UX system from this command mode using normal HP-UX job control.

Activating VT3K Escape Command Mode

To activate the VT3K escape command mode, press [Break] β times in 1 second.

Note   The values "3" and "1" are defaults. You can set them to whatever you wish. See the section, "Changing Break Count and Timing Values."

Successful entry into the VT3K command mode is indicated by the following system response:

```
Please enter vt3k command (Exit or Continue):
```

Do one of the following:

- If you want to abort vt3k, go to the next section, "Aborting VT3K."

- If you want to suspend vt3k, go to the section, "Suspending VT3K."

- If you want to go back into the vt3k session, go to the section, "Continuing VT3K."

Aborting VT3K

Once you have entered the VT3K escape command mode, enter "Exit" or e to terminate your vt3k session:

```
Please enter vt3k command (Exit or Continue): e
```

You are returned to the HP-UX shell prompt.

Suspending VT3K

Once you have entered the VT3K escape command mode, you can suspend VT3K to return to your local HP-UX system using job control.

Job control allows you to temporarily return to the original local HP-UX shell from which you invoked vt3k. This shell retains the environment you had set up, any background jobs you left running, and any jobs you left suspended when you invoked vt3k. Job control is available if you use csh or ksh, and lets you work on your local host for as long as you need to before you return to vt3k. For more information about job control, see *csh*(1) and *ksh*(1) in the *HP-UX Reference*.

In the steps that follow, you can suspend the VT3K session, enter HP-UX commands on your local host, and return to the VT3K session.

1. Enter [Ctrl]-[z] at your escape command mode prompt:

   `Please enter vt3k command (Exit or Continue):` [Ctrl]-[z]

   You return to the original local HP-UX shell from which you invoked vt3k, and your local host displays:

   [job_number] + Stopped   vt3k *remote_host*

2. Enter your HP-UX commands. Your original local shell executes each command that you enter.

3. When you want to return to the remote host by resuming your VT3K session, at your local HP-UX prompt, enter:

   `jobs`

   This lists the jobs you have running in the background.

4. Note the job number associated with your suspended VT3K session.

5. At your local HP-UX prompt, enter:

   `fg` *%vt3k_job_number*

For example, if you enter:

    fg %3

Your VT3K session is placed in the foreground and your local host displays:

    vt3k *remote_host*

Note   If the vt3k job was listed with a plus sign (+) following the job number, you can just enter fg at your local HP-UX prompt.

If you have only one VT3K session running, you can enter fg %vt3k.

Your VT3K session resumes, returning you to the vt3k command mode.

Continuing VT3K

If you are in the VT3K escape command mode or if you are returning from a suspended session, and you wish to return to the HP 3000, enter "Continue" or c at the escape command mode prompt.

    Please enter vt3k command (Exit or Continue): c

This sends a system break to the HP 3000 then returns you to the remote host.

Using Input Files With VT3K

Input files may be used with VT3K to automate login and other processes.

Protecting Your VT3K Input Files

Because VT3K input files contain login information to your remote HP 3000, you should use a method for protecting your input files.

In order to prevent unauthorized users from obtaining your HP 3000 login information, you must protect your VT3K input files and your input file directory. You should have sole access for reading or writing to your VT3K input files. To accomplish this unique access, perform the following steps:

1. Ensure that your input files are owned by you, the user.

2. Use the HP-UX chmod command to protect your input files with 0400 (-r————) permission.

3. Use the HP-UX chmod command to protect your input file directory so that no one else can read it or write to it. For example, you should protect your input file directory with at least 0700 (-rwx————) permission.

4. Ensure your HP-UX account has a password.

Using an Input File for Automatic Login and Command Execution

Caution	This file creates a significant security risk because it contains your login and password information.

The automatic login (-a option) causes vt3k to read input from an input file (also known as a script) instead of the standard input. The first line in the input file must be a valid MPE login statement, possibly including the password(s). MPE commands can also be included in the input file. vt3k returns input control to the keyboard after the last command in the file. This is especially useful for an "automated" HP 3000 login and application invocation. In addition, the last line in the input file may be an MPE BYE command.

Note	Only MPE commands can be placed in an input file. You cannot use VT3K input files for providing keystroke input to MPE applications.

Example

You have an input file named *myloginfile* containing the following statements:

```
hello user/passwd.acct/passwd
listf
hpdesk
```

When you enter:

```
vt3k -a myloginfile remote_host
```

vt3k logs into the remote system, issues a LISTF command, and invokes HPDesk. Input control is returned to you, allowing you to log into HPDesk.

Using an Input File for Automatic Execution

Caution	This file creates a significant security risk because it contains your login and password information.

The automatic execution (-I option) causes vt3k to read input from an input file instead of the standard input. It does the same thing as the -a option previously described, except it terminates the connection to the HP 3000 at the end of the input file, whether or not an MPE BYE command exists.

Note	The -a and -I options cannot be used together.

Example

You have an input file named *myexecfile* containing the following statements:

```
hello user/passwd.acct/passwd
showjob
```

When you enter:

```
vt3k -I myexecfile remote_host
```

vt3k logs into the remote host and issues a SHOWJOB command. The connection to the HP 3000 terminates, and you are returned to the local HP-UX system.

Logging Input and Output to a File

VT3K allows you to log its input and/or output to a file with the command line options in Table 3-2.

Table 3-2. Options for Logging Input and Output to a File	
Option	**Description**
-li (logging input)	Causes vt3k to log all input to the file which is defined by the -f option.
-lo (logging output)	Causes vt3k to log all output to the file which is defined by the -f option.
-f (filename)	Causes logging set by the above options to be routed to *filename*. If logging is enabled and this option is not given, logging will go to stdout.
-lio (logging input and output)	Causes combination of -li and -lo options.

Example

If you enter:

        vt3k -li -f *transcript_file remote_host*

All input to vt3k will be logged to the file *transcript_file*.

Enabling Typeahead

VT3K incorporates typeahead, but not by default. Typeahead provides the user with keyboard input buffering. To enable typeahead, use the -t option.

Caution   Some MPE applications do not run correctly with typeahead enabled.

Example

If you enter:

        vt3k -t *remote_host*

vt3k will process keyboard input with typeahead buffering.

Changing Break Count and Timing Values

To enter the VT3K escape command mode, you press [Break] a set number of times within a set time period. The default values for these parameters are 3 for the break count and 1 for the seconds that you need to complete the break count.

To change the break count, use the -B option followed by the number of times you want to press [Break] o activate the escape command mode. To change the timing, use the -T option followed by the seconds that you need to complete the break count.

For example, to change the break count to 5 and the timing to 2, you enter:

```
vt3k -B 5 -T 2
```

If you press [Break] a different number of times within the set time, a system break is sent to the HP 3000 and vt3k starts counting breaks over again.

For example, if 6 breaks are sent in 1 second, vt3k sends the HP 3000 a system break and stops the timer from looking for escape command breaks. If only 1 break is received when the timer elapses, vt3k sends the HP 3000 a system break and stops counting the breaks received.

A

ASCII Character Set

ASCII Char	Dec	Binary	Oct	Hex	HP-IB	ASCII Char	Dec	Binary	Oct	Hex	HP-IB
NUL	0	00000000	000	00		ESC	27	00011011	033	1B	
SOH	1	00000001	001	01	GTL	FS	28	00011100	034	1C	
STX	2	00000010	002	02		GS	29	00011101	035	1D	
ETX	3	00000011	033	03		RS	30	00011110	036	1E	
EOT	4	00000100	004	04	SDC	US	31	00011111	037	1F	
ENQ	5	00000101	005	05	PPC	space	32	00100000	040	20	LA0
ACK	6	00000110	006	06		!	33	00100001	041	21	LA1
BEL	7	00000111	007	07		"	34	00100010	042	22	LA2
BS	8	00001000	010	08	GET	#	35	00100011	043	23	LA3
HT	9	00001001	011	09	TCT	$	36	00100100	044	24	LA4
LF	10	00001010	012	0A		%	37	00100101	045	25	LA5
VT	11	00001011	013	0B		&	38	00100110	046	26	LA6
FF	12	00001100	014	0C		'	39	00100111	047	27	LA7
CR	13	00001101	015	0D		(	40	00101000	050	28	LA8
SO	14	00001110	016	0E		)	41	00101001	051	29	LA9
SI	15	00001111	017	0F		*	42	00101010	052	2A	LA10
DLE	16	00010000	020	10		+	43	00101011	053	2B	LA11
DC1	17	00010001	021	11	LLO	'	44	00101100	054	2C	LA12
DC2	18	00010010	022	12		.	45	00101101	055	2D	LA13
DC3	19	00010011	023	13		.	46	00101110	056	2E	LA14
DC4	20	00010100	024	14	DCL	/	47	00101111	057	2F	LA15
NAK	21	00010101	025	15	PPU	0	48	00110000	060	30	LA16
SYNC	22	00010110	026	16		1	49	00110001	061	31	LA17
ETB	23	00010111	027	17		2	50	00110010	062	32	LA18
CAN	24	00011000	030	18	SPE	3	51	00110011	063	33	LA19
EM	25	00011001	031	19	SPD	4	52	00110100	064	34	LA20
SUB	26	00011010	032	1A		5	53	00110101	065	35	LA21

ASCII	EQUIVALENT FORMS				HP-IB	ASCII	EQUIVALENT FORMS				HP-IB
Char	Dec	Binary	Oct	Hex		Char	Dec	Binary	Oct	Hex	
6	54	00110110	066	36	LA22	[	91	01011011	133	5B	TA27
7	55	00110111	067	37	LA23	\	92	01011100	134	5C	TA28
8	56	00111000	070	38	LA24	]	93	01011101	135	5D	TA29
9	57	00111001	071	39	LA25	^	94	01011110	136	5E	TA30
:	58	00111010	072	3A	LA26	_	95	01011111	137	5F	UNT
;	59	00111011	073	3B	LA27	`	96	01100000	140	60	SC0
<	60	00111100	074	3C	LA28	a	97	01100001	141	61	SC1
=	61	00111101	075	3D	LA29	b	98	01100010	142	62	SC2
>	62	00111110	076	3E	LA30	c	99	01100011	143	63	SC3
?	63	00111111	077	3F	UNL	d	100	01100100	144	64	SC4
•	64	01000000	100	40	TA0	f	101	01100101	145	66	SC5
A	65	01000001	101	41	TA1	e	102	01100110	146	66	SC6
B	66	01000010	102	42	TA2	g	103	01100111	147	67	SC7
C	67	01000011	103	43	TA3	h	104	01101000	150	68	SC8
D	68	01000100	104	44	TA4	i	105	01101001	151	69	SC9
E	69	01000101	105	45	TA5	j	106	01101010	152	6A	SC10
F	70	01000110	106	46	TA6	k	107	01101011	153	6B	SC11
G	71	01000111	107	47	TA7	l	108	01101100	154	6C	SC12
H	72	01001000	110	48	TA8	m	109	01101101	155	6D	SC13
I	73	01001001	111	49	TA9	n	110	01101110	156	6E	SC14
J	74	01001010	112	4A	TA10	o	111	01101111	157	6F	SC15
K	75	01001011	113	4B	TA11	p	112	01110000	160	70	SC16
L	76	01001100	114	4C	TA12	q	113	01110001	161	71	SC17
M	77	01001101	115	4D	TA13	r	114	01110010	162	72	SC18
N	78	01001110	116	4E	TA14	s	115	01110011	163	73	SC19
O	79	01001111	117	4F	TA15	t	116	01110100	164	74	SC20
P	80	01010000	120	50	TA16	u	117	01110101	165	75	SC21
Q	81	01010001	121	51	TA17	v	118	01110110	166	76	SC22
R	82	01010010	122	52	TA18	w	119	01110111	167	77	SC23
S	83	01010011	123	53	TA19	x	120	01111000	170	78	SC24
T	84	01010100	124	54	TA20	y	121	01111001	171	79	SC25
U	85	01010101	125	55	TA21	z	122	01111010	172	7A	SC26
V	86	01010110	126	56	TA22	{	123	01111011	173	7B	SC27
W	87	01010111	127	57	TA23			124	01111100	174	7C	SC28
X	88	01011000	130	58	TA24	}	125	01111101	175	7D	SC29
Y	89	01011001	131	59	TA25	~	126	01111110	176	7E	SC30
Z	90	01011010	132	5A	TA26	DEL	127	01111111	177	7F	SC31

A-2 ASCII Character Set

B

Error Messages

Overview

This appendix lists and describes the error messages that can be produced by User Services. These NS error messages are divided into the following categories:

dscopy error messages   These ASCII error messages may be returned by the Network File Transfer program dscopy. They are printed to the standard output device.

errno values   Some NFT logged errors return errno values.

The values for errno are not documented in this manual. They are defined in the file /usr/include/sys/errno.h and in the *HP-UX Reference* entry for *errno*(2).

Note   Refer to the link product installation manual for messages logged to the system console. Refer to *Installing and Administering Network Services* and link product installation manual for lists and descriptions of Nodal Management Services error messages.

dscopy Error Messages

The following error messages may be returned by dscopy.

Message   dscopy: abort request packet send fail

Cause   This message is returned when [CTRL]-[\] is used to terminate a file transfer in progress and NFT is unable to signal the producer node to terminate the transfer.

The dscopy program will terminate, but the transfer may continue and complete successfully.

Action   This is an informational message only. No action is necessary.

Message   dscopy: ascii character value out of range

Cause   An ASCII value was specified that is less than zero or greater than 255.

Action   Specify an ASCII value that is between zero and 255, inclusive, and try again.

Message   dscopy: can't set user id

Cause   NFT was not installed correctly.

Action   Ask the Node Manager to correct the installation.

Message	dscopy: connection to source node has gone down
Cause	An error was detected on the connection to the node where the source file or files reside. There are two possible reasons:

- If the producer process is still active on the source node, the producer will attempt to carry out the remainder of the user file copy command.

- If the file producer is no longer active, the remaining files that were to be copied will not be copied.

Action	Determine which, if any, of the file or files were not copied. Retry if appropriate. If this error occurs frequently, contact your HP support representative.

Message	dscopy: connection to target node has gone down
Cause	An error was detected on the connection to the node where the target file is to be created. If both the producer and consumer nodes are HP 1000 computers and this error occurs while the file producer is copying several files, the current file may not have been copied successfully and no attempt will be made to copy the remainder of the files.
Action	Determine which, if any, file or files were not copied. Retry if appropriate. Determine which file or files were not copied. Retry if appropriate. If this error occurs frequently, contact your HP support representative.

Message	dscopy: delimiter character option specified without delimiter character
Cause	The -d option was specified, but the delimiter character was omitted.
Action	Specify the delimiter character immediately after the -d option and try again.

Message	dscopy: duplicate target file
Cause	The target file exists, but the Replace option (-r) was not specified.
Action	Verify that the target file name is correct, or specify the Replace option, whichever is appropriate.

Message	dscopy: illegal character or concatenated options
Cause	An unsupported option was specified or options were concatenated.
Action	Check the syntax and try again.

Message	dscopy: incorrect source file password
Cause	The given source file password was incorrect.
Action	Specify the correct source file password and try again.

Message	dscopy: incorrect target file password
Cause	The given target file password was incorrect.
Action	Specify the correct target file password and try again.

B-4 dscopy Error Messages

Message	dscopy: initialization of the transfer incomplete: no data sent yet
Cause	This message is returned when [CTRL]-[C] is used to obtain status information and the file transfer has not yet begun.
Action	This is an informational message only. No action is necessary.
Message	dscopy: insufficient resources are available on source node
Cause	There are insufficient resources at the producer node to copy the file or files.
Action	Verify that there are sufficient resources on the producer node and try again.
Message	dscopy: insufficient resources are available on target node
Cause	There are insufficient resources at the consumer node to copy the file or files.
Action	Verify that there are sufficient resources on the consumer node and try again.
Message	dscopy: internal NFT error
Cause	An internal NFT error has occurred.
Action	Notify your HP support representative.
Message	dscopy: invalid or unsupported source device
Cause	A request was made to copy a file from a device that NFT does not support for reading.
Action	Specify a supported device.

Message	`dscopy: invalid or unsupported target device`
Cause	A request was made to copy a file to a device that NFT does not support for writing.
Action	Specify a supported device.

Message	`dscopy: invalid source file id`
Cause	Either the source file path name contained illegal or incorrect characters or had illegal or incorrect syntax, or the path name specified was bad.
Action	Make sure the path name specified is correct.

Message	`dscopy: invalid target file id`
Cause	Either the target file path name contained illegal or incorrect characters or had illegal or incorrect syntax, or the path name specified was bad.
Action	Make sure the path name specified is correct.

Message	`dscopy: maximum input length or number of parameters exceeded`
Cause	This error is returned when NFT is used in interactive mode and the length of the input line is greater than 800 characters, or the number of arguments is greater than 30.
Action	Make sure your line length is less than 800 characters and/or 30 arguments and try again.

Message	`dscopy: maximum login or nodename length exceeded`
Cause	A login or node name exceeded the maximum length allowed.
Action	Check syntax and try again.

B-6 dscopy Error Messages

Message	dscopy: maximum pathname length is 1023 characters
Cause	The source and target file path names may not exceed 1023 characters.
Action	Specify a path name that is 1023 characters or less.

Message	dscopy: need password to access source file
Cause	The source file could not be accessed without the proper password.
Action	Specify the password along with the source file name and try again.

Message	dscopy: need password to access target file
Cause	The target file could not be accessed without the proper password.
Action	Specify the password along with the target file name and try again.

Message	dscopy: no response to abort request
Cause	This message is returned when [CTRL]-[\] is used to terminate a file transfer in progress and no acknowledgement of the request is received from the producer within 10 seconds. The dscopy program will terminate, but the transfer may or may not continue and complete successfully.
Action	This is an informational message only. No action is necessary.

Message	dscopy: out of disc space
Cause	The consumer node is out of disc space.
Action	Free up enough disc space on the consumer node for the target file and try again.

Message	dscopy: progress request packet send failed
Cause	This message is returned when dscopy is interrupted to obtain status information, and NFT is unable to determine what percentage of the file has been copied.
Action	Try again. The transfer may still complete successfully.
Message	dscopy: read from source file failed
Cause	A file system error occurred when reading from or opening the source file.
Action	Verify that the file is accessible with the specified login on the producer node. An internal error may have occurred.
Message	dscopy: replace option is not supported
Cause	The consumer node does not support the Replace option.
Action	This is an informational message only. No action is required.
Message	dscopy: requested data type was refused
Cause	A binary file transfer was requested for an ASCII file or an ASCII file transfer was requested for a binary file.
Action	Include or omit the -B option as necessary.

Message	`dscopy: requested file size was refused`
Cause	The file size specified would exceed the space available on the consumer node.
Action	Make more space available on the consumer node.

Message	`dscopy: requested file type was refused`
Cause	This error is returned if: ■ An attempt is made to copy an HP-UX directory. ■ An attempt is made to copy a directory file from a non-HP-UX system.
Action	These file transfers are not supported.

Message	`dscopy: requested record size refused`
Cause	The value specified for maximum record length (-L) was too large, or the producer or consumer node could not accept the interchange file copy request because of buffer space limitations. If the producer or consumer node is an HP 1000 computer, this message may indicate that one of the records in the HP 1000 file is larger than 4400 bytes, or that the user-defined -L value is larger than 4400 bytes.
Action	If the producer or consumer node is an HP 1000 computer, specify a record size smaller than 4400 bytes.

Message	dscopy: requested record type was refused
Cause	The user-defined record type was refused. Either an existing target file has a record type different from that requested, or the consumer node does not support files of that record type.
Action	Let NFT choose the record type by not specifying a record type option and try again.
Message	dscopy: search character option specified without search character
Cause	The -s option was specified, but the search character was omitted.
Action	Specify the search character immediately after the -s option and try again.
Message	dscopy: sending a transient file in interchange mode is not allowed
Cause	Transient file storage is not supported.
Action	This is an informational message only. No action is required.
Message	dscopy: source file was not found
Cause	The source file does not exist or the file name, path name or login was incorrectly specified.
Action	Verify that the file exists and that the correct file name, login and node name were specified and try again.

Message	dscopy: target file was not found
Cause	The target file does not exist, or the file name, path name or login was incorrectly specified.
Action	Verify that the file exists and that the correct file name, login and node name were specified and try again.
Message	dscopy: target record size is invalid
Cause	The user-defined record size (-L) value is out of the acceptable range. Files copied to or from an HP 1000 computer may not have records larger than 2200 words.
Action	Specify an acceptable record size and try again.
Message	dscopy: transfer aborted per user request
Cause	A quit signal was sent to the process running NFT after the file transfer had begun.
Action	This is an informational message only. No action is required.
Message	dscopy: transient storage is not supported
Cause	Transient file storage is not supported.
Action	This is an informational message only. No action is required.

Message   dscopy: unable to access source file/device

Cause   If the producer node is an HP 1000 computer, this error indicates that an unexpected file system error occurred in opening or accessing the source file. If the producer node is an HP-UX system, this error may indicate that:

- A protection violation occurred in accessing the source file or the directory it is in.

- The source file name specifies an unsupported device.

- The user was unable to search the source directory.

Action   Verify that the source file and/or directory exists and is accessible.

Message   dscopy: unable to access target file/device

Cause   This error message is returned when one or more of the following problems occur:

- The target device does not exist or has failed.

- The target file does not exist.

- The user does not have access privileges to the target file or device.

- The specified directory could not be searched.

- The user is unable to write to the target file because it is write protected for the specified login.

- The user is unable to write to the target directory because the Replace option (-r) was specified and the "old" file was removed, thus requiring write access to the directory.

B-12 dscopy Error Messages

Action   The recommended actions are:

- Verify that the target device exists and/or is accessible.

- Verify that the target file exists.

- Obtain access privileges to the target file or device.

- Verify that the target directory exists.

- Use the Replace option (-r).

- Obtain write access to the specified directory.

Message   `dscopy: unable to close target file`

Cause   The target file could not be closed after the transfer was complete. A file system error may have occurred on the consumer node.

Action   Verify the state of the file. Refer to the file system error on the consumer node for more information. Retry. This may indicate an internal error.

Message	`dscopy: unable to connect to source node`
Cause	A connection could not be established to the node where the source file resides. One or more of the following problems may exist:

- The node name specified is incorrect.

- The producer node is not connected to the network.

- The producer node does not have enough memory space available to establish a connection.

- NFT has not been initialized on the source node.

- The network is not up.

- The producer node is incorrectly configured.

- The initiator node does not have enough memory available to establish a connection.

Action	Verify that:

- The producer node name is correct.

- The producer node is connected to the network.

- There are sufficient resources to establish a connection.

- NFT has been initialized on the producer node.

B-14 dscopy Error Messages

Message	`dscopy: unable to connect to target node`
Cause	A connection could not be established to the node where the target file is to reside. One or more of the following problems may exist:

- The node name specified is incorrect.

- The consumer node is not connected to the network.

- The consumer node does not have enough memory space available to establish a connection.

- NFT has not been initialized on the consumer node.

- The network is not up.

- The consumer node is incorrectly configured.

- The producer node's network directory does not contain an entry for the producer node.

- The producer node does not have enough memory available to establish a connection.

Action   Verify that:

- The consumer node name is correct.

- The consumer node is connected to the network.

- There are sufficient resources to establish a connection.

- NFT has been initialized on the consumer node.

Message	dscopy: unable to create or open target file
Cause	This error may indicate that a file system error occurred while creating or opening the target file, or that the target login does not allow access to the specified target file.
Action	Verify that you can access the file and its directory on the consumer node.

Message	dscopy: unable to logon to source node
Cause	The login string specified is invalid for the producer node.
Action	This error may require one of the following actions:

- If an additional error message is returned, refer to it for further information.

- Check the login string and try again.

- Provide a different login string and try again.

Message	dscopy: unable to logon to target node
Cause	The login string specified is invalid for the consumer node.
Action	This error may require one of the following actions:

- If an additional error message is returned, refer to it for further information.

- Check the login string and try again.

- Provide a different login string and try again.

Message	dscopy: unable to purge target file
Cause	This error may indicate that a file system error occurred when attempting to purge the target file, or that the target login does not allow access to the specified target file.
Action	Verify that you can access the file and its directory on the consumer node.

Message	dscopy: unable to start NFT service on source node
Cause	NFT internal error.
Action	Contact the node manager.

Message	dscopy: unable to start NFT service on target node
Cause	NFT internal error.
Action	Contact the node manager.

Message	`dscopy: (warning) can't initialize logging`
Cause	Logging could not be initialized.
Action	Ask the node manager to make sure that logging is correctly installed and operational.

Message	`dscopy: (warning) invalid characters in target file name were removed`
Cause	The target file name contained some characters which were invalid for the consumer node, and they were removed from the target file name before it was created.
Action	This is an informational message only. No action is necessary.

Message	`dscopy: (warning) record length unspecified; assumed default = 160 bytes`
Cause	Because the -L option was not specified, dscopy will create a target file with 160-byte records.
Action	This is an informational message only. No action is necessary.

Message	`dscopy: (warning) record(s) truncated to fit maximum target file record size`
Cause	At least one source logical record is larger than the maximum size specified. Trailing data in the record beyond the maximum size were truncated.
Action	This is an informational message. No action is necessary.

B-18 dscopy Error Messages

Message	dscopy: (warning) source and target file attributes differ
Cause	The target file existed before the transfer, and its attributes were not the same as the source file. A set of attributes was chosen and the transfer continued.
Action	This is an informational message. No action is necessary.

Message	dscopy: (warning) target file name has been truncated
Cause	One of the following problems has occurred:

- The target file was not specified, and the source file name was too long or contained illegal characters.

- The target file specified was too long or contained illegal characters.

- Illegal characters were removed and/or the name was truncated.

Action	This is an informational message. No action is necessary.

Message	dscopy: write to target file failed
Cause	The target file was opened, but a write to it failed. A file system error may have occurred during the transfer.
Action	Verify the state of the file. Refer to the file system error on the target node for more information. Retry. This may indicate an internal error.
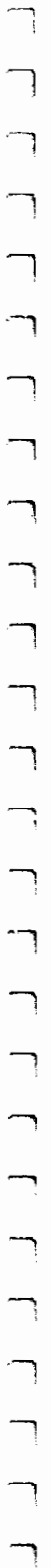
Network Services/HP 9000 Migration

This appendix introduces NS/9000 for users who are current DS/1000-IV, NS/1000 or NS/9000 customers. Because it addresses three different audiences, this appendix is organized into two sections:

- *NS/9000 for DS/1000-IV Users*. This section compares DS/1000-IV and NS/9000.

- *NS/1000 to NS/9000 Migration*. This section compares NS/1000 and NS/9000. In addition, differences between the NFT implementations on the HP 1000 (A-Series) and the HP 9000 are highlighted.

Note   For information on porting NS/1000 applications to LAN/9000 NetIPC, refer to "Porting NetIPC Programs" and "Cross-System NetIPC" sections of *NetIPC Programmer's Guide*.

NS/9000 for DS/1000-IV Users

NS/9000 and DS/1000-IV do not share any common user services. As a result, programs written using DS/1000-IV calls are not transportable to NS/9000 systems.

To help customers migrate from DS/1000-IV to NS/9000, Hewlett-Packard has developed a utility that reads RTE program source files and flags DS/1000-IV calls. This program can help determine the difficulty of converting a program to use NS/9000 calls and help locate calls that must be modified. For more information about this utility, call your local HP sales office.

Feature Comparison

Table C-1 maps the DS/1000-IV services to NS/9000 services with similar functionality. There is no one-to-one correspondence between DS/1000-IV and NS/9000 services.

Table C-1. DS/1000-IV vs. NS/9000	
DS/1000-IV Service	**Similar NS/9000 Service**
Distributed Executive (DEXEC)	Not Available
Program-to-Program Communication (PTOP)	Network Interprocess Communication (NetIPC)
REMAT	Network File Transfer (NFT)
RMOTE	Network File Transfer (NFT)
Remote File Access (RFA)	Not Available
Remote Data Base Access (Image/1000)	Not Available

Note   DS/1000-IV Remote File Access is not available on NS/9000 systems.

The next section compares DS/1000-IV and NS/9000 product features.

File Transfer

DS/1000-IV provides three different file transfer services:

- The REMAT ST command. This command allows you to copy files to, from and between DS/1000-IV nodes.

- The RMOTE MO command. This command allows you to copy files from your local DS/1000-IV node to a remote DS/3000 node, or from a remote DS/3000 node to your local DS/1000-IV node. You cannot copy files between remote nodes using the MO command.

- The RTE CO command used with DS transparency software. This command copies files to, from and between DS/1000-IV nodes.

NS/9000 provides one file transfer service: NS Network File Transfer (NFT). NFT is an HP AdvanceNet service that is also implemented on HP 1000 (A-Series) computers, HP 9000 computers, HP 3000 computers, DEC VAX computers, HP Vectra PCs and IBM PC/ATs.

Hewlett-Packard supports all combinations of cross-system NFT among the NS/1000, NS/3000, NS/9000, HP Vectra PC, IBM PC/AT (with NS), and DEC VAX (with NS) systems.

The REMAT ST command, DS file transparency CO command and the NFT dscopy command share the following common features:

- All three use the three-node model (i.e., you can copy files from the local node to a remote node, from a remote node to the local node, or from a remote node to another remote node).

- All three include options or parameters that allow you to alter target file characteristics.

- All three services allow you to log in to specific remote accounts. (This feature is also shared by RMOTE.)

Refer to Chapter 2, "Network File Transfer," for information about using NFT to copy files between NS/9000 systems. Refer to the *NS Cross-System NFT Reference Manual* for information about copying files between different types of NS systems.

Interprocess Communication

The DS/1000-IV service Program-to-Program Communication (PTOP) allows a master program to exchange information with and control the execution of a slave program. PTOP calls are divided into two categories, master calls and slave calls. The master and the slave programs may be located at the local node, or one may be at the local node and the other may be at a remote node. DS/1000-IV PTOP programs can communicate with other PTOP programs on remote DS/1000-IV or DS/3000 nodes.

LAN/9000 provides a service similar to PTOP called Network Interprocess Communication (NetIPC). NetIPC allows two or more peer processes to exchange information; one program does not control the execution of another. Because NetIPC operates in a peer-to-peer rather than master-to-slave fashion, any NetIPC process can use any of the NetIPC calls. As a result, the form of interprocess communication offered by NetIPC is more flexible than that provided by PTOP. NetIPC peer processes may be located on the same or different nodes.

NetIPC processes establish connections with other processes via sockets. A NetIPC process can engage in a dialogue that references certain sockets in order to create a connection with another NetIPC process. Several NetIPC calls are provided to allow processes to engage in this dialogue. Once a connection, called a virtual circuit, is established, the processes may exchange data. An NS/9000 NetIPC process can communicate with other systems that support NetIPC processes.

Unlike PTOP, NetIPC does not provide a call to schedule a remote process. Remote processes must be manually started or can be daemons that are started at system start up.

Table C-2 maps the DS/1000-IV PTOP calls to similar NS/9000 NetIPC calls. Most of the NetIPC calls have no PTOP equivalents; therefore, they are not listed in the table. These calls are not similar to any PTOP calls because they are primarily used to create and establish virtual circuit connections. The NetIPC calls that have no PTOP equivalents include ipcconnect(), ipccreate(), ipcdest(), ipclookup(), ipcname(), ipcnamerase(), ipcrecvn(), ipcselect(), addopt(), initopt(), and readopt().

NetIPC is described in detail in the *NetIPC Programmer's Guide*.

Table C-2. PTOP Calls vs. NetIPC Calls		
PTOP Call	**NetIPC Call**	**Comparison**
POPEN	No similar NetIPC call.	NetIPC does not provide a call to schedule a peer process.
PREAD	ipcrecv()	PREAD allows a PTOP master program to receive data contained in the buffer parameter of a slave program's ACEPT call. The master program must call PREAD before the slave program can transmit data via an ACEPT call. Ipcrecv() allows a NetIPC process to receive data queued on a virtual circuit connection. The data becomes queued on this connection when another NetIPC process calls ipcsend().
PWRIT	ipcsend()	PWRIT allows a PTOP master program to transfer data contained in its buffer parameter to the buffer parameter of a slave program's GET call. Ipcsend() allows a NetIPC process to send data on a virtual circuit connection. The data becomes queued on this connection and may be dequeued by another NetIPC process when that process calls ipcrecv().
PCONT	ipcsend()	PCONT allows a PTOP master program to transfer data contained in its tag parameter to the tag parameter of a slave program's GET call.
PCLOS	ipcshutdown()	PCLOS allows a PTOP master program to terminate a slave program. If the slave program resides on an HP 1000 node, PCLOS also terminates logical communication with that node. Ipcshutdown() may be used to abort a virtual circuit connection. This terminates logical communication with a peer process over that connection. Ipcshutdown() cannot be used to terminate a peer process; NetIPC does not provide a call with this functionality.

Table C-2. PTOP Calls vs. NetIPC Calls

PTOP Call	NetIPC Call	Comparison
PNRPY	ipccontrol( )	PNRPY allows a PTOP master program to issue PWRIT, PCONT and PCLOS requests asynchronously. Master programs that use this call will not be suspended when they issue requests to send data to, or to terminate, slave programs. The NetIPC call ipccontrol( ) may be used to enable asynchronous I/O between NetIPC processes. Unlike PNRPY, ipccontrol allows processes to both send and receive data asynchronously by placing the sockets shared by the processes in asynchronous mode.
GET	ipcrecv( )	The main function of the PTOP slave call GET is to receive master program requests (PWRIT, PREAD, etc.) However, the tag and buffer parameters of the GET call can be used to receive data sent by the master program. The NetIPC call ipcrecv( ) is similar to GET only in that it allows a process to receive data. (Refer to the discussion of PREAD above for more information on ipcrecv( ).)
ACEPT	ipcrecv( ) and ipcsend( )	The PTOP slave call ACEPT allows PTOP slave programs to receive data from, and send data back, to PTOP master programs. When a master program sends data via a call to PWRIT, the buffer parameter of the ACEPT call can be used to receive the data. When a master program requests data via a call to PREAD, the ACEPT's buffer parameter contains the data that will be transmitted to the master program. The ACEPT call also contains a tag parameter that can be used to send data to the master program. The ACEPT call's data acceptance and transmission functions are similar to ipcrecv( ) and ipcsend( ), respectively. (Refer to the discussion of PWRIT and PREAD above for more information on these NetIPC calls.)

Table C-2. PTOP Calls vs. NetIPC Calls		
PTOP Call	**NetIPC Call**	**Comparison**
REJCT	ipcsend()	The main function of the PTOP slave call REJCT is to reject a master request. REJCT also contains a tag field that can be used to transmit data back to the master program. This secondary feature of REJCT is similar to the NetIPC call ipcrecv(). (Refer to the discussion of PREAD above for more information on ipcrecv().)
FINIS	ipcshutdown()	The PTOP slave call FINIS is similar to the PTOP master call PCLOS in that it terminates communication between two programs. The NetIPC call ipcshutdown() terminates logical communication over a certain connection.

Remote Resource Access

DS/1000-IV provides two services that allow you to interactively access remote resources: REMAT and RMOTE.

DS/1000-IV also provides two services that allow you to programmatically access remote resources: Distributed Executive (DEXEC) and Remote File Access (RFA).

DS/1000-IV supports programmatic access to Image/1000 data bases on remote systems.

Note   There is no way to interactively or programmatically access remote resources using NS/9000 systems.

NS/1000 to NS/9000 Migration

NS/1000 and NS/9000 share the following HP AdvanceNet NS user services:

- Network File Transfer (NFT).

- Network Interprocess Communication (NetIPC). (NetIPC ships with the LAN/9000 product).

NS/1000's DS/1000-IV Compatible Services (Remote File Access, Distributed Executive, Program-to-Program Communication, REMAT, RMOTE and Remote File Access) are not supported on NS/9000 nodes. NetIPC migration is discussed in the "Porting NetIPC Programs" section of *NetIPC Programmer's Guide*

Table C-3 maps the NS/1000 services to the same or similar NS/9000 services.

Table C-3. NS/1000 vs. NS/9000	
NS/1000 Service	**NS/9000 Service**
Network File Transfer (NFT)*	Network File Transfer (NFT)*
Network Interprocess Communication (NetIPC)*	Network Interprocess Communication (NetIPC)*
Distributed Executive (DEXEC)	Not Available
Program-to-Program Communication (PTOP)	Network Interprocess Communication (NetIPC)
REMAT	Network File Transfer (NFT)
RMOTE	Network File Transfer (NFT)
Remote File Access (RFA)	Not Available
Remote Data Base Access (Image/1000)	Not Available

*Indicates compatible HP AdvanceNet NS user services.

Note	DS/1000-IV Remote File Access is not available on NS/9000 systems.

The DS/1000-IV Compatible Services are the same as the DS/1000-IV services described in the previous section, "NS/9000 for DS/1000-IV Users." Refer to this section for comparison information.

The following paragraphs compare the NS/1000 and NS/9000 HP AdvanceNet NS NFT.

Network File Transfer (NFT)

Network File Transfer (NFT) is an HP AdvanceNet NS service that is implemented on HP 1000 (A-Series) computers, HP 9000 computers, HP 3000 computers, DEC VAX computers, HP Vectra PCs and IBM PC/ATs.

Hewlett-Packard supports all combinations of cross-system NFT among the NS/1000, NS/3000, NS/9000, HP Vectra PC, IBM PC/AT (with NS), and DEC VAX (with NS) systems.

You can initiate a file transfer from an NS/9000 node in almost the same way that you initiate a file transfer from an NS/1000 node.

On an NS/1000 system, NFT is initiated by running the program DSCOPY as follows:

NS/1000 DSCOPY Syntax

```
DSCOPY [   ,copydescriptor  ]
       [   ,dscopycommand  ]
```

The *copydescriptor* parameter is a copy descriptor. The *dscopycommand* parameter is one of the NS/1000 DSCOPY commands.

NS/9000 dscopy Syntax

On an NS/9000 system, you initiate NFT by running the program dscopy as follows:

    dscopy   {copydescriptor}
                {-i}

Note   Program names are case sensitive on HP 9000 systems.

The *copydescriptor* parameter is a copy descriptor. The -i option specifies that Interactive
Mode should be used. Interactive Mode is the same as running DSCOPY without parameters
at an NS/1000 system.

Both the NS/1000 and NS/9000 dscopy commands use a copy descriptor. The syntax of the
copy descriptor is different at each system.

NS/1000 Copy Descriptor

    sfile[[slogon]][>snode]{ΔTOΔ} tfile[[tlogon]][>tnode][,option][,option]...
                            { , }

NS/9000 Copy Descriptor

    [option] [option]...[[snode#]slogin#]sfile [[tnode#]tlogin#]tfile

Copy Descriptor Parameters

sfile   The source file name.

slogin or *slogon*   The log in and password, if any, at the source node.

snode   The name of the source node.

tfile   The target file name.

C-10 NS/1000 to NS/9000 Migration

tlogon or *tlogin*	The log in and password, if any, at the target node.
option	May be one or more of the dscopy options.
tnode	The name of the target node.

DSCOPY Options

NS/1000 NFT supports a larger set of DSCOPY options than does NS/9000 NFT. The following options are not supported by NS/9000 NFT:

- FSIZE
- APPEND
- INTERCHANGE
- MOVE
- QUIET
- VARIABLE
- STRIP

The remaining NS/1000 NFT options have NS/9000 equivalents. See Table C-4.

Table C-4. NS/1000 vs. NS/9000 NFT Options	
NS/1000 Option	**NS/9000 Option**
ASCII	-A
BINARY	-B
FIXED	-F
REPLACE	-r
RSIZE	-L
ICHAR	-d
SCHAR	-s
SILENT	Not Available

NS/9000 also includes an additional option,-p, which causes the status of the dscopy command to be printed to the standard output file.

Refer to the *NS Cross-System NFT Reference Manual* for a complete cross-mapping of the options at all NS NFT implementations. This manual also explains how to copy files between different types of NS systems.

DSCOPY Commands

NS/1000 NFT includes ten DSCOPY commands. There are no equivalent commands in NS/9000 NFT.

Programmatic Interface

NS/1000 NFT includes a programmatic interface in the form of two calls: DSCOPY and DSCOPYBUILD. These calls are not part of NS/9000 NFT. However, you can use dscopy programmatically on an HP 9000 by using the HP-UX system call system(). (For more information about *system()*, refer to the *HP-UX Reference*.)

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COL. DEL PRADO - 76030 Qro.
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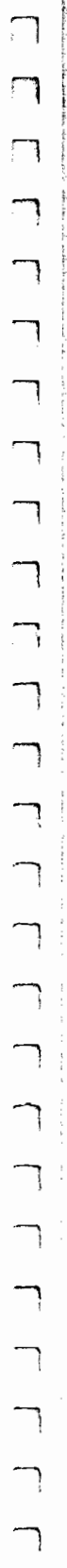B.P. 12797
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