DECnet–ULTRIX

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DECnet–Internet Gateway Use and Management

Order Number: AA–JQ71C–TE

DECnet–ULTRIX

DECnet–Internet Gateway Use and Management

May 1990

This manual tells you how to install, use, and manage the DECnet–Internet Gateway. The manual is for both DECnet and Internet system users and managers.

Supersession/Update Information:	This is a revised manual.
Operating System and Version:	ULTRIX V4.0
Software Version:	DECnet–ULTRIX V4.0

digital™

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May 1990

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Contents

Preface

This manual contains directions for installing, using, and managing the DECnet–Internet Gateway software.

Intended Audience

This manual is intended for DECnet–Internet Gateway users and anyone responsible for installing or managing the Gateway.

Chapter 2 applies to Internet host end users; Chapter 3 applies to DECnet node end users. End users should be familiar with general file-transfer principles. They should also understand how to use any systems they will be logging on to remotely.

Chapter 4 applies to Gateway managers. Gateway managers need superuser (root) access and/or system administrator privileges and must be familiar with general network management principles.

Structure of This Manual

This manual contains four chapters:

Chapter 1	Introduces the DECnet–Internet Gateway functions and commands, and contains instructions for installing the DECnet–Internet Gateway as part of the DECnet–ULTRIX software installation procedure. (The *DECnet–ULTRIX Installation* contains complete instructions for installing the Gateway software.)
Chapter 2	Explains how to use the DECnet–Internet Gateway from an Internet host. The examples in this chapter assume that your Internet host is an ULTRIX system; however, your Internet host might be another Internet system that is based on Berkeley 4.2/4.3 BSD Transmission Control Protocol/Internet Protocol (TCP/IP) implementations.
Chapter 3	Explains how to use the DECnet–Internet Gateway from a DECnet node. The examples in this chapter assume that your DECnet node is a DECnet–VAX node; however, your DECnet node might be another DECnet system, such as DECnet-11M-PLUS or DECnet–DOS.
Chapter 4	Contains guidelines for managing the DECnet–Internet Gateway software.

Related Documents

To supplement this manual, see the following documents:

- *DECnet–ULTRIX Release Notes*

  This manual contains miscellaneous information and updates not included in the DECnet–ULTRIX documentation set.

- *DECnet–ULTRIX Installation*

  This manual describes procedures for installing, configuring, and testing a DECnet–ULTRIX node. The manual also lists the names of the files installed with DECnet–ULTRIX software and gives their path names.

- *DECnet–ULTRIX Use*

  This manual contains both tutorial and reference information on how DECnet–ULTRIX end users can log on to remote DECnet nodes, exchange mail with users on remote DECnet nodes, and work with files on remote DECnet nodes.

- *DECnet–ULTRIX Programming*

  This manual explains concepts and guidelines for application programming in the DECnet–ULTRIX environment. The manual also describes DECnet–ULTRIX system calls and subroutines, and shows DECnet–ULTRIX data structures and programming examples.

- *DECnet–ULTRIX Network Management*

  This manual describes procedures for managing the network, such as defining permanent and volatile databases, node identifications and addresses, and lines and circuits; enabling event logging; displaying network counter information; operating and controlling a DECnet–ULTRIX node; and testing the network operation.

- *DECnet–ULTRIX NCP Command Reference*

  This manual describes how to use the Network Control Program (ncp) to perform network management functions.

For a detailed description of the Digital Network Architecture (DNA), refer to the *DECnet Digital Network Architecture (Phase IV) General Description.*

Graphic Conventions

This manual uses the following conventions:

Convention	Meaning
special	In running text, commands, command options, parameters, system calls, subroutines, user names, file names, and directory names appear in this **special** type.
`example`	Indicates an example of system output or user input. System output is in black type; user input is in red type.
lowercase	If a command appears in lowercase type in a command format or in an example, you enter it in lowercase.
UPPERCASE	Node and Gateway names appear in uppercase. VMS commands also appear in uppercase.
italic	Italic type in command formats and system displays indicates a variable, for which either you or the system supply a value.
[ ]	Square brackets enclose optional data. You can use only one of the enclosed options. Do not type the brackets when you enter the command line.
key	Indicates a key on your keyboard. CTRL/*key* represents a CTRL key sequence, where you press the CTRL key at the same time as the specified key. Note that keyboard keys are represented by this symbol, <*key*>, on line.
%	The percent sign is the standard DECnet–ULTRIX system prompt.
#	The pound sign is the DECnet–ULTRIX superuser prompt.

All Ethernet addresses are hexadecimal; all other numbers are decimal unless otherwise noted.

Terminology

In this manual, "DECnet–RSX" stands for any of these DECnet products: DECnet–11M–PLUS, DECnet–Micro/RSX, DECnet–11S, DECnet–11M.

Also, "Gateway" stands for the DECnet–ULTRIX DECnet-Internet Gateway software.

Chapter 1

Introduction

This chapter describes the DECnet–Internet Gateway functions, some sample user commands, and installation.

DECnet–Internet Gateway software provides bidirectional access between DECnet systems (such as DECnet–VAX, DECnet–RSX, and DECnet–DOS) and Internet systems (such as those based on Berkeley 4.2/4.3 BSD TCP/IP implementations).

The Gateway software lets you:

- Log on to an Internet system from a DECnet system and vice versa
- Exchange mail between these systems
- Access files on both types of systems
- Transfer files between these systems

Systems that use the DECnet–Internet Gateway software do not have to run special software, and remote users do not have to establish accounts on the Gateway system.

1.1 Gateway Functions and Sample Commands

The Gateway supports a subset of DECnet and Internet commands. Table 1–1 shows the DECnet–VAX and Internet commands by function that the Gateway software supports.

Table 1–1: Commands Supported Through the DECnet–Internet Gateway

Gateway Function	DECnet–VAX (VMS) Command	Internet (UNIX) Command
Exchange mail	MAIL	mail
Log in	SET HOST	telnet
Work with Files		
Change directory	(No command)	ftp> cd
Display directory	DIRECTORY	ftp> ls
		ftp> dir
Show current directory	(No command)	ftp> pwd

(continued on next page)

Table 1–1 (Cont.): Commands Supported Through the DECnet–Internet Gateway

Gateway Function	DECnet–VAX (VMS) Command	Internet (UNIX) Command
Delete files	DELETE	ftp> delete
		ftp> mdelete
Display files	TYPE	ftp> get *file* -
		ftp> recv
Transfer files	COPY	ftp> recv
		ftp> get
		ftp> mget
		ftp> send
		ftp> put
		ftp> mput
	APPEND	ftp> append

The Internet commands are described in Chapter 2, and the DECnet-VAX commands are described in Chapter 3.

1.2 How to Use This Manual

If you log on to an Internet system (such as ULTRIX) and use the Gateway to access DECnet systems, see Chapter 2 for instructions.

If you log on to a DECnet system (such as a DECnet–VAX or DECnet–RSX system) and use the Gateway to access Internet systems, see Chapter 3 for instructions.

If you manage an Internet, DECnet, or Gateway host system, see Chapter 4 for instuctions.

1.3 Installing the Gateway

Before you install the DECnet–Internet Gateway software onto your DECnet–ULTRIX node, configure your system for Internet by choosing the ULTRIX Internet subset when you install the ULTRIX base software.

You can use the DECnet–ULTRIX installation procedure to install both the DECnet–ULTRIX base software and the DECnet–Internet Gateway. You can install these software subsets at the same time, or the base software first and the Gateway afterward.

You can install the DECnet–Internet Gateway as a unidirectional gateway, enabling gateway functionality in one direction only. For more information, see Section 4.1.

For a complete description of the installation procedure, see *DECnet–ULTRIX Installation*.

Chapter 2

Using the Gateway from an Internet Host

This chapter tells you how to perform these tasks while logged on to an Internet host:

- Log on to a remote DECnet node
- Exchange mail with a remote DECnet node
- Work with files on a remote DECnet node

Note that the examples in this chapter assume that your Internet host is an ULTRIX system. Your Internet host might be a non-Digital Internet system based on Berkeley 4.2/4.3 BSD TCP/IP implementations. In that case, you might use different commands to perform the tasks described in this chapter.

2.1 Sample Internet Commands

Table 2–1 lists common Internet commands you can use through the Gateway.

Table 2–1: Sample Internet Commands and Their Functions

Command	Function
ftp	Starts an **ftp** session.
ftp> append	Copies a local file to the end of a remote file.
ftp> ascii	Sets the file transfer type to ASCII mode.
ftp> binary	Sets the file transfer type to binary image mode.
ftp> bye	Closes an **ftp** session.
ftp> cd	Changes the current remote directory.
ftp> close	Terminates a connection to a remote node.
ftp> delete	Deletes a single remote file.
ftp> dir	Lists the contents (in long form) of a remote directory.
ftp> disconnect	Terminates a connection to a remote node.
ftp> get	Copies a remote file to the local directory. (Same as **ftp> recv**.)
ftp> ls	Displays the names of files in the remote directory.
ftp> mdelete	Deletes multiple remote files.
ftp> mget	Copies multiple remote files to the local directory.
ftp> mput	Copies multiple local files to the remote directory.

(continued on next page)

Table 2–1 (Cont.): Sample Internet Commands and Their Functions

Command	Function
ftp> open	Starts a connection to a remote node.
ftp> put	Copies a local file to the remote directory. (Same as **ftp> send**.)
ftp> pwd	Displays the full path name of the current remote directory.
ftp> quit	Closes the **ftp** session.
ftp> recv	Copies a remote file to the local directory. (Same as **ftp> get**.)
ftp> send	Copies a local file to the remote directory. (Same as **ftp> put**.)
ftp> type	Shows current file transfer type.
mail	Sends mail to remote DECnet users.
telnet	Provides log on to remote DECnet nodes.

2.2 Logging On to a Remote DECnet Node

You can use the Gateway to log on to a remote DECnet node. Once you have logged on, or established a remote login session with the remote node, you can use programs running on that node. This section shows you how to begin and end a remote login session.

You must have an account on the remote node before you can log on.

2.2.1 Beginning a Remote Login Session

To log on to a DECnet node through the Gateway, type **telnet** and the Gateway host name at the system prompt. In the following example, the Gateway host is BOSTON:

```
% telnet boston RET
```

When the Gateway's login prompt appears, type the name of the DECnet node you want to log on to, followed by a double colon. In the following example, the target DECnet node is LYONS.

```
boston login: lyons:: RET
```

The DECnet node then prompts you for the DECnet user name and password set up for you on that system. In this example, the user is Dube. The password does not appear, or echo, when you type it.

```
Username: DUBE RET
Password: secret RET  (not echoed)

    Welcome to VAX/VMS version V5.2 on node LYONS
Last interactive login on Thursday, 4-SEP-1990 13:13
```

User Dube is now logged in to the remote DECnet node and can run programs, work with files, and perform other tasks. For information about the tasks and activities you can perform on remote DECnet nodes, see the documentation for those nodes.

NOTE

If you specify the user name or password incorrectly, you must start over. If you try to finish logging on without breaking the connection,

you will be logging on to the Gateway node instead of the target node or host.

2.2.2 Ending a Remote Login Session

You end your remote login session by logging off the remote node. To log off the remote DECnet node, simply type the remote node's logout command. Logout commands vary; for example, the command is LOGOUT for DECnet–VAX systems and **bye** for DECnet–RSX systems. If you do not know the logout command for the remote operating system you are connected to, see that system's documentation.

The following example shows a complete remote login session. User Dube logs on to the DECnet node LYONS, deletes a file, and types the VMS LOGOUT command to end the remote login session:

```
% telnet boston  RET
Trying...
Connected to boston.
Escape character is '^]'.
boston login: lyons::  RET

Username: DUBE  RET
Password: secret RET  (not echoed)

    Welcome to VAX/VMS version V5.2 on node LYONS
Last interactive login on Thursday, 4-SEP-1990 13:13

$ DELETE TESTFILE.TXT;*  RET
$ LOGOUT  RET
  DUBE          logged out at 1-SEP-1990 13:18:30.29
dlogin -- session terminated
Connection closed by foreign host.
%
```

2.3 Exchanging Mail

The **mail** utility lets you communicate with DECnet users across the Internet. To send mail to a DECnet user, enter the **mail** command followed by the user's mail address. The mail address includes this information:

- Recipient's DECnet user name
- Recipient's DECnet node name
- DECnet communication domain symbol (dnet)
- Gateway host name

Use the following format:

mail *username%node.dnet@gate*

where

username	is the user assigned to the target account.
node	is the target DECnet node name.
dnet	is the DECnet psuedo-domain name.
gate	is the DECnet–Internet Gateway host name.

The "%" and "@" symbols are separators in the mail address format.

The following example shows the Internet user Susan sending a message to the DECnet user Simone on node PARIS. The Gateway host is BOSTON.

```
% mail simone%paris.dnet@boston [RET]
Subject: Today's teleconference postponed [RET]
[RET]
The team teleconference scheduled for today is postponed to [RET]
Tuesday, May 29th, at 2 PM.  [RET]
[RET]
                                        Susan [RET]
[CTRL/D]
CC:ben [RET]
%
```

2.4 Working with Files on Remote DECnet Nodes

You can use **ftp** commands to work with files and directories on remote DECnet nodes. The Gateway supports twenty **ftp** commands, which are discussed in the following sections and in the *ULTRIX Reference Pages, Section 1*.

To use **ftp**, first start an **ftp** session. You start a session by invoking the **ftp** program. The session lasts until you end it. During an **ftp** session, you see the **ftp>** prompt.

You also establish a connection with the remote DECnet node that you want to access. Once connected, you can use **ftp** commands to manipulate files and directories on that node.

The following sections describe specific tasks you can perform using **ftp** commands.

2.4.1 Starting an ftp Session

To start an **ftp** session, simply type **ftp** at the system prompt. For example:

```
% ftp [RET]
ftp>
```

2.4.2 Ending an ftp Session

To end an **ftp** session, type **bye** or **quit** at the **ftp>** prompt. For example:

```
ftp> quit [RET]
%
```

2.4.3 Connecting to a Remote DECnet Node

To access files on a remote DECnet node using **ftp**, you first need to establish a connection to that node. Once you are connected to a node, you can use **ftp** commands to work with files and directories on that node.

You can connect to a node before or after you have started the **ftp** session. Perform one of the following steps:

- If you have not started the **ftp** session yet, type the **ftp** command and the Gateway name at the Internet system prompt. In this example, the Gateway system is BOSTON:

  ```
  % ftp boston [RET]
  ```

- If you have already started the **ftp** session, type the **open** command and the Gateway name at the **ftp>** prompt. In this example, the Gateway system is BOSTON:

```
ftp> open boston RET
```

When the Gateway prompts you for a user name, specify the name of the DECnet node to which you want to connect and your user name on that node. Enter the information in this format: *node::username*.

In this example, BOSTON is the Gateway host name, PARK is the target DECnet node name, and Renee is the DECnet user name.

```
Name (boston:renee): park::renee RET
```

Finally, enter the password at the Password prompt. The password does not appear on your screen, or echo, when you type it. For example:

```
Password (boston:park::renee): secret RET  (not echoed)
```

NOTE

You may not receive an error message if you enter your password incorrectly. The system simply does not execute your commands. Instead, it displays messages such as "Requested file action not taken," "Broken pipe," and "Directory unavailable."

Also, the message, "Access control rejected," may indicate that your DECnet node name/user name string may be too long for the **ftp** implementation you are using. (Some implementations set a 16-character name limit.) Section 4.3 tells you how to correct this incompatibility.

Here is an example of the complete connection process. Again, the Gateway is BOSTON, the DECnet node is PARK, the user is Renee, and the password is **secret**.

```
% ftp RET
ftp> open boston RET
Connected to boston.
220 boston FTP server (Version 4.1 Sun Aug 7 19:42:25 EDT 1990) ready.
Name (boston:renee): park::renee RET
Password (boston:park::renee): secret RET  (not echoed)
331 Password required for gateway access park::renee.
230 Access control info received.
ftp>
```

2.4.4 Disconnecting from a Remote DECnet Node

To end your connection to a remote DECnet node, type the **close** or **disconnect** command at the **ftp>** prompt. For example:

```
ftp> close RET
221 Goodbye.
ftp>
```

Note that the **close** command does not end the **ftp** session.

2.4.5 Viewing Remote Directories

While you are connected to a remote DECnet node, you can use directories on that node, as follows:

To display the name of the current remote directory, type the **pwd** command at the **ftp>** prompt. For example:

```
ftp> pwd RET
257 "[RENEE]" is current directory.
ftp>
```

To change the current remote directory, type the **cd** command followed by the name of the directory. Enter the complete path name of the remote directory in the syntax expected by the remote system. If you do not specify the directory name, the system prompts you for one. For example:

```
ftp> cd [renee.memos] RET
250 CWD command successful.
ftp>
```

or

```
ftp> cd RET
(remote-directory) [renee.memos] RET
250 CWD command successful.
ftp>
```

To return to the home directory after accessing a subdirectory in **ftp**, specify the full path name and the correct directory syntax with the **cd** command. You can also close and reopen your connection to return to the home directory.

To display the names of the remote files, type the **ls** command. For example:

```
ftp> ls RET
200 PORT command successful.
150 Opening data connection for dls (123.45.6).
BC.LN03;3
BC.TXT;12
STATUS.SDML;2
TIPS.TXT;
226 TRANSFER COMPLETE.
54 bytes received in 0.83 seconds (0.064 Kbytes/s)
ftp>
```

For an expanded display, type the **dir** command. For example:

```
ftp> dir RET
200 PORT command successful.
150 Opening data connection for dls (123.45.6).
BC.LN03;3         rwxrwxr-x--    14-MAR-90 12:55:10    29266   [430,501]
BC.TXT;12         rwxrwxr-x--    12-MAR-90 00:12:55     7718   [430,501]
STATUS.SDML;2     rwxrwxr-x--    19-APR-90 10:19:15     6534   [430,501]
TIPS.TXT;1        rwxrwxr-x--    22-DEC-89 07:53:59     2038   [430,501]
226 TRANSFER COMPLETE.
300 bytes received in 0.71 seconds (0.41 Kbytes/s)
ftp>
```

2.4.6 Displaying Remote Files

To display a remote file, type the **get** command followed by the name of the remote file and a hyphen. For example:

```
ftp> get team.txt - RET
200 PORT command successful.
150 Opening data connection for
    park/renee/password::team.txt (123.45.6)
This file lists all the reviewers for Tim's book:
Jim
Susan
Pat
William
Dan S.
Dan M.
Maryellen
226 Transfer complete.
remote: team.txt
111 bytes received in 0.15 seconds (0.72 Kbytes/s)
ftp>
```

The hyphen indicates that you want the file to be displayed. If you omit the hyphen, the system copies the remote file to your local directory, without displaying anything.

The **recv** command works exactly like **get**.

2.4.7 Setting the File Transfer Type

You can transfer, or copy, ASCII and binary files using **ftp** commands. Set the Gateway file transfer type to ASCII when you transfer ASCII files and to binary (image mode) when you transfer binary files. By default, the Gateway transfers files in ASCII.

You can display and set the file transfer type using the **ftp** commands shown in the following examples.

To display the current file transfer type, enter the **type** command. For example:

```
ftp> type RET
Using binary mode to transfer files.
ftp>
```

To set the file transfer type to ASCII, enter the **type ascii** or **ascii** command. For example:

```
ftp> type ascii RET
200 Type set to A.
ftp>
```

or

```
ftp> ascii RET
200 Type set to A.
ftp>
```

To set the file transfer type to binary image mode, type the **type binary** or **binary** command. For example:

```
ftp> type binary RET
200 Type set to I.
ftp>
```

or

```
ftp> binary  RET
200 Type set to I.
ftp>
```

2.4.8 Copying Files Between Systems

While you are connected to a remote DECnet node, you can copy files to and from that node. The following examples illustrate the different ways you can copy files with **ftp** commands.

To copy a remote file, type either the **get** or **recv** command, followed by the remote file name. If you want the copy to have a different name, also type the local file name. The **get** and **recv** commands are interchangeable.

In this example, a local file name is not specified, so **ftp** creates a local file with the same name as the remote file:

```
ftp> recv tasks.lis RET
200 PORT command successful.
150 Opening data connection for
    park/renee/password::tasks.lis (123.45.6)
226 Transfer complete.
local: tasks.lis remote:tasks.lis
6010 bytes received in 0.8 seconds (7.3 Kbytes/s)
ftp>
```

In this example, a local file name is specified:

```
ftp> get tasks.lis tasks RET
200 PORT command successful.
150 Opening data connection for
    park/renee/password::tasks.lis (123.45.6)
226 Transfer complete.
local: tasks remote:tasks.lis
6010 bytes received in 0.41 seconds (14 Kbytes/s)
ftp>
```

NOTE

If you use the **get** or **recv** command and type a hyphen instead of specifying a local file name for the file, the file is displayed without being copied.

To copy multiple remote files, type the **mget** command, followed by the remote file names. The system prompts you to accept or reject each file. Press RET for yes or type **n** for no. The following example uses the wildcard character (*) to copy all the files with the .txt extension:

```
ftp> mget *.txt [RET]
mget MEMO73.txt;1 ? [RET]
200 PORT command successful.
150 Opening data connection for
    park/renee/password::memo73.txt;1 (123.45.6)
226 Transfer complete.
local: MEMO73.TXT;1 remote:MEMO73.TXT;1
24000 bytes received in 1.1 seconds (21 Kbytes/s)
mget DOCTYPE.TXT;2 ? n [RET]
mget DOCTYPE.TXT;3 ? [RET]
200 PORT command successful.
150 Opening data connection for
    park/renee/password::doctype.txt;3 (123.45.6)
226 Transfer complete.
local: DOCTYPE.TXT;3 remote:DOCTYPE.TXT;3
9398 bytes received in 6.6 seconds (1.4 Kbytes/s)
ftp>
```

To copy a local file to a remote file, type either the **send** or **put** command, followed by the local file name and the remote file name (optional). The **send** and **put** commands are interchangeable. For example:

```
ftp> send team.txt newteam.txt [RET]
200 PORT command successful.
150 Opening data connection for
    park/renee/password::team.txt (123.45.6)
226 Transfer complete.
local: team.txt remote: newteam.txt
6010 bytes sent in 0.4 seconds (42 Kbytes/s)
ftp>
```

To copy multiple local files to a remote node, type the **mput** command, followed by the local file names. The system prompts you to accept or reject each file. Press [RET] for yes or type **n** for no.

The following example uses the wildcard character (*) to copy every file named **status**, no matter what its extension:

```
ftp> mput status.* [RET]
mput status.dat ? [RET]
200 PORT command successful.
150 Opening data connection for
    park/renee/password::status.dat (123.45.6)
226 Transfer complete.
local: status.dat remote: status.dat
6010 bytes sent in 0.1 seconds (50 Kbytes/s)
mput status.txt ? [RET]
200 PORT command successful.
150 Opening data connection for
    park/renee/password::status.txt (123.45.6)
226 Transfer complete.
local: status.txt remote: status.txt
6010 bytes sent in 0.14 seconds (42 Kbytes/s)
ftp>
```

To copy a local file to the end of a remote file, type the **append** command followed by the local file name and the remote file name. The following example appends the local file **scores** to the remote file **team.txt**:

```
ftp> append scores team.txt [RET]
200 PORT command successful.
150 Opening data connection for
    park/renee/password::team.txt (123.45.6)
226 Transfer complete.
local: scores remote: team.txt
9398 bytes sent in 0.59 seconds (16 Kbytes/s)
ftp>
```

You cannot use the **append** command to copy a remote file to the end of a local file.

2.4.9 Deleting Remote Files

To delete a single remote file, type the **delete** command followed by the filename. For example:

```
ftp> delete team.txt [RET]
250 DELE command successful.
ftp>
```

If you do not specify the file name after the delete command, the system prompts you for the file name. For example:

```
ftp> delete [RET]
(remote-file) team.txt [RET]
250 DELE command successful.
ftp>
```

To delete multiple remote files, type the **mdelete** command and the file names. The system prompts you to accept or reject each file. Press [RET] for yes or type **n** for no. For example:

```
ftp> mdelete memo.txt memo.ln03 memo.ps [RET]
mdelete MEMO.TXT;1? [RET]
250 DELE command successful.
mdelete MEMO.LN03? [RET]
250 DELE command successful.
mdelete MEMO.PS? [RET]
250 DELE command successful.
ftp>
```

You can use wildcards when you use the **mdelete** command. For example:

```
ftp> mdelete memo.* [RET]
mdelete memo.ln03 ? [RET]
250 DELE command successful.
mdelete memo.txt;10 ? n [RET]
mdelete memo.txt;9 ? [RET]
250 DELE command successful.
mdelete memo.txt ? [RET]
250 DELE command successful.
ftp>
```

Chapter 3

Using the Gateway from a DECnet Node

This chapter tells you how to perform these tasks while logged on to a DECnet node:

- Log on to an Internet host
- Exchange mail with an Internet host
- Work with files on an Internet host

Note that the examples in this chapter assume that your DECnet node is a VMS system. Your DECnet node might be another DECnet system, such as DECnet–VAX or DECnet–RSX. In that case, you might use different commands to perform the tasks described in this chapter.

3.1 Sample DECnet–VAX Commands

Table 3–1 lists common DECnet–VAX commands you can use through the Gateway.

Table 3–1: Sample DECnet–VAX Commands and Their Functions

Command	Function
APPEND	Copies a remote file to the end of a local file.
COPY	Transfers a file to or from an Internet host.
DELETE	Deletes a file.
DIRECTORY	Displays the file names in an Internet directory.
MAIL	Sends mail to remote Internet users.
SET HOST	Provides remote login to Internet systems.
TYPE	Displays the contents of a file.

3.2 Logging On to a Remote Internet Node

With the DECnet–Internet Gateway, you can use the VMS SET HOST utility to log in to an Internet host as an Internet user. Once you have logged on, or established a remote login session with the Internet host, you can use programs running on that host. This section shows you how to begin and end a remote login session.

You must have an account on the remote node before you can log on.

3.2.1 Beginning a Remote Login Session

To log on to an Internet host through the Gateway, type the SET HOST command and the Gateway host name at the system prompt. In this example, the Gateway is BOSTON:

```
$ SET HOST boston [RET]
```

When the Gateway node displays a login prompt, enter the target Internet host name and an exclamation point (!). Do not include spaces or tabs in this string.

```
login: lyons! [RET]
```

The Internet host then prompts you for access-control information. You can log in as usual by entering your user name and password. In this example, the user name is Renee. Your password does not appear on the screen as you type it.

```
lyons login: renee [RET]
Password: secret [RET]  (not echoed)

Last login: Thu Jun 28 11:57:49 from 1.0.0.6
4.3 BSD UNIX #0: Thu May 29 11:18:26 EDT 1990
```

User Renee is now logged in to the Internet host and can run programs, work with files, and perform other tasks. For information about the tasks and activities you can perform on the Internet host, refer to the documentation describing the host.

NOTE

If you specify the user name or password incorrectly, you must start over. If you try to finish logging in without breaking the connection, you will be logging in to the Gateway node instead of the target Internet host.

3.2.2 Ending a Remote Login Session

You end the remote login session by logging off the remote Internet node. To log off, simply type the remote node's logout command. Logout commands vary from system to system; your system may require [CTRL/D] or **logout**. If you do not know the logout command for the remote operating system you are working on, see that system's documentation.

The following example shows a complete remote login session. User Renee uses the Gateway node BOSTON to log on to the Internet host LYONS. Then Renee displays the **report.2** file and presses [CTRL/D] to end the login session:

```
$ SET HOST boston [RET]

Ultrix V4.0 (boston)

login: lyons! [RET]
Trying...
Connected to lyons.
Escape character is '^]'.
lyons login: renee [RET]
Password: secret [RET]  (not echoed)
Last login: Thu Jun 28 11:57:49 from 1.0.0.6
4.3 BSD UNIX  0: Thu May 29 11:18:26 EDT 1990

% cat report.2 [RET]
This report outlines the results of our last experiment.
.
.
.
```

```
% logout [RET]
$
```

3.3 Exchanging Mail

The MAIL utility lets you communicate with Internet users. To send mail to an Internet user, enter the MAIL command followed by the user's mail address. The mail address consists of the Gateway node name, the recipient's Internet host name, the recipient's Internet user name, and the communication domain (optional).

Use the following format:

MAIL *gate*::"*username@host*[.*DOMAIN*]"

where

gate	is the DECnet–Internet Gateway node name, which is a string of 1 to 6 alphanumeric characters.
username	is the user name assigned to the target Internet account.
host	is the target Internet node name.
DOMAIN	is the communication domain, which is optional. Each Internet host has a **sendmail** file for routing mail in a heterogeneous network. Each system manager can configure **sendmail** for different types of mail addressing. Whether or not the domain is required depends on how your network is configured. Some examples of domains are ARPA, UUCP, and LOCAL. For more information about **sendmail**, refer to the *ULTRIX Reference Pages, Section 8*, and the article entitled "SENDMAIL - An Internetwork Mail Router" in the *ULTRIX Supplementary Documents, Volume III*.

Here is a sample DECnet–VAX mail message that Dave is sending through the Gateway BOSTON to Sarah, a user on the Internet host TULSA:

```
$ MAIL [RET]

MAIL> send [RET]
To:     boston::"sarah@tulsa" [RET]
Subj:   Vacation [RET]

Enter your message below.  Press CTRL/Z when complete, or CTRL/C to quit:

I won't be able to attend the meeting next week because [RET]
I will be on vacation. [RET]

                                        Dave [RET]

 [CTRL/Z]
Exit

MAIL> exit [RET]
$
```

3.4 Working with Files

From your DECnet system prompt, you can use five DECnet–VAX commands to work with files and directories on an Internet host: APPEND, COPY, DELETE, DIRECTORY, and TYPE. The following sections on Gateway-supported DECnet–VAX commands explain how to type command lines, which tasks you can perform with these commands, and how to shorten your file specifications.

3.4.1 Using DECnet–VAX Commands

When you use DECnet–VAX commands through the Gateway, you must specify the Gateway name, access-control information, and file-specification information. Use either of the following formats:

command gate"inet!username password"::"filename"

command gate"username@inet password"::"filename"

where

command	is a Gateway-supported DECnet command.
gate	is the DECnet–Internet Gateway node name, which is a string of up to 6 alphanumeric characters.
inet	is the target Internet host name contained in the access-control information.
username	is the user assigned to the target Internet account. This is part of the access-control information that you supply to the target node.
password	is the Internet user's password. This is part of the access-control information that you supply to the target node.
filename	is the string of alphanumeric characters that identifies the file. It can be an absolute specification, such as **/bin/login**, or a relative one, such as **directory/file2.c**. The file name is optional.

NOTE

Enclose the file name in quotation marks. Otherwise, VMS interprets the file name according to DCL command syntax, changing lowercase characters to uppercase and adding an extension and version number to the file name. The access-control information must also be set off in quotation marks.

3.4.2 Viewing Remote Directories

To list the file names in remote Internet directories, type the DIRECTORY command and specify the directory and files (optional) you want displayed. For example:

```
$ DIRECTORY boston"bean!a_lima topsecret":: RET

Directory BOSTON"bean!a_lima password"::

Message1            dnetcheck.rnd       doctype.txt         inventory
tasks.s             team.txt

Total of 6 files.
$
```

NOTE

This command lists only the file names within specific directories; any other information you receive may be incorrect.

3.4.3 Displaying Remote Files

To display remote Internet files, enter the TYPE command followed by the file name. For example:

```
$ TYPE boston"bean!a_lima topsecret"::"team.txt" RET
Here are the members of Bill's design team:
Jim, Susan, Pat, William, Maryellen, Dan S. and Dan M.
$
```

3.4.4 Copying Files Between Systems

To copy a remote file to your local system, type the COPY command followed by the remote file name and the local file name. For example:

```
$ COPY boston"bean!a_lima topsecret"::"dnetcheck.rnd" dnetcheck.txt RET
```

To copy a local file to a remote system, type the COPY command followed by the local file name and the remote file name. For example:

```
$ COPY easynotes.lis boston"bean!a_lima topsecret"::"easynotes.lis" RET
```

To copy the contents of a remote file to the end of a local file, type the APPEND command followed by the remote file name and the local file name. In the following example, the phone numbers in the remote file **phones.txt** are copied to the end of the local file **team.txt**:

```
$ APPEND boston"a_lima@bean topsecret"::"phones.txt" team.txt RET
```

3.4.5 Deleting Remote Files

To delete a remote file, type the DELETE command followed by the name of the remote file to be deleted. For example, both of the following command lines remove the file **report.1** from Kiko's account on the Internet host TOKYO. The password is **secret**; the Gateway node name is BOSTON.

```
$ DELETE boston"tokyo!kiko secret"::"report.1" RET
$ DELETE boston"kiko@tokyo secret"::"report.1" RET
```

Notice that the file name must be in lowercase type enclosed within quotation marks to ensure that the Internet host receives the file name in lowercase as required.

3.4.6 Using Shortcuts in File Specifications

To shorten the file specifications that you type, you can use wildcard characters and logical names.

3.4.6.1 Using Wildcard Characters

Both the Gateway and the VMS operating system support the asterisk (*) wildcard character. The asterisk replaces a string of alphanumeric characters.

When you want your DECnet node to interpret a wildcard character, just include it in the file specification. The following example copies all files ending with **.c** from a DECnet node to the target host NEWLONDON. Note that the file names will appear in VMS format (uppercase text with version numbers) at the destination.

```
$ COPY *.c boston"newlondon!sailor racetime":: RET
```

When you want the target Internet host rather than your DECnet node to interpret a wildcard character, enclose the file specification in quotes. For example, the following command removes all files ending with **.c** from Liana's account on the Internet host NEWYORK:

```
$ DELETE boston"newyork!liana sailing"::"*.c" RET
```

3.4.6.2 Using Logical Names

You can define a logical name to use in place of the Gateway node name, target host name, and access-control information in a file specification. Using a logical name can help improve accuracy and convenience.

Use the VMS DEFINE command to define a logical name as follows:

DEFINE *logical-name*"*gate*""*inet*!*username password*""::"

where

logical-name	is the new name that you assign to a portion of the file specification. This string can contain 1 to 255 characters, including alphanumerics, the dollar sign, or the underscore.
"gate""inet!username password""::"	is the Gateway node name, Internet host name, Internet user name, and password that you want to associate with the logical name. This string can contain 1 to 255 characters, including alphanumerics, the dollar sign, or the underscore. As this format shows, you enclose the string in quotation marks and use two sets of quotation marks ("") in the places where you want one quotation mark (") to appear.

NOTE

You cannot use the *username@inet* format when you define logical names.

For example, the following command assigns the logical name SIDNEY to the Gateway node name BOSTON, target host name SIDNEY, user name Charlie, and password **downunder**. Notice that the string includes the double colon that normally follows a node name in a DECnet–VAX file specification.

```
$ DEFINE sidney "boston""sidney!charlie downunder""::" RET
```

Include your logical name in your **login.com** file, so it is redefined every time you log in.

Once you have defined a logical name, you can use it in place of the file specification. In the following example, **sidney** replaces the **boston"sidney!charlie downunder"::** string.

```
$ COPY file.dat sidney RET
```

3.5 Special Considerations for Non-UNIX-Based Internet Systems

If you are transferring text files from a non-UNIX-based Internet system, watch for the following:

- A file you transfer appears on your system with no end-of-line terminators.
- The file transfer fails, and an error message indicates that the record was too large for your buffer.

These problems may indicate that the Gateway's default data transfer mode is inappropriate for transferring files from non-UNIX-based Internet systems. Contact your system administrator. For more information, see Section 4.4.

Chapter 4

Managing the Gateway

This chapter tells you how to manage the DECnet–Internet Gateway by performing these tasks:

- Controlling access to Gateway functions
- Keeping a log of connections to the Gateway

As this chapter also shows, you can manage these common Gateway situations:

- Handling length restrictions for access-control information
- Special considerations for non-UNIX-based Internet systems

You need superuser or system administrator privileges to perform these tasks.

4.1 Controlling Access to the Gateway

Your system can perform as a Gateway node only if the Gateway software has been enabled. If, when you were installing DECnet-ULTRIX, you configured your node to run the Gateway software, it was enabled at that time. The following sections describe how you can manually control file transfer and remote login for both DECnet and Internet networks.

NOTE

You do not have to enable the mail systems; both DECnet and Internet mail systems run in Gateway mode when DECnet–ULTRIX is installed.

If you enable access in both directions (from DECnet to Internet and from Internet to DECnet) the Gateway operates as a bidirectional gateway. You can also configure the Gateway as a unidirectional gateway by disabling either DECnet-to-Internet or Internet-to-DECnet access. With access in only one direction enabled, the Gateway functions as a unidirectional gateway. The following sections describe how to enable and disable access in both directions. Note that the DECnet–ULTRIX installation configures the Gateway, by default, as a bidirectional gateway.

4.1.1 Controlling Access from DECnet to Internet

You can control the use of your node as a DECnet Gateway for file transfer and remote login functions. (This task requires system administrator privileges.)

To enable or disable DECnet file transfer and remote login Gateway functions, use the **ncp set executor** command:

```
ncp set executor gateway access [ enabled  ]
                                [ disabled ]
```

The **enabled** option turns on DECnet Gateway access, and the **disabled** option turns it off. The following example turns on DECnet Gateway access:

```
$ ncp set executor gateway access enabled RET
```

To use file transfer, you must also define the Gateway user. When a Gateway node receives a file-access request, its DECnet object spawner tries to verify any access-control information that the request contains. However, since that information is for the destination Internet host, not for the Gateway node, the DECnet object spawner sets the privileges for the object (on the Gateway node) to those of the Gateway user.

Define the Gateway user with the following **ncp** command format:

ncp set executor gateway user *login-name*

where *login-name* specifies the default login name for the Gateway. To ensure system security, give the Gateway user **guest** privileges. For example, the following command defines the Gateway user as **guest**, because **guest** has limited user privileges.

```
% ncp set executor gateway user guest RET
```

4.1.2 Controlling Access from Internet to DECnet

You can control the use of your node as an Internet Gateway for file transfer functions or remote login functions or both. This task requires superuser privileges.

To enable or disable Internet file transfer and remote login functions, edit the file **/etc/inetd.conf**, then stop the **inetd** process and restart it. When you edit **/etc/inetd.conf**, find the lines that contain the following daemon names:

```
/etc/ftpd
/etc/telnetd
/etc/ftpd.gw
/etc/telnetd.gw
```

To turn on Gateway file transfer services, delete the pound sign (#) in front of the line containing **/etc/ftpd.gw**, and add a pound sign in front of the line containing **/etc/ftpd**. When the lines look like this, access is turned on:

```
#ftp      stream   tcp   nowait     /etc/ftpd      ftpd
 ftp      stream   tcp   nowait     /etc/ftpd.gw   ftpd
```

To turn on Gateway remote login services, delete the pound sign (#) in front of the line containing **/etc/telnetd.gw**. Then add a pound sign at the beginning of the line containing **/etc/telnetd**. For example:

```
#telnet   stream     tcp    nowait    /etc/telnetd     telnetd
 telnet   stream     tcp    nowait    /etc/telnetd.gw  telnetd
```

After you edit **/etc/inetd.conf**, stop the **/etc/inetd** process by using the **kill** command in the following format:

kill -9 *process-number*

In this example, the user finds the process number for **inetd**, kills the process, and restarts it:

```
# ps -ax | grep inetd [RET]
  104 ?  I      0:02 /etc/inetd
 1789 18 S      0:00 grep inetd
# kill -9 104 [RET]
# /etc/inetd [RET]
       [1] 1792
```

4.2 Keeping a Log of Connections to the Gateway

You can keep records of connections to the Gateway, including file-access and remote-login connections.

4.2.1 File-Access Connections

You can keep records of file-access connections in two ways: through the file **/usr/adm/wtmp**, which keeps track of **ftp** activity, and through the **syslog** function, which keeps track of File Access Listener (**fal**) activity.

To view the contents of **/usr/adm/wtmp**, enter the **last** command as follows:

```
% last gateway [RET]
gateway   ftp       boston      Mon Aug  3 15:59 - 16:03  (00:04)
gateway   ttyp0     MONTRL      Mon Aug  3 15:54 - 15:59  (00:01)
gateway   ttyp0     atlant      Mon Aug  3 15:51 - 15:55  (00:01)
```

Each **ftp** Gateway entry in **/usr/adm/wtmp** lists **gateway** as the user name, **ftp** as the type of request, the name of the node that issued the request, the date and time, and the duration of the connection. In the following example, node BOSTON made the request and the connection lasted for 4 minutes:

```
gateway   ftp       boston      Mon Aug  3 15:59 - 16:03  (00:04)
```

Note that **/usr/adm/wtmp** also keeps track of remote login activity; for more information, refer to the following section.

For each **fal** connection, the **syslog** function records the process number, object name, type of access, node name, Gateway user name, target host, file name, and exit time. Each entry begins with the date, time, and local host. In this example, 1482 is the process number. The connection is from **art** on node MONTRL.

```
Aug 29 13:57:02 localhost: 1482 fal: DIRECTORY access from
MONTRL::ART, user=guest, to host=boston, filename=a.c
```

For more information about **syslog**, see **syslog(8)** in the *ULTRIX Reference Pages, Section 8.*

4.2.2 Remote-Login Connections

You can keep records of remote-login connections in the file **/usr/adm/wtmp**, which contains an entry for each **telnet** and **dlogin** connection.

Entries for **dlogin** and **telnet** in **/usr/adm/wtmp** list **gateway** as the user name, the terminal type (**ttyp***n*), the name of the node issuing the request, the time and date, and the duration of the connection. In this example, ttyp0 is the terminal, and MONTRL is the requesting node:

```
% last gateway RET
gateway    ttyp0      MONTRL      Mon Aug  3 15:54 - 15:55  (00:01)
```

When **dlogin** logs a request, the node name appears in uppercase, as in the previous example. When **telnet** logs the request, the node name appears in lowercase.

To view **/usr/adm/wtmp**, issue the **last** command.

4.3 Handling Length Restrictions for Access-Control Information

Some implementations of **ftp** limit access-control information to 16 characters. If your DECnet node name and user name exceed 16 characters (including the double colon), the remote DECnet node rejects the access.

Other **ftp** implementations limit passwords to 8 characters. In this case, you may receive an "Access control rejected" message if your DECnet password is longer than 8 characters.

Avoid violating these restrictions by establishing a new account on the DECnet node with a user name of 8 or fewer characters and a password of 8 or fewer characters. If this method is not possible, there are other solutions depending upon the **ftp** implementation you are using. Two possible solutions follow.

4.3.1 Establishing Connections Through .netrc Files

Some implementations support **ftp** connections through a file named **.netrc**. The **.netrc** file allows the user to specify the remote **ftp** system, user name, and password. The **ftp** utility reads the file and uses the information contained within it instead of prompting the user. This file must exist in the user's home directory and, if it contains a password, must be readable only by the user.

Entries in **.netrc** should have the following format:

```
machine gateway_name
login decnet_node_name::user_account_name
password user_account_password
```

For example, user **massachusetts_man** on the VMS system JEWEL with the password *massachusetts* would bypass login prompting when using the Gateway system FOCUS if the following entry existed in **.netrc** in his home directory:

```
machine focus
login jewel::massachusetts_man
password massachusetts
```

4.3.2 Using the quote Command

If your **ftp** implementation supports the use of the **quote** command, you can use it to bypass user and password size restrictions. However, there is no way to disable echoing of the password to the screen.

To use the **ftp quote** command, invoke **ftp** with autologin disabled (use the **-n** option). At the **ftp>** prompt, enter the **ftp** command name preceded by **quote**. To send the user name, enter **quote user** *user_account_name*. To send the password, enter **quote pass** *user_account_password*. The following example shows how to use the **quote** command:

```
% ftp -n focus RET
Connected to focus.
220 focus FTP server (Version 4.1 Tue Mar 1 16:47:05 EST 1990) ready.
ftp> quote user jewel::massachusets_man RET
331 Password required for gateway access jewel::massachusetts_man.
ftp> quote pass massachusetts RET
231 Access control info received.
ftp>
```

4.4 Special Considerations for Non-UNIX-Based Internet Systems

Users may encounter problems if they initiate file transfers with a non-UNIX-based Internet system that does not use a newline \n as the end-of-line terminator.

By default, the Gateway performs image mode transfers over the Internet connection and allows the DECnet connection to handle any data conversions. However, this default mode assumes that the newline character denotes end-of-line.

If a file transfer to a DECnet system using **copy** (or another DECnet file transfer command) results in a file with no end-of-line terminators or in an error message of "record too large for the user's buffer," it may be the result of the Gateway's default data transfer mode. This is true for text files only.

You can solve this problem by configuring the Gateway to force the Internet connection to preserve the data transfer mode. For example, if you perform an ASCII mode transfer over the Internet connection when the transfer mode for the DECnet connection is ASCII, you must set the environment variable **fal_inet** to **nonunix**.

Be aware that if you do force the Gateway connection to preserve the data transfer mode over the Internet connection, an incompatibility may arise in **ftp** implementations based on the Berkeley 4.2 BSD implementation.

As part of the ULTRIX V3.0 product, changes based on 4.3 BSD have been incorporated into some of the Internet applications. As a result, the same changes have been incorporated into **fal** for the Internet connection handling.

One of the incorporated changes based on 4.3 BSD is the handling of embedded carriage returns (not end-of-line indicators) in ASCII text files. Prior to 4.3 BSD, as well as in earlier versions of the ULTRIX product and the DECnet–Internet Gateway product, if an embedded carriage return was not immediately followed by a newline character, a null character was inserted into the data stream following the carriage return. On the receiving side, the null character was discarded before writing the data to a file.

The default mode for the Gateway follows 4.3 BSD conventions. That is, a null character is not inserted into the data stream if an embedded carriage return is found in a file, nor is a null character inserted into a data stream following a carriage return stripped.

If the Internet systems to which you are transferring files through DECnet-initiated commands are based on 4.2 BSD, and if you expect to transfer files that may contain embedded carriage returns, set the **fal** environment variable **fal_ascii** to **crnul**.

Note that this variable will have meaning only if you have also set **fal_inet** to **nonunix**. If not, the data transfer over the Internet connection occurs in binary mode, thus preventing data conversions.

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